Dolphin Imaging User's Guide

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Welcome

Congratulations on your decision to purchase Dolphin Imaging.

This manual describes how to use Dolphin Imaging features to improve information flow in your practice. It describes how to capture patient images into the Dolphin Imaging program, perform cephalometric analyses, modify images for patient presentations, and use treatment simulation and prediction tools.

Dolphin Imaging software is designed specifically for clinicians and trained assisting staff. Results produced by Dolphin's diagnostic and treatment planning tools are dependent on the interpretation of trained and licensed practitioners.

Indications for Use

Dolphin Imaging software is designed for use by specialized dental practices for capturing, storing and presenting patient images and assisting in treatment planning and case diagnosis. Additionally the 3D Surgery module can be used to design 3D guides to assist during surgery. Results produced by Dolphin's diagnostic and treatment planning tools are dependent on the interpretation of trained and licensed practitioners.

Getting Training

To help you get the most out of your Dolphin Imaging system, we highly recommend the comprehensive in-office training. You can also arrange to attend training in Dolphin's California facility. Dolphin trainers are experienced and certified in clinical and treatment coordination. With this background, they are very knowledgeable in how to enhance your practice by using the imaging and diagnostic tools that Dolphin Imaging provides. To arrange a training session, contact Dolphin.

Contacting Technical Support

If you need help, you can contact Dolphin in any of these ways:

By E-mail	support@dolphinimaging.com: A support technician will respond to your message within 24 hours.
By Telephone	Toll free from the US and Canada: 1 800.548.7241 Toll free from Australia: 1.800.881.011 (wait) 800.548.7241 Toll free from New Zealand: 000.911 (wait) 800.548.7241 From all other countries: +1 818.435.1368 Telephone support hours are 5:00 AM to 6:00 PM Pacific Time (8:00 AM to 9:00 PM Eastern Time). At other times, you may leave a message on our emergency pager by calling 1 818.687.6327.
By Fax	+1.818.435.1369
Web site	www.dolphinimaging.com provides the latest product information and a list of local Dolphin representatives.

Software License Acknowledgments

Dolphin Imaging version 12 includes Open Source projects under various licenses as listed below. The license files can be found in the Dolphin installed folder.

Project/Name	Website	License File
DCMTK 3.6	dicom.offis.de/dcmtk.php.en	**DCMTK_COPYRIGHT.txt**
VolPack	graphics.stanford.edu/software/volpack	**VolPack-License.pdf**
PCL	pointclouds.org	**PCL-License.txt**
BOOST v1.0	www.boost.org	**Boost-license.txt**
Eigen3	eigen.tuxfamily.org	**Eigen3-License.txt**
Flann	github.com/flann-lib/flann	**Flann-License.txt**
FFmpeg n4.3.221	ffmpeg.org	**ffmpeg-license.pdf**
zLib v1.2.8	www.zlib.net	**zlib-License.pdf**
GMP v5.0.1.0	web.archive.org/web/20070303202950/https:/gmplib.org/#DOWNLOAD	**gmp-License.pdf**
VTK	vtk.org	**VTK-License.pdf**

Typographical Conventions

File names and directory names: These are shown in Courier. For example:

> The **DOLPHIN.INI** file contains system settings for the Dolphin Imaging software.

Optional parameters and variables: Optional parameters appear in square brackets ([]). Variables that you replace with actual values are shown in italic courier. In the following example:

File#=*Label*, *Format*, [*BitsPerPixel*,] *FileFormula*
[ExitRoutineBatchFile=*PathName*]

Label, ***Format***, ***BitsPerPixel***, ***FileFormula***, and ***PathName*** are all variables that you replace with actual values. **BitsPerPixel** and **ExitRoutineBatchFile=*PathName*** are optional parameters, which you may omit.

Keyboard combinations: Keys that you press together are shown with a plus sign between them. For example:

Press ALT+A

Part I: Installation

This part of the *Dolphin Imaging User's Guide* describes how to install Dolphin Imaging to improve information flow in your practice.

Before following the installation instructions, go to www.dolphinimaging.com/imaging.html and click **Minimum Requirements** for information on the system requirements for installing Dolphin Imaging.

The Dolphin Imaging software is distributed on DVD. If you do not have a DVD drive, you can request an installation CD from Dolphin. In addition, Dolphin Imaging software updates can be downloaded automatically over the Internet.

1 Installing Dolphin Imaging

As of version 12, Dolphin Imaging is a 64-bit application. Whereas previous versions could only use 2GB of RAM regardless of how much memory your computer had, Dolphin Imaging can now use up to 2 billion times as much memory. As a result Dolphin Imaging can load larger DICOM datasets, larger digital model files, and so on. This 64-bit version is also faster at loading high-resolution camera photos (though we still recommend setting your camera to no more than five megapixels for optimal images and optimal performance). The Email feature now supports both the 32-bit and 64-bit editions Microsoft Outlook, and the Dolphin Letter System now supports both the 32-bit and 64-bit editions of Microsoft Word.

Because of Dolphin Imaging's database structure, several components must be installed before the imaging software. There are times when user interaction is required, so **it is very important that you follow along with the instructions.**

Depending on your system configuration, a technician may need to work with you during the installation:

- If the workstation that you're upgrading is **stand-alone** (not on a network), you can install the software without a technician's help.
- If you run Dolphin Imaging over a **network**, you may need the assistance of a local technician to prepare your network for the database components. Have your local technician call Dolphin for requirements prior to their visit to your office. This helps the installation process in a couple ways:
    - The tech will be better prepared for their visit.
    - Dolphin can find out when your technician will be visiting your office so that a Dolphin technician can be available if needed.

The core database installation can take between 15-25 minutes, so please make sure that you have ample time before beginning installation.

Before installing, please note the following requirements for installation. For more information on minimum system requirements and recommendations, go to www.dolphinimaging.com/req.

- You can mix Dolphin Imaging 12 with Dolphin Imaging versions 10.0 or later; you are not required to upgrade all computers in your practice at once. However, you cannot mix Dolphin Imaging 12 with Dolphin Imaging versions earlier than 10.0.
- Your computer must meet the minimum system requirements for installing Dolphin Imaging.
- If you are installing on a computer running Microsoft Windows Server, you need to install the following prerequisite features, which are included with Server but not automatically installed:
    - Microsoft .NET
    - Windows installer
    - Windows PowerShell

- Dolphin Imaging 12 is not compatible with Dolphin Aquarium versions earlier than version 3. If you have Dolphin Aquarium, please upgrade to version 3 before installing Dolphin Imaging 12.

In addition, please review the following recommendations:

1 As with any major upgrade, please perform a complete backup of your system before installing the new software!

2 Shut down any open programs before beginning the installation.

3 If you are using Dolphin Imaging over a network, make sure that the imaging software has been closed on all the workstations. Install this update on the station where your patient files are stored (the server) before updating the other workstations!

Licensing

If you are currently using a licensing scheme that uses USB security dongles and mail-in registration numbers, you need to upgrade to the DOLI licensing system, which deploys licenses to you automatically through the Dolphin Update Service. Please review the following frequently-asked questions to determine whether you need to upgrade to the DOLI licensing scheme.

How can I tell which type of licensing I have currently?

In most cases, practices that have not yet upgraded to the DOLI licensing have a black or purple security key plugged into the USB port on the computer running Dolphin Imaging. The following picture illustrates the purple USB Dolphin security key.

Within Dolphin Imaging, practices that have not yet upgraded to DOLI licensing will see a Module Activation option on the Tools menu accessible from the Dolphin Imaging main screen. However, practices that use DOLI licensing will see a Dolphin Licensing option on the Tools menu instead. For more information, see “Viewing and Updating Licenses” on page 3-73.

How do I go about upgrading to DOLI?

1 Contact Dolphin Inside Sales (see http://www.dolphinimaging.com/Contact/RegionalMap) to request the upgrade. Dolphin will arrange for the DOLI licensing software to be downloaded to your computer using the Dolphin automatic update service (DUS).

2 Once the upgrade has been downloaded and installed, verify that the system is working properly.

3 Mail your security dongle back to Dolphin.

Are there any circumstances in which I must upgrade to DOLI?

Yes. DOLI is required for all Dolphin Imaging installations starting with version 12. Starting with version 12, Dolphin Imaging is not compatible with the dongle-based licensing scheme.

Does DOLI support "floating" licenses?

Yes, as long as all the licenses are on the same office network (for example, if your office purchased five licenses that float between twelve computers on your office network). If you have more than one office network, each network must be licensed separately. If you have more than one office network, contact your Dolphin sales representative for multi-office licensing details.

How can I find out what DOLI licenses I have?

1 From the Dolphin Imaging main screen, select Dolphin Licenses... from the Tools menu.

The Dolphin Imaging Licenses dialog box opens and lists the licenses you have purchased.

For more information, see "Viewing and Updating Licenses" on page 3-73.

How can I get additional DOLI licenses?

You can add previously-unlicensed modules (such as the Dolphin 3D Orthognathic Surgical Planning module). In addition, you can increase the number of floating licenses you have for modules that limit the number of concurrent users.

1 Contact Dolphin Inside Sales (see http://www.dolphinimaging.com/Contact/RegionalMap) to purchase additional licenses.

Dolphin will authorize the new licenses to be downloaded to your computer.

2 Download the new licenses to your computer.

To update your licenses from within Dolphin Imaging:

a From the Dolphin Imaging main screen, select Dolphin Licenses... from the Tools menu.

b Click **Refresh Licenses**.

To use the Dolphin automatic update service (DUS) to update your licenses:

a Click the DUS icon ( ) in the Microsoft Windows tray.

b In the Dolphin Update Service dialog box, click the **About** tab.

c Click **Refresh License**.

Do I have to be connected to the Internet to use my DOLI licenses?

No. Once you have downloaded your licenses, you don't need to maintain an Internet connection to use them. An Internet connection is only required to download newly-purchased licenses.

Using Microsoft SQL Server Standard Edition

Dolphin Imaging includes Microsoft SQL Server Express, which is a free edition of SQL Server. If you have a large practice, however, you may prefer to purchase and use the standard edition of Microsoft SQL Server. In this case, you need to install it before installing Dolphin Imaging.

Generally speaking, you should follow the installation instructions provided by Microsoft for the version of Microsoft SQL Server Standard Edition that you are installing. There are, however, a few instances where you need to make specific choices or enter information to enable Dolphin Imaging to connect to your SQL Server database.

To install Microsoft SQL Server Standard Edition for use with Dolphin Imaging:

1 Launch the Microsoft SQL Server Standard Edition installation.

2 Follow the installation program's prompts to begin installing Microsoft SQL Server Standard Edition.

3 When the Feature Selection dialog box appears, make sure that the following features are selected: Database Engine Services, Client Tools Connectivity, Client Tools Backward Compatibility, and Management Tools-Complete.

4 When the Instance Configuration dialog box appears, select **Named Instance** and enter **`Dolphin`** in the field.

Dolphin Imaging expects the database instance to be named **`Dolphin`**, so using this name enables Dolphin Imaging to find the database without further configuration. If you name the database instance something else, you will need to explicitly configure Dolphin Imaging to use that name for its database. For more information, see “Troubleshooting” on page 1-17.

5 When the Server Configuration dialog box appears, set up accounts as follows:

Service	Account Name	Startup Type
SQL Server Database Engine	Local System or *Domain*\Administrator, where *Domain* is the name of your domain (for example, Dolphin)	Automatic
SQL Server Browser	NT AUTHORITY\Network Account	Automatic

6 When the Database Engine Configuration dialog box appears, enter the following options:

- Select **Mixed Mode** as the Authentication Mode.
- Enter a strong password for the SQL Server system administrator account. A strong password is 1-128 characters long and includes letters, digits, and symbols.
- Specify the SQL Server administrators. You can click **Add Current Account** to add your account as a server administrator. If you are not presently logged in using the Domain account created for Dolphin, make sure to add that account as well.

7 Follow the installation program's prompts to complete the Microsoft SQL Server Standard Edition installation.

8 Once you have completed the installation, call Dolphin to have the Server administrator's password changed.

Starting the Dolphin Imaging Installation

Depending on the number of computers in your practice, you may need to install Dolphin Imaging on the following types of workstations:

Stand-alone workstation	Typically used in practices that only need one computer running Dolphin Imaging. A stand-alone workstation has everything you need to use the Dolphin Imaging program. Although the Dolphin database resides on this computer, other computers cannot access it.
Dolphin database server	Typically used in practices that need several computers running Dolphin Imaging and sharing patient data in a single Dolphin database. The Dolphin database resides on this server, and other Dolphin Imaging workstations (clients) access the database over the network. You can also use the Dolphin Imaging program on this computer.
Client workstation	Typically used in practices that need several computers running Dolphin Imaging and sharing patient data in a single Dolphin database. Client workstations running Dolphin Imaging all share patient data in a single Dolphin database residing on the Dolphin database server.

You can install Dolphin Imaging on any type of workstation (stand-alone, database server, or client) by following the procedure described in “Typical Installation” below.

If your practice uses a Dolphin database server and several client workstations, you can automate the installation and update processes as described in “Automating Dolphin Imaging Installation and Updates” on page 1-14.

Typical Installation

You must use this procedure when you initially install Dolphin Imaging on a stand-alone workstation or a Dolphin database server. You can also use this procedure to install Dolphin Imaging on client workstations.

To start the installation:

1 Close any open programs.

2 Choose one of the following methods to start the installation process.

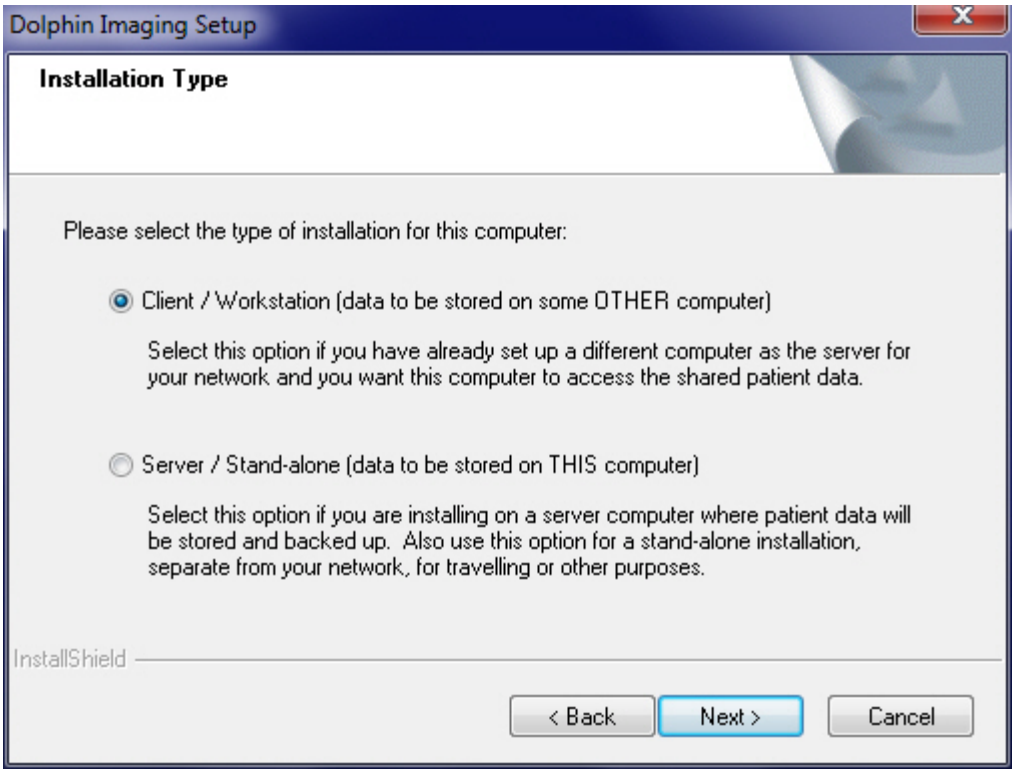
- Place the installation DVD into your DVD drive. The installation will begin automatically. If the DVD was already inserted when the computer booted up, eject and reinsert the DVD to begin installation.
- Start the installation process from Windows Explorer by selecting **Computer** or **This PC**. Then, double-click the **Dolphin DVD** icon. Installation should begin within a few seconds.

The Welcome dialog box appears and lists options for installing the software, viewing the documentation, and installing prerequisite software (Internet Explorer and Adobe Reader). If you need to install Internet Explorer, the installation program will prompt you to do so. For information on viewing the documentation and installing Adobe Reader, see Chapter 2, Introduction to Dolphin Imaging.

3 Click **Install Dolphin**.

The Dolphin Imaging installation procedure starts.

4 Follow the instructions on the installation dialog boxes until the following dialog box appears:

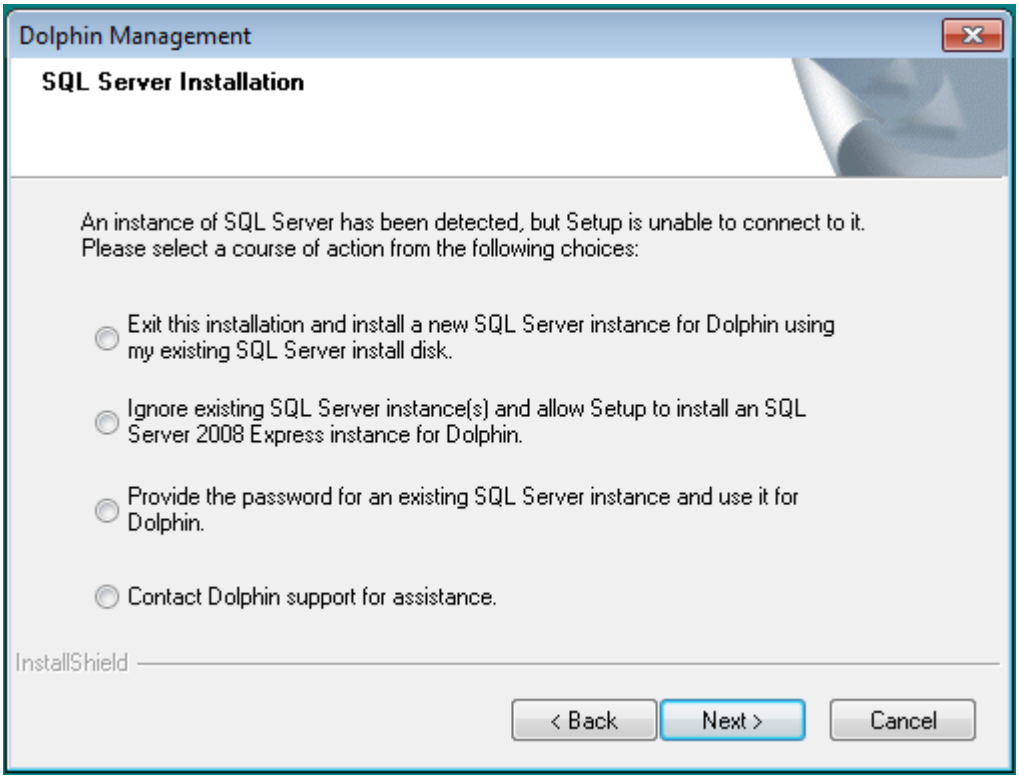


5 Select the type of workstation on which you are installing Dolphin Imaging. Then, click **Next >**.

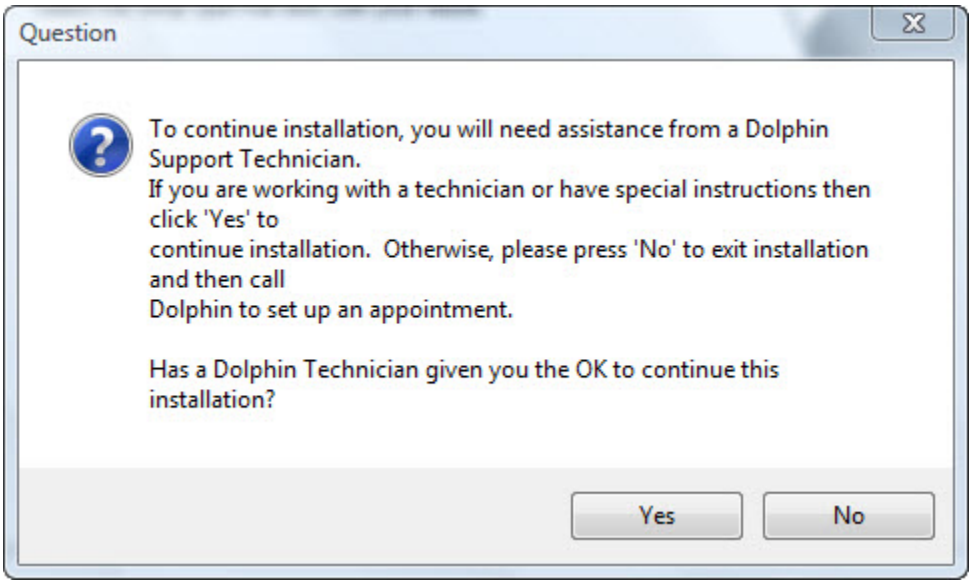
Select from the following options:

Client/Workstation	Select this option if you are installing Dolphin Imaging on a networked workstation that is not the Dolphin database server. If you select this option, continue your installation with “Installing the Dolphin Imaging Software” on page 1-10.
Server/Stand-alone	Select this option if you are installing Dolphin Imaging on a a stand-alone workstation or on a networked workstation that you want to use as the Dolphin database server. If you select this option, continue your installation with “Installing the Database Components” on page 1-8.

If you are installing the Dolphin Imaging software on a stand-alone workstation or a networked workstation that is the Dolphin SQL database server and you have already installed Microsoft SQL Server, the following dialog box may appear. If it does, see “Troubleshooting” on page 1-17 for information on how to resolve the issue.



If you are installing the Dolphin Imaging software on a networked workstation, you may need to work with a Dolphin support technician. The following dialog box gives you the option of exiting the installation procedure so that you can make an appointment with a Dolphin support technician.



6 Click **Yes** to continue the installation procedure on your networked workstation.

Or,

Click **No** to exit the installation procedure.

If you click **No**, the installation procedure exits. Once you have made an appointment with a Dolphin support technician, you can start the installation procedure again.

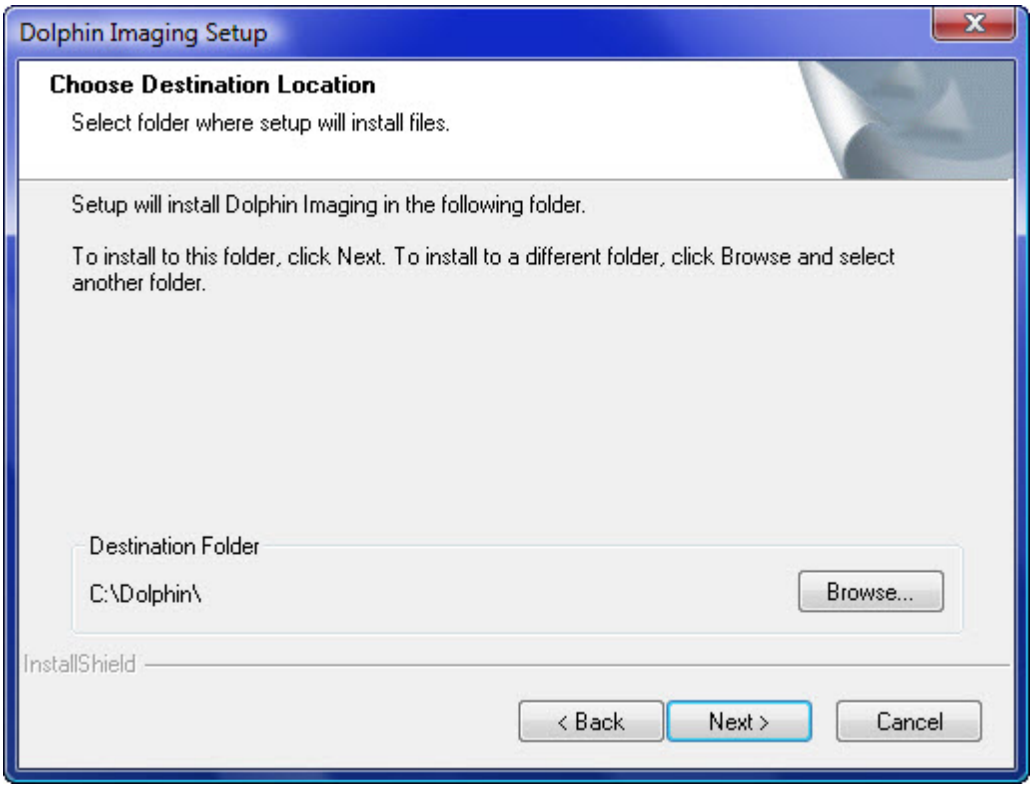
Installing the Database Components

Dolphin Imaging includes Microsoft SQL Server Express, which is a is a free edition of SQL Server. The instructions below describe how to install it as part of your Dolphin Imaging installation.

Note: *If you have a large practice, however, you may prefer to purchase and use the standard edition of Microsoft SQL Server. In this case, you should have installed it before installing Dolphin Imaging as described in "Using Microsoft SQL Server Standard Edition" on page 1-4, and you should skip this section.*

To install the database components:

If you are installing the Dolphin Imaging software on a stand-alone workstation or on a network workstation that is the database server, you see several progress dialog boxes as various database components are installed. Installing the database components may take several minutes. When the database component installation completes, the following dialog box appears:



This dialog box is the beginning of the Dolphin Imaging software installation. Continue your installation as described in “Starting the Dolphin Imaging Installation” on page 1-5.

Note: *If this is the first time you are installing Dolphin Imaging, SQL Server Management Studio Express will be installed along with Microsoft SQL Express.*

Enabling Multi-byte Characters

If you are running the Russian, Chinese, or Japanese version of Microsoft Windows, you can use Dolphin Imaging's multi-byte character support to enter patient data using Russian, Chinese, or Japanese characters.

Note: *Enabling multi-byte character support requires the assistance of a Dolphin Support representative. Also, multi-byte character support is not compatible with Dolphin Management, Mobile, or the Security Utilities.*

If you are installing the Dolphin Imaging software on a network server or stand-alone workstation running Microsoft Windows in Russian, Chinese, or Japanese, a prompt similar to the following will appear during installation. This prompt does not appear on networked workstations that are not network servers.

To respond to this prompt:

1 Optionally, check the **Don't show this message again** box.

If you check this box, this message won't appear in future installations on this computer.

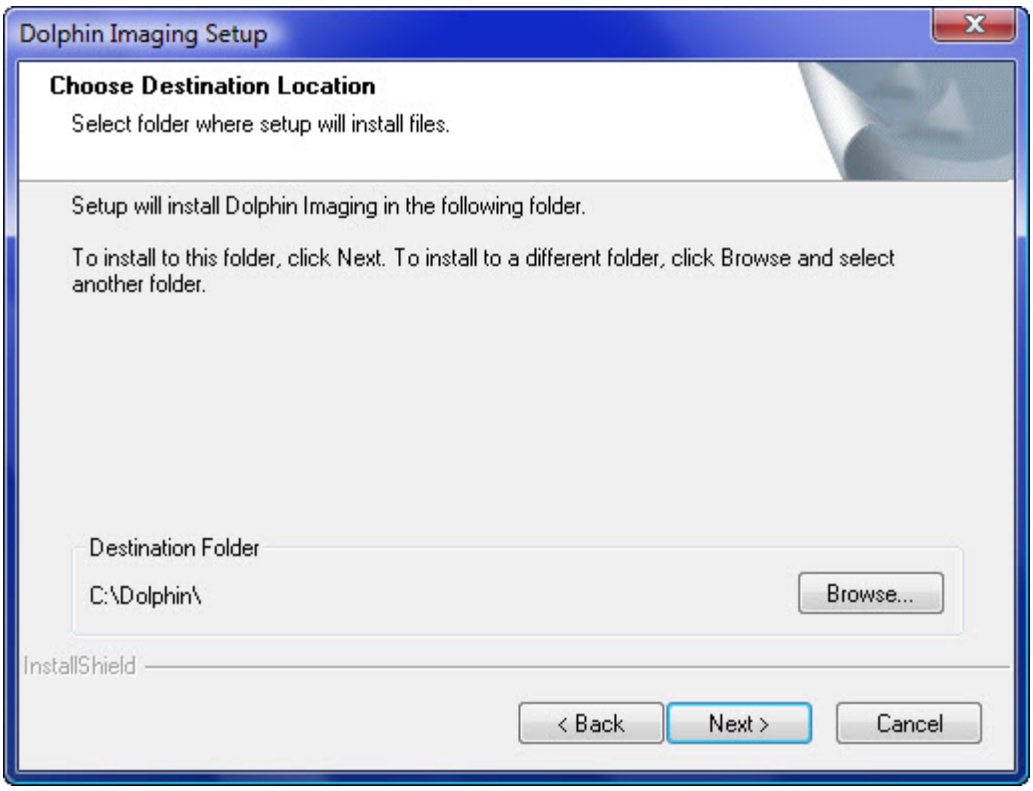
2 Click **OK**.

If you do not want to enable multi-byte character support, you can simply continue with the installation.

If you want to enable multi-byte character support, contact your Dolphin Support representative for assistance in making the necessary modifications to your Dolphin Imaging database.

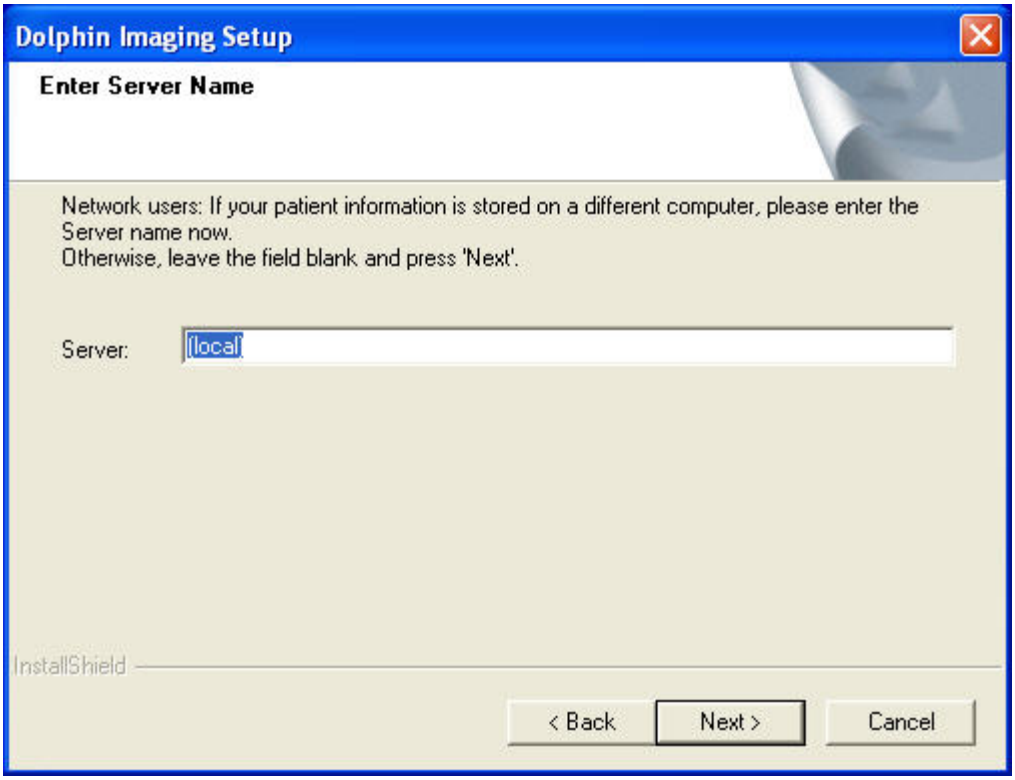
Installing the Dolphin Imaging Software

The Choose Destination Location dialog box shown below is the beginning of the Dolphin Imaging software installation.



To install the Dolphin Imaging software:

1 If you are installing the software on a networked workstation that is not the Dolphin server, follow the instructions on the installation dialog boxes until the following dialog box appears:



If you are installing the software on a stand-alone workstation or on a networked workstation that *is* the Dolphin server, this dialog box does not appear, and you should skip the next step.

2 If you are installing the software on a networked workstation that is not the Dolphin server, enter the name of the server followed by a back-slash (\) and the instance (typically “DOLPHIN”). For example, you might enter **`SERVER\DOLPHIN`**. Then, click **Next**.

3 Follow the instructions on the installation dialog boxes to install the software.

4 On the last installation dialog box, click **Finish**.

Installing the Security Utilities

The Security Utilities are a set of optional utilities that you may want to install to comply with national privacy acts such as HIPAA. These utilities include the following features:

- The ability to require Dolphin Imaging users to log in before they can use the software.
- The ability to set up employee login IDs and associate rights with them. This protects patient privacy by restricting access to various Dolphin Imaging features to authorized employees only.

You need to install the Security Utilities in order to access the following features, which are shared with Dolphin Management: Database Log, Document Organizer, Dolphin Ocean Client Administration[1], Location Rights[1], Employee Rights[1], Employee Types[1], Employees[1], Locations[1], My Orthodontist, One-Page Questionnaire[1], Password Setup[1], Patient Add and Edit (Dolphin Management interface)[1], Referring Doctors (Dolphin Management interface)[1], Reset Locks[1], SMS/Email Manager[1], Super Questionnaire[1], and Treatment Card[1].

If you want to install the Security Utilities, you can do so after you have installed Dolphin Imaging. If you want these utilities, bear the following considerations in mind:

- If you install the Security Utilities, you must install them on every Dolphin station on your network.
- If you use the Dolphin Practice Management System, please contact Dolphin support to enable the Security Utilities instead of installing them from the Dolphin Imaging installation media.
- The Security Utilities require that the Dolphin database be set to SQL Server 2005 (90) compatibility or higher. If you are not running the required SQL server or the Dolphin database SQL Server compatibility is set incorrectly, a message box appears and the installation fails. For information on resolving the problem, see “Microsoft SQL Server Compatibility” below.

To install the Security Utilities:

1 On the installation program's Welcome dialog box, click **Install Dolphin Premium Security Utilities**.

2 Follow the instructions on the installation dialog boxes to install the utilities.

After installing and before you set up your own employees and passwords, you can log into Dolphin Imaging using a default account. The default user name is admin and the password is admin.

Microsoft SQL Server Compatibility

If you were unable to install the Security Utilities:

- Make sure you are running a supported version of Microsoft SQL Server. For information on supported versions, go to www.dolphinimaging.com/req.
- Make sure that the compatibility level of your Dolphin database is set correctly.

You can use Microsoft SQL Server Management Studio or Microsoft SQL Server Management Studio Express to change the compatibility level of your Dolphin database as described below. Microsoft SQL Server Management Studio or Microsoft SQL Server Management Studio Express is installed when you install the Microsoft SQL Server.

1. Before a Dolphin Imaging user can access this feature, the associated Employee Right must be granted to that user’s account. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder)

To change the compatibility level of your Dolphin database:

1 Launch Microsoft SQL Server Management Studio or Microsoft SQL Server Management Studio Express.

To launch the appropriate program:

a On the **Start** menu, select the version of Microsoft SQL Server installed on your computer.

b Select **Microsoft SQL Server Management Studio** or **Microsoft SQL Server Management Studio Express**.

2 On the Connect to Server dialog box, select your Dolphin database server from the **Server name** drop-down list.

For example, your Dolphin database server might be called MYCOMPUTER\DOLPHIN.

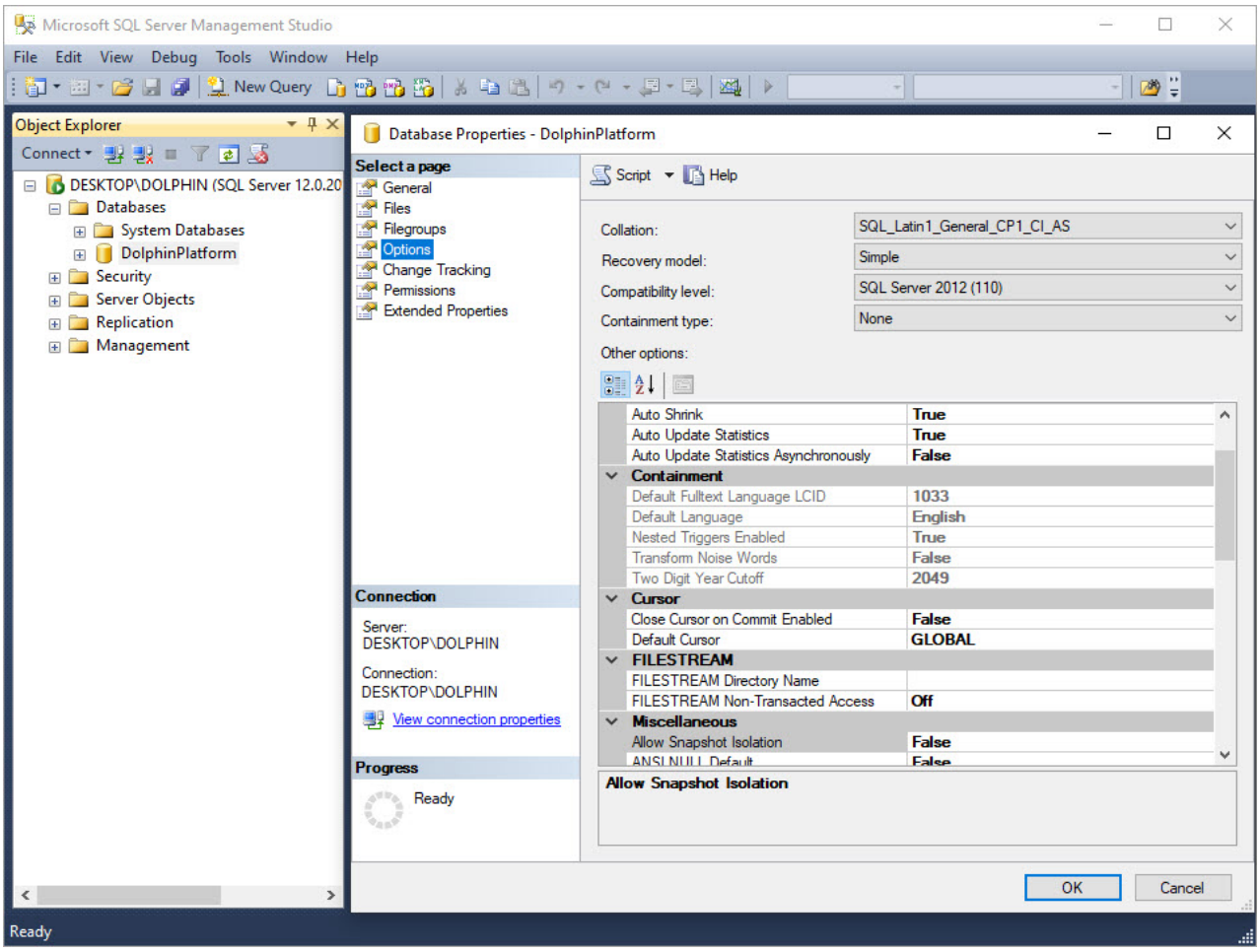
3 Click **Connect**.

4 In the Object Explorer pane, click the plus sign (**+**) next to Databases to see the available databases.

5 Right-click **DolphinPlatform** under Databases, and select **Properties** from the context menu.

6 In the Select a Page pane, click **Options**.

7 From from the **compatibility level** drop-down list, select the version of SQL Server that you have installed. Then, click **OK**.



Once you have changed the compatibility level of your Dolphin database, you need to stop and start the SQL Server for the change to take effect.

To stop and start the SQL Server:

1 In the Object Explorer pane, right click your Dolphin database server (for example, MYCOMPUTER\DOLPHIN). Then, select **Stop** to stop the SQL Server.

2 Click **Yes** on the confirmation message that appears to stop the SQL Server.

3 In the Object Explorer pane, right click your Dolphin database server again. Then, select **Start** to start the SQL Server.

4 Click **Yes** on the confirmation message that appears to start the SQL Server.

5 Select **Exit** from the **File** menu.

Once the SQL server is restarted, you can retry the Security Utilities installation.

Automating Dolphin Imaging Installation and Updates

Dolphin Imaging offers an unattended installation process that you can use to automate installation from a DVD onto several workstations. When installing Dolphin Imaging for the first time, you can only perform unattended installations on client workstations (not on stand-alone workstations or the Dolphin database server).

Before installing Dolphin Imaging on the client workstations:

1 Complete the installation of your Dolphin database server, making sure to specify a network path and not a local path for the Dolphin Imaging working folder.

For information on installing Dolphin Imaging on the Dolphin database server, see “Typical Installation” on page 1-5.

2 Copy the contents of the Dolphin Imaging installation DVD to a network location that is accessible by all client workstations.

Once these steps are complete, you can install Dolphin Imaging on the client workstations, typically using some type of network deployment tool.

To perform an unattended installation on the client workstations:

1 Copy the **DOLPHIN.INI** file from **C:\Windows** folder of the Dolphin database server to the **C:\Windows** folder on each client workstation.

The **DOLPHIN.INI** file contains system settings for the Dolphin Imaging software. Since the Dolphin Imaging software maintains many program settings individually for each workstation, each workstation needs to have its own copy of this file. For more information, see Appendix C, DOLPHIN.INI File.

2 Execute the Dolphin Imaging installation on each client workstation using the following command line:

```
\setup.exe /z"/accepteula"
```

You can also use your network deployment tool to automate updates whenever a new software version is downloaded by the Dolphin Update Service.

To perform an automated update:

1 Execute the Dolphin Imaging update procedure from within the **working\data\dus\updates** folder on the Dolphin database server using the following command line:

```
DIUP*.exe -ap "/z"/accepteula""
```

Installing the Dolphin Letter System

The Dolphin Letter System (DLS) is an optional module that simplifies and automates generation of referral and patient letters. Every letter can include your patient's digital pictures. You can choose from dozens of pre-defined, professionally written correspondence templates or easily customize your own.

To install DLS:

1 Close any open programs.

2 Choose one of the following methods to start the installation process.

- Place the installation DVD into your DVD drive. The installation will begin automatically. If the DVD was already inserted when the computer booted up, eject and reinsert the DVD to begin installation.
- Start the installation process from Windows Explorer by selecting **Computer** or **This PC**. Then, double-click the DLS DVD icon. Installation should begin within a few seconds.

3 When the installation program prompts you for the folder in which your Dolphin Imaging data is stored, click **Next>** if you are using the default folder (**C:\Dolphin\Working**).

Or,

If you are not using the default folder to store your Dolphin Imaging data, enter the location of the folder, and click **Next>**.

The installation program installs the DLS software.

Using an Encrypted SQL Connection

Using encryption on the connection between Dolphin Imaging and your SQL Server database provides an additional level of data security. Using encryption is optional. If you want to use encryption, you must explicitly enable it in your **DOLPHIN.INI** file, which contains system settings for the Dolphin Imaging software.

Note: *Encryption is supported for Microsoft SQL Server Express (the free edition of SQL Server that is included with Dolphin Imaging) and for the standard edition of Microsoft SQL Server.*

To enable encryption:

1 Add the following line to the **[Environment]** section of your **DOLPHIN.INI** file:

AddlConnString=Encrypt=True;TrustServerCertificate=True

This should be on a single line in the **DOLPHIN.INI** file.

For more information, see Appendix C, DOLPHIN.INI File.

Getting Software Updates

When you install the Dolphin Imaging software, the Dolphin Update Service (DUS) is automatically installed. This service automates Dolphin software updating. If your practice uses DOLI licensing (see "Licensing" below), DUS is also used to deliver newly-purchased DOLI licenses.

Note: *DUS does not support global* **DOLPHIN.INI** *configurations. To use DUS:*

- *A* ***DOLPHIN.INI*** *file must reside in the* ***C:\Windows*** *directory.*
- *If you are using a global* ***DOLPHIN.INI*** *file, the* ***[Environment]*** *section in the global* ***DOLPHIN.INI*** *should also be in the local copy of the* ***DOLPHIN.INI*** *file.*
- *The* ***SYS*** *setting in the* ***[Environment]*** *section of* ***DOLPHIN.INI*** *must point to the directory where Dolphin software is installed on the computer. Once installed, DUS reads the local* ***DOLPHIN.INI****. By design, it looks in the* ***C:\Dolphin*** *folder for a* ***DOLPHIN.INI*** *file. If it does not find it there, it looks in the* ***C:\Windows*** *folder for the* ***DOLPHIN.INI*** *file.*

For more information on the **DOLPHIN.INI** file, see Appendix C, DOLPHIN.INI File.

To install DUS:

1 Go to www.dolphinimaging.com/dus.

2 Follow the instructions to download and install the service.

After DUS is installed, the DUS icon ( ) appears in the Microsoft Windows tray.

If you see this icon blinking:

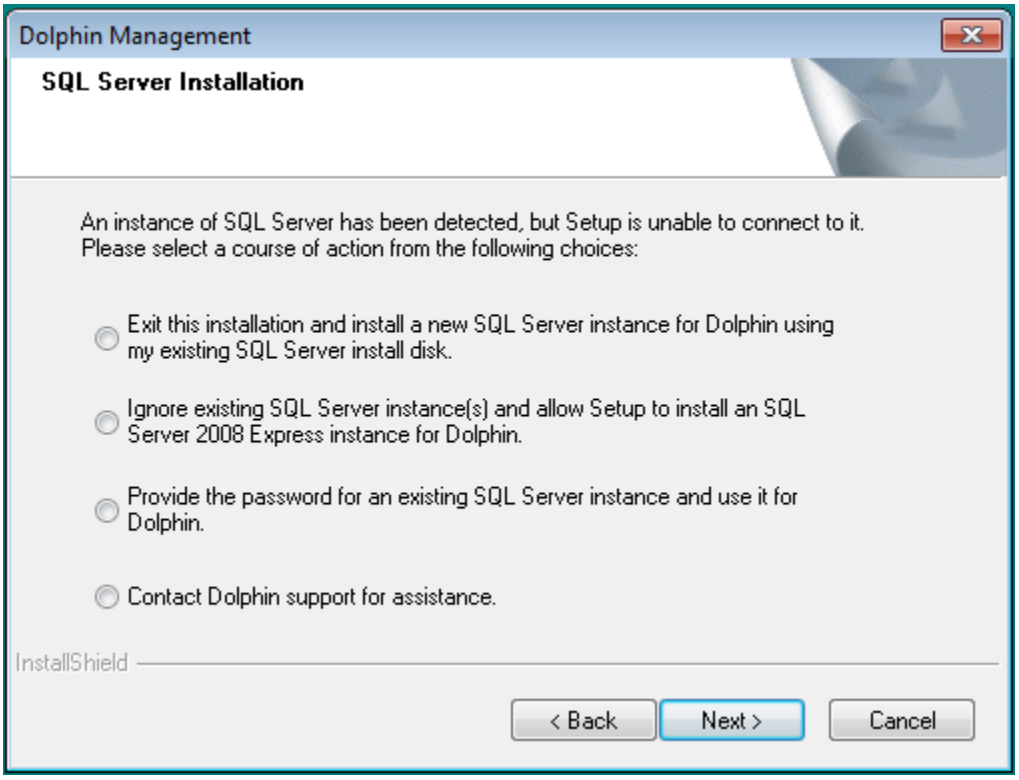
1 Point to with your mouse and follow the instructions that appear.

Troubleshooting

This section describes how to resolve some issues that might arise during or after installation.

Issues During Installation

If you are installing the Dolphin Imaging software on a stand-alone workstation or a networked workstation that is the Dolphin SQL database server and you have already installed Microsoft SQL Server, the following dialog box may appear during the Dolphin Imaging software installation.



To resolve this issue:

1 Select the third option.

2 Provide the password for an existing SQL Server instance and use it for Dolphin. Then, click **Next >**.

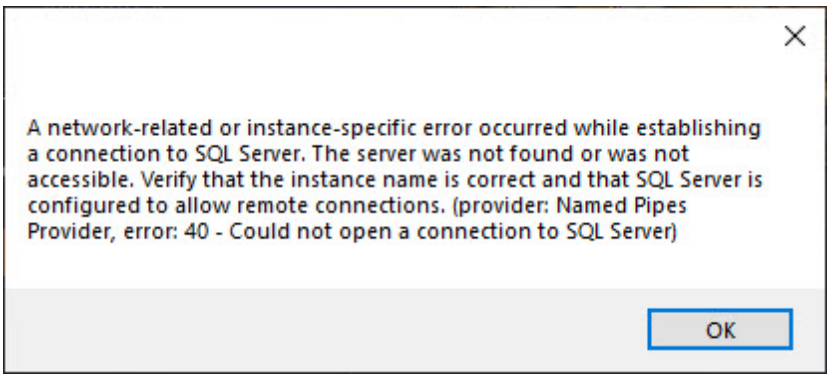
3 Select the SQL Server database instance from the drop-down list.

4 Enter the Server administrator's password.

For information on how the SQL Server database instance name and Server administrator's password were originally set up, see “Using Microsoft SQL Server Standard Edition” on page 1-4.

Issues After Installation

You may see the following error message when you try to launch Dolphin Imaging after installation:



To correct this error:

1 Select **Windows Administrative Tools** from the **Start** menu.

2 Select **Services**.

The Windows Services dialog box opens.

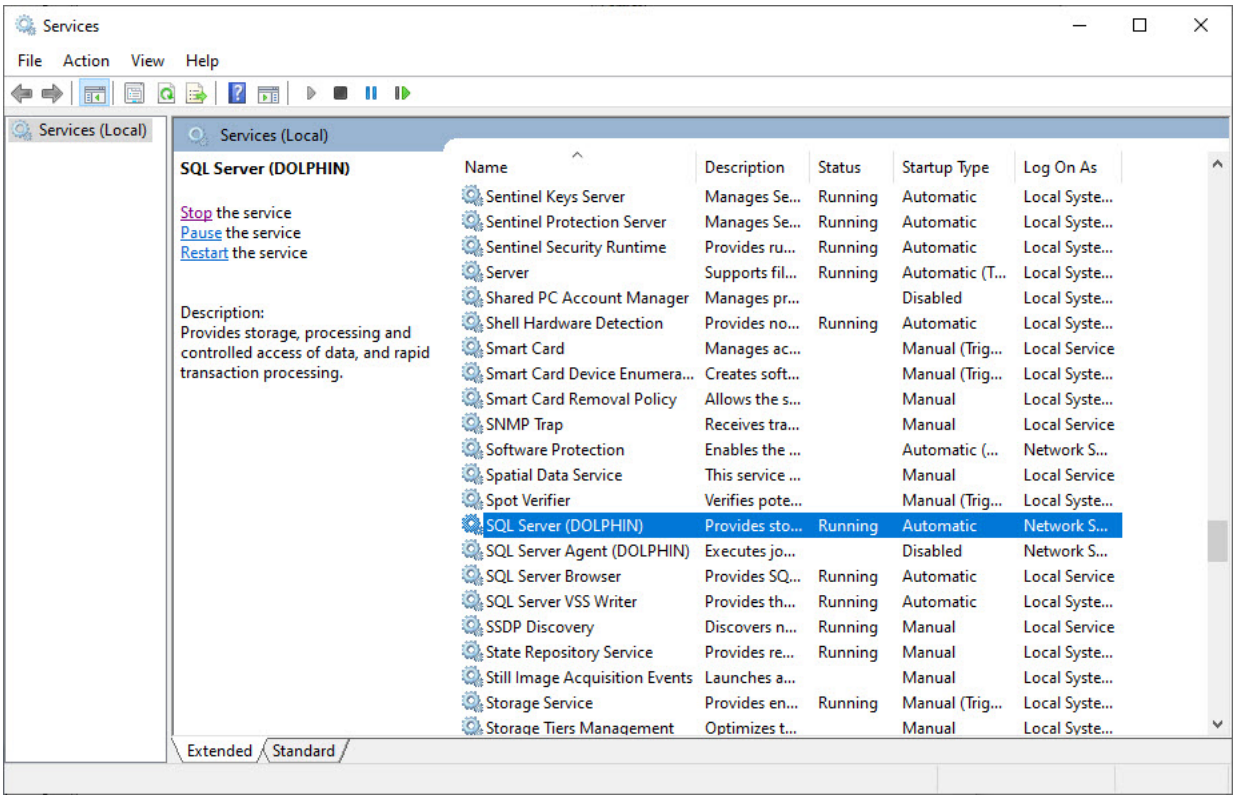
3 If the database service SQL Server (Dolphin) is present but its status is not Running, follow the steps under “To correct this error if the database service is present but not running:” below.

Or,

If the database service SQL Server (Dolphin) is present and its status is Running, follow the steps under “To correct this error if the database service is present and running:” below.

Or,

If the database service is not present, follow the steps under “To correct this error if the database service is not present:” on page 1-20.



To correct this error if the database service is present but not running:

1 Right-click the database service and select **Start** from the context menu.

2 Launch Dolphin Imaging.

If Dolphin Imaging still won't launch, follow the steps under “To correct this error if the database service is present and running:” below.

To correct this error if the database service is present and running:

1 Select **Windows Administrative Tools** from the **Start** menu.

2 Select **Computer Management**.

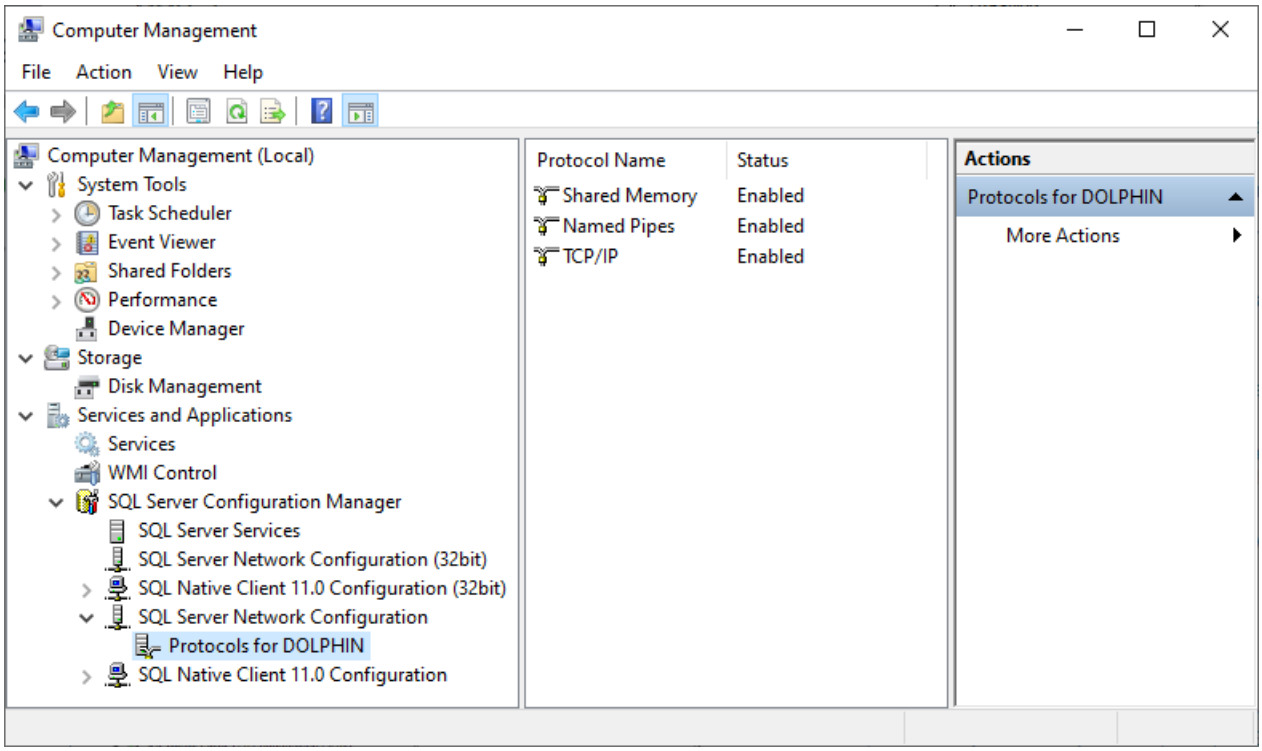
3 In the left pane of the Computer Management dialog box, expand Services and Applications.

4 Expand SQL Server Configuration Manager.

5 Expand SQL Server Network Configuration.

6 Click **Protocols for Dolphin**.

7 Make sure that Named Pipes and TCP/IP are both enabled (see below).



8 If either of these protocols is disabled, right-click it and select **Enable** from the context menu.

9 Click **SQL Server Services**.

10 Right-click **SQL Server (DOLPHIN)** and select **Restart** from the context menu.

To correct this error if the database service is not present:

1 Make sure that your computer meets the minimum requirements for Dolphin Imaging (see www.dolphinimaging.com/req).

2 Make sure your computer has all latest high priority Windows updates installed (see http://update.microsoft.com).

3 In the Microsoft Windows Explorer, right-click **C:\Dolphin**, and select **Properties** from the context menu.

4 On the Dolphin Properties dialog box, click the **Security** tab.

5 Click **Edit...**.

6 Select **Everyone** or **Authenticated Users**.

7 Check the **Full Control** box. Then, click **OK**.

8 Delete the **DOLPHIN.INI** file from the **C:\Dolphin** and **C:\WINDOWS** folders.

The **DOLPHIN.INI** file contains system settings for the Dolphin Imaging software, and it is installed in both your **Dolphin** and **Windows** folders. For more information, see Appendix C, DOLPHIN.INI File.

9 Re-run the Dolphin Imaging installer from the distribution DVD.

10 In the Microsoft Windows Explorer, right-click **C:\WINDOWS\DOLPHIN.INI**. Then, select **Properties** from the context menu.

11 On the Dolphin Properties dialog box, click the **Security** tab.

12 Click **Edit...**.

13 Select **Everyone** or **Authenticated Users**.

14 Check the **Full Control** box. Then, click **OK**.

15 Launch Dolphin Imaging.

Part II: Dolphin Basics

This part of the *Dolphin Imaging User's Guide* provides detailed information on using the basic features of the Dolphin Imaging software.

- Chapter 2, Introduction to Dolphin Imaging describes using the documentation and online help, starting and exiting from the software, and performing a pre-backup
- Chapter 3, The Dolphin Imaging Main Screen describes the image viewing features available on the main screen, its menus and tool bars, annotating and measuring using the patient's images, setting preferences and options, adding information about the doctors and insurance companies with whom your practice communicates, and setting up PACS communications.
- Chapter 4, Patient Charts describes using the Patient Lookup features to add and change, search for, and archive patient records.

2 Introduction to Dolphin Imaging

Dolphin Imaging is designed for orthodontic, oral maxillofacial surgery, and dental-specialty practices. Dolphin Imaging can assist your practice in the following ways:

- Electronically store and organize patient photos, x-ray images, and study model images.
- Perform computerized cephalometric analyses using standard analyses or your own customized analysis.
- Easily emphasize the condition or area of concern by zooming in on the patient's picture on the computer screen or by altering the patient's picture.
- Establish treatment goals by showing how the patient may look during and after treatment.
- Simulate surgical and orthodontic treatment outcomes based on scientific rules.
- Predict skeletal and soft tissue growth based on the Bolton and Ricketts studies.
- Create customized letters with pictures to patients, doctors, and other parties.
- Create, customize, and save slide show presentations.
- Drag-and-drop images into any application that supports drag-and-drop.
- Print patient images and treatment forecasts in pre-defined or customized layouts.

Using the Documentation

This manual is distributed both in electronic form in Adobe® portable document format (PDF). You can use Adobe Reader to view this manual online or print any or all of the pages. Adobe Reader is available free from the Adobe Systems web site. The Dolphin installation program provides a link to the Adobe Systems website for your convenience.

To install Adobe Reader from the Dolphin installation program:

1 Start the Dolphin installation program.

   For information on starting the Dolphin installation program, see Chapter 1, Installing Dolphin Imaging.

2 Click **Install Adobe Reader**.

3 Follow the instructions on the Adobe Systems web site to install Adobe Reader.

To view the documentation from the Dolphin installation program:

1 Start the Dolphin installation program.

For information on starting the Dolphin installation program, see Chapter 1, Installing Dolphin Imaging.

2 Click **View What's New** to view a list of enhancements for this version.

Or,

Click **View Getting Started Guide** to view the *Dolphin Imaging Getting Started Guide*.

Or,

Click **View Complete Manual** to view the *Dolphin Imaging User's Guide*.

To view the documentation after installation:

1 From the Microsoft Windows **Start** menu, select **All Programs**.

2 Select the **Dolphin** folder.

3 Click **What's New** to view a list of enhancements for this version.

Or,

Click **Getting Started** to view the *Dolphin Imaging Getting Started Guide*.

Or,

Click **Dolphin Manual** to view the *Dolphin Imaging User's Guide*.

To print the manual:

1 Open the file to print in Adobe Reader.

2 Select **Print** from the **File** menu.

A dialog box appears where you specify printing options.

3 Specify any printing options and click **OK**.

Using the Online Help

The online help provides the same information as the printed manual, but in an easy-to-use online format. The Dolphin Imaging online help is a Microsoft HTML Help system. The following information will get you started using the online help. For more detailed information on using the online help, refer to your Microsoft documentation.

To open the online help:

1 Choose **Contents** from the **Help** menu.

Or,

Press **F1** from any dialog box.

Or,

Click **?** on any dialog box where it appears.

If you press **F1** or click **?**, the online help opens to the topic for the dialog box you are currently using. If you choose **Contents** from the **Help** menu, the online help opens at a default topic.

Starting and Exiting Dolphin Imaging

To start Dolphin Imaging from the Microsoft Windows desktop:

1 Click .

To start Dolphin Imaging from the Microsoft Windows Start menu:

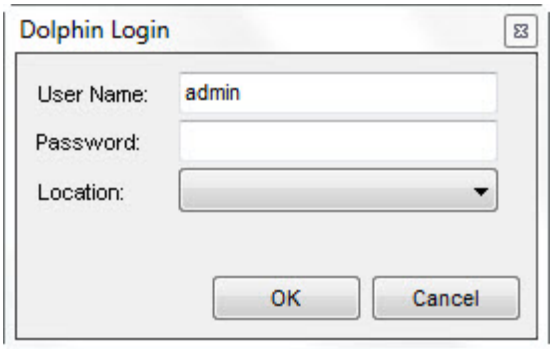
1 From the Microsoft Windows Start menu, select **All Programs**.

2 Select the **Dolphin Imaging** folder from the **All Programs** sub-menu.

3 Select the **Dolphin Imaging** icon in the **Dolphin Imaging** folder.

If you do not have the Dolphin Imaging Security Utilities installed and enabled, Dolphin Imaging starts, and the Patient Lookup dialog box is displayed. For more information, see Chapter 4, Patient Charts.

If you have the Dolphin Imaging Security Utilities installed, a dialog box appears asking you to log in to Dolphin Imaging.



User Name	Your Dolphin Imaging user name.
Password	Your Dolphin Imaging password.
Location	Your office location (multi-office practices only).

To log in:

1 Type your user name in the **User Name** field.

Or,

If your practice uses finger scan login, use the fingerprint scanner to enter your fingerprint.

2 Type your password in the **Password** field.

3 Optionally, select a location from the **Location** drop-down list.

4 Click **OK**.

Dolphin Imaging starts, and the or Patient Lookup dialog box is displayed. For more information, see Chapter 4, Patient Charts.

To log out from Dolphin Imaging without exiting the program:

1 Select **Log Out Current User** from the **File** menu.

The Login dialog box appears so that a different user can log in.

To exit from Dolphin Imaging:

1 Click the close icon (X) on the Dolphin Imaging main screen's title bar.

Or,

Choose **Exit** from the **File** menu.

Performing a Pre-backup

The pre-backup prepares your system for a backup by moving the Dolphin patient data from the SQL Server locations to the C:\Dolphin\Working directory. When your backup procedure backs up your `C:\Dolphin\Working` directory, all patient data, including data stored in the database, is backed up.By default, Dolphin Imaging performs a pre-backup automatically whenever you exit the program. However, you can also start a pre-backup manually.

Note: *You cannot perform a pre-backup manually if you are using Dolphin Management in addition to Dolphin Imaging or if the Dolphin Imaging Security Utilities are installed and you not have backup rights. For more information, see "Installing the Security Utilities" on page 1-11 and the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To start a pre-backup manually:

1 Select **Pre-Backup** from the **File** menu.

2 Perform your regular backup routine to back up your computer.

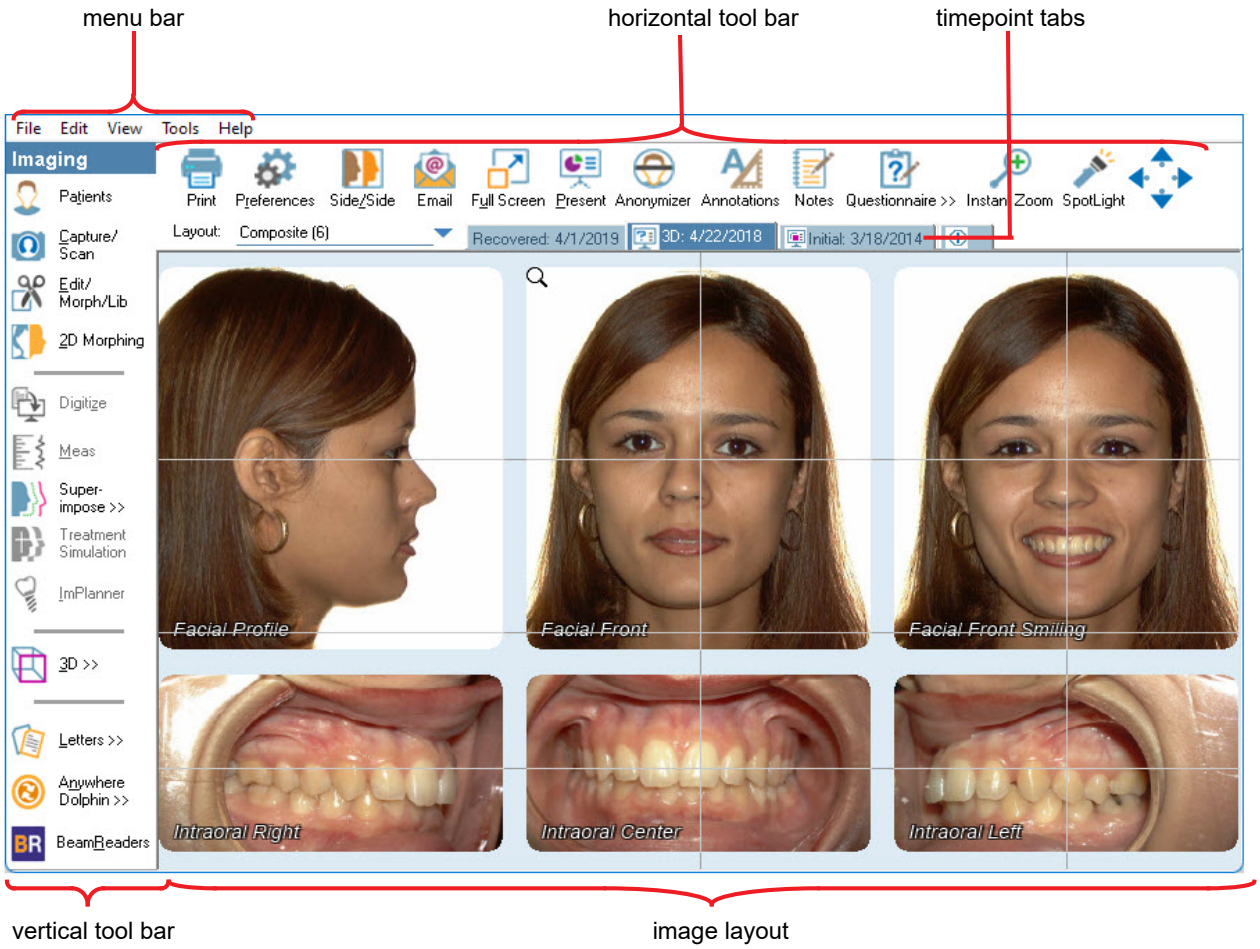
On the General Preferences dialog box, you can set the following options:

- You can disable the automatic pre-backup feature so that Dolphin Imaging only performs a pre-backup when you start it manually.
- You can specify how many pre-backup files you want to keep before overwriting the oldest file.

For more information, see "Setting General Preferences" on page 3-63.

3 The Dolphin Imaging Main Screen

The Dolphin Imaging main screen displays a series of patient images and provides buttons for accessing other areas of the Dolphin Imaging program. The main screen is displayed when you click **OK** or **Cancel** from the Patient Lookup dialog box. The following figure illustrates the main screen:

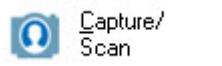
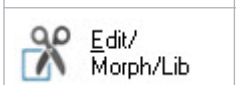
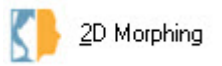


Note: *If the menu bar and tool bars are not visible, the main screen is in Full Screen Mode. To return the screen to the format shown above, click the image layout or press* Esc. *If the menu bar is visible, but the tool bars are not, select* ***Show Toolbars*** *from the* ***View*** *menu.*

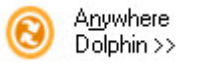
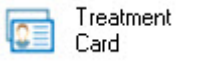
Menu bar	Contains menus that you can use to access program features. For more information, see “The Menu Bar” on page 3-7.
Vertical tool bar	Contains buttons that you use to access program features. For more information, see “The Vertical Tool Bar” on page 3-2.
Horizontal tool bar	Contains buttons that you use to access program features. For more information, see “The Horizontal Tool Bar” on page 3-5.
Layout drop-down list	Lists the image layouts that you can display. Each image layout contains a pre-define group of images in a specific arrangement. For more information, see “Choosing Another Image Layout” on page 3-26.
Timepoint tabs	Contain images for each of the patient’s timepoints. Dolphin Imaging uses timepoints to group related sets of patient images. : Identifies timepoints with diagnostic (questionnaire) data. For more information, see Chapter 34, Questionnaires. : Identifies timepoints with 3D data. For more information, see Part IV, Dolphin 3D. : Identifies timepoints with both diagnostic (questionnaire) and 3D data. : Identifies timepoints with 3D surgery data. For more information, see Part IV, Dolphin 3D. : Identifies timepoints with both diagnostic (questionnaire) and 3D surgery data. ***Note:*** *You can double-click a timepoint tab to rename the timepoint. For more information, see “Renaming Patients, Timepoints, or Images” on page 4-52.*
Image layout	Displays patient images for the selected timepoint in the selected layout. For more information, see “Choosing Another Image Layout” on page 3-26.
	Indicates the image that is currently selected.

The Vertical Tool Bar

The vertical tool bar contains buttons that you can use to access program features quickly.

	Opens the Patient Lookup dialog box. For more information, see Chapter 4, Patient Charts.
	Opens the Capture Setup dialog box so that you can capture patient images. For more information, see Chapter 5, Capture.
	Opens the Edit dialog box so that you can modify an image using the editing, morphing, and Image Library tools. For more information, see Chapter 6, Image Edit.
	Opens the 2D Morph Editor dialog box so that you can create a movie that morphs between any two images of a patient. For more information, see “2D Morphing” on page 16-7.

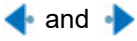
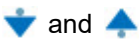
Digitize	Opens the Digitize Setup dialog box so that you can digitize landmarks and trace skeletal structures on patient images. For more information, see Chapter 7, Digitize (Medical Device).
Meas	Opens the Measurement dialog box, where you can view patient measurements based on cephalometric information for this patient. For more information, see Chapter 8, Measurements (Medical Device).
Super-impose >>	Accesses the Superimpose feature.You can superimpose two or more tracings or two or more images for analysis and comparison, or overlay a patient's tracing over the profile photo for Treatment Simulation operations. For more information, see Chapter 9, Superimposition (Medical Device).
Treatment Simulation	Accesses the Treatment Simulation features. For more information, see Chapter 12, Treatment Simulation (Medical Device).
ImPlanner	Accesses the ImPlanner feature so that you can plan the placement of implants using the patient's x-ray image. For more information, see Chapter 15, ImPlanner (Medical Device).
3D >>	Accesses the Dolphin 3D features, which you can use to view, edit, add, or delete 3D images, photos, and surfaces for this patient using Dolphin 3D. This button opens a menu with the following options: **View Only...:** View an existing volume. For more information, see "Adding, Editing, and Deleting 3D Volumes" on page 19-1. **Edit...:** Edit an existing volume. For more information, see "Viewing or Editing an Existing Volume" on page 19-2. **Import New DICOM...:** Add a new volume. For more information, see "Adding a New 3D Volume" on page 19-3. **Import New DICOM From PACS...:** Import a volume from a PACS server. For more information, see "Importing a New 3D Volume from a PACS Server" on page 19-5. **Import New Arch Models/3D Photo/Surface:** Opens a sub-menu with the following options. • **Import Upper and Lower Arch Models (STL, OBJ, PLY, or DIXD)...:** Import surfaces representing the patient's arch models whether or not you already have a 3D volume for that patient. For more information, see "Defining the Occlusion" on page 19-86. • **Import New 3D Photo (OBJ + Bitmap)...:** Import a patient's 3D photo whether or not you already have a 3D volume for that patient. For more information, see "Importing a 3D Photo" on page 19-56. • **Import New General Surface (OBJ, STL, or PLY)...:** Import a general surface (one that isn't the patient's soft tissue or arch models) whether or not you already have a 3D volume for that patient. For more information, see "Importing a Surface" on page 19-78.

	Delete Volume...: Delete an existing volume. For more information, see “Deleting a 3D Volume” on page 19-8. **DICOM Storage Options...:** View and set DICOM storage options. For more information, see “Setting DICOM Volume Storage Options” on page 19-126. **DICOM Volume Downsizing Tool...:** Downsize a DICOM data set. For more information, see “Downsizing a DICOM Data Set” on page 19-9. ***Note:*** *If you purchased the full Dolphin 3D module, all these options are available to you. If you purchased the stand-alone digital study module product, only the **Import New 3D Photo (OBJ + Bitmap)...**, **Import New General Surface (OBJ, STL, or PLY)...**, and **Import Upper and Lower Arch Models (STL, OBJ, PLY, or DIDX)...** options are available.*
	Accesses the Dolphin Letter System using the current image layout. This button opens a menu with the following options: **Merge Letter:** Launches the Merge Letter wizard, which begins by prompting you to select an existing template and then prompts for the information necessary to complete the letter. **Open Word:** Launches Word so that you can create a free-form letter. For more information, see Chapter 35, The Dolphin Letter System (DLS).
	Uploads the current patient to AnywhereDolphin or download patients from AnywhereDolphin. For more information, see “AnywhereDolphin” on page 32-1.
	Sends the current patient’s record, along with work-order notes, to BeamReaders for a radiology report and/or image portfolio. Refer to www.beamreaders.com for more information about the services they provide. For more information on sending patient records to BeamReaders, see “BeamReaders” on page 33-1.
	Launches Dolphin Management with the current patient selected. This button is enabled only if you have installed Dolphin Management. For more information, refer to the Dolphin Management online help.
	Opens the Dolphin Management Treatment Card for this patient. Available as an add-on option for Dolphin Imaging. For more information, refer to the Dolphin Management online help.
	Opens the Documents Manager for this patient. Available as an add-on option for Dolphin Imaging. For more information, refer to the Dolphin Management online help.
	Opens Dolphin Aquarium for this patient. Enabled only if you have Dolphin Aquarium installed. For more information, refer to the Dolphin Aquarium documentation.

The Horizontal Tool Bar

The horizontal tool bar contains buttons that you can use to access program features quickly.

Print	Prints the current image layout. For more information, see “Printing” on page 16-4.
Preferences	Opens a dialog box where you can set preferences. For more information, see “Setting Preferences and Options” on page 3-63.
Side/Side	Display two images side-by-side, either horizontally or vertically (see “Displaying Two Images Side By Side” on page 3-20).
Email	Sends an email message with the current image layout. For more information, see “Emailing Images” on page 16-1
Full Screen	Changes the display format to Full Screen mode, so that the image layout takes up the entire screen, hiding the menus and tool bars (see “Changing to Full-screen Mode” on page 3-17).
Present	Opens a dialog box where you can set up a slide show of this patient’s images. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
Anonymizer	Adds black bars over a patient’s eyes. For more information, see “Using Anonymizer Bars” on page 3-52.
Annotations	Opens a dialog box where you can specify calibration information that Dolphin Imaging uses to scale the patient’s image, enter annotations on the image, or measure distances and angles on the image. For more information, see “Annotating and Measuring” on page 3-40.
Notes	Opens the Notes dialog box so that you can associate notes with this patient (see “Using Patient Notes” on page 3-16).

	Opens a menu from which you can select the type of questionnaire you want to run to collect data for the selected patient and timepoint. **Questionnaire...:** Runs a multi-page questionnaire. For more information, see the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder). **One Page Questionnaire...:** Runs a one-page questionnaire. Only available if you have the Dolphin Imaging Security Utilities installed. **Super Questionnaire:** Accesses the Super Questionnaire feature. Only available if you have the Dolphin Imaging Security Utilities installed. For more information on the Dolphin Imaging Security Utilities, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
	Opens a join.me online meeting. In a join.me online meeting, you can share patient images and treatment simulations on your computer screen with patients or other professionals. For more information, visit https://www.join.me.
	Opens lens that magnifies areas of the patient’s image or the image layout, For more information, see “Using Instant Zoom” on page 3-21.
	Opens a spotlight that you can use to quickly magnify and change the contrast of areas of the patient’s image or the image layout, For more information, see “Using Spotlight” on page 3-24.
	Behave differently depending on whether you are viewing a maximized image: • When no image is maximized, these buttons move the to the previous or next image in the image layout. For more information, see “To move the to another image in the image layout:” on page 3-17. • When an image is maximized, these buttons display the corresponding image in the previous and next timepoints. For more information, see “Viewing Images From Another Timepoint” on page 3-26. For information on maximizing an image, see “Maximizing an Image” on page 3-17.
	Behave differently depending on whether you are viewing a maximized image: • When no image is maximized, these buttons move the to the previous or next image in the image layout. For more information, see “To move the to another image in the image layout:” on page 3-17. • When an image is maximized, these buttons replace the current maximized image with the previous or next image in the current timepoint and layout. For more information, see “Viewing Another Image in the Current Timepoint and Layout” on page 3-26. For information on maximizing an image, see “Maximizing an Image” on page 3-17.

Note: *The horizontal tool bar may include additional buttons to the right of the buttons listed above. For more information, see “Customizing the Tool Bars” on page 3-71.*

The Menu Bar

At the top of the main screen, there are several menus (File, Edit, View, Tools, and Help) that you can use to access program features.

Some of the program features accessible from the menus are also accessible from buttons on the main screen.

The File Menu

The **File** menu contains the following choices:

New Patient	Currently unused.
Open Patient Charts...	Opens the Patient Lookup dialog box. For more information, see Chapter 4, Patient Charts.
Page Setup...	Opens the Dolphin Layout Editor so you can set many format options for printed output from Dolphin Imaging. This is an advanced feature of the Dolphin Imaging program. Please proceed with caution when making any changes using the Dolphin Layout Editor. For more information, see Chapter 17, Layout Editor.
Printer Setup...	Opens the Print Setup dialog box so you can set printing options. For more information, see “Printing” on page 16-4.
Print	Opens a sub-menu offering the following choices. • **Print...:** Prints the current image layout. Opens the Print dialog box where you can select printing options. • **Print Preview:** Previews the print job on the computer screen. • **Print 1:1:** Prints the current image layout. Available only for images with cephalo-metric tracings. This option opens the Print dialog box with the 1:1 option already selected. • **Print Preview 1:1:** Previews the print job on the computer screen using the 1:1 print option. For more information, see“Printing” on page 16-4.
Save As...	Saves this image to a file on your computer. For more information, see “Saving Images” on page 3-32.
Save Original As...	Saves the original (uncropped, unenhanced) image to a file on your computer. Only available for images for which an original version was saved during capture. For more information on using this menu item, see “Saving Images” on page 3-32. For more information on setting One-Click capture preferences to save the original image, see “Setting One-Click Capture Preferences” on page 5-29.
Save Layout As...	Saves this image layout to a file on your computer. For more information, see “Saving Images” on page 3-32.
Rebuild Patient List...	An advanced maintenance option used by Dolphin Imaging support technicians to regenerate the Dolphin patient list file from the current patient files. For more information, see “Rebuilding the Patient List” on page 3-76.

Recent Patients	Opens a sub-menu from which you can select recently-accessed patient records.
Pre-Backup	Performs a pre-backup procedure. Depending on your permissions and Dolphin Imaging configuration, this option may not appear. For more information, see “Performing a Pre-backup” on page 2-5.
Log Out Current User	Logs out the current user so that a different user can log in without exiting the program. Available only if you have the Dolphin Imaging Security Utilities (see “Installing the Security Utilities” on page 1-11).
Exit	Exits from Dolphin Imaging. For more information, see “Starting and Exiting Dolphin Imaging” on page 2-3.

The Edit Menu

The **Edit** menu contains the following choices:

Search...	Unused.
Questionnaire Setup...	Opens a Questionnaire Setup dialog box so that you can set up a new Questionnaire. For more information, see Chapter 34, Questionnaires.
Super Questionnaire	Accesses the setup options for the Dolphin Management Super Questionnaire feature. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
Notes...	Opens the Notes dialog box so that you can associate notes with this patient (see “Using Patient Notes” on page 3-16).
Edit Referring Doctors...	Opens the Edit Referring Doctors dialog box so you can add information about the doctors who refer patients to your practice. For more information, see “Editing Doctors” on page 3-53.
Edit Treating Doctors...	Opens the Edit Treating Doctors dialog box so you can add information about the doctors who work at your practice. For more information, see “Editing Doctors” on page 3-53.
Edit Insurance Companies...	Opens the Edit Insurance Companies dialog box so you can set up a list of insurance companies and addresses. For more information, see “Editing Insurance Companies” on page 3-56.
Edit Layouts...	Opens the Dolphin Layout Editor. For more information, see Chapter 17, Layout Editor.
Edit Capture Sequences...	Opens the Sequence Editor. For more information, see “Editing Capture Sequences” on page 5-40.
Edit Titlebar Caption	Opens the Custom Title Bar dialog box so that you can customized the information that appears on the Dolphin Imaging window’s title bar (see “Customizing the Window Title Bar” on page 3-69).
Edit Image Caption	Opens the Edit Image Caption dialog box so that you can customized the information that appears in the captions for patient images (see “Customizing Image Captions” on page 3-70).

Edit Custom Toolbar...	Opens the Custom Toolbar Configuration dialog box so that you can add customized buttons to the horizontal tool bar (see “Customizing the Tool Bars” on page 3-71).
Copy Image	Copies the image to the clipboard. For more information, see “Copying and Pasting Images” on page 3-33.
Copy Original Image	Copies the original (uncropped, unenhanced) image to the clipboard. Only available for images for which an original version was saved during capture. For more information, see “Copying and Pasting Images” on page 3-33.
Copy Image to Resolution	Copies the image to the clipboard using a resolution you select. For more information, see “Copying and Pasting Images” on page 3-33.
Copy Layout	Copies the image layout to the clipboard. For more information, see “Copying and Pasting Images” on page 3-33.
Copy Layout to Resolution	Copies the image layout to the clipboard using the resolution you select. For more information, see “Copying and Pasting Images” on page 3-33.
Copy Image as File	Copies the image you are currently viewing to the clipboard as a file. For more information, see “Copying and Pasting Images” on page 3-33.
Copy Image To Resolution as File	Copies the image you are currently viewing to the clipboard at the resolution you select as a file. For more information, see “Copying and Pasting Images” on page 3-33.
Copy Layout as File	Copies the image layout to the clipboard as a file. For more information, see “Copying and Pasting Images” on page 3-33.
Copy Layout To Resolution as File	Copies the image layout to the clipboard at the resolution you select as a file. For more information, see “Copying and Pasting Images” on page 3-33.
Annotations and Measurements.	Opens a dialog box where you can specify calibration information that Dolphin Imaging uses to scale the patient’s image, enter annotations on the image, or measure distances and angles on the image. For more information, see “Annotating and Measuring” on page 3-40.
Employees...	Opens the Add an Employee dialog box so that you can look up an existing employee or add a new employee. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
Employee Types...	Opens the Add an Employee Type dialog box so that you can look up an existing employee type or add a new employee type. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
Employee Rights...	Opens the Employee Rights dialog box so you can set rights for employees to use the various Dolphin Imaging features. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).

Employee Locations...	Opens the Location Rights dialog box so you can grant employees access to information in the Dolphin Imaging system by location. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
Password Setup...	Opens the Password Setup dialog box so you can set up requirements for Dolphin Imaging passwords. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
Treatment Card Setup	Opens the Treatment Card Setup dialog box so that you can customize your treatment card. Only available if you have purchased the optional Dolphin Management Treatment Card module as an add-on option for Dolphin Imaging. For more information, refer to the Dolphin Management help, which is included with this feature.
Locations...	Opens the Choose a Location dialog box so that you can look up an existing practice location or add a new location. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
3D View...	Opens Dolphin 3D so that you can view the selected 3D image. For more information, see “Viewing or Editing an Existing Volume” on page 19-2.
3D Edit...	Opens Dolphin 3D so that you can edit the selected 3D image. For more information, see “Viewing or Editing an Existing Volume” on page 19-2.
Delete Volume...	Deletes the entire 3D image data set stored in the Dolphin database for the patient.
DICOM Storage Options...	Opens the DICOM Volume Storage dialog box so that you can set default DICOM volume storage options. For more information, see “Setting DICOM Volume Storage Options” on page 19-126.
Anywhere Dolphin	Opens a sub-menu with the following option: **My Orthodontist Setup:** Set up accounts in MyOrthodontist. Only available if you have the optional Dolphin Imaging Security Utilities. For more information on the Dolphin Imaging Security Utilities, see “Installing the Security Utilities” on page 1-11. For more information on MyOrthodontist, refer to the *Dolphin MyOrthodontist Setup and User’s Guide*.
Custom Analysis	Opens the Custom Analysis Editor so that you can create and edit analyses. For more information, see Chapter 18, Custom Analysis Editor (Medical Device).

The View Menu

The **View** menu contains the following choices:

Full Screen	Hides the title and menu bars on the main screen. To exit this mode, press ESC or click any image. For more information, see “Changing to Full-screen Mode” on page 3-17.
Side by Side	Displays two images side-by-side, either horizontally or vertically (see “Displaying Two Images Side By Side” on page 3-20).
Image Enhance (View Only)	Opens the Enhance Image dialog box so that you can temporarily apply enhancement operations to this image. Available on view workstations only. With this option, you cannot save the enhanced image. For more information, see “Enhancing an Image” on page 5-16
Show Toolbars	Toggles the display of the horizontal and vertical tool bars on the main screen.
Show Status Bar	Toggles the display of the status bar on the main screen.
Show Image Caption	Toggles the display of an image caption on each of the images.
Cloak Patient Names	Toggles the display of the patient’s full name on the window title bar. If this option is enabled, the title bar shows first few letters of the patient’s first and last name, with an asterisk (*) appearing in place of the remaining letters. ***Note:*** *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if the Dolphin Imaging user account that you are using has the Cloak and Uncloack Patient Names privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder)*
Show Anonymizing Bars	Toggles the display of anonymizer bars to a patient's Facial Front, Facial Front Smiling, and Facial Profile pictures if those images were captured so that the patient's eyes were aligned with the appropriate guideline. For more information, see “Using Anonymizer Bars” on page 3-52.
Show Zoom-Pan Dialog	Toggles the display of the zoom and align tool bar. It this tool bar is enabled, it appears when you maximize an image. For more information, see “Using the Zoom and Align Tool Bar” on page 3-19.
Show Measurements and Annotations	Toggles the display of measurements and annotations that have been added to the patient's image. For more information, see “Annotating and Measuring” on page 3-40.
Show Guidelines	Displays gray guidelines over some image layouts on the Dolphin Imaging main screen.
Show Patient Name Bar	Displays a banner above the image layout with the patient’s last name, first name, and ID.
List All Images...	Opens a dialog box listing all images for this patient. From this dialog box, you can temporarily view another patient image in place of the current image. For more information, see “Choosing an Image From Any Timepoint and Image Layout” on page 3-28.

Timepoint	Opens a sub-menu listing the timepoints for this patient. Select another timepoint from the sub-menu to view patient images for that timepoint.
Layout	Opens a sub-menu listing the available image layouts. You can select another layout from the sub-menu to view that image layout.
Display Quality/ Speed	Opens a sub-menu that you can use to set options relating to the trade-offs between image quality and speed of the display. ***Note:*** *These options only affect the quality of images displayed on your computer screen. Images are always printed at the highest quality.* **Zoom/Shrink Display Quality:** Opens another sub-menu listing image quality levels. You can select one of the following levels: • **Traditional**: Display quality that Dolphin has always used in the past. • **Good**: Displays good quality images and provides the fastest performance. • **Better**: The recommended choice, because it provides the best balance of image quality and fast performance. • **Best**: Displays the best quality image, but with the slowest display performance. **Use Stamps:** Specifies whether to use lower resolution images in the image layout. Using this option causes the image layout to load more quickly. If you maximize an image in the layout, the high-resolution image is displayed.
Refresh Images	Refreshes the images in the image layout.

The Tools Menu

The **Tools** menu contains the following choices:

Letters...	Opens the Dolphin Letter System using the current image layout. For more information, see Chapter 35, The Dolphin Letter System (DLS).
Presentation...	Opens a dialog box where you can set up or display a slide show of this patient's images. For more information, see "Setting Up a Slide Show Presentation" on page 16-15.
Email...	Sends an email message with the current image layout. For more information, see "Emailing Images" on page 16-1
Questionnaire...	Runs a questionnaire that you have defined. For more information on setting up and running questionnaires, see Chapter 34, Questionnaires.
One Page Questionnaire...	Runs a questionnaire using the one-page questionnaire interface. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see "Installing the Security Utilities" on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).

Super Questionnaire	Accesses the Super Questionnaire feature. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
SMS/Email Manager...	Accesses the Dolphin Management SMS and Email feature. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
Enable Location Security	Enables location security for all employees and all locations. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder). Once you have enabled location security, this option disappears from the menu.
Treatment Card	Opens the Treatment Card for this patient. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
Tooth Chart...	Opens a tooth diagram used to indicate missing teeth for this patient. The inner diagram is for baby teeth. To indicate a missing tooth, click that position on the tooth diagram.
Reset Locks...	Opens a dialog box for resetting locks on database records. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
Dolphin Ocean Client Admin...	Opens the dialog box for configuring the Dolphin Ocean service, which enables your office network to communicate over the Internet with devices running Dolphin Mobile (such as iPhones, iPads, and Android devices). Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
McLaughlin Dental VTO	Opens the McLaughlin Dental VTO Analysis. For more information, see Chapter 13, McLaughlin Dental VTO Analysis (Medical Device).
Image Library	Opens the Image Library Presenter, which you can use to review images in the Image Library. For more information, see Chapter 6, Image Edit.

AnywhereDolphin	Opens a sub-menu with options for using AnywhereDolphin. **Show Sonar Window:** Opens the Sonar window, which you use to manage the Dolphin Sonar queue and set options for the Dolphin Sonar module. **Upload Current Patient:** Uploads the current patient to the AnywhereDolphin Internet site. **Download Patient:** Accesses the AnywhereDolphin Internet site so that you can download a patient stored there. **Upload Preferences:** Opens a further sub-menu that you use to toggle the following options for uploading patients to AnywhereDolphin: • **Include original uncropped images (if they exist):** Uploads the original, uncropped images for this patient, if they were saved when the patient's images were captured. For more information, see “Setting One-Click Capture Preferences” on page 5-29. • **Include video and DICOM files (if they exist):** Uploads video or DICOM files for this patient, if any are available. For more information about DICOM support, consult your Dolphin representative. • **Include 3D files (if they exist):** Uploads 3D files for this patient, if any are available. For more information, see Chapter 32, AnywhereDolphin.
Capture	Opens the Capture Setup dialog box so you can begin capturing images. To capture images, you need the appropriate equipment. For more information, see Chapter 5, Capture
Digitize	Opens the Digitize Setup dialog box so you can generate measurements by digitizing landmarks and tracing skeletal structures on patient images. For more information, see Chapter 7, Digitize (Medical Device).
Overlay Tracing+ Image	Opens the Link Tracing+Image dialog box, where you can overlay a patient’s tracing over the profile picture for Treatment Simulation operations. For more information, see “Tracing+Image” on page 9-1.
Tracing Superimpositions	Opens the Tracing Superimpositions dialog box, where you can superimpose two or more tracings for analysis and comparison. For more information, see “Tracings Over Tracings” on page 9-8.
Image Superimpositions	Opens the Image Superimpositions dialog box, where you can superimpose two or more patient images for analysis and comparison. For more information, see “Images Over Images” on page 9-32.
Edit	Opens the Edit Image dialog box, where you can modify patient images. For more information, see Chapter 6, Image Edit.
Measurements	Opens the Measurement dialog box, where you can view patient measurements based on cephalometric information for this patient. For more information, see Chapter 8, Measurements (Medical Device).
Treatment Simulation	Opens the Treatment Simulation dialog box, where you can simulate orthodontic and surgical treatment for this patient. For more information, see Chapter 12, Treatment Simulation (Medical Device).
ImPlanner	Opens the ImPlanner dialog box so you can plan the placement of implants using the patient’s x-ray image. For more information, see Chapter 15, ImPlanner (Medical Device).

2D Image Morph	Opens the 2D Morphing feature so you can create a movie that morphs between any two images of a patient. For more information, see “2D Morphing” on page 16-7.
PACS Communication Setup	Opens a dialog box where you can set up client/server communication with a PACS server. This option is enabled only if you have purchased the optional PACS Support module. For more information, see “Setting Up PACS Communications” on page 3-58.
Convert Patient Files...	An advanced maintenance option used to convert a specific patient record or group of patient records to a different image format. This feature is for use only by Dolphin support technicians. For more information, see “Converting Patient Files” on page 3-75.
Module Activation...	Opens the Module Activation dialog box. Contact Dolphin to activate optional modules.
Dolphin Licensing	Opens the Dolphin Imaging Licenses dialog box, which lists the Dolphin Imaging licenses you have purchased, indicates which computers on your network are using those licenses, and provides an option for refreshing your licenses to update them for recent changes. For more information, see “Viewing and Updating Licenses” on page 3-73.
Preferences	Opens a sub-menu offering the following choices: **Confirmations:** Specifies the Prompt on Exit option. With this option enabled, a dialog box appears asking if you want to perform the pre-backup procedure whenever you exit from Dolphin Imaging. For more information, see “Performing a Pre-backup” on page 2-5. **General Preferences:** Opens the General Preferences dialog box, where you can set preferences for Dolphin Imaging. For more information, see “Setting General Preferences” on page 3-63. **Tracing Preferences:** Opens the Tracing Preferences dialog box, where you can set preferences for tracings. For more information, see “Setting Tracing Preferences” on page 3-66.
View Database Log	Opens a log of database activity listing what operations were performed, the date and time of each operation, and the user who performed it. Only available if you have the optional Dolphin Imaging Security Utilities. For more information, see “Installing the Security Utilities” on page 1-11 and the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).
Options...	Opens the System Options dialog box so that you can set general system options. For more information, see “The Help Menu” on page 3-16.
Custom Analysis	Opens the Custom Analysis Editor so that you can create and edit analyses. For more information, see Chapter 18, Custom Analysis Editor (Medical Device).

The Help Menu

The **Help** menu contains the following choices:

Contents	Opens the Table of Contents for the online help.
Index	Opens the Index for the online help.
Search	Opens the Search feature for the online help.
Using Help	Accesses help on using the online help.
Remote Support	Accesses Dolphin's remote support feature on the Internet. Use this option when directed to do so by Dolphin Technical Support to enable them to connect to your computer for diagnostic purposes.
Live Chat	Opens a chat session with a Dolphin representative.
FAQ	Opens a list of frequently asked questions.
What's New	Opens the "What's New in Dolphin Imaging" document, which describes the enhancements in the latest major release.
Release Notes	Opens the Release Notes, which describe all the changes in recent program updates.
End User License Agreement	Opens the "Dolphin Software License Agreement."
About Dolphin Imaging	Opens a dialog box that provides the Dolphin Imaging program version and information on contacting Dolphin.

Using Patient Notes

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Imaging Configuration (Page Setup, Layout, Custom Analysis, etc.) privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To add notes for this patient:

1 Select **Notes** from the **Edit** menu.

2 Enter any notes for this patient.

These patient notes are also available from the **Details** tab of the Patient Information dialog box (see "Patient Information Details Tab" on page 4-42).

To move the Notes dialog box:

1 Click and drag the dialog box to any location on your screen.

Or,

If you move the dialog box to an edge of the main screen's image viewing area to "dock" it there.

To close the Notes dialog box:

1 Click .

Using Images and Layouts

The image layout displays patient images for the selected timepoint in the selected layout. You can display a different set of images as described in “Viewing a Different Image or Image Layout” on page 3-26.

In the image layout, the indicates the image that is currently selected.

To move the to another image in the image layout:

1 Use the arrow keys or the arrow buttons on the horizontal tool bar (, , , or).

Changing to Full-screen Mode

To change the display to full-screen mode:

1 Click Full Screen .

Or,

Select **Full Screen** from the **View** menu.

The menu bar and tool bars are hidden, and the image layout takes up the entire screen.

To exit full screen mode:

1 Click anywhere on the main screen.

Or,

Press any key on the keyboard.

The main screen appears with the menu bar and tool bars.

Maximizing an Image

To maximize an image:

1 Click the image that you want to maximize.

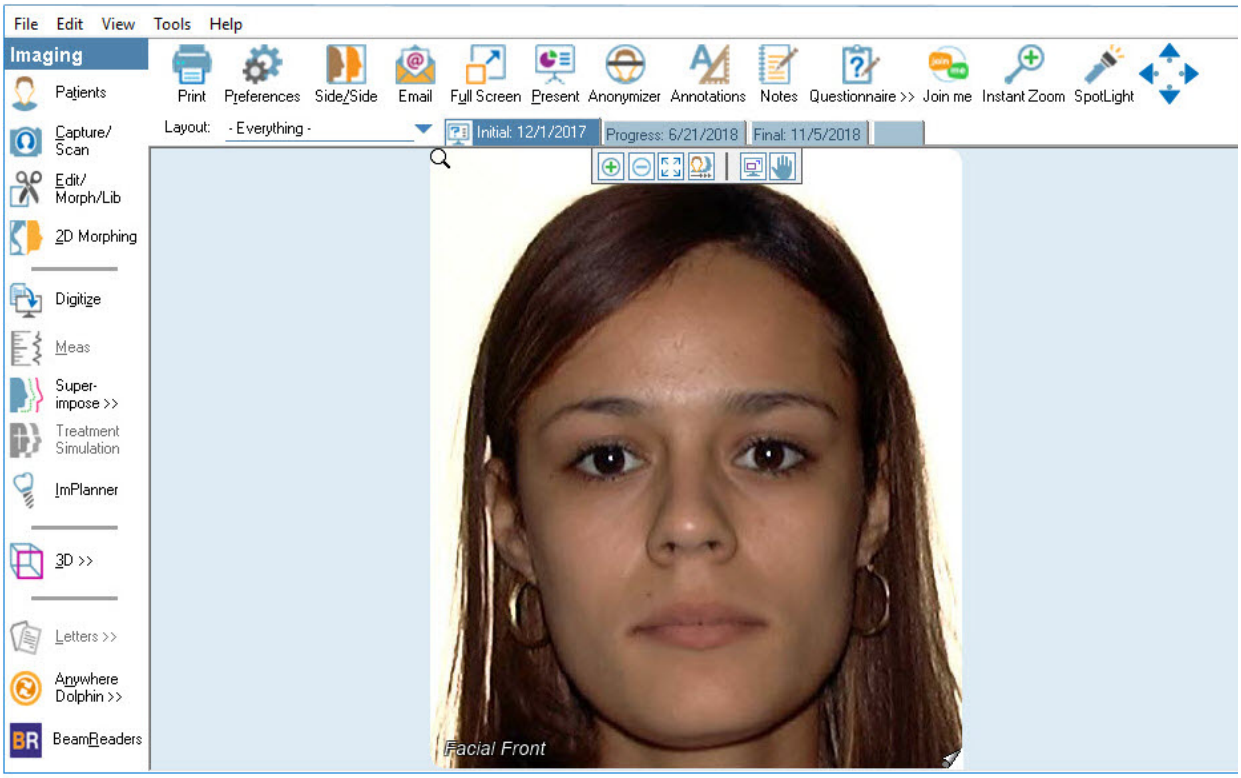
Or,

Right-click the image, and select **Maximize** from the **Image** context menu.

Or,

Use the arrow keys or the arrow buttons on the horizontal tool bar (, , , or) to move the to the image you want to maximize. Then, press ENTER.

The image expands to fill the main screen, and the zoom and align tool bar appears.



To return to the image layout after maximizing an image:

1 Click again or press any key (other than SHIFT, CTRL, or an arrow key) to see all the images in the image layout.

Or,

Right-click the maximized image, and select **Restore** from the **Image** context menu.

Using the Zoom and Align Tool Bar

When you maximize an image, the zoom and align tool bar appears and offers the following buttons for changing the image magnification and aligning it in the window.

	Zooms in or out on the currently selected image. You can also use the mouse wheel to zoom in and out.
	Fits the image in the window and aligns it in the center.
	Fits the image in the window and aligns it to the right.
	Opens or closes the Zoom/Pan window so you can zoom in on a particular area of the image.
	Opens the Zoom/Pan window and repositions the image in it, or closes the Zoom/Pan window.

To toggle display of the zoom and align tool bar:

1 Select **Show Zoom-Pan Dialog** from the **View** menu.

To zoom in on part of the image:

1 Click on the tool bar or press **F2**.

Or,

Click the image, and use your mouse wheel to zoom in.

To zoom out after zooming in on part of the image:

1 Click on the tool bar or press **F3**.

Or,

Click the image, and use your mouse wheel to zoom out.

To fit the image in the window and reposition it in the center:

1 Click on the tool bar or press **F4**.

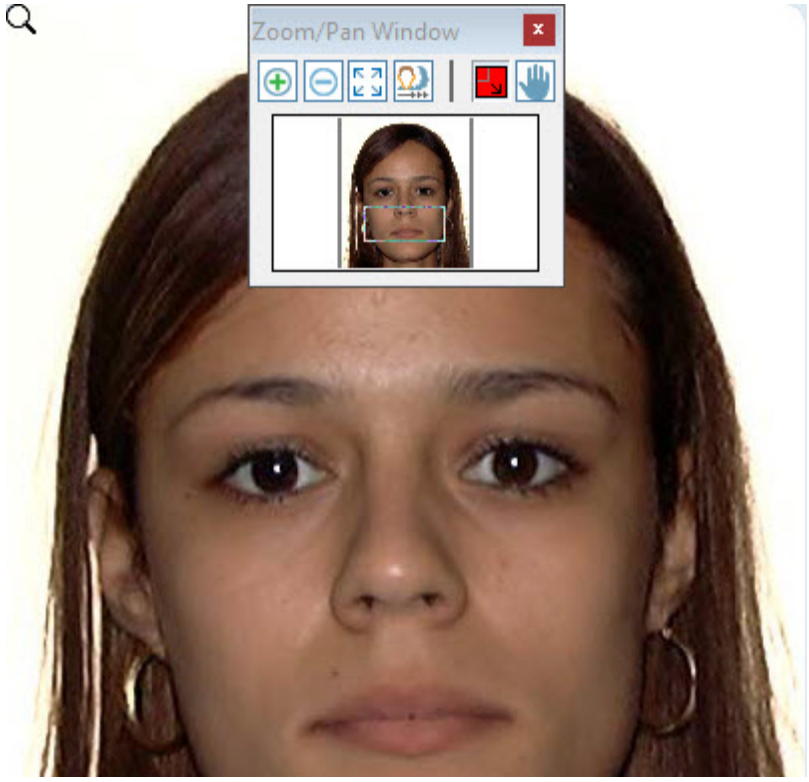
To fit the image in the window and reposition it at the right side of the window:

1 Click on the tool bar or press **F5**.

To zoom in on a particular part of the image:

1 Click on the tool bar or press **F6**.

The Zoom/Pan window opens and the cursor changes to the corner of a box.



2 Click at one corner of the area that you want to zoom in on, and drag the mouse diagonally to zoom to the selected area.

To reposition the image within the window:

1 Click on the tool bar or press **F7** to open the Zoom/Pan window.

2 Click and drag the image in the Zoom/Pan window.

The patient image in the main screen pans as you move the image in the Zoom/Pan window.

To close the Zoom/Pan window

1 Click or on the tool bar.

Or,

Press **F6** or **F7**.

Displaying Two Images Side By Side

To display two images side by side:

1 Click one of the patient images to select it.

2 Click Side/Side on the horizontal tool bar.

Or,

Select **Side by Side** from the **View** menu.

3 Select **Horizontal** to display two images side by side horizontally.

Or,

Select **Vertical** to display two images side by side vertically

A list appears containing the other patient images.

4 Select an Image from the list and click **OK**.

The two images are displayed side-by-side.

5 Click either image to return to the image layout.

Using Instant Zoom

Using the Instant Zoom feature, you can place a customizable magnifying lens over an image or an image layout to get a quick close-up. For example:

- Use Instant Zoom on an image layout to see details on the images without maximizing each one.
- Use it on a maximized image (see “Maximizing an Image” below) to quickly zoom in on any area.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Imaging Configuration (Page Setup, Layout, Custom Analysis, etc.) privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

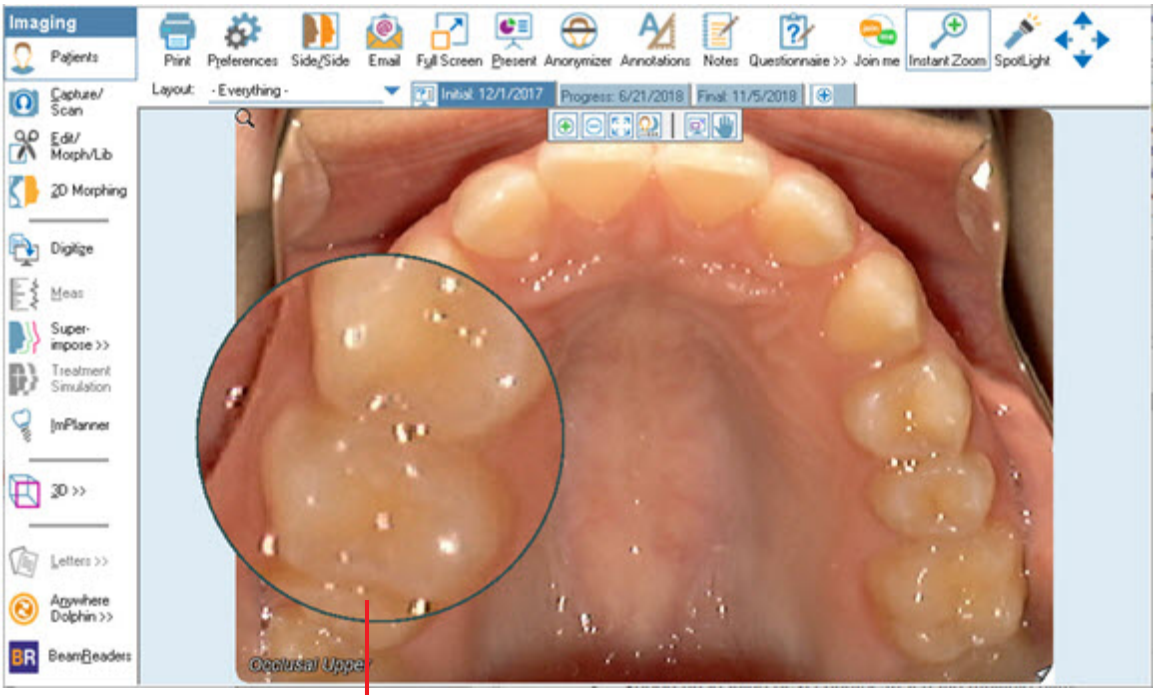
To open the Instant Zoom lens:

1 Click

.

The Instant Zoom lens appears over the image or image layout.

2 Move the mouse to change the location of the lens.



Instant Zoom lens

To stop the lens from moving when you move the mouse:

1 Right-click the lens, and select **Suspend** from the context menu.

To make the lens move when you move the mouse:

1 Right-click the lens, and select **Release** from the context menu.

To change the size of the lens:

1 Right-click the lens, and select the size that you want from the context menu.

Or,

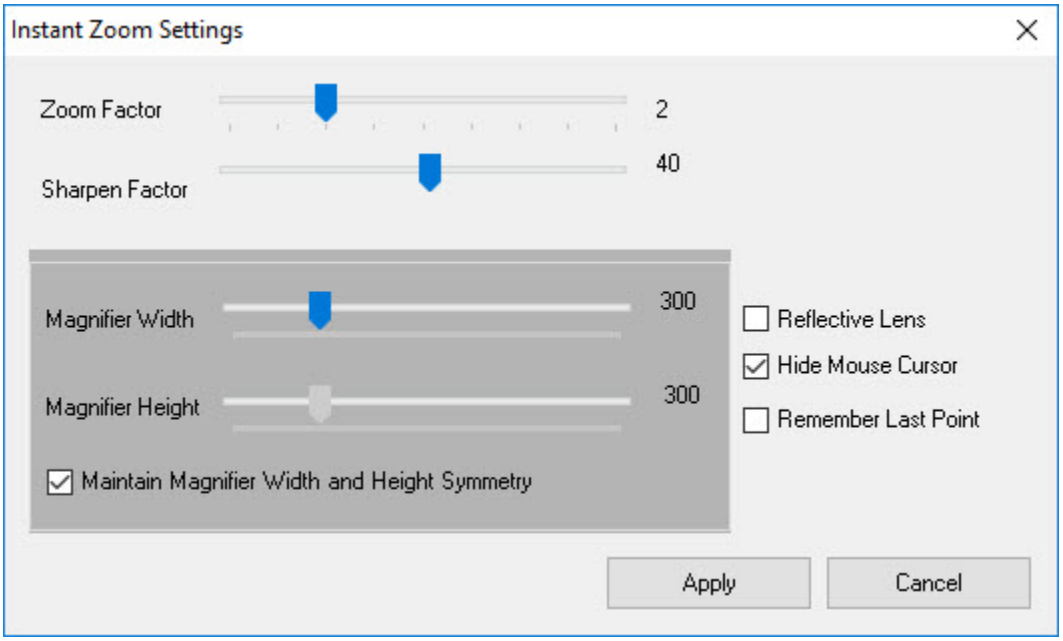
Use the lens settings to set the height and width of the lens (see below).

To configure settings for the lens:

1 Right-click the lens, and select **Settings** from the context menu.

The Instant Zoom Settings dialog box opens.

2 Set any configuration options, and click **Apply**.



Zoom Factor	Sets the amount of magnification for the Instant Zoom lens.
Sharpen Factor	Sets the amount of sharpening that the Instant Zoom lens applies to the image.
Magnifier Width	Sets the width of the Instant Zoom lens.
Magnifier Height	Sets the height of the Instant Zoom lens.
Maintain Magnifier Width and Height Symmetry	Maintains the width/height ratio as you resize the Instant Zoom lens. When this box is checked, the **Magnifier Width** and **Magnifier Height** sliders move together, and the Instant Zoom lens resizes while maintaining the same shape.
Reflective Lens	When checked, the Instant Zoom lens has a reflective appearance that makes it look more three-dimensional.
Hide Mouse Cursor	When checked, the mouse cursor is not visible when it's over the Instant Zoom lens.
Remember Last Point	When checked, the Instant Zoom lens appears in the position it was in the last time you closed it.

To close the Instant Zoom lens:

1 Click the mouse.

Or,

Press any key on your keyboard.

Or,

Right-click the lens, and select **Close** from the context menu.

Using Spotlight

Using the Spotlight feature, you can place a customizable spotlight over an image or an image layout to both magnify and change the image contrast in the spotlighted area.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Imaging Configuration (Page Setup, Layout, Custom Analysis, etc.) privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

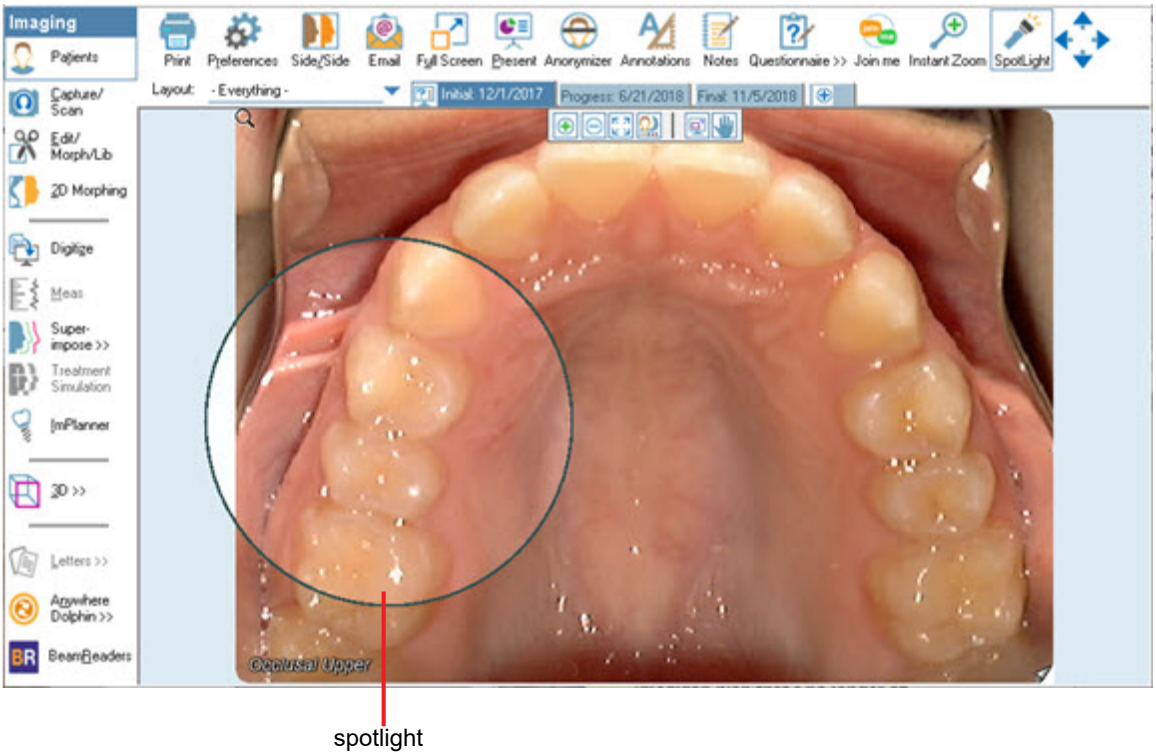
To open the spotlight:

1 Click

.

The spotlight appears over the image or image layout.

2 Move the mouse to change the spotlight's location.



To stop the spotlight from moving when you move the mouse:

1 Right-click the spotlight, and select **Suspend** from the context menu.

To make the spotlight move when you move the mouse:

1 Right-click the spotlight, and select **Release** from the context menu.

To change the spotlight's size:

1 Right-click the spotlight, and select the size that you want from the context menu.

Or,

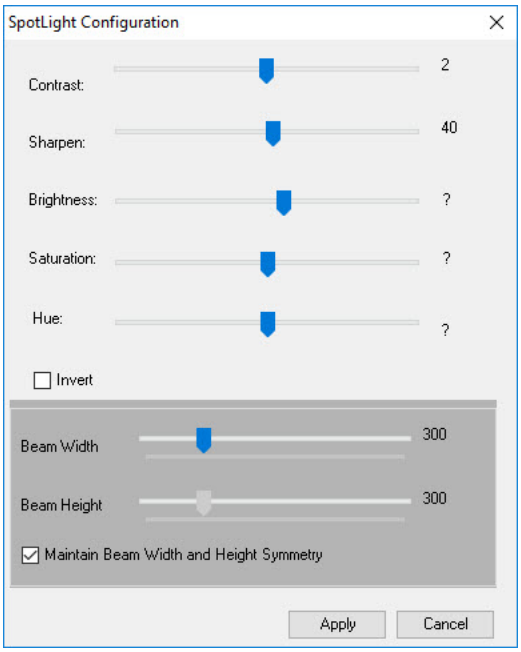
Use the spotlight settings to set the height and width of the spotlight (see below).

To configure spotlight's settings:

1 Right-click the spotlight, and select **Settings** from the context menu.

The Spotlight Configuration dialog box opens.

2 Set any configuration options, and click **Apply**.



Contrast	Sets the amount of contrast for the spotlight.
Sharpen	Sets the amount of sharpening that the spotlight applies to the image.
Brightness	Sets the brightness of the spotlight.
Saturation	Sets the amount of saturation that the spotlight applies to the image colors.
Hue	Sets the amount that the spotlight adjusts the hue of the image.
Invert	Sets the spotlight to invert the image colors (produce the equivalent of a photographic negative).
Beam Width	Sets the width of the spotlight.
Beam Height	Sets the height of the spotlight.
Maintain Beam Width and Height Symmetry	Maintains the width/height ratio as you resize the spotlight. When this box is checked, the **Beam Width** and **Beam Height** sliders move together, and the spotlight resizes while maintaining the same shape.

To close the spotlight:

1 Click the mouse.

Or,

Press any key on your keyboard.

Or,

Right-click the spotlight, and select **Close** from the context menu.

Viewing a Different Image or Image Layout

This section describes how to:

- view another image in the current timepoint and layout
- choose another image layout
- choose another timepoint
- choose an image from any timepoint and layout

Viewing Another Image in the Current Timepoint and Layout

When an image is maximized (see “Maximizing an Image” on page 3-17), you can easily view another maximized image in the same timepoint and image layout.

To view another image:

1 Press the UP ARROW key or click to see the next image in this timepoint and layout.

Or,

Press the DOWN ARROW key or click to see the previous image in this timepoint and layout.

By pressing the arrow keys or clicking the arrow buttons repeatedly, you can cycle through all the images in the current timepoint and layout.

Choosing Another Image Layout

You can select any image layout available for the currently selected timepoint.

Note: *By default, the Tracing Display Preferences dialog box appears whenever you display an image layout that includes tracings. For more information on this dialog box, see “Setting Tracing Preferences” on page 3-66.*

To choose another layout:

1 Select another layout from the drop-down list.

Or,

Select **Layout** from the **View** menu. Then, select the appropriate layout from the sub-menu.

Viewing Images From Another Timepoint

Dolphin Imaging uses timepoints to group related sets of patient images and other patient data. Like different sections of a patient’s file, a timepoint may contain all the images taken of a patient on a particular office visit. You can also use a timepoint to record pictures and x-rays of a patient at a particular milestone in the patient’s treatment. A timepoint can contain any combination of the pictures, x-rays, treatment simu-

lations, and so on. Each patient image stored using Dolphin Imaging is associated with a timepoint in the patient's record.

To view all the images in the current image layout for another timepoint:

1 Select another timepoint using the timepoint tabs.

Or,

Click CTRL+TAB to select the next timepoint tab.

Or,

Click CTRL+SHIFT+TAB to select the previous timepoint tab.

Or,

Right-click a timepoint tab. Then, select the appropriate timepoint from the context menu.

Or,

Select **Timepoint** from the **View** menu. Then, select the appropriate timepoint from the sub-menu.

To compare images for different timepoints within an image layout:

1 Use the arrow keys or the arrow buttons on the horizontal tool bar (, , , or) to move the to an image in the layout.

2 Press PAGE UP to substitute the corresponding image from the previous timepoint for the selected image in the image layout.

Or,

Press PAGE DOWN to substitute the corresponding image from the next timepoint for the selected image in the image layout.

Only the image identified by the changes. All other images in the layout remain the same.

By repeatedly pressing PAGE UP or PAGE DOWN, you can cycle through all the timepoints, comparing images for different phases of the patient's treatment.

To compare maximized images for different timepoints:

1 Maximize one of the patient's images as described in "Maximizing an Image" on page 3-17.

2 Click in the lower right corner, click , or press the RIGHT ARROW key to see the corresponding image in the next timepoint.

Or,

Click or press the LEFT ARROW key to see the corresponding image in the previous timepoint.

The icon only appears if the patient's image is maximized and the patient has corresponding images for other timepoints.

You can cycle through all the timepoints, comparing images for different phases of the patient's treatment. For example, you could view all lateral facial pictures taken for this patient. For more information on timepoints, see "Timepoints" on page 4-17.

Choosing an Image From Any Timepoint and Image Layout

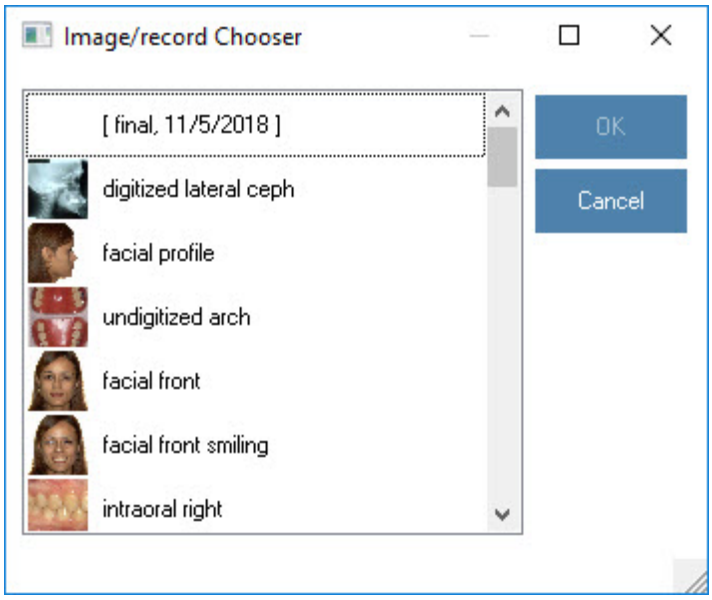
To choose an image from a list of all images for this patient:

1 Right-click the image, and select **Display Another Image** from the **Image** context menu.

Or,

Select **List All Images...** from the **View** menu.

The dialog box shown below opens.



2 Select the image that to use, and click **OK**.

The image you selected appears in the image layout.

Viewing X-rays Built in Dolphin 3D

When you build x-rays from a 3D volume, the x-rays are built using several different rendering filters. All the resulting x-ray images are saved together in a single image layout slot and represented on the main screen as a single image. For more information, see Chapter 21, Build X-rays.

To view a group of x-rays built in Dolphin 3D:

1 Click in the upper right corner of an x-ray image.

The icon only appears if the x-ray image is part of a series of x-rays built in Dolphin 3D.

If you continue clicking , Dolphin will cycle through all the x-rays, enabling you to compare x-ray images created from the 3D volume using different rendering filters.

The Image Context Menu

The **Image** context menu provides options for working with the image layout and the images it contains.

To access the Image context menu:

1 Right-click any image in the image layout.

The **Image** context menu offers the following choices:

Maximize or Restore	Maximizes this image, so that it takes up the entire main screen. If the image is already maximized, the **Restore** choice appears instead, enabling you to return to the image layout. For more information, see “Maximizing an Image” on page 3-17.
Paste From File	Pastes an image from an image file into this location in the image layout. For more information, see “Pasting an Image From a File” on page 3-36.
Display Another Image	Opens a dialog box where you can select another image captured for this patient to display temporarily instead of this image in the image layout. For more information, see “Choosing an Image From Any Timepoint and Image Layout” on page 3-28.
Play	Plays a video file using the default player registered on your computer for the video file type. Only available if you right-click the image placeholder for a video file. For more information, see “Working With Videos” on page 3-31. For information on capturing a video file, see “Capturing a Video File” on page 5-10.
Open Report	Opens a report that was saved from Dolphin 3D to a slot in this image layout. For more information, see “Viewing Dolphin 3D Reports” on page 3-32.
Add to Image Library	Adds this image to the Image Library. For more information, see “Adding an Image to the Library” on page 6-14
Save As...	Saves this image and any tracings to a file on your computer. For more information, see “Saving Images” on page 3-32.
Save Original As...	Saves the original (uncropped, unenhanced) image to a file on your computer. Only available for images for which an original version was saved during capture. For more information on using this menu item, see “Saving Images” on page 3-32. For more information on setting One-Click capture preferences to save the original image, see “Setting One-Click Capture Preferences” on page 5-29.
Save Layout As...	Saves this image layout to a file on your computer. For more information, see “Saving Images” on page 3-32.
Save Movie as...	Saves this movie to a file on your computer. For more information, see “Working With Videos” on page 3-31.

Copy Image	Copies the image you are currently viewing to the clipboard. For more information, see “Copying to the Clipboard” on page 3-34.
Copy Original Image	Copies the original (uncropped, unenhanced) image to the clipboard. Only available for images for which an original version was saved during capture. For more information on using this menu item, see “Copying to the Clipboard” on page 3-34. For more information on setting One-Click capture preferences to save the original image, see “Setting One-Click Capture Preferences” on page 5-29.
Copy Image To Resolution	Copies the image you are currently viewing to the clipboard at the resolution you select. For more information, see “Copying to the Clipboard” on page 3-34.
Copy Layout	Copies the image layout to the clipboard. For more information, see “Copying to the Clipboard” on page 3-34.
Copy Layout To Resolution	Copies the image layout to the clipboard at the resolution you select. For more information, see “Copying to the Clipboard” on page 3-34.
Copy Image as File	Copies the image you are currently viewing to the clipboard as a file. For more information, see “Copying as a File” on page 3-35.
Copy Image To Resolution as File	Copies the image you are currently viewing to the clipboard at the resolution you select as a file. For more information, see “Copying as a File” on page 3-35.
Copy Layout as File	Copies the image layout to the clipboard as a file. For more information, see “Copying as a File” on page 3-35.
Copy Layout To Resolution as File	Copies the image layout to the clipboard at the resolution you select as a file. For more information, see “Copying as a File” on page 3-35.
Delete Image	Deletes the selected image. For more information, see “Deleting Images” on page 3-36.
Image Enhance	Opens the Enhance Image dialog box so that you can apply enhancement operations to this image. If you have zoomed in on the image, the image is zoomed in the Enhance Image dialog box. For more information, see “Enhancing an Image” on page 5-16.
Annotations and Measurements...	Opens a dialog box where you can specify calibration information that Dolphin Imaging uses to scale the patient’s image, enter annotations on the image, or measure distances and angles on the image. For more information, see “Annotating and Measuring” on page 3-40.
PACS: Upload Current Image to Server	Uploads the currently-selected image to a Picture Archiving and Communication System (PACS) server. This option is enabled only if you have purchased the optional PACS Support module. Before uploading images, you must set up communications between Dolphin Imaging and your PACS server. For more information, see “Uploading Images to a PACS Server” on page 3-37 and “Setting Up PACS Communications” on page 3-58.

PACS: Upload Current Layout to Server	Uploads this image layout to a PACS server. This option is enabled only if you have purchased the optional PACS Support module. Before uploading an image layout, you must set up communications between Dolphin Imaging and your PACS server. For more information, see “Uploading Images to a PACS Server” on page 3-37 and “Setting Up PACS Communications” on page 3-58.
3D View...	Opens Dolphin 3D so that you can view the selected 3D image. This option is enabled only if you select a 3D image. For more information, see “Viewing or Editing an Existing Volume” on page 19-2
3D Edit...	Opens Dolphin 3D so that you can edit the selected 3D image. This option is enabled only if you select a 3D image and have purchased the optional Dolphin 3D module. For more information, see “Viewing or Editing an Existing Volume” on page 19-2.
Properties	Opens a dialog box where you can enter properties for this image. For more information, see “Setting Image Properties” on page 3-37.

Working With Videos

You can capture and play the following types of video files: AVI, MP4, WMV, MOV, MPG, M4V, M2V, 3GP, and DivX. For information on capturing a video file, see “Capturing a Video File” on page 5-10.

To play a video file:

1 Right-click the video file’s thumbnail, and select **Play** from the **Image** context menu.

Or,

Click on the video file’s thumbnail.

The default video player registered on your computer for the video file type launches in a new window.

2 Play the video file in the video player window.

3 When you finish playing the video, close the video player window.

To save a movie to a file:

1 Right-click the slot for the movie to save in the image layout. Then, select **Save Movie As...** from the **Image** context menu.

The Save As dialog box appears.

2 Specify the directory and file in which to save the movie.

3 Click **Save**.

Viewing Dolphin 3D Reports

To view a report saved from Dolphin 3D:

1 Right-click the report and select **Open Report** from the **Image** context menu to view the report.

Or,

Click in the upper right corner of a multi-page report to view the individual pages in the report.

Or,

Select a multi-page report and press **F8** to view the individual pages in the report.

The report opens in the Dolphin Imaging Report window. For more information, see Chapter 29, Reports.

Saving Images

To save an image to a file:

1 Right-click the image to save, and select **Save As...** from the **Image** context menu.

Or,

Right-click the image for which to save the original (uncropped, unenhanced) version, and select **Save Original As...** from the **Image** context menu.

The Save Dolphin Image As dialog box appears.

2 Specify the directory and file in which to save the image.

3 Optionally, select any other options from the drop-down lists.

Most options on this dialog box are described in the Microsoft Windows documentation.

You can use the **Save As Type** drop-down list to select the graphics file type to use when saving this image. JPEG 24-bit is recommended for producing high quality images with a small file size and maximum compatibility between imaging programs. Typically, you should use the default selections for all other options. Only modify these options if you are very familiar with graphics files types.

Depending on the image type you select in the **Save As Type** drop-down list, additional options may be available in the other drop-down lists.

Note: *If you select one of the JPEG 2000 file types, an additional button appears on the Save Dolphin Image As dialog box that enables you to set advanced options.*

4 Click **Save**.

The image and any tracings are saved in the specified file.

To save an image layout to a file:

1 Right-click an image in the image layout to save. Then, select **Save Layout As...** from the **Image** context menu.

The Save As dialog box appears.

2 Specify the directory and file in which to save the image layout.

3 Optionally, select the graphics file type that to use from the **Save As Type** drop-down list.

Depending on the image type you select, additional options may be available in the other drop-down lists.

4 Optionally, check the **Save Individually** box to save each image in the layout in a separate file.

If you select this option, several files will be created in the directory you chose. These files will automatically be assigned names of the following format:

***SpecifiedFileName ImageSlotName*.ext**

For example, suppose you save the Composite (6) image layout, enter Jane Smith in the **File Name** field, and select **JPEG** in the **Save As Type** drop-down list. The following files will be created (assuming you have images in all the image slots): **Jane Smith Facial Front.jpg**, **Jane Smith Facial Front Smiling.jpg**, **Jane Smith Facial Profile.jpg**, **Jane Smith Intraoral Center.jpg**, **Jane Smith Intraoral Right.jpg**, and **Jane Smith Intraoral Left.jpg**.

5 Optionally, select any other options from the drop-down lists.

Most options on this dialog box are described in the Microsoft Windows documentation.

You can use the **Save As Type** drop-down list to select the graphics file type to use when saving this image. JPEG 24-bit is recommended for producing high quality images with a small file size and maximum compatibility between imaging programs. Typically, you should use the default selections for all other options. Only modify these options if you are very familiar with graphics files types.

Note: *If you select one of the JPEG 2000 file types, an additional button appears on the Save Dolphin Image As dialog box that enables you to set advanced options.*

6 Click **Save**.

Copying and Pasting Images

Using the Dolphin Imaging copy and paste features, you can:

- copy an image or image layout from the Dolphin Imaging to the clipboard. From there, you can paste it into another application, e-mail message, and so on.
- copy an image or image layout from the Dolphin Imaging as a file to the clipboard. From there, you can paste the file into Microsoft Windows Explorer, an e-mail message attachment, and so on.
- paste images from files on your computer into Dolphin Imaging.

Copying to the Clipboard

You can copy a single image or an entire image layout to the clipboard. If you saved the original (uncropped, unenhanced) version when you captured an image, you can copy that version to the clipboard instead of the edited version. For more information on saving original images, see Chapter 5, Capture.

You can also specify the resolution that to use for an image or image layout when you copy it to the clipboard.

If you are currently viewing an image with a cephalometric tracing, your current view (the image, the image with the tracing, or the tracing only) is copied to the clipboard.

To copy an image or image layout to the clipboard:

1 Right-click the image, and select **Copy Image** from the **Image** context menu.

Or,

Right-click the image for which to copy the original (uncropped, unenhanced) version, and select **Copy Original Image** from the **Image** context menu.

Or,

Right-click an image in the image layout to copy. Then, select **Copy Layout** from the **Image** context menu.

Or,

Select an image. Then, select **Copy Image** from the **Edit** menu.

Or,

Select an image. Then, select **Copy Original Image** from the **Edit** menu.

Or,

Select **Copy Layout** from the **Edit** menu.

To copy an image or image layout at a specific resolution:

1 Right-click the image, and select **Copy Image To Resolution** from the **Image** context menu.

Or,

Right-click an image in the image layout to copy. Then, select **Copy Layout To Resolution** from the **Image** context menu.

Or,

Select an image. Then, select **Copy Image To Resolution** from the **Edit** menu.

Or,

Select **Copy Layout To Resolution** from the **Edit** menu.

2 Select the desired resolution from the drop-down list.

Or,

Select **Other** from the drop-down list.

If you select **Other**, the Enter Resolution dialog box appears.

3 If the Enter Resolution dialog box appears, enter the resolution, and click **OK**.

The resolution you entered will appear on the drop-down list the next time you select **Copy Image to Resolution**.

The image or image layout is copied to the clipboard. If you are currently viewing an image with a cephalometric tracing, your current view (the image, the image with the tracing, or the tracing only) is copied to the clipboard.

Copying as a File

An image or image layout that you've copied to the clipboard as a file can be pasted as a file into Microsoft Windows Explorer, an e-mail message attachment, and so on. Pasting data copied as a file is different than pasting an image or layout from the clipboard that was not copied as a file.

For example, if you paste an image that was just copied to the clipboard into an e-mail message, it appears embedded in the text of the message. If you copy the image as a file, pasting it into an e-mail message creates an attachment to the message.

If you are currently viewing an image with a cephalometric tracing, your current view (the image, the image with the tracing, or the tracing only) is copied into the file.

You can also specify the resolution to use for an image or image layout when you copy it as a file to the clipboard.

To copy an image or image layout as a file:

1 Right-click the image, and select **Copy Image as File** from the **Image** context menu.

Or,

Right-click an image in the image layout to copy. Then, select **Copy Layout as File** from the **Image** context menu.

Or,

Select an image. Then, select **Copy Image as File** from the **Edit** menu.

Or,

Select **Copy Layout as File** from the **Edit** menu.

To copy an image or image layout as a file at a specific resolution:

1 Right-click the image, and select **Copy Image To Resolution as File** from the **Image** context menu.

Or,

Right-click an image in the image layout to copy. Then, select **Copy Layout To Resolution as File** from the **Image** context menu.

Or,

Select an image. Then, select **Copy Image To Resolution as File** from the **Edit** menu.

Or,

Select C**opy Layout To Resolution as File** from the **Edit** menu.

2 Select the desired resolution from the drop-down list.

Or,

Select **Other** from the drop-down list.

If you select **Other**, the Enter Resolution dialog box appears.

3 If the Enter Resolution dialog box appears, enter the resolution, and click **OK**.

Pasting an Image From a File

Pasting an image from a file into Dolphin Imaging enables you to bring in images from other applications, e-mail messages, and so on.

To paste an image from a file:

1 Right-click an image that to replace with an image from a file. Then, select **Paste From File...** from the **Image** context menu.

The Select Image File dialog box appears.

2 Specify the directory and file containing the image that to paste into this image layout.

When you select an image file, the Select Image File dialog box displays a thumbnail of the image.

3 Click **Open** to paste the selected image into the image layout.

Deleting Images

To delete an image:

1 Right-click the image, and select **Delete Image** from the **Image** context menu.

A dialog box appears asking you to confirm the deletion.

2 Click **Yes** to delete the image.

Uploading Images to a PACS Server

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Export (copy/save/drag) Imaging Data privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Note: *When uploading images or image layouts to your PACS server, you should make sure that you are not duplicating images already on your PACS server.*

For information on uploading a patient's 3D volume data to a PACS server from Dolphin 3D, see "Uploading the Volume to a PACS Server" on page 19-122.

To upload an image to a PACS server:

1 Right-click the image to upload, and select **PACS: Upload Current Image to Server** from the **Image** context menu.

The image is uploaded to your PACS server.

To upload an image layout to a PACS server:

1 Right-click an image in the image layout to upload, and select **PACS: Upload Current Layout to Server** from the **Image** context menu.

The images in the layout are uploaded to your PACS server. A separate file is created on the PACS server for each image in the layout. If a duplicate image is found on the server, that image is not uploaded.

Setting Image Properties

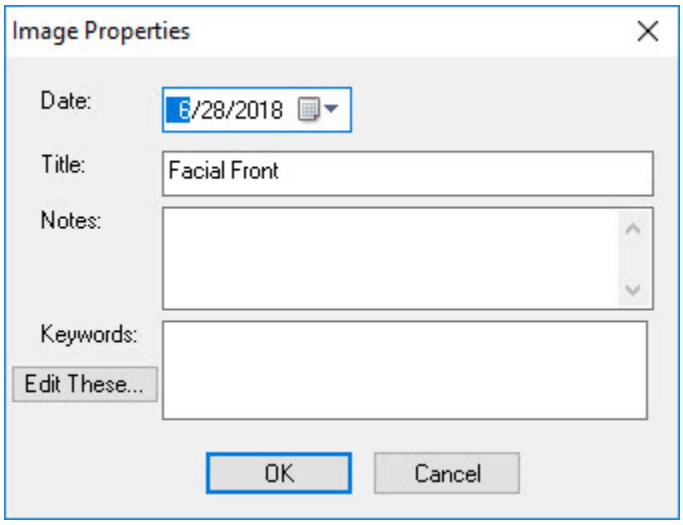
You can set properties such as a date, title, notes, or keywords for patient images.

To specify properties for an image:

1 Right-click the image, and select **Properties** from the **Image** context menu.

The Image Properties dialog box is displayed.

2 Enter any image properties for this image. Then, click **OK**.



Date	Date for this image.
Title	Image title.
Notes	Any notes for this image.
Keywords	Any keywords for this image. Right-click this box to select from a context menu of predefined keywords.
Edit These...	Add new predefined keywords or remove existing ones. For more information, see “Adding and Removing Pre-defined Image Keywords” on page 3-38.

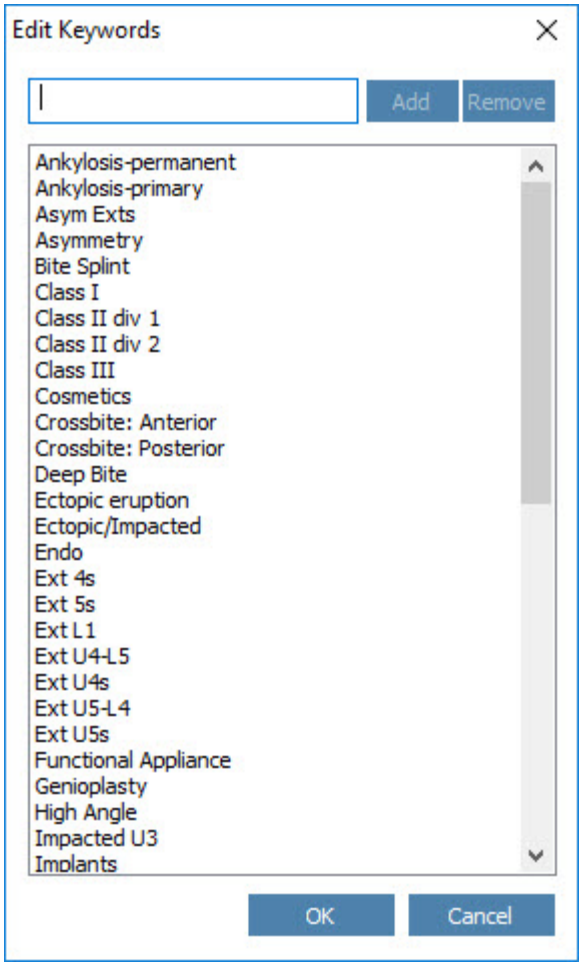
Adding and Removing Pre-defined Image Keywords

The keywords that you can add to patient images are predefined, but you can customize the list of pre-defined keywords by adding new ones or deleting ones that you don’t use.

To edit the pre-defined image keywords:

1 On the Image Properties dialog box, click **Edit These...**.

The Edit Keywords dialog box opens.



field	Enter a new keyword to add to the list of predefined keywords.
Add	Adds a new predefined keyword.
Remove	Removes the selected predefined keyword.
list	Lists the predefined keywords that you can assign to an image.

To add a new keyword:

1 Type the new keyword in the field, then click **Add**.

To remove an existing keyword:

1 Select the keyword to remove in the list, then click **Remove**.

To close this dialog box:

1 Click **OK**.

Annotating and Measuring

Using the annotation and measurement feature, you can:

- specify information that Dolphin Imaging uses to scale the patient's image
- measure distances, angles, areas, and paths on the image
- annotate the image using text, shapes, arrows, and free-form lines and curves

To toggle the display of any annotations and measurements already added to the patient's images:

1 Select **Show Measurements and Annotations** from the **View** menu.

To open the Annotations and Measurements dialog box:

1 Select an image. Then, click

.

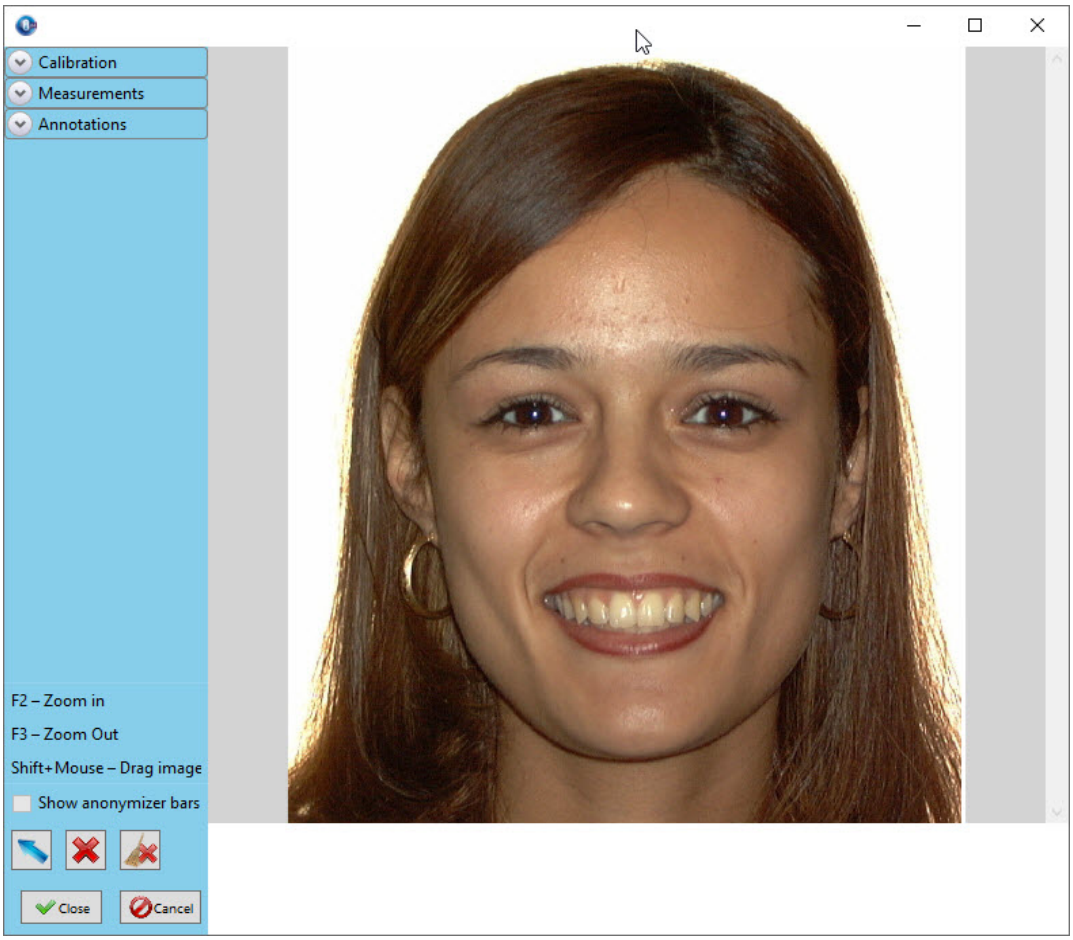
Or,

Right-click the image, and select **Annotations and Measurements...** from the **Image** context menu.

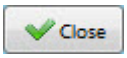
Or,

Select an image. Then, select **Annotations and Measurements...** from the **Edit** menu.

The Annotations and Measurements dialog box is displayed.



Calibration	Information that Dolphin Imaging uses to scale the patient's image. **Distance:** The distance in millimeters between two points on the image identified using the calibration line. **DP:** The dots-per-inch (DPI) of the image. For more information, see "Calibrating the Image" on page 3-43.
Measurements	Options for measuring distances and angles on the image. **Distance:** Measure the distance in millimeters between two specified points on the image. **3-point Angle:** Measure the angles between two lines joined by an apex. **4-point Angle:** Measure the angle between two lines that are not joined by an apex. **Area:** Calculate the area enclosed by a polygon. **Path:** Measure the length of a path consisting of joined lines. For more information, see "Measuring Distances, Angles, Areas, and Paths" on page 3-43.

Annotations	Options for adding annotations to the image. **Line:** Draw a line on the image. **Arrow:** Draw an arrow on the image. **Ellipse:** Draw an ellipse on the image. **Rectangle:** Draw a rectangle on the image. **Label:** Add a text label to the image. **Free-hand:** Draw free-hand lines, curves, and shapes on the image. For more information, see “Using Annotations” on page 3-47.
Show anonymizer bars	Adds black bars over a patient’s eyes. For more information, see “Using Anonymizer Bars” on page 3-52.
	Switches from drawing objects to selecting objects. Typically, when the Measurements or Annotations section is expanded, clicking and dragging draws lines, angles, and shapes on the patient's image. This button enables you to select objects instead.
	Removes the selected measurement or annotation from the image.
	Removes the all measurements and annotations from the image.
	Saves your changes and return to the main screen.
	Returns to the main screen without saving your changes.

To zoom in or out:

1 Use the scroll button or wheel on your mouse.

Or,

Press **F2** to zoom in.

Or,

Press **F3** to zoom out.

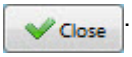
To move the image within the window:

1 SHIFT+click and drag the image.

To delete all measurements and annotations from the patient's image:

1 Click .

To save your changes and close the Annotations and Measurements window:

1 Click  .

Calibrating the Image

When you calibrate an image, you specify information that Dolphin Imaging uses to scale it. Once the image is calibrated, you can print it life size using the 1:1 option or take distance measurements on it (see “Measuring Distances, Angles, Areas, and Paths” on page 3-43).

Note: *If the image already has calibration information (for example, if you are adding annotations to a digitized image), Dolphin Imaging uses the stored calibration information.*

To calibrate the image:

1 On the Annotations and Measurements dialog box, click **Calibration**.

The following calibration options appear:

Distance	Calibrate the image by specifying the distance in millimeters between two points on the image identified using the calibration line.
DPI	Calibrate the image by specifying its dots-per-inch (DPI).

To calibrate the image by entering the distance between two points:

1 Check the **Distance** box.

2 On the patient’s image, click and drag each of the calibration line’s boxes to the points on the image to use as the end points for your calibration measurement.

For example, if you know the distance between the patient's eyes, you might position the ends of the calibration line at the corners of the patient's eyes. When the mouse is over one of the boxes, triangles appear around that box.

3 Enter the distance in millimeters between the two points in the **Distance** field.

To calibrate the image by entering the DPI of the image:

1 Check the **DPI** box.

2 Enter the DPI of the image in the field.

Measuring Distances, Angles, Areas, and Paths

Once an image is calibrated, you can measure distances, areas, and paths on it. For information on calibrating an image, see “Calibrating the Image” on page 3-43.

Note: *You can take angular measurements without first calibrating the image.*

To begin measuring distances, angles, areas, and paths:

1 On the Annotations and Measurements dialog box, click **Measurements**.

The following options appear:

Distance	Measure the distance in millimeters between two specified points on the image
3-point Angle	Measure the angle between two lines joined by an apex.
4-point Angle	Measure the angle between two lines that are not joined by an apex.
Area	Calculate the area enclosed by a polygon.
Path	Measure the length of a path consisting of joined lines.

For more information, see “Measuring Distances” and “Measuring Angles” below.

Measuring Distances

To measure the distance between two points:

1 Click **Distance**.

2 On the patient’s image, click the two points between which to measure the distance.

Hold down the SHIFT key while clicking the second point to measure along a straight line.

A line appears between the two points along with the distance in millimeters.

Measuring Angles

To measure the angle between two lines joined by an apex:

1 Click **3-point Angle**.

2 On the patient’s image, click one end point for the angle, the angle's apex, and a second end point for the angle.

Two lines appear joined by the apex. The number of degrees for the angle appears near the apex.

To measure the angle between two lines not joined by an apex:

1 Click **4-point Angle**.

2 On the patient’s image, click the two end points for one line.

3 Click the two end points for the second line.

The two lines appear along with a measurement of the angle between them.

Measuring Areas

To calculate the area inside a polygon:

1 Click the point where you want to begin drawing the polygon.

2 Release the mouse button and move the mouse to begin drawing the polygon.

3 Click whenever you want to place a point and change the direction of the line.

4 To complete the polygon, click the first point again to close the polygon.

Cross-hatching appears inside the polygon, and a label appears indicating the area in mm^2.

Measuring Paths

To measure the length of a path:

1 Click two points to define the first segment of the path.

2 Click whenever you want to add a segment to the path.

3 Double-click to end the path.

A label appears indicating the length of the path.

Modifying Measurements

To modify a measurement line or angle:

1 If the Measurements section is expanded, click .

2 Click the line or angle to modify.

When the line or angle is selected, it turns red and flashes.

3 Click and drag the line or angle handles (small boxes) to change its size or shape.

To move a measurement line or angle:

1 If the Measurements section is expanded, click .

2 Click the line or angle to move.

When the line or angle is selected, it turns red and flashes.

3 Click and drag the line to move it.

Measurement Properties

When you select the type of measurement you want to add, properties for it appear in the Annotations and Measurements dialog box.

Pen Color	The color sample shows the current pen color. Click the color sample to change the color.
Pen Width	Number of pixels to use for the pen width.
Pen Style	Pen style.

Modifying Measurement Labels

To move or resize a measurement label:

1 If the Measurements section is expanded, click .

2 Click the measurement label you want to resize.

A flashing blue outline with resizing handles (small boxes) at the corners appears.

3 Place your mouse pointer on the label.

4 When the mouse pointer changes to a move icon ( ), click and drag the measurement label to move it.

Or,

When the mouse pointer changes to a hand icon ( ), click and drag the one of the resizing handles to resize it.

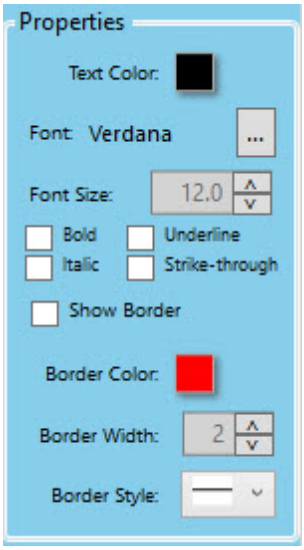
To set properties for measurement label:

1 If the Measurements section is expanded, click .

2 Click the measurement label.

A Properties group box appears on the left.

3 Set any properties you want for the text label.



Text Color	Color of the label text. Click the color sample to pick another color.
Font	Font for the label text. **...:** Opens the Font dialog box so that you can select a different font.
Font Size	Font size for the label text.
Bold	Sets the font to boldface.
Italic	Sets the font to italic.
Underline	Underlines the label text.
Strike-through	Sets the font to strike-through
Show Border	Displays a border around the label text.
Border Color	Color of the label border. Click the color sample to pick another color.
Border Width	Width of the label border in pixels.
Border Style	Border style, such as solid or dotted line.

Deleting Measurements

To delete a measurement line or angle from the patient's image:

1 Click the line or angle to delete.

When the line or angle is selected, it turns red and flashes.

2 Click .

Alternatively, you can right-click the line or angle and select **Delete** from the context menu.

To delete all measurement lines and angles from the patient's image:

1 Click .

Using Annotations

With annotations, you can add text, shapes, arrows, and arbitrary “ink” doodles on images. The annotations are stored in a layer that can be displayed or hidden (just like cephalometric tracings) when you are viewing images on the main screen. You can also print them.

An image does not need to be calibrated before you can annotate it.

Adding Annotations

To add an annotation:

1 On the Annotations and Measurements dialog box, click **Annotations**.

The following options appear:

Line	Draw a line on the image.
Arrow	Draw an arrow on the image.
Ellipse	Draw an ellipse on the image.
Rectangle	Draw a rectangle on the image.
Label	Add a text label to the image.
Free-hand	Draw free-hand lines, curves, and shapes on the image.

2 Click the type of annotation to add.

3 Set properties for the annotation (see “Annotation Properties” on page 3-49).

4 Click and drag on the image to draw the annotation.

Or,

SHIFT+click and drag to create straight lines and uniform shapes.

If you are adding a label, clicking and dragging creates a placeholder for it.

5 If you are adding a label, type the text of the label.

Modifying Annotations

To modify an annotation:

1 If the Annotations section is expanded, click .

2 Click the annotation to modify.

When the annotation is selected, it flashes.

3 Click and drag the annotation's handles (small boxes) to change its size or shape.

Or,

SHIFT+click and drag the handles to reshape the annotation in a uniform fashion.

Change the annotation's properties (see “Annotation Properties” on page 3-49).

Moving Annotations

To move an annotation:

1 If the Annotations section is expanded, click .

2 Click the annotation to move.

When the annotation is selected, it flashes.

3 Click and drag inside an ellipse or rectangle to move it.

Or,

Click along a line, arrow, or curve to move it.

Deleting Annotations

To delete an annotation from the patient's image:

1 Click the annotation to delete.

When the annotation is selected, it turns blue and flashes.

2 Click .

Alternatively, you can right-click the annotation and select **Delete** from the context menu.

To delete all annotations from the patient's image:

1 Click .

Annotation Properties

When you select the type of annotation you want to add, properties for that annotation type appear in the Annotations and Measurements dialog box.

Pen Color	The color sample shows the current pen color. Click the color sample to change the color.
Pen Width	Number of pixels to use for the pen width.
Head Width	Number of pixels to use for the arrowhead width. Available for arrows only.
Head Length	Number of pixels to use for the arrowhead length. Available for arrows only.
Pen Style	Pen style.
Head Filled	Fills in the arrowhead with the selected pen color. Available for arrows only.
Filled	Fills in the shape with the selected pen color. Available for ellipses and rectangles only.

Text Color	Color to use for labels.
Font	Font used for labels. **...:** Opens the Font dialog box so you can change the font. For more information, see "Setting Font Options" below.
Font Size	Font size for labels.
Bold	Sets the font for labels to boldface.
Italic	Sets the font for labels to italics.
Underline	Enables underlining for labels.
Strike-through	Enables strike through for labels.
Show Border	Adds a border around labels.
Border Color	The color sample shows the current label border color. Click the color sample to change the color.
Border Width	Number of pixels for the label border width.
Border Style	Label border style.

Setting Font Options

Many Dolphin Imaging dialog boxes offer an option to set font options for labels, measurement numbers, and so on.

To set font options:

1 Click the button labeled **...** next to the **Font** field.

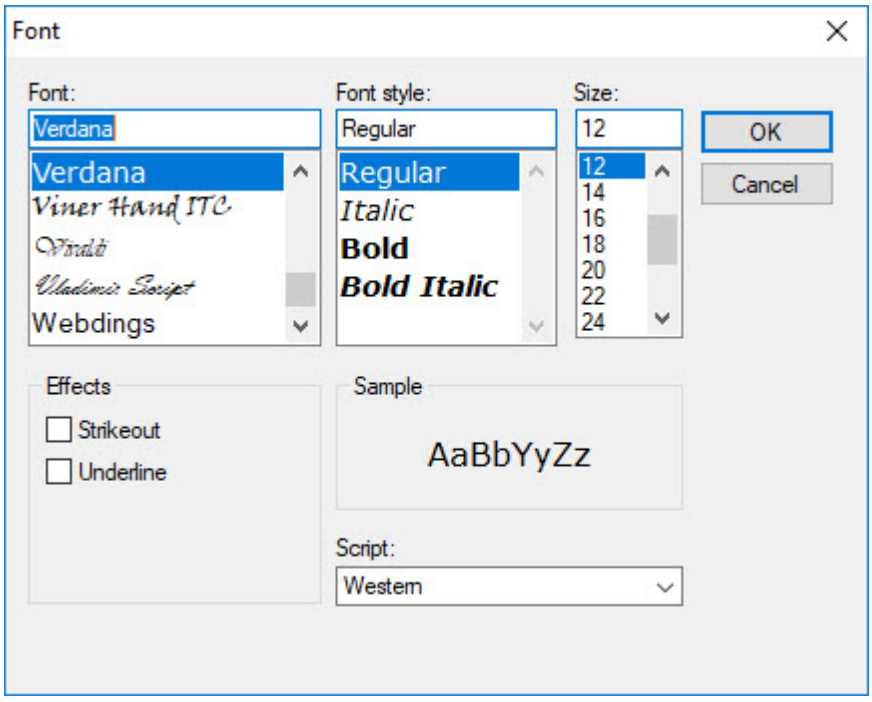
Or,

Click **Font...** or **Fonts...**.

The Font dialog box opens.

2 Set any font options.

3 Click **OK**.



Font	Font face.
Font Style	Font style.
Size	Font size.
Strikeout	Strikes out the text.
Underline	Underlines the text.
Sample	Displays a preview of your chosen settings.
Script	Script type.

Using Anonymizer Bars

Anonymizer bars are a special type of annotation used to obscure the identity of a patient for case presentation purposes. You can add, adjust, show, and hide anonymizer bars separately from the other annotations.

To add anonymizer bars on the patient's facial pictures using the default settings:

1 Check the **Show anonymizer bars** box on the Annotations and Measurements dialog box.

Or,

Click

on the main screen's horizontal tool bar.

Or,

Select **Show Anonymizing Bars** from the **View** menu on the main screen.

If a patient's Facial Front, Facial Front Smiling, and Facial Profile pictures were captured so that the patient's eyes were aligned with the appropriate guideline, the guideline's location is used to position the anonymizer bars.

To customize the size and location of the anonymizer bar on one of the patient's facial pictures:

1 Select the picture on the main screen.

2 Select **Annotations and Measurements...** from the **Edit** menu.

3 On the Annotations and Measurements dialog box, check the **Show anonymizer bars** box if it isn't already checked.

4 Click the anonymizer bar on the patient's picture.

5 Resize the anonymizer bar as described in "Modifying Annotations" on page 3-48.

Or,

Move the anonymizer bar as described in "Moving Annotations" on page 3-49.

You can also add anonymizer bars manually. For example, you might add an anonymizer bar to a patient's x-ray if it contains identifying information.

To add anonymizer bars manually:

1 On the Annotations and Measurements dialog box, click **Annotations**.

2 Click **Rectangle** as the type of annotation to add.

3 Check the **Filled** box in the Properties group box.

4 Click and drag to draw a rectangle on the patient's image.

5 Right-click the filled rectangle you just added, and select **Anonymizer** from the context menu.

Editing Doctors

You can enter information about the doctors that work in your practice or with whom your practice frequently corresponds into the database for easy reference and for use in the Dolphin Letters System.

Note: *If you are using Dolphin Imaging with Dolphin Management or if you have the Dolphin Imaging Security Utilities installed, you enter information about referring doctors in Dolphin Management. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**Dolphin Management User Guide.PDF** or **DM_Help.chm** in your **C:\Dolphin** folder).*

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account hase the Edit Menu and Edit Doctors privileges granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**Dolphin Management User Guide.PDF** or **DM_Help.chm** in your **C:\Dolphin** folder).*

Adding a Doctor

To add a doctor to the database:

1 Select **Edit Referring Doctors** from the **Edit** menu to add a doctor who refers patients to your practice.

Or,

Select **Edit Treating Doctors** from the **Edit** menu to add a doctor who works in your practice.

The Edit Referring Doctors or Edit Treating Doctors dialog box lists doctors currently in the database.

2 Click **New** to add a new doctor.

The Edit Doctor Information dialog box is displayed. This dialog box is blank so you can enter information for a new doctor.

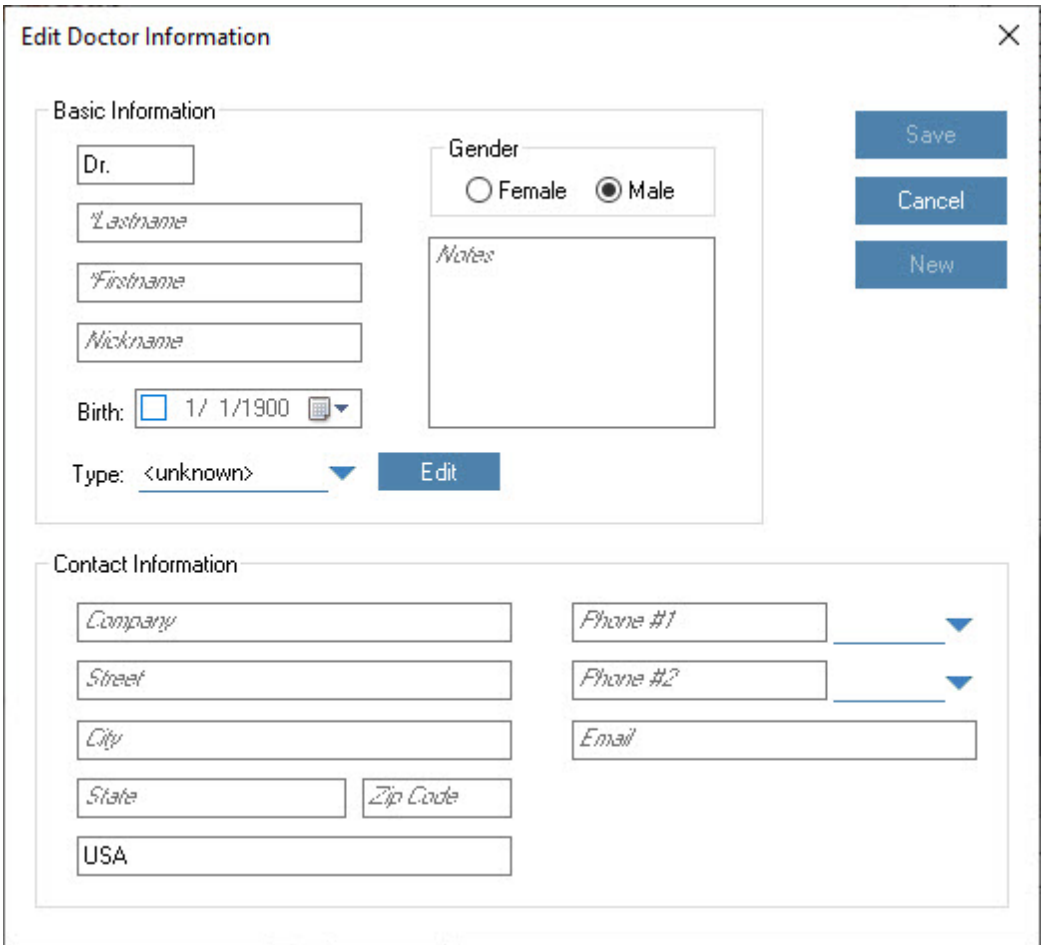
3 Enter any information for this doctor. Then, click **Save**.

In each field, gray italic text indicates the information that you should enter. An asterisk indicates required information that you must enter for every doctor. All other information is optional.

4 If you wish to add another doctor, click **New** to clear the Edit Doctor Information dialog box.

5 When you finish adding doctors, click **Close** or **Cancel** to close this dialog box.

6 Click **Exit** to close the Edit Referring Doctors or Edit Treating Doctors dialog box.



Title	Doctor's title, which defaults to Dr.
Last Name	Doctor's last name.
First Name	Doctor's first name.
Nickname	Any nickname for this doctor.
Birth	Doctor's birth date. By default, the check box is unchecked, which disables this field. The current date appears initially.
Type	Type of practice for this doctor. **Edit:** Opens a dialog box where you can set up the doctor types for your practice. For more information, see "Setting Up Referring Doctor Types" on page 3-56.
Gender	Doctor's gender.
Notes	Any notes for this doctor.
Company	Name of the practice for which this doctor works.
Street	Street address for this doctor.
City	City for this doctor's address.

State	State for this doctor's address.
Zip Code	Zip code for this doctor's address.
Country	Country for this doctor's address. This value defaults to USA.
Phone #1, Phone #2	Telephone numbers for this doctor. These fields accept both letters and numbers. Some practices use one of these fields for another purpose, such as a database index.
Email	Email address for this doctor.
Save	Saves the information for this doctor.
New	Clears all entry fields so you can enter information for a new doctor.

Modifying an Existing Doctor

To modify a doctor already in the database:

1 Select **Edit Referring Doctors** from the **Edit** menu to add a doctor who refers patients to your practice.

Or,

Select **Edit Treating Doctors** from the **Edit** menu to add a doctor who works in your practice.

The Edit Referring Doctors or Edit Treating Doctors dialog box lists doctors currently in the database.

2 Select the doctor for whom you want to change information, and click **Modify**.

The Edit Doctor Information dialog box is displayed with the information currently in the database for this doctor.

3 Change any information for this doctor. Then, click **Save**.

The doctor's information is updated in the database.

4 Click **OK**.

5 Click **Close** to close the Edit Doctor Information dialog box.

6 Click **Exit** to close the Edit Referring Doctors or Edit Treating Doctors dialog box.

Deleting a Doctor

To delete a doctor from the database:

1 Select **Edit Referring Doctors** from the **Edit** menu to add a doctor who refers patients to your practice.

Or,

Select **Edit Treating Doctors** from the **Edit** menu to add a doctor who works in your practice.

The Edit Referring Doctors or Edit Treating Doctors dialog box lists doctors currently in the database.

2 Select the doctor to delete, and click **Delete**.

A dialog box asks you to confirm the deletion.

3 Click **Yes**.

4 Click **Exit** to close the Edit Referring Doctors or Edit Treating Doctors dialog box.

Setting Up Referring Doctor Types

You can define the doctor types (such as General Dentist, Orthodontist, Oral Surgeon, and so on) used by your practice to categorize referring doctors.

To set up referring doctor types:

1 On the Edit Doctor Information dialog box, click **Edit** next to the **Type** drop-down list.

The Edit Doctor Types dialog box lists doctor types currently in the database.

2 Make any changes to the doctor types as described below.

3 Click **Close** to close the Edit Doctor Types dialog box when you're done.

To add a new referring doctor type:

1 On the Edit Doctor Types dialog box, enter a new doctor type in the text field.

2 Click **Add** to add the new doctor type to your database.

To change an existing referring doctor type:

1 On the Edit Doctor Types dialog box, select the doctor type you want to change.

2 Click **Modify**.

3 On the dialog box that appears, enter a new value for this doctor type, and click **Change**.

To delete an existing referring doctor type:

1 On the Edit Doctor Types dialog box, select the doctor type you want to delete.

2 Click **Delete**.

Editing Insurance Companies

You can enter information about the insurance companies with which your practice frequently corresponds into the database for easy reference and for use in the Dolphin Letters System.

Note: *If you are using Dolphin Imaging with Dolphin Management, you enter information about insurance companies in Dolphin Management. For more information, refer to the Dolphin Management online help.*

Adding an Insurance Company

To add an insurance company to the database:

1 Select **Edit Insurance Companies** from the **Edit** menu.

The Edit Insurance Companies dialog box lists insurance companies currently in the database.

2 Click **New** to add a new insurance company.

The Edit Insurance Company dialog box is displayed. This dialog box is blank so you can enter information for a new insurance company.

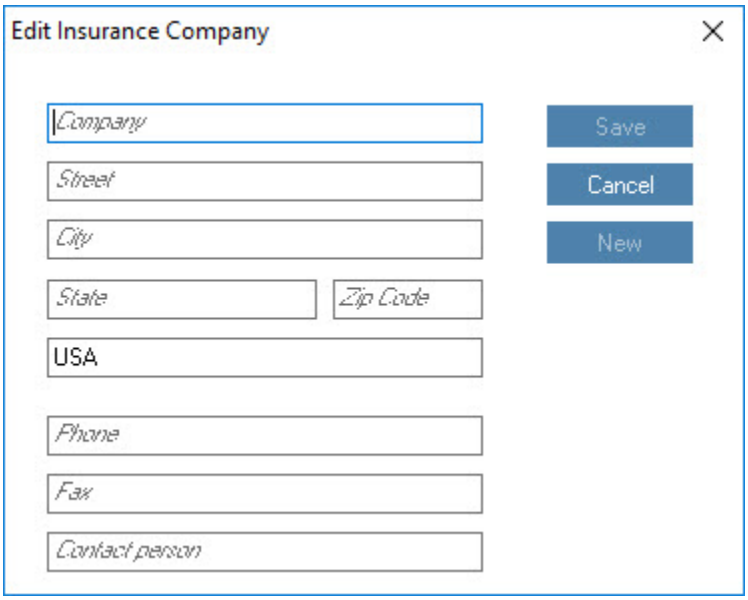
3 Enter any information for this insurance company. Then, click **Save**.

In each field, gray italic text indicates the information that you should enter. All information except Company is optional.

4 If you wish to add another insurance company, click **New** to clear the Edit Insurance Company dialog box.

5 When you finish adding insurance companies, click **Close** or **Cancel** to close this dialog box.

6 Click **Exit** to close the Edit Insurance Companies dialog box.



Company	Name of this insurance company.
Street	Street address for this insurance company.
City	City for this insurance company's address.
State	State for this insurance company's address.
Zip Code	Zip code for this insurance company's address.
Country	Country for this insurance company's address. This value defaults to USA.
Phone	Telephone number for this insurance company.

Fax	Fax number for this insurance company.
Contact Person	Name of your contact person at this insurance company.
Save	Saves the information for this insurance company.
New	Clears all the entry fields so you can enter information for a new insurance company.

Modifying an Existing Insurance Company

To modify an insurance company already in the database:

1 Select **Edit Insurance Companies** from the **Edit** menu.

The Edit Insurance Companies dialog box lists insurance companies currently in the database.

2 Select the insurance company for which you want to change information, and click **Modify**.

The Edit Insurance Company dialog box is displayed with the information currently in the database for this insurance company.

3 Change any information for this insurance company. Then, click **Save**.

The insurance company's information is updated in the database.

4 Click **OK**.

5 Click **Close** to close the Edit Insurance Company dialog box.

6 Click **Exit** to close the Edit Insurance Companies dialog box.

Deleting an Insurance Company

To delete an insurance company from the database:

1 Select **Edit Insurance Companies** from the **Edit** menu.

The Edit Insurance Companies dialog box lists insurance companies currently in the database.

2 Select the insurance company that to delete, and click **Delete**.

3 Click **Yes** on the dialog box that appears to confirm the deletion.

4 Click **Exit** to close the Edit Insurance Companies dialog box.

Setting Up PACS Communications

You can set up client/server communication between Dolphin Imaging and a PACS server so that you can capture patient images from it or upload patient images and image layouts to it. For more information, see "Capturing from a PACS Server" on page 5-38, "Uploading Images to a PACS Server" on page 3-37, "Importing a New 3D Volume from a PACS Server" on page 19-5, and "Uploading the Volume to a PACS Server" on page 19-122.

Note: *This feature is available only if you have purchased the optional PACS Support module.*

To set up PACS communication:

1 Select **PACS Communication Setup...** from the **Tools** menu.

The PACS Server/Client Connections dialog box opens.

2 Select the name of the client/server configuration properties you want to view from the **Name** drop-down list.

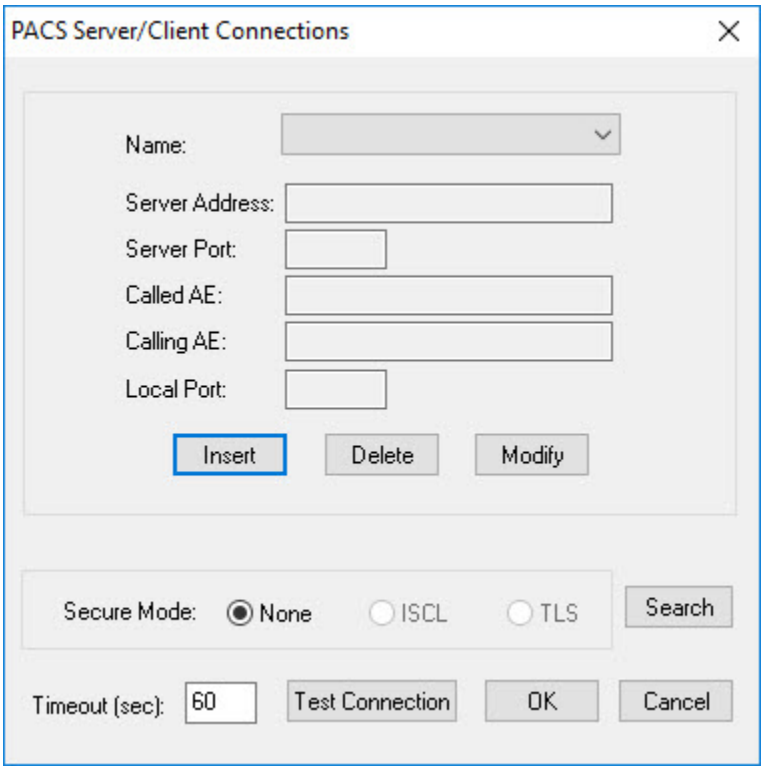
Or,

Add, modify, or delete PACS server/client connection properties as described in “Setting PACS Connection Properties” on page 3-60.

3 Optionally, click **Search** to set options for searching for patients on your PACS server as described in “Setting Up Search Options” on page 3-62.

4 Optionally, click **Test Connection** to test whether Dolphin Imaging can communicate with your PACS server successfully as described in “Testing the Connection” on page 3-61.

5 Click **OK** to close this dialog box.



Name	Name of the client/server configuration properties to display. This drop-down list is blank if no properties have been set up yet.
Server Address	IP address of the PACS server.
Server Port	Number of the port on the PACS server that Dolphin Imaging should use to communicate with it.

Called AE	Application entity receiving the PACS messaging service request. This should be the application name of your PACS server.
Calling AE	Application entity initiating the PACS messaging service request. Typically, this should match the value in the **Name** field.
Local Port	Number of the port on your Dolphin Imaging server that Dolphin Imaging should use to communicate with the PACS server.
Insert	Adds the configuration settings to communicate with this PACS server to your database.
Delete	Deletes the configuration settings for the selected PACS server from your database.
Modify	Changes the configuration settings for the selected PACS server in your database.
Secure Mode	Type of security to use when communicating with the PACS server: **None:** Don't use any security mechanism. **ISCL:** Use the Integrated Secure Communication Layer (ISCL) secure transport connection profile. **TLS:** Use the Transport Layer Secure (TLS) secure transport connection profile. For more information on the security your PACS server supports, refer to your PACS server documentation.
Search	Set options for finding patient files on the PACS server.
Timeout (sec)	Number of seconds to use as the time out for communications between Dolphin Imaging and the PACS server.
Test Connection	Tests the connection to the PACS server.

Setting PACS Connection Properties

To add or modify PACS server/client connection properties:

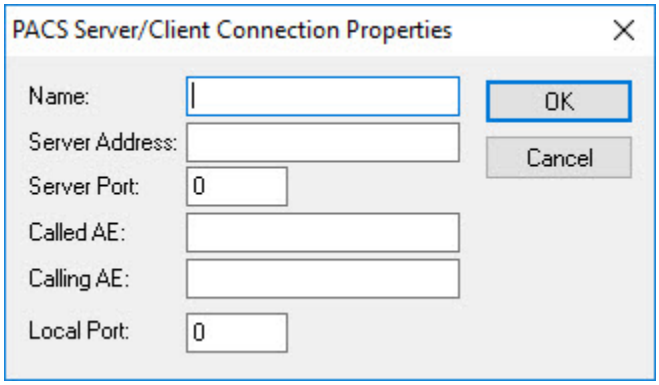
1 On the PACS Server/Client Connections dialog box, click **Insert** to add a new set of properties.

Or,

On the PACS Server/Client Connections dialog box, select the name of the client/server configuration properties to modify. Then, click **Modify**.

The PACS Server/Client Connection Properties dialog box opens.

2 Enter or change the information necessary for the server/client connection. Then, click **OK**.



Name	Application name to use for this client/server configuration.
Server Address	IP address of the PACS server.
Server Port	Number of the port on the PACS server that Dolphin Imaging should use to communicate with it.
Called AE	Application entity receiving the PACS messaging service request. This should be the application name of your PACS server.
Calling AE	Application entity initiating the PACS messaging service request. Typically, this should match the value in the **Name** field.
Local Port	Number of the port on your Dolphin Imaging server that Dolphin Imaging should use to communicate with the PACS server.

To delete PACS Server/Client connection properties:

1 On the PACS Server/Client Connections dialog box, select the name of the client/server configuration properties to delete. Then, click **Delete**.

2 Click **Yes** on the dialog box that appears to confirm the deletion.

Testing the Connection

To test the connection to the PACS server:

1 On the PACS Server/Client Connections dialog box, click **Test Connection**.

If the connection is ready to use, a message appears stating that Dolphin was able to connect to the PACS server. Otherwise, an error message appears stating that Dolphin was not able to connect to the PACS server.

2 Click **OK**.

If Dolphin was not able to connect to the PACS server, you should check that:

- the PACS server is running properly
- the connection information on the PACS Server/Client Connections dialog box is correct
- the network is up and running

Setting Up Search Options

By default, Dolphin Imaging uses the patient ID to search for patient files on your PACS server. However, you can configure Dolphin Imaging to use the different or additional search criteria. For example, you can search by patient name and limit the search by birth date or gender.

To specify patient search criteria:

1 On the PACS Server/Client Connections dialog box, select the name of the client/server configuration properties for which to set search options.

2 Click **Search**.

The PACS Search Settings dialog box opens.

3 Select **Patient ID** to use the patient ID as the primary search criteria.

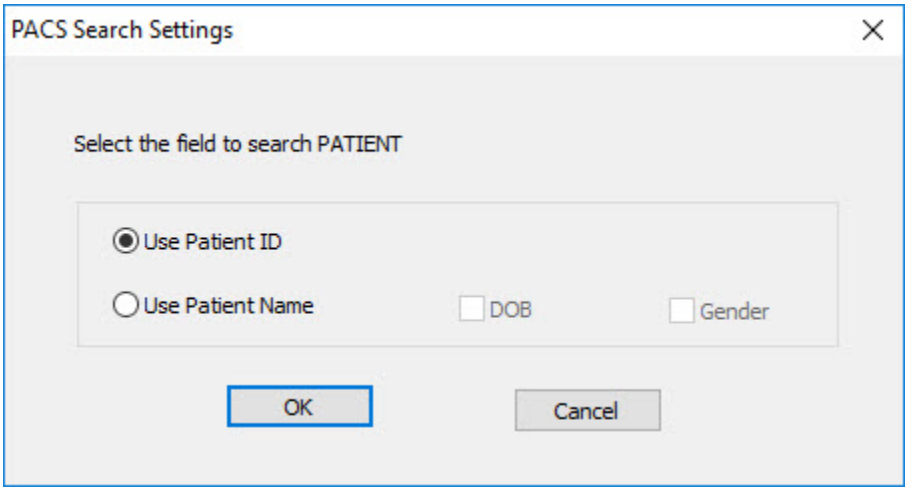
Or,

Select **Patient Name** to use the patient's name as the primary search criteria.

4 If you selected **Patient Name**, optionally check **DOB** and enter the patient's birth date to further narrow your search by birth date.

5 If you selected **Patient Name**, optionally check **Sex** and enter the patient's gender to further narrow your search by gender.

6 Click **OK** to save your search settings and close the dialog box.



Use Patient ID	Use the patient ID as your primary search criteria.
Use Patient Name	Use the patient's name as your primary search criteria. **DOB:** Use the patient's date of birth as additional information for the search. **Sex:** Use the patient's gender as additional information for the search.

Customizing Dolphin Imaging

Dolphin Imaging's customization features enable you to control certain aspects of the main screen's appearance and the program's behavior.

Setting Preferences and Options

You can set two types of preferences:

- By setting general preferences, you can control certain aspects of the main screen's appearance and the program's behavior.
- By setting tracing preferences, you can control only the display of cephalometric tracings on images.
- By setting system options, you can enable Dolphin Imaging users to log in using their fingerprints.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use these features only if your Dolphin Imaging user account has the Edit Imaging Main View Preferences privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Setting General Preferences

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Edit Imaging Main View Preferences privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To set general preferences:

1 Select any image layout that does not contain tracings. Then, click

on the horizontal tool bar.

Or,

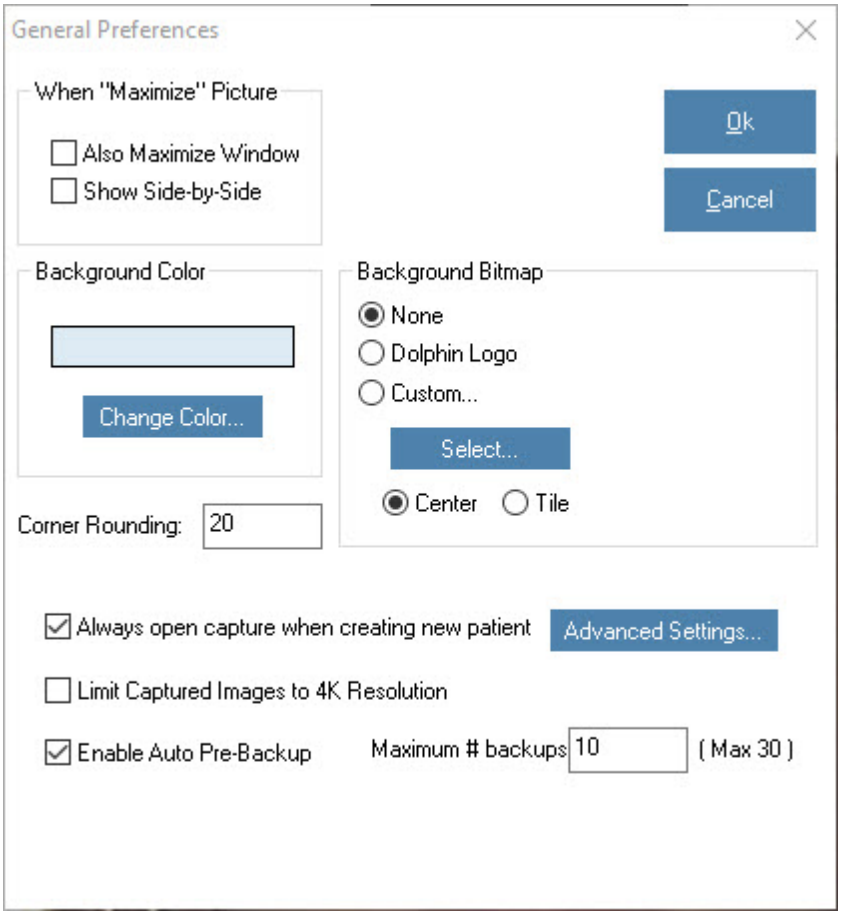
Select **Preferences** from the **Tools** menu. Then, select **General Preferences** from the sub-menu.

The General Preferences dialog box is displayed.

Note: *If you select an image layout that contains tracings and then click*

on the horizontal tool bar, a dialog box appears where you can set x-ray tracing preferences. For more information on setting lateral x-ray tracing preferences, see "Setting Tracing Preferences" on page 3-66.

2 Select any options you want, and click **OK**.



When "Maximize" Picture	Determines the behavior when you maximize an Image. **Also maximize window:** Enters full-screen mode when you maximize an image in the image layout. **Show side-by-side:** Enters side-by-side mode when you maximize an image in the image layout.
Tool bar	Determines how the tool bar is displayed. **Icons and Text:** Displays the tool bar as small images with text labels. **Icons only:** Displays the tool bar icons only. **Text only:** Displays the tool bar as text labels only.
Background Color	Indicates the current background color. **Change Color...:** Change the background color.

Background bitmap	Options for using a bitmap imagei to use as the background. **None:** Displays a solid color background. **Dolphin logo:** Uses the Dolphin logo as your background. **Custom:** Uses a custom image (selected using the **Select...** button) as your background. **Select...:** Select a custom image to use as a background. **Center:** Centers the image on the background. **Tile:** Repeats the image as small tiles on the background.
Corner Rounding	Value between 0 and 500 to use to round the corners of the images displayed on the main screen. To use square corners, set this value to 0. This value is set to 20 by default.
Always open capture when creating new patient	Opens the Capture Setup dialog box automatically after you create a new patient so you can begin capturing images for the new patient immediately.
Advanced Settings...	Opens your **DOLPHIN.INI** file in Notepad so you have access to all Dolphin Imaging program configuration settings. ***Note:*** *The Dolphin Imaging software automatically maintains almost all of the settings in the **DOLPHIN.INI** file, and setting these options improperly can cause problems in the software's functioning. For these reasons, it is recommended that you do not modify the settings in this file unless specifically instructed to do so.* For more information, see Appendix C, DOLPHIN.INI File.
Limit Captured Images to 4K resolution	Downsizes high megapixel 2D images to 4K during image capture to speed up the capture process.
Enable Auto Pre-Backup	Automatically launches a pre-backup whenever you exit Dolphin Imaging, Uncheck this box to do a pre-backup only when you explicitly launch it by selecting **Pre-Backup** from the **File** menu (see "Performing a Pre-backup" on page 2-5). ***Note:*** *If Dolphin Imaging and Dolphin Aquarium are installed on the same system, changing this setting in either program affects both programs.*
Maximum # backups	Number of pre-backup files to keep, up to a maximum of 30. When this number of pre-backup files is reached, the oldest pre-backup file is overwritten when a new file is created.

To change the background color:

1 Click **Change Color...** on the General Preferences dialog box.

The Color dialog box is displayed.

2 Select the color to use as a background, and click **OK**.

To select a custom bitmap as a background:

1 Click **Custom** in the Background Bitmap group box. Then, click **Select...**.

The Select Image File dialog box is displayed.

2 Select a file in this dialog box, and click **OK**.

Setting Tracing Preferences

For any analysis, you can set tracing preferences to specify the items that you want to display and the colors that you want to use. The tracing preferences that you set apply to all patient images with the selected analysis and are reflected in the image properties set in the Layout Editor (see “Tracing Tab” on page 17-19). In addition, these settings are retained when you exit and restart Dolphin.

On the Dolphin Imaging main screen, the Tracing Display Preferences dialog box appears by default whenever you select an image layout that contains tracings. If it doesn’t, you can open it manually.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Edit Imaging Main View Preferences privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To set tracing preferences:

1 Select an image layout that contains tracings and click

on the horizontal tool bar.

Or,

Select an image layout that contains tracings and select **Preferences** from the **Tools** menu. Then, select **Tracing Preferences** from the sub-menu.

Or,

The Tracing Display Preferences dialog box is displayed.

Note: *If you select an image layout that does not contain tracings and then click*

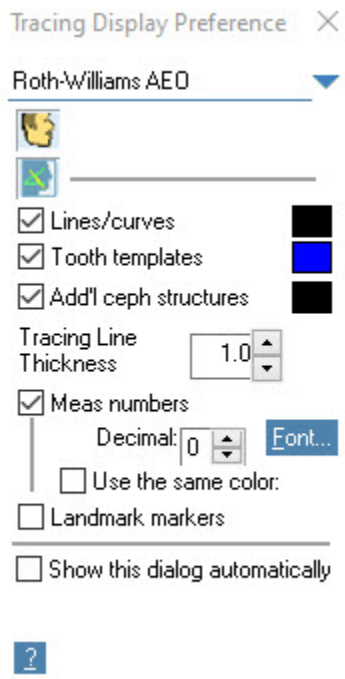
on the Dolphin Imaging main screen’s horizontal tool bar, a dialog box appears where you can set general preferences.

2 Select the analysis for which to specify tracing preferences from the drop-down list.

3 Select all the items to display on the tracing.

4 To change the color for an item, click the color sample next to the item and select a new color.

If you want to set preferences for another analysis, repeat these steps for that analysis.



drop-down list	Analysis for which to set tracing preferences.
	Toggles display of the image.
	Toggles display of the following tracing elements. Click the color sample for an element to change its color. **Lines/Curves:** Tracing as defined in the patient's cephalometric analysis. **Tooth Templates:** Outlines of the patient's teeth. **Add'l Ceph Structures:** Cephalometric structures. • **Tracing Line Thickness:** Width of the tracing lines. • **Meas Numbers:** Measurement numbers defined in the cephalometric analysis. • **Decimal:** Number of digits to display to the right of the decimal point. **Use the Same Color:** Use the same color for all measurement numbers. By default, the color of each measurement number is determined by that measurement's deviation from the norm. **Landmarks Markers:** Digitized landmarks.
Show this dialog automatically	Displays this dialog box whenever you select an image layout that contains tracings.

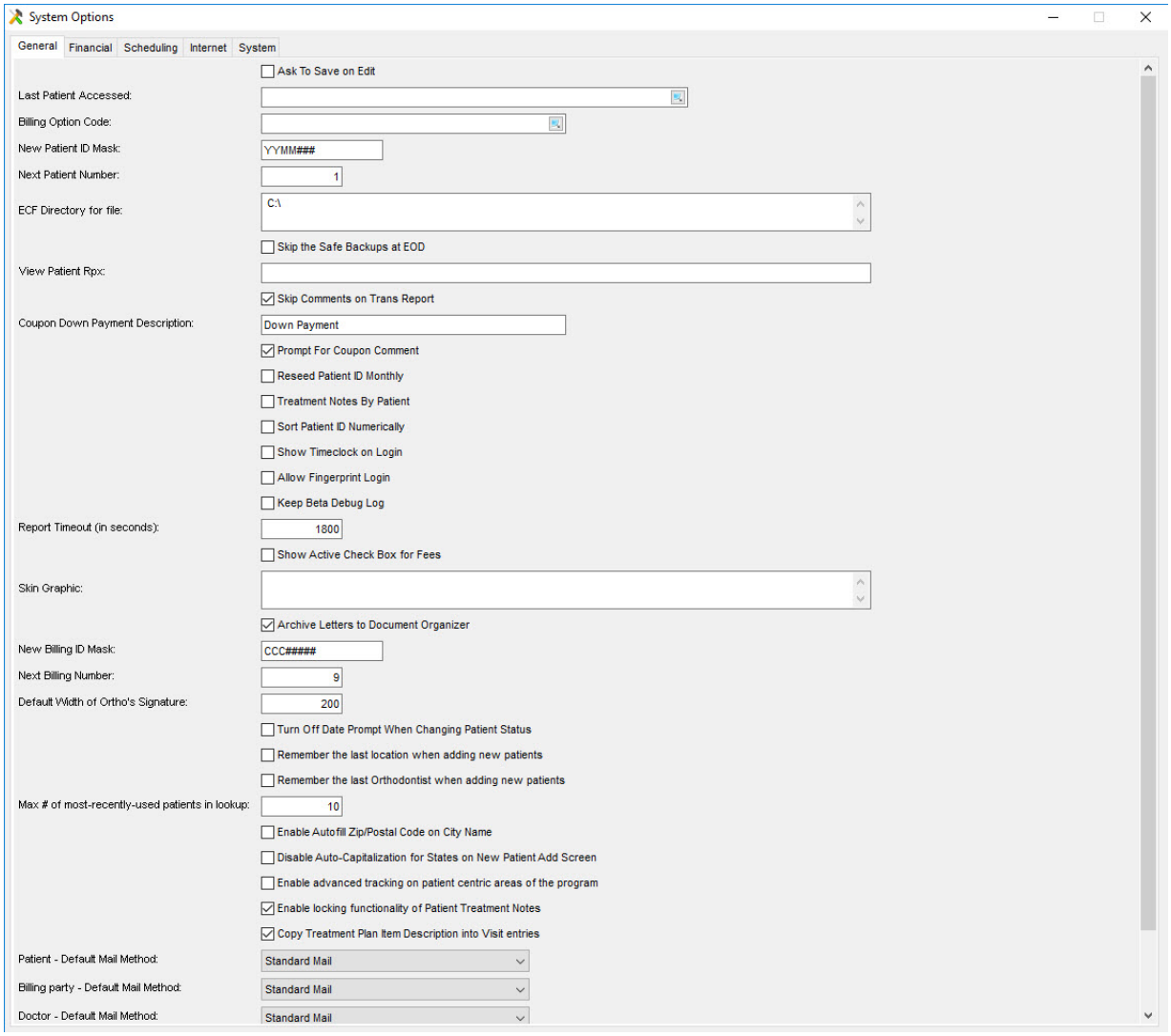
Setting System Options

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Options privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To set system-wide options:

1 Select **Options** from the **Tools** menu.

The System Options dialog box opens. If you are using Dolphin Imaging with Dolphin Management, this dialog box contains several tabs (refer to the Dolphin Management online help). If you are not using Dolphin Imaging with Dolphin Management, this dialog box contains a single tab, **General**.



Some of the options on the **General** tab apply only if you are using Dolphin Imaging with Dolphin Management. For information on these options, refer to the Dolphin Management online help. The following table describes the options that apply to Dolphin Imaging.

Last Patient Accessed	Last patient you selected.
Allow Fingerprint Login	Enables Dolphin users to log in to the system using a fingerprint scanner. ***Note:*** *Actual images of fingerprints are not stored anywhere in your system. The fingerprint scanner creates a unique ID based on the patterns on a person's finger. The actual fingerprint itself cannot ever be re-created or "stolen" from this ID.* For more information on using fingerprint information for security purposes, please consult your Dolphin sales and support representative.

Customizing the Window Title Bar

You can customize the Dolphin Imaging window's title bar to display the information that you want.

To customize the title bar:

1 Select **Edit Titlebar Caption...** from the **Edit** menu.

The Customize Title Bar dialog box opens.

2 Add any text and tokens that you want to use in the **Caption** field.

If you use tokens in your title bar caption, they will replaced with the appropriate information. For example, the {PatientLastName} token will be replaced with the current patient's last name. To use a token:

a Place your cursor in the **Caption** field where you want to insert a token.

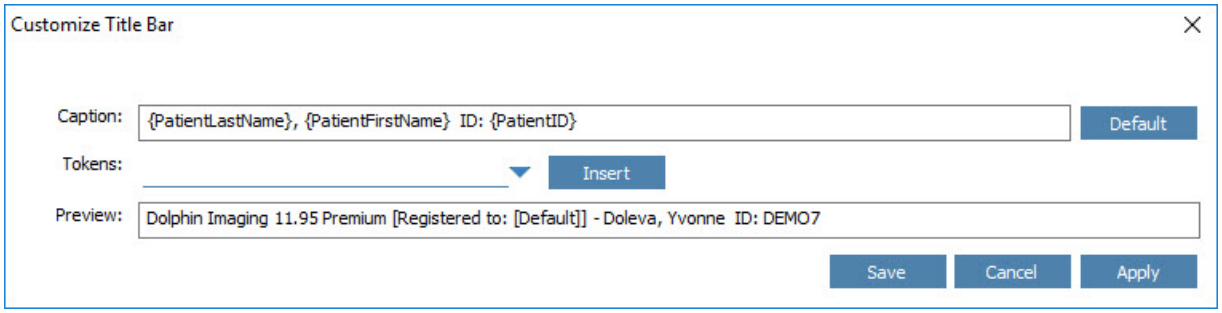
b Select the token from the **Tokens** drop-down list.

c Click **Insert** to insert the token into the **Caption** field at your cursor location.

For more information on the available tokens, see "Tokens" on page B-1.

3 Click **Apply** to preview your new title bar caption in the **Preview** field.

4 Click **Save** to save your changes and close the Customize Title Bar dialog box.



Caption	Text and tokens to use in the Dolphin Imaging window title bar.
Default	Return to the default Dolphin Imaging window title bar.
Tokens	Tokens available for use in the Dolphin Imaging window title bar.
Insert	Insert the selected token at the cursor position in the **Caption** field.
Preview	Previews the Dolphin Imaging window title bar with the specified text and tokens.
Save	Saves your changes to the Dolphin Imaging window title bar and closes the Customize Title Bar dialog box.
Apply	Updates the **Preview** field to reflect the text and tokens currently in the **Caption** field.

To discard your customizations and return to the default title bar caption:

1 Click **Default**.

Customizing Image Captions

You can customize the captions for patient images to display the information that you want.

To customize the image captions:

1 Select **Edit Image Caption...** from the **Edit** menu.

The Edit Image Caption dialog box opens.

2 Add any text and tokens that you want to use in the **Caption** field.

If you use tokens in your image caption, they will replaced with the appropriate information. For example, the {PatientLastName} token will be replaced with the current patient's last name. To use a token:

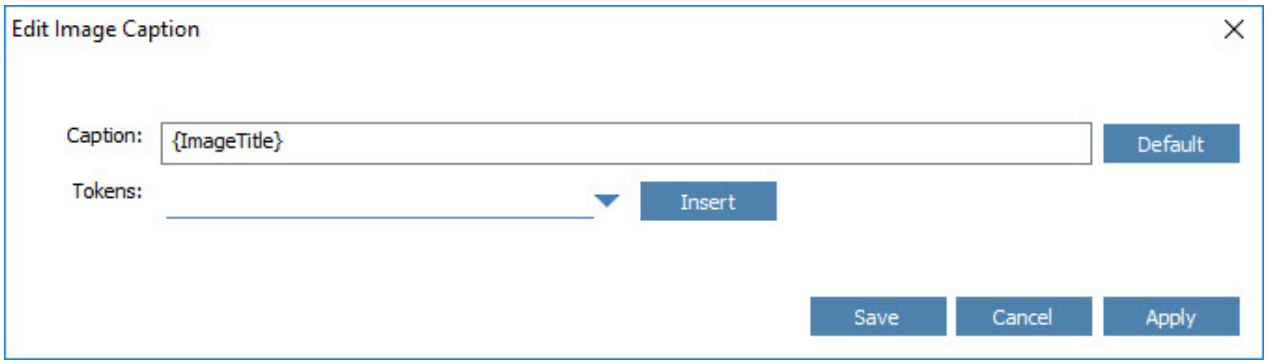
a Place your cursor in the **Caption** field where you want to insert a token.

b Select the token from the **Tokens** drop-down list.

c Click **Insert** to insert the token into the **Caption** field at your cursor location.

For more information on the available tokens, see "Tokens" on page B-1.

3 Click **Save** to save your changes and close the dialog box.



Caption	Text and tokens to use in the image caption.
Default	Return to the default image caption.
Tokens	Tokens available for use in the image caption.
Insert	Insert the selected token at the cursor position in the **Caption** field.
Save	Saves your changes to the image caption and closes the dialog box.
Apply	Applies the text and tokens currently in the **Caption** field.

To discard your customizations and return to the default image caption:

1 Click **Default**.

To toggle display of image captions:

1 Select **Show Image Caption** from the **View** menu.

Customizing the Tool Bars

To toggle display of the tool bars on the main screen:

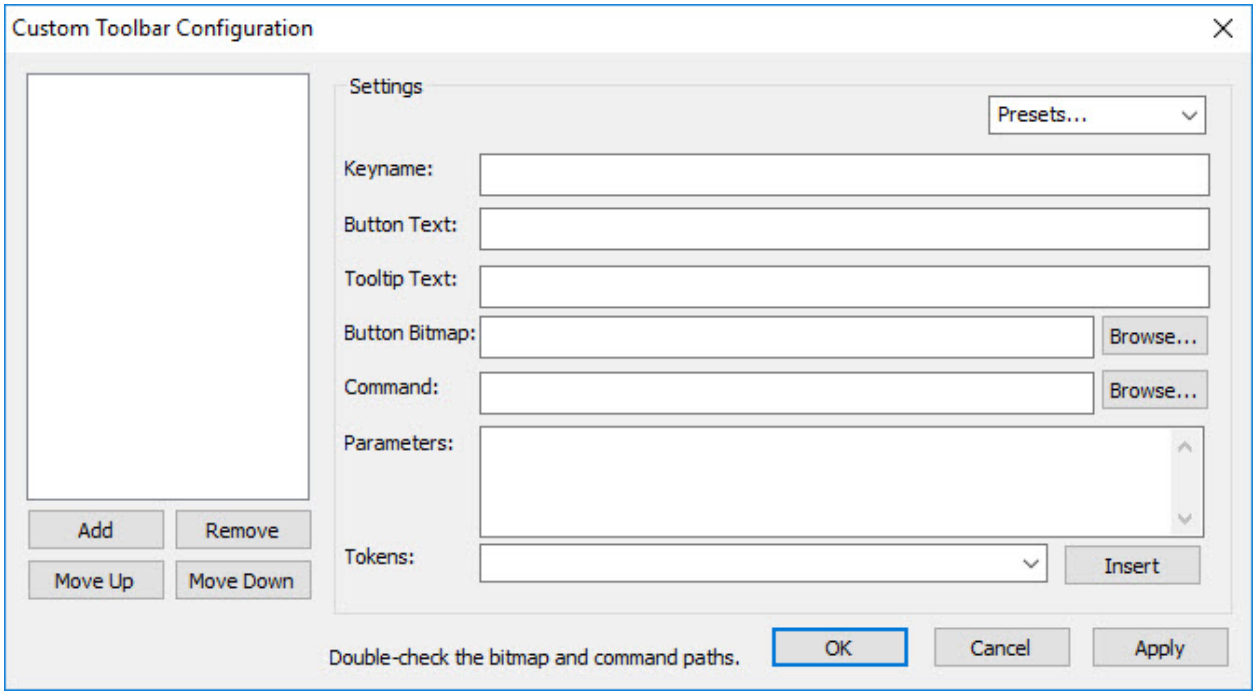
1 Select **Show Toolbars** from the **View** menu.

You can add up to six custom buttons to the horizontal tool bar (see “The Horizontal Tool Bar” on page 3-5). A custom button can launch any program and even pass information from Dolphin Imaging to that program when it launches.

To open the Custom Toolbar Configuration dialog box:

1 Select **Edit Custom Toolbar...** from the **Edit** menu.

The Custom Toolbar Configuration dialog box opens.



list	Lists the custom buttons currently defined in the order that they will appear (left to right) on the horizontal tool bar.
Add	Adds a new custom button.
Remove	Removes the button selected in the list from the horizontal tool bar.
Move Up	Moves the button up in the list, which causes it to move to the left on the horizontal tool bar.
Move Down	Moves the button down in the list, which causes it to move to the right on the horizontal tool bar.
Presets...	Preset button configurations for programs commonly added to the horizontal tool bar.
Keyname	Name of this custom button definition.

Button Text	Text to display on the button itself to identify its purpose.
Tooltip Text	Text to display as a tool tip if the user places the mouse pointer over the button for a few seconds.
Button Bitmap	Folder and file name for a bitmap image to use for the button (for example, **`C:\Program Files\Microsoft Games\FreeCell\FreeCell.bmp`**). For best results, this bitmap image should be no more than 30 pixels high.
Command	Command to run when the user clicks the button (for example, **`C:\Program Files\Microsoft Games\FreeCell\FreeCell.exe`**).
Parameters	Parameters that the command needs to run. The parameters can include replaceable tokens, such as Patient ID, that you can select from the **Tokens** drop-down list (see below). Dolphin replaces these tokens with the appropriate information from your database before running the command.
Tokens	Replaceable tokens that you can insert into the **Parameters** field. Dolphin will replaces the tokens with the appropriate information from your database before running the command. These tokens are defined in“Tokens” on page B-1. **Insert:** Inserts the selected token into the **Command** field at the current cursor position.
Save	Saves your changes and close the dialog box.

To add a custom button:

1 Click **Add**.

Or,

Select from the **Presets...** drop-down list to use a pre-defined button configuration for one of the programs commonly added to the horizontal tool bar.

You can add up to 20 buttons to the tool bar.

Depending on what you chose, Dolphin populates some of the fields for the custom button.

2 Enter or customize the appropriate information to define the custom button in each of the fields.

It is required that you complete all the fields to define a custom button.

The command in the **Command** field can include replaceable tokens, such as Patient ID, that you can select from the **Tokens** drop-down list (see below). Dolphin replaces these tokens with the appropriate information from your database before running the command.

3 Click **Save** to save the button and add it to the horizontal tool bar.

To add a token in the **Command** field:

1 Place the cursor at the location where you want to add the token.

2 Select the token from the **Tokens** drop-down list.

3 Click **Insert**.

To change the order of your custom buttons on the horizontal tool bar:

1 In the list on the Custom Toolbar Configuration dialog box, select the button to move.

2 Click **Move Up** to move the button up in the list, which causes it to move to the left on the horizontal tool bar.

Or,

Click **Move Down** to move the button down in the list, which causes it to move to the right on the horizontal tool bar.

3 Click **Save** to save your changes.

To remove a custom buttons from the horizontal tool bar:

1 In the list on the Custom Toolbar Configuration dialog box, select the button to remove.

2 Click **Remove**.

Using Maintenance Features

Dolphin Imaging's maintenance features enable you to view and refresh your licenses, view the databse log, and troubleshoot issues with your database.

Note: *Some advanced maintenance options should only be used on the advice of a Dolphin support technician.*

Viewing and Updating Licenses

You can view the Dolphin Imaging licenses you have purchased, see which computers on your network are using those licenses, and, if necessary, refresh your licenses to update them for recent changes (for example, if you have recently purchased additional licenses).

To view your licenses:

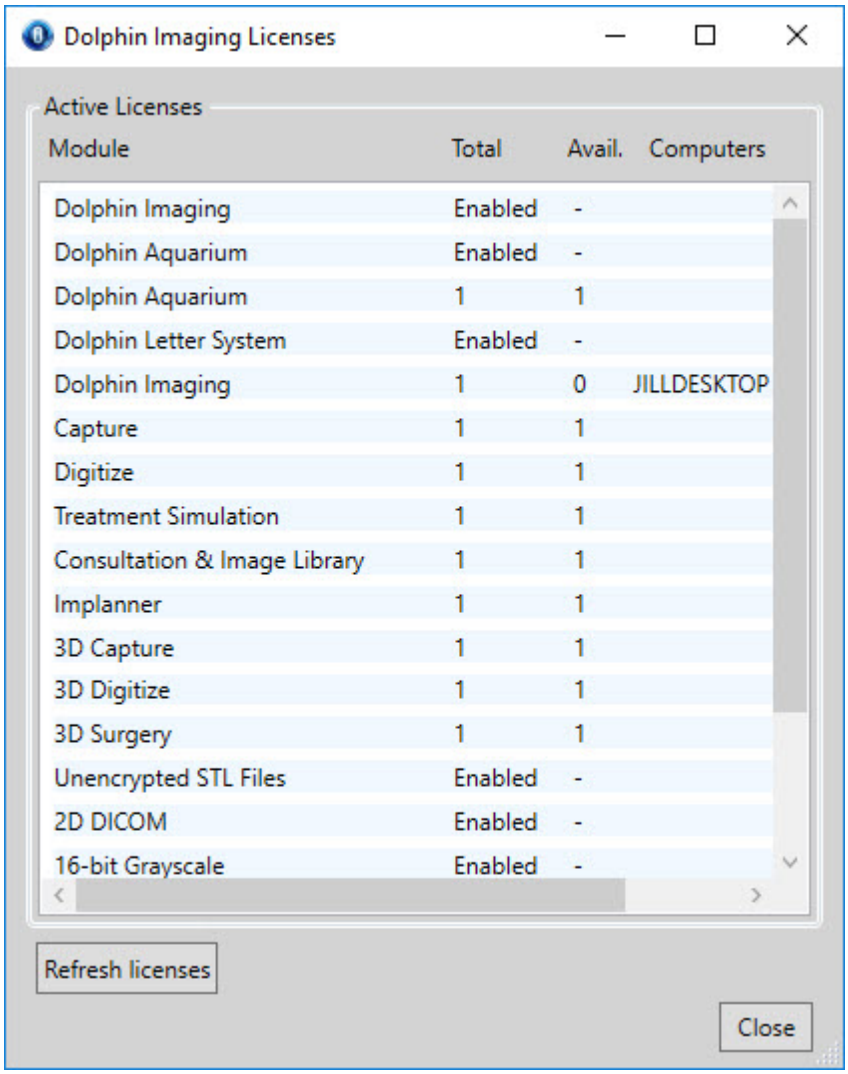
1 Select **Dolphin Licenses...** from the **Tools** menu.

The Dolphin Imaging Licenses dialog box opens. It lists the licenses you have purchased and the computers on your network currently using them.

To update your licenses from within Dolphin Imaging:

1 Click **Refresh Licenses**.

You can also use the Dolphin Update Service (DUS) to update your licenses (see below).



Active Licenses	Licenses you have purchased. **Module:** Lists the Dolphin Imaging modules that you have licensed. **Total:** One of the following: • **Enabled:** The Dolphin Imaging module does not limit the number of concurrent users. • ***Number of Licenses:*** The number of purchased floating licenses for modules that limit the number of concurrent users. **Avail:** The number of users currently using modules that limit the number of concurrent users. **Computers:** The computers currently using modules that limit the number of concurrent users.
Refresh Licenses	Refreshes your Dolphin Imaging licenses to reflect recent changes, such as the purchase of additional licenses.

To use DUS to update your licenses:

1 Click the DUS icon ( ) in the Microsoft Windows tray.

Note: *If you see this icon blinking, point to it with your mouse and follow the instructions that appear to install the update. For more information about DUS, see www.dolphinimaging.com/dus.*

2 In the Dolphin Update Service dialog box, click the **About** tab.

3 Click **Refresh License**.

Converting Patient Files

Note: *Patient file conversion is an advanced maintenance option used to convert a specific patient record or group of patient records to a different image format for an image. This feature is used only by Dolphin support technicians.*

To convert patient files:

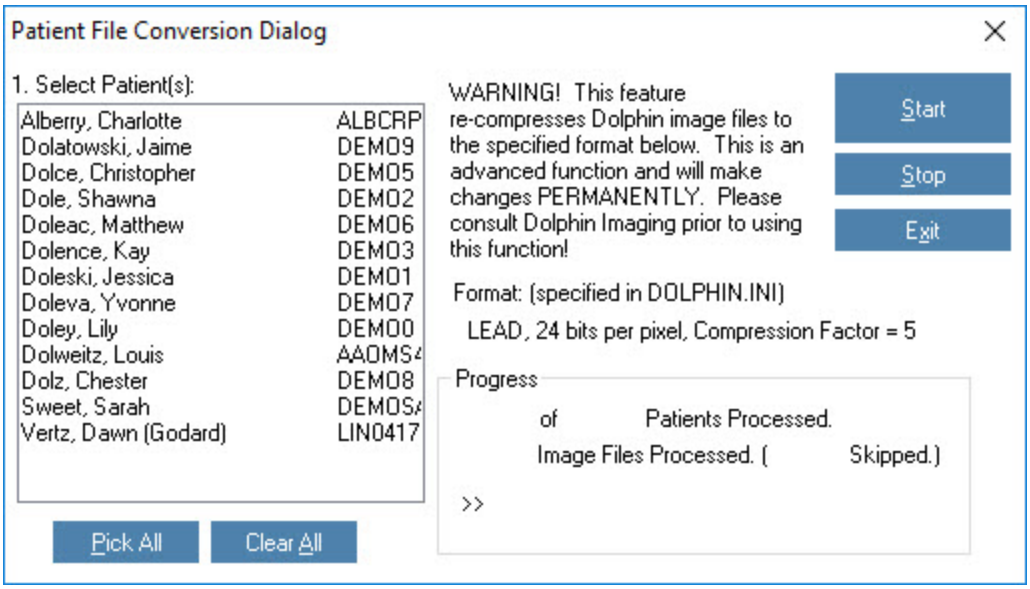
1 Select **Convert Patient Files...** from the **Tools** menu.

The Patient File Conversion dialog box is displayed.

2 Select the patients to convert.

You can select individual patients from the list of patients or select all the patients listed by clicking the **Pick All** button.

3 Click **Start** to start the conversion process.



Select Patient(s)	Select one or more patients to convert those patients.
Pick All	Selects all patients in the **Select Patient(s)** list.
Clear All	Deselects all patients in the **Select Patient(s)** list.
Start	Begins converting patients.
Stop	Stops converting patients.
Exit	Closes this dialog box.
Progress	Progress of the conversion process

Rebuilding the Patient List

Note: *Rebuilding the patient list is an advanced maintenance option used to regenerate the Dolphin patient list file from the current patient files. This feature is for use only by Dolphin Imaging support technicians.*

To rebuild the patient list:

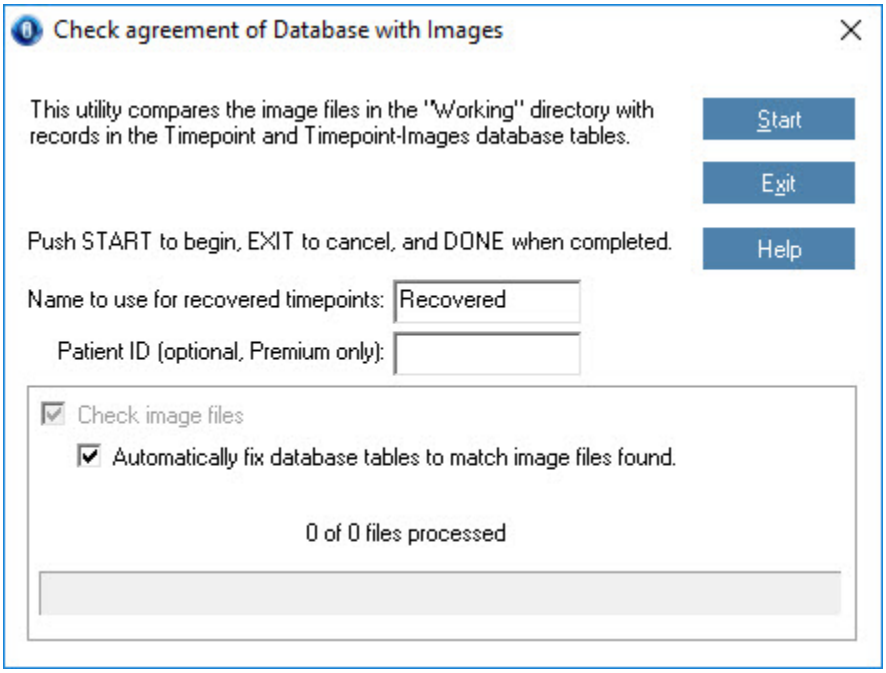
1 Select **Rebuild Patient List...** from the **File** menu.

The dialog box that you use to start the rebuild process appears.

2 Click **Start** to begin regenerating the patient list from your patient files.

A progress bar on the dialog box reflects the progress of the rebuild.

3 Click **Done** when the patient list regeneration is completed.



Name to use for recovered timepoints	Name to use for timepoints recovered during this process.
Patient ID (optional, Imaging only)	Patient ID to rebuild a single patient.
Check image files	Checks patient image files as the patient list is rebuilt.
Automatically fix patient files OR Automatically fix database tables to match image files found	Fixes any missing image links in the patient database automatically as the patient list is rebuilt.

4 Patient Charts

When you start Dolphin Imaging, the first dialog box you see is the Patient Lookup dialog box.You can also access these dialog boxes by clicking

on the Dolphin Imaging main screen.

The Patient Lookup dialog box provides options for searching for a patient's chart. This dialog box offers two views:

- Basic View offers basic search options that enable you to perform the most commonly-used searches.
- Advanced View offers options to perform more complex searches.

Switching Between Basic and Advanced View

To switch from basic to advanced view:

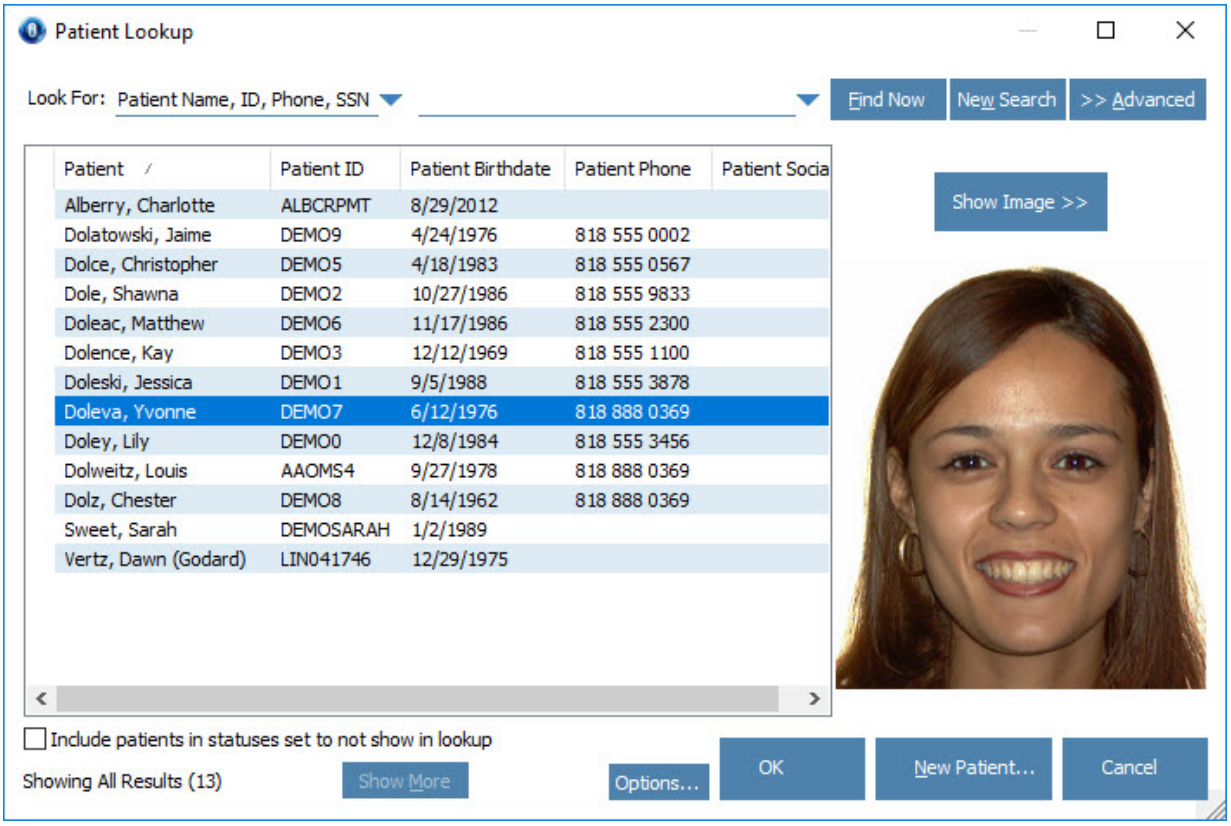
1 Click **>> Advanced**.

To switch from advanced to basic view:

1 Click **Basic <<**.

Basic View

The following figure illustrates the basic view of the Patient Lookup dialog box.



In the basic view, the Patient Lookup dialog box provides the following information and options:

Patient Search	Options to search for a patient. For more information, see “Searching for Patients” on page 4-3. **Look For:** Select the criteria to use to search for a patient from the first drop-down list. Then, enter the criteria in the second drop-down list to search for patients. Alternatively, click the arrow button on the second drop-down list to select a recent patient. **Find Now:** Finds patients that meet the search criteria you entered. **New Search:** Clears all your search criteria and begins a new search. **>>Advanced:** Switches to the Advanced view.

Patient Image	Optionally, displays an image for this patient. For more information, see “Changing the Image Option” on page 4-7. **Show Image>>:** Open a menu of the following options for the patient image to display. • **No Image:** Omit the patient's image. • **ID Photo:** Show the ID photo for the patient selected in the patient list. • **Layout:** Show an image layout for the patient selected in the patient list. A sub-menu opens and lists the available image layouts.
Patient List	Lists the patients that meet the search criteria you entered and provides information about the currently-selected patient. For more information, including how to customize the patient list’s columns, see “Patient List” on page 4-5. ✖ : Used in the patient list to identify deleted patients. Deleted patients only appear if the **Include patients in statuses set to not show in lookup** box is checked on the **Advanced** tab. For more information, see “Advanced Tab” on page 4-36. **Include patients in statuses set to not show in lookup:** Searches for patients in statuses that typically wouldn't be included in a search, such as patients that have been deleted. If you are using Dolphin Imaging with Dolphin Management, checking this box searches records for patients whose patient status is set to a status that does not appear in patient lookup. For more information about Dolphin Management patient statuses, refer to the online help for Dolphin Management. **Showing All Results:** Number of patients that met your search criteria and whether they are all listed in the patient list. **Show More:** When you first open the Patient Lookup dialog box, if only one patient is listed, lists patients adjacent to the current patient in an alphabetical list. Following a search that resulted in more than 100 matching patients, shows all the patients that met your search criteria. Otherwise, only the first 100 matching patients are listed. **Options...:** Set searching options. For more information, see “Setting Search Options” on page 4-22.
New Patient...	Adds a record for a new patient. For more information, see “Adding or Changing Patients” on page 4-38 or “Adding or Changing Patients (with Dolphin Management or the Security Utilities)” on page 4-49.

Searching for Patients

You can look up a patient's record using the Patient Lookup dialog box.

To look up a patient's record:

1 Select the type of search criteria you want to use to use to look up patients in the **Look For** drop-down list.

You can look up patients by the patient name, patient ID, patient phone number, patient social security number, billing party name, billing party social security number, or patient last name.

2 Enter the appropriate search criteria in the **Look For** field.

- By default, one set of letters is interpreted as a partial first name, a partial last name, or a partial patient ID. For example, entering **ja** would find Jane Smith, Thomas Jackson, and a patient whose ID is JA123.
- If the **Enable first-initial-last name** search option is enabled, one set of letters is interpreted as a first initial followed by a partial last name or a partial patient ID. For example, entering **ja** would find Joan Anderson and a patient whose ID is JA123. For more information, see "Setting Search Options" on page 4-22.
- Two sets of letters separated by a comma (with or without a space) are interpreted as a partial last name followed by a partial first name. For example, **ja,t** or **ja, t** finds Thomas Jackson and Tina Jacobs.
- A set of numbers is interpreted as a partial patient ID, a partial phone number, or a partial social security number. For example, entering **123** would find a patient whose ID is 123072 and a patient whose phone number is 123-555-4321.
- A set that includes both letters and numbers is interpreted as a partial patient ID. For example, ES3 would find patients whose IDs are ES3072 and ES3221.

3 Click **Find Now**.

A list of patients meeting your search criteria appears in the patient list. You can select a patient from this list to begin working with that patient's record.

To include patients in statuses that typically wouldn't be included in a search:

1 Check the **Include patients in statuses set to not show in lookup** box.

2 Enter any other search criteria.

3 Click **Find Now**.

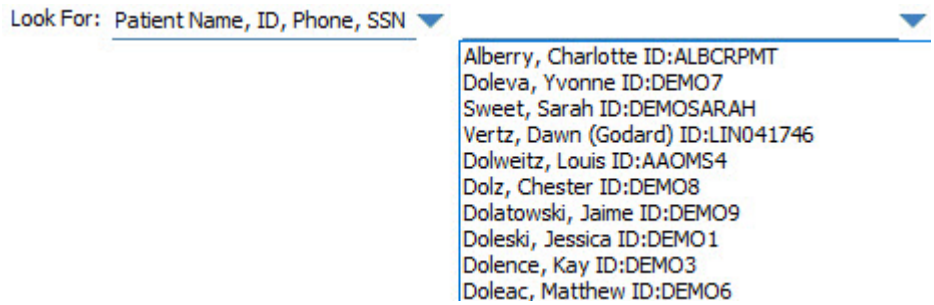
The search results include all patients that meet the search criteria, regardless of their status. For example, the search results include deleted patients that meet the search criteria.

To clear your search criteria and begin a new search:

1 Click **New Search**.

To select from a list of recent patients:

1 Select the patient from the second **Look For** box (see below).

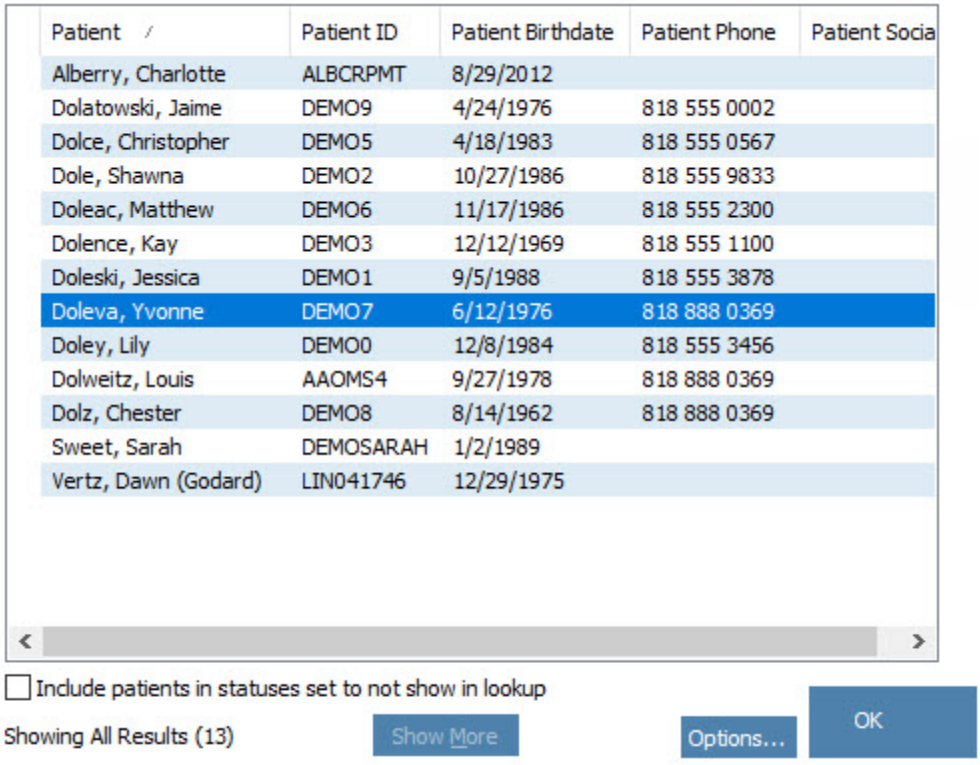


Patient List

Use the patient list to select a patient from the list of patients that match the search criteria you entered.

The list of patients is customizable. You can change:

- The columns that appear: Depending on the number of columns selected for display, the current sizes of the columns, and the size of the Patient Lookup dialog box, you may need to use a horizontal scroll bar at the bottom of the list to see all the information available for each of the patients. For information on customizing the columns, see “Customizing the Columns” on page 4-6.
- The image that appears for the currently-selected patient: You can display the patient's ID photo, one of the image layouts, or no image. For information on changing the image that’s displayed, see “Changing the Image Option” on page 4-7.
- Whether to include all patients (regardless of their status) in search results: Check the **Include patients in statuses set to not show in lookup** box to include records for patients in statuses that typically wouldn't be included in a search, such as patients that have been deleted. If you are using Dolphin Imaging with Dolphin Management, checking this box searches records for patients whose patient status is set to a status that does not appear in patient lookup. For more information about Dolphin Management patient statuses, refer to the online help for Dolphin Management.



Available Columns

Patient	Name of a patient who matched the search criteria you entered.
Patient ID	ID of a patient who matched the search criteria you entered.
Patient Birthdate	Patient's birth date.

Patient Phone	Patient's telephone number.
Patient Address	Patient's address.
Patient Email	Patient's e-mail address.
Patient Gender	Patient's gender.
Patient Social	Patient's social security number.
Patient Entry Date	Date that the patient was entered into the Dolphin database.
Patient Current Age	Patient's current age.
Billing Party	Party responsible for paying for the patient's treatment.
Billing Party Social	Billing party's social security number.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can only display the **Patient Social** and **Billing Party Social** columns if the Dolphin Imaging user account that you are using has the View Patient Details privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (`Dolphin Management User Guide.PDF` or `DM_Help.chm` in your `C:\Dolphin` folder).*

To select a patient:

1 Click the patient in the patient list.

To return to the Dolphin Imaging main screen:

1 Click **OK**.

Alternatively, you can double-click a patient in the patient list to select that patient and return immediately to the Dolphin Imaging main screen.

Re-Sorting the Patient List

To re-sort the patient list:

1 Click the column by which to sort the patient list.

A down arrow appears next to the column heading, and the patient list is re-sorted.

2 Click the column again to reverse the sort order (descending to ascending and vice-versa).

Customizing the Columns

To resize the columns in the patient list:

1 Move the mouse pointer to the dividing line between two column headings.

2 When the mouse pointer changes to a two-headed arrow across a line, click and drag the mouse to resize the column headings.

To show different columns in the patient list:

1 Right-click one of the column headings.

A context menu appears listing all available columns. The columns currently selected for the display are checked. For more information, see “Patient List” on page 4-5.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can only display the **Patient Social** and **Billing Party Social** columns if you have the appropriate employee rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**Dolphin Management User Guide.PDF** or **DM_Help.chm** in your **C:\Dolphin** folder).*

2 Click an unselected column to add it to the display.

Or,

Click a selected column to remove it from the display.

To change the order of the columns in the patient list:

1 In the patient list, click the heading for the column to move.

2 Drag and drop that column heading into a different position.

The column moves to the location where you dropped it.

Changing the Image Option

To change the image option:

1 Click **Show Image**.

2 Select **No Image** to omit the image of the selected patient.

Or,

Select **ID Photo** to show the selected patient's ID photo.

Or,

Select **Layout**. Then, select the image layout to display.

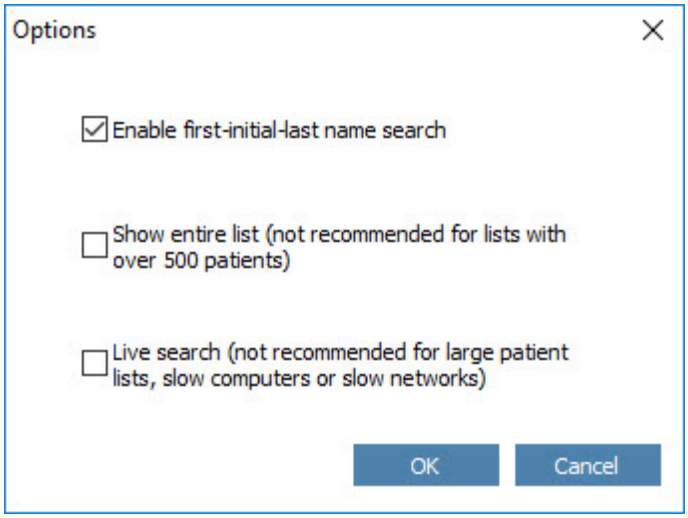
The image that appears for the patient if you select **ID Photo** depends on the images available for this patient.

Setting Search Options

To set search options:

1 Click **Options...**.

2 Check the box for each searching option to enable. Then, click **OK**.



Enable First-Initial-Last Name Search	Enables first initial, last name search. With this option disabled, if you type “smi” in the Patient Lookup dialog box and click **Find Now**, Dolphin Imaging only lists patients whose last name or patient ID begin with “smi.” With this option enabled, Dolphin Imaging also lists patients whose first initial is “s” and whose last name begins with “mi.”
Show Entire List	Displays your entire patient list in the Patient Lookup dialog box when it first opens. This option is not recommended.
Live Search	Begins the search automatically if you pause momentarily when typing a search string. This option is not recommended.

Advanced View

The following figure illustrates the advanced view of the Patient Lookup dialog box.

This dialog box contains the following information and options:

Patient Search	Options to search for a patient:. For more information, see “Searching for Patients” on page 4-10. **Look For:** Select the criteria to use to search for a patient from the first drop-down list. Then, enter the criteria in the second drop-down list to search for patients. Alternatively, click the arrow button on the second drop-down list to select a recent patient. **Find Now:** Finds patients that meet the search criteria you entered. **New Search:** Clears all your search criteria and begins a new search.

Tabs	**Basic Info:** Lists the patients that meet the search criteria you entered and provides information about the currently-selected patient (see “Basic Info Tab” on page 4-12). **Info:** Searches for patients using demographic information or keywords (see “Info Tab” on page 4-23). **Records:** Searches for patients based on their timepoints and images (see “Records Tab” on page 4-26). **Diagnostics:** Searches for patients based on diagnostic information (see “Diagnostics Tab” on page 4-28). **Cephalometrics:** Searches for patients based on cephalometric information (see “Cephalometrics Tab” on page 4-29). **Advanced:** Searches for deleted patients, and enables you to save, load, or remove favorite searches (see “Advanced Tab” on page 4-36). If you have Dolphin Management, the following additional tabs appear: **Financials:** Searches for patients based on financial information (see “Financials Tab” on page 4-31). **Scheduling:** Searches for patients based on scheduling information (see “Scheduling Tab” on page 4-32). **Referrals:** Searches for patients based on referral information (see “Referrals Tab” on page 4-34). **Custom Fields:** Searches for patients based on information in custom fields (see “Custom Fields Tab” on page 4-35).

Searching for Patients

You can look up a patient's record using the Patient Lookup dialog box.

To look up a patient's record:

1 Select the criteria to use to look up patients in the **Look For** drop-down list.

You can look up patients by the patient name, patient ID, patient phone number, patient social security number, billing party name, billing party social security number, or patient last name.

2 If you selected **Patient Name**, **ID**, **Phone**, **SSN** in the **Look For** drop-down list, enter part of a patient’s name, ID, telephone number, or social security number in the second **Look For** box.

Or,

If you selected **Patient Last Name** in the **Look For** drop-down list, enter part of a patient’s last name in the second **Look For** box.

Or,

If you selected **Billing Party Name, SSN** in the **Look For** drop-down list, enter part of a billing party's first, last name, or social security number in the second **Look For** box.

Or,

Enter search criteria on one or more of the tabs other than the **Basic Info** tab.

If you enter search criteria on more than one tab, the search criteria are combined and only those patients who meet all the criteria are considered to be a match.

3 Click **Find Now**.

A list of patients meeting your search criteria appears in the patient list on the **Basic Info** tab. You can select a patient from this list to begin working with that patient's record.

To sort the patient list:

1 Click a column header to sort using the information in that column.

Click the column header again to switch between ascending and descending order.

2 SHIFT+click another column header to use the information in that column as a secondary sorting criterion.

SHIFT+click the column header again to switch between ascending and descending order.

To include patients in statuses that typically wouldn't be included in a search:

1 Click the **Advanced** tab. Then, check the **Include patients in statuses set to not show in lookup** box.

2 Enter any other search criteria.

3 Click **Find Now**.

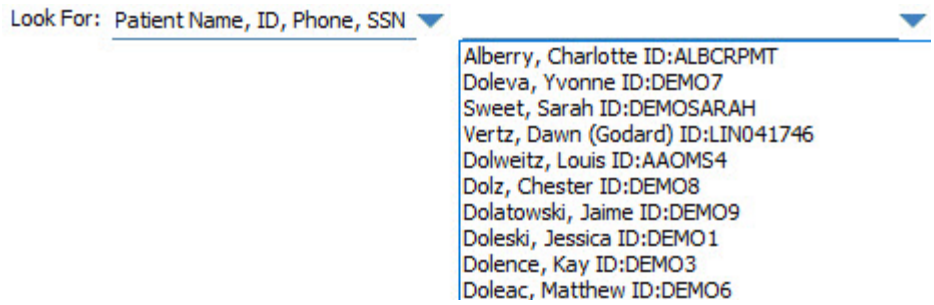
The search results include all patients that meet the search criteria, regardless of their status. For example, the search results include deleted patients that meet the search criteria.

To clear your search criteria and begin a new search:

1 Click **New Search**.

To select from a list of recent patients:

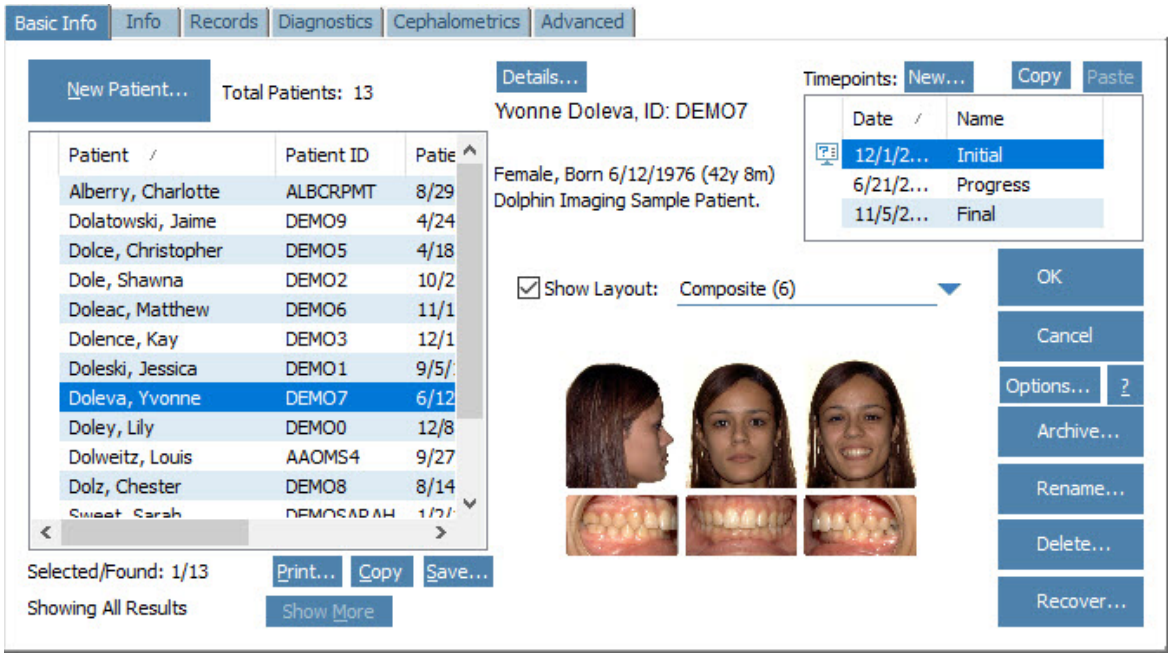
1 Select the patient from the second **Look For** box (see below).



Basic Info Tab

This tab appears when you open the Patient Lookup dialog box in advanced view. Initially, this tab is blank. Using this tab, you can:

- select a patient from a list of patients matching search criteria that you entered
- view information about the selected patient
- view patient images
- add, rename, or delete a patient
- view or create timepoints for the patient
- archive patient records or retrieve archived records



New Patient...	Adds a new patient. For more information, see “Adding or Changing Patients” on page 4-38, or “Adding or Changing Patients (with Dolphin Management or the Security Utilities)” on page 4-49.

Patient List	Information about each patient that matched search criteria that you entered. For more information, including how to customize the patient list's columns, see "Patient List" on page 4-14. : Used in the patient list to identify deleted patients. Deleted patients only appear if the **Include patients in statuses set to not show in lookup** box is checked on the **Advanced** tab. For more information, see "Advanced Tab" on page 4-36. **Selected/Found:** Number of patients currently selected in the patient list and the number of patients that met your search criteria. ***Note:*** *You can select several patients in the patient list to batch export their measurements tables. For more information, see "Batch Exporting Measurements Reports" on page 8-10.* **Show More:** When you first open the Patient Lookup dialog box, if only one patient is listed, lists patients adjacent to the current patient in an alphabetical list. Following a search that resulted in more than 100 matching patients, shows all the patients that met your search criteria. Otherwise, only the first 100 matching patients are listed. **Print...:** Prints the list of patients that met your search criteria. **Copy...:** Copies the list of patients that met your search criteria to the clipboard. **Save...:** Saves the list of patients that met your search criteria to a file.
Patient Summary	Information entered for the selected patient. Blank if no patient is selected. For more information, see "Patient Summary" on page 4-17. **Details...:** Changes the information for the selected patient. For more information, "Adding or Changing Patients" on page 4-38 or "Adding or Changing Patients (with Dolphin Management or the Security Utilities)" on page 4-49.
Timepoints	Timepoints for this patient, which you use to organize patient images from different time periods or for different purposes. For more information, see "Timepoints" on page 4-17. The following icons may appear in the timepoint list: : Identifies timepoints with diagnostic (questionnaire) data. For more information, see Chapter 34, Questionnaires. : Identifies timepoints with 3D data. For more information, see Part IV, Dolphin 3D. : Identifies timepoints with both diagnostic (questionnaire) and 3D data. You can use the following buttons to manage patient timepoints. **New...:** Adds a new timepoint. **Copy:** Copies the images for the selected timepoint to the clipboard. **Paste:** Pastes images from the timepoint stored on the clipboard to the selected patient.
Image or Layout	One or more images on file for the selected patient. For more information, see "Image or Layout" on page 4-21. **Show Layout:** Displays the image layout selected in the drop-down list.

Archive...	Archives the selected patient's record or loads a patient record from an archive. For more information, see "Using Patient Archives" on page 4-49
Rename...	Renames the selected patient, timepoint, or image. For more information, see "Renaming Patients, Timepoints, or Images" on page 4-52.
Delete...	Deletes the selected patient, timepoint, or image. For more information, see "Deleting Patients, Timepoints, and Images" on page 4-53
Recover...	Recovers demographic and diagnostic questionnaire data from deleted patient records. For more information, see "Deleting Patients, Timepoints, and Images" on page 4-53.

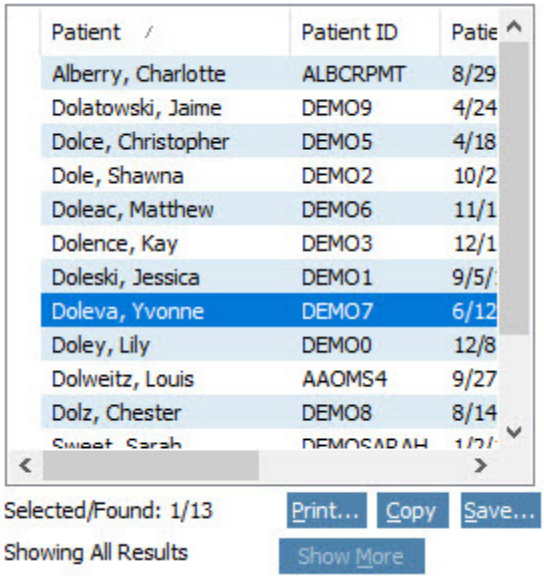
Patient List

Use the patient list on the Patient Lookup dialog box's **Basic Info** tab to:

- select a patient from the list of patients that match the search criteria you entered
- view basic information about each matching patient.

You can also print a copy of the patient list, copy it to the clipboard, or save it to a file.

The list of patients is customizable. Depending on the number of columns selected for display, the current sizes of the columns, and the size of the Patient Lookup dialog box, you may need to use a horizontal scroll bar at the bottom of the list to see all the information available for each of the patients.



Available Columns

Patient	Name of a patient who matched the search criteria you entered.
Patient ID	ID of a patient who matched the search criteria you entered.

Patient Birthdate	Patient's birth date.
Patient Phone	Patient's telephone number.
Patient Address	Patient's address.
Patient Email	Patient's e-mail address.
Patient Gender	Patient's gender.
Patient Social	Patient's social security number.
Patient Entry Date	Date that the patient was entered into the Dolphin database.
Patient Current Age	Patient's current age.
Billing Party	Party responsible for paying for the patient's treatment.
Billing Party Social	Billing party's social security number.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can only display the **Patient Social** and **Billing Party Social** columns if the Dolphin Imaging user account that you are using has the View Patient Details privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (`Dolphin Management User Guide.PDF` or `DM_Help.chm` in your `C:\Dolphin` folder).*

To select a patient:

1 Click the patient in the patient list.

The timepoints and image layout for that patient appear.

To return to the Dolphin Imaging main screen:

1 Click **OK**.

Alternatively, you can double-click a patient in the patient list to select that patient and return immediately to the Dolphin Imaging main screen.

Re-sorting the Patient List

To re-sort the patient list:

1 Click the column by which to sort the patient list.

A down arrow appears next to the column heading, and the patient list is re-sorted.

2 Click the column again to reverse the sort order (descending to ascending and vice-versa).

Resizing the Columns

To resize the columns in the patient list:

1 Move the mouse pointer to the dividing line between two column headings.

2 When the mouse pointer changes to a two-headed arrow across a line, click and drag the mouse to resize the column headings.

Showing Different Columns

To show different columns in the patient list:

1 Right-click one of the column headings.

A context menu appears listing all available columns. The columns currently selected for the display are checked. For more information, see “Patient List” on page 4-14.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can only display the **Patient Social** and **Billing Party Social** columns if you have the appropriate employee rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**Dolphin Management User Guide.PDF** or **DM_Help.chm** in your **C:\Dolphin** folder).*

2 Click an unselected column to add it to the display.

Or,

Click a selected column to remove it from the display.

Changing the Column Order

To change the order of the columns in the patient list:

1 In the patient list, click the heading for the column to move.

2 Drag and drop that column heading into a different position.

The column moves to the location where you dropped it.

Printing the Patient List

To print the patient list:

1 Click **Print**.

The Print dialog box is displayed.

2 Select any printing options and click **OK**.

For information on the printing options, see “Printing” on page 16-4.

Copying or Saving the Patient List

To copy the patient list to the clipboard:

1 Click **Copy**.

The patient list is copied to the clipboard. You can then paste it into another application, such as Microsoft Word.

To save the patient list to a file:

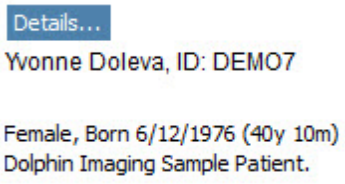
1 Click **Save**.

The Save As dialog box is displayed.

2 Select the folder in which to save the patient list.

3 Enter the name of the file in which to save the patient list. Then, click **Save**.

Patient Summary

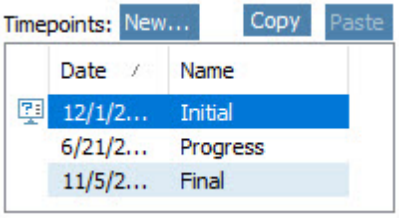


Once you have selected a patient, the **Basic Info** tab displays the information already on file for that patient. If no patient is selected, the Patient Summary is blank.

You can select **Details...** to view more information for this patient or to change the patient's information. For more information, see "Adding or Changing Patients" on page 4-38 or "Adding or Changing Patients (with Dolphin Management or the Security Utilities)" on page 4-49.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can view patient details only if your Dolphin Imaging user account has the View Patient details privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Timepoints



Use the **Timepoints** section of the Patient Lookup dialog box's **Basic Info** tab to add or select a patient timepoint. Dolphin Imaging uses timepoints to group related sets of patient images and x-rays. Like different sections of a patient's file, a timepoint may contain all the s taken of a patient on a particular office visit. You can also use a timepoint to record pictures and x-rays of a patient at a particular milestone in the patient's treatment. A timepoint can contain any combination of the pictures, x-rays, forecasts, and so on. Each patient image that you store using the Dolphin Imaging program is associated with a timepoint in the patient's record.

New...	Adds a new timepoint.
Copy	Copies the images for the selected timepoint to the clipboard.
Paste	Pastes images from the timepoint stored on the clipboard to the selected patient.

icons	Identify timepoints with specific types of data: : Identifies timepoints with diagnostic (questionnaire) data. For more information, see Chapter 34, Questionnaires. : Identifies timepoints with 3D data. For more information, see Part IV, Dolphin 3D. : Identifies timepoints with both diagnostic (questionnaire) and 3D data. : Identifies timepoints with 3D surgery data. For more information, see Part IV, Dolphin 3D. : Identifies timepoints with both diagnostic (questionnaire) and 3D surgery data.
Date	Timepoint date.
Name	Timepoint name.

To select a patient timepoint and return to the Dolphin Imaging main screen:

1 Double-click a timepoint in the Patient Lookup dialog box.

The Dolphin Imaging main screen appears showing an image layout for that patient and timepoint.

To resort the list of timepoints:

1 Click a column heading to resort the list of timepoints by that column.

2 Click the column heading again to change between ascending and descending order.

Resorting the timepoints also changes the order in which they appear on the Dolphin Imaging main screen.

To resize the columns in the timepoint list:

1 Move the mouse pointer to the dividing line between the two column headings.

2 When the mouse pointer changes to a two-headed arrow across a line, click and drag the mouse to resize the column headings.

Creating a New Timepoint

To create a new timepoint for a patient:

1 Click **Timepoints: New** on the Patient Lookup dialog box's **Basic Info** tab.

Or,

Click **New Timepoint** on the Capture Setup dialog box (see Chapter 5, Capture).

Or,

Click ⊕ on the right-most timepoint tab on the Dolphin main screen (see below).

The New Timepoint dialog box appears.

2 Enter the name for the timepoint you want to define.

Or,

Choose a name from the list of standard timepoint names.

This name will be used to identify this timepoint in the **Timepoints** list box.

3 Optionally, enter the date for this timepoint.

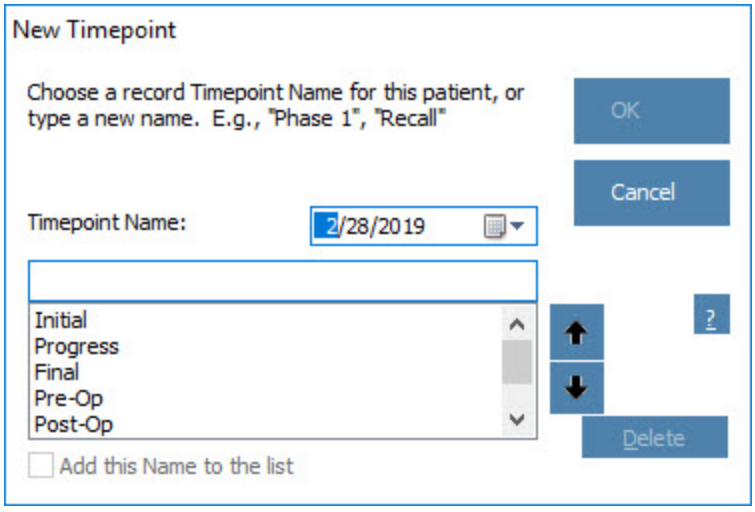
The current date appears in this field automatically. To enter the timepoint date, you can:

- Type the date in this field using your computer's regional date setting. For example, you may use two numbers each for the month, day, and year separated by slashes: mm/dd/yy.
- Use the LEFT ARROW and RIGHT ARROW keys to move between the month, day, and year parts of the date. You can then use the UP ARROW and DOWN ARROW keys to increase or decrease the number for that part of the date.
- Use a drop-down calendar to enter the date.

4 To add the timepoint name that you entered into the list of standard timepoint names, check the **Add this Name to the list** box.

The standard timepoint names are automatically shared among all the computers on the same network.

5 Click **OK** to create the new timepoint.



Treatment	Treatments for this timepoint. Select **<Add New>** to add a new treatment. Appears only if you are using Dolphin Imaging with Dolphin Management.
Date	Date that these images were taken.
Timepoint Name	Name for the timepoint.
Timepoints list	Standard timepoint names defined for your system.

	Moves the selected timepoint name up in the list.
	Moves the selected timepoint name down in the list.
Delete	Deletes the selected timepoint name from the list of standard timepoint names.
Add this Name to the list	Adds the new timepoint name to the list of standard timepoint names. The standard timepoint names are automatically shared among all the computers on the same network.

To change the order of the timepoint names:

1 On the New Timepoint dialog box, select a timepoint name.

2 Click to move the name up in the list.

Or,

Click to move the name up in the list to move the name down in the list.

To add a new treatment for this patient (Dolphin Imaging with Dolphin Management only):

1 On the New Timepoint dialog box, enter the name for the timepoint you want to define.

Or,

Choose a name from the list of standard timepoint names.

2 Optionally, enter the date for this timepoint.

3 From the **Treatment** drop-down list, select the treatment to which this timepoint applies. Then, click **OK**.

Or,

Select **<Add New>** from the **Treatment** drop-down list to add a new treatment for this patient and timepoint. Then, click **OK**.

If you selected a treatment, the new timepoint is added with the selected treatment, and you should skip the next step.

If you selected **<Add New>**, the Choose a Treatment dialog box opens listing the available treatment types for this patient.

4 If the Choose a Treatment dialog box opens, select a treatment type from the list. Then, click **OK**.

The new timepoint is added with the selected treatment.

Deleting a Standard Timepoint Name

To delete a standard timepoint name:

1 Click **Timepoints: New** on the Patient Lookup dialog box's **Basic Info** tab.

Or,

Click **New Timepoint** on the Capture Setup dialog box (see Chapter 5, Capture).

The New Timepoint dialog box is displayed.

2 Select the standard timepoint name to delete from the timepoint list on the New Timepoint dialog box.

3 Click **Delete**.

For instructions on deleting a timepoint for a patient, see “Deleting Patients, Timepoints, and Images” on page 4-53.

Copying a Timepoint to Another Patient

To copy and paste a timepoint from one patient to another:

1 To paste the images associated with a timepoint to another patient, select the patient and timepoint from which to copy images on the Patient Lookup dialog box's **Basic Info** tab.

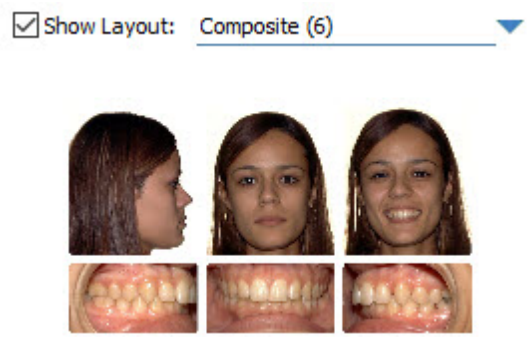
For example, if you accidentally add patient images to the wrong patient, you can use this feature to copy the images to the correct patient and timepoint.

2 Click **Copy**.

3 Select the patient to which to paste the images.

4 Click **Paste**.

Image or Layout



Once you have selected a patient, you can view any images available for him or her. The image that appears for the currently-selected patient is customizable. You can display the patient's ID photo, one of the image layouts, or no image. If you select a timepoint, the ID photo or image layouts reflect the images available for that timepoint.

Show Layout	Display the image layout selected from the drop-down list for this patient.
Layout Preview	Image layout to display for the selected timepoint.

To change the image option:

1 Check the **Show Layout** box to show an image layout for the selected patient.

Or,

Uncheck this box to omit the image layout.

2 If you checked the **Show Layout** box, select a layout from the drop-down list to view the patient's images for that layout.

Comparing Images Across Timepoints

To compare patient images in a particular image layout for different timepoints:

1 Select the patient whose images you want to view.

2 Select the layout containing the images to compare.

3 Select a timepoint from the **Timepoint** list box to view the patient images for that timepoint.

4 Select a different timepoint from the **Timepoint** list box to view the patient images for that timepoint.

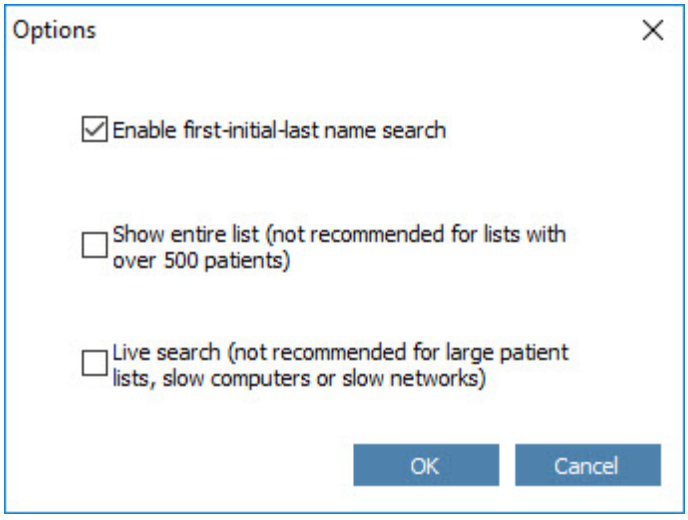
Setting Search Options

To set search options:

1 Click **Options...**.

The Options dialog box opens.

2 Check the box for each searching option to enable. Then, click **OK**.



Enable First-Initial-Last Name Search	Enables first initial, last name search. With this option disabled, if you type “smi” in the Patient Lookup dialog box and click **Find Now**, Dolphin Imaging only lists patients whose last name or patient ID begin with “smi.” With this option enabled, Dolphin Imaging also lists patients whose first initial is “s” and whose last name begins with “mi.”
Show Entire List	Displays your entire patient list in the Patient Lookup dialog box when it first opens. This option is not recommended.
Live Search	Begins the search automatically if you pause momentarily when typing a search string. This option is not recommended.

Info Tab

You use this tab to enter search criteria such as demographic information or keywords for looking up patients. All information on this tab is optional.

To enter search criteria on this tab:

1 Check one or more boxes in the Norm Filter group box to look up patients based on age, gender, or racial norms.

2 Click a radio button in the Gender group box to look up patients based on gender.

3 Enter an age range to limit your search according to the patient's age.

4 Enter a date range in the Birthday Filter group box to look up patients based on the month and day of their birthdays (for example, to find all patients born in May).

5 Select a doctor from the **Doctor** drop-down list to limit your search according to the patient's primary doctor.

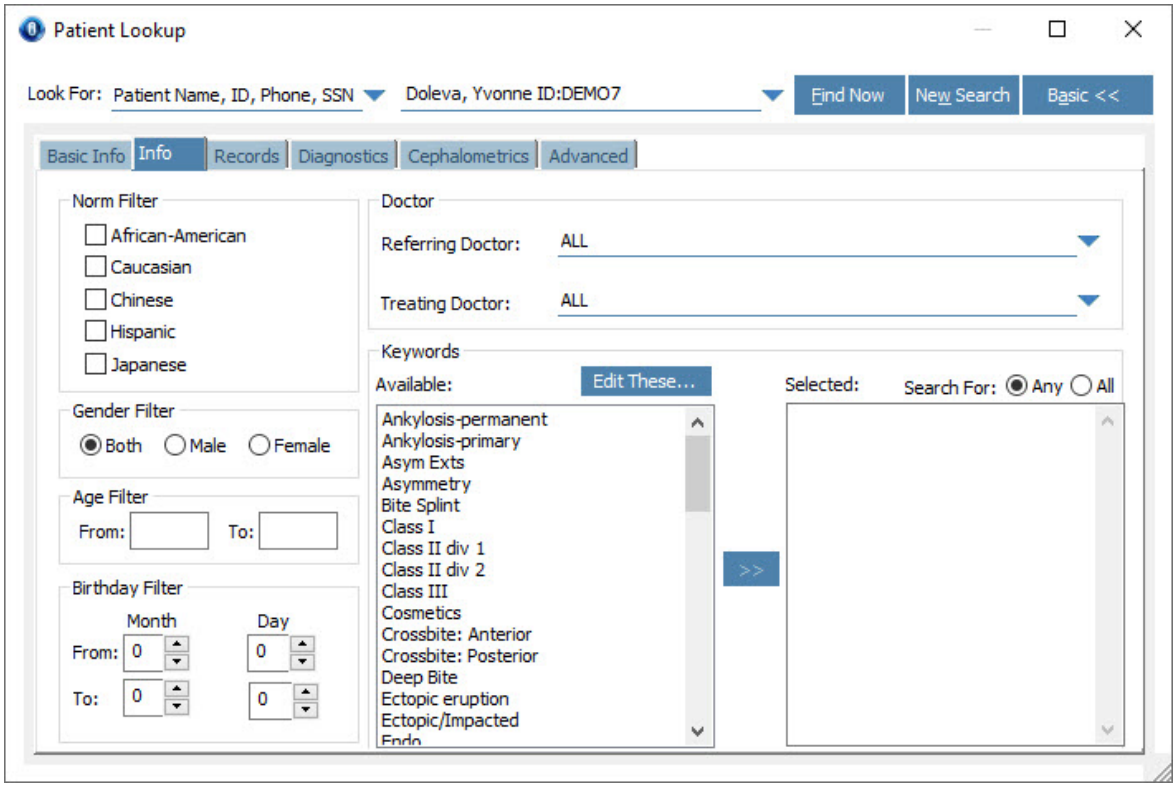
6 Select keywords from the **Available** list box in the Keywords group box and click **>>** to limit your search according to keywords associated with the patient.

Repeat this step to select additional keywords for your search. To deselect a selected keyword, click it in the **Selected** list box and click **<<**.

7 Click **Any** to find patients associated with any (one or more) of the selected keywords.

Or,

Click **All** to find patients associated with all of the selected keywords.



Norm Filter	Looks up patients based on age, gender, or racial norms. The options that appear depend on the settings in your **`dolphin.ini`** file. For more information, see Appendix C, DOLPHIN.INI File.
Gender Filter	Looks up patients based on gender. By default, your search is not limited by gender (**Both** is selected).
Age Filter	Limits your search according to the patient's age. **From:** The lower boundary of the age range. **To:** The upper boundary of the age range.
Birthday Filter	Finds patients based on the month and day of their birthdays (for example, to find all patients born in May). **From:** The month and day for the beginning of the birthday range. **To:** The month and day for the end of the birthday range.
Referring Doctor	Limits your search based on the patient's primary doctor. Select **ALL** (the default) to include patients for all doctors in your search.
Treating Doctor	Limits your search based on the doctor treating the patient. Select **ALL** (the default) to include patients for all doctors in your search.

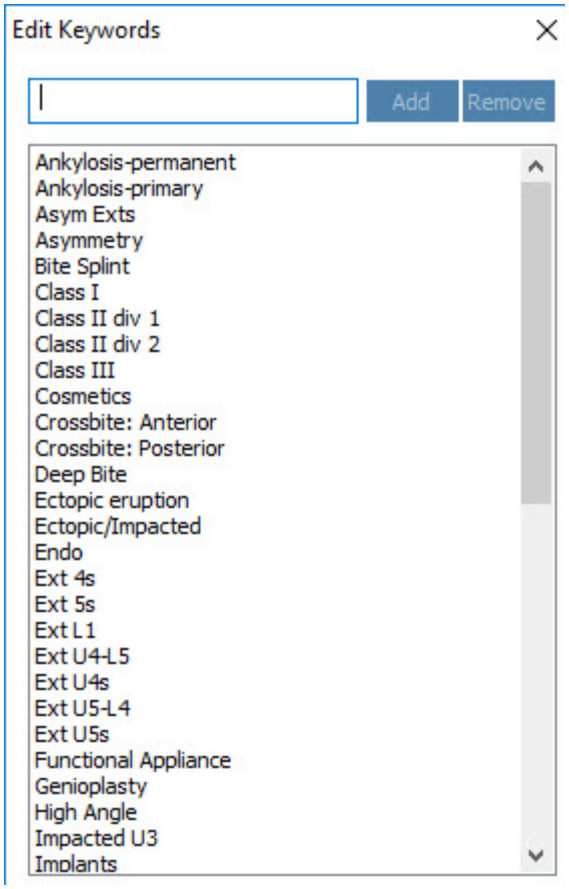
Keywords	Limits your search cased on keywords associated with the patient. **Edit These...:** Edits the list of predefined keywords. **Available:** Lists all the keywords available to use for search criteria. **Selected:** Lists the keywords that you have selected to use for your search. **Search For:** Number of the selected keywords that must be associated with a patient. • **Any:** Finds patients associated with one or more of the specified keywords. • **All:** Finds patients associated with all of the specified keywords. **<< or >>:** Move items between the two list boxes in the Keywords group box.

Editing Patient Keywords

To edit the predefined patient keywords:

1 In the Keywords group box on the **Info** tab, click **Edit These....**

The Edit Keywords dialog box opens.



Add	Adds a new keyword.
Remove	Deletes an existing keyword.
Keyword List	Lists the currently defined keywords.

To define a new keyword:

1 Type the new keyword in the field.

2 Click **Add**.

To remove a keyword:

1 Select the keyword to remove from the list.

2 Click **Remove**.

To close this dialog box:

1 Click **OK**.

Records Tab

You use this tab to enter search criteria that selects patients based on their timepoints and images. All information on this tab is optional.

To enter search criteria on this tab:

1 Check one or more boxes in the Record Type (Timepoint) group box to look up patients based on timepoints.

2 Click **Any** to find patients with any (one or more) of the selected timepoints.

Or,

Click **All** to find patients with all of the selected timepoints.

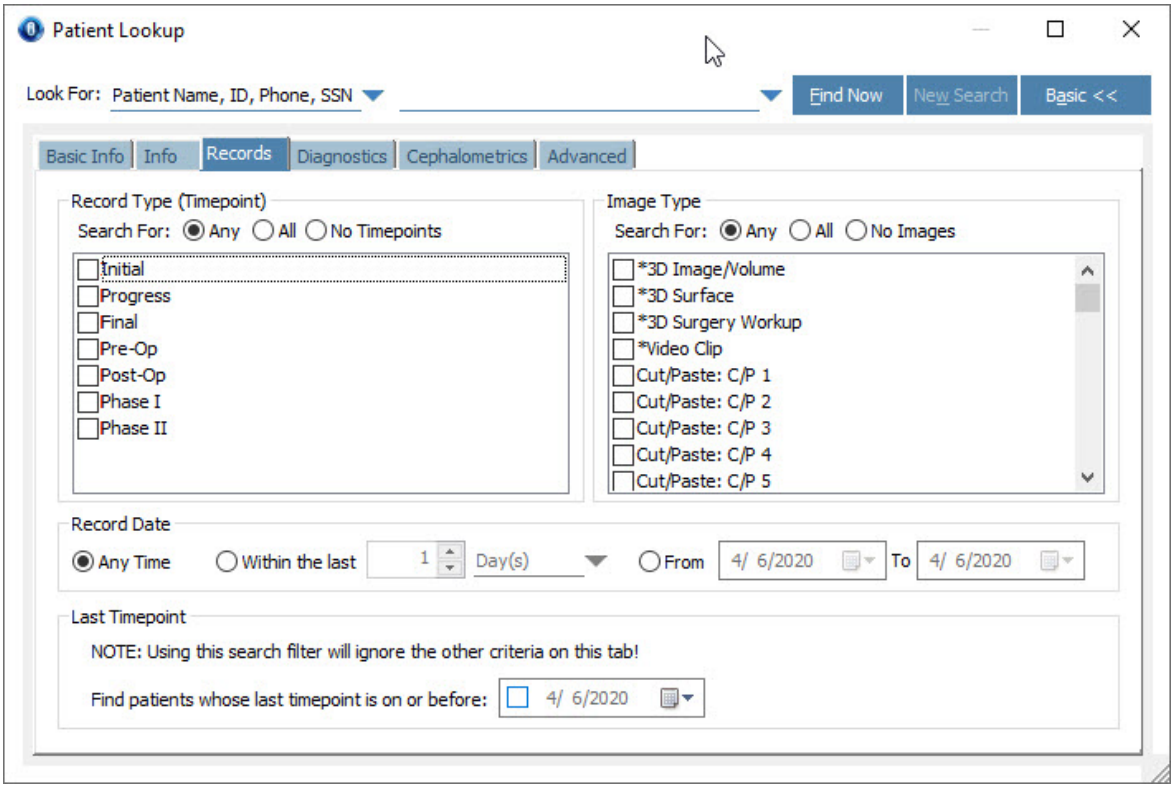
3 Check one or more boxes in the Image Type group box to look up patients based on image types.

4 Click **Any** to find patients with any (one or more) of the selected image types.

Or,

Click **All** to find patients with all of the selected image types.

Enter date criteria in the Record Date group box to limit your search to timepoints or images that were created or changed within a particular date range.



Record Type (Timepoint)	Looks up patients based on timepoints. **Search For:** Number of the selected timepoints a patient must have. • **Any:** Finds patients with one or more of the specified timepoints. • **All:** Finds patients with all of the specified timepoints. • **No Timepoints:** Finds patients with no timepoints.
Image Type	Looks up patients based on the types of images captured or saved for them. **Search For:** Number of the selected image types a patient must have. • **Any:** Finds patients with one or more of the specified image types. • **All:** Finds patients with all of the specified image types. • **No Images:** Finds patients with no images.
Record Date	Limits your search to timepoints or images created or changed within a particular date range: **Any Time:** Does not to limit your search by date. **Within the Last:** Limits your search to timepoints or images created or changed during the specified time period. For instance, you can search for images that changed within the last 2 weeks or 5 months. **From/To:** Limit your search to timepoints or images created or changed during the specified date range.

Last Timepoint	Searches for patients whose last timepoint was on or before the specified date. This is useful for archiving records for patients who have not been seen recently. When you use this option, any other criteria entered on this tab are ignored.

Diagnostics Tab

You use this tab to enter search criteria that selects patients based on diagnostic information entered for them using the Questionnaire feature (see Chapter 34, Questionnaires). All information on this tab is optional.

To enter search criteria on this tab:

1 Select a diagnostic group in the **Diagnostic Groups** list box to list the items in that group.

Or,

Enter a text string (keyword or partial keyword) in the **Keyword Search For Group Items** field and click **Find** to list all diagnostic group items that contain that string.

The diagnostic group items that match the criteria you entered appear in the **Available Group Items** list box.

If you entered a text string and clicked **Find**, the list of matching diagnostic group items may be long. You can then select a diagnostic group from the **Diagnostic Groups** list box to limit the matching group items to those that match the text string and the selected diagnostic group.

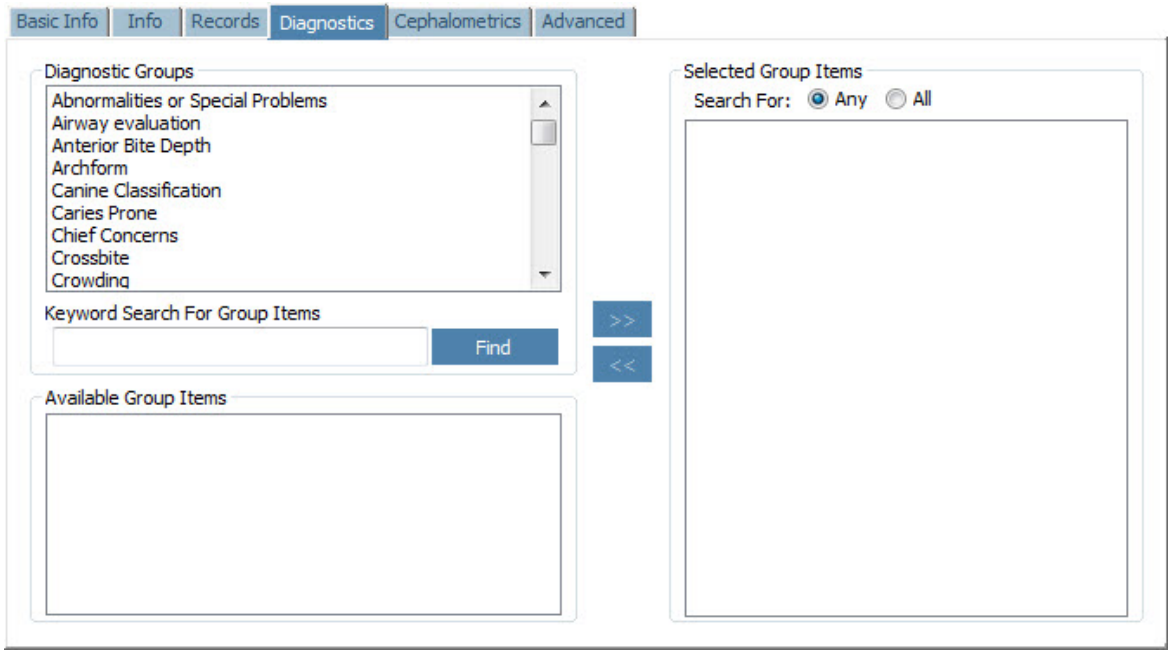
2 Select a diagnostic item in the **Available Group Items** list box and click **>>** to limit your search to patients with that diagnosis.

Repeat this step to select additional group items for your search. To deselect a selected group item, click it in the **Selected Group Items** list box and click **<<**.

3 Click **Any** to find patients with any (one or more) of the selected diagnostic items.

Or,

Click **All** to find patients with all of the selected diagnostic items.



Diagnostic Groups	Diagnostic groups defined for your system. For more information, see “Setting Up a Questionnaire” on page 34-2.
Keyword Search for Group Items	Searches all diagnostic groups and group items for the specified string.
Available Group Items	Lists diagnostic group items in the selected diagnostic group that match the entered search keyword.
Selected Group Items	Lists diagnostic group items that you selected to use for your search. **Search For:** Number of the selected diagnostic group items a patient must have. • **Any:** Finds patients with one or more of the specified diagnostic group items. • **All:** Finds patients with all of the specified diagnostic group items.
<< and >>	Move group items between the **Available Group Items** and **Selected Group Items** list boxes.

Cephalometrics Tab

You use this tab to enter search criteria that selects patients based on cephalometric information. On this tab, you select an analysis and a measurement from that analysis. Then, you identify the range of values for the measurement to use to select patients. All information on this tab is optional.

To enter search criteria on this tab:

1 Select the analysis to use to select patients from the **Analysis** drop-down list.

2 Select a measurement from the selected analysis using the **Measurement** drop-down list.

3 Click and drag the lower and/or upper boundaries of the range to identify a range of values to use to select patients.

4 Click **Left** to select patients for whom the selected measurement is to the left of the lower range boundary.

Or,

Click **Right** to select patients for whom the selected measurement is to the right of the upper range boundary.

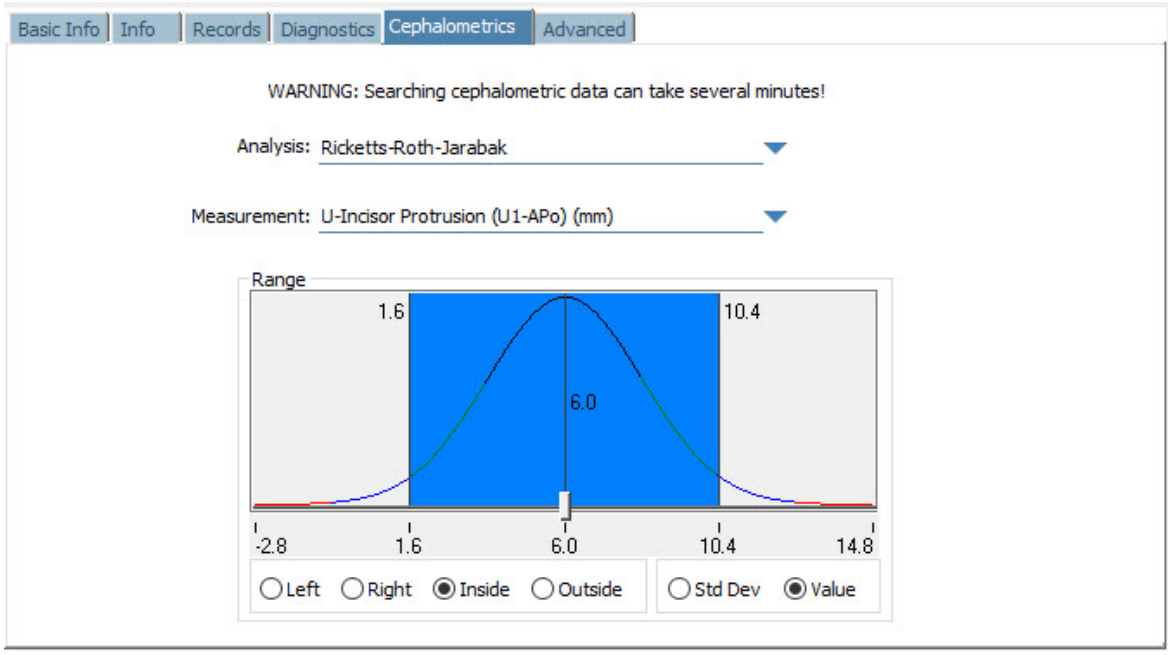
Or,

Click **Inside** (the default) to select patients for whom the selected measurement is within the range identified by the upper and lower range boundaries.

Or,

Click **Outside** to select patients for whom the selected measurement is outside the range identified by the upper and lower range boundaries.

When you select one of these options, the blue shading moves so that it identifies the selected range.



Analysis	Searches for patients based on the selected analysis.
Measurement	Searches for patients based on the selected measurement.

Range	Range to use to select patients. The blue selector indicates the range of values that will be used to select patients. **Left:** Selects values to the left of the lower boundary (moves the blue selector to the left side of the curve). **Right:** Selects values to the right of the upper boundary (moves the blue selector to the right side of the curve). **Inside:** Selects values between the upper and lower boundaries (moves the blue selector to the center of the curve). **Outside:** Selects values outside the upper and lower boundaries (moves the blue selector to the two sides of the curve). **Std Dev:** Uses standard deviation as the units on the curve. **Value:** Uses the actual measurement values as the units on the curve.

Financials Tab

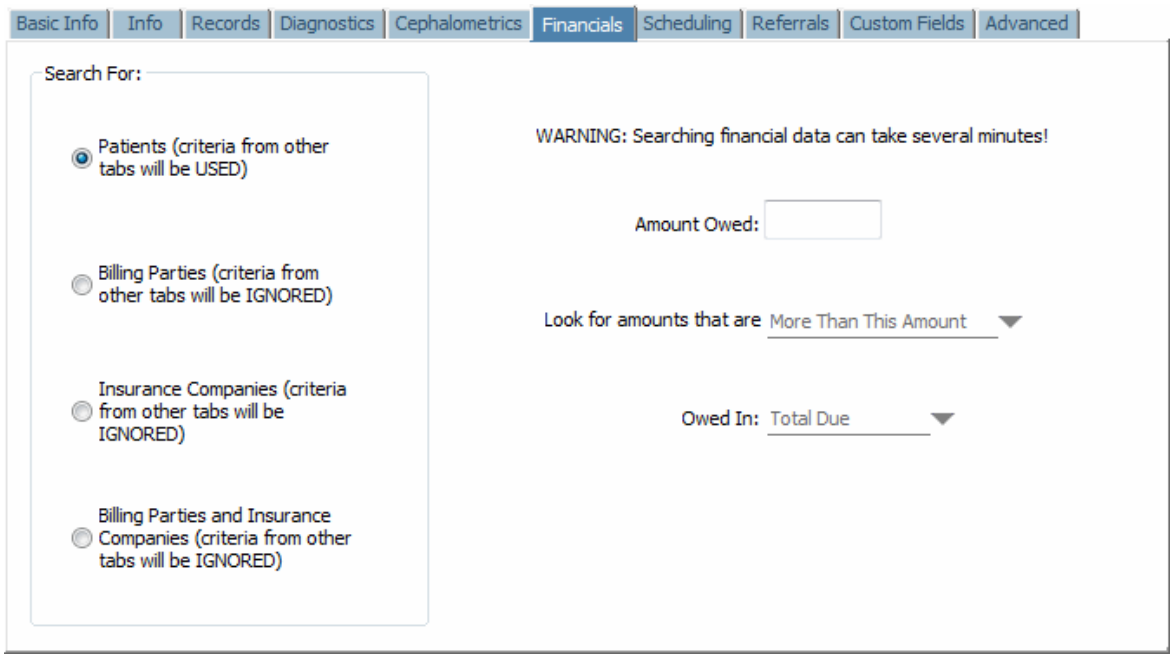
You use this tab to enter search criteria that selects patients, billing parties, or insurance companies based on the amount owed. This tab only appears if you also have Dolphin Management. All information on this tab is optional.

To enter search criteria on this tab:

1 Select an option in the Search For group box.

2 Enter a dollar amount in the **Amount Owed** field.

3 Specify how to use the amount owed to identify patients, billing parties, or insurance companies by selecting options from the two drop-down lists.



Search For	Search criteria to use. You can search for patients, billing parties, insurance companies, or billing parties and insurance companies. ***Note:*** *If you select **Billing Parties**, **Insurance Companies**, or **Billing Parties and Insurance Companies**, search criteria from all other tabs is ignored when you perform the search.*
Amount Owed	Limits the search based on the amount that patients, billing parties, or insurance companies owe.
Look for amounts that are	How to select accounts based on the amount owed: **More Than This Amount:** Selects accounts with an amount owed that is greater than the amount in the **Amount Owed** field. **Less Than This Amount:** Selects accounts with an amount owed that is less than the amount in the **Amount Owed** field. **Equal To This Amount:** Selects accounts with an amount owed that is equal to the amount in the **Amount Owed** field. **Not Equal To This Amount:** Selects accounts with an amount owed that is not equal to the amount in the **Amount Owed** field.
Owed In	Selects accounts based on aging of the amount owed: **Total Due:** Compares the total due amount with the amount in the **Amount Owed** field. **Current Due:** Compares the current due amount with the amount in the **Amount Owed** field. **Over 30:** Compares the over 30 amount with the amount in the **Amount Owed** field. **Over 60:** Compares the over 60 amount with the amount in the **Amount Owed** field. **Over 90:** Compares the over 90 amount with the amount in the **Amount Owed** field. **Unbilled:** Compares the unbilled amount with the amount in the **Amount Owed** field. **Account Balance:** Compares the account balance amount with the amount in the **Amount Owed** field.

Scheduling Tab

You use this tab to enter search criteria that selects patients based on recalls or appointments scheduled. This tab only appears if you also have Dolphin Management. All information on this tab is optional.

To enter search criteria on this tab:

1 Check the **Search Recalls** box to search for patients based on scheduled recalls.

Or,

Check the **Search Appointment** box to search for patients based on scheduled appointments.

Or,

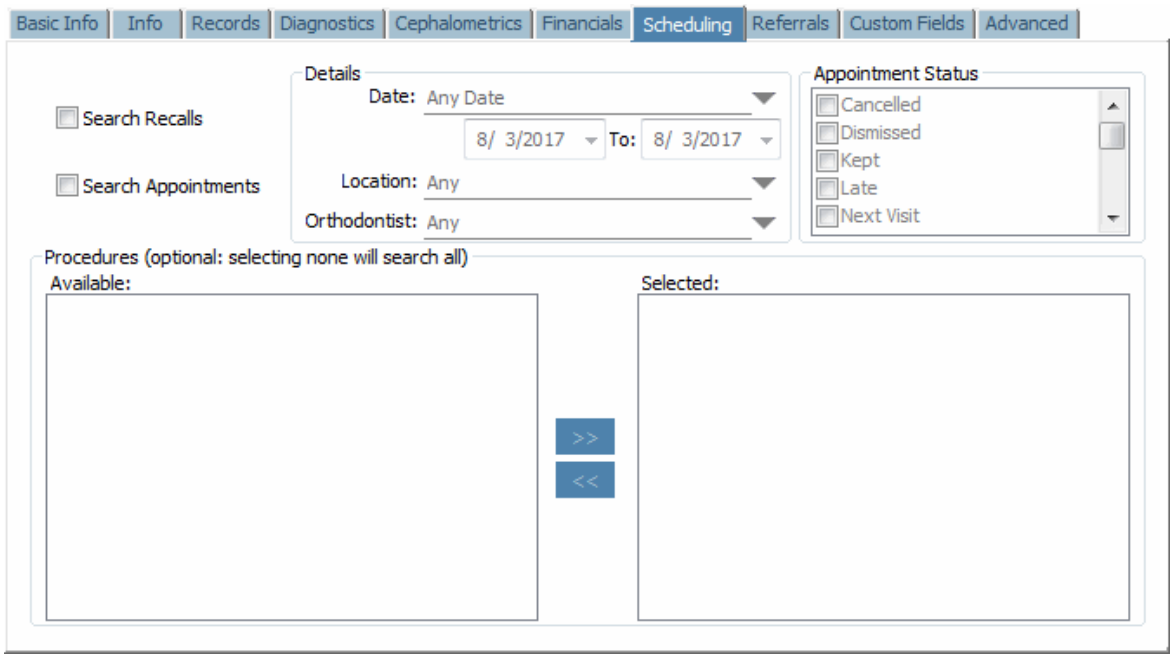
Check both boxes to search for patients based on both recalls and appointments.

2 Enter search criteria in the Details group box to narrow your search by date, location, or orthodontist.

3 Check one or more appointment statuses to limit your search by appointment status.

4 Select one or more procedures and click **>>** to limit your search by the scheduled procedure.

When you click **>>**, the selected procedures moved from the **Available** list box to the **Selected** list box. To deselect a procedure, click it in the **Selected** list box and click **<<** to move it back to the **Available** list box.



Search Recalls	Searches for patients with scheduled recalls.
Search Appointments	Searches for patients with scheduled appointments.
Date	Limits your search to patients with scheduled recalls or appointments during a specific date range. Possible values are: **Any Date** (do not limit the search by date), **Last Year**, **Last Quarter**, **Last Month**, **Last Week**, **Yesterday**, **Today**, **Tomorrow**, **This Week**, **Next Week**, **This Month**, **Next Month**, **Quarter To Date**, **Year To Date**, and **Range**. If you select **Range**, enter a date range using the drop-down lists below the **Date** drop-down list.
Location	Limits your search to patients with scheduled recalls or appointments at a specific practice location.
Orthodontist	Limits your search to patients with scheduled recalls or appointments with a specific orthodontist.
Appointment Status	Limits your search to patients with scheduled recalls or appointments in the selected statuses.

Procedures	Limits your search to patients with scheduled recalls or appointments for those procedures. **Available:** Lists all procedures set up for your practice that have not been selected for this search. **>>:** Click this button to move the selected procedures from the **Available** list box to the **Selected** list box. **<<:** Click this button to move the selected procedures from the **Selected** list box to the **Available** list box. **Selected:** Lists the procedures selected for this search.

Referrals Tab

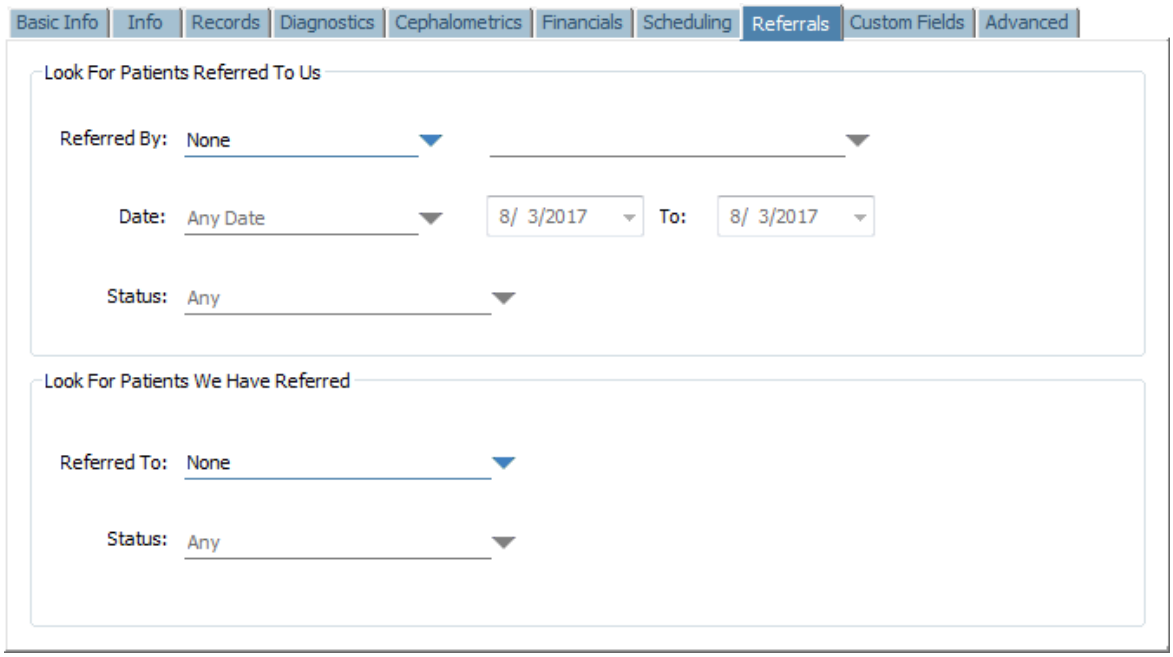
You use this tab to enter search criteria that selects patients based on referrals. This tab only appears if you also have Dolphin Management. All information on this tab is optional.

To enter search criteria on this tab:

1 Enter search criteria in the Look For Patients Referred To Us group box to search for patients based on who referred them to your practice.

Or,

Enter search criteria in the Look For Patients We Have Referred group box to search for patients based on who your practice referred them to.



Referred By	Searches for patients referred to your office by that referral.
Date	Limits your search to patients referred during a specific date range. Possible values are: **Any Date** (do not limit the search by date), **Last Year**, **Last Quarter**, **Last Month**, **Last Week**, **Yesterday**, **Today**, **Tomorrow**, **This Week**, **Next Week**, **This Month**, **Next Month**, **Quarter To Date**, **Year To Date**, and **Range**. If you select **Range**, enter a date range using the second and third drop-down lists.
Status	Limits your search to patients in the specified patient status.
Referred To	Limits your search to patients that your practice referred to the specified doctor.

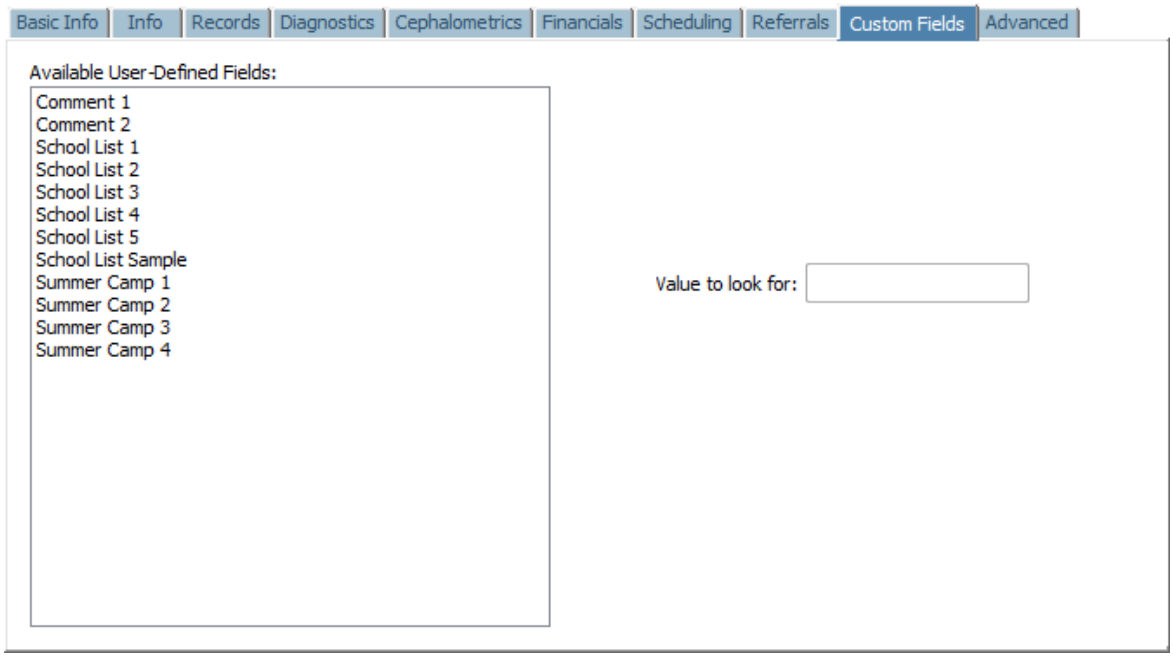
Custom Fields Tab

You use this tab to enter search criteria that selects patients based on values entered on the **Custom** tab of the Edit a Patient window in Dolphin Management. This tab only appears if you also have Dolphin Management. All information on this tab is optional.

To enter search criteria on this tab:

1 Select a custom field in the **Available User-Defined Fields** list box.

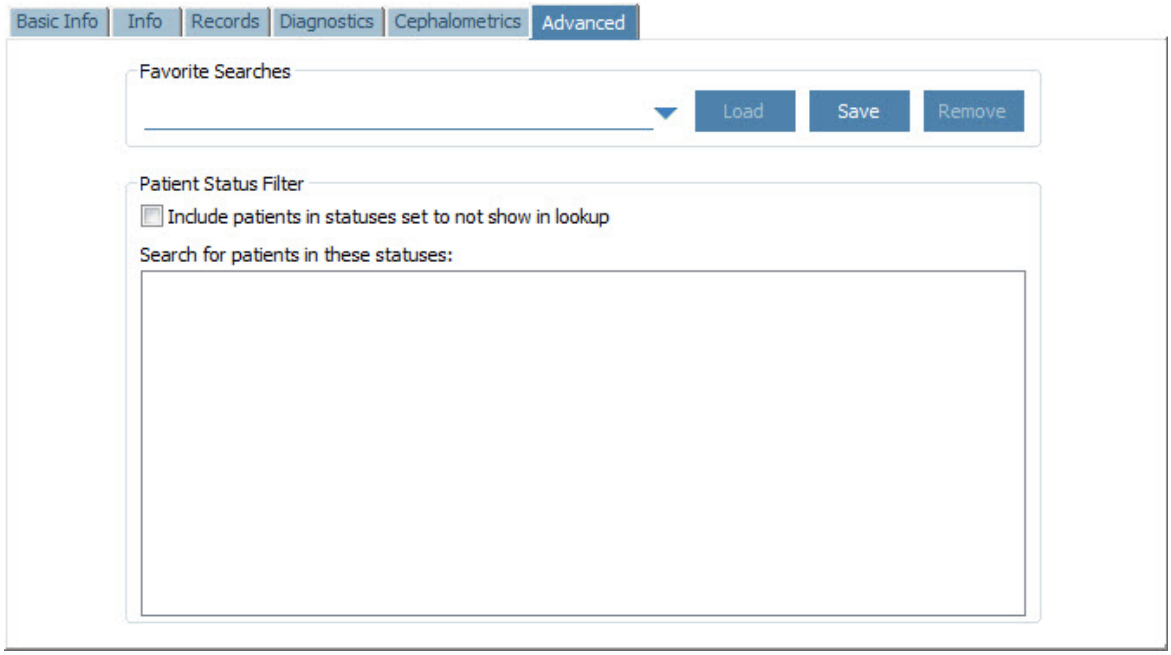
2 Enter a value in the **Value to look for** field to search for patients with that value in the selected custom field.



Available User-Defined Fields	Searches for patients based on the value of this field.
Value to look for	Searches for patients with that value in the selected custom field.

Advanced Tab

You use this tab to perform previously-saved favorite searches, save or remove favorite searches, and enter advanced search criteria. All information on this tab is optional.



Favorite Searches	Lists existing favorites and provides the option of entering the name of a new favorite search.
Load	Loads the selected favorite search.
Save	Saves the current search as a favorite.
Remove	Removes the selected favorite search.
Patient Status Filter	Searches by patient status. **Include patients in statuses set to not show in lookup:** Searches for patients in statuses that typically wouldn't be included in a search, such as patients that have been deleted. If you are using Dolphin Imaging with Dolphin Management, checking this box searches records for patients whose patient status is set to a status that does not appear in patient lookup. **Search for patients in these statuses:** If you are using Dolphin Imaging with Dolphin Management, searches based on the treatment statuses set for patients In Dolphin Management. For more information about Dolphin Management patient statuses, refer to the online help for Dolphin Management.

Performing Favorite Searches

To perform a favorite search:

1 Select a previously-saved favorite search from the drop-down list in the Favorite Searches group box.

2 Click **Load**.

The criteria for the favorite search you selected are entered on the tabs of the Patient Lookup dialog box.

3 Make any changes to the search criteria. Then, click **Find Now** to execute the search.

All patients meeting the search criteria are listed in the patient list on the **Basic Info** tab.

Saving and Removing Favorite Searches

To save a favorite search:

1 Enter the criteria for the search to save.

Your criteria can consist of a string in the **Look For** field; information entered on the **Info**, **Records**, **Diagnostics**, **Cephalometrics**, **Financials**, **Scheduling**, **Referrals**, and **Custom Fields** tabs; and/or criteria entered in the Other Search Criteria group box on the **Advanced** tab.

2 Click **Save**.

The Save Search dialog box is displayed.

3 Enter the name to use for this favorite search. Then, click **OK** to save it.

To remove a favorite search:

1 Select a previously-saved favorite search from the drop-down list in the Favorite Searches group box.

2 Click **Remove**.

A dialog box appears asking you to confirm removal of the favorite search.

3 Click **Yes** to remove the search.

Or,

Click **No** to cancel the removal.

Managing Patient Records

The Patient Lookup dialog box's advanced view contains the following buttons that you use to manage this patient's record:

New Patient...	Adds a new patient. For more information, see "Adding or Changing Patients" on page 4-38 or "Adding or Changing Patients (with Dolphin Management or the Security Utilities)" on page 4-49.
Details...	Changes the information for the selected patient. For more information, see "Adding or Changing Patients" on page 4-38 or "Adding or Changing Patients (with Dolphin Management or the Security Utilities)" on page 4-49.
Archive...	Archives the selected patient's record or loads a patient record from an archive. For more information, see "Using Patient Archives" on page 4-49
Rename...	Renames the selected patient, timepoint, or image. For more information, see "Renaming Patients, Timepoints, or Images" on page 4-52.
Delete...	Deletes the selected patient, timepoint, or image. For more information, see "Deleting Patients, Timepoints, and Images" on page 4-53
Recover...	Recovers demographic and diagnostic questionnaire data from deleted patient records. For more information, see "Deleting Patients, Timepoints, and Images" on page 4-53.

Adding or Changing Patients

Note: *If you are using Dolphin Imaging with Dolphin Management or if you have the Dolphin Imaging Security Utilities installed, see "Adding or Changing Patients (with Dolphin Management or the Security Utilities)" on page 4-49.*

To add a new patient or change a patient's information:

1 To add a patient, click **New Patient...** on the Patient Lookup dialog box. Then, select **New Patient**.

Or,

To change a patient's information, select that patient. Then, click **Details...** on the Patient Lookup dialog box in the advanced view.

The Patient Information dialog box opens and displays several tabs for information about this patient.

To add a new patient from a DICOM file or set of files:

1 Click **New Patient...** on the Patient Lookup dialog box.

2 Select **New Patient From DICOM**.

3 Browse to and select a DICOM file or file set.

Dolphin Imaging loads the patient information from the DICOM file or file set to create a new patient record. Then, the Patient Information dialog box opens with tabs for information about this patient. On this dialog box, you can confirm the patient details and provide in any missing information.

To enter patient information:

1 Click any tab to enter information on that tab.

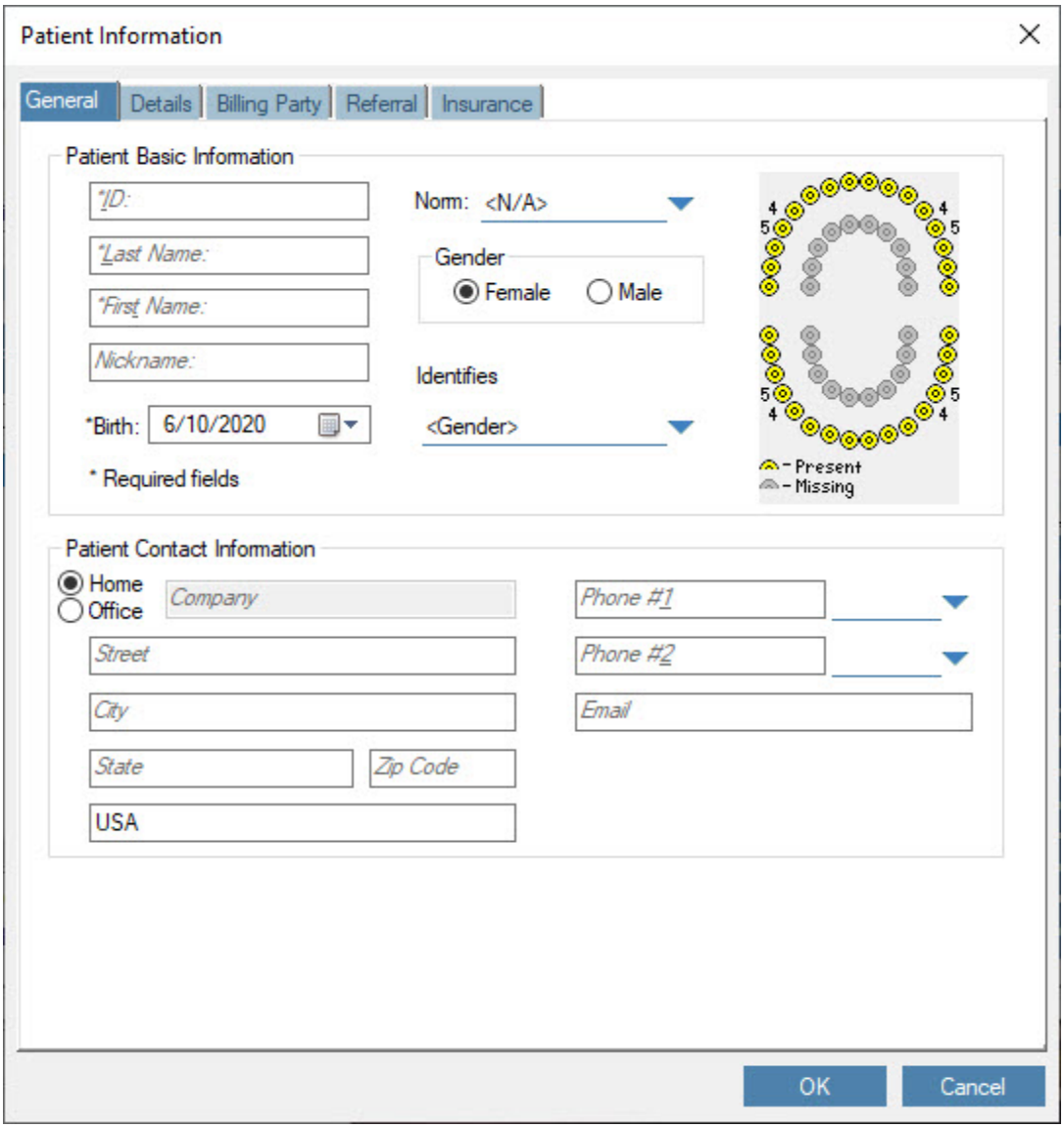
When you first open the Patient Information dialog box, the **General** tab is displayed. For more information, see “Patient Information General Tab” on page 4-40.

If you are adding a new patient manually (not from a DICOM file or set of files), the Patient Information dialog box is blank so you can enter information for a new patient. If you are changing information for an existing patient, this dialog box contains the information currently on file for the selected patient. If you are adding a new patient from a DICOM file or set of files, this dialog box contains the information imported from the DICOM file or set of files.

In blank fields, gray italic text indicates the information that you should enter. An asterisk indicates required information that you must enter for every patient. All other information is optional. To indicate a missing tooth, click that position on the tooth chart on the **General** tab.

2 When you finish entering or changing information on all tabs of this dialog box, click **OK**.

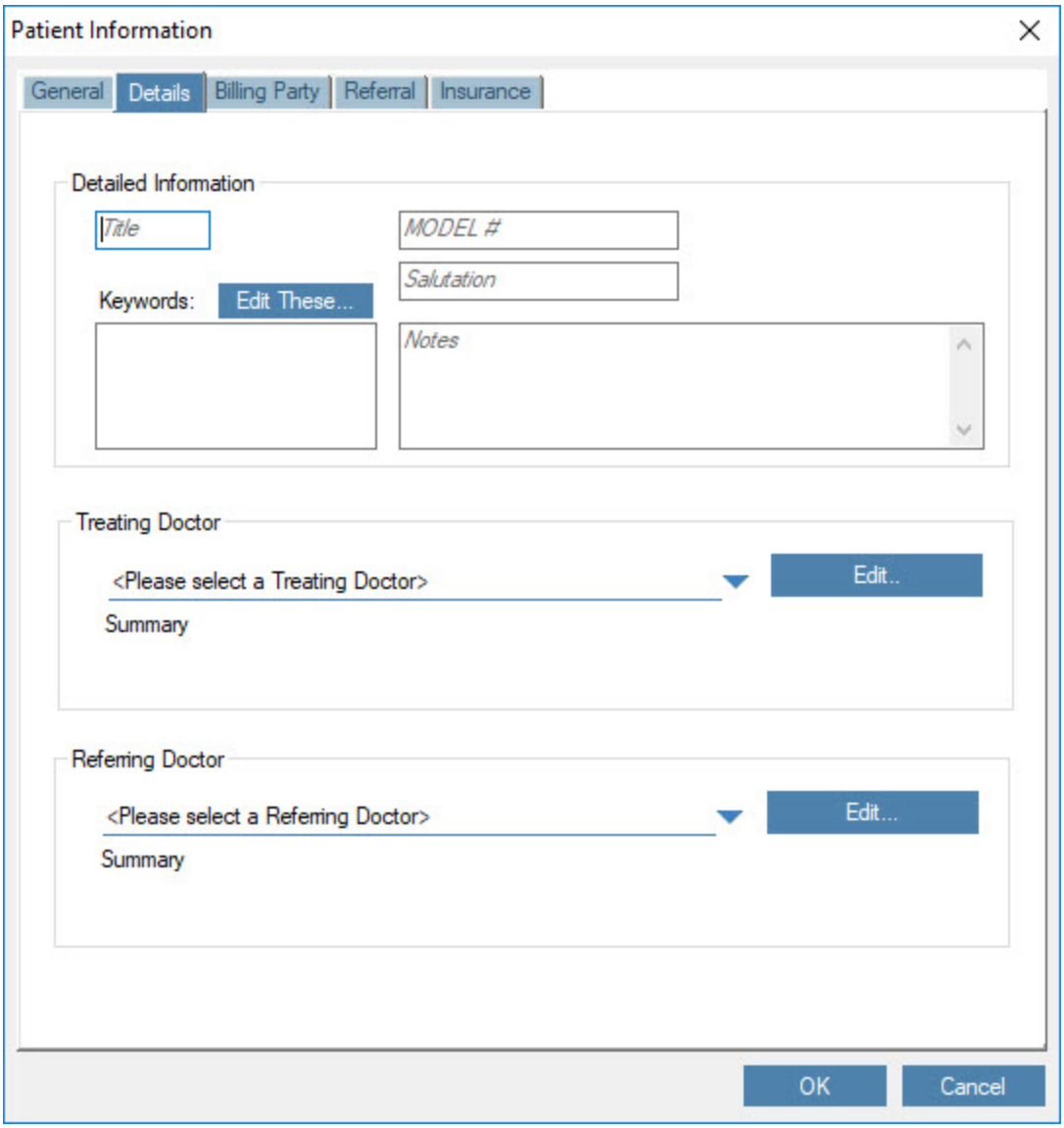
Patient Information General Tab



ID	Patient ID used to keep track of the patient's records. Use the same patient ID that you use in your office management system. The patient ID must be unique to this patient. It can be up to 25 characters long and can be any combination of the following: upper-case letters from the ISO basic Latin alphabet (A-Z), digits (0-9), hyphens (-), and underline (_). ***Note:*** *Dolphin Imaging versions before version 12 support patient IDs up to 10 characters in length. If your practice has workstations running Dolphin Imaging versions 12 and 11.95, you should limit your patient IDs to a maximum 10 characters.*
Last Name	Patient's last name.
First Name	Patient's first name.

Nickname	Nickname for this patient.
Birth	Patient's birth date. The current date appears in this field initially, but you must change it to the patient's actual birth date.
Norm	Most appropriate category for this patient. Used only if you use comparisons to age, gender, or racial norms in your practice. For those practices that use comparisons to norms, Dolphin Imaging includes standard measurements and can perform these comparisons.
Gender	Patient's gender. Used only if you use comparisons to racial and gender norms in your practice.
Identifies	The patient's gender identity.
Tooth Diagram	Diagram used to indicate missing teeth. The inner diagram is for baby teeth.
Home	Indicates that the address is the patient's home address. You can enter either the patient's home or office address, but not both.
Office	Indicates that the address is the patient's office address. You can enter either the patient's home or office address, but not both.
Company	Company for which this patient works. Available only when **Office** is selected as the address type (see above).
Street	Street address for this patient.
City	City for this patient's address.
State	State for this patient's address.
Zip Code	Zip code for this patient's address.
Country	Country for this patient's address (defaults to USA).
Phone #1, Phone #2	Telephone numbers for this patient. These fields accept both letters and numbers. Some practices use one of these fields for another purpose, such as a database index.
Email	Email address for this patient.

Patient Information Details Tab



Title	Patient's title.
Model #	Number for the study model for this patient.
Salutation	Salutation to use on letters to this patient.
Keywords	Keywords assigned for this patient. These keywords appear in the Patient Summary section of the Patient Lookup dialog box.
Edit These...	Edits the patient keywords.
Notes	Notes for this patient. These notes are also available from the Dolphin Imaging main screen.
Treating Doctor	Doctor treating this patient.

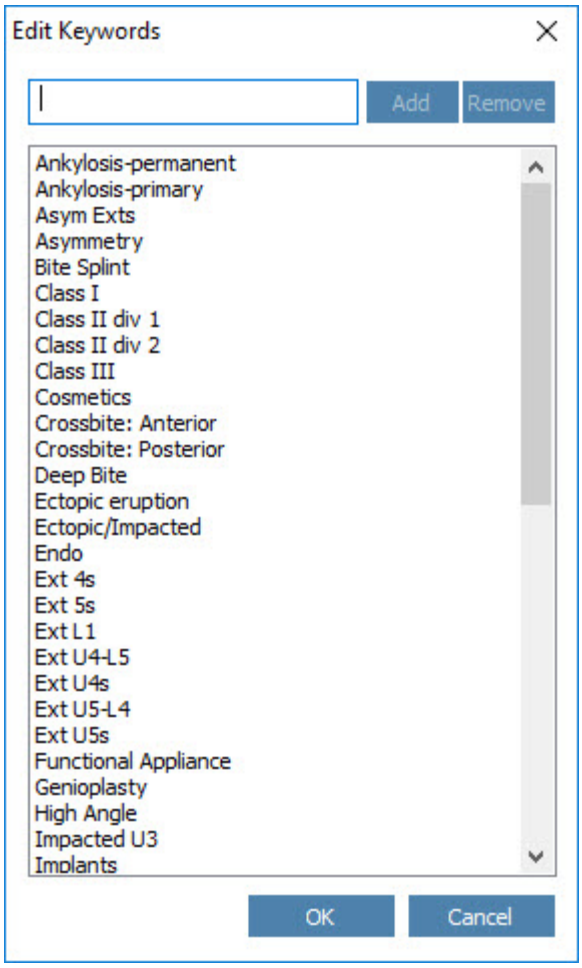
Edit	Edits information for the selected treating doctor or adds a new doctor. For more information, see “Editing Doctors” on page 3-53.
Referring Doctor	Doctor who referred this patient.
Edit	Edits the information for the selected referring doctor or adds a new doctor. For more information, see “Editing Doctors” on page 3-53.

Editing Patient Keywords

To edit the predefined patient keywords:

1 Under Keywords on the **Details** tab, click **Edit These...**.

The Edit Keywords dialog box opens.



Add	Adds the keyword entered in the text field.
Remove	Deletes the selected keyword.
Keyword List	Lists the currently defined keywords.

To define a new keyword:

1 Type the new keyword in the field.

2 Click **Add**.

To remove a keyword:

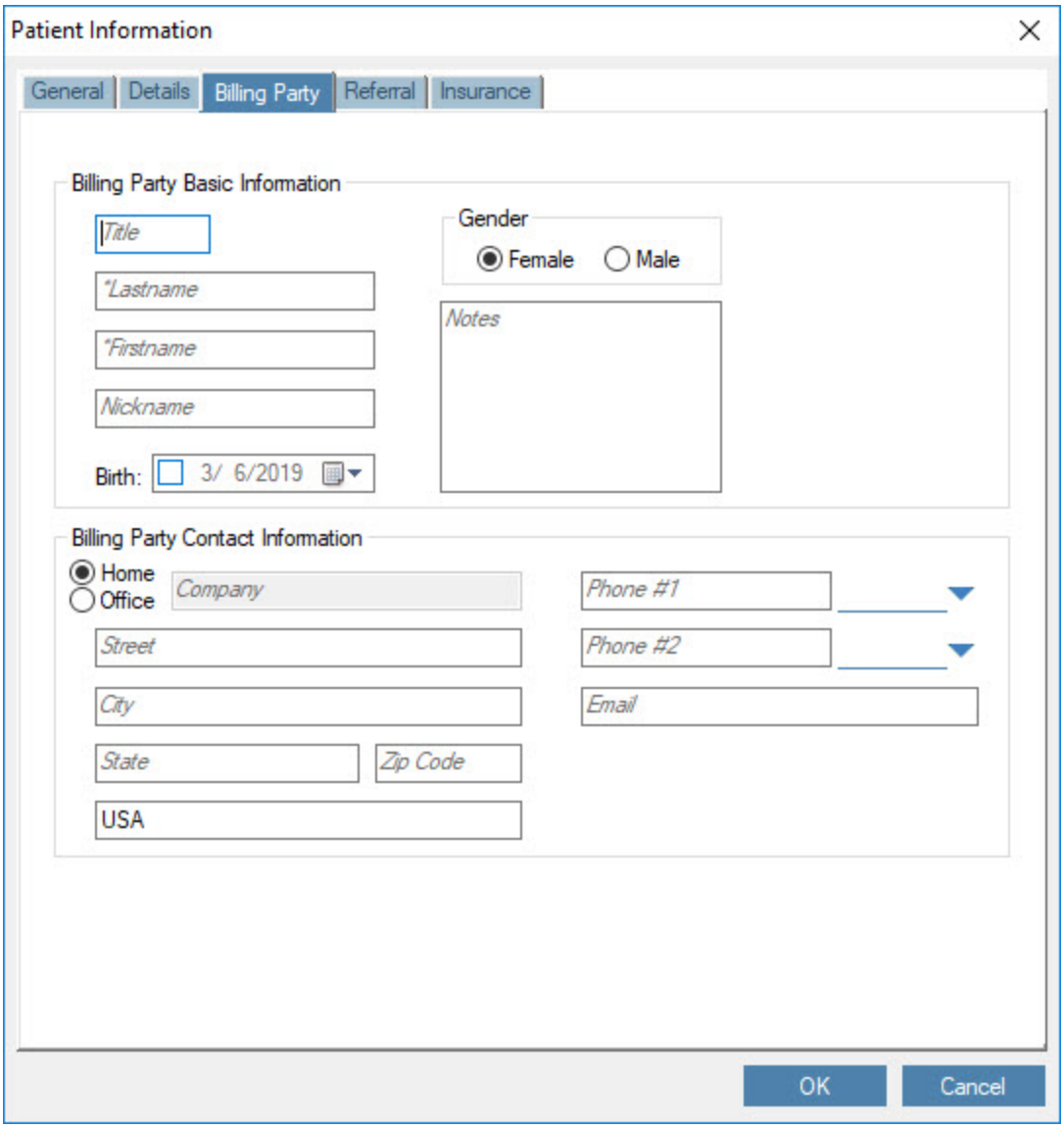
1 Select the keyword to remove from the list.

2 Click **Remove**.

To close this dialog box:

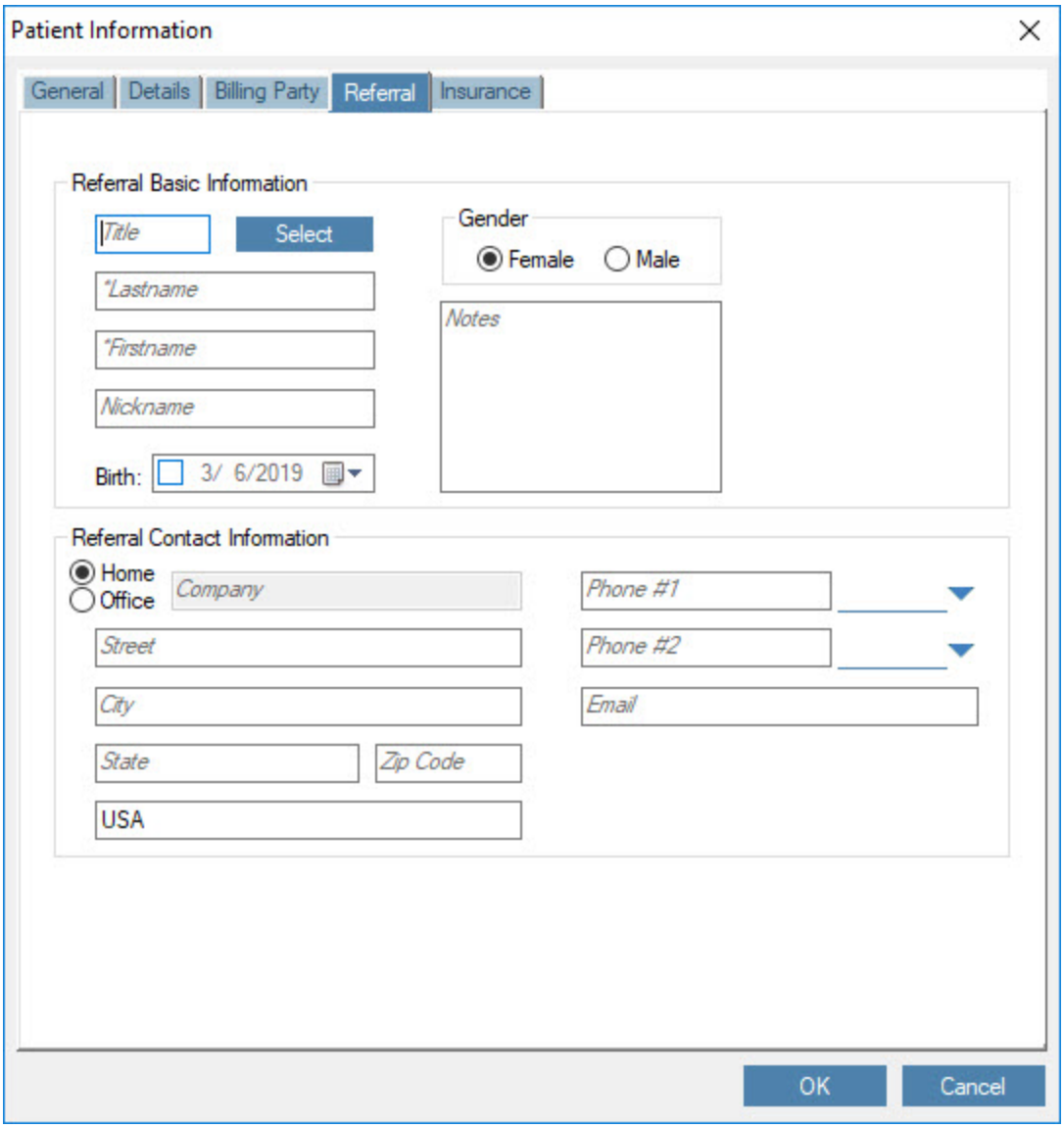
1 Click **OK**.

Patient Information Billing Party Tab



Title	Billing party's title.
Last Name	Billing party's last name.
First Name	Billing party's first name.
Nickname	Nickname for the billing party.
Birth	Billing party's birth date *(*disabled by default).
Gender	Billing party's gender.
Notes	Any notes for the billing party.
Home	Indicates that the address is the billing party's home address.You can enter either the billing party's home or office address, but not both.
Office	Indicates that the address is the billing party's office address. You can enter either the billing party's home or office address, but not both.
Company	Company for which the billing party works. Available only when **Office** is selected as the address type (see above).
Street	Street address for the billing party.
City	City for the billing party's address.
State	State for the billing party's address.
Zip Code	Zip code for the billing party's address.
Country	Country for the billing party's address (defaults to USA).
Phone #1, Phone #2	Telephone numbers for the billing party. These fields accept both letters and numbers. Some practices use one of these fields for another purpose, such as a database index.
Email	Email address for the billing party.

Patient Information Referral Tab



Title	Doctor's title.
Select	Selects from a list of previously-entered referrals.
Last Name	Doctor's last name.
First Name	Doctor's first name.
Nickname	Nickname for this doctor.
Birth	Doctor's birth date (disabled by default). To enter the doctor's birth date, check the box to enable this field.
Gender	Doctor's gender.
Notes	Notes for this doctor.

Home	Indicates that the address is the doctor's home address. You can enter either the doctor's home or office address, but not both.
Office	Indicates that the address is the doctor's office address. You can enter either the doctor's home or office address, but not both.
Company	Company for which this doctor works. Available only when **Office** is selected as the address type (see above).
Street	Street address for this doctor.
City	City for this doctor's address.
State	State for this doctor's address.
Zip Code	Zip code for this doctor's address.
Country	Country for this doctor's address (defaults to USA).
Phone #1, Phone #2	Telephone numbers for this doctor. These fields accept both letters and numbers. Some practices use one of these fields for another purpose, such as a database index.
Email	Email address for this doctor.

To select a previously-entered referral:

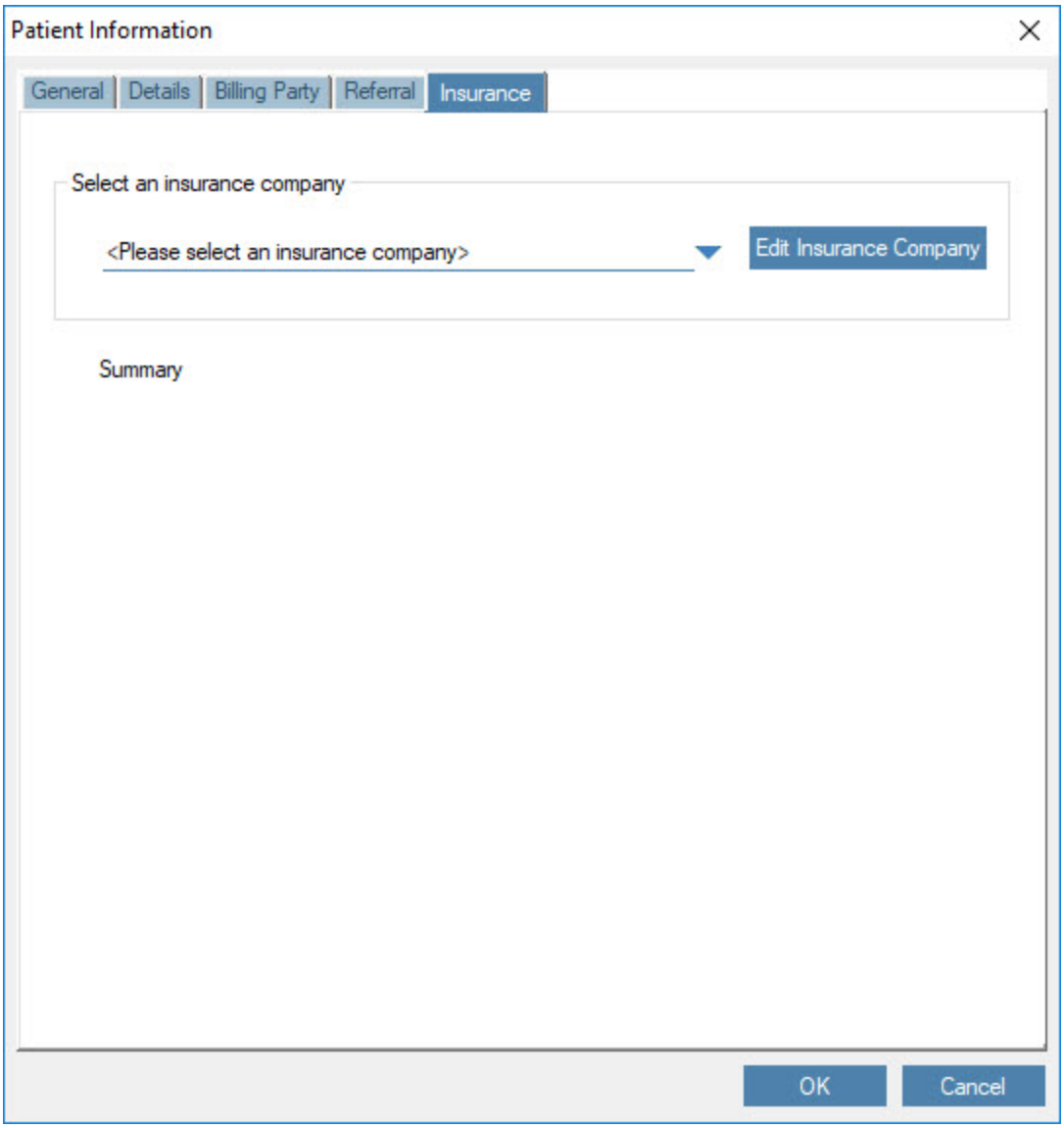
1 Click **Select**.

A dialog box appears listing the referring doctors that you have previously entered.

2 Select a referring doctor from the list. Then, click **Select**.

The information entered for the selected referral is entered on the **Referral** tab of the Patient Information dialog box. At this point, you can make any changes to this information.

Patient Information Insurance Tab



Select an Insurance Company	Patient's insurance company.
Edit Insurance Company	Adds a new insurance company or edits the information for the selected insurance company. For more information, see "Editing Insurance Companies" on page 3-56
Summary	Contact information for the insurance company.

Adding or Changing Patients (with Dolphin Management or the Security Utilities)

If you are using Dolphin Imaging with Dolphin Management or if you have the Dolphin Imaging Security Utilities installed, you should follow the steps below. For more information on installing the Dolphin Imaging Security Utilities, see “Installing the Security Utilities” on page 1-11.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Add Patient privilege granted in Employee Rights. To view patient information, you need the View Patient Details privilege. To change patient information, you need both the View Patient Details and Edit Patient privileges. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To add a new patient or change a patient’s information:

1 Click **New Patient...** on the Patient Lookup dialog box's **Basic Info** tab to add a patient.

Or,

Select the patient whose information you want to change. Then, click **Details...**.

The Edit a Patient dialog box opens.

2 Enter or change the patient’s information.

For more information, refer to the *Dolphin Management User Guide* or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).

To record missing teeth for a patient:

1 Select the patient using the Patient Lookup dialog box, and click **OK**.

2 On the Dolphin Imaging main screen, select **Tooth Chart...** from the **Tools** menu.

A tooth chart for this patient opens. The inner diagram is for baby teeth.

3 Click the position of each missing tooth on the tooth diagram. Then, click **OK**.

Using Patient Archives

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Archive Save Patients privilege granted in Employee Rights. To load a patient from an archive, you need the Archive Load Patients privilege. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To use archive operations:

1 Optionally, select one or more patients to archive from the patient list on the Patient Charts dialog box or the advanced view of the Patient Lookup dialog box.

Or,

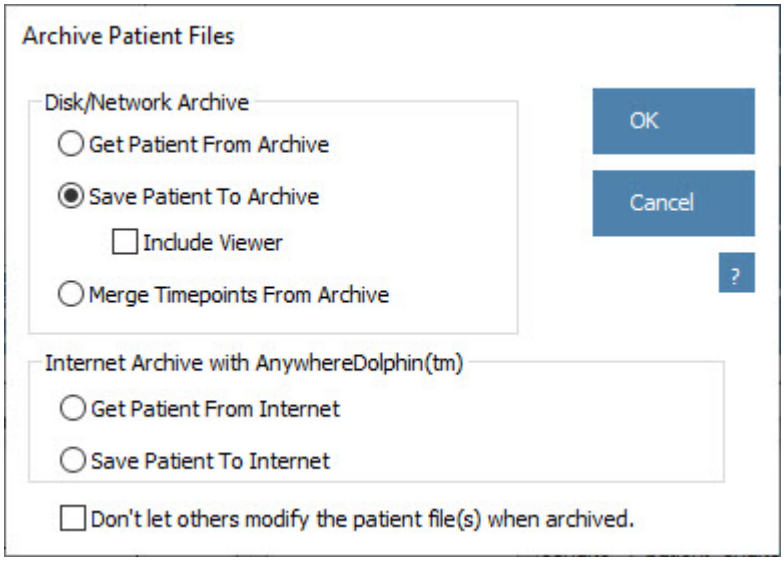
Press CTRL+A to select all the patients in the patient list.

If you plan to get a patient from an archive, you do not need to select a patient.

To select several adjacent patients, SHIFT+click the patients. To select several patients that are not adjacent, CTRL+click the patients.

2 Click **Archive...**.

A dialog box prompts you for the archive option you want.



Get patient from Archive	Loads a patient from an archive file.
Save patient to Archive	Saves the entire patient record to an archive file. **Include Viewer:** Bundles the Dolphin Imaging Viewer with the patient archive.
Merge Timepoints from Archive	Merges timepoints from an archive.
Get patient from Internet	Loads a patient that was saved to the Internet using AnywhereDolphin. For more information, see “Getting Patients from the Internet” on page 32-2.
Save patient to Internet	Saves the entire patient record to the Internet for use with AnywhereDolphin For more information, see “Saving Patients to the Internet” on page 32-4.
Don’t let others modify the patient file(s) when archived	Prevents anyone from making changes to this archived patient. No changes can be made to the archived patient until the patient’s record is loaded again from the archive.

Note: *Archiving a patient saves diagnosis codes but not the associated text. Since Dolphin Imaging allows you to customize the text associated with diagnosis codes, this may cause difficulties if you load an archived patient on a computer other than the computer on which the archive was saved. For example, if you archive a patient on a computer that uses the default text for diagnosis codes described in “DLS Diagnostic Lists and Codes” on page B-12 and then load that archived patient on a computer that has customized diagnosis text, the patient’s record on the new computer reflects the customized diagnosis text.*

Using a Disk or Network Archive

Note: *If the Dolphin Imaging Security Utilities are installed, you need the Archive Load Patients privilege to load a patient from an archive. For more information, see "Installing the Security Utilities" on page 1-11 and the Dolphin Management User Guide or Dolphin Management online help (**Dolphin Management User Guide.PDF** or **DM_Help.chm** in your **C:\Dolphin** folder).*

To get a patient from or save a patient to an archive:

1 On the Archive Patient Files dialog box, select an archive operation in the Disk/Network Archive group box

2 Optionally, if you are saving a patient to an archive, check the **Include Viewer** box to bundle the Dolphin Imaging Viewer with the patient archive.

Dolphin Imaging Viewer is a free, and freely-distributable, stand-alone Dolphin patient viewing program. You can use this option if you plan to share this patient archive with someone who doesn't have Dolphin Imaging. If you then put the patient archive files along with the files for the Dolphin Imaging Viewer on a CD or USB drive, Dolphin Imaging Viewer will install automatically when the recipient uses that CD or USB drive.

For more information on the Dolphin Imaging Viewer, see www.dolphinimaging.com/product/ImagingViewer.

The Choose an archive file... dialog box is displayed.

3 Click **OK** to start the archive operation.

4 If you are loading one or more patients from archive files, select the files in this dialog box.

When you select an archive file to load, the patient name and patient ID for that archive file appears in the dialog box.

5 Click **OK** to perform the archive operation.

If you are saving to an archive, the selected patient's chart is saved to the file you chose.

Note: *Archiving a patient saves diagnosis codes but not the associated text. Since Dolphin Imaging allows you to customize the text associated with diagnosis codes, this may cause difficulties if you load an archived patient on a computer other than the computer on which the archive was saved. For example, if you archive a patient on a computer that uses the default text for diagnosis codes (described in "DLS Diagnostic Lists and Codes" on page B-12), and then load that archived patient on a computer that has customized diagnosis text, the patient's record on the new computer reflects the customized diagnosis text.*

If you are loading from an archive, the patient's chart is loaded from the file you chose, and that patient is added to the patient list in the Patient Lookup dialog box.

If you are merging from an archive, the patient's chart is merged from the file you chose into the selected patient's chart.

6 Click **Yes** to remove the patient from the patient list or **No** to retain the patient in the patient list.

Or,

If you are loading from an archive, click **Yes** to remove the archive file or **No** to retain the file.

7 If you are loading from an archive, click **Overwrite All** to overwrite all patients that already exist in your database with those you are loading from the archive.

Or,

Click **Don't Overwrite Any** to skip all patients that already exist in your database.

Or,

Click **Prompt Individually** if you want Dolphin Imaging to ask whether to overwrite whenever it encounters a patient that already exists in your database.

When the archive operation is complete, the Patient Lookup dialog box is displayed.

Renaming Patients, Timepoints, or Images

To rename a patient or timepoint:

1 To rename a patient, select that patient using the advanced view of the Patient Lookup dialog box.

Or,

To rename a timepoint, select a patient using the advanced view of using the Patient Lookup dialog box. Then, select the timepoint to rename from the **Timepoints** list box.

Note: *If you are using Dolphin Imaging with Dolphin Management, you use Dolphin Management to rename patients. You cannot rename patients in Dolphin Imaging. For information, refer to the Dolphin Management online help.*

2 Click **Rename...**.

3 Select **Patient** to rename a patient.

Or,

Select **Timepoint** to rename a timepoint, change the timepoint date, or change the treatment for a timepoint.

4 Make any changes.

5 (Optional) Check the **Add this Name to list** box if you are renaming a timepoint and want to add the new timepoint name to the list of standard timepoint names.

6 Click **OK**.

To rename an image:

1 On the Dolphin Imaging main screen, right-click the image to rename, and select **Properties** from the **Image** context menu.

The Image Properties dialog box opens.

2 Enter the new name for this image in the **Title** field. Then, click **OK**.

To rename a timepoint from the main screen:

1 Double-click the tab for the timepoint that you want to rename.

2 Type a new name for the timepoint.

3 Press the ENTER or ESC key to save the new name.

Deleting Patients, Timepoints, and Images

Note: *If you have the Dolphin Imaging Security Utilities installed, you can only delete a patient or timepoint if your Dolphin Imaging user account has the Delete Timepoints and Patients privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To delete a patient or timepoint:

1 To delete a patient, select that patient using the advanced view of the Patient Lookup dialog box.

Or,

To delete the images stored in a timepoint or an entire timepoint, select a patient using the advanced view of the Patient Lookup dialog box. Then, select the timepoint to delete from the **Timepoints** list box.

Note: *Deleting an entire timepoint deletes all the images and diagnostic data associated with that timepoint.*

2 Click **Delete...**.

3 Select **Current Timepoint's Images** to delete only the images stored in the current timepoint.

Or,

Select **Current Timepoint** to delete the images and diagnostic data stored in the current timepoint.

Or,

Select **Entire Patient** to delete the entire patient record.

4 Click **OK**.

A confirmation dialog box appears.

5 Click **Yes** to delete.

To delete an image:

1 On the Dolphin Imaging main screen, right-click the image, and select **Delete Image** from the **Image** context menu.

A dialog box appears asking you to confirm the deletion.

2 Click **Yes** to delete the image.

Recovering Deleted Data

You can use the **Recover...** button on the Patient Lookup dialog box's advanced view recover demographic and diagnostic questionnaire data from deleted patient records.

Note: *This feature does not recover image data.*

To recover demographic and diagnostic questionnaire data from deleted patient records:

1 On the advanced view of the Patient Lookup dialog box, click **Recover...**.

2 Select the deleted patient record to recover.

3 Click **Recover...**.

Using the Recycle Bin

By default, Dolphin Imaging deletes patient records, timepoints, or images entirely. In some cases, however, you can specify that deleted timepoints and images be placed in the recycle bin upon deletion, so that you can retrieve them, if necessary. You can use the recycle bin feature in the following circumstances:

- if you are using Dolphin Imaging on a stand-alone workstation
- if you are using Dolphin Imaging on the server for your network

Note: *If you delete an entire patient record, it is deleted entirely and not placed in the recycle bin even if the recycle feature is enabled. The recycle bin only retains records when you delete a timepoint or an image.*

To enable the recycle bin feature:

1 Select **Preferences** from the Tools menu.

2 Select **General Preferences...** from the sub-menu.

3 Click **Advanced Settings...** on the General Preferences dialog box.

4 Click **OK** on the warning message that appears.

Note: *The Dolphin Imaging software automatically maintains almost all of the settings in the* ***DOLPHIN.INI*** *file, and setting these options improperly can cause problems in the software's functioning. For these reasons, it is recommended that you do not modify the settings in this file unless specifically instructed to do so. For more information, see Appendix C, DOLPHIN.INI File.*

Your **DOLPHIN.INI** file opens in Notepad so you have access to all Dolphin Imaging program configuration settings.

5 In Notepad, select **Find...** from the Edit menu.

6 Enter **[Defaults]** in the Find what field, and click **Find Next**.

7 If a **Recycle** line doesn't already exist in the **[Defaults]** section, add the line shown below.

Or,

If a **Recycle** line already exists in the **[Defaults]** section, modify it so that it matches the line below.

Recycle=1

If you want to disable the recycle bin feature, enter **Recycle=0** instead.

8 Select **Save** from the File menu.

9 Close the Notepad window.

10 Restart Dolphin Imaging so that the configuration change takes effect.

To retrieve a deleted timepoint or image from the recycle bin:

1 Move the file for the patient, timepoint, or image from your computer's recycle bin to your **C:\Dolphin\Working** directory.

2 Enter the patient's demographic data using the patient ID that was originally assigned to the patient.

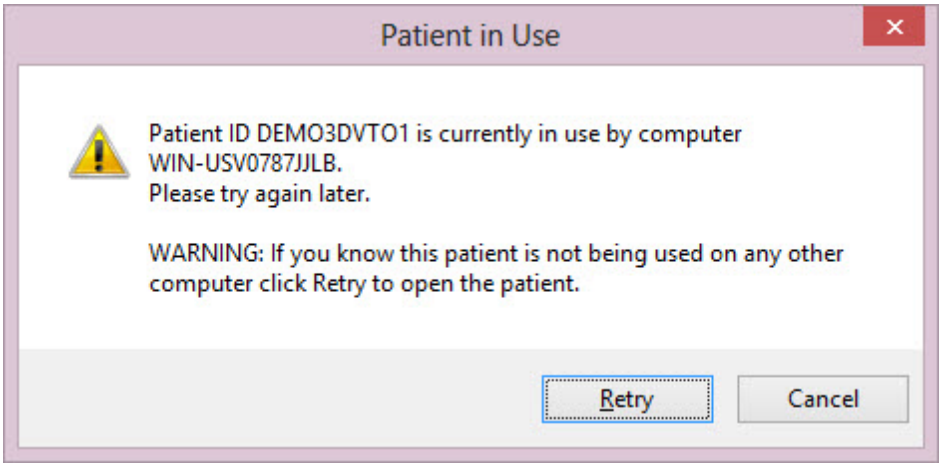
Patient demographic data is stored in an SQL database, which does not provide a “recycle bin” feature. You must manually enter this information again using the Patient Information dialog box. In addition, you must use the patient's original patient ID, so that the rebuild process can match the deleted timepoints and/or images to the correct patient record.

3 Rebuild your patient list.

For information on rebuilding your patient list, refer to the Dolphin Management User Guide or Dolphin Management online help (**Dolphin Management User Guide.PDF** or **DM_Help.chm** in your **C:\Dolphin** folder).

Unlocking Locked Patient Records

Sometimes when a workstation goes down unexpectedly, the patient database record that was open on that workstation remains locked. If this happens, a message similar to the following appears the next time someone tries to access that record. This message provides the patient ID of the locked patient record and the ID of the workstation that has it locked.

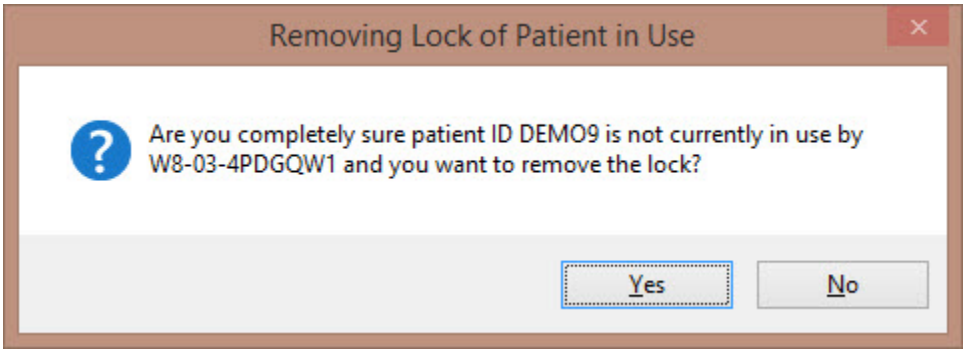


To unlock the patient record:

1 Verify that no one is currently using this patient record.

2 Click **Retry**.

The following confirmation message appears:



3 If you're sure that the patient record is not currently in use, click **Yes** to unlock it and open the patient record.

Part III: Dolphin 2D

This part of the *Dolphin Imaging User's Guide* provides detailed information on using Dolphin Imaging to capture 2D images, digitize analyses on them, and use them in treatment simulations.

Note: *The features offered by Dolphin Imaging are meant to assist dental clinicians and trained assisting staff in treatment planning. The results of this process should not be used as the primary source of patient evaluation and should be verified by other independent methods.*

- Chapter 5, Capture describes capturing patient photos, x-rays, study models, and video files into the Dolphin Imaging patient record; correcting captured images (for example, to straighten them or fix red eyes), and setting up image capture sequences.
- Chapter 6, Image Edit describes how to modify any image using cut and paste, touch-up brushes, image morphing, and the Image Library.
- Chapter 7, Digitize (Medical Device) describes digitizing landmarks on the patient's x-ray and study models using standard and customized analyses, automatically tracing skeletal cephalometric structures, and adding custom structures to a patient's tracing.
- Chapter 8, Measurements (Medical Device) describes viewing, printing, and exporting tables of the patient's cephalometric measurements.
- Chapter 9, Superimposition (Medical Device) describes overlaying the patient's tracing over the profile photo for treatment simulation purposes, superimposing two or more tracings for comparison, and superimposing two or more patient images for comparison.
- Chapter 10, CO/CR Conversion describes repositioning a patient's condyle from centric occlusion (CO) to centric relation (CR).
- Chapter 11, Growth (Medical Device) describes forecasting growth using the patient's lateral photo and cephalometric tracings.
- Chapter 12, Treatment Simulation (Medical Device) describes how to use Dolphin Imaging's scientifically-based orthodontic and surgical treatment simulation and prediction tool to simulate treatment results on the patient's lateral cephalometric tracings and soft tissue image.
- Chapter 13, McLaughlin Dental VTO Analysis (Medical Device) describes a comprehensive system for a clinician to analyze and experiment with positions and treatment options dentally.
- Chapter 14, Ricketts VTO/Roth-Williams AEO VTO (Medical Device) describes simulating the combination of changes taking place with growth and the outcome of the orthodontic treatment, thus enabling the clinician to quickly predict, plan, and visualize the sequence of treatment to be performed.
- Chapter 15, ImPlanner (Medical Device) describes how to use the Dolphin Imaging ImPlanner (Medical Device)^{TM} module, which is a powerful and easy-to-use tool for planning implant procedures. ImPlanner (Medical Device) can assist you in case evaluation, creation of individualized treatment plans, patient education, and creation of precise documentation.

- Chapter 16, Sharing and Presenting Patient Images describes emailing images to patients or other doctors, printing patient images, creating movies that morph between two images of a patient (for example, before and after treatment images), creating slide show presentations, and using patient images in other applications (such as Microsoft Word or PowerPoint).
- Chapter 17, Layout Editor describes creating custom image layouts for viewing or printing patient images.
- Chapter 18, Custom Analysis Editor (Medical Device) describes how to create your own custom analyses.

5 Capture

This chapter describes the dialog boxes that you use to capture patient images and movies into Dolphin Imaging.

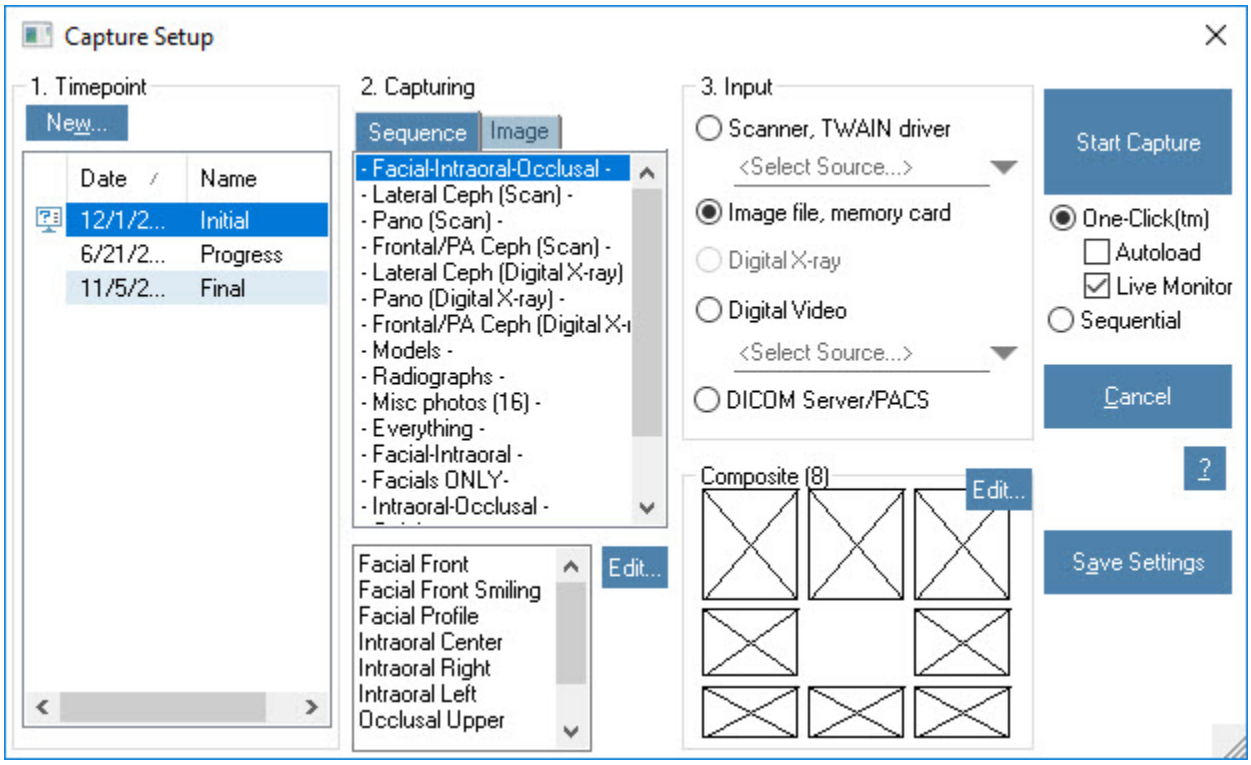
Before you begin capturing images or movies, you need to select a patient using the Patient Lookup dialog box. Then, you access the Capture Setup dialog box by clicking

on the Dolphin Imaging main screen's vertical tool bar.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can only capture patient images if your Dolphin Imaging user account has the Capture Images privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Note: *Although Dolphin Imaging provides powerful features to enhance photos and x-ray images, there is no substitute for high-quality original images. Consult your Dolphin support technician for tips on taking high-quality images with your digital camera. Consult your x-ray vendor for tips on taking high-quality x-rays.*

The following figure illustrates the Capture Setup dialog box:



Timepoint	Select an existing timepoint or add a new timepoint. Click a column heading to resort the listed timepoints using that heading. **New...:** Adds a new timepoint. For more information, see “Timepoints” on page 4-17. **Date:** Date that the currently selected timepoint was created. **Name:** Name of the timepoint.
Capturing	Sequence of images, individual images, or movies that you can capture. **Sequence Tab:** Available capture sequences. **Image Tab:** Individual images or movies that you can capture. When the **Sequence** tab is selected, this group box contains the following additional elements: **List:** Images in the currently selected sequence. **Edit...:** Opens the Sequence Editor. For more information, see “Editing Capture Sequences” on page 5-40.

Input	Source from which to capture images or video. **Scanner, TWAIN driver:** Captures images using a TWAIN device, such as a scanner. This option is typically used when scanning x-rays. Refer to the Dolphin Imaging web site (www.dolphinimaging.com) for recommended scanners. **Image file, memory card:** Captures image or video files from a memory card. With this option, you can capture images in the following formats: .BMP, .JP2, .JPG, .JNG, .JPEG (or any of the JPEG extensions), PCX, PNG, PSD, TGA, .TIFF and raw image formats. **Digital X-ray:** Captures images using a digital x-ray package. Available if you have purchased a digital x-ray package. For more information, see Appendix D, Digital Radiographic System Integration. **Digital Video:** Captures still images from a digital video source. Only available for systems equipped with video capturing devices. For more information, see “Capturing Still Images From a Digital Video Source” on page 5-33. **DICOM Server/PACS:** Captures images from a PACS server. Available only if you have purchased the optional PACS Support module and set up PACS communication. For more information, see “Capturing from a PACS Server” on page 5-38 and “Setting Up PACS Communications” on page 3-58.
Layout	Edit the image layout associated with the currently selected capture sequence. This group box appears only when the **Sequence** tab is selected in the Capturing group box. This group box is labeled with the name of the image layout associated with the currently selected capture sequence. It depicts the arrangement of images or video thumbnails in the image layout. **Edit...:** Opens the Dolphin Layout Editor. For more information, see Chapter 17, Layout Editor.
Start Capture	Starts image capture with the currently selected options.
One-Click	Displays all the images or videos in the selected capture sequence at once. For more information, see “Using One-Click Capture” on page 5-4. **Autoload:** Loads the first group of images from your memory card automatically into the One-Click Capture layout. This feature is useful if you consistently take only one picture for each image in the layout and take the images in order. Otherwise, you may not want to use this option. **Live Monitor:** Monitors the folder in which you store patient images and loads new images into One-Click capture as you take them. For more information, see “Capturing Images as You Take Them” on page 5-7.
Sequential	Displays the selected image or sequence of images one at a time. For more information, see “Using Sequential Capture” on page 5-30.
Save Settings	Saves the following settings for the currently selected capture sequence: • The settings in the Input group box • The **One-Click** or **Sequential** radio button selection • The state (checked or unchecked) of the **Autoload** and **Live Monitor** boxes For example, you can preset your facial images to be captured from a memory card using One-Click capture and your x-rays to be captured from a scanner using Sequential capture.

Using One-Click Capture

Using the One-Click feature, you can download an entire capture sequence at the same time. Then, for example, you can crop, resize, reorder, and capture all images in a sequence before capturing them. The following procedures describe how to:

- Capture images from a memory card, TWAIN device (such as a scanner), or DICOM Server/PACS
- Capture video files
- Capture images from a non-standard folder on your computer
- Drag and drop images into One-Click capture from Windows Explorer or Outlook

Capturing Images from a Memory Card

To capture images on a memory card using the One-Click feature:

1 Select an existing timepoint from the **Timepoint** list.

Or,

Click **New...** in the Timepoint group box to create a new timepoint. In the resulting dialog box, enter a descriptive name for this timepoint and click **OK**.

2 Select the **Sequence** tab in the Capturing group box. Then, select the capture sequence to capture from the list of capture sequences.

3 Select the source from which to capture the images in the Input group box.

You can capture images in the following formats: .BMP, .JP2, .JPG, .JNG, .JPEG (or any of the JPEG extensions), .PCX, .PNG, .PSD, .TGA, and .TIFF.

4 Make sure the **One-Click** option is selected. Then, click **Start Capture**.

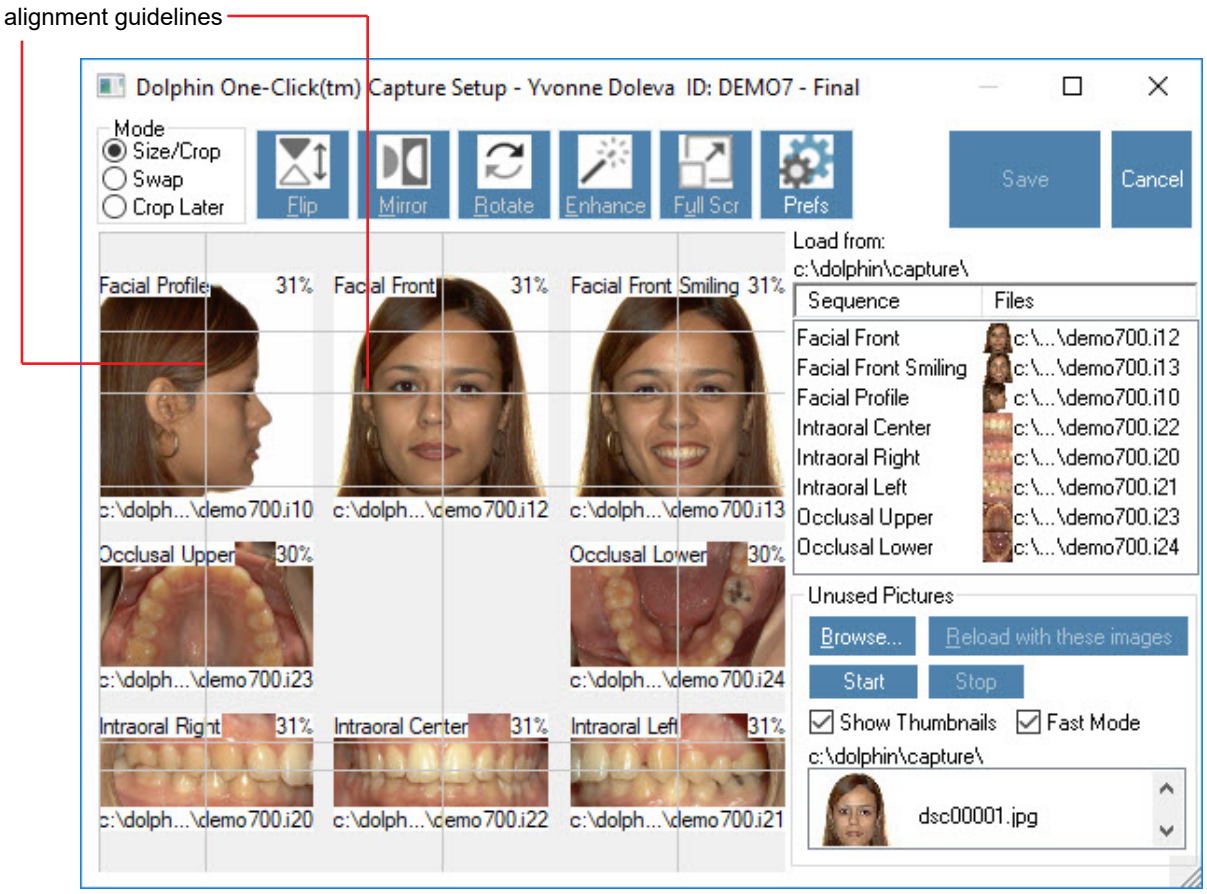
The One-Click Capture Setup dialog box displays all the images in the sequence. Any previously-captured patient images are loaded automatically into the One-Click Capture image layout. This allows you to replace or re-crop previously-captured images selectively.

5 Make any adjustments to the images and click **Save**.

A progress dialog box appears to show the progress of the operation.

When you click **Save**, the images are cropped and saved as they appear in the One-Click Capture Setup dialog box, unless you have selected **Crop Later** in the Mode group box. If you selected **Crop Later**, the images are simply saved--they are not cropped. You can return to the One-Click Capture dialog box at any time to crop the images. To do this, follow the One-Click steps listed above. When the One-Click Capture Setup dialog box opens, it will show your previously captured images. From there, you can crop, replace, enhance, and/or rotate these previously captured images.

When you click **Save**, the Dolphin Imaging program remembers whether the One-Click Capture Setup dialog box is maximized. In addition, if you moved the alignment guidelines, the Dolphin Imaging program remembers their location for this capture sequence. For more information on the alignment guidelines, see “Using the Alignment Guidelines” on page 5-13.



Mode	One of the following modes: **Size/Crop:** Resize or crop the images in this capture sequence. **Swap:** Swap the positions of two images in the image layout. Used to correct the image layout if the images in this sequence were taken out of order. **Crop Later:** Save the images in this capture sequence without resizing or cropping them. You can return to this dialog box at any time to resize or crop the images.
	Flips the selected image vertically (up to down).
	Flips the selected image to its mirror image (left to right).
	Opens the Image Rotation dialog box, where you can specify how much to rotate the image.
	Enhances the image.

	Expands the selected image temporarily to fill the entire screen. This is useful for checking the fine details of an image. To return to the One-Click Capture dialog box, click the image or press any key.
	Sets One-Click Capture preferences.
Layout Preview	Shows a preview of the image layout that will be created when these images are captured. The layout preview includes yellow (unlocked) or gray (locked) alignment guidelines. You can use the guidelines to line up the images. For more information on the alignment guidelines (including how to lock and unlock them), see “Using the Alignment Guidelines” on page 5-13.
Save	Crops the images in this sequence as they are displayed in the dialog box and saves them. When you click **Save**, if you have maximized the dialog box or moved the alignment guidelines, these settings are also saved.
Sequence & Files	Lists the image names, file names, and thumbnails for all images in this sequence. If the folder and file names are too long to fit in the **Files** column, ellipses are used to make the file names fit. Drag the column divider between **Sequence** and **File** to change the space allocation between the columns.
Unused Pictures	Lists patient images not currently loaded into the image layout. **Browse...:** Navigates to another folder. For more information, see “Capturing Image Files in Another Folder” on page 5-11. **Reload with these images:** Loads the listed images into the image layout. **Start:** Start monitoring your image capture folder for new images. For more information, see “Capturing Images as You Take Them” below. **Stop:** Stop monitoring your image capture folder for new images. For more information, see “Capturing Images as You Take Them” below. **Show Thumbnails:** Shows thumbnails of all the images on your memory card or folder. If you have many image files on the memory card or the image files are very high resolution, displaying the thumbnails may take some time. **Unused Pictures List:** Lists file names for any image or movie files in the current image folder that are not used in the image layout. • **Show Thumbnails:** Displays thumbnails of the unused images or movies. • **Fast Mode:** Assumes that all your image and movie files have the correct file extension for their image or video type. Otherwise, Dolphin Imaging checks the content of each file in your image capture folder to determine whether it’s an image or video file.

If you right-click an image in the image layout, a context menu appears with the following options:

Revert to Original	Discard any changes that you have made to the image.
Quick Rotate 90° (CW)	Rotate the image 90° clockwise.
Quick Rotate 90° (CCW)	Rotate the image 90° counter-clockwise.
Size/Crop	Resize or crop the images in this capture sequence.
Swap	Swap the positions of two images in the image layout. Used to correct the image layout if the images in this sequence were taken out of order.
Crop Later	Save the images in this capture sequence without resizing or cropping them. You can return to this dialog box at any time to resize or crop the images.
Flip	Flip the selected image vertically (up to down).
Mirror	Flip the selected image to its mirror image (left to right).
Rotate	Open the Image Rotation dialog box, where you can specify how much to rotate the image.
Enhance	Enhance the image.
Full Scr	Expand the selected image temporarily to fill the entire screen. This is useful for checking the fine details of an image. To return to the One-Click Capture dialog box, click the image or press any key.
Paste	Paste an image from the clipboard into this slot in the image layout.
Clear	Remove the image from the image layout and place it in the Unused Pictures List.

Capturing Images as You Take Them

You can configure Dolphin Imaging to monitor a folder on your computer and immediately load image files into the One-Click Capture Setup dialog box as soon they appear. Then, for example, when you download images from your digital camera into the monitored folder, Dolphin Imaging loads them into One-Click Capture immediately. In this way, you can capture images in real-time from devices like Wi-Fi camera cards.

Note: *This feature is designed for use with still photos, not video. For information on capturing video, see "Capturing a Video File" on page 5-10.*

To set up a monitored folder and capture images from it:

1 On the Capture Setup dialog box, select a timepoint, capture sequence, and input source as described in "Capturing Images from a Memory Card" on page 5-4.

The folder monitoring feature is designed for use with still photos. You can capture images in the following formats: .BMP, .JP2, .JPG, .JNG, .JPEG (or any of the JPEG extensions), .PCX, .PNG, .PSD, .TGA, and .TIFF.

2 Make sure the **One-Click** option is selected.

3 Check the **Live Monitor** box to enable the folder monitoring feature.

4 Optionally, click **Save Settings** to save the options you selected on the Capture Setup dialog box for the selected capture sequence.

If you save your settings, each time you capture images for this capture sequence, Dolphin Imaging will monitor your image capture folder for new images.

5 Click **Start Capture**.

The One-Click Capture Setup dialog box displays all the images in your image capture folder, and any previously-captured patient images are loaded automatically into the One-Click Capture image layout.

You can change the image capture folder as described in “Capturing Image Files in Another Folder” on page 5-11. For example, if you are using a Wi-Fi camera card, you can choose the folder in which the images will be stored on the Wi-Fi camera card as you take them.

Note: *Once you start monitoring the image capture folder, you can’t change to a different folder until you stop monitoring.*

6 Click **Start** to start monitoring your image capture folder for new images.

7 Place images into your image capture folder in the correct order for the capture sequence.

For example, if you are capturing photos from a Wi-Fi camera card as you take them, take the pictures in the correct order for the capture sequence. The images in the capture sequence are listed in order in the **Load From** list box.

As you add images to your image capture folder, they appear automatically in the image layout and the file names appear in the **Load From** list box.

If you want to temporarily stop loading images from your image capture folder, you can click **Stop** to stop monitoring the folder. Then, you can restart the monitoring by clicking **Start**.

8 Make any adjustments to the images and click **Save**.

A progress dialog box appears to show the progress of the operation.

When you click **Save**, the images are cropped and saved as they appear in the One-Click Capture Setup dialog box, unless you have selected **Crop Later** in the Mode group box. For more information, see “Capturing Images from a Memory Card” on page 5-4.

Capturing Images from a TWAIN Device

To capture images from a TWAIN device (scanner or digital camera) using the One-Click feature:

1 Select an existing timepoint from the **Timepoint** list.

Or,

Click **New...** in the Timepoint group box to create a new timepoint. In the resulting dialog box, enter a descriptive name for this timepoint and click **OK**.

2 Select the **Sequence** tab in the Capturing group box. Then, select the capture sequence to capture from the list of capture sequences.

3 Select **Scanner, TWAIN Driver** as the source from which to capture the images in the Input group box.

4 Make sure the **One-Click** option is selected. Then, click **Start Capture**.

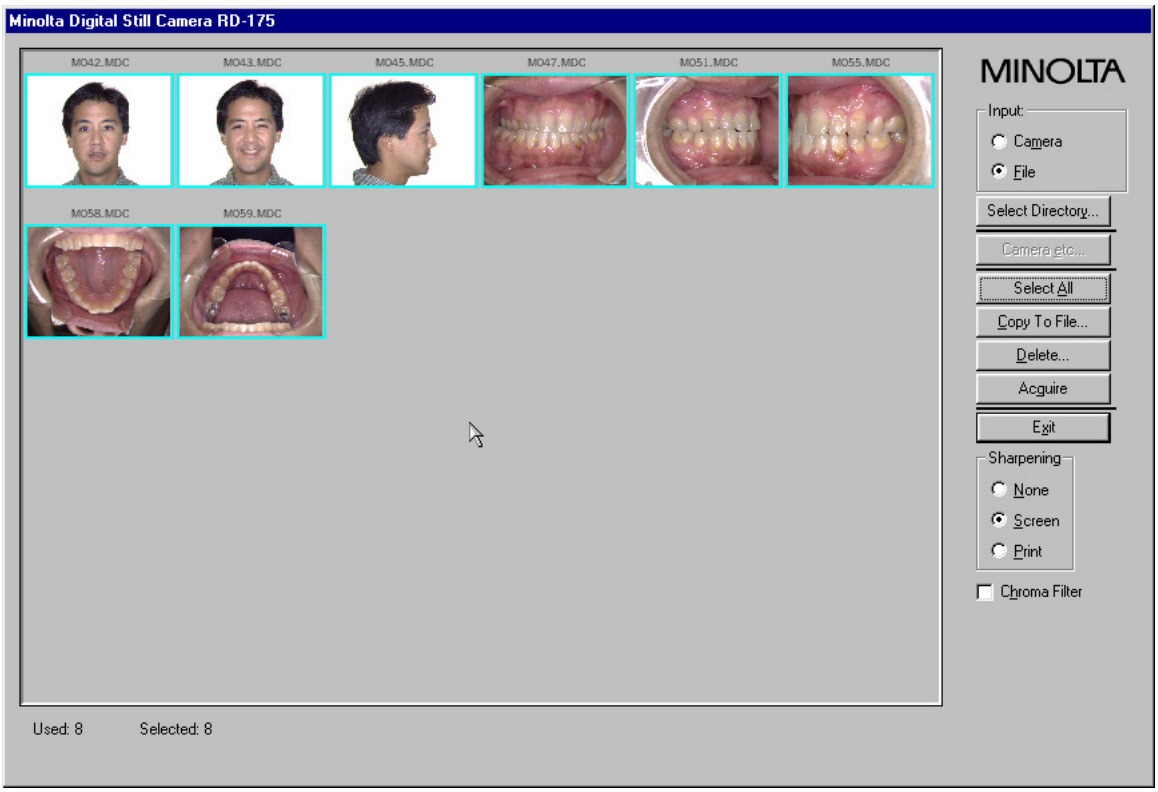
The following figures show examples of the One-Click capture working with different TWAIN drivers (specifically, the Minolta RD-175 digital camera and the Epson Expression Pro version 1.5). Functionality of TWAIN drivers varies. For information for your specific TWAIN driver, please contact Dolphin.

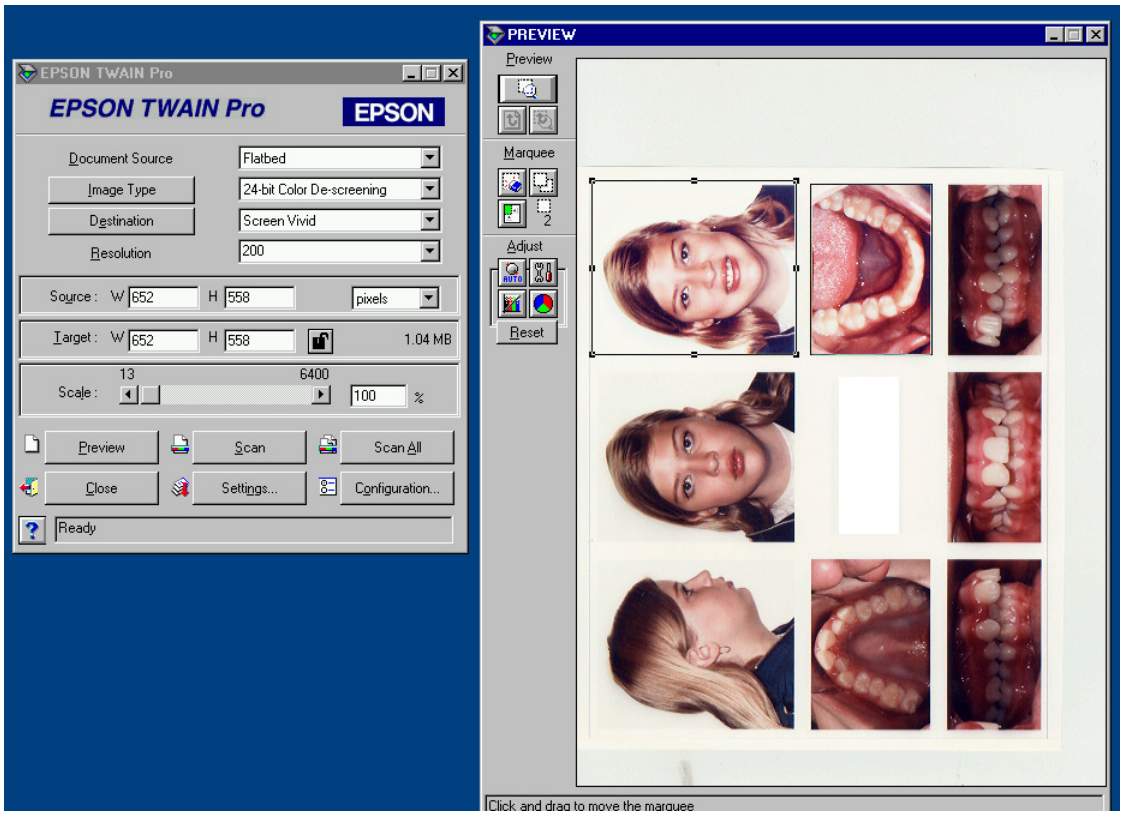
The procedure that you use to save the image depends on your TWAIN driver. For example, the Minolta TWAIN capture displays all the images taken by the digital camera. You can then select some or all the images displayed, and click **Acquire**.

After you have acquired the full sequence of TWAIN images, the One-Click Capture Setup dialog box displays all the images in the sequence.

5 Make any adjustments to the images, and save them.

If you have resized the One-Click Capture Setup dialog box, the Dolphin Imaging program remembers these settings when you save the images.





Capturing a Video File

You can capture the following types of video files: AVI, MP4, WMV, MOV, MPG,M4V, M2V, 3GP, and DivX.

To capture a video file:

1 Select an existing timepoint from the **Timepoint** list.

Or,

Click **New...** in the Timepoint group box to create a new timepoint. In the resulting dialog box, enter a descriptive name for this timepoint and click **OK**.

2 Select the **Sequence** tab in the Capturing group box. Then, select the capture sequence into which to capture the video file.

3 Select **Image file, memory card** as the source from which to capture in the Input group box.

4 Make sure the **One-Click** option is selected. Then, click **Start Capture**.

5 Click **Browse...**.

A dialog box opens where you can select a different folder from which to capture image files.

6 Select the folder containing the video file, and click **OK**.

The **Unused Pictures** list shows thumbnails and file names for the image files in this folder.

When you click **OK**, a dialog box appears asking whether you would like Dolphin to use the selected folder as its default image folder from now on.

7 Click **Yes** to use this folder as the Dolphin image folder. Otherwise, click **No**.

8 Click and drag the video file from the **Unused Pictures** list to the image layout.

The image layout shows the first frame of the video file as an image placeholder for the video in the layout. For information on playing a video file, see “Working With Videos” on page 3-31.

Capturing Image Files in Another Folder

To capture image files in another folder:

1 On the One-Click Capture Setup dialog box, click **Browse...**.

A dialog box opens where you can select a different folder from which to capture image files.

2 Select another folder, and click **OK**.

A dialog box appears asking whether you would like Dolphin to use the selected folder as its default image folder from now on.

3 Click **Yes** to use this folder as the Dolphin image folder. Otherwise, click **No**.

The **Unused Pictures** list shows file names for the image files in this folder. You can check the **Show Thumbnail** box to preview the images in this folder.

4 If the images are in the correct order for the capture sequence, select the first image in the sequence from the **Unused Pictures** list. Then, click **Reload With These Images** to load the selected image files into the image layout.

Or,

If the images are not in the correct order for the capture sequence, click and drag each image to the correct slot in the image layout.

Or,

If the images are not in the correct order for the capture sequence, select the first image from the sequence from the **Unused Pictures** list, and click **Reload With These Images**. Once the images are in the image layout, use the swap feature to move them into the correct image slots in the layout.

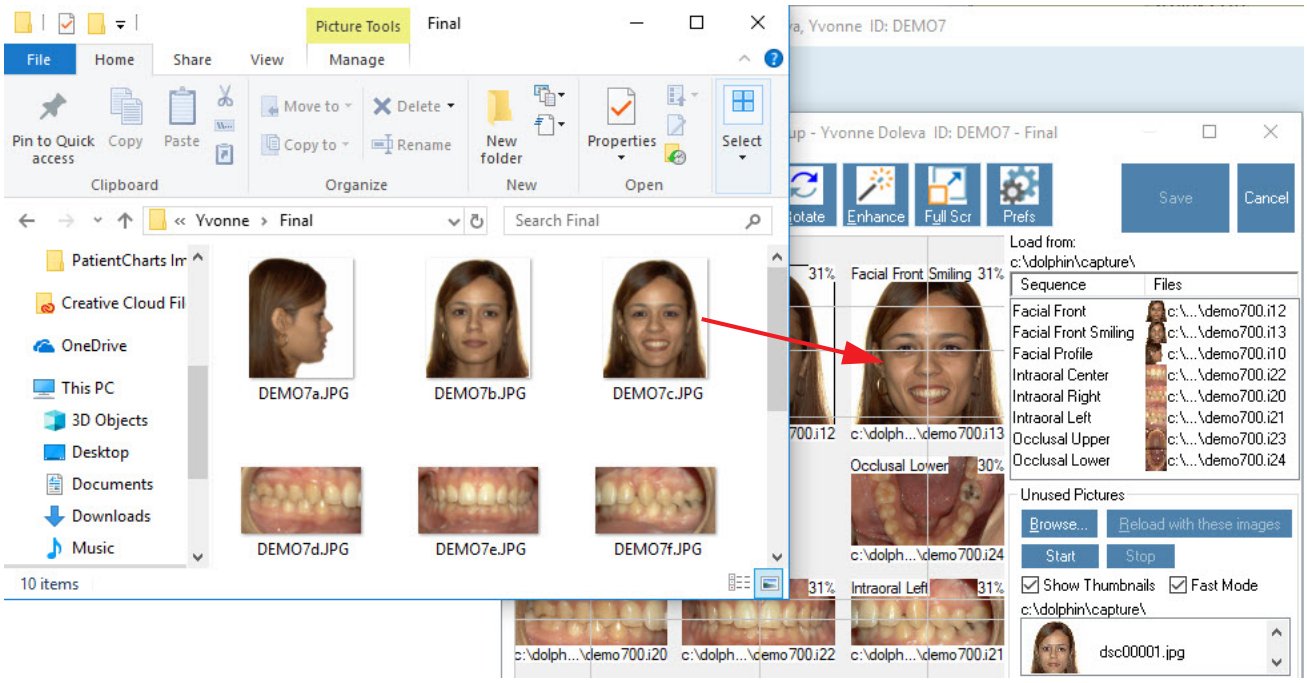
For more information on swapping images in an image layout, see “Swapping Images” on page 5-26.

Dragging and Dropping From the Windows Explorer

To drag and drop images from the Windows Explorer into the One-Click Capture Setup dialog box:

1 In the Microsoft Windows Explorer, click the image you want.

2 Drag and drop the image to an image slot in the image layout.



Dragging and Dropping Images From Outlook

To drag and drop images from Microsoft Outlook to One-Click capture:

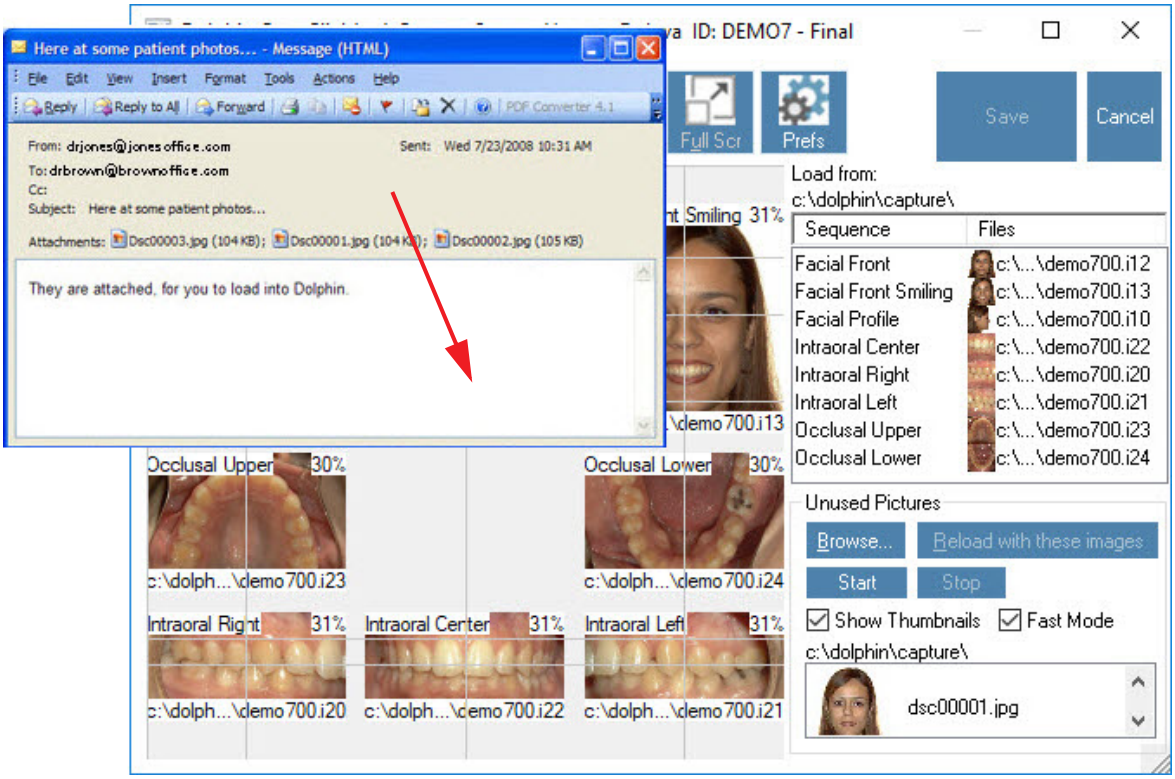
1 Start Microsoft Outlook and open the email message containing the images.

2 On the email message window, select one or more images that you want to drag and drop.

3 Drag and drop the images to image slots on the One-Click Capture Setup dialog box.

The images appear in the One-Click Capture Setup dialog box.

Note: *If an image contains tracings (such as a digitized x-ray image or a tracing superimposed over the patient's profile photo), both the image and the tracing appear.*



Correcting Images

The following procedures describe how to:

- Align images in the image layout
- Resize or crop images
- Maximize images
- Enhance images, including reducing red eye and correcting color

Using the Alignment Guidelines

To use the alignment guidelines:

1 On the One-Click Capture Setup dialog box, select **Size/Crop** from the Mode group box.

Or,

Right-click an Image, and select **Size/Crop** from the context menu.

2 If the alignment guidelines are gray, unlock the guidelines as described below.

Locking the guidelines prevents you from accidentally moving them when you move the images in the image layout. Locked guidelines are gray, and unlocked guidelines are yellow.

3 Select one of the yellow alignment guidelines (either the horizontal or vertical line) and drag it over the image layout.

For example, if you are working with the facial intra-oral occlusal images, you may want to drag one of the horizontal lines and place it at the patient's eyebrows on the facial images to align them in the image layout. You may want to drag another horizontal line over the bottom row of images to line up the point where the patient's teeth meet. Similarly, you may want to place the vertical lines over the columns of images on the right and left to center the images below each other.

If you need more guidelines, you can click and drag them from the edges of the image layout. For more horizontal guidelines, click and drag them from the top of the image layout. For more vertical guidelines, click and drag them from the left of the image layout. There is no limit to the number of guidelines you can have.

If you have more guidelines than you need, you can click and drag them back to the edges of the image layout. To get rid of horizontal guidelines, click and drag them to the top of the image layout. To get rid of vertical guidelines, click and drag them to the left of the image layout.

4 If any images are out of alignment in the layout, click and drag them to line them up with the alignment guidelines.

To lock or unlock the alignment guidelines:

1 Click

to open the One-Click Preferences dialog box.

2 Check the **Lock Guidelines** box to lock the guidelines.

Or,

Uncheck the **Lock Guidelines** box to unlock the guidelines.

3 Click **OK**.

Resizing or Cropping an Image

To resize or crop one of the images:

1 On the One-Click Capture Setup dialog box, select **Size/Crop** from the Mode group box. Then, select the image to resize or crop.

Or,

Right-click an Image, and select **Size/Crop** from the context menu.

A cropping rectangle appears around that image with eight sizing handles and four rotation handles around the edges. For information on using the rotation handles, see "Rotating Images" on page 5-24.

2 Click and drag the black sizing handles to resize the image.

Or,

Use your mouse wheel to resize the image.

If either the **Info on Layout** or **Info as Tooltips** boxes are checked on the One-Click Preferences dialog box (see “Setting One-Click Capture Preferences” on page 5-29), a zoom percentage indicates the expansion or shrinkage of the image as compared to the original, “fit-to-frame” size (100%).

Note: *To crop models, frame each model so that its base just fits into the crop box frame. On tall models, you may have open space on the sides of the image.*

To crop x-rays, crop squarely around the x-ray image.

Maximizing an Image

To maximize an image so that it takes up the entire screen:

1 On the One-Click Capture Setup dialog box, select the image to maximize. Then, click **Full Scr**.

Or,

Right-click the image to maximize, and select **Full Scr** from the context menu.

2 To return to the One-Click Capture dialog box, click the maximized image.

Or,

Press any key on the keyboard.

Enhancing an Image

Dolphin Imaging offers easy-to-use features for improving your patient images.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can only save your enhancements to patient images if your Dolphin Imaging user account has the Edit/Morph Images privilege granted in Employee Rights. Without this privilege, you can enhance the image temporarily for viewing purposes, but you cannot save it. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Even if you have permission to save image enhancements, you can only save if an appropriate license is available for doing so. Generally speaking, the license that you need depends on the Dolphin Imaging module you are using.

*For example, enhancing Images on the Dolphin Imaging main screen is controlled by the ImagingPlus license. Suppose your practice has purchased two ImagingPlus licenses and one license for Treatment Simulation. You open the Enhance Image dialog box by right-clicking an image on the Dolphin Imaging main screen, and selecting **Enhance** from the context menu. If two other people are currently using the practice's ImagingPlus licenses, you will be unable to save your enhanced image. However, if no one is currently using the practice's Treatment Simulation license, you can open the Enhance Image dialog box from the Treatment Simulation module, enhance the image, and save it from there.*

To open the Enhance Image dialog box:

1 On the One-Click Capture dialog box, select the image to enhance. Then, click

.

Or,

On the Dolphin Imaging main screen, right-click the image to enhance, and select **Enhance** from the context menu.

Or,

On the Sequential Capture Cropping dialog box (see “Using Sequential Capture” on page 5-30), click

.

Or,

On the Digitize palette (see “Digitize Landmarks” on page 7-6), click .

Or,

On the **Edit** tool bar (see “Using the Edit Tool Bar” on page 6-3), click .

Or,

On the **Treatment Simulation** tool bar (see “Using the Treatment Simulation Tool Bar” on page 12-6), click .

The Enhance Image dialog box opens.

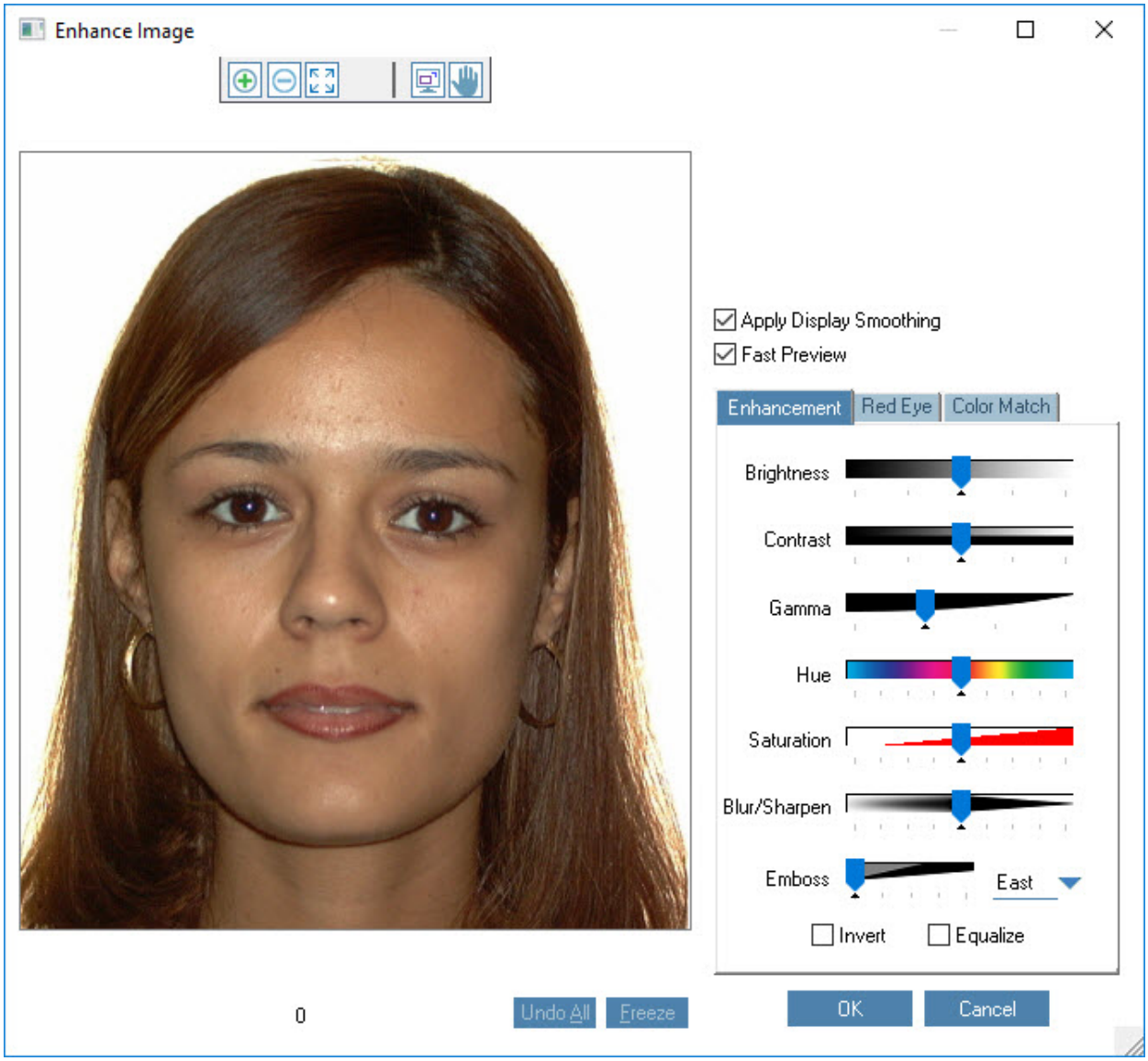


Image	Image you are currently enhancing.
Apply Display Smoothing	Smooths out the image for display on a computer monitor.
Fast Preview	Opens a small preview window, which reflects image enhancements more quickly.
Undo All	Undoes all the enhancement settings.
Freeze	Keeps all the enhancements that you have made so far when adding another enhancement.
Enhancement tab	Offers the following image enhancement options: **Brightness:** Adjusts the overall brightness of the image. **Contrast:** Adjusts the light/dark contrast of the image. **Gamma:** Adjusts the contrast and brightness of the image's midtones. **Hue:** Adjusts the color of the image. **Saturation:** Adjusts the color saturation of the image. **Blur/Sharpen:** Adjusts the blurriness/sharpness of the image. **Emboss:** Creates an embossed effect. **Invert:** Inverts the image colors (change an image negative to a positive or vice-versa). **Equalize:** Equalizes the image colors. For more information, see “Enhancement Tab” on page 5-19.
Red Eye tab	Offers the following options for correcting red eyes in the image: **Do Redeye Reduction:** Places two circles appear on the patient’s image, which you can place to mask the red eye effect in the patient’s image. **AutoZoom:** Zooms in on the circles on patient’s image so that you can accurately place them over the red pupils. **Threshold:** Adjusts the sensitivity of the red eye detection. **Darkness:** Adjusts the darkness of the circles used to mask the red eye effect in the patient’s image. For more information, see “Red Eye Tab” on page 5-20.
Color Match	Offers the following options for matching the color of the current image to another of the patient’s images: **Select Image:** Lists all the images available for the current patient grouped by timepoint. **Match the Color:** Matches the color of the current image to the image selected in the **Select Image** list. For more information, see “Color Match Tab” on page 5-22.

Enhancement Tab

On this tab, you can correct the color, brightness, contrast, and sharpness of an image. In addition, you can apply an embossed effect to highlight certain features in the image.

To enhance the patient's image:

1 Select the **Enhancement** tab if it isn't already selected.

2 To enhance only part of the image, draw a boundary around that area of the image.

To draw a boundary:

a Click the point where you want to begin drawing the boundary

b Move the mouse to begin drawing the boundary.

c Click whenever you want to place a point and change the direction of the line.

If you make a mistake, right-click to undo the line to the last point you placed.

d To complete the boundary, click the first point again to close the boundary.

Alternatively, you can click and drag the mouse to draw the boundary without placing points. Using this method, you may be able create a smoother boundary. However, you may find it more difficult to draw the boundary. In addition, undoing is more cumbersome, since this method effectively creates many points and lines in the boundary.

3 Use the sliders, check boxes, and other controls to set enhancement options.

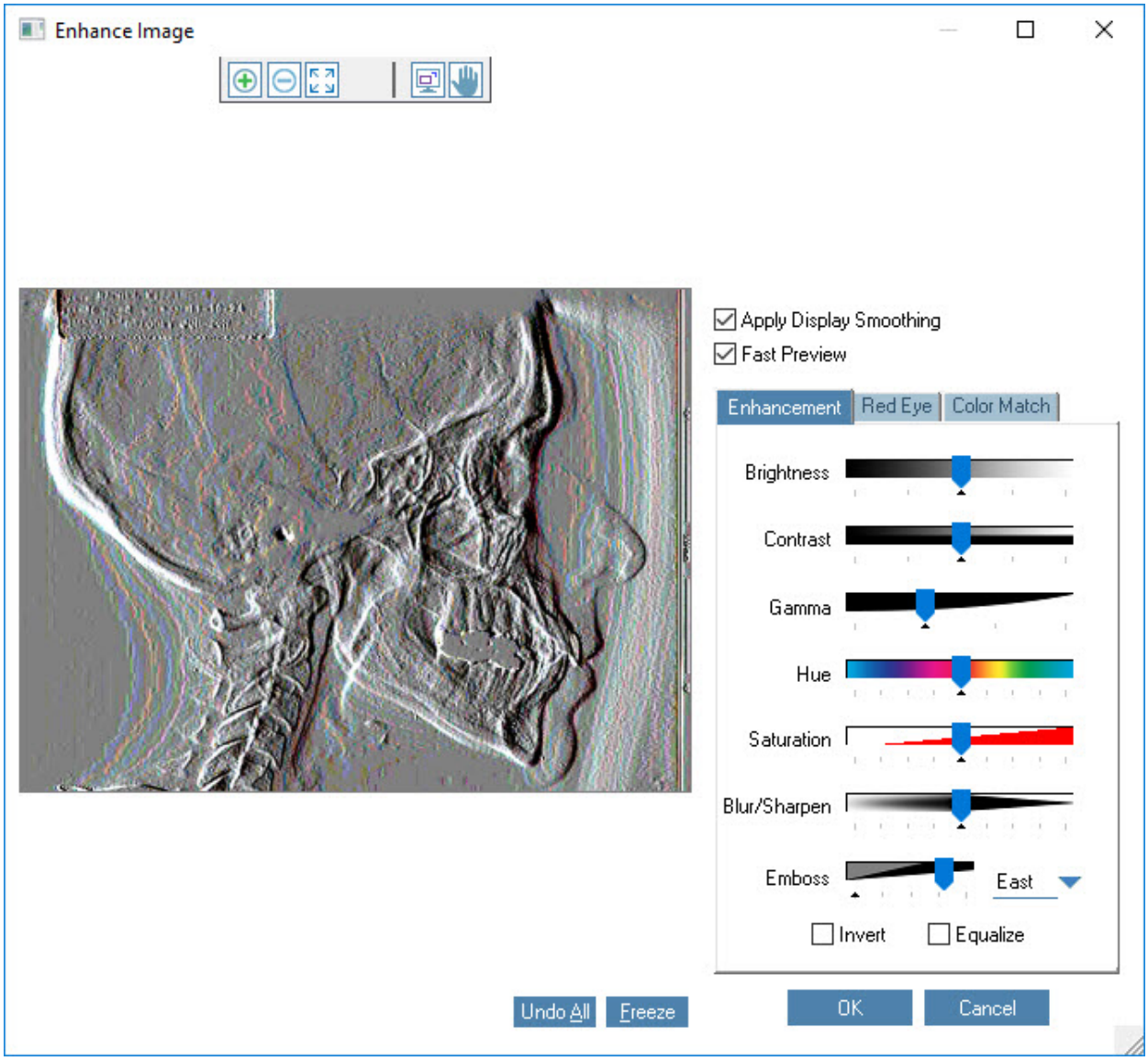
Check the **Fast Preview** box to open a small preview window while you are moving the sliders that shows a preview of the enhancement. When you finish moving the slider, the preview window closes, and the image in the Enhance Image dialog box changes to reflect the options you chose.

If you are not using the **Fast Preview** option, the image in the Enhance Image dialog box changes as you move the sliders.

4 When you are happy with the way the image appears, click **OK** to save it.

Note: *Depending on your permissions, you may be able to enhance the image temporarily for viewing purposes, but you may not be permitted to save it. For more information, see "Enhancing an Image" on page 5-16.*

For the **Emboss** enhancement option, you can pick the direction of the light source used for the embossing effect.



Red Eye Tab

If the patient's image came out with red eyes, you can use this tab to reduce the red in the patient's eyes.

To reduce red eye:

1 On the Enhance Image dialog box, select the **Red Eye** tab.

2 Check the **Do Redeye Reduction** box.

Two circles appear on the patient's image.

3 Optionally, click **AutoZoom** to zoom in on the patient's image.

4 Click and drag the center of the two circles to the patient's eyes.

When clicking and dragging the center of a circle, the cursor changes to a hand icon. When you place one of the circles over one of the patient's eyes, Dolphin Imaging detects the color red within the circle and darkens it.

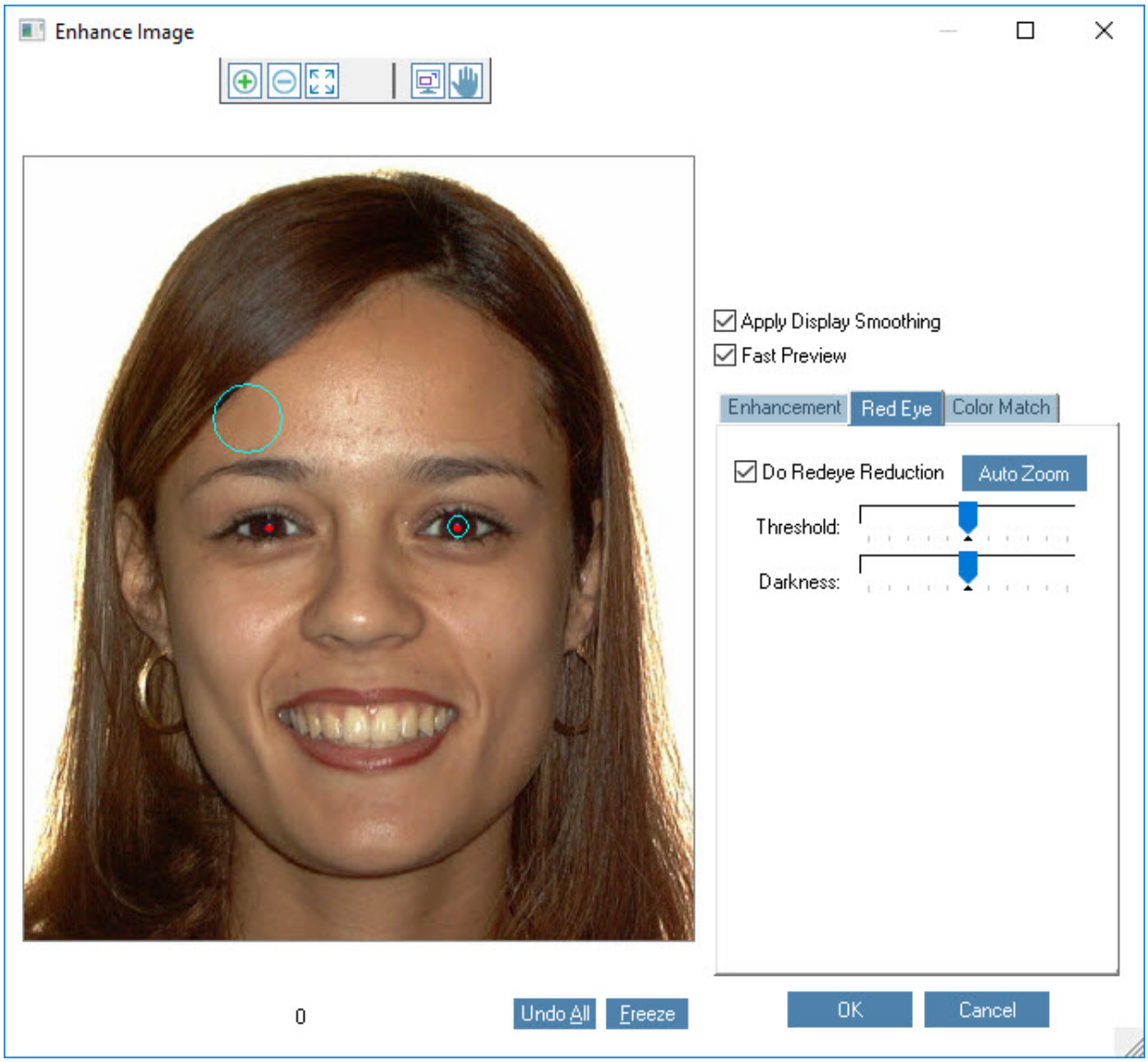
5 If necessary, click and drag the edges of the circles to resize them so that the correction is applied only to the red dots in the patient's eyes.

When clicking and dragging the edge of a circle, the cursor changes to a double-headed arrow.

6 Adjust the **Threshold** and **Darkness** sliders to achieve the best appearance.

7 When you are happy with the way the image appears, click **OK** to save it.

Note: *Depending on your permissions, you may be able to enhance the image temporarily for viewing purposes, but you may not be permitted to save it. For more information, see "Enhancing an Image" on page 5-16.*



Color Match Tab

On this tab, you can match the color of the current image to the color of another one of the patient's images. For example, if you have done color correction on one of the patient's images, you can use the color matching feature to quickly apply the correct colors to the patient's other images. In addition, you can automatically adjust images from one timepoint to match the color of images taken with a different camera or in different lighting conditions.

To perform color matching:

1 On the Enhance Image dialog box, select the **Color Match** tab.

2 Select the image that has the correct color settings from the **Select Image** list.

3 Click **Match the Color**.

The color of the image in the left pane changes to match the color of the image selected in the **Select Image** list.

4 When you are happy with the way the image appears, click **OK** to save it.

Note: *Depending on your permissions, you may be able to enhance the image temporarily for viewing purposes, but you may not be permitted to save it. For more information, see* *"Enhancing an Image" on page 5-16.*

Flipping Images

To flip an image horizontally to its mirror image (right to left):

1 On the One-Click Capture Setup dialog box, select the image to flip. Then, click

.

Or,

Right-click the image to flip, and select **Mirror** from the context menu.

Or,

On the Sequential Capture Cropping dialog box (see “Using Sequential Capture” on page 5-30), click

.

To flip an image vertically (top to bottom):

1 On the One-Click Capture Setup dialog box, select the image to flip. Then, click

.

Or,

Right-click the image to flip, and select **Flip** from the context menu.

Or,

On the Sequential Capture Cropping dialog box (see “Using Sequential Capture” on page 5-30), click

.

Rotating Images

To rotate an image 90 degrees using Quick Rotate:

1 On the One-Click Capture Setup dialog box, right-click the image to rotate.

2 Select one of the **Quick Rotate** options from the context menu.

You can quickly rotate the image 90 degrees clockwise or counter-clockwise.

To rotate an image using the rotation handles:

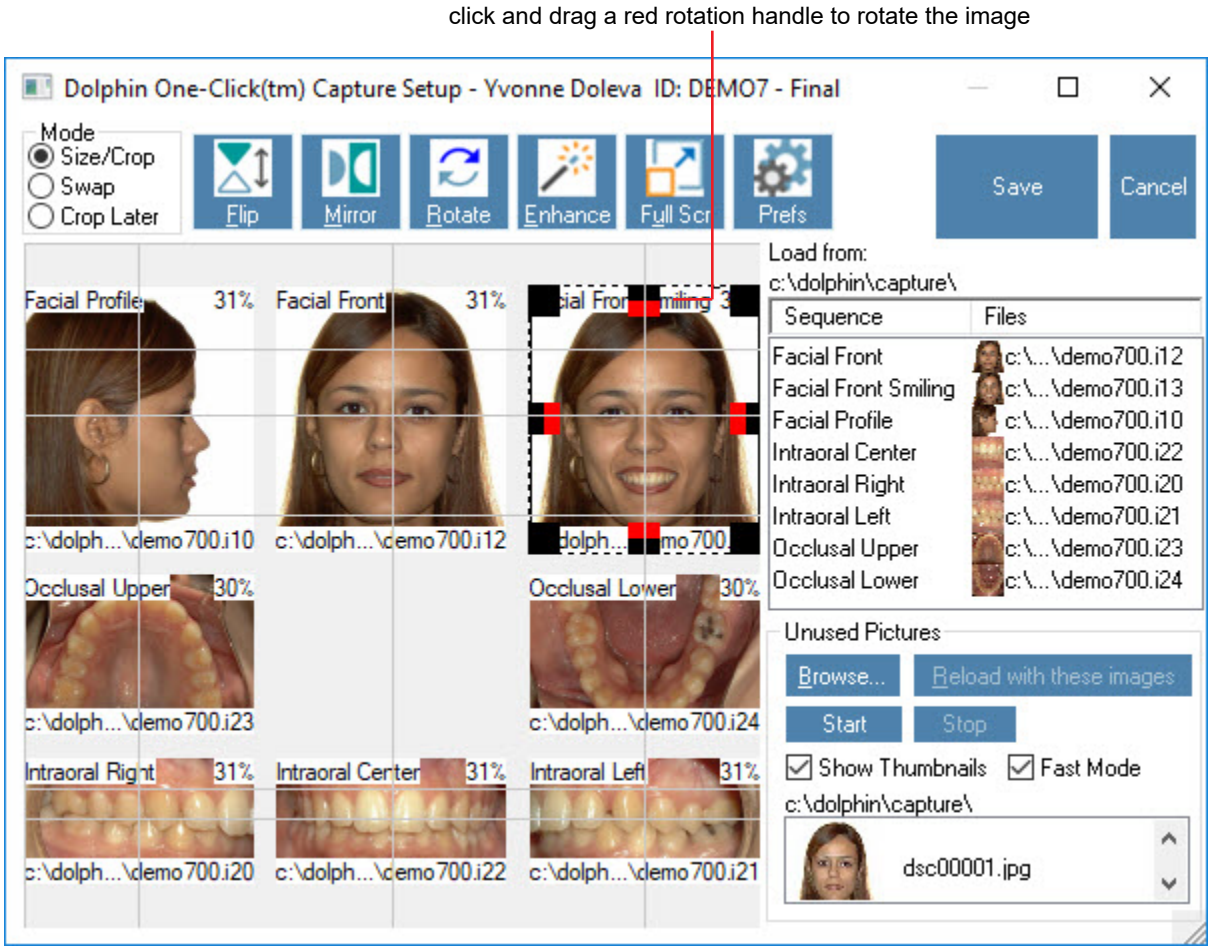
1 On the One-Click Capture Setup dialog box, select the image to rotate.

A cropping rectangle appears around that image with eight sizing handles and four rotation handles around the edges. For information on using the sizing handles, see “Resizing or Cropping an Image” on page 5-14.

2 Click and drag one of the red rotation handles to rotate the image.

The color that fills the empty corners resulting from rotating the image is set in the Rotate Image dialog box.

Note: *For best results, keep the mouse down, rotate the image back and forth until you see the desired result, then release the mouse button. If you rotate the image using several, separate rotation operations, the image quality can degrade, especially on lower resolution images.*



To rotate an image a specific number of degrees using the Rotate Image dialog box:

1 If you are using the One-Click Capture Setup dialog box, select the image to rotate.

2 Click

.

The Rotate Image dialog box is displayed.

Note: *On the One-Click Capture dialog box, you can also rotate images using the rotation handles as described above.*

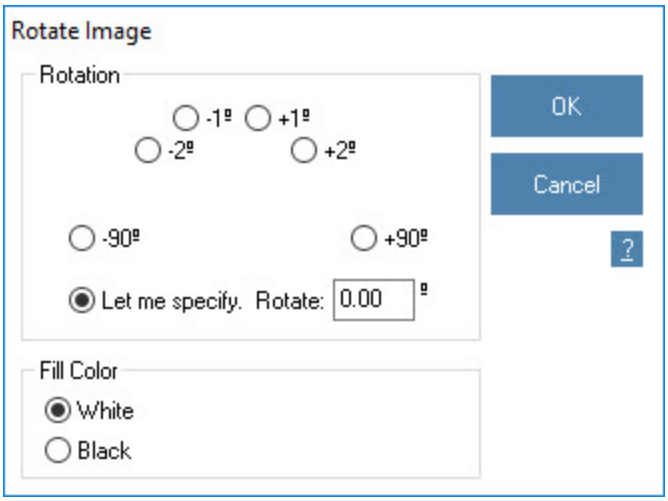
3 Pick a rotation amount and click **OK**.

Or,

Click **Let Me Specify**, and enter the number of degrees to rotate the image.

4 Select the color with which to fill the empty corners resulting from rotating the image from the Fill Color group box.

The One-Click Capture Setup dialog box or the Cropping dialog box is displayed with the image rotated.



Number of degrees radio buttons	Rotates the image the indicated number of degrees. These buttons are useful for images that are just slightly slanted or were photographed side-ways.
Let me specify. Rotate:	Rotates the image by the number of degrees you specify.
Fill Color	Color to use to fill the empty corners resulting from rotating the image.

Adding, Removing, and Reordering Images

The following procedures describe how to:

- Swap images in an image layout
- Load a different set of images into One-Click capture
- Copy and paste images into One-Click capture
- Remove images from the capture sequence

Swapping Images

To swap images:

1 Select one of the images to swap.

You can select an Image to swap from the image layout preview, from the **Sequence and Files** list, or from the **Unused Pictures** list. In addition, you can drag and drop an image into the image layout from any Microsoft Windows program that supports drag-and-drop.

2 Drag that image on top of the image with which to swap it.

You can drag an Image to the image layout preview, the **Sequence and Files** list, or the **Unused Pictures** list.

Loading Another Set of Images

To load another set of images into the image layout:

1 Select the image in the **Sequence and Files** list from which to reload this capture sequence.

For example, if only the last three images in the sequence are incorrect, select the third image from the end of the sequence.

2 Select an Image in the **Unused Pictures** list.

Or,

Use the **Browse...** button to select an Image.

3 If the images are in the correct order for the capture sequence, select the first image in the sequence from the **Unused Pictures** list. Then, click **Reload With These Images** to load the selected image files into the image layout.

Or,

If the images are not in the correct order for the capture sequence, click and drag each image to the correct slot in the image layout.

Or,

If the images are not in the correct order for the capture sequence, select the first image from the sequence from the **Unused Pictures** list, and click **Reload With These Images**. Once the images are in the image layout, use the swap feature to move them into the correct image slots in the layout.

For more information on swapping images in an image layout, see “Swapping Images” on page 5-26.

Copying and Pasting Images

To copy and paste images into the image layout:

1 Copy a patient image to the clipboard.

For example, you can open an image from the Dolphin Imaging main screen or the Microsoft Windows Explorer, right-click it, and select **Copy** from the context menu to copy the image to the clipboard.

2 Open the One-Click Capture window.

3 Right-click the slot in the image layout to which to copy this image. Then, select **Paste** from the context menu.

Or,

Click the slot in the image layout to which to copy this image. Then, press CTRL+V or SHIFT+INS on your keyboard to paste the image.

Removing an Image From the Sequence

To remove an image from the sequence:

1 Drag and drop the image to remove from the image layout or the **Sequence and Files** list to the blank area at the bottom of the **Unused Pictures** list.

Or,

Right-click the image to remove from the image layout, and select **Clear** from the context menu.

Modifying Previously Saved Images

You can return to the One-Click Capture dialog box at any time to modify previously saved images for a patient.

To modify previously saved images:

1 On the Capture Setup dialog box, select the timepoint containing the images you want to modify from the **Timepoint** list.

2 Select the **Sequence** tab in the Capturing group box. Then, select the capture sequence containing the images you want to modify from the list of capture sequences.

3 To replace one or more existing image with newly-captured images, select the source from which to capture the new images in the Input group box.

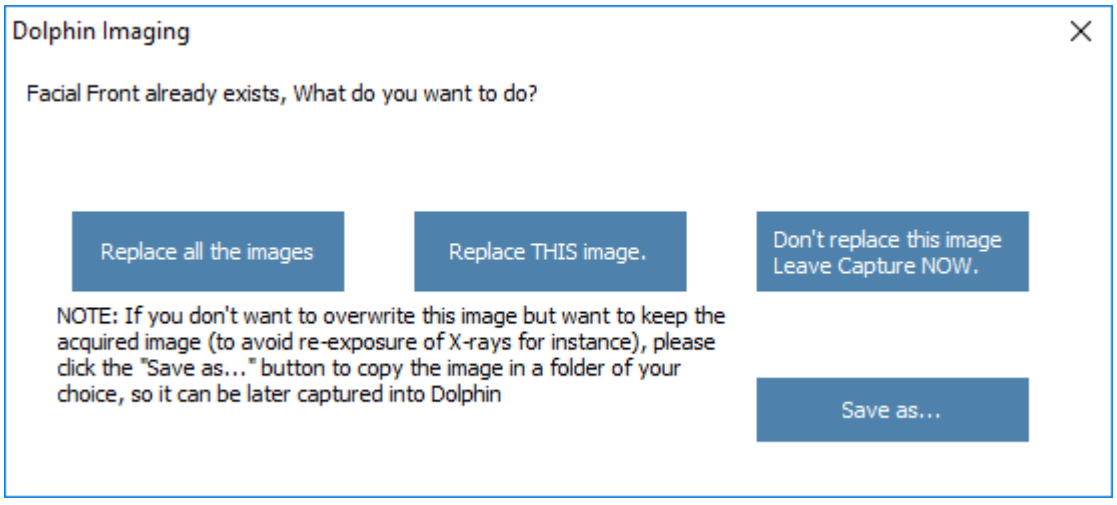
4 Make sure the **One-Click** option is selected. Then, click **Start Capture**.

The One-Click Capture Setup dialog box displays all the previously-captured images in the sequence so that you can crop, replace, enhance, and/or rotate them.

5 Make any changes to the patient's images. Then, click **Save**.

A dialog box opens and asks what you would like to do with the modified images.

6 Click the button for the operation to perform.



Replace all the images	Saves all modified images, replacing the existing images. Unaltered images will not be changed.
Replace THIS image	Saves the currently selected image, replacing the existing image.
Don't replace this image. Leave Capture NOW	Leaves the existing image unchanged and exits image capture.
Save as…	Saves a copy of the modified image to a file rather than to your Dolphin database.

Setting One-Click Capture Preferences

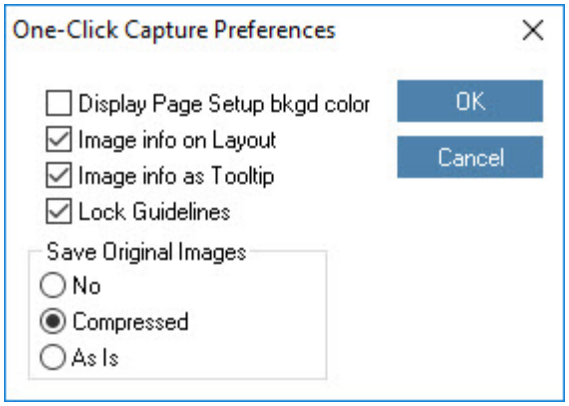
To set One-Click Capture preferences:

1 Click

.

The One-Click Preferences dialog box appears.

2 Check the boxes for any options you want. Then, click **OK**.



Display Page Setup bkgd color	Uses the printer background color on the One-Click Capture dialog box, so you can see how the image layout will appear when printed.
Image info on Layout	Displays the following information on each image in layout preview: image type, image scale percentage (percentage zoomed in or out), and the image file path.
Image info as Tooltip	Displays the following information as tool tips for each image in layout preview: image type, image scale percentage (percentage zoomed in or out), and the image file path.
Lock Guidelines	Locks the alignment guidelines at their current location. Locked guidelines are gray. Unlocked guidelines are yellow. Locking guidelines prevents you from accidentally moving them when trying to move an image. For more information on the alignment guidelines, see "Using the Alignment Guidelines" on page 5-13.

Save Original Images	Specifies whether to save original images: **No:** Saves only the images with the modifications that you make in the One-Click Capture Setup dialog box. **Compressed:** Saves two versions of the images: a version with the modifications that you make in the One-Click Capture Setup dialog box and a compressed version of the images as they were originally taken by the digital camera. This is the recommended option if you want to save the original, unmodified images. **As Is:** Saves two versions of the images: a version with the modifications that you make in the One-Click Capture Setup dialog box and an uncompressed version of the images as they were originally taken by the digital camera. This option can consume large amounts of disk space.

Reverting to the Original Images

To revert to the original images as they were taken by the digital camera:

3 Set the **Save Original Images** option on the One-Click Preferences dialog box to either **Compressed** or **As Is** (see "Setting One-Click Capture Preferences" above).

4 Make any changes (such as cropping, rotating, or enhancing) to the images in the One-Click Capture Setup dialog box. Then, click **Save** to save the modified images and close the dialog box.

5 Return to the One-Click Capture Setup dialog box by clicking

on the Dolphin main screen and **One-Click Capture** on the Capture Setup dialog box.

The One-Click Capture dialog box shows the images that you previously modified and saved.

6 Right-click one of the images. Then, select **Revert to Original** from the context menu.

The modified image is replaced with the original, unmodified image on the One-Click Capture Setup dialog box.

Using Sequential Capture

Using Sequential Capture, you can individually download, crop, enhance, and capture the images in a sequence.

Note: *In most cases, you will probably find One-Click capture more convenient than sequential capture.*

Capturing Images from a Memory Card

To capture images from image files on a memory card using Sequential Capture:

1 Select an existing timepoint from the **Timepoint** list.

Or,

Click **New...** in the Timepoint group box to create a new timepoint. In the resulting dialog box, enter a descriptive name for this timepoint and click **OK**.

2 Select the sequence of images to capture from the **Sequence** tab in the Capturing group box.

3 Select **Image File, Memory Card** as the source from which to capture these images in the Input group box.

4 Select **Sequential** to use Sequential Capture.

5 Click **Start Capture** to begin capturing the images.

A dialog box prompts you for the image file to capture.

6 Select the first image in the capture sequence, and click **OK**.

The image you selected is displayed in the Cropping dialog box.

Capturing Images from a TWAIN Device

To capture images from a TWAIN device (typically a scanner) using Sequential Capture:

1 Place the x-ray and the Dolphin calibration ruler on the scanner.

The Dolphin calibration ruler is used to simplify image calibration for tracing purposes. If you do not have a Dolphin calibration ruler, you can contact Dolphin to obtain one. Alternatively, you can place a semi-transparent object with a known fixed length, such as a small piece of paper, on the scanner when you scan the x-ray image.

Place the x-ray face down on the scanner. Place the top of the skull to the right side of the scanner. The x-ray image should face the Dolphin calibration ruler, and the ruler should be on top of the x-ray film.

2 Select an existing timepoint from the **Timepoint** list.

Or,

Click **New...** in the Timepoint group box to create a new timepoint. In the resulting dialog box, enter a descriptive name for this timepoint and click **OK**.

3 From the **Sequence** tab in the Capturing group box, select the **Ceph (Scan)** or **Pano (Scan)** capture sequence, which are capture sequences containing only one image.

4 Select **Scanner, TWAIN driver** as the source from which to capture the image in the Input group box.

5 Select the scanner you are using from the drop-down list in the Input group box.

6 Select **Sequential** to use Sequential Capture.

7 Click **Start Capture** to begin capturing the images.

At this point, the scanner driver takes over the capture process. If this is the first image you are scanning and you are using an older scanner model, the scanner lamp may take about 30 seconds to warm up to achieve the correct color temperature. The scanner performs a preview scan of the image. Then, a dialog box similar to the figure below displays a preview of the scan.

Note: *The appearance of the dialog box you see depends on the scanner you are using. The figure below shows the appearance of this dialog box for Hewlett-Packard Deskscan 4, 5, and 6000 series scanners. Refer to the Dolphin Imaging web site (www.dolphinimaging.com) for recommended scanners. Refer to your scanner documentation for information about setting your scanner up.*

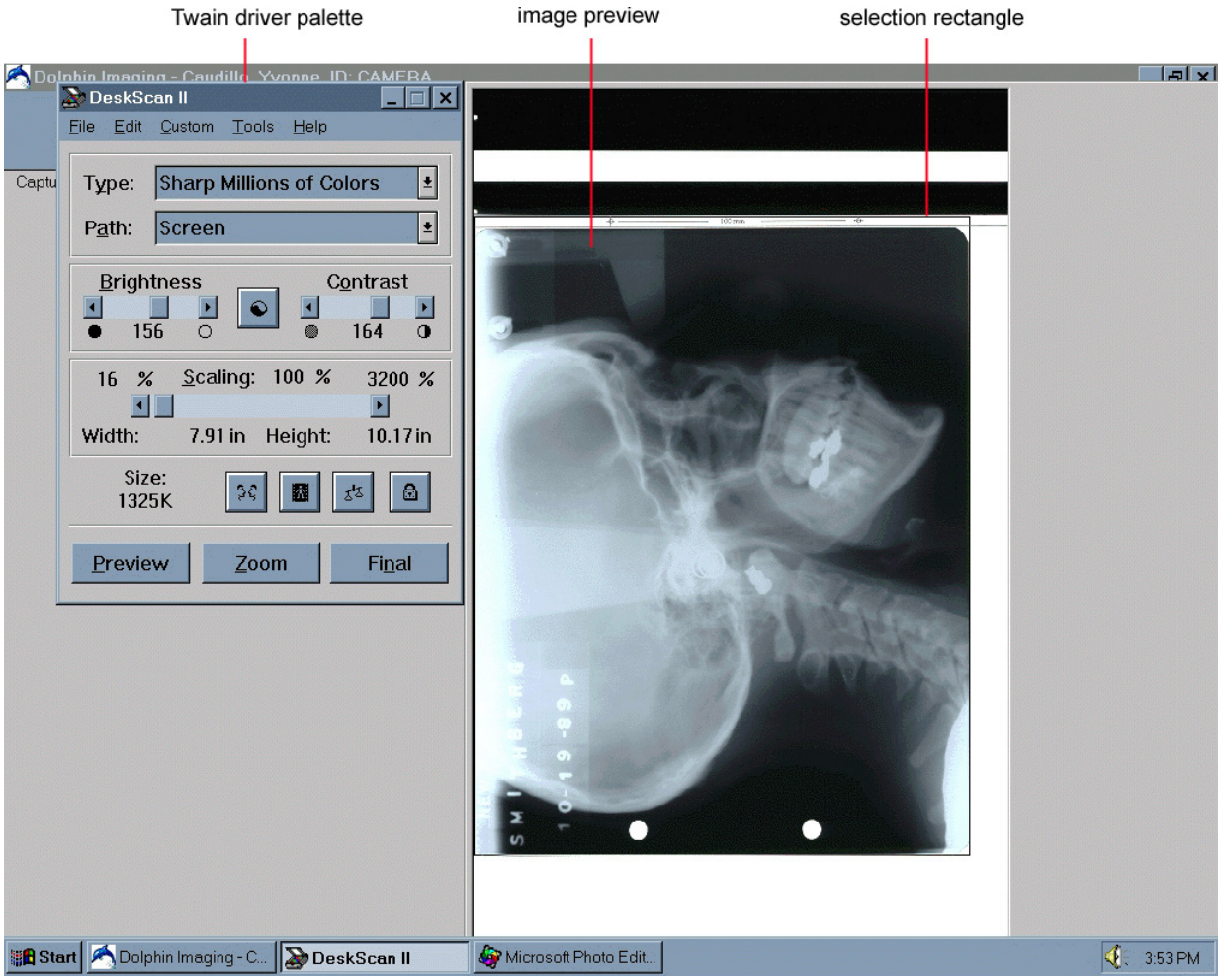
8 Examine the preview image to make sure that the image rectangle encompasses the part of the image to capture and the Dolphin calibration ruler. If necessary, change the image rectangle size or location using your scanner driver program.

9 Make any modifications to the settings for the scanner driver program for the final scan.

For more information on the options available, refer to your scanner and scanner driver documentation.

10 Click **Final** to perform the final scan.

At this point, the scanner driver program delivers the scanned image to the Cropping dialog box (see “Cropping an Image” on page 5-34). Depending on your scanner driver and its settings, you may need to rotate the scanned image 90 degrees.



TWAIN driver palette	Sets scanning options using this palette. For information on the options available, refer to your scanner documentation.
Preview image	Shows how the final scanned image will look.
Selection rectangle	Boundaries of the scanned image.

Capturing Still Images From a Digital Video Source

To capture still images from a digital video source:

1 Select an existing timepoint from the **Timepoint** list.

Or,

Click **New...** in the Timepoint group box to create a new timepoint. In the resulting dialog box, enter a descriptive name for this timepoint and click **OK**.

2 Select the **Sequence** tab in the Capturing group box. Then, select the capture sequence into which to capture the images.

3 Select **Digital Video** as the source from which to capture in the Input group box.

4 Select the digital video device from which to capture the images from the drop-down list.

5 Select **Sequential**. Then, click **Start Capture**.

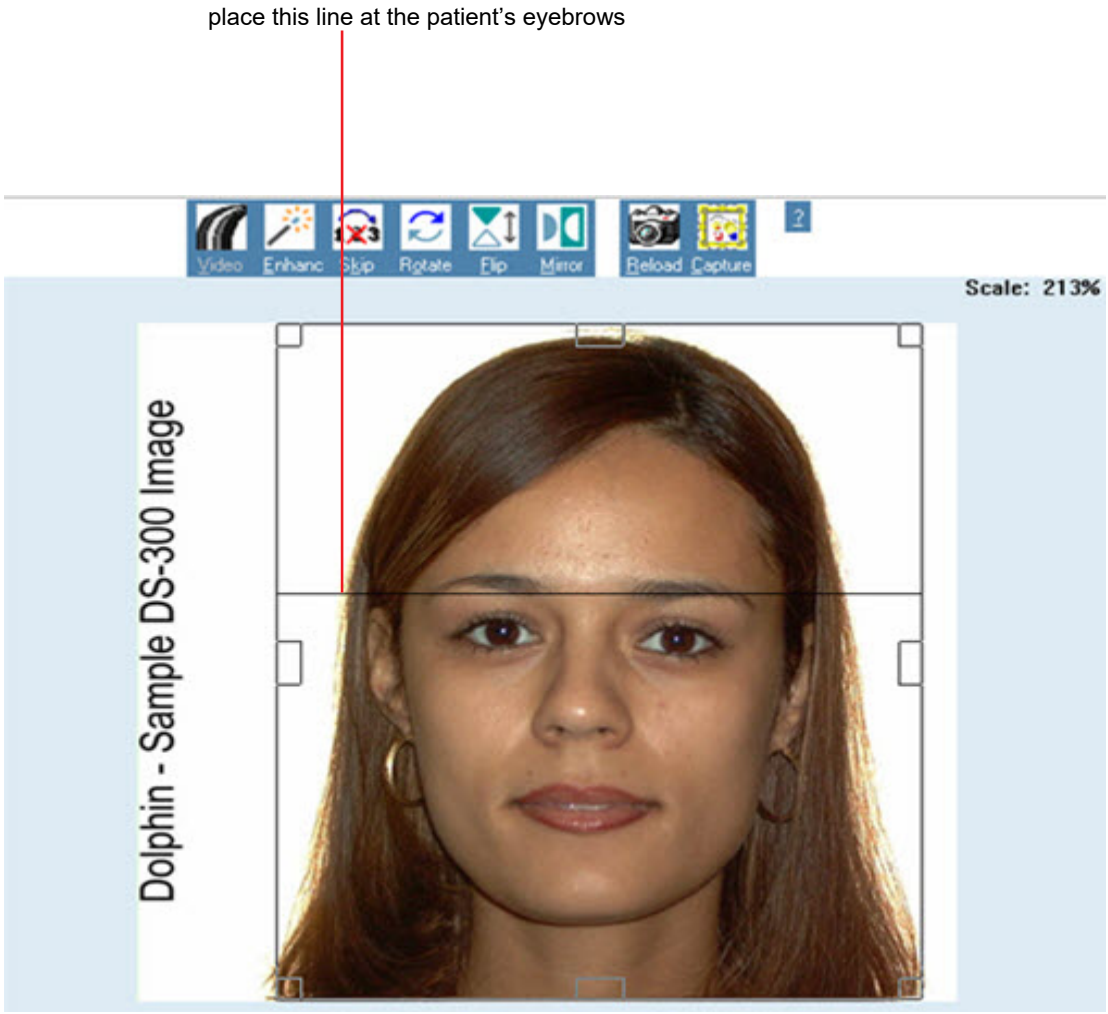
A live video feed from your digital video source appears in the Cropping dialog box.

6 Optionally, click **Freeze** to freeze the image.

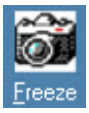
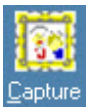
Click **Live** to unfreeze the image and return to the live video feed.

Cropping an Image

When you select an image to capture, that image is displayed in the Cropping dialog box.



Video	Adjusts video image using the AVI or Video for Windows interface driver. Only available for systems equipped with video capturing devices. For more information, contact Dolphin.
Enhanc	Enhances the image. For more information, see “Enhancing an Image” on page 5-16.
Skip	Skips the current image and proceeds to the next image file (see below).

	Opens the Image Rotation dialog box, so you can specify how much to rotate the image. For more information, see “Rotating Images” on page 5-24.
	Flips the image vertically (up to down). For more information, see “Flipping Images” on page 5-23.
	Flips the image to its mirror image (left to right). For more information, see “Flipping Images” on page 5-23.
	Returns to the Choose an Image File dialog box so you can pick another image file (see below). This button does not appear if you are using video capture.
 **or**	Toggles between a frozen video image and live video feed. Only appears if you are using video capture.
	Captures the current image, as cropped, into Dolphin Imaging.
Capturing *image name*	Image in the sequence that you are currently capturing.
Scale	Scaling percentage at which the image is being displayed.
File loaded *file name*	Name of the image file on which you are currently working.

To crop and capture the image:

1 If you are capturing an x-ray, rotate the image so that it is right side up and faces right.

For more information on rotating the image, see “Rotating Images” on page 5-24.

2 Click and drag the boxes to resize the cropping rectangle.

Or,

Press SHIFT+UP ARROW to make the cropping rectangle bigger or SHIFT+DOWN ARROW to make the cropping rectangle smaller.

Or,

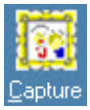
Press CTRL+UP ARROW or CTRL+DOWN ARROW to resize the rectangle faster.

Or,

Press ALT, then click and drag to resize the rectangle without maintaining its proportions (to make the rectangle larger in only one direction).

If you are capturing an x-ray, make sure that the cropping rectangle encompasses the entire x-ray and the Dolphin calibration ruler.

3 Check that the correct image name is displayed at the top left of the image capture area under the tool bar.

4 Click 

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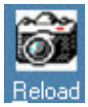
If you are capturing a capture sequence from a memory card, the Choose an Image File dialog box is displayed so you can capture the next image in the sequence.

If you took your images in the correct sequence and cropped them properly when you took them, you can simply keep pressing ENTER to capture the entire sequence.

When you finish capturing all the images in the sequence, the main screen displays the images you captured.

To pick another image:

1 Click 

.

Or,

Click

.

The Choose an Image File dialog box is displayed so you can select another image file. If you clicked **Skip**, a message appears asking you to confirm that you want to skip the current image. Then, the Choose an Image File dialog box is displayed with the file for the next image in the sequence automatically selected.

Capturing Study Model Images

Typically, you use Sequential Capture to capture a study model image that contains both arches in a single image. To make digitizing the image easier, you can include the Dolphin calibration ruler or another ruler in the image.

To capture a study model image:

1 On the Capture Setup dialog box, select an existing timepoint from the **Timepoint** list.

Or,

Click **New...** in the Timepoint group box to create a new timepoint. In the resulting dialog box, enter a descriptive name for this timepoint, and click **OK**.

2 In the Capturing group box, select the **Image** tab.

3 In the list, select **Undigitized Arch** to capture a study model image.

4 In the Input group box, select **Image File, Memory Card** as the source from which to capture the image.

The **Sequential** option is selected automatically.

5 Click **Start Capture**.

The dialog box prompts you for the image file to capture.

6 Select the file containing the study model image, and click **OK**.

The study model image is displayed in the Cropping dialog box.

7 Click and drag the boxes to resize the cropping rectangle.

Or,

Press SHIFT+UP ARROW to make the cropping rectangle bigger or SHIFT+DOWN ARROW to make the cropping rectangle smaller.

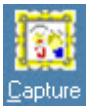
Or,

Press CTRL+UP ARROW or CTRL+DOWN ARROW to resize the rectangle faster.

Or,

Press ALT, then click and drag to resize the rectangle without maintaining its proportions (to make the rectangle larger in only one direction).

Make sure that the cropping rectangle encompasses the entire image and the Dolphin calibration or other ruler (if the image includes a ruler).

8 Click 

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Capturing from a PACS Server

You can use either One-Click or Sequential Capture to capture to capture images from a PACS server.

For information on importing a patient's 3D volume data from a PACS server into Dolphin 3D, see "Importing a New 3D Volume from a PACS Server" on page 19-5.

Note: *Dolphin Imaging does not create new patient records based on the downloaded PACS files. The patient must exist in Dolphin Imaging before you download and capture the images. During the capturing session, Dolphin Imaging extracts the images from the PACS files and discards all other information.*

To begin capturing an image from the PACS server:

1 On the Capture Setup dialog box, select an existing timepoint from the **Timepoint** list.

Or,

Click **New...** in the Timepoint group box to create a new timepoint. In the resulting dialog box, enter a descriptive name for this timepoint, and click **OK**.

2 Select the **Sequence** tab in the Capturing group box. Then, select the capture sequence to capture from the list of capture sequences.

3 In the Input group box, select **DICOM Server/PACS** as the source from which to capture the image.

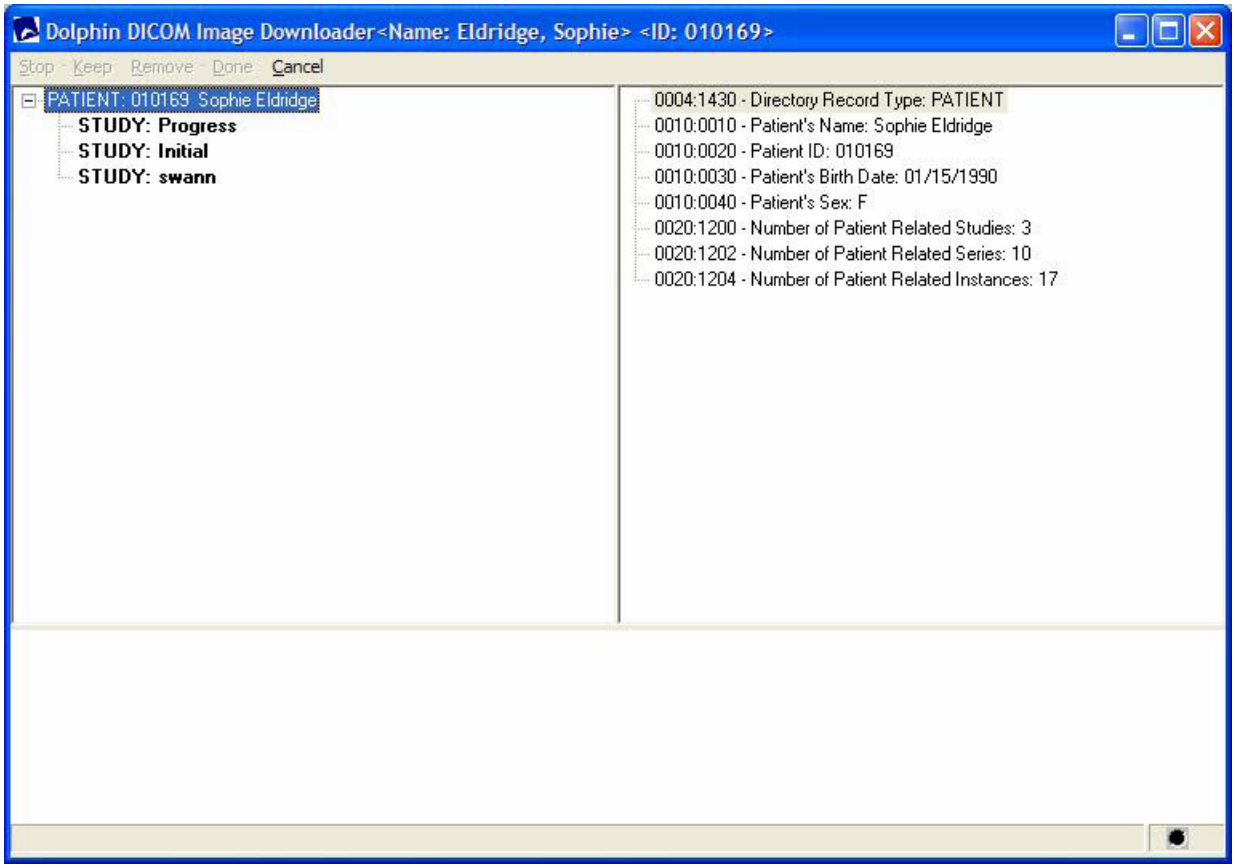
4 Select **One-Click** to use One-Click Capture.

Or

Select **Sequential** to use Sequential Capture.

5 Click **Start Capture**.

If images for the current patient exist on the PACS server, a window similar to the example below opens:



To select the image to capture:

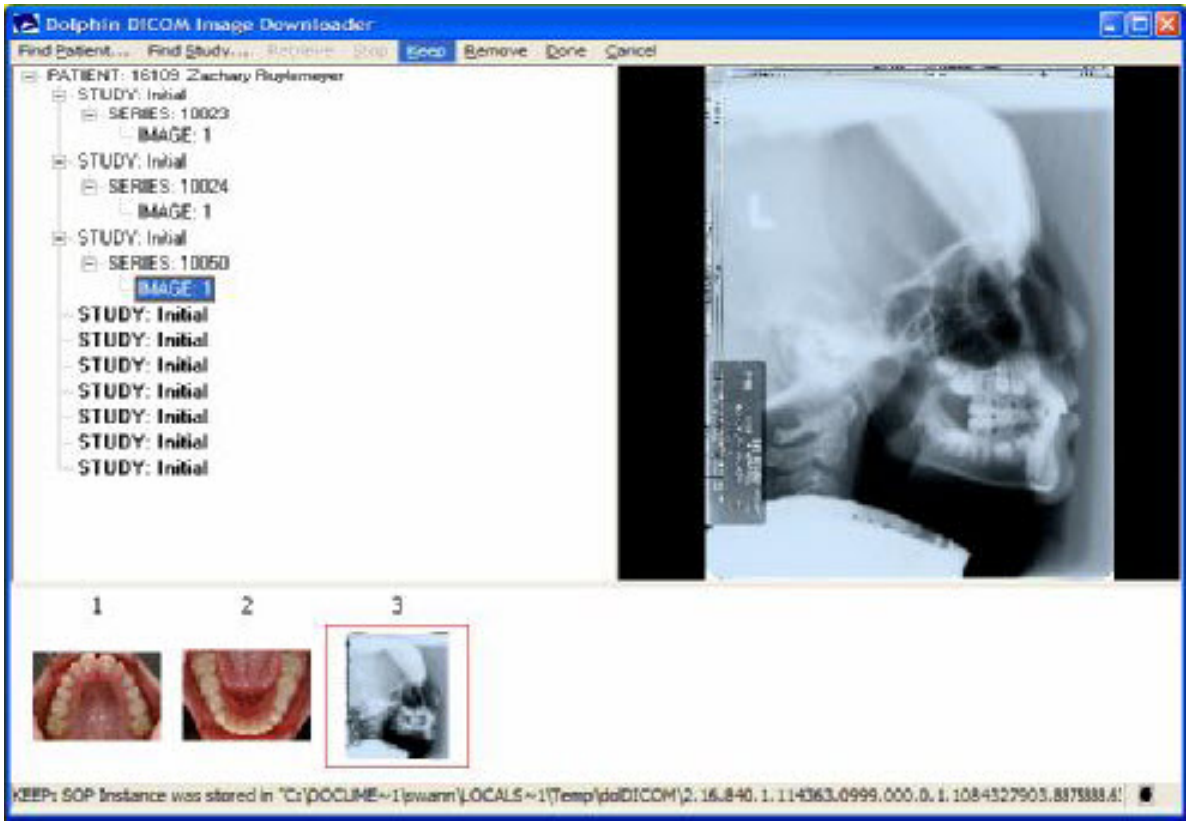
1 Click the image to download it.

2 Click **Keep** on the menu bar.

A thumbnail of the image appears in the lower part of the window along with a number.

3 Repeat steps 1-3 until you have selected all the images to capture.

4 If the image thumbnails are not in the correct order for the capture sequence, drag and drop the thumbnails to reorder them.



To capture the selected images:

1 Click **Done** on the menu bar.

The One-Click Capture Setup or Sequential Capture dialog box opens. In the One-Click Capture Setup dialog box, the downloaded images appear in the **Unused Pictures** list on the right.

2 Capture the images using One-Click or Sequential Capture.

For more information, see “Using One-Click Capture” on page 5-4 or “Using Sequential Capture” on page 5-30.

Editing Capture Sequences

Using the Capture Sequence Editor, you can change the images in a sequence, reorder the images in a sequence, and set other options for a capture sequence.

Dolphin Imaging capture sequences are automatically shared among all the computers on the same network. So, any new capture sequences and revisions to existing capture sequences are automatically shared to the rest of your network when you save them.

To open the Capture Sequence Editor from the **Edit** menu:

1 Select **Edit Capture Sequences...** from the **Edit** menu.

To open the Capture Sequence Editor from the Capture Setup dialog box:

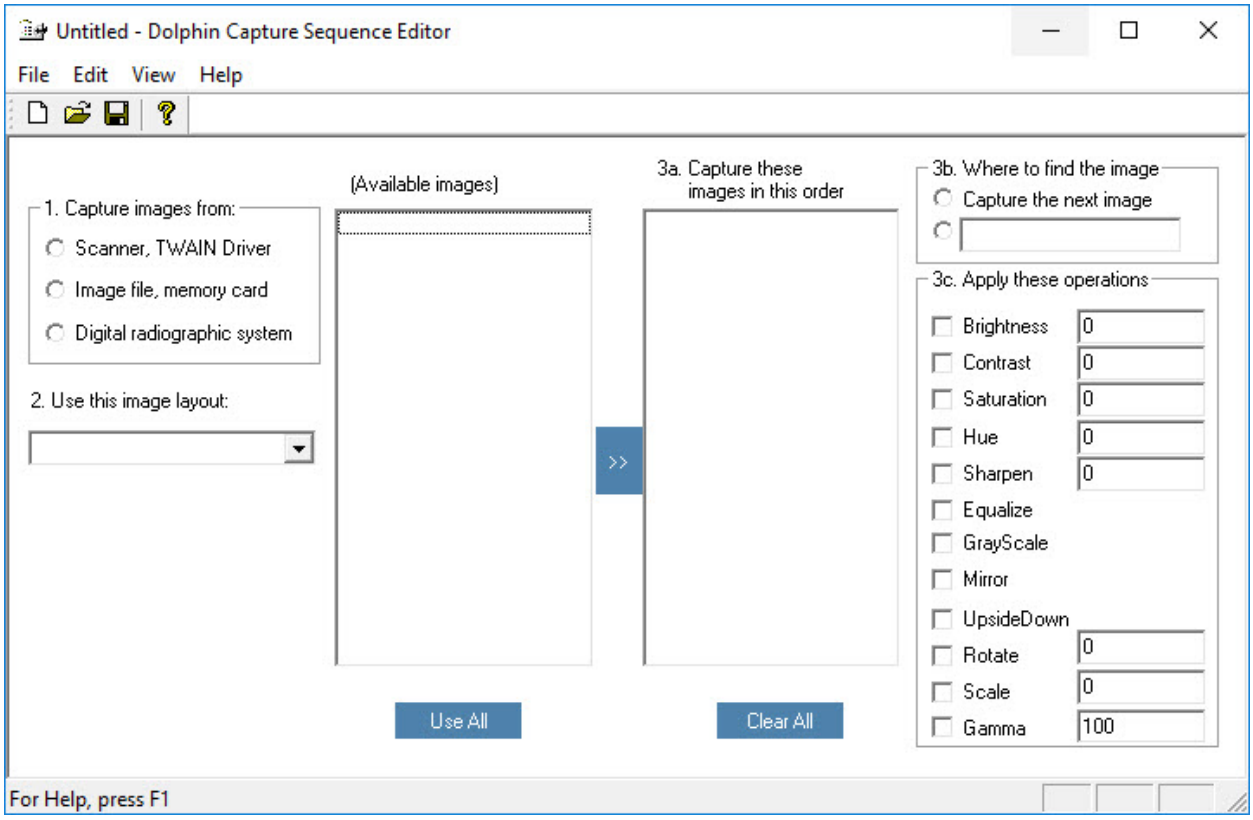
1 In the Capturing group box of the Capture Setup dialog box, select the **Sequence** tab.

2 Optionally, select the capture sequence to edit from the list.

From within the Sequence Editor, you can change the sequence you are editing or define a completely new capture sequence.

3 Click **Edit** in the Capturing group box.

The Capture Sequence Editor dialog box opens. If you select the capture sequence to edit from the Capture Setup dialog box, the Capture Sequence Editor displays information for the selected capture sequence.



File menu	Contains the following options: **New:** Defines a new capture sequence. For more information, see “Creating a New Capture Sequence” on page 5-44. **Open...:** Opens and edits an existing capture sequence. For more information, see “Opening an Existing Capture Sequence” on page 5-45. **Save:** Saves the current capture sequence. For more information, see “Saving the Capture Sequence” on page 5-47. **Save As...:** Saves the current capture sequence under a different name. For more information, see “Saving the Capture Sequence” on page 5-47. **Print...:** Prints the current capture sequence. Opens the Print dialog box where you can select printing options. For more information, see “Printing a Capture Sequence” on page 5-50. **Print Preview:** Previews the print job on the computer screen. For more information, see “Printing a Capture Sequence” on page 5-50. **Print Setup...:** Opens the Print Setup dialog box so you can set printing options. For more information, see “Printing” on page 16-4. **Recent File:** Opens a recently edited capture sequence. **Export Sequences:** Exports a capture sequence and its associated image layout to a file so that they can be imported into Dolphin Imaging on another computer. For more information, see “Exporting and Importing a Capture Sequence” on page 5-49. **Import Sequences:** Imports a previously exported capture sequence. For more information, see “Exporting and Importing a Capture Sequence” on page 5-49. **Exit:** Exits from the Sequence Editor. For more information, see “Exiting the Sequence Editor” on page 5-51.
Edit menu	Contains the following options: **Undo:** Undoes the most recent change to the current capture sequence. **Cut:** Cuts the currently highlighted text and places it on the clipboard. **Copy:** Copies the currently highlighted text and places it on the clipboard. **Paste:** Pastes the contents of clipboard at the current cursor position.
View menu	Contains the following options: **Toolbar:** Toggles display of the Sequence Editor tool bar. **Status Bar:** Toggles display of the Sequence Editor status bar. For more information, see “Changing Sequence Editor View Options” on page 5-50.
Help menu	Contains the following options: **Help Topics:** Opens the online help for the Sequence Editor. **About Sequence Editor...:** Opens a window with the current Sequence Editor version.
	Defines a new capture sequence. For more information, see “Creating a New Capture Sequence” on page 5-44.

	Opens and edits an existing capture sequence. For more information, see “Opening an Existing Capture Sequence” on page 5-45.
	Saves the current capture sequence. For more information, see “Saving the Capture Sequence” on page 5-47.
Capture images from:	Default device to use for capturing images for this sequence. This default can be changed on the Capture Setup dialog box.
Use this image layout:	image layout to use for this capture sequence.
Edit Layout	Edits the selected image layout. For more information, see Chapter 17, Layout Editor.
(Available images)	Images that you can add to the capture sequence.
Use All	Uses all the images in the **Available Images** list in this capture sequence.
>> or <<	Move images between the **Available Images** and **Capture These Images In This Order** lists.
Capture These Images In This Order	Images in the capture sequence listed in the order that they will be captured.
Clear All	Removes all the images from the capture sequence.
Where to find the image	Location where the Dolphin Imaging program should look for this image. **Capture the Next Image:** Dolphin Imaging program should increment the file name for the previous image and look for this image under the new file name. **Field:** File name that the Dolphin Imaging program should use when looking for this image.

Apply these operations	Options for enhancing the image selected in the **Capture These Images In This Order** list during capturing. **Brightness:** Adjusts the brightness of the image. A positive value brightens the image, and a negative value darkens it. **Contrast:** Adjusts the difference between the lightest and darkest parts of the image. A positive value increases the contrast, and a negative value decreases it. **Saturation:** Adjusts the amount of color in the image. A positive value increases the saturation, and a negative value decreases it. **Hue:** Adjusts the hue of the image. **Sharpen:** Adjusts the sharpness of the image. A positive value sharpens the image, and a negative value blurs it. **Equalize:** Equalizes the image colors. **GrayScale:** Changes the image from color to gray scale. **Mirror:** Flips the image to its mirror image (left to right). **UpsideDown:** Flips the image vertically (up to down). **Rotate:** Rotates the image and specify the number of degrees in the field. A positive value rotates the image to the right, and a negative value rotates it to the left. **Scale:** Scales the image by the specified percentage. **Gamma:** Adjusts the light/dark contrast of the image. A value of 100 is normal, a value between 0 and 100 increases the light/dark contrast of the image, and a value greater than 100 decreases the light/dark contrast of the image.

Creating a New Capture Sequence

To begin defining a new capture sequence:

1 Click on the tool bar.

Or,

Select **New** from the **File** menu.

All the images are removed from the **Capture These Images In This Order** list.

Opening an Existing Capture Sequence

To select an existing capture sequence to edit:

1 Click on the tool bar.

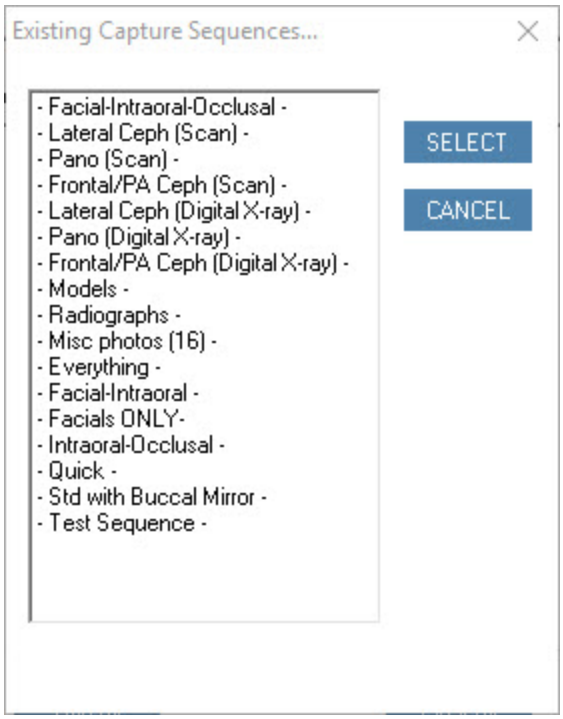
Or,

Select **Open...** from the **File** menu.

The Existing Capture Sequences dialog box appears so that you can select an existing capture sequence.

2 Select the capture sequence to edit in the list. Then, click **SELECT**.

When you select a capture sequence in the list, two additional buttons appear so that you can rename or delete the capture sequence.



list	Existing capture sequences.
SELECT	Edits the capture sequence selected in the list.
RENAME	Renames an existing capture sequence. Appears only when a capture sequence is selected in the list.
DELETE	Deletes an existing capture sequence. Appears only when a capture sequence is selected in the list.

Renaming a Capture Sequence

To rename an existing capture sequence:

1 Click on the tool bar.

Or,

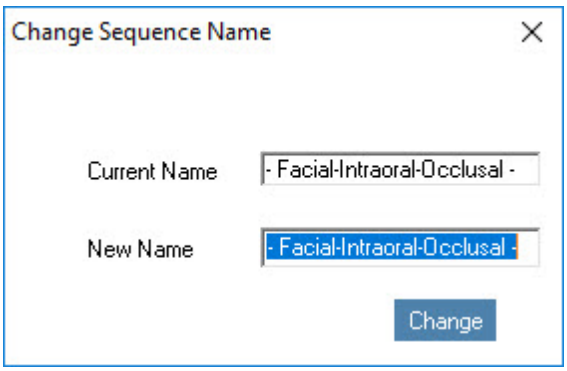
Select **Open...** from the **File** menu.

The Existing Capture Sequences dialog box appears.

2 Select the capture sequence to rename in the list. Then, click **RENAME**.

The Change Sequence Name dialog box appears.

3 Enter a new name for this capture sequence in the **New Name** field. Then, click **Change**.



Current Name	Current name of this capture sequence.
New Name	New name for this capture sequence in this field.
Change	Changes the capture sequence name.

Deleting a Capture Sequence

To delete an existing capture sequence:

1 Click on the tool bar.

Or,

Select **Open...** from the **File** menu.

The Existing Capture Sequences dialog box appears.

2 Select the capture sequence to delete. Then, click **DELETE**.

Specifying a Capture Device and Image Layout

To specify the capture device and image layout for the capture sequence:

1 In the Capture Images From group box, select the default device to use when capturing images for this capture sequence.

2 Select the image layout to use for this capture sequence from the **Use This Image Layout** drop-down list.

Specifying the Images in the Sequence

To add one or more images to the capture sequence:

1 Click one or more images in the **Available Images** list. Then, click **>>**.

Or,

Click **Use All t**o add all the available images to the capture sequence.

The image or images you selected move to the **Capture These Images In This Order** list.

To remove one or more images from the capture sequence:

1 Click one or more images in the **Capture These Images In This Order** list. Then, click **<<**.

Or,

Click **Clear All** to remove all images from the capture sequence.

To change the order in which images are captured:

1 In the **Capture These Images in This Order** list, click and drag an image to a new location in the list.

Setting Image Options

To set options for each of the images in the sequence:

1 Select each image in the sequence from the **Capture These Images In This Order** list.

2 Set the location where Dolphin should look for that image in the Where to Find The Image group box.

3 Specify any operations to apply to the image in the Apply These Operations group box.

Saving the Capture Sequence

Dolphin Imaging capture sequences are automatically shared among all the computers on the same network. So, any new capture sequences and revisions to existing capture sequences are automatically shared to the rest of your network when you save them.

To save the capture sequence:

1 Click on the tool bar.

Or,

Select **Save** from the **File** menu.

Or,

Select **Save As...** from the **File** menu to save this capture sequence under a new name.

If this is a new capture sequence or you selected **Save As...**, the Existing Capture Sequences dialog box appears.

2 Enter a name for this capture sequence.

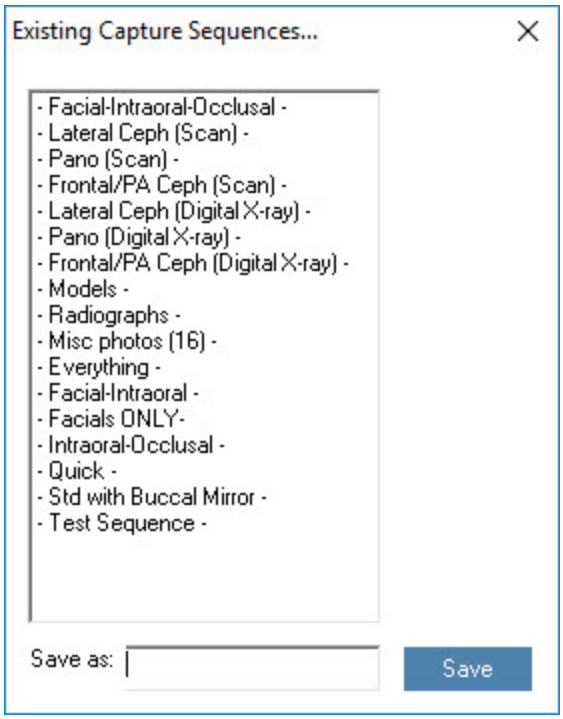
Or,

Select an existing capture sequence from the list to save this sequence using that name.

Note: *If you select an existing sequence name from the list, your new options will overwrite any options previously defined for that capture sequence.*

3 Click **Save**.

4 Click **OK** on the confirmation dialog box.



list	Existing capture sequence names.
Save As	New name for this capture sequence
Save	Saves the capture sequence.

Exporting and Importing a Capture Sequence

Dolphin Imaging capture sequences are automatically shared among all the computers on the same network. However, if you need to share a custom capture sequence with a colleague who is not on the same network, you can export it and its associated image layout to a file that can be imported into Dolphin Imaging on another computer.

To export a capture sequence and its associated layout:

1 Select **Export Sequences** from the **File** menu.

The Export Sequence dialog box opens.

2 Select a capture sequence you want to export from the Select sequence drop-down list, and click **Export**.

The capture sequence and its associated layout are exported as a .ZIP file, and the folder containing your exported capture sequences opens in a Microsoft Windows Explorer window. You can share the .ZIP file with your colleagues (for example, by copying it to a USB flash drive or attaching it to an email message) who can then import it as described below.

3 Repeat step 2 to export additional capture sequences.

4 When you finish exporting capture sequences, click **Close**.

To import a capture sequence and its associated layout:

1 Select **Import Sequences** from the **File** menu.

The Import Sequence dialog box opens.

2 In the **Select ZIP file to import** field, enter the folder and file name for the .ZIP file containing one or more capture sequences that you want to import.

Or,

Click **...** to browse for the .ZIP file.

3 Select the capture sequence you want to import from the Select sequence drop-down list, and click **Import**.

4 When you finish importing capture sequences, click **Close**.

Changing Sequence Editor View Options

To change view options for the Sequence Editor dialog box:

1 Select **Toolbar** from the **View** menu to toggle whether the tool bar appears.

All tool bar options are available from the menus.

2 Select **Status Bar** from the **View** menu to toggle whether the status bar appears at the bottom of the dialog box.

Printing a Capture Sequence

To print the capture sequence:

1 Select **Print** from the **File** menu.

The Print dialog box is displayed.

2 Select any printing options you want, and click **OK**.

For information on the printing options, see “Printing” on page 16-4.

To preview your print job:

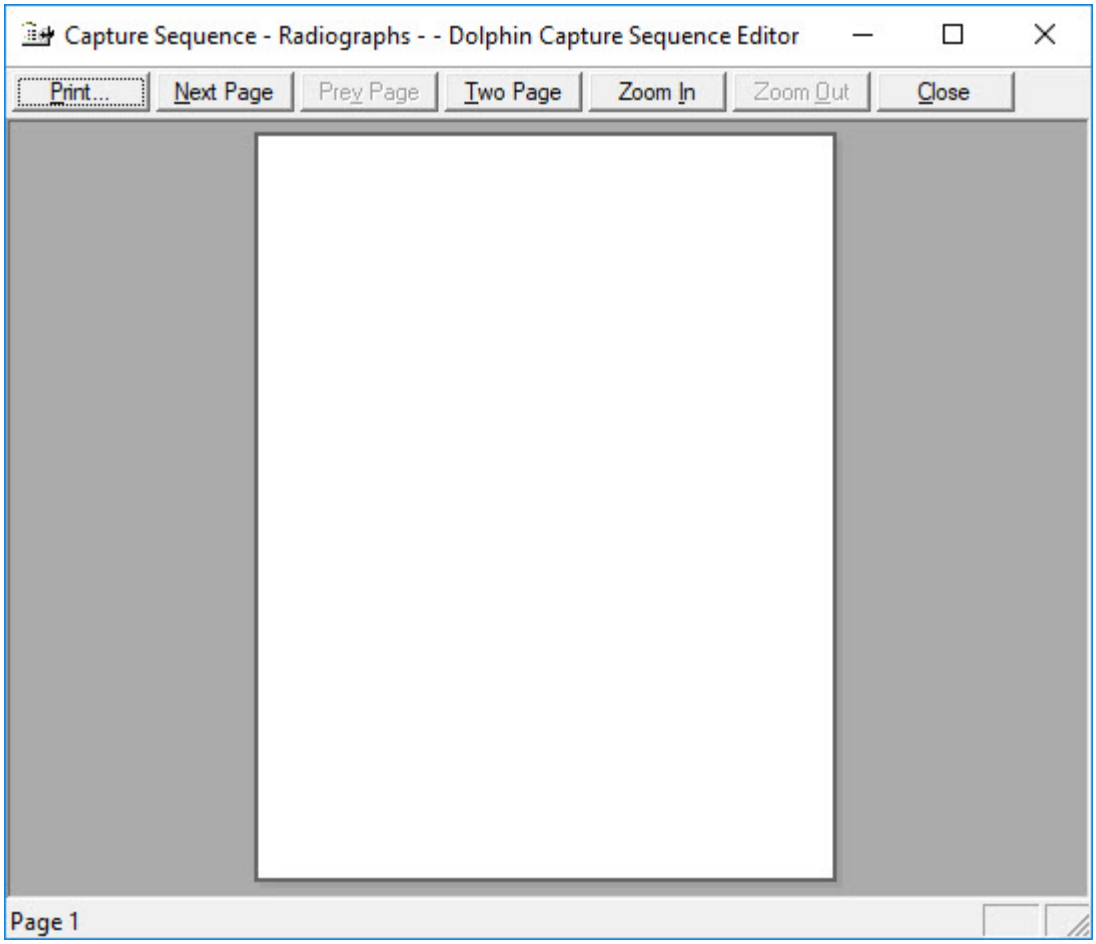
1 Select **Print Preview** from the **File** menu.

A preview of the print job appears.

2 Click **Print** to print the print job.

Or,

Click **Close** to close this dialog box.



Print	Prints the print job.
Next Page	Displays the next page of the print job. Available only if the print job is more than one page long.
Prev Page	Displays the previous page of the print job. Available only if the print job is more than one page long.
Two Page	Displays two pages of the print job side-by-side. Available only if the print job is more than one page long.
Zoom In	Zooms in on the print job.
Zoom Out	Zooms back out after zooming in.
Close	Closes the preview dialog box.

Exiting the Sequence Editor

To exit from the Sequence Editor:

1 Select **Exit** from the **File** menu.

6 Image Edit

You can use the edit function to modify any image. Some of the tasks that you can perform with the edit function are:

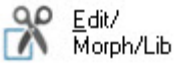
- Moving, stretching, and rotating selected areas of the image
- Morphing selected areas of the image
- Drawing, roughing, and blending colors on the image
- Replacing a patient's original smile with a smile from the Image Library to show after treatment results or show the patient's appearance with a variety of appliances
- Viewing the original image and the edited image side by side
- Saving the modified image

Note: *If you have the Dolphin Imaging Security Utilities installed, you can only save your enhancements to patient images if your Dolphin Imaging user account has the Edit/Morph Images privilege granted in Employee Rights. Without this privilege, you can enhance the image temporarily for viewing purposes, but you cannot save it. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Understanding the Edit Dialog Box

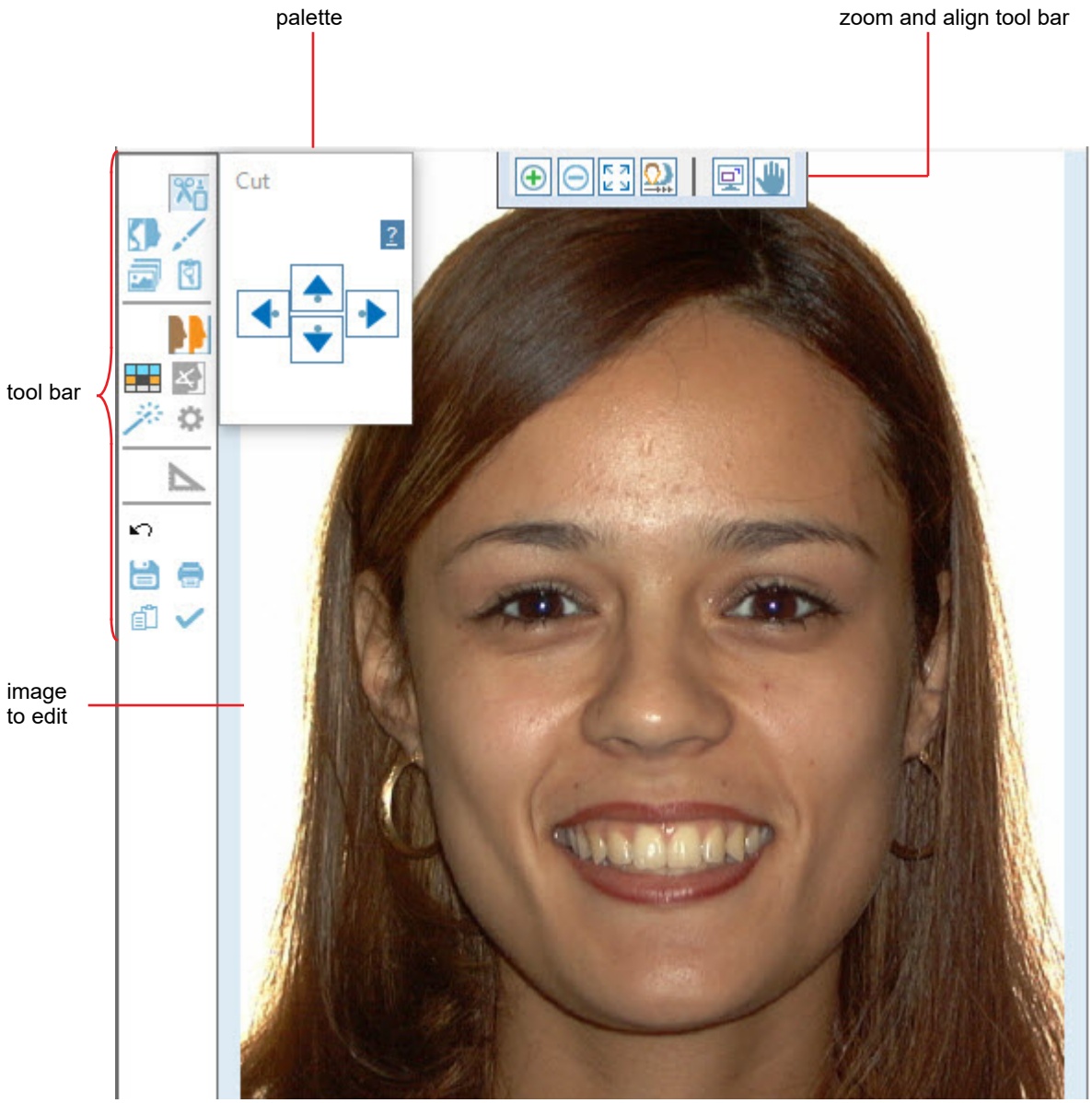
Before you access the Edit dialog box, you need to:

- Select a patient using the Patient Lookup dialog box, as described in Chapter 4, Patient Charts.
- Select an image on the Dolphin Imaging main screen, which is described in Chapter 3, The Dolphin Imaging Main Screen.

Then, you can access the Edit dialog box by clicking 

on the Dolphin Imaging main screen's vertical tool bar. Alternatively, you can select **Edit** from the **Tools** menu.

The following figure illustrates the Edit dialog box:



patient summary	Name and ID of the selected patient.
tool bar	Buttons for accessing image editing tools.
palette	Tools for modifying the image. The palette's appearance depends on the editing tool you are using.
zoom and align tool bar	Tools for zooming in, zooming out, and aligning the image in the window. For more information, see "Maximizing an Image" on page 3-17.

Using the Edit Tool Bar

The Edit tool bar contains the following buttons:

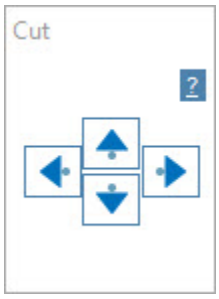
	Opens the **Cut** palette. For more information, see “Using the Cut Palette” on page 6-4.
	Opens the **Morph** palette. For more information, see “Using the Morph Palette” on page 6-7.
	Opens the **Brushes** palette. For more information, see “Using the Brushes Palette” on page 6-10.
	Opens the Image Library. For more information, see “Using the Image Library” on page 6-12.
	Opens the **ImPlanner** feature. For more information, see Chapter 15, ImPlanner (Medical Device).
	Displays the modified image side-by-side with the original image. For more information, see “Viewing Two Images Side by Side” on page 6-20.
	Opens the Original Records window. For more information, see “Using the Original Records Window” on page 12-25.
	Toggles the display of the patient’s tracing.
	Opens the **Enhance** tool. For more information, see “Enhancing an Image” on page 5-16.
	Sets display preferences. For more information, see “Setting General Preferences” on page 3-63.
	Opens the measurements table. For more information, see Chapter 8, Measurements (Medical Device).
	Undoes the previous operation. For more information, see “Undoing Your Changes” on page 6-10
	Saves the image. For more information, see “Saving a Modified Image” below.
	Prints the image. For more information, see “Printing” on page 16-4.
	Copies the image and/or its tracings to the clipboard.

Using the Cut Palette

Using the **Cut** palette, you can select an area of the image and move it, rotate it, or stretch it.

To open the **Cut** palette:

1 Click on the tool bar.



Arrow buttons	Buttons used to move the selected portion of the image.

Selecting an Area of an Image

Many Dolphin Imaging features require you to draw a polygon to select part of an image.

To select part of an image (draw a polygon):

1 Click the point where you want to begin drawing the polygon.

2 Release the mouse button and move the mouse to begin drawing the polygon.

As you move the mouse, you'll see a line extending from the point to the current mouse position.

3 Click whenever you want to place a point and change the direction of the line.

If you make a mistake, right-click to undo the line to the last point you placed.

4 To complete the polygon, click the first point again to close the polygon.

Alternatively, you can click and drag the mouse to draw the polygon without placing points. Using this method, you may be able create a smoother polygon, although you may find it more difficult to draw. In addition, undoing is more cumbersome, since this method effectively creates many points and lines in the polygon.

Using the Push Pin

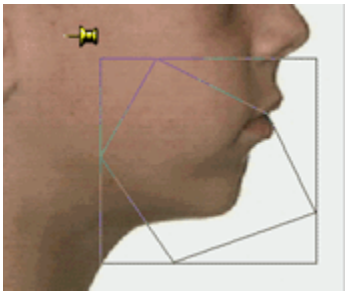
When you finish drawing the polygon, a rectangle appears enclosing it. In addition, the push pin appears at one corner of the rectangle. The figure to the right illustrates the rectangle and push pin.

At this point, you can make changes to the area inside the polygon. The effects of your changes vary depending on whether the push pin is out (as illustrated in the figure to the right) or in.

To move the push pin and place it:

1 Click and drag the push pin to the location where you want to place it.

2 Click the push pin to push it in.



Making Changes with the Push Pin Out

With the push pin out, you can make the types of changes described below.

To move the area inside the polygon:

1 Click anywhere inside the rectangle and drag the contents to the new location.

To stretch both sides of the area inside the polygon:

1 Move the mouse to the middle 1/3 of any side of the rectangle.

The mouse pointer changes to a double-headed arrow.

2 Click and drag the rectangle to stretch the image inside the polygon.

To stretch the area inside the polygon in four directions:

1 Move the mouse to a corner of the rectangle.

The mouse pointer changes into a double-headed arrow.

2 Click and drag the rectangle to stretch the image inside the polygon in four directions.

The polygon only stretches equally in all four directions if you drag the mouse at a 45º angle. If you drag the mouse at a steeper angle, the polygon stretches more in height. If you drag the mouse at a shallower angle, the polygon stretches more in length.

To flip the area inside the polygon:

1 Move the mouse near one corner of the rectangle until the mouse pointer changes into a flip symbol.

To flip the area inside the polygon vertically, place the mouse pointer along the top of the rectangle. To flip the area inside the polygon horizontally, place the mouse pointer along one side of the rectangle.

2 Click to flip the image inside the polygon.

Making Changes with the Push Pin In

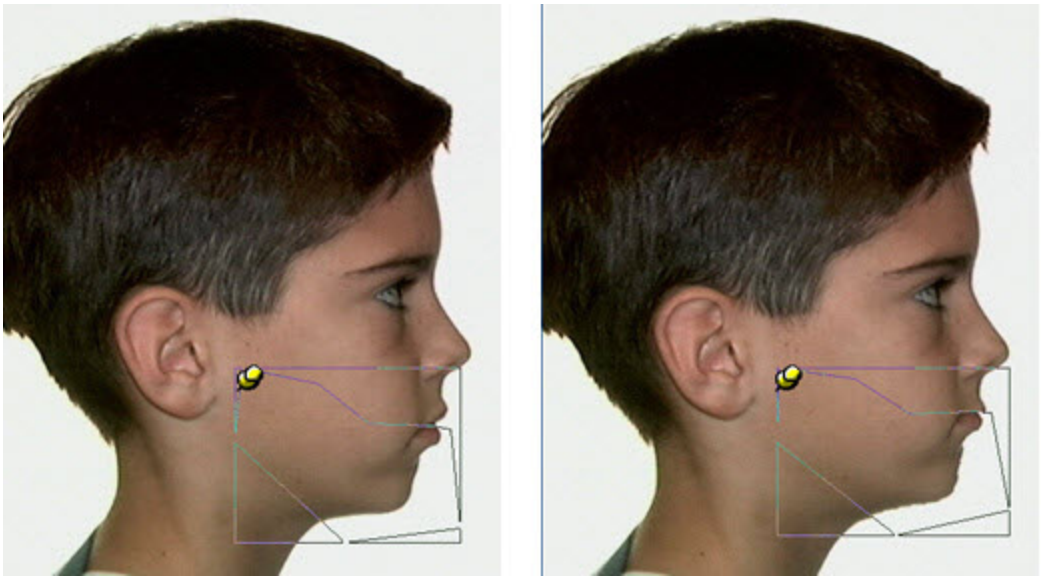
With the push pin in, you can make the types of changes described below.

To rotate the area inside the polygon around the push pin:

1 Click anywhere inside the rectangle and drag the contents around the push pin.

The area inside the polygon moves as illustrated below.

Before **After**



To stretch one side of the area inside the polygon:

1 Move the mouse to the middle 1/3 of any side of the rectangle.

The mouse pointer changes to a double-headed arrow.

2 Click and drag the rectangle to stretch the image inside the polygon.

To stretch the area inside the polygon proportionally in two directions:

1 Move the mouse to a corner of the rectangle.

The mouse pointer changes into a double-headed arrow.

2 Click and drag the rectangle to stretch the image inside the polygon in two directions.

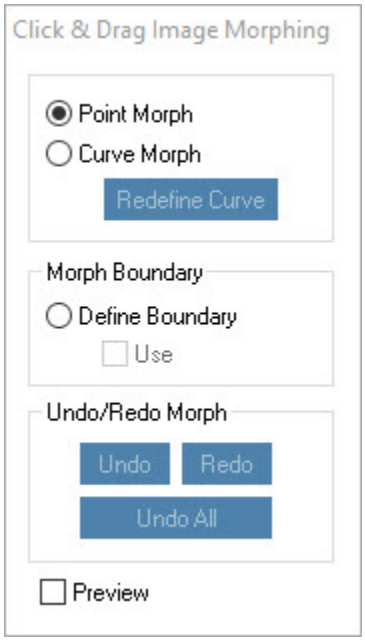
The polygon only stretches equally in two directions if you drag the mouse at a 45º angle. If you drag the mouse at a steeper angle, the polygon stretches more in height. If you drag the mouse at a shallower angle, the polygon stretches more in length.

Using the Morph Palette

Using the **Morph** palette, you can creatively warp and stretch parts of an image. Morph is an excellent tool to quickly change an image for communicating treatment goals with patients. This is also an excellent tool for fine-tuning the soft tissue profile contour and touching up image enhancements.

To open the **Morph** palette:

1 Click on the tool bar.



Point Morph	Morphs the image from a single point (see "Using Point Morph" below).
Curve Morph	Morphs the image based on control points along a curve (see "Using Curve Morph" on page 6-8). **Redefine Curve:** Redefines a morph curve.
Define Boundary	Morphs the image only within a defined boundary (see "Morphing Within a Boundary" on page 6-9). This option gives you more precise control and speeds up processing of the changes. **Use:** Uses a previously defined boundary.
Undo	Undoes the last morph operation.
Redo	Redoes the last undo operation.
Undo All	Undoes all morph operations.
Preview	Hides the morph curve.

Note: *After you morph an image, you may want to display the before and after images side-by-side. For more information, see "Viewing Two Images Side by Side" on page 6-20.*

Using Point Morph

To use Point Morph:

1 Select **Point Morph** on the **Morph** palette.

2 Click and drag an area of the image.

As you drag the mouse, the area affected by the morph operation increases. To morph only a small section of the image, click and drag a small distance. Then, click and drag again.

Note: *Using Point Morph in conjunction with a morph boundary gives you greater control over the changes to the image and also saves time by speeding up the processing of your changes.*

Using Curve Morph

To use Curve Morph:

1 Select **Curve Morph** on the **Morph** palette.

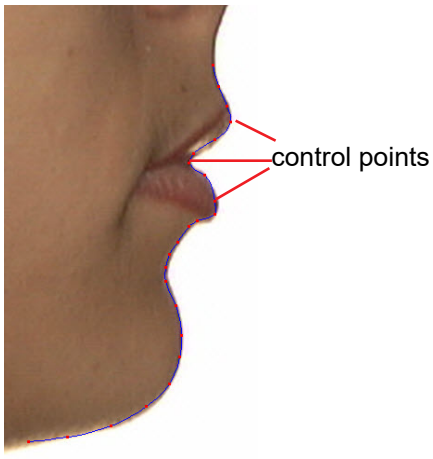
2 Define the morph curve.

There are two ways to define the morph curve:

- You can click and hold the left mouse button while moving the mouse to draw the curve. When you finish drawing the curve, release the mouse button.
- You can click and release the left mouse button on a point where you want to begin the morph curve. Then, move the mouse to draw the curve. As you move the mouse, you'll see a line extending from the point to the current mouse position. Click the mouse button whenever you want to place a point and change the direction of the curve. To complete the morph curve, double-click, or click the last point you placed again.

Although the first method of drawing may be faster, the second method gives you more precision on where the control points are placed along the curve. You use these control points to change the image along the morph curve.

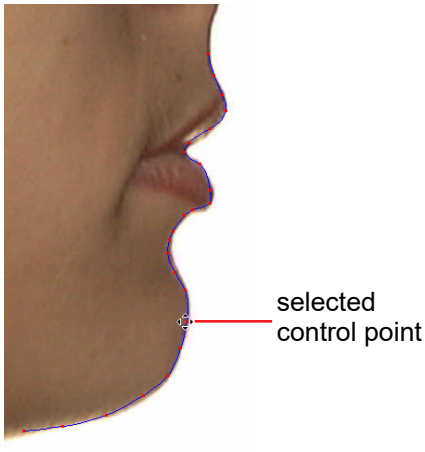
The figure below illustrates the morph curve and indicates some of the control points along the curve.



If you make a mistake, right-click to undo to the last point you placed. If you want to start over, click **Redefine Curve**. If you click **Redefine Curve** after you have morphed the image using the curve, a dialog box appears asking whether you want to keep the changes you've made to the image. Click **Yes** to keep the changes and define a new curve, or click **No** to discard the changes.

3 Click and drag any control point on the morph curve to morph the image.

When the mouse is over one of the points, arrows appear around that point. When you move the point, the image changes to conform to the curve's new shape.



4 Optionally, check the **Preview** box to view the results of morphing by hiding the morph curve.

To continue morphing, uncheck the **Preview** box.

Morphing Within a Boundary

To define a boundary and morph within that boundary:

1 Select **Define Boundary** on the **Morph** palette.

2 Click the point where you want to begin drawing the boundary.

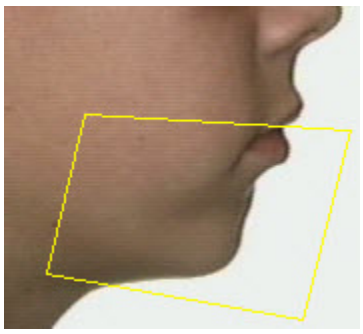
3 Release the mouse button and move the mouse to begin drawing the boundary.

As you move the mouse, you'll see a line extending from the point to the current mouse position.

4 Click whenever you want to place a point and change the direction of the line.

5 To complete the boundary, click the first point again to close the boundary.

The figure below illustrates a completed morph boundary.



If you make a mistake, right-click to undo the line to the last point you placed. If you want to start over again, click **Remove**.

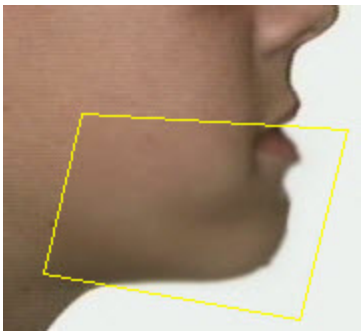
When you complete the boundary, the **Use** box is automatically checked so you can begin morphing within the boundary.

6 Select either **Point Morph** or **Curve Morph** to determine how you want to morph the image within the boundary.

For more information, see “Using Point Morph” on page 6-7 and “Using Curve Morph” on page 6-8.

7 Morph the image.

Only that part of the image that is within the boundary changes.



Undoing Your Changes

To undo your morphing changes:

1 Click **Undo** to undo your last change.

Or,

Click **Undo All** to undo all the changes you’ve made.

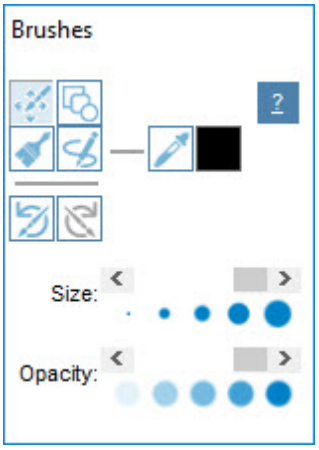
If you change your mind after clicking **Undo** or **Undo All**, click **Redo** to reinstate your changes.

Using the Brushes Palette

Using the **Brushes** palette, you can “paint” on the image. The **Brushes** palette provides brushes to paint colors on the image, rough up colors, or blend colors.

To open the **Brushes** palette:

1 Click on the tool bar.



	Selects the colors under the brush position and paints with them.
	Blends colors and edges.
	Roughs up the colors.
	Draws with the currently selected color.
	Picks a color from the image to use for painting
Color Sample	Used to pick a standard color or define a custom color.
	Undoes the latest changes to the image.
	Redoes a previous undo operation.
Size	Size of the brush. All brushes default to the largest size.
Opacity	Level of opacity. Defaults to the lowest level.

To use a brush:

1 Click the brush you want to use on the palette.

2 Select any attributes for that brush.

3 Click and drag on the image to apply the brush.

To pick a color from the image to use for painting:

1 Click on the **Brushes** palette.

2 Click a point on the image containing the color with which you want to draw.

The color you picked appears in the color sample.

To pick a basic or custom color to use for painting:

1 Click the color sample on the palette.

The Color dialog box is displayed.

2 Click one of the basic colors using the samples on the left side of the dialog box.

Or,

Select a custom color using the tools on the right side of the dialog box. Then, click **Add to Custom Colors**.

3 Click **OK**.

The color you picked appears next to the **Draw Color** on the palette.

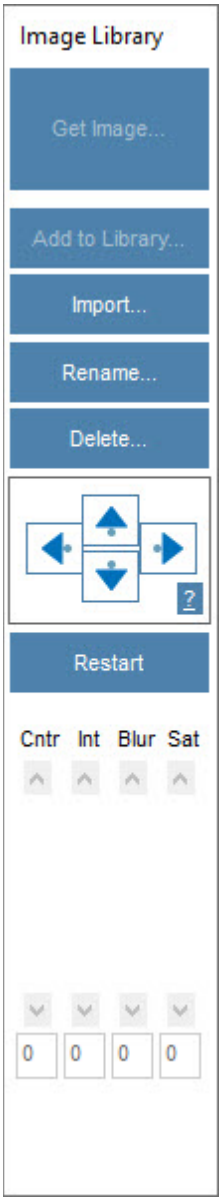
Using the Image Library

Using the Image Library, you can replace a patient's smile with one selected from an Image Library to show after treatment results or the patient's appearance with a variety of appliances. To access the Image Library, you use the **Image Library** palette.

Note: *After you replace a patient's smile with an image from the Image Library, you may want to display the before and after images side-by-side. For more information, see "Viewing Two Images Side by Side" on page 6-20.*

To open the **Image Library** palette:

1 Click on the tool bar.



Get Image...	Gets an image from the Image Library (see "Replacing a Patient's Smile" on page 6-13).
Add to Library...	Adds an image or category of images to the Image Library (see "Adding an Image to the Library" on page 6-14 and "Adding a Category to the Image Library" on page 6-17).
Import...	Imports an image file from your computer and adds it to the image library (see "Adding an Image to the Library" on page 6-14).
Rename...	Renames an image or category in the Image Library (see "Renaming an Image or Category in the Image Library" on page 6-18).
Delete...	Deletes an image or image category from the Image Library (see "Deleting an Image From the Library" on page 6-16 and "Deleting a Category From the Image Library" on page 6-18).
Arrow buttons	Move an image that's been added from the Image Library.
Restart	Undoes the last operation
Cntr	Adjusts the contrast of the selected area.
Int	Adjusts the intensity of the selected area.
Blur	Adjusts the blurriness of the selected area.
Sat	Adjusts the color saturation of the selected area.

Replacing a Patient's Smile

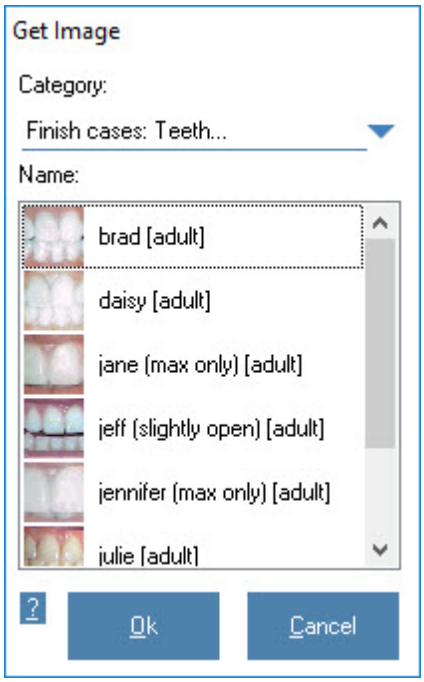
To replace a patient's smile with an image from the Image Library:

1 Draw a polygon around the patient's teeth.

The figure below illustrates the polygon. For information on how to draw a polygon, see "Selecting an Area of an Image" on page 6-4.

2 Click **Get Image** on the **Image Library** palette.

The Get Image dialog box is displayed.



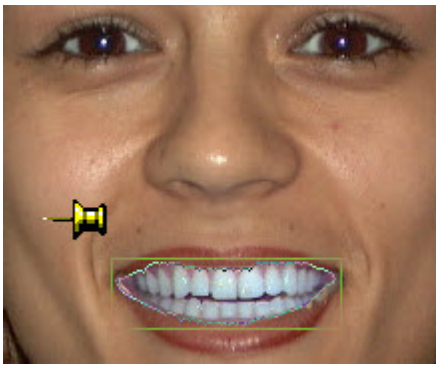
Category	Category of the image you want to use.
Name	Name of the image you want to use.

3 Select the category of the image you want to use from the **Category** drop-down list.

4 Select the name of the image you want to use from the **Name** list.

5 Click **OK**.

The image you picked appears within the polygon as shown below.



6 Reposition the image, if necessary, by clicking and dragging it, using the arrow keys, or using the arrow buttons on the palette.

Once the image is placed properly, you may want to use the Brushes tool to make the image look more natural. You might also want to use the Side-by-Side feature to compare the modified image with the original image.

Adding an Image to the Library

You can add images from the following sources to the Image Library:

- You can add patient images that are already in your Dolphin database
- You can import images from your computer

To add an image to the Image Library using the Edit dialog box:

1 Select the image you want to add to the Image Library from the Dolphin Imaging main screen.

Usually, you will want to use the intra-oral center image.

2 Click **Edit** to access the Edit dialog box.

3 Select on the tool bar to open the **Image Library** palette.

4 Draw a polygon around the patient's teeth.

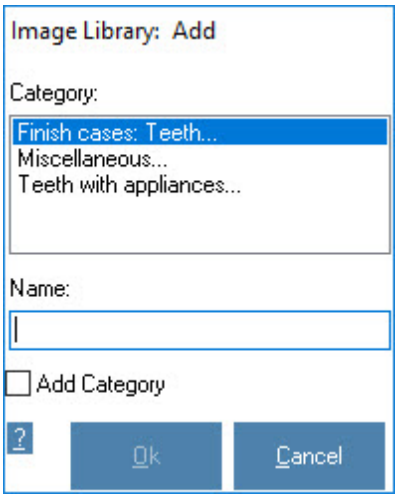
For information on drawing a polygon, see "Selecting an Area of an Image" on page 6-4.

5 Click **Add to Library**.

The Image Library: Add dialog box is displayed:

6 Select the category to which you want to add this image from the **Category** list.

7 Type an image name in the **Name** field, and click **OK**.



Category	Category to which you want to add an image.
Name	Name for this image or image category.
Add Category	Adds a category with the specified name to the Image Library. For more information, see “Adding a Category to the Image Library” on page 6-17.

To add an image to the Image Library directly from the Dolphin Imaging main screen:

1 Right-click the image on the Dolphin Imaging main screen, and select **Add to Image Library** from the **Image** context menu.

Usually, you will want to use the intra-oral center image.

The Image Library: Add dialog box is displayed:

2 Select the category to which you want to add this image from the list.

3 Type a name for this image in the **Name** field, and click **Add**.

To import an image from your computer and add it to the Image Library:

1 Click **Import...**.

2 Select the category to which you want to add this image from the list.

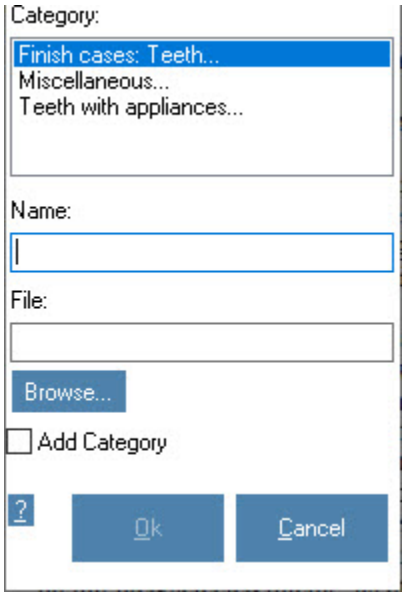
3 Type a name for this image in the **Name** field.

4 Click **Browse...**.

A dialog box opens where you can select the image file to import.

5 Select the folder and image file, and click **Open**.

6 Click **Ok**.



Category	Category to which you want to add an image.
Name	Name for this image or image category.
File	Image file to import into the Image Library.
Browse...	**Browse...:** Navigates to the folder. and file you want to import into the Image Library
Add Category	Adds a category with the specified name to the Image Library. For more information, see “Adding a Category to the Image Library” on page 6-17.

Deleting an Image From the Library

To delete an image from the Image Library:

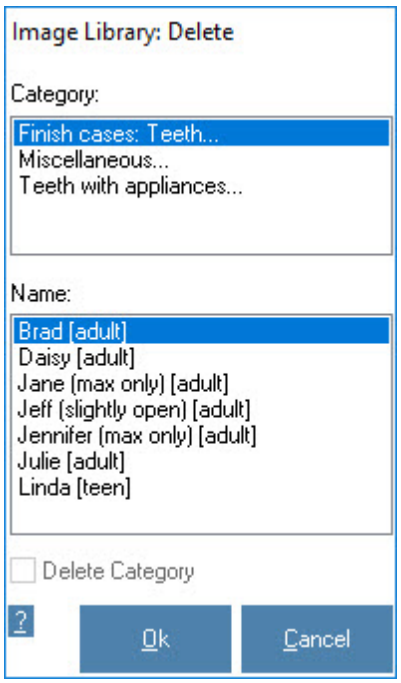
1 Click **Delete** on the **Image Library** palette.

The Image Library: Delete dialog box is displayed.

2 Select the category containing the image you want to delete.

If you wish to delete an image category, you must first delete all the images it contains.

3 Select the image to delete. Then, click **OK**.



Category	Category to delete or from which you want to delete an image.
Name	Images within the selected image category.
Delete Category	Deletes the selected category from the Image Library. Only available if you have deleted all the images in the category.

Adding a Category to the Image Library

To add an image category to the Image Library:

1 Draw a polygon around the patient's teeth, and click **Add to Library** on the **Image Library** palette.

Or,

Click **Import...** on the **Image Library** palette.

For information on drawing a polygon, see "Selecting an Area of an Image" on page 6-4.

2 Type an image category name in the **Name** field.

3 Check the **Add Category** box, and click **OK**.

Deleting a Category From the Image Library

To delete an image category from the Image Library:

1 Delete all the images in the image category.

2 Select the image category from the **Category** list.

3 Check the **Delete Category** box. Then, click **OK**.

Renaming an Image or Category in the Image Library

To rename an image or image category:

1 Click **Rename** on the **Image Library** palette.

The Image Library: Rename dialog box is displayed.

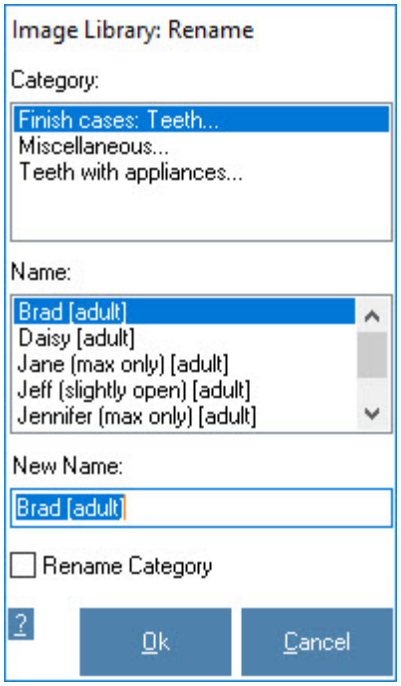
2 Select the category to rename or that contains the image you want to rename.

3 If you want to rename the category, check the **Rename Category** box.

Or,

If you want to rename an image, select the image in the **Name** list.

4 Type a new name for the image or image category name in the **New Name** field. Then, click **OK**.



Category	Category you want to rename or from which you want to rename an image.
Name	Images within the selected image category.

New Name	New name for this image or image category.
Rename Category	Renames the selected category in the Image Library.

Viewing Images in the Library

To view the Image Library:

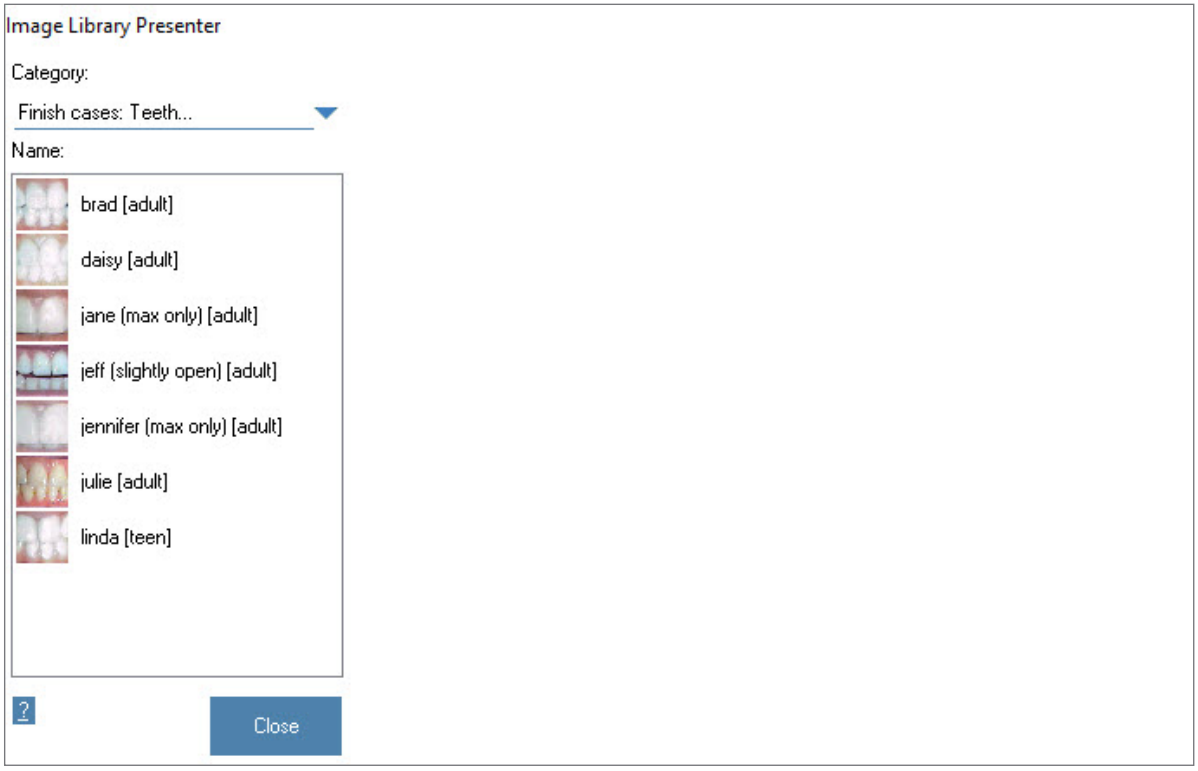
1 On the Dolphin Imaging main screen, select **Image Library** from the **Tools** menu.

The Image Library Presenter dialog box appears.

2 Select the category of images you want to view from the **Category** drop-down list.

3 Select any image in the category to see a close-up view of that image.

4 Click **Close** to close this dialog box.

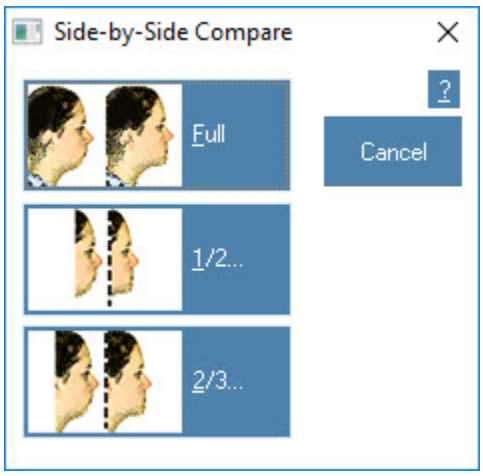


Viewing Two Images Side by Side

To view the modified image side-by-side with the original image:

1 Click on the tool bar.

The Side-by-Side Compare dialog box is displayed:



2 Select the amount of the images you want to show.

If you picked **Full**, the two images are displayed side-by-side in the Edit dialog box.

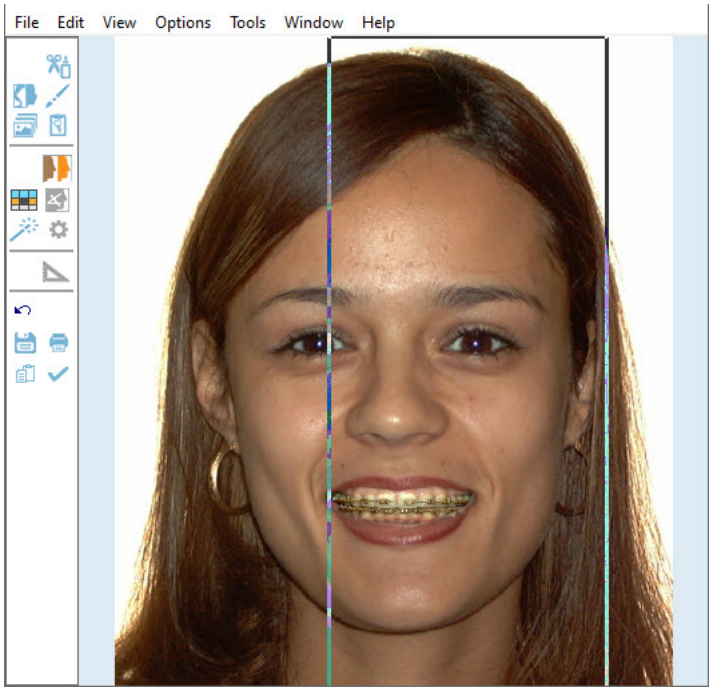
If you picked **1/2...** or **2/3...**, a rectangle appears on the Edit dialog box so that you can select the half or two-thirds of the images you want to view, as shown in the first figure below.

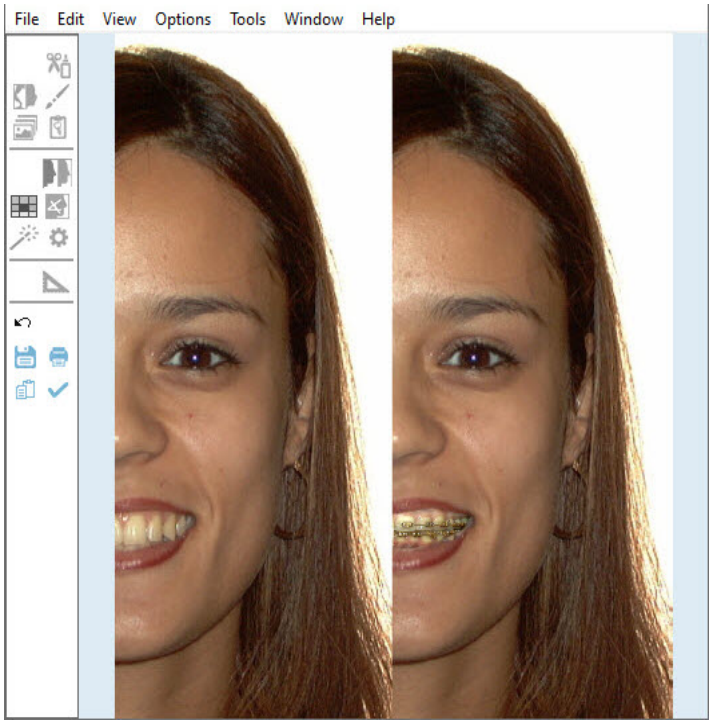
3 If you picked **1/2...** or **2/3...**, click and drag the rectangle to select the part of the images you want to view. Click again to view the two images side-by-side.

The images appear side by side as shown in the second figure below. If you click **Save** at this point, the side-by-side images are saved. For more information on saving edited images, see “Saving a Modified Image” on page 6-22.

4 When you finish viewing the images side-by-side, click the image again.

The original image disappears, and only the image you are editing is displayed.


File Edit View Options Tools Window Help


File Edit View Options Tools Window Help

Saving a Modified Image

To save a modified image:

1 Click on the tool bar.

The Save Image dialog box is displayed.

2 Enter an image title.

3 Select a slot from the **Save As** list in which to save this image, and click **OK**.

Note: *If you are viewing two images side by side when you save, the side-by-side view of the two images is saved.*

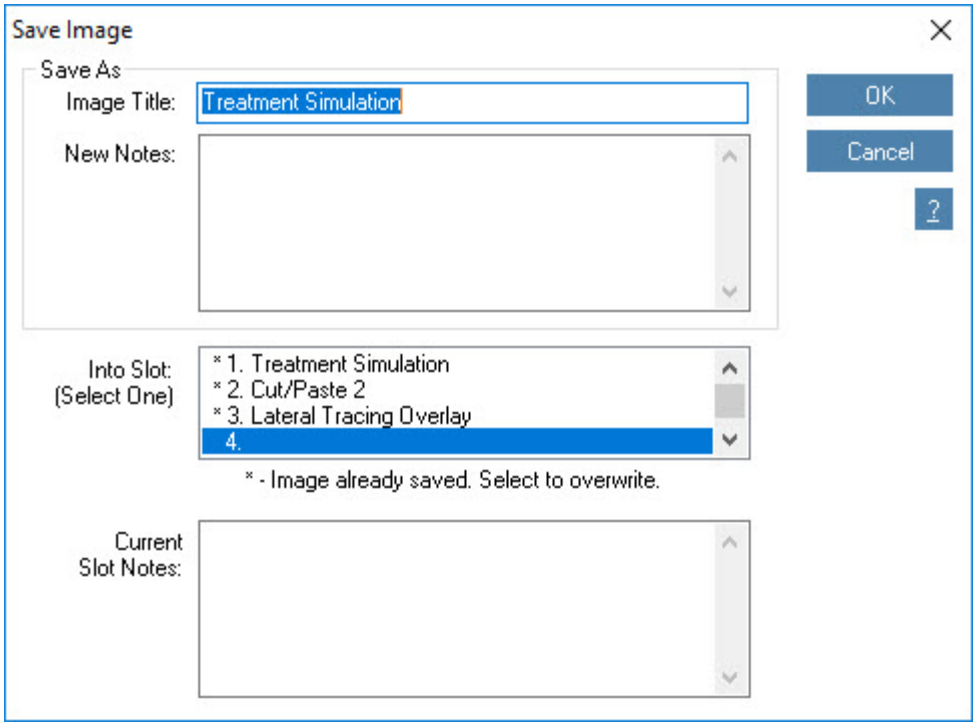


Image Title	Title for this image, up to 25 characters.
New Notes	Optional notes for this image.
Into Slot	Slot in which to save this image. If you select a slot containing an image, the existing image is overwritten with the new image.
Current Slot Notes	Notes entered for the image currently saved in the selected slot.

7 Digitize (Medical Device)

To digitize images, you specify landmarks on the image that are used for cephalometric analyses. Once you have digitized images for a patient, you can easily view measurements for different types of analyses, view skeletal tracings over the image, or print the tracings and measurements. For more information on analyses and landmarks, see Appendix A, Cephalometric Analyses.

Dolphin Imaging can automatically draw the skeletal cephalometric structures. You simply identify some key landmarks, and Dolphin Imaging automatically draws the structures, saving you lots of time. The structures generated are based on statistics of relationships between key landmarks. Therefore, it is very important that you digitize these landmarks accurately.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can only digitize images if your Dolphin Imaging user account has the Digitize and Link X-rays privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Note: *Although Dolphin Imaging provides powerful features to enhance x-ray images, there is no substitute for high-quality original images. Before using Dolphin Imaging for x-ray diagnostics, consult your x-ray system vendor to ensure that you have the best possible quality x-rays.*

Notes for Digitizing Digital X-rays

Traditional film x-rays produce x-rays that are slightly larger than life-size, similar to the way a nearby light source shining on a person creates a larger-than-life-size shadow on a wall. For example, if a patient's skull is physically 200mm, it may show up as 230mm on film. The closer the film plate is to the patient and the farther the x-ray emitter focal point is from the patient, the less magnification is introduced. Since traditional cephalometric research was done with tracing paper over film, traditional norms are based on these enlarged sizes, not on actual patient size.

Digital x-ray systems that have a ruler embedded at mid-line distance in the head-holder nose piece do not introduce this magnification. The ruler is magnified along with the patient, so if you calibrate Dolphin using the nose piece ruler, you get actual, non-magnified results. The following list provides ruler lengths for some popular digital x-ray systems.

Digital X-Ray System	Ruler
GE/Instrumentarium Orthoceph OC100 D, Orthopatomograph - OP100 D	50 mm long, where each large graduation is 5 mm
Planmeca Dimax, Dixi	45 mm long, where each large graduation is 5 mm
Sirona ORTHOPHOS/Sidexis	50 mm long, where each large graduation is 5 mm

Kodak/Practice Works/Trophy	The Nasion bar has 4 ball bearings spaced 10 mm apart, making 40 mm total

When possible, we recommend arranging the Nasion bar so that the entire ruler length is visible in the x-ray image. This is because a longer distance between ruler points will result in greater accuracy of scaling. For instance, if a ruler with 10 large graduations is visible in the x- ray image, with each large graduation being equal to 5 millimeters, the top-most and bottom-most graduations would be equal to 50 millimeters. You would then enter a value of 50 mm in the **Ruler Length** field of the Digitize Setup dialog box when starting a digitizing session.

If you are using an indirect digital x- ray system such as Gendex/DenOptix or Air techniques/ScanX, it may be necessary to affix a rod or wire of a known length to the x-ray machine so that it appears in the image. Then, you can enter its length in the **Ruler Length** field of the Digitize Setup dialog box. Alternatively, if you know the Dots Per Inch (DPI) setting used by your digital x-ray system, you can select **DPI** as your calibration method on the Digitize Setup dialog box and enter the appropriate value.

Since the traditional literature was based on magnified films, you may want to re-introduce the magnification to your digital system. This is a step backward, but allows digital images to match the old, magnified film images from the research literature. Also, if you want to overlay an old film x-rays with a new digital x-rays, you need to magnify the new digital x-rays to match the old film x-rays. To re-introduce film magnification to your digital images, you need to determine the magnification percentage of your old film system so that you can adjust your digital images to match.

You can do this in one of the following ways:

- Contact the manufacturer of the film system, and ask them what magnification it introduces into x-rays.
- Measure the “X-ray to Object Distance” (XOD), which is the distance from the focal point of the x-ray emitter to the midline of the patient head holder. Measure the “Object to Film Distance” (OFD), which is the distance from the patient midline to the film plate. The magnification percentage is calculated at OFD / XOD x 100.
- Take a metal calibration ruler (like the one in Planmeca's system), or even a piece of bracket wire of a known length. Attach it to the nose holder at patient midline. Take a traditional film x-ray. Develop the film, and measure the ruler image on the resulting film. The magnification percentage is the 100 * (measured / actual - 1). For example, if a 45mm ruler shows up as 51.75mm on film, then the magnification percentage is 100 * (51.75 / 45 - 1) = 15%.

Once you have determined the magnification percentage of your old film system, you can make the appropriate adjustment when digitizing your digital x-rays. For example, assume that the film magnification is 15%, and your digital x-ray system has a built-in 45mm ruler. When digitizing in Dolphin, you should specify that the ruler length is 45 + 15% = 45 * 1.15 = 51.75mm. If you have already digitized digital images that do not have this magnification correction, you can update them by completing the following steps:

1 On the Digitize Setup dialog box, select **Existing Session (Add/Modify Points)**.

2 Change the **Ruler Length** field to the adjusted measurement (for example, from 45 to 51.75 mm).

3 Click **Save Settings** to save your changes.

4 Click **Start Digitize**.

5 On the Digitize dialog box, click **OK** to save your work without actually re-digitizing any points.

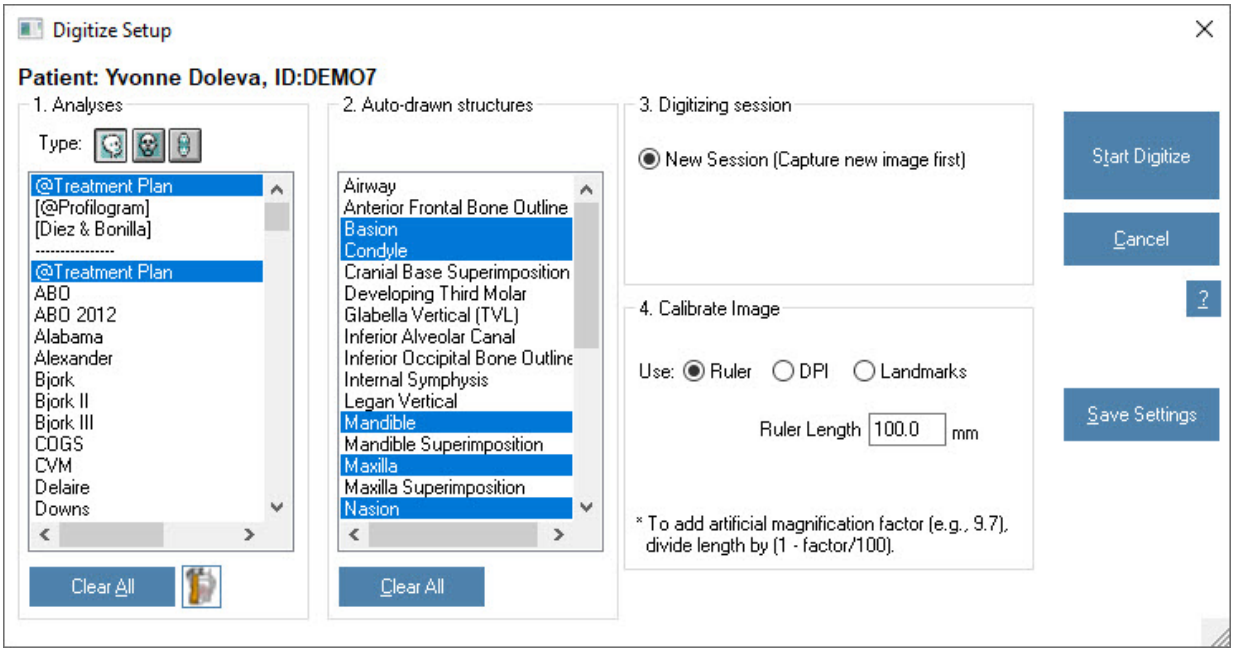
Digitize Setup

Before you begin digitizing images, you need to:

- Select a patient using the Patient Lookup dialog box, as described in Chapter 4, Patient Charts.
- Select a timepoint for the selected patient. You can select a timepoint on the Patient Lookup dialog box, the Patient Charts dialog box, or on the Dolphin Imaging main screen (described in Chapter 3, The Dolphin Imaging Main Screen).
- Select the image that you want to digitize.

  Note: *If you have Dolphin 3D and you have built x-rays from a 3D volume, the x-rays are built using several different rendering methods. All the resulting x-ray images are saved together in a single image layout slot on the Dolphin Imaging main screen. You can choose this group of images and digitize them. For more information on building x-rays from a 3D volume, see Chapter 21, Build X-rays.*

Then, access the Digitize Setup dialog box by clicking Digitize on the Dolphin Imaging main screen.



Patient	Currently selected patient.
1. Analyses	Type of image and analyses to digitize. **Type icons:** Type of analyses you want: : Lateral x-ray digitizing. : Frontal x-ray digitizing. : Model arch digitizing using the Bolton arch analysis. **Analysis:** Analyses of the type you chose. An at-sign (@) indicates a Dolphin-proprietary analysis and square brackets ([ ]) indicate a custom analysis created for a specific doctor, practice, or institution. All other analyses are standard analyses. For more information, see “Standard and Dolphin-proprietary Analyses” on page A-1 and “Notes on Frequently Used Analyses” on page A-9. **Clear All:** Deselects all analyses. : Opens the Custom Analysis Editor so you can create your own analysis. For more information, see Chapter 18, Custom Analysis Editor (Medical Device).
2. Auto-drawn structures	Structures to trace automatically for this analysis. Dolphin Imaging generates the landmarks necessary to draw the selected structures automatically.
3. Digitizing session	Type of digitizing session: **New Session (Capture new image first):** Capture the image, then digitize it. **New Session:** Digitize a previously captured image, clearing any points previously digitized. Typically, you use this option. **Existing Session (Add/modify points):** Add or modify points on an image that’s already digitized. Only available if you already have a digitized image for this patient. Dolphin Imaging retains any custom structures and updates any automatically drawn structures.

4. Calibrate Image	Image calibration to use: **Ruler:** Scales the x-ray using the Dolphin calibration ruler. To use this option, a Dolphin calibration ruler must have been placed on the scanner when the x-ray was captured or a piece of metal of a specific length can be placed next to the patient when using digital x-ray systems to take x-ray images. This is the default and recommended option. ***Note:*** *If you do not have a Dolphin calibration ruler, you can contact Dolphin to obtain one. Alternatively, you can place a semi-transparent object with a fixed size, such as a small piece of paper, on the scanner when you scan the x-ray image.* **Ruler Length:** Length of the ruler you are using. Defaults to the correct value for a Dolphin calibration ruler. See “Notes for Digitizing Digital X-rays” on page 7-1 for information on the ruler lengths to enter for digital x-ray systems. **DPI:** Scales the image using its dots-per-inch (DPI) setting. Enter a DPI if you do not want to use the DPI calibration setting stored with the image when it was scanned. **Landmarks:** Scales the x-ray using landmarks. Use this option if the ruler was not placed on the scanner when the x-ray was captured. You must manually measure the relevant distances (Tip of Nose to ST Pogonion, Porion to Orbitale) in millimeters to generate accurate tracings.
Start Digitize	Starts the digitize process.
Save Settings	Saves the settings you have selected in this dialog box.

Beginning Digitizing

To begin digitizing an image:

1 In the Ceph Analyses group box, select an analysis type icon.

2 Select one or more analyses from the **Ceph Analysis** list.

The selection bar indicates each analysis you have selected. To deselect a selected analysis, click it again. To deselect all selected analyses, click **Clear All**.

For more information on the available analyses, see “Standard and Dolphin-proprietary Analyses” on page A-1.

3 Optionally, select any structures that you want Dolphin Imaging to draw automatically from the **Auto Drawn Structures** list.

Note: *Even though automatically drawing structures is designed to be as efficient as possible, please remember that, similar to cephalometric analysis, the more structures you select for Dolphin Imaging to draw, the more landmarks you will need to digitize.*

Typically, you would select the analyses and structures you usually need when you first begin using Dolphin Imaging and save those settings using the Save Settings button. From that point, whenever you access the Digitize Setup dialog box, those analyses and structures are automatically selected.

4 In the Digitizing Session group box, select the digitize method you want to use.

5 In the Calibrate Image group box, select the method you want to use to calibrate the image.

Ruler is the default and recommended option.

6 Click **Save Settings** to save your settings so that Dolphin Imaging will remember them the next time you digitize an image.

7 Click **Start Digitize**.

Depending on the digitize session you chose, you should continue with one of the following procedures:

- If you chose **New Session (Capture new image first)**, the Capture Setup dialog box appears (see Chapter 5, Capture). After you finish capturing the image, the Digitize dialog box is displayed (see “Digitize Landmarks” below).
- If you chose **New Session** or **Existing Session (Add/modify points)**, the Digitize dialog box is displayed (see “Digitize Landmarks” below).

Digitize Landmarks

Once an image is captured, you can digitize the image to generate the analyses. You use the Digitize dialog box to digitize landmarks on the image.

Note: *If you are digitizing x-rays built from a 3D volume, you can view the image created using each of the rendering methods. Press* **F8** *on your keyboard to switch among the different rendering methods. If you continue pressing* **F8***, Dolphin will cycle through all the x-rays, enabling you to compare x-ray images created from the 3D volume using different rendering methods.*

For definitions of the landmarks, see “Cephalometric Landmarks” on page A-2. For information about specific analyses, see “Notes on Frequently Used Analyses” on page A-9.

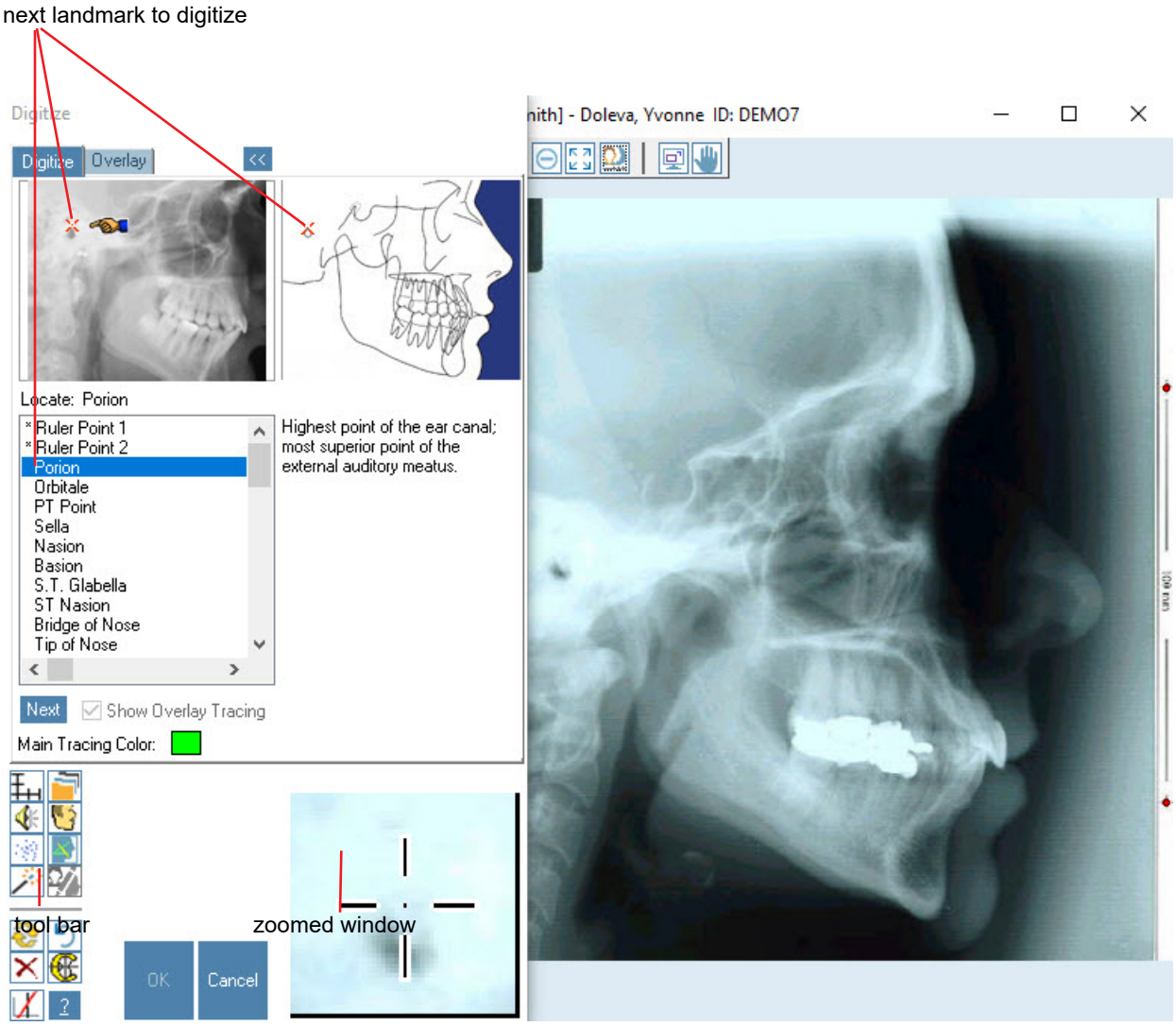


Image	Image you are currently digitizing.
>> or <<	Toggles display of the selected landmark's description.
zoomed window	Close-up of the current mouse position on the patient's image so you can see more detail.
Digitize	Options for digitizing landmarks: **Visual Cues:** Location of the current landmark using a red X and a pointer. **Landmarks:** Landmarks that you need to digitize for this analysis. For definitions of the landmarks, see "Cephalometric Landmarks" on page A-2. **Next:** Goes to the next landmark in the list that you haven't already digitized. **Show Overlay Tracing:** Shows the overlay tracing while digitizing the image. For more information, see "Overlaying an Existing Tracing" on page 7-18. **Main Tracing Color:** Color to use for the tracing structures.

Overlay	Options for overlaying a tracing from another timepoint on the patient's image. Overlaying an existing tracing can provide a shortcut to digitizing the landmarks for this image. **Timepoint/Record:** Select a timepoint containing a tracing to overlay on the patient's image. **Overlay Display:** Displays the overlay tracing. **Color Sample:** Color to use for the overlay tracing. **Structures Only:** Displays only the structures (no landmarks) on the overlay tracing. **Analysis:** Analysis for the overlay tracing. **Transfer Calibration:** Transfers the calibration of the overlay tracing to the current image in order to match the scale of the tracing and image. For more information, see “Transferring Calibration From the Overlay Tracing” on page 7-22. **Transfer Structures:** Opens a menu of structures you can transfer from the overlay tracing to this image. For more information, see “Transferring Structures From the Overlay Tracing” on page 7-22. **Align Tracings:** Specify how to align the overlay tracing with the image. For more information, see “Scaling and Aligning the Overlay Tracing” on page 7-19.

Digitize Tool Bar Buttons

	Opens a menu for displaying and configuring a symmetry ruler on the image. For more information, see “Using the Symmetry Ruler” on page 7-16. **Show Symmetry Ruler:** Specifies display options for the symmetry ruler. • **None:** Don’t display a symmetry ruler. • **Horizontal:** Display a horizontal symmetry ruler. • **Vertical:** Display a vertical symmetry ruler. • **Both:** Display a horizontal and vertical symmetry ruler. **Ruler Length:** Sets the length of the symmetry ruler in millimeters. Select **Full Length** to set the ruler length to the full width and/or height of the image. **Link Ruler To:** Positions the center of the ruler at the specified landmark.
	Opens the original records window. For more information, see “Using the Original Records Window” on page 12-25.
	Toggles the audio cues.
	Toggles the display of the patient’s x-ray image.
	Toggles display of the calculated landmarks.
	Toggles the display of the patient’s tracing.
	Opens the Enhance tool. For more information, see “Enhancing an Image” on page 5-16.

	Returns the image to its original, un-enhanced appearance.
	Refreshes the calculated landmarks and automatically drawn structures after you have modified points.
	Undoes the previous operation.
	Omits the current landmark.
	Opens the Custom Structures feature to so that you can manually draw structures or modify the automatically drawn structures.
	Aligns the image to a reference plane. For more information, see “Aligning the Image to a Reference Plane” on page 9-5

Digitizing Landmarks

To digitize landmarks:

1 Zoom in on the image, if necessary, so that the landmarks are clearly visible.

To zoom in, click on the zoom and align tool bar, press **F2**, or place your mouse pointer over the image and use your mouse wheel.

2 Optionally, overlay an existing tracing for this patient on the patient's image as described in “Overlaying an Existing Tracing” on page 7-18.

If you have already digitized an image for this patient (for example, for another timepoint), you can overlay that tracing on the patient's image. Then, you can use that tracing as a guide in digitizing the patient's image.

Depending on the patient's treatment, many of the digitized landmarks may be the same across several timepoints. In this case, using a tracing from an earlier timepoint as a digitizing guide may save time.

3 Using the visual cues and the **Landmarks** list as a guide, click each landmark.

When you click a landmark on the image, the highlighter in the Landmarks list automatically moves to the next landmark. You can manually move the highlighter by:

- clicking **Next**
- clicking a landmark in the list
- placing your mouse pointer over the Digitize palette and using your mouse wheel

If you don’t want to digitize a particular landmark, highlight it and click .

As you go through the list of landmarks, the selection bar in the **Landmarks** list indicates the current landmark. If you are unfamiliar with a landmark’s location, the cartoon and description of the landmark provide a guide. If you make a mistake, right-click and select **Undo** from the context menu to undo the last digitized points,

For definitions of the landmarks, see “Cephalometric Landmarks” on page A-2.

If you are familiar with the landmarks, using the audio cues may make digitizing go faster. Rather than looking at the **Landmarks** list or the cartoon, an audio cue will guide you through the list of landmarks. Also, you can also click **>>** and **<<** to view or hide a description of the selected landmark.

Note: *If you have difficulty seeing how the molars occlude in the patient's x-ray, you may find it helpful to open an original records window and display the patient's right buccal photo. For information on using the original records window, see "Using the Original Records Window" on page 12-25.*

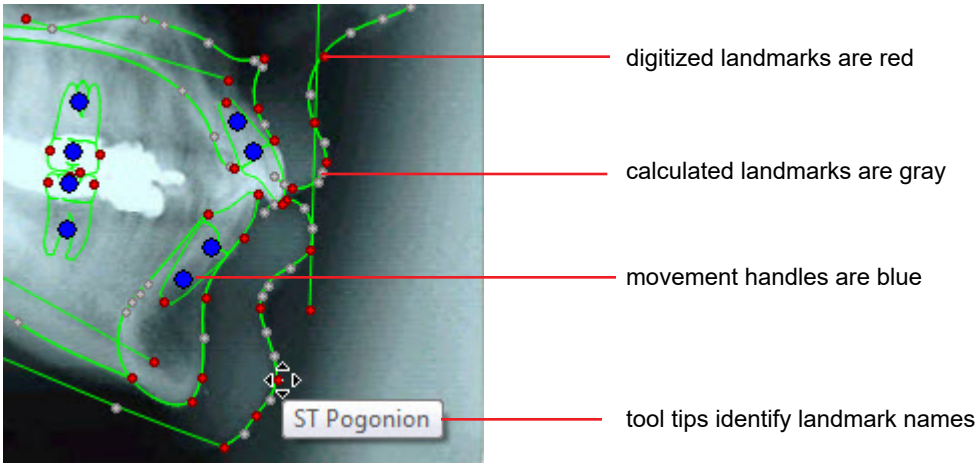
If you selected any structures for Dolphin to draw automatically ("Auto Structures"), those structures are drawn immediately when you digitize the required landmarks. You can modify these structures by clicking and dragging the associated landmarks on the Digitize dialog box. You can also refresh the structures by right-clicking and selecting **Refresh All Structures** from the context menu.

4 For each image that you digitize, check each of the key components and results to ensure accuracy.

The following table lists some common key components to be aware of in orthodontic analyses:

After Digitizing...	Check...	Other landmarks involved
Soft tissue pogonion	E-Plane (Aesthetic plane or Nose-chin line)	Tip of nose
Gonion	Mandibular Plane	Menton
Mesial L6	Posterior bite	Mesial U6

The Dolphin Imaging program does not automatically check the validity of the landmark locations. You must verify that the landmarks are placed properly by you or your technician. If you briefly hold and "hover" your mouse at a digitized landmark, a tool tip displays the landmark's name to help you verify the landmarks you have digitized.



As shown above, manually digitized landmarks appear in red. Landmarks automatically calculated by the Dolphin Imaging program are gray. In addition, a calculated landmark has an asterisk (*) in its tool tip. The movement handles, which enable you to move the outlines of the teeth, are blue.

You can review and modify the calculated landmarks and automatically generated structures.

When you finish digitizing all the landmarks, the selection bar in the **Landmarks** list is on **<<end of list>>**.

5 Click **OK** to save the digitized image and return to the Dolphin Imaging Main Screen.

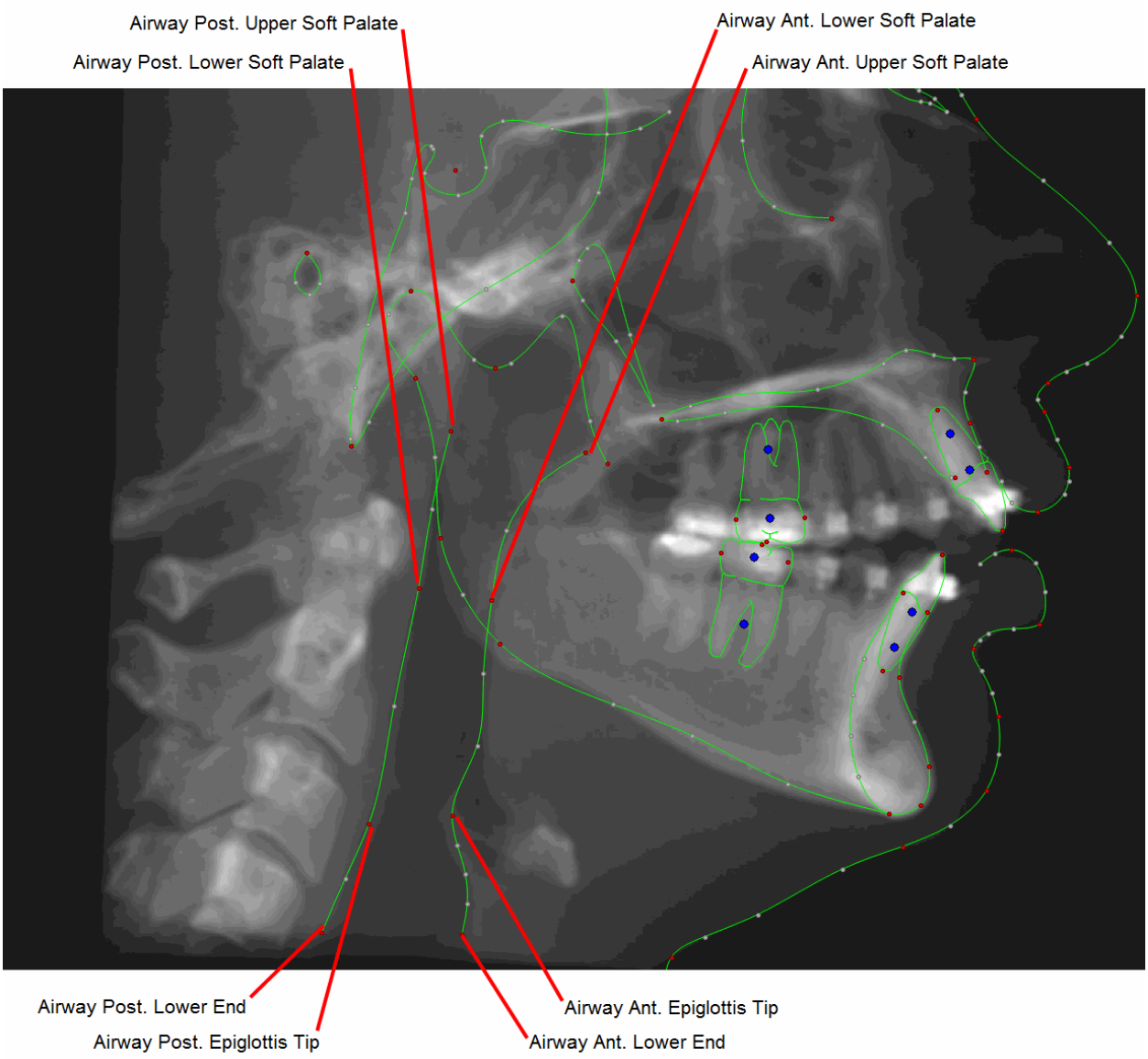
Or,

Click on the tool bar to add custom tracings to the digitized image.

Digitizing the Airway

Some analyses include points that you can digitize to delineate the patient's airway. As you digitize one of these analyses, horizontal lines appear on the patient's image to help you locate the airway points. Once you have digitized the airway points, you can do treatment planning that takes the patient's airway into account.

The following figure illustrates the digitized airway points for the @Treatment Plan analysis.



Digitizing Study Models

Dolphin Imaging offers arch analyses that you can use to digitize study models.

To digitizing a study model image:

1 In the Ceph Analyses group box, click .

The arch analyses are selected automatically in the **Ceph Analysis** list.

2 In the Digitizing Session group box, select **New Session (Capture new image first)** if you have not captured a study model image yet.

Or,

Select **New Session** if you already have captured a study model image.

3 In the Calibrate Image group box, select the method you want to use to calibrate the image.

Ruler is the default and recommended option.

4 Click **Start Digitize**.

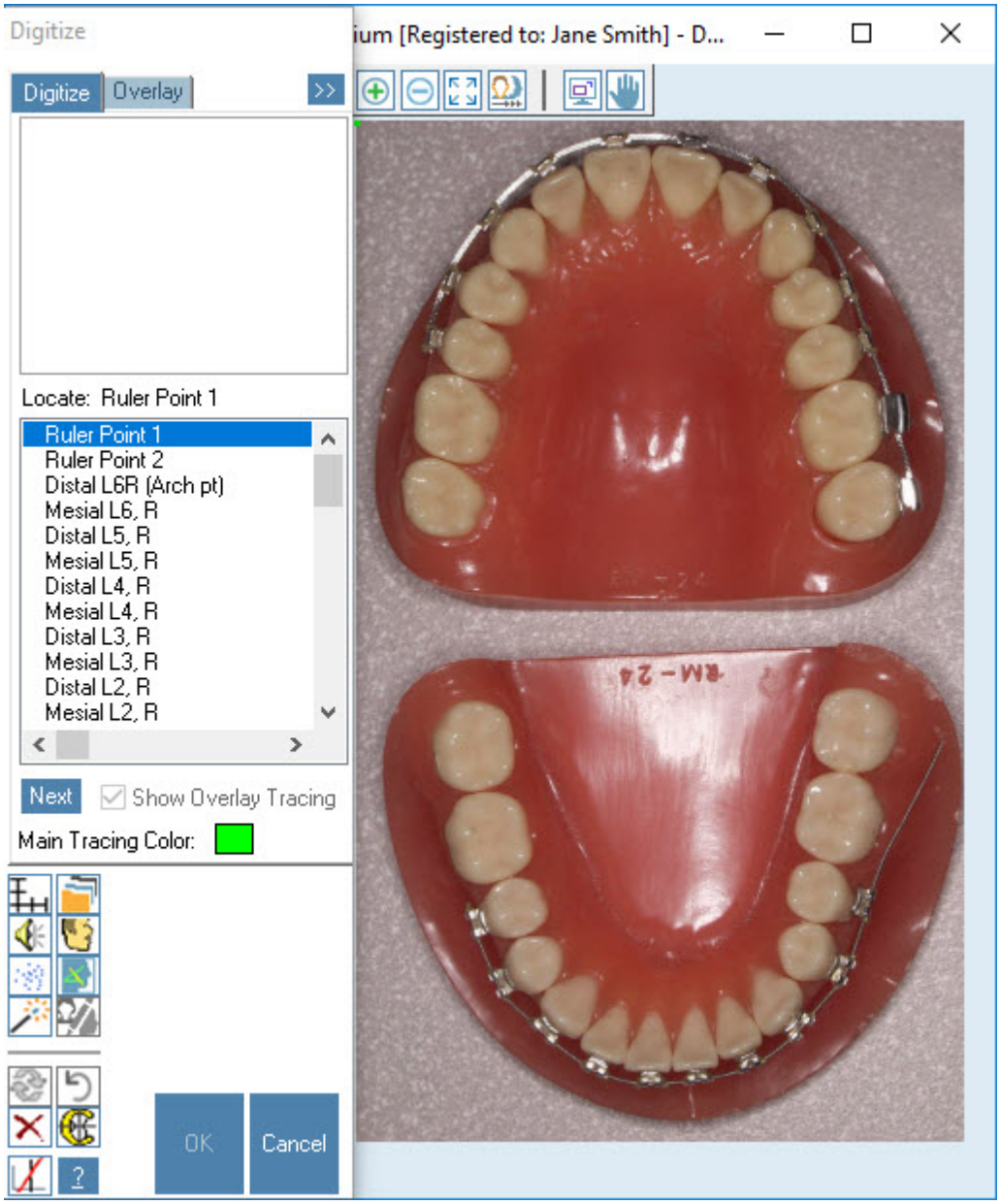
Depending on the digitize session you chose, you should continue with one of the following procedures:

- If you chose **New Session (Capture new image first)**, the Capture Setup dialog box appears. See “Capturing Study Model Images” on page 5-36 for information on capturing a study model image. After you finish capturing the image, the Digitize dialog box is displayed.
- If you chose **New Session** or **Existing Session (Add/modify points)**, the Digitize dialog box is displayed.

5 Zoom in on the image, if necessary, so that the landmarks are clearly visible.

6 Using the visual cues and the **Landmarks** list as a guide, click each landmark.

7 Click **OK** to save the digitized image and return to the Dolphin Imaging main screen.



Changing a Landmark's Location

To change the location of a landmark:

1 Click the landmark in the **Landmarks** list.

Or,

Press the UP ARROW key until the selection bar in the list is over the landmark name.

A pair of intersecting dotted lines appears on the digitized image to identify the landmark selected in the **Landmarks** list.

2 Click the correct location for the landmark.

Alternatively, you can simply click and drag the landmark to a new location.

Note: *If you change the location of any of the points on a digitized image, Dolphin changes the location of the associated landmark.*

When you move landmarks, the curve changes in different ways depending on the color of the point:

- When you click and drag a red point (a digitized landmark), the curve and all the gray points between it and the next red point move to accommodate the new location of the red point you are moving.
- When you CTRL+click and drag a red point, only the red point moves. The adjacent gray points do not move.
- When you click and a gray point (a calculated landmark), only the curve adjacent to that point moves. The adjacent gray and red points do not move.

To recalculate after moving a landmark:

1 Click on the tool bar.

The Dolphin Imaging program recalculates the calculated landmarks and automatically generated structures.

Moving and Rotating the Tooth Outlines

To move a tooth outline:

1 Move the mouse over the blue movement handle for the tooth outline you want to move.

When the mouse is over a movement handle, the mouse pointer changes to small triangles surrounding the handle.

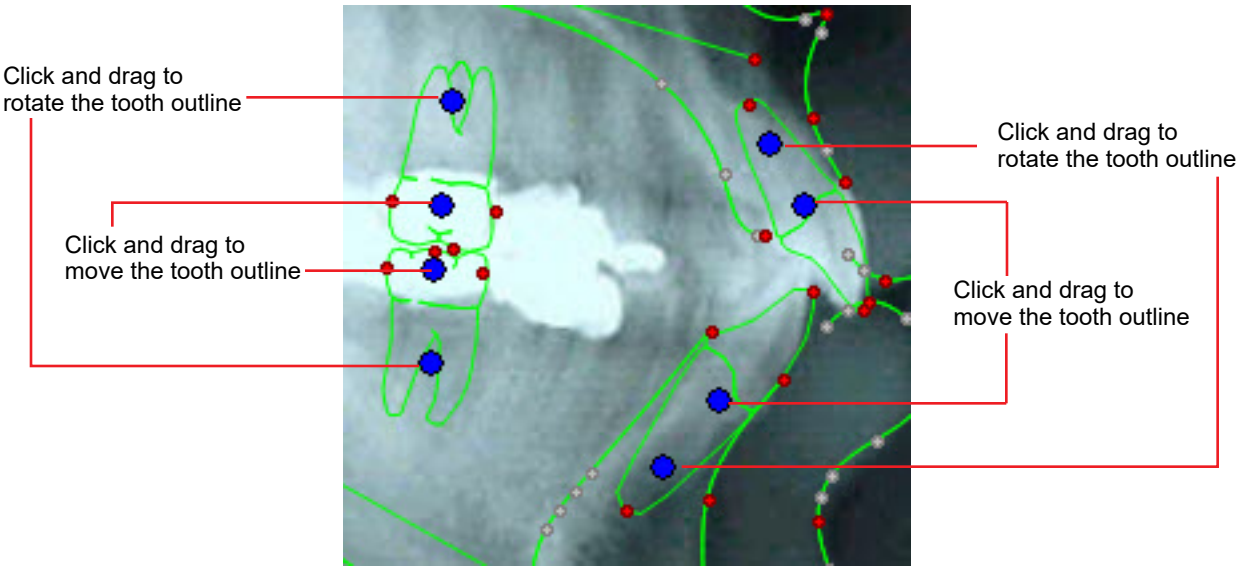
2 Click and drag the tooth outline to a new location.

To rotate a tooth outline:

1 Move the mouse over the blue rotation handle for the tooth outline you want to rotate.

When the mouse is over a rotation handle, the mouse pointer changes into a rotation icon surrounding the handle.

2 Click and drag the tooth outline to rotate it.



Note: *Moving and rotating tooth outlines can be especially useful in conjunction with the Overlay Tracing feature. With this feature, you can transfer tracings from any pre-treatment cephalogram to a progress or post-treatment cephalogram, thus creating the new tracings with a minimum of effort. During treatment, however, the teeth are likely to move. By moving and/or rotating the entire tooth outline, you can easily move the teeth from their location on the pre-treatment tracing to the correct progress or post-treatment location.*

Using the Symmetry Ruler

To display a symmetry ruler on the image:

1 Click on the Digitize tool bar.

2 Select **Show Symmetry Ruler** from the menu that appears.

3 Select **Horizontal** to display a horizontal symmetry ruler.

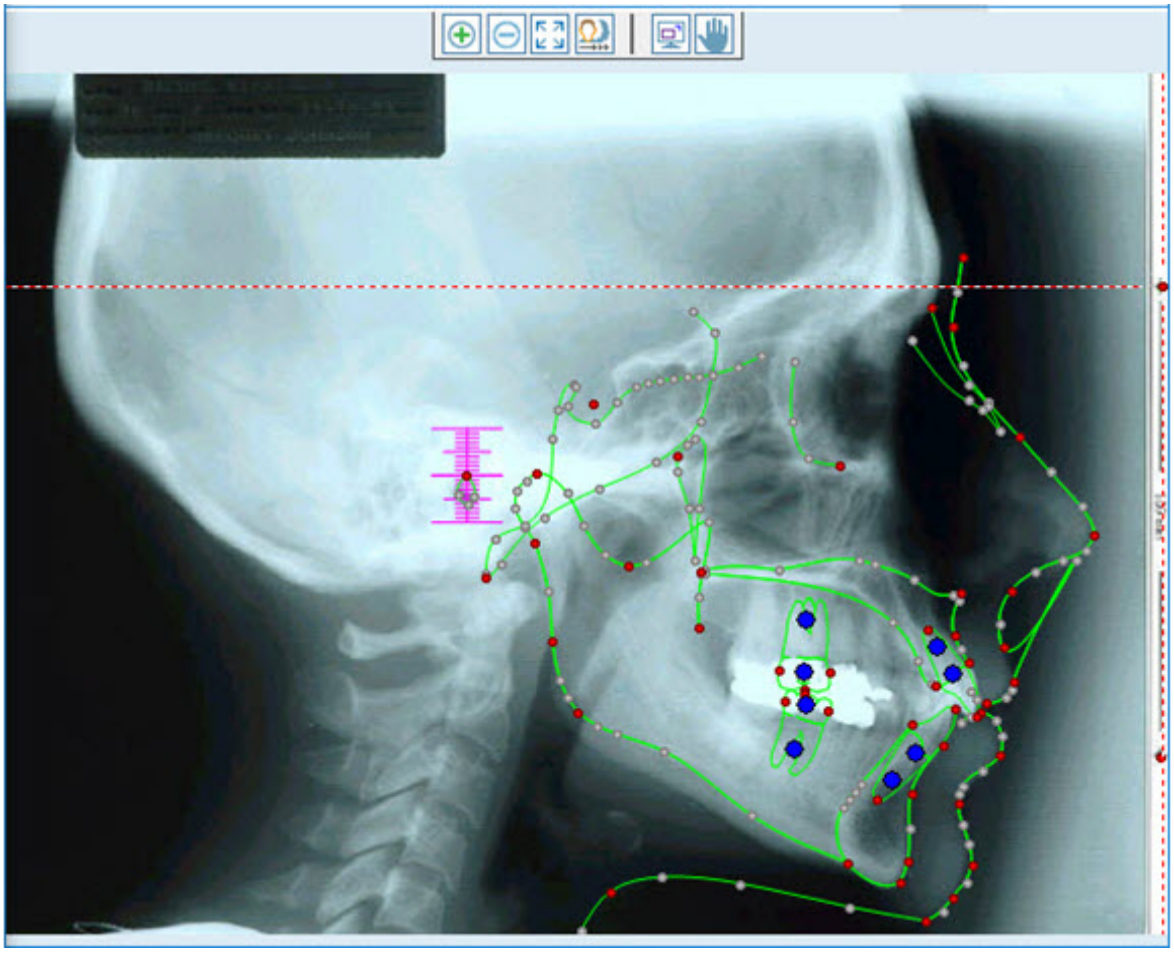
Or,

Select **Vertical** to display a vertical symmetry ruler.

Or,

Select **Both** to display a horizontal and vertical symmetry ruler.

The symmetry ruler you selected appears on the image.



To change the symmetry ruler's length:

1 Click on the Digitize tool bar.

2 Select **Ruler Length** from the menu that appears.

3 Select the length of the symmetry ruler in millimeters.

Or,

Select **Full Length** to set the ruler length to the full width and/or height of the image.

To change the symmetry ruler's location:

1 Click on the Digitize tool bar.

2 Select **Link Ruler To** from the menu that appears

3 Select the landmark that you want at the center of the ruler.

To remove the symmetry ruler from the image:

1 Click on the Digitize tool bar.

2 Select **Show Symmetry Ruler** from the menu that appears.

3 Select **None** to remove the symmetry ruler from the image.

Overlaying an Existing Tracing

If you have already digitized an image for this patient (for example, you have digitized an x-ray for another timepoint), you can select that tracing and overlay it on the current image. Once you have correctly aligned the existing tracing over the image, you can transfer structures from the existing tracing to the image.

This feature is particularly useful to construct before and after treatment digitized images. For example, suppose you have created a timepoint called Initial that contains images for the patient taken before beginning treatment. These initial images include a digitized x-ray. Then, you treated the patient, created a timepoint called Final, and took images (including an x-ray) to record the treatment result. On the patient's x-ray, the landmarks and structures affected by the treatment would change. However, some of the landmarks and structures may have remained the same. To simplify digitizing the final x-ray, you could overlay the tracing for the initial x-ray and transfer all the structures that did not change to the final x-ray. Then, you would only need to digitize the landmarks that changed.

Selecting the Overlay Tracing

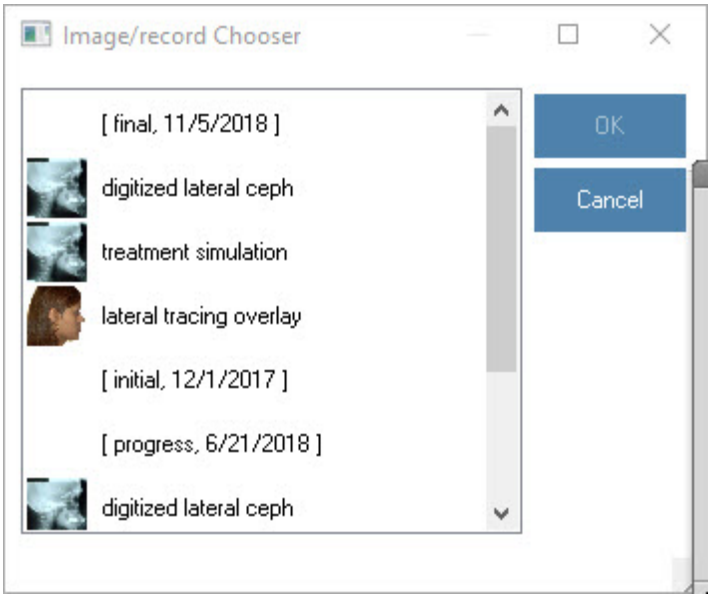
Before you can overlay an existing tracing, you must digitize calibration points on the patient's image. For example, if you are using the ruler to calibrate your image, you must digitize the Ruler Point 1, Ruler Point 2, and the first two landmarks (typically Porion, and Orbitale) before you click the **Overlay** tab. Similarly, if you are using landmarks to calibrate your image, you must digitize the Tip of Nose, ST Pogonion, Porion, and Orbitale before you click the **Overlay** tab.

To select the overlay tracing:

1 Click the **Overlay** tab.

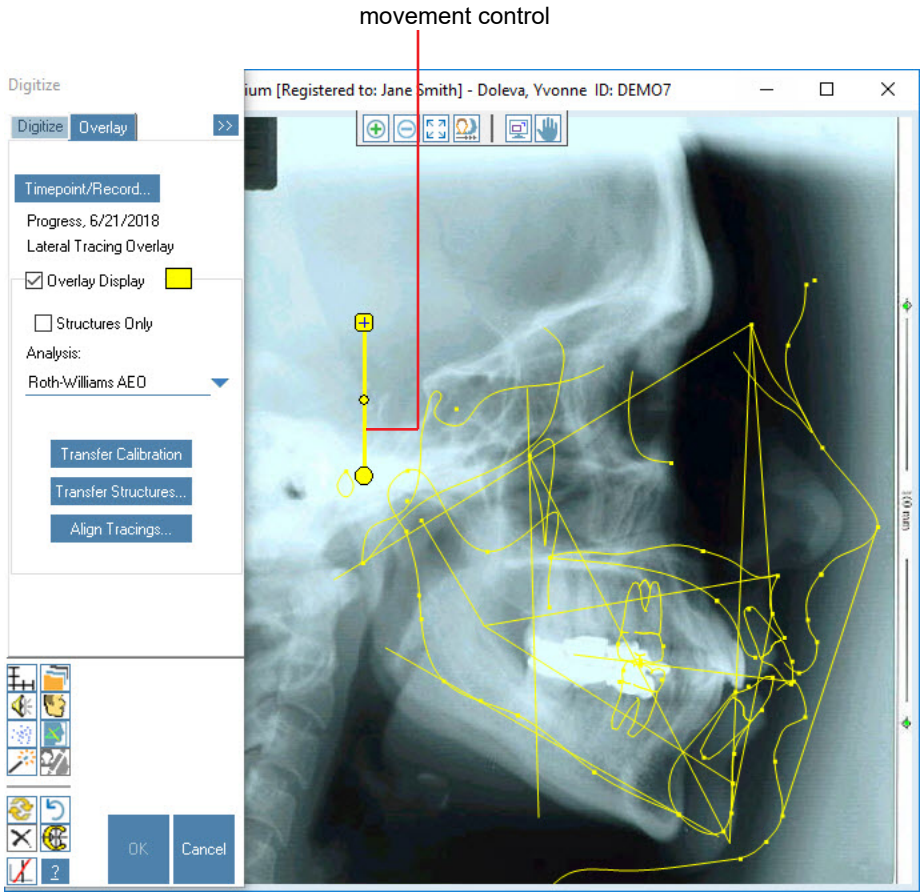
2 On the **Overlay** tab, click **Timepoint/Record**.

The Image/Record Chooser dialog box is displayed.



3 Select the image with the tracing overlay on the patient's image. Then, click **OK**.

The tracing for the image that you selected appears over the current image, along with a movement control that you can use to resize and/or rotate the tracing.



To overlay the tracing for a different analysis:

1 On the **Overlay** tab on the Digitize palette, select the analysis for the tracing to overlay from the **Analysis** drop-down list.

Scaling and Aligning the Overlay Tracing

After you have chosen the overlay tracing, you must align it with the x-ray image. If the tracing is not to the same scale as the x-ray, you can first scale it so that it matches. Once the tracing and x-ray are scaled the same, you can align them using the following mechanisms:

- You can click and drag the tracing to align it over the patient's image.
- You can use the movement control to resize and/or rotate the tracing relative to the patient's image.
- You can use digitized landmarks to align the tracing if you have digitized some landmarks on this x-ray.

To click and drag the tracing to align it to the x-ray:

1 Place your mouse cursor anywhere on the tracing except the movement control.

The cursor appears as a hand icon ( ).

2 Click and drag to move the tracing in any direction.

You can also press the arrow keys on your keyboard to move the tracing.

To resize the tracing:

1 Place your mouse cursor over the box at the top of the movement control.

The cursor appears as a rotation icon ( ).

2 Click and drag the box up to enlarge the tracing.

Or,

Click and drag the box down to reduce the size of the tracing.

You can also enlarge the tracing by pressing SHIFT+UP ARROW or reduce its size by pressing SHIFT+DOWN ARROW.

To rotate the tracing:

1 Place your mouse cursor over the smaller dot at the center of the movement control.

The cursor appears as directional arrows ( ).

2 Click and drag the movement control to place the small box at its center at the location around which you want to rotate the tracing. For example, if you want to rotate the tracing around the Porion, place the small box at the center of the movement control over the Porion.

3 Place your mouse cursor over the box at the top or the larger dot at the bottom of the movement control.

The cursor appears as a rotation icon ( ).

4 Click and drag to rotate the tracing.

Bear in mind that if you use the box at the top of the movement control, the tracing may change size as well as rotate.

You can also rotate the tracing by pressing CTRL+LEFT ARROW or CTRL+RIGHT ARROW.

To use digitized landmarks to align the tracing:

1 On the **Overlay** tab of the **Digitize** palette, click **Align Tracings**.

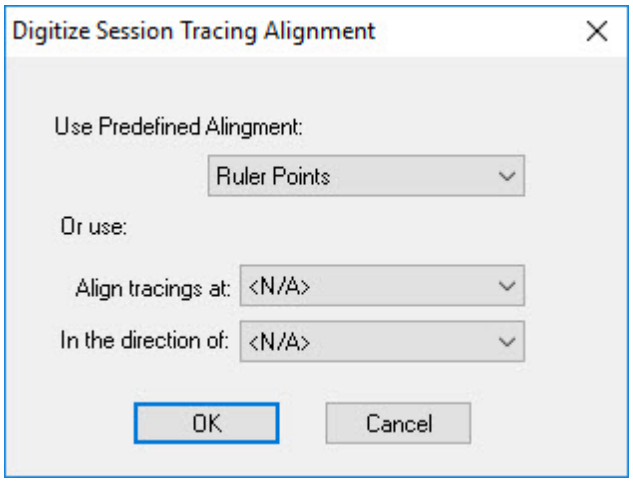
The Digitize Session Tracing Alignment dialog box opens with options for aligning the tracing to the image using digitized landmarks.

2 Select a pre-defined alignment from the **Use Predefined Alignment** drop-down list.

Or,

Create a custom alignment by selecting landmarks from the **Align Tracings At** and **In the Direction Of** drop-down lists.

The tracing is aligned with the image according to the option you selected.



Use Predefined Alignment	Predefined alignment to use to align the tracing with the image. The options depend on the landmarks that you digitized.
Align tracings at	Landmark to use to align the tracing with the image. Typically, you would choose a landmark whose location did not change. The options depend on the landmarks that you digitized for the x-ray. For example, if you have digitized the Porion, you can select this landmark to align the tracing and image. In this case, Dolphin Imaging places the tracing's Porion landmark directly on top of the Porion landmark you digitized on the x-ray.
In the direction of	Landmark to use as the second point on the axis along which you want to align the tracing and image. The options depend on the landmarks that you have digitized. For example, suppose you digitized the Porion and Orbitale on the x-ray, and you selected **Porion** as the landmark at which to align the tracing and image. You could then select **Orbitale** in this drop-down list to define an alignment axis running between the Porion and Orbitale. In this case, Dolphin Imaging places the tracing's Porion landmark directly on top of the Porion landmark you digitized on the x-ray. Dolphin Imaging then rotates the tracing relative to the x-ray so that the Orbitale landmarks are either on top of each other (if this landmark did not move) or in line with each other (if this landmark did move).

Transferring Calibration From the Overlay Tracing

Once you have scaled and aligned the overly tracing, you can transfer the calibration from the overlay tracing to the x-ray image. Once you have transferred the calibration, it is recommended that you do not change the size of the overly tracing.

To transfer the calibration:

1 On the **Overlay** tab of the **Digitize** palette, click **Transfer Calibration**.

2 On the confirmation dialog box that appears, click **Yes**.

Transferring Structures From the Overlay Tracing

Once you have aligned the tracing with the image, you can transfer one or more structures from the tracing to the image.

To transfer a structure from the overlay tracing to the image:

1 On the **Overlay** tab of the **Digitize** palette, click **Transfer Structures...**.

A menu opens listing options for transferring structures from the overlay tracing to the image.

2 Select a structure from the list to transfer it from the overlay tracing to the image.

To transfer all listed structures from the overlay tracing to the image:

1 On the **Overlay** tab of the **Digitize** palette, click **Transfer Structures...**.

A menu opens listing options for transferring structures from the overlay tracing to the image.

2 Select **All (Below)** to transfer all listed structures from the overlay tracing to the image.

To identify a specific group of structures to transfer from the overlay tracing to the image:

1 On the **Overlay** tab of the **Digitize** palette, click **Transfer Structures...**.

A menu opens listing options for transferring structures from the overlay tracing to the image.

2 Select **Choose Group from List**.

The **Transfer Structures Selection** dialog box opens.

3 Click each structure to transfer in the **Complete List**.

Or,

Click **Select All** below the **Complete List** list to select all the listed structures.

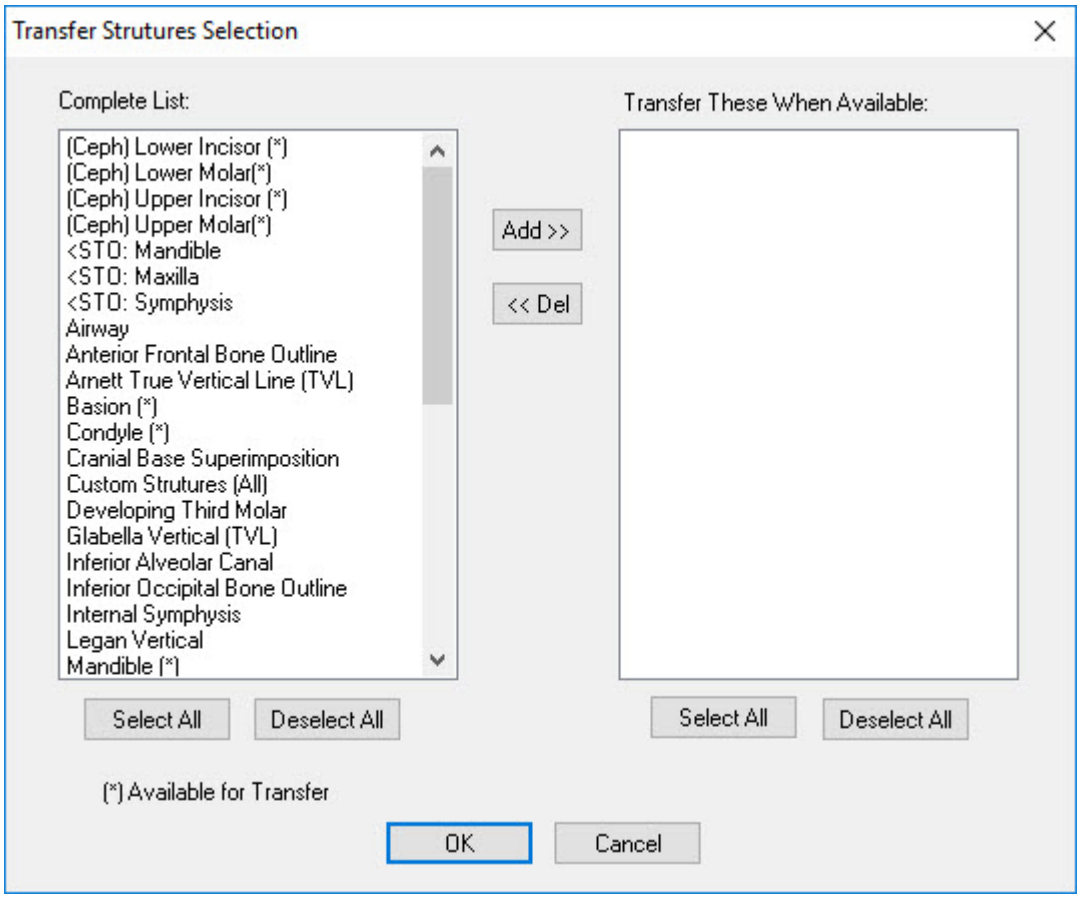
4 Click **Add>>** to move the selected structures from the **Complete List** list to the **Transfer These When Available** list.

The selected structures move to the **Transfer These When Available** list.

If you make a mistake, you can click one or more structures in the **Transfer These When Available** list and click **<<Del** to move them back to the **Complete List**.

5 Click **OK** to transfer the structures listed in the **Transfer These When Available** list from the overlay tracing to the image.

Dolphin Imaging transfers all the identified structures that are available on the overlay tracing to the image.



Complete List	Structures that you may be able to transfer from the overlay tracing to the image. Structures identified with an asterisk (*) are available for transfer from the overlay tracing to the image.
Transfer These When Available	Structures to transfer from the overlay tracing to the image if they are available on the tracing.
Add>>	Moves structures selected in the **Complete List** to the **Transfer These When Available** list.
<<Del	Moves structures selected in the **Transfer These When Available** list to the **Complete List**.
Select All	Selects all the structures in the associated list.
Deselect All	Deselects all the structures in the associated list.

Custom Structures

Using the Auto-Drawn Structures feature on the Digitize Setup dialog box, you can specify the skeletal cephalometric structures that you want Dolphin Imaging to draw automatically. Using this feature can save you a lot of time, because you simply identify some key landmarks, and Dolphin Imaging automatically draws the structures. For more information on how to use this feature, see “Digitize Setup” on page 7-3.

If you want to add custom structures, you can trace them manually as described in this section.

Note: *The Dolphin Imaging program uses an advanced mathematical technique called “piece-wise cubic splines.” Using a spline, you can easily create complex curves as though they were done manually by a professional. The result is very smooth and accurate curves that do not look like computer-generated jagged lines. If you are familiar with a similar technique, the Bezier curve, splines are much easier to use from the user’s perspective.*

Tracing Custom Structures

To trace custom structures:

1 After digitizing the landmarks, click on the tool bar.

The **Custom Structures** palette replaces the **Digitize** palette.

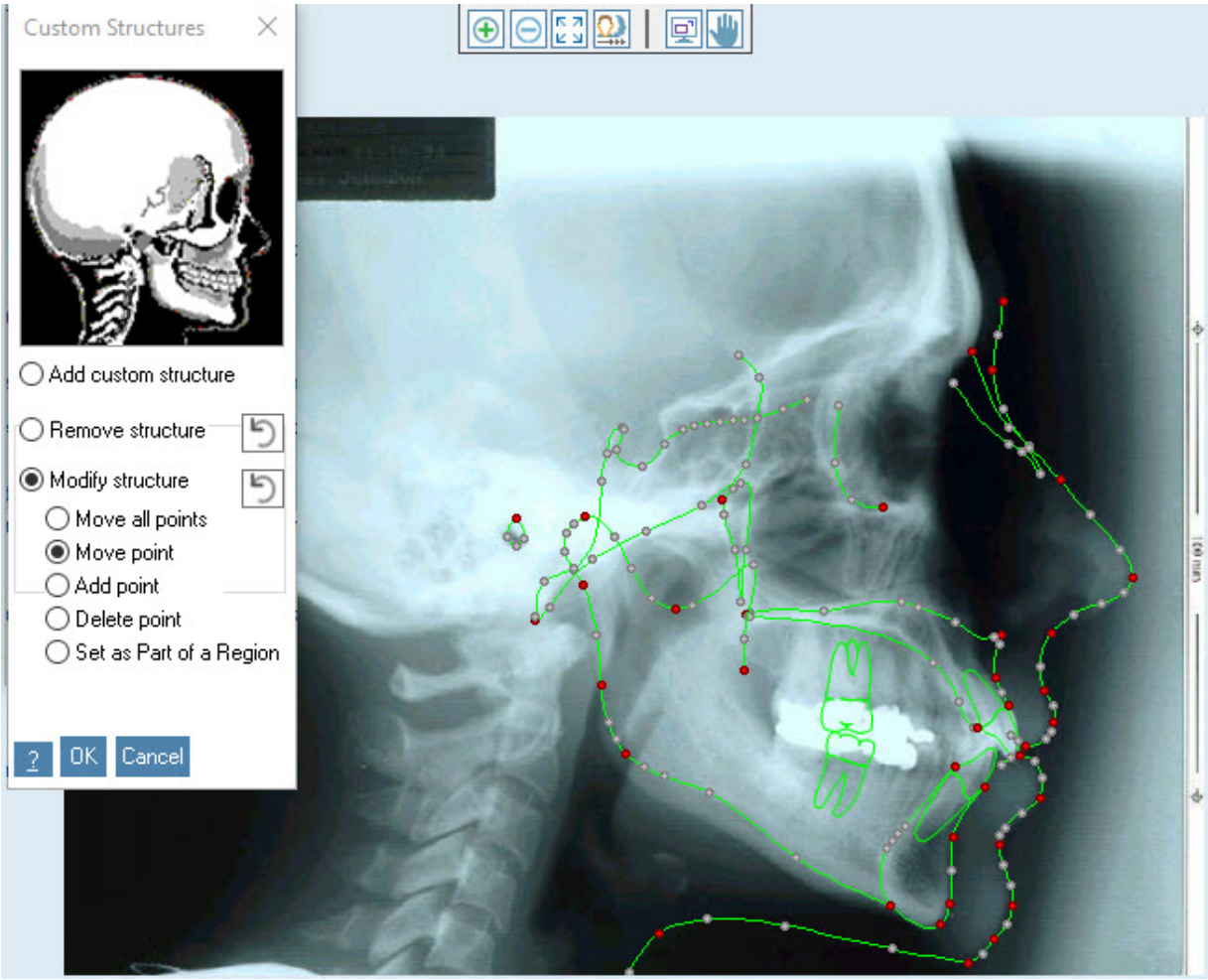


Image	Image on which you are tracing structures.
Add custom structure	Adds structures to your tracing (see below).
Remove structure	Removes structures from your tracing (see “Removing a Custom Structure” on page 7-26).

Modify structure	Modify a structure on your tracing: **Move all Points:** Moves all the points on one spline, moving the spline to a new location without changing its shape (see “Moving a Custom Structure” on page 7-27). **Move Point:** Moves a single point on a spline, changing its shape (see “Adding, Moving, and Deleting Points” on page 7-27). **Add Point:** Adds a point to a traced structure, changing its shape (see “Adding, Moving, and Deleting Points” on page 7-27). Only available for manually added structures. **Delete Point:** Deletes a point from a traced structure, changing the shape of the spline (see “Adding, Moving, and Deleting Points” on page 7-27). Only available for manually added structures. **Set as Part of a Region:** Identifies a structure as part of the maxilla, part of the mandible, part of the profile, or none of these.

To add a custom structure:

1 Select **Add Custom Structure**.

2 Click the point where you want to begin tracing.

3 Move the mouse to begin tracing.

As you move the mouse, you’ll see a line extending from the point to the current mouse position.

4 Click whenever you want to place a point and change the direction of the line.

If you make a mistake, right-click to undo to the last point you placed.

5 Double-click to complete the tracing line.

6 When you finish tracing structures, click **OK**.

Alternatively, you can click and drag the mouse to draw the tracing line without placing points. Using this method, you may be able create a smoother line. However, you may find it more difficult to draw the line. In addition, undoing is more cumbersome, since this method effectively creates many points and line segments in the tracing.

Note: *The Dolphin Imaging program internally keeps track of which structures were automatically generated and which are custom. Automatically generated structures appear as solid lines, while custom structures appear as dotted lines. These distinctions are especially important for the Treatment Simulation program.*

Removing a Custom Structure

To remove a structure:

1 Select **Remove Structure**.

2 Move the mouse over one of the points on the structure.

An **X** appears over that point, and all points on the curve turn red.

3 Click to remove the traced structure.

If you are removing an automatically generated structure, a dialog box asks you for confirmation.

4 If you are removing an automatically generated structure, click **Yes** to confirm the deletion.

Moving a Custom Structure

To move a structure:

1 Select **Modify Structure**.

2 Select **Move all Points**.

3 Move the mouse over one of the points on the structure.

Small triangles surround the point, and all points on the curve turn red.

4 Click and drag the structure to a new location.

Adding, Moving, and Deleting Points

To add a point on a custom structure:

1 Select **Modify Structure**.

2 Select **Add Point**.

3 Move the mouse to the location on a line where you want to add a point.

The mouse pointer turns into an up arrow.

4 Click and drag the mouse to the location where you want the new point to be.

When you click the line, the new point appears in red surrounded by small triangles. As you drag the mouse, the line changes shape to accommodate the new point's location.

To move a point:

1 Select **Modify Structure**.

2 Select **Move Point**.

3 Move the mouse over one of the points on the structure.

Small triangles surround the point, and the point turns red.

4 Click and drag the point to a new location.

The line changes shape to accommodate the point's new location.

To delete a point on a custom structure:

1 Select **Modify Structure**.

2 Select **Delete Point**.

3 Move the mouse over one of the points on the structure.

An **X** appears over that point, and the point turns red.

4 Click to delete that point.

Identifying the Region for a Structure

To identify a custom structure as part of a region:

1 Select **Modify Structure**.

2 Select **Set as Part of a Region**.

Labels appear on the custom structures.

3 Place your cursor over a custom structure's label, and click when an up-arrow appears.

4 Select the region to which the structure belongs.

Exiting from Custom Structures

To exit from Custom Structures:

1 Click **OK**.

The custom tracings are saved, and the **Digitize** palette replaces the **Custom Structures** palette.

8 Measurements (Medical Device)

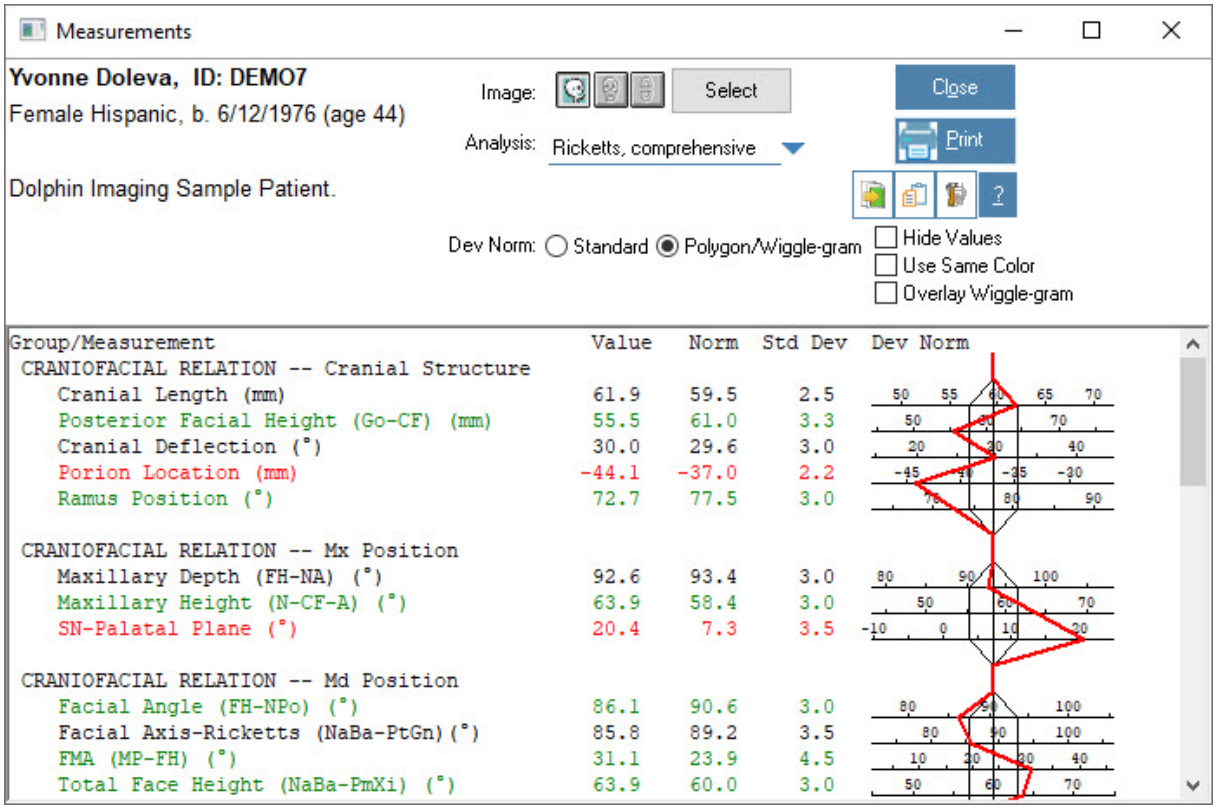
After you have digitized cephalometric landmarks for a patient (see Chapter 7, Digitize (Medical Device)), you can view detailed measurements from the tracings. Before you view measurements, you need to select a patient for whom you have digitized images using the Patient Lookup dialog box (see Chapter 4, Patient Charts). Then, you can access the Measurements dialog box.

To open the Measurements dialog box:

1 Click Meas on the Dolphin Imaging main screen.

Or,

Click on the tool bar on the Edit or Treatment Simulation dialog boxes.



The Measurements dialog box contains the following sections:

Patient summary	Information about the selected patient (see “Patient Summary” below).
Display options	Image, analysis, and format for the measurements display. For more information, see “Display Options” on page 8-2.
Measurements	Measurements for the image and analysis selected using the display options. For more information, see “Measurements” on page 8-3.
Other Options	Buttons for other operations, such as exporting or printing the measurements table. For more information, see “Other Options” on page 8-5.

Patient Summary

The patient summary part of the Measurements dialog box lists:

- The patient’s name and patient ID
- The patient’s gender and racial category (if specified as described in Chapter 4, Patient Charts).
- The patient’s birth date and age.

Yvonne Doleva, ID: DEMO7
Female Hispanic, b. 6/12/1976 (age 40)

Dolphin Imaging Sample Patient.

Display Options

The display options part of the Measurements dialog box is illustrated below:

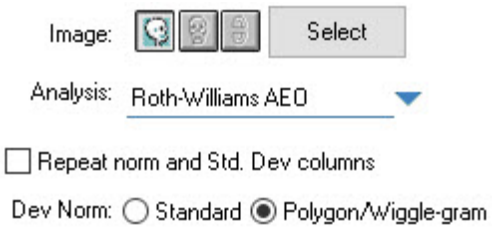
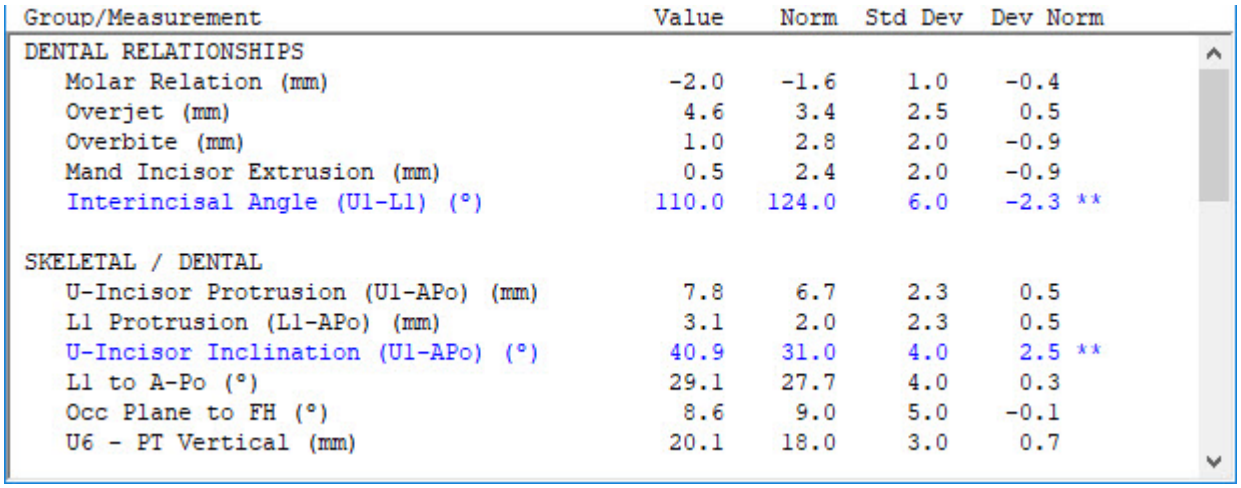


Image buttons	Type of image you want to use: : Lateral x-ray digitized image. : Frontal x-ray digitized image. : Model arch digitized image.
Select	Opens the Image/record Chooser dialog box where you can select one or more images with tracings to use to create the measurements table.

Analysis	Analyses that you selected when you digitized the selected image(s) along with any other analyses that can be computed using the landmarks you digitized.
Repeat norm and Std. Dev. columns	Displays a **Norm** and **Std Dev** column for each image you selected to include in the measurements table. If this box is not checked, only the **Value** and **Dev Norm** columns appear for each selected image. For more information on the columns in the table, see “Measurements” below.
Dev Norm	Options for displaying deviations from the norms: **Standard:** Displays deviations as a numerical list. **Polygon/Wiggle-gram:** Displays deviations graphically using a red line. By default, the red line wiggles left for measurements below the norm and right for measurements above the norm.

Measurements

The measurements part of the Measurements dialog box using the standard option for displaying norms is illustrated below. The information contained in this list depends on the analysis you chose.

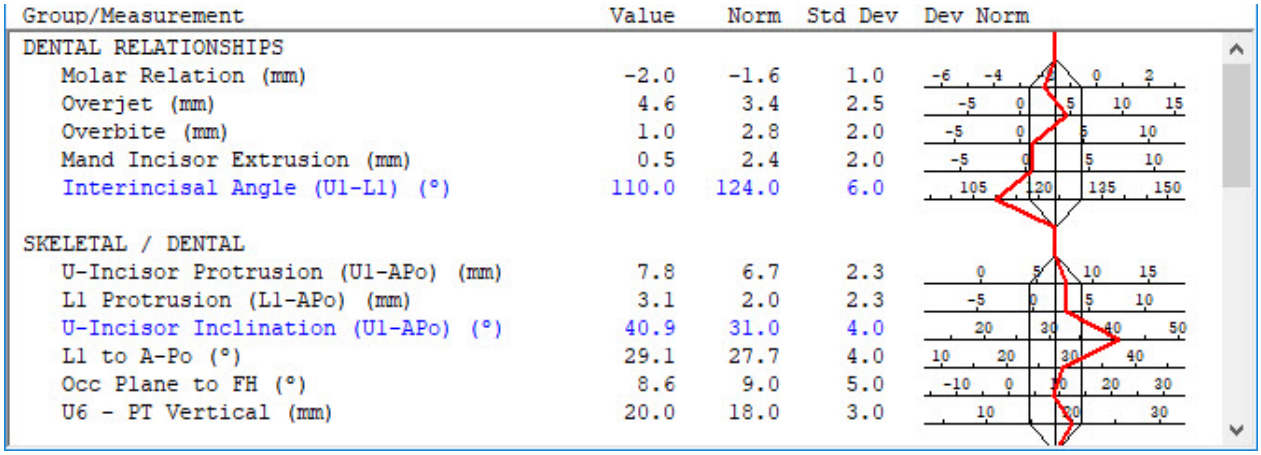


Group/Measurement	Value	Norm	Std Dev	Dev Norm
DENTAL RELATIONSHIPS				
Molar Relation (mm)	-2.0	-1.6	1.0	-0.4
Overjet (mm)	4.6	3.4	2.5	0.5
Overbite (mm)	1.0	2.8	2.0	-0.9
Mand Incisor Extrusion (mm)	0.5	2.4	2.0	-0.9
Interincisal Angle (U1-L1) (°)	110.0	124.0	6.0	-2.3 **
SKELETAL / DENTAL				
U-Incisor Protrusion (U1-APo) (mm)	7.8	6.7	2.3	0.5
L1 Protrusion (L1-APo) (mm)	3.1	2.0	2.3	0.5
U-Incisor Inclination (U1-APo) (°)	40.9	31.0	4.0	2.5 **
L1 to A-Po (°)	29.1	27.7	4.0	0.3
Occ Plane to FH (°)	8.6	9.0	5.0	-0.1
U6 - PT Vertical (mm)	20.1	18.0	3.0	0.7

Group/ Measurement	Measurements for the analysis grouped by type.
Value	Value for each measurement.
Norm	Value considered normal or average for the patient’s age, gender, and racial classification.
Std Dev	Standard deviation, which is a statistical term that indicates the expected variation of data from the norm. For instance, if a measurement has a small standard deviation, the measurements for most patients are expected to be close to the norm. If a measurement has a large standard deviation, it is not expected that most patient's measurement will be close to the norm.

Dev Norm	Patient's deviation from the norm calculated as follows: Dev Norm = (Value - Norm) / Std Dev For example, suppose a patient's value for SNA is 84 degrees, the norm is 82 degrees, and the standard deviation is 3.5. The patient's deviation from the norm would be: (84 - 82) / 3.5 = 0.6 This means this patient is 2 degrees above norm (84 - 82 = 2) for this measurement. Every 3.5 degrees above normal is one standard deviation. So, the patient is 0.57 standard deviations above normal (2 / 3.5 = 0.57) In the measurements table above, 0.57 is rounded up to 0.6.
Measurement listing	Values for each measurement, color coded as follows: **Black:** A deviation less than or equal to 1. **Green:** A deviation greater than 1 and less than or equal to 2. **Blue:** A deviation of greater than 2 and less than or equal to 3. **Red:** A deviation of greater than 3.

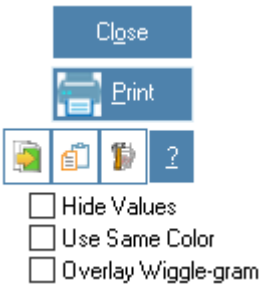
The measurements part of the Measurements dialog box using the polygon option for displaying norms is illustrated below.



Group/Measurement	Value	Norm	Std Dev
DENTAL RELATIONSHIPS			
Molar Relation (mm)	-2.0	-1.6	1.0
Overjet (mm)	4.6	3.4	2.5
Overbite (mm)	1.0	2.8	2.0
Mand Incisor Extrusion (mm)	0.5	2.4	2.0
Interincisal Angle (U1-L1) (°)	110.0	124.0	6.0
SKELETAL / DENTAL			
U-Incisor Protrusion (U1-APo) (mm)	7.8	6.7	2.3
L1 Protrusion (L1-APo) (mm)	3.1	2.0	2.3
U-Incisor Inclination (U1-APo) (°)	40.9	31.0	4.0
L1 to A-Po (°)	29.1	27.7	4.0
Occ Plane to FH (°)	8.6	9.0	5.0
U6 - PT Vertical (mm)	20.0	18.0	3.0

Other Options

The other options available on the Measurements dialog box are illustrated below.



	Prints this analysis (see “Printing the Measurements Table” on page 8-7).
	Exports this analysis (see “Exporting the Measurements Table” on page 8-10).
	Copies the formatted measurement table onto the clipboard with the proper font, color, and column alignment. You can paste the formatted measurement table from the clipboard into Microsoft Office or other applications. In some applications you use “Edit | Paste” and in others “Edit | Paste Special” to paste the formatted measurements table. ***Note:*** *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Archive Save Patients privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*
	Opens the Custom Analysis Editor to create your own analysis. For more information, see Chapter 18, Custom Analysis Editor (Medical Device).
Hide Values	Hides the Value, Norm, and Std Dev columns in the measurements table when using the Polygon/Wiggle-gram view.
Use Same Color	Suppresses the color coding in the measurements table.
Overlay Wiggle-gram	If the table includes measurements from more than one image, overlays the Polygon/Wiggle-grams for all sets of images. Each Polygon/Wiggle-gram’s color matches the color used in the table for the associated set of measurements. By default, a separate Polygon/Wiggle-gram appears for each set of measurements listed in the table.

Selecting Images for the Measurements Table

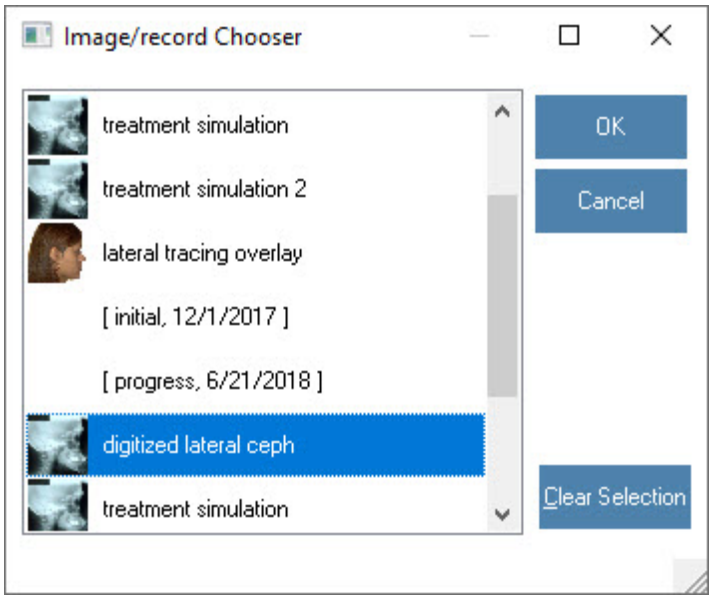
When you initially open the measurements table, the table is created using the cephalometric landmarks and tracings digitized for the current timepoint. If you have digitized images for other timepoints or a treatment simulation, you can easily select one of those images for the measurements table. In fact, you can select more than one image to create a table that compares measurements. For example, you can compare measurements for different timepoints, or you can compare a digitized tracing with a treatment simulation.

To select one or more images for the measurements table:

1 Click the image type icon (, , or) for the type of image(s) you want to use for this measurements table.

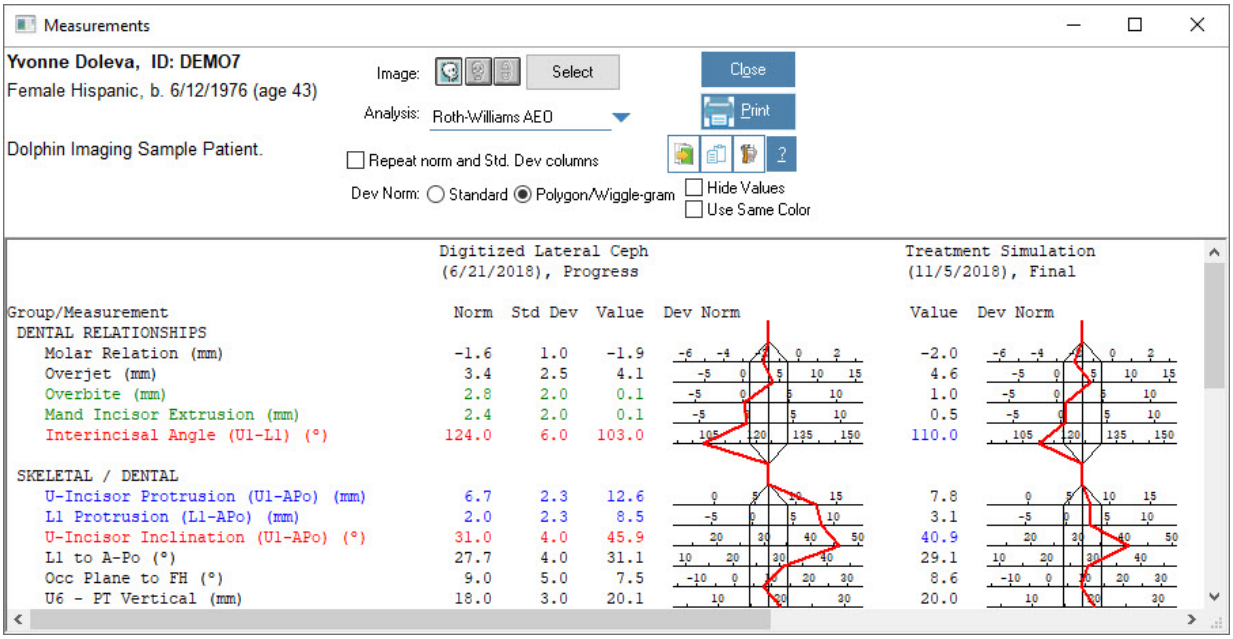
2 Click **Select**.

The Image/Record Chooser dialog box opens and lists images of the type you selected.



3 Select one or more images to use in your measurements table. Then, click **OK**.

The following figure shows a measurements table that compares a digitized lateral cephalometric image with a treatment simulation.Headings at the top of the table identify the image for each set of measurements listed in the table.



Printing the Measurements Table

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Print images, tracings, measurements privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To print the measurement table:

1 Click Print.

The Print dialog box opens.

2 Set any options or properties for the print job. Then, click **OK**.

In addition to the standard Microsoft Windows printing options, Dolphin Imaging offers the following options for printing measurements tables:

Include Tracing	Prints the patient's tracing along with the measurements table.
Preview	Previews the print job (see “Previewing Your Print Job” below).

Previewing Your Print Job

To preview your print job:

1 Check the **Preview** box on the Print dialog box, and click **OK**.

Or,

Select **Print** from the **File** menu. Then, select **Print Preview** from the sub-menu.

A preview of the print job appears in the Dolphin Layout Editor window.

Note: *Any changes you make to the print preview using the Dolphin Layout Editor apply to this print job only. They are not saved to the Dolphin image layout.*

For more information on the options the Dolphin Layout Editor offers, see Chapter 17, Layout Editor.

2 Click to print the print job.

Or,

Select **Exit** from the **File** menu to close this dialog box.

Setting Options for the Table

The print preview offers a context menu that you can use to set options for the measurements table.

To specify the analysis for the table:

1 Right-click the measurements table, and select **Analysis** from the context menu.

2 Select an analysis from the sub-menu.

To toggle display of the polygon/wiggle-gram:

1 Right-click the measurements table, and select **Show Wigglegram** from the context menu.

To toggle display of the measurement values:

1 Right-click the measurements table, and select **Show Values** from the context menu.

Setting Measurement Table Properties

To set properties for the measurements table on the print preview:

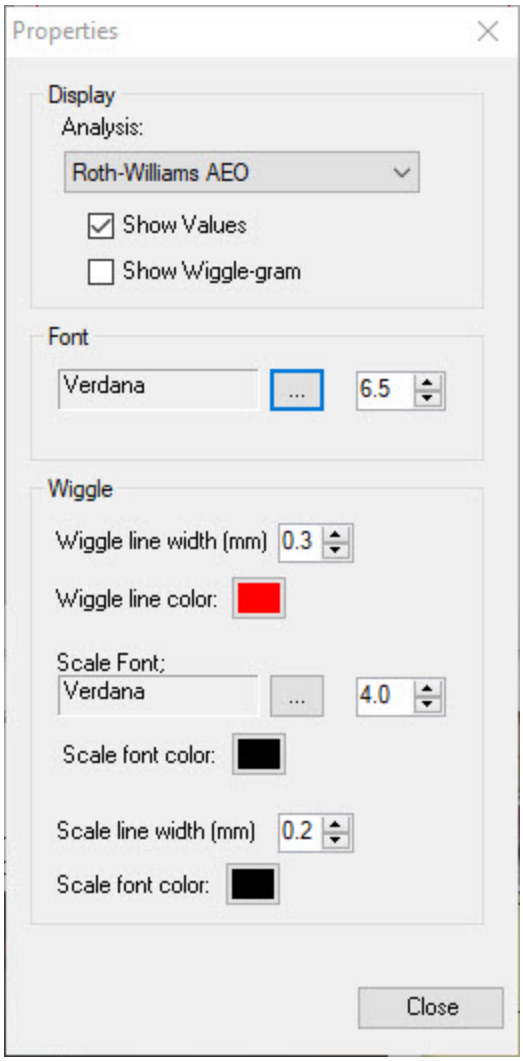
1 Right-click the measurements table, and select **Properties** from the context menu.

Or,

Double-click the table.

The Properties dialog box opens so that you can view and set properties that determine the formatting of the table.

2 Set any properties. Then, click **Close**.



Display	Options for the measurements table: **Analysis:** Analysis to use for the table. **Show Values:** Displays the measurement values on the table. **Show Wiggle-gram:** Displays the polygon/wiggle-gram on the table.
Font	Font to use for the measurements table. **...:** Opens the Font dialog box so you can change the font. For more information, see “Setting Font Options” on page 3-50. **spinner:** Sets the font size.

Wiggle	Options for the polygon/wiggle-gram: **Wiggle line width (mm):** Width in millimeters (mm) for the polygon/wiggle-gram line. **Wiggle line color:** Color for the polygon/wiggle-gram line. **Scale Font:** Font to use for the polygon/wiggle-gram scale. • **...:** Opens the Font dialog box so you can change the font. For more information, see "Setting Font Options" on page 3-50. • **spinner:** Sets the font size. **Scale line width (mm):** Width in millimeters (mm) for the scale line. **Scale font color:** Font color for the polygon/wiggle-gram scale.

Exporting the Measurements Table

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Archive Save Patients privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**Dolphin Management User Guide.PDF** or **DM_Help.chm** in your **C:\Dolphin** folder).*

To export the measurement table:

1 Click .

The Save As dialog box is displayed.

2 Select the directory and file name for the exported file.

3 Select **Tab-Delimited Text File** from the **Save as type** drop-down list.

4 Optionally, check the **Include Header/ Footer** box to include the header and footer that are used when printing the measurements table.

5 Click **Save**.

Batch Exporting Measurements Reports

To export measurements reports for multiple patients:

1 Open the Patient Lookup dialog box (see Chapter 4, Patient Charts).

2 Select the patients for which you want to generate measurements reports from the patient list.

To select several adjacent patients, click the first patient, then SHIFT+click the last patient. To select several non-adjacent patients, click the first patient, then CTRL+click any other patient.

When you select several patients from the patient list, the **OK** button changes to a **Batch** button.

3 Click **Batch**.

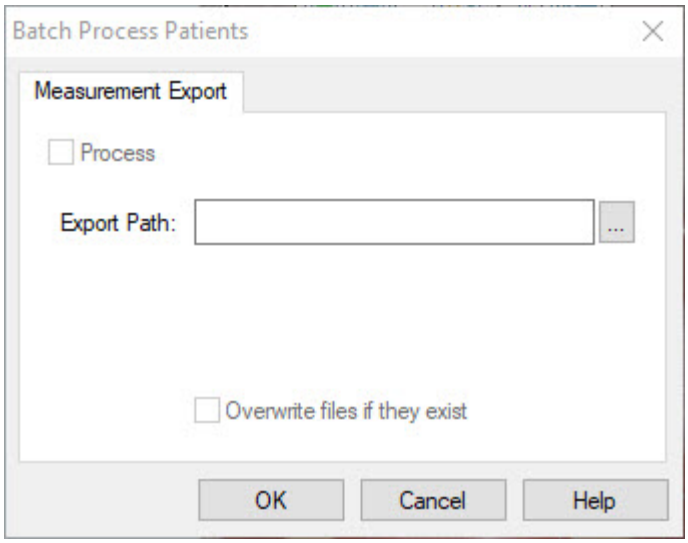
The Batch Process Patients dialog box appears.

4 Enter the directory in which you want to store the exported measurements reports in the **Export Path** field.

Or,

Click the button labeled **...** to browse to the directory.

The exported measurement reports are saved in the directory you specified. Each report file is named using the patient's ID and the analysis used to create the report.



Transferring an Exported Measurements Table to Microsoft Excel

To transfer an exported measurements table into Microsoft Excel:

1 Start Microsoft Excel.

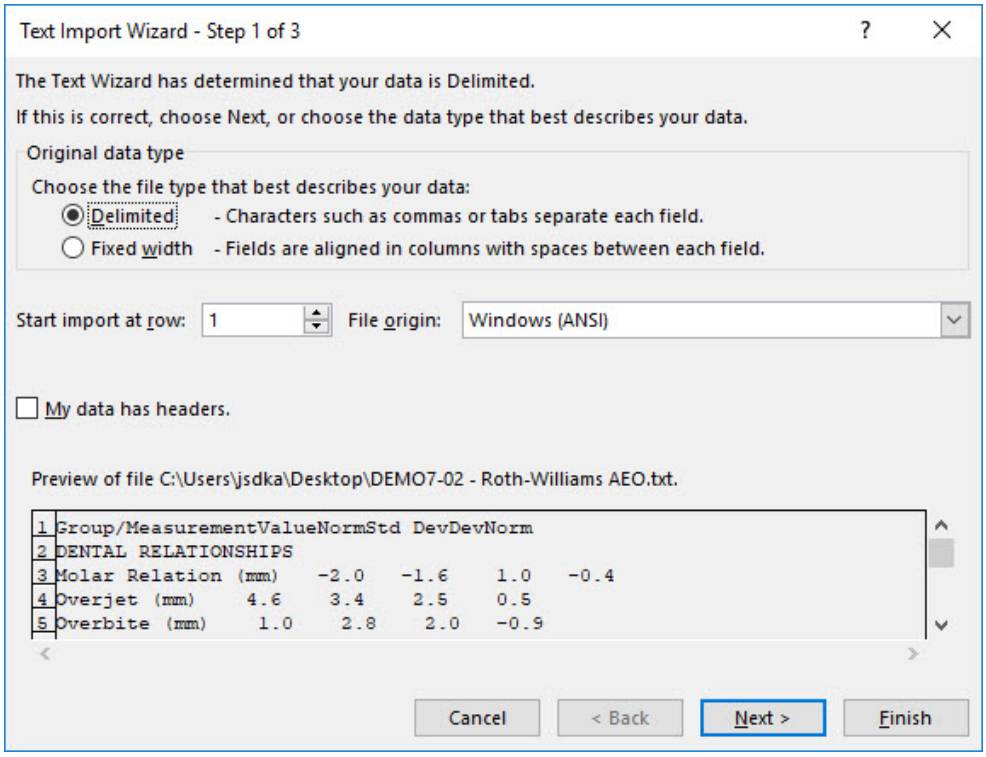
2 Select **Open** from the **File** menu.

3 Browse to the folder containing the exported measurements table.

4 In the Open dialog box, select **All Files (*.*)** from the file type drop-down list.

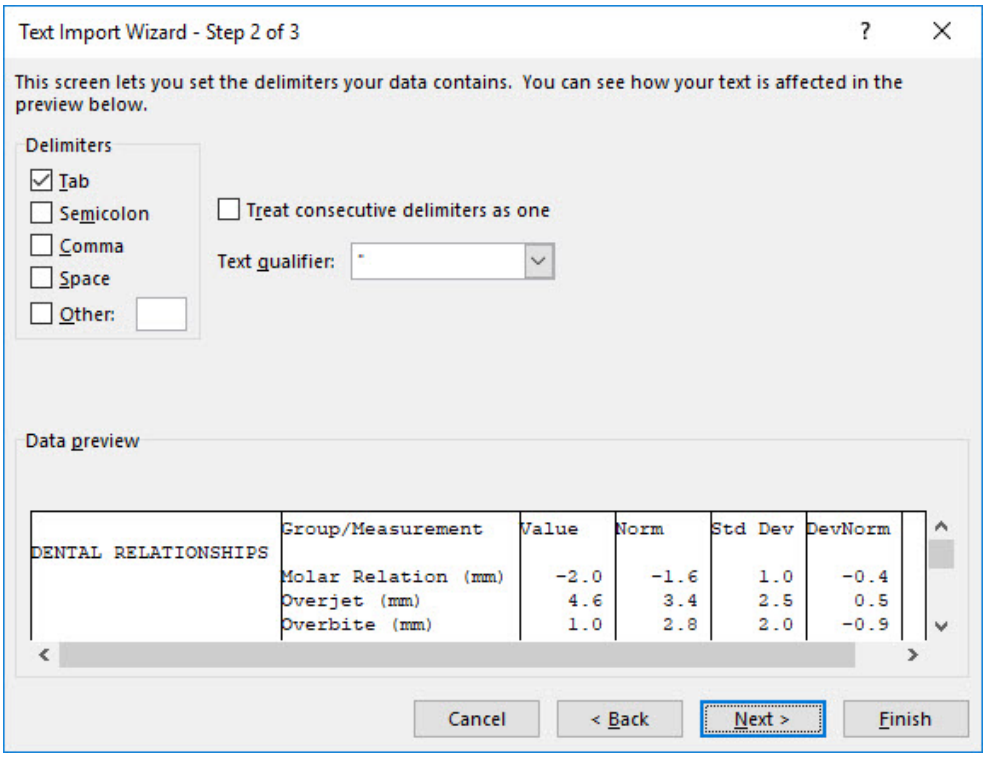
5 Select the file containing the exported measurements table, and click **Open**.

A dialog box for Step 1 of the import wizard appears where you specify information about the file.



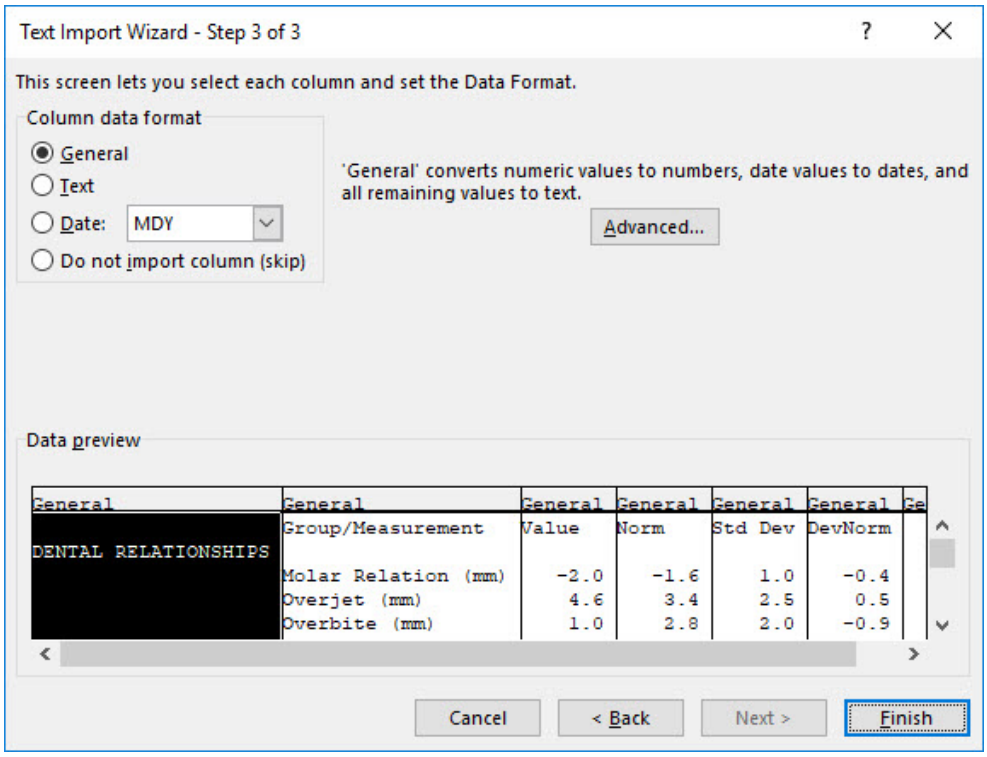
6 Select **Delimited**. Then, click **Next**.

A dialog box for Step 2 of the import wizard appears.



7 In the **Delimiters** group box, check the **Tab** box. Then, click **Next**.

A dialog box for Step 3 of the import wizard appears.



8 Select **General**. Then, click **Finish**.

9 Superimposition (Medical Device)

This chapter describes how to perform the following tasks:

- superimpose a patient's tracing on the profile photo
- superimpose a patient's tracing over another tracing
- superimpose a patient's image over another image

Tracing+Image

After you have digitized cephalometric landmarks for a patient (see Chapter 7, Digitize (Medical Device)), you can superimpose the patient's cephalometric tracing over the profile image for the following purposes:

- to analyze the patient's soft tissue profile against the patient's cephalometric tracing.
- to perform common treatment simulation procedures such as CO/CR conversion and growth forecasting using the patient's soft tissue profile image.
- to prepare a case for a patient consultation or a conference with a referring doctor.
- to give the patient a printout of the profile image with cephalometric tracings for documentation purposes.

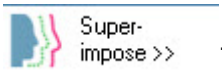
Many research papers have indicated that superimposing a cephalometric tracing over a patient's image is extremely inaccurate and can only serve as a rough estimate of how the patient's cephalometric tracings would fit over the patient's profile. Therefore, we highly recommend that you capture x-ray images and take soft tissue images in such a way as to minimize discrepancies between them in orientation and view angle. Keep in mind, however, that due to the x-ray machine design and the distortions of the camera's optical lens, the two images will never match exactly.

Note: *The Superimposition function alters the measurements of the original cephalometric tracing. A superimposed tracing's lines and angles are not only visually altered to fit the image, but its original measurements are also modified.*

Selecting the Image to Link with the Tracing

Before you can link a patient image and tracing, you need to select a patient for whom you have a lateral cephalometric tracing and a lateral image using the Patient Lookup dialog box (see Chapter 4, Patient Charts).

To select the image to link with the tracing:

1 On the Dolphin Imaging main screen, click 

. Then, select **Link Tracing+Image for Treatment Simulation**.

Or,

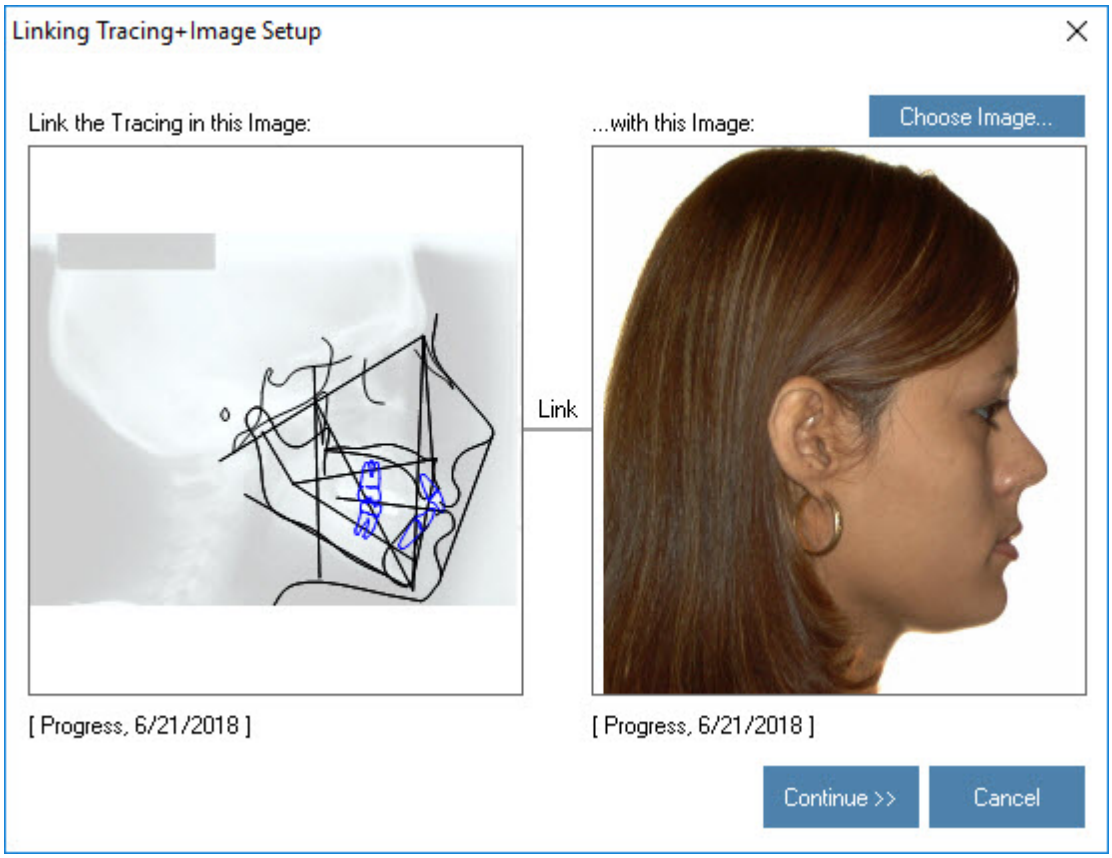
Select **Overlay Tracing+Image** from the **Tools** menu.

The Linking Tracing+Image Setup dialog box opens so that you can select the image to superimpose with the patient's tracing. By default, the profile image for the current timepoint is selected.

2 If the image on the right is the correct image, click **Continue>>**.

Or,

If the image on the right is not the correct image, click **Choose Image...**.



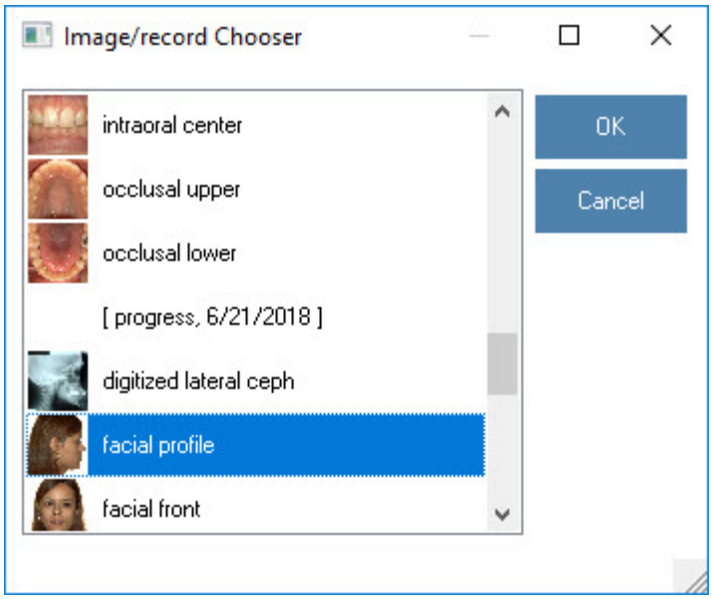
Link the Tracing in this Image	Tracing to use in this superimposition.
...with this Image	Image to use in this superimposition.
Choose Image...	Select another patient image to superimpose with this tracing.
Continue>>	Begin superimposing the tracing with the image.

To select another image for this superimposition:

1 Click **Choose Image...**.

The Image/Record Chooser dialog box opens.

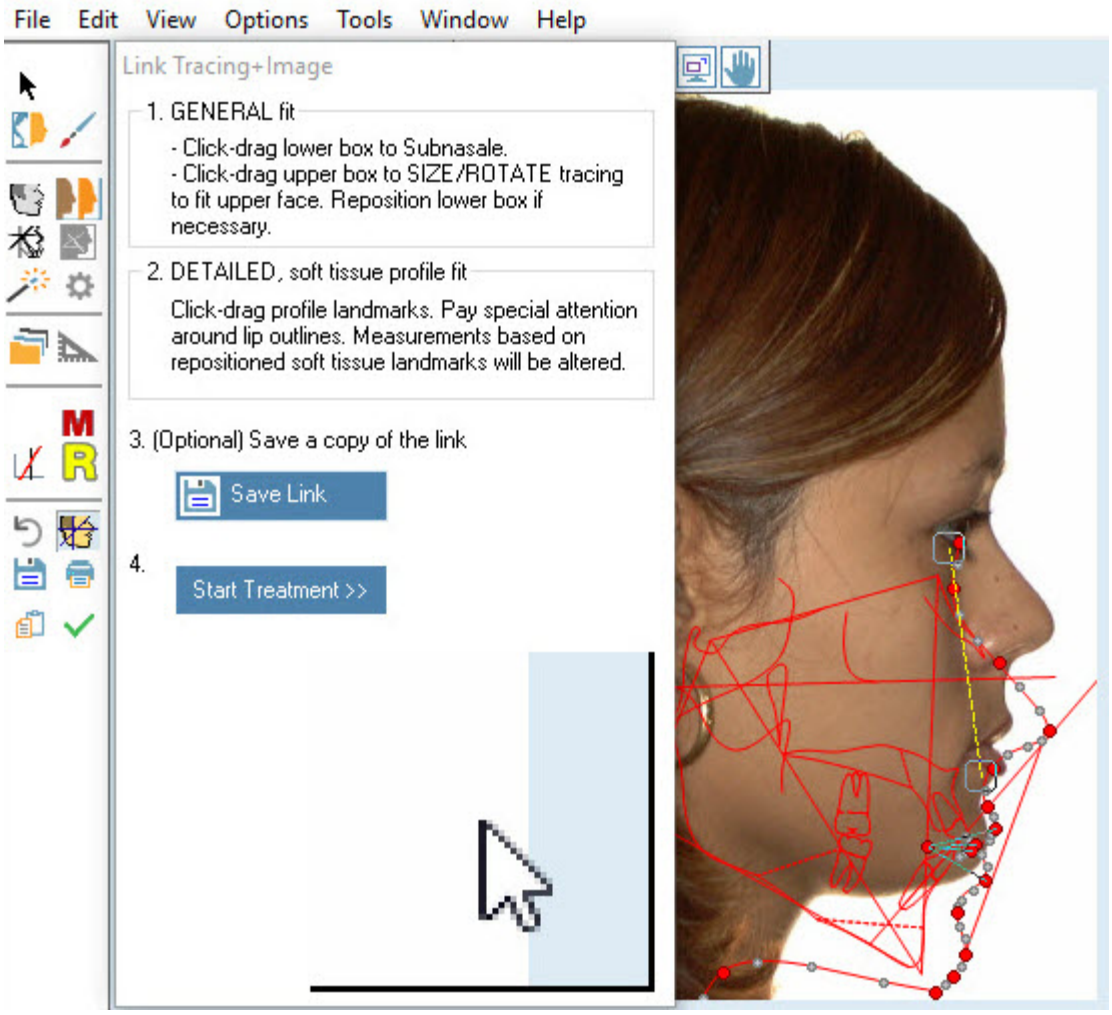
2 Select the image you want to use in your superimposition. Then, click **OK**.



Superimposing the Lateral View

Note: *You can superimpose tracings for either the frontal view or the lateral view. The following procedure describes how to superimpose tracings for the lateral view. If you need help in superimposing using the frontal view, please contact Dolphin Imaging.*

After you select the image to link to the patient's tracing, the Link Tracing+Image dialog box is displayed.



For information on the options offered on the tool bar, see “Using the Treatment Simulation Tool Bar” on page 12-6.

To superimpose a patient’s lateral photo with the patient’s tracing:

1 Click and drag the lower box to the Subnasale.

Refer to the zoomed window on the palette to see a close-up view of the area.

2 Click and drag the upper box to size and rotate the tracing to fit it as closely as possible over the patient’s profile image, paying special attention to the nasal area.

3 If necessary, click and drag the lower box again to position it at the Subnasale.

4 Click and drag the other landmarks to align the soft tissue profile and lip outlines in the tracing to the image.

Or,

CTRL+click and drag a landmark to move only that landmark and leave nearby landmarks unchanged.

On the patient's image, manually digitized landmarks appear in red. Landmarks automatically calculated by the Dolphin Imaging program are gray. In addition, a calculated landmark has an asterisk (*) in its tool tip

Again, you can refer to the zoomed window on the palette to see a close-up view of the area when moving the landmarks.

Before moving on to treatment planning, we recommend that you save the results of overlaying the tracing on the profile image (see "Saving the Superimposed Image" on page 9-7).

Aligning the Image to a Reference Plane

To align the patient's image to a reference plane:

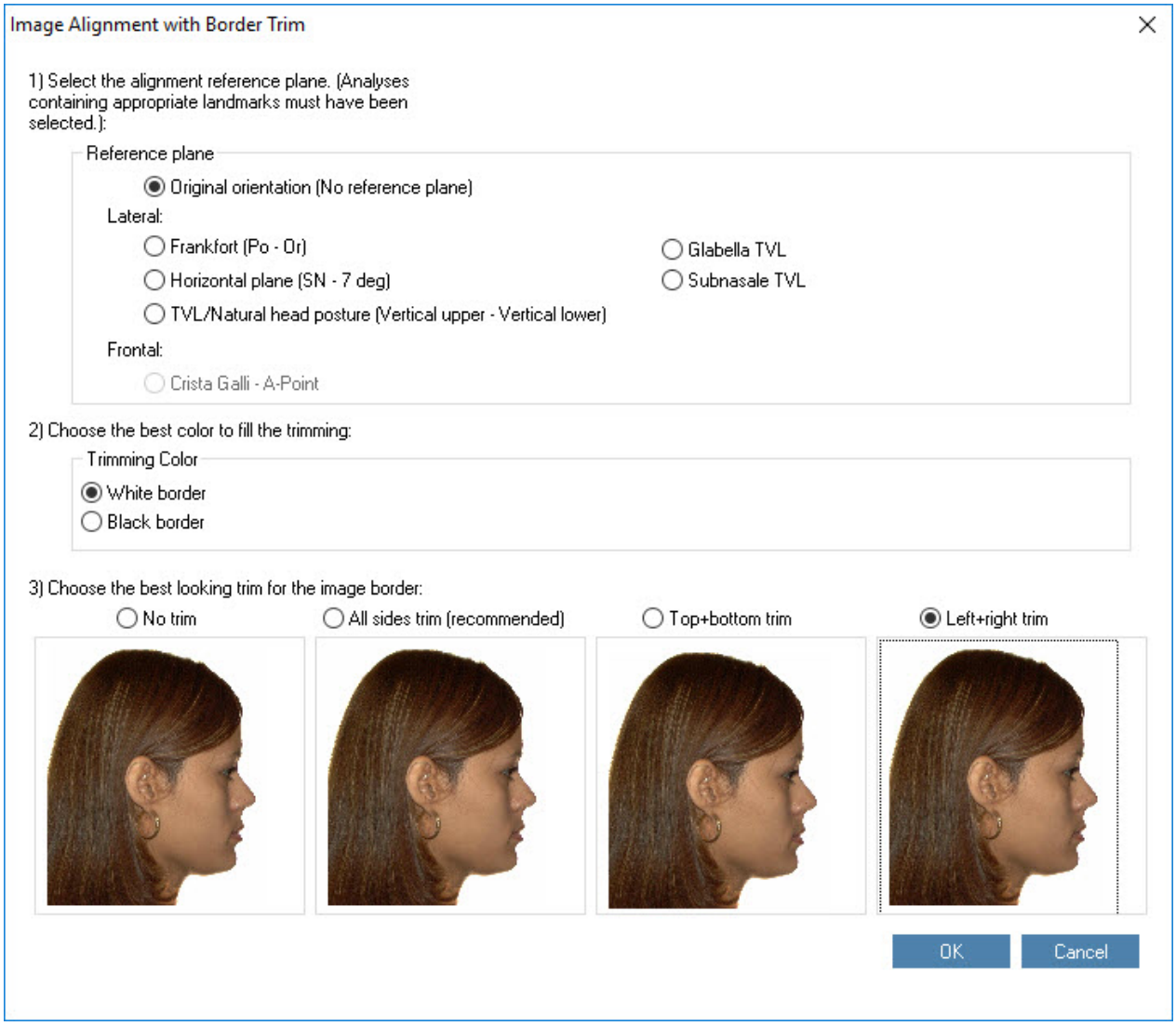
1 Click on the tool bar to open the Image Alignment With Border Trim dialog box.

2 Select the reference plane to use in aligning the image.

Depending on the orientation of your image, the alignment procedure may produce jagged edges on the photo, which may not be visually pleasing when used in a presentation. For this reason, Dolphin Imaging gives you the option to choose the best option for trimming the borders of the newly oriented image. You may also choose a default border fill that best suits your image.

3 Select either a black or white border to use for the image after trimming.

4 Select an option for fixing the image after rotation. Then, click **OK**.



Reference Plane	Options for aligning this image to a reference plane: **Original Orientation:** Does not change the alignment of the image. **Frankfort (Po-Or):** Aligns a lateral image using the Frankfort reference plane. **Horizontal Plane:** Aligns a lateral image to a horizontal reference plane. **TVL/Natural Head Posture (Vertical Upper - Vertical Lower):** Aligns a lateral image using the true vertical line reference plane. **Glabella TVL:** Aligns a lateral image to a true geometric vertical line passing through the Glabella. **Subnasale TVL:** Aligns a lateral image to a true geometric vertical line passing through the Subnasale. **Crista Galli - A-Point:** Aligns a frontal image using the Crista Galli - A-Point reference plane.

Trimming Color	Border color to use for the image after trimming.
Trimming Options	Options for trimming the patient's image: **No trim:** Makes no changes to the image borders. **All sides trimmed:** Crops the image on all sides to create a rectangular image area. **Top+bottom trim:** Crops the image only on the top and bottom to straighten those sides. **Left+Right trim:** Crops the image only on the left and right to straighten those sides.

Saving the Superimposed Image

To save the superimposed image:

1 Click Save Link on the palette.

The Save Image dialog box appears.

2 Enter an image title.

3 Select a slot from the **Save As** list in which to save this image, and click **OK**.

If you attempt to save this image into a slot that already contains an image, a dialog box appears asking for confirmation that you want to replace the existing image with the new image.

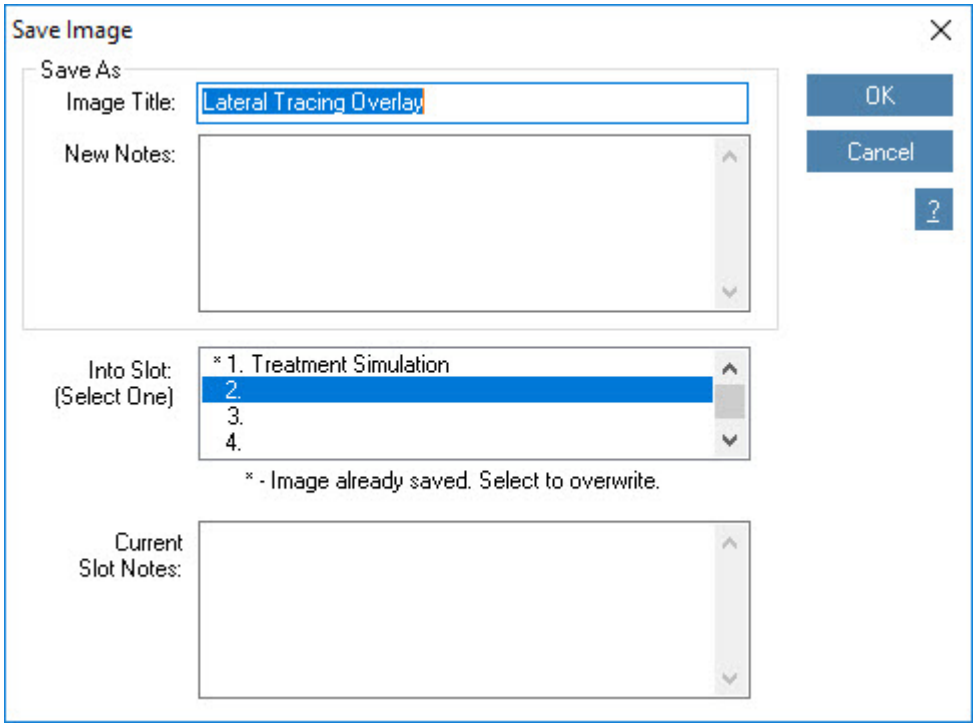


Image Title	Title for this image, up to 25 characters.
New Notes	Optional notes for this image.
Into Slot	Slots available for saving this image. If you select a slot containing an image, the existing image is overwritten with the new image.
Current Slot Notes	Notes previously entered for the selected image slot (if any).

Finishing the Superimposition

To close the Link Tracing+Image dialog box and start treatment simulation:

1 Click Start Treatment >> on the palette to begin treatment simulation for this patient.

If the patient's image needs to be aligned to a reference plane, the Image Border Trim dialog box opens so that you can choose options for aligning the patient's image. For more information, see "Aligning the Image to a Reference Plane" on page 9-5.

When you start treatment, the digitized lateral x-ray or the superimposed image appears in the Edit dialog box along with the Treatment Simulation palette and the Load Soft Tissue Rules dialog box.

2 Click **OK** to start your treatment simulation with the last-used set of soft tissue rules.

Or,

Select a different set of soft tissue rules, and click **OK**.

For information on treatment simulation and on soft tissue rules, see Chapter 12, Treatment Simulation (Medical Device).

Tracings Over Tracings

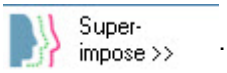
If you have two or more digitized images for a patient, you can superimpose the tracings for analysis and comparison. You might want to compare:

- tracings from different timepoints to analyze and monitor before, during, and after treatment progress.
- one or more simulated tracings (created using Treatment Simulation, Growth, or CO/CR) to the original tracing.

Superimposing Tracings

Before you can superimpose tracings, you need to select a patient for whom you have two or more tracings using the Patient Lookup dialog box (see Chapter 4, Patient Charts).

To superimpose one tracing over another:

1 On the Dolphin Imaging main screen, click 

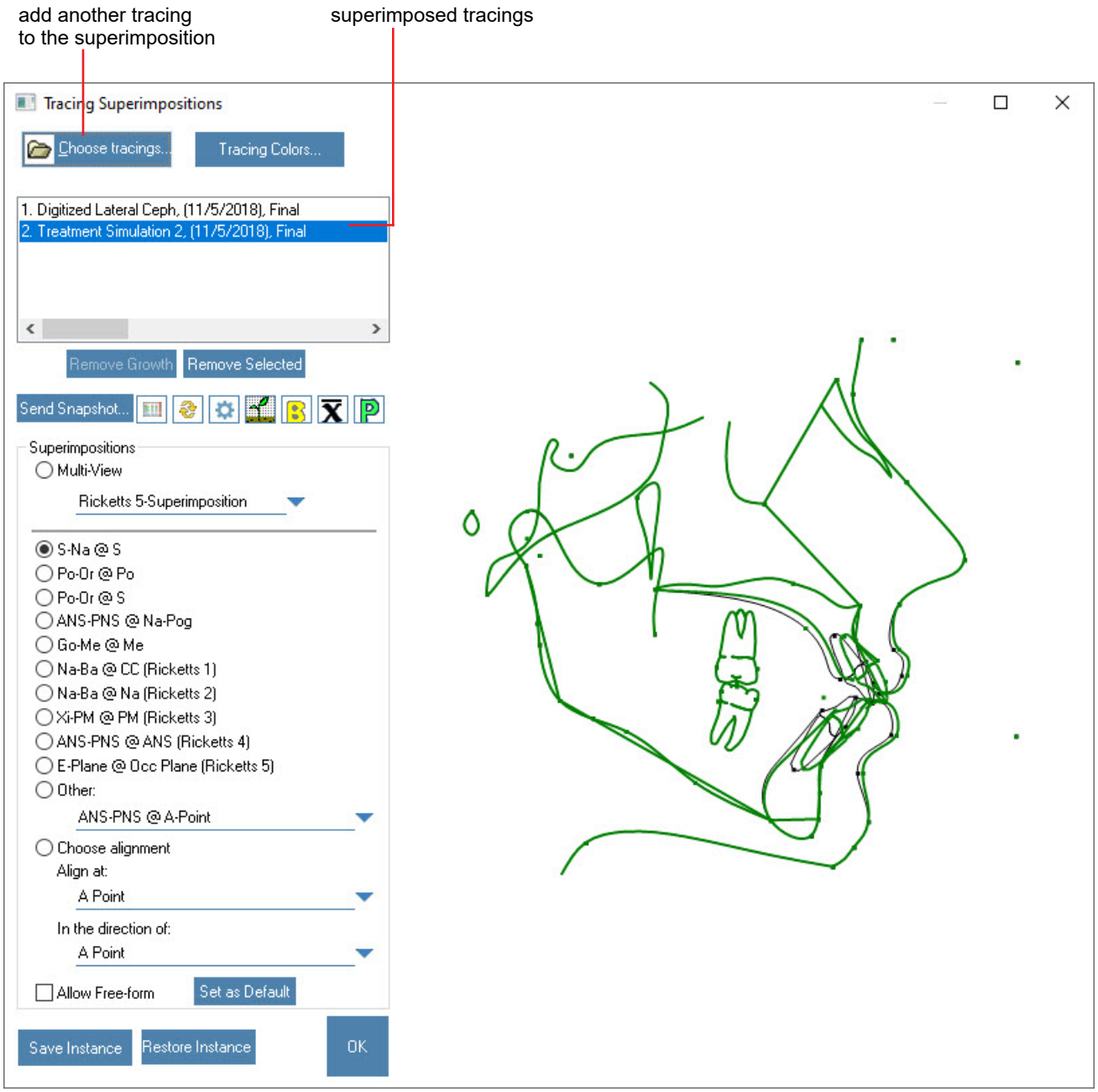
.

2 Select **Tracing Superimpositions**.

The Tracing Superimpositions dialog box appears along with the Image/Record Chooser dialog box.

3 Select the tracings you want to use in your superimposition from the Image/Record Chooser dialog box. Then, click **OK**.

The selected tracings are displayed using different colors in the Tracing Superimpositions dialog box.



Choose tracings...	Opens the Image/Record Chooser dialog box so that you can add another tracing to the superimposition (see “Adding and Removing Tracings” on page 9-12). You can superimpose any number of tracings.
Tracing Colors...	Opens the Tracing Superimposition Colors dialog box so that you can set colors for the tracings in the superimposition (see “Setting Tracing Colors” on page 9-19).
list	Tracings in the superposition. The numbers on the tracing display are for the currently selected tracing.
Remove Growth	Removes all growth tracings from the superimposition (see “Adding and Removing Growth Tracings” on page 9-13).

Remove Selected	Removes the tracing selected in the list from the superimposition (see “Adding and Removing Tracings” on page 9-12).
Send Snapshot...	Opens a menu with the following options: **Close This Menu:** Closes the menu. **Save To Dolphin Layout/Database:** Saves the superimposed tracings to a slot in an image layout and stores them in your database. For more information, see “Saving and Restoring a Superimposition” on page 9-29. **Copy To Clipboard:** Copies the superimposed tracings to the clipboard. Then, you can paste them into another application. For more information, see “Copying a Superimposition to the Clipboard” on page 9-31. **Print...:** Prints the superimposed tracings. For more information, see “Printing a Superimposition” on page 9-32. **Export To File...:** Exports the superimposed tracings to a file. For more information, see “Exporting a Superimposition” on page 9-31.
	Opens the Tracing Differences Analysis dialog box (see “Viewing the Tracing Differences Analysis” on page 9-27).
	Refits the tracings so that they are all in the view window.
	Sets preferences for the selected tracing (see “Setting Tracing Preferences” on page 3-66).
	Opens the Growth Superimposition Options dialog box (see “Adding and Removing Growth Tracings” on page 9-13).
	Opens the Bolton “Normal” Tracing Option dialog box (see “Adding and Removing Growth Tracings” on page 9-13).
	Replaces the tracings in the Tracing Superimpositions dialog box with three new tracings: • a tracing created by averaging the tracings originally in the dialog box • a tracing that represents one standard deviation above the average • a tracing that represents one standard deviation below the average For more information, see “Creating Averaged Tracings” on page 9-15.
	Opens a menu with the following options for superimposing a set of age-based mean tracings over the patient’s Profilogram tracing: • **Select TMDU Profilograms:** Opens the Profilogram Display Options dialog box so that you can select the TMDU Profilogram tracings to display. • **Select Osaka Profilograms:** Opens the Profilogram Display Options dialog box so that you can select the Osaka Profilogram tracings to display. • **Exit Profilograms Mode:** Exits from the Profilogram tracing display. This option is only available when a Profilogram superimposition is being displayed. For more information, see “Displaying Profilogram Tracings” on page 9-17).

Superimpositions	Superimposition to perform. **Multi-View:** Displays the multi-view superimposition selected from the drop-down list. The Max, Md, Profile Multi-View superimposition aligns the tracings as follows: • For the maxilla, the tracings are aligned to the (ANS, PNS) line, with the ANS points overlapping. • For the mandible, the tracings are aligned to the (MENTON, GONION) line, with the MENTON points overlapping. • For the profile, the tracings are aligned to the (SUBNASALE, ST_NASION) line, with the SUBNASALE points overlapping. Check the **Allow Freeform** box (see below) to adjust these alignments. ***landmark @ landmark:*** Aligns the tracings using the specified landmarks. **Other:** Aligns the tracings at the landmarks selected from the drop-down list. **Choose Alignment:** Creates a custom superimposition using the landmarks selected from the drop-down lists. For more information, see “Specifying Landmarks for Superimposition” on page 9-21.
Allow Freeform	Enables repositioning and realignment of the superimposed tracings using movement controls (see “Adjusting the Superimposition” on page 9-21).
Set As Default	Saves your current tracing superimposition settings as defaults (see “Saving Your Settings as Defaults” on page 9-29).
Save Instance	Saves this tracing superimposition to a file (see “Saving and Restoring a Superimposition” on page 9-29).
Restore Instance	Restores a previously saved tracing superimposition from a file (see “Saving and Restoring a Superimposition” on page 9-29).
Tracing display	Displays the selected tracings, aligned on the selected landmark.

To exit the Tracing Superimpositions dialog box:

1 Click **OK**.

Adding and Removing Tracings

To add another tracing to this superimposition:

1 Click

.

2 Select another tracing from the Image/Record Chooser dialog box, and click **OK**.

The selected tracing is displayed in another color.

To remove a tracing from this superimposition:

1 In the list on the Tracing Superimpositions dialog box, click the tracing you want to remove from the superimposition.

2 Click **Remove Selected**.

Adding and Removing Growth Tracings

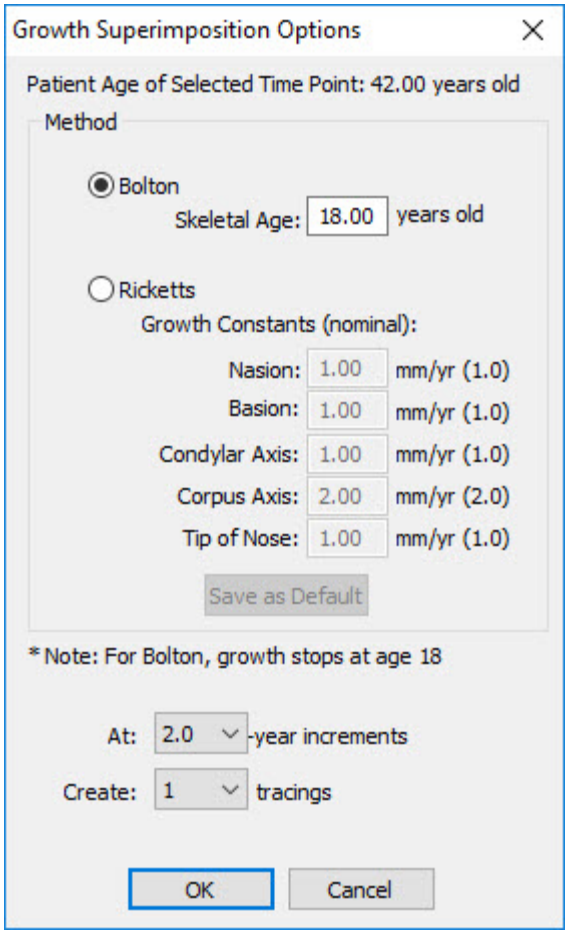
To add one or more growth forecast tracings to this superimposition:

1 Click .

The Growth Superimposition Options dialog box opens.

2 Set options for the growth forecast tracings you want to add to this superimposition, and click **OK**.

The specified tracings appear, each in a different color.



Method	Growth method to use to simulate growth **Bolton:** Uses the Bolton method for the forecast. • **Patient skeletal age:** Skeletal age as obtained from the patient's wrist x-ray. **Ricketts:** Uses the Ricketts method for the forecast. • **Growth Constants (nominal):** Amount of change (in millimeters) that should occur each year for the following landmarks: Nasion, Basion, Condylar Axis, Corpus Axis, and Tip of Nose. **Save as Default:** Saves the growth constants as the defaults for the Ricketts growth method.
At *n*-year increments	Increment (in years) to use between multiple growth forecast tracings. For example, if you are using the Bolton growth method for a 10-year-old patient and you specify two-year increments, growth forecast tracings will be created for the ages of 12, 14, 16, and 18.
Create *n* tracings	Number of growth forecast tracings to create. For the Bolton growth method, growth stops at the age of 18. For example, suppose you are using the Bolton growth method for a 10-year-old patient and you specify two-year increments and you specify that you want to create six tracings. Although six growth forecast tracings will be created (for the ages of 12, 14, 16, 18, and 20), the last two tracings (ages 18 and 20) will be identical.

To add a single Bolton "normal" growth forecast tracing to this superimposition:

1 Click .

The Bolton "Normal" Tracing Option dialog box opens.

2 Enter the patient age (between 6 and 18) for the growth forecast tracing you want to add to this superimposition, and click **OK**.

To remove a single growth forecast tracing from this superimposition:

1 In the list on the Tracing Superimpositions dialog box, click the tracing you want to remove from the superimposition.

2 Click **Remove Selected**.

To remove all growth forecast tracings from this superimposition:

1 Click **Remove Growth**.

2 Click **Yes** on the confirmation dialog box that appears.

All growth forecast tracings are removed from the display.

Creating Averaged Tracings

The averaged tracing feature replaces the tracings in the Tracing Superimpositions dialog box with three new tracings.

- a tracing created by averaging the tracings originally in the window.
- a tracing that represents one standard deviation above the average
- a tracing that represents one standard deviation below the average

Dolphin Imaging then creates a new timepoint and saves these three tracings in it. You can use the tracings in research projects and to visually demonstrate average norms and values.

To create the averaged tracings:

1 Superimpose the tracings you want to use to create the average.

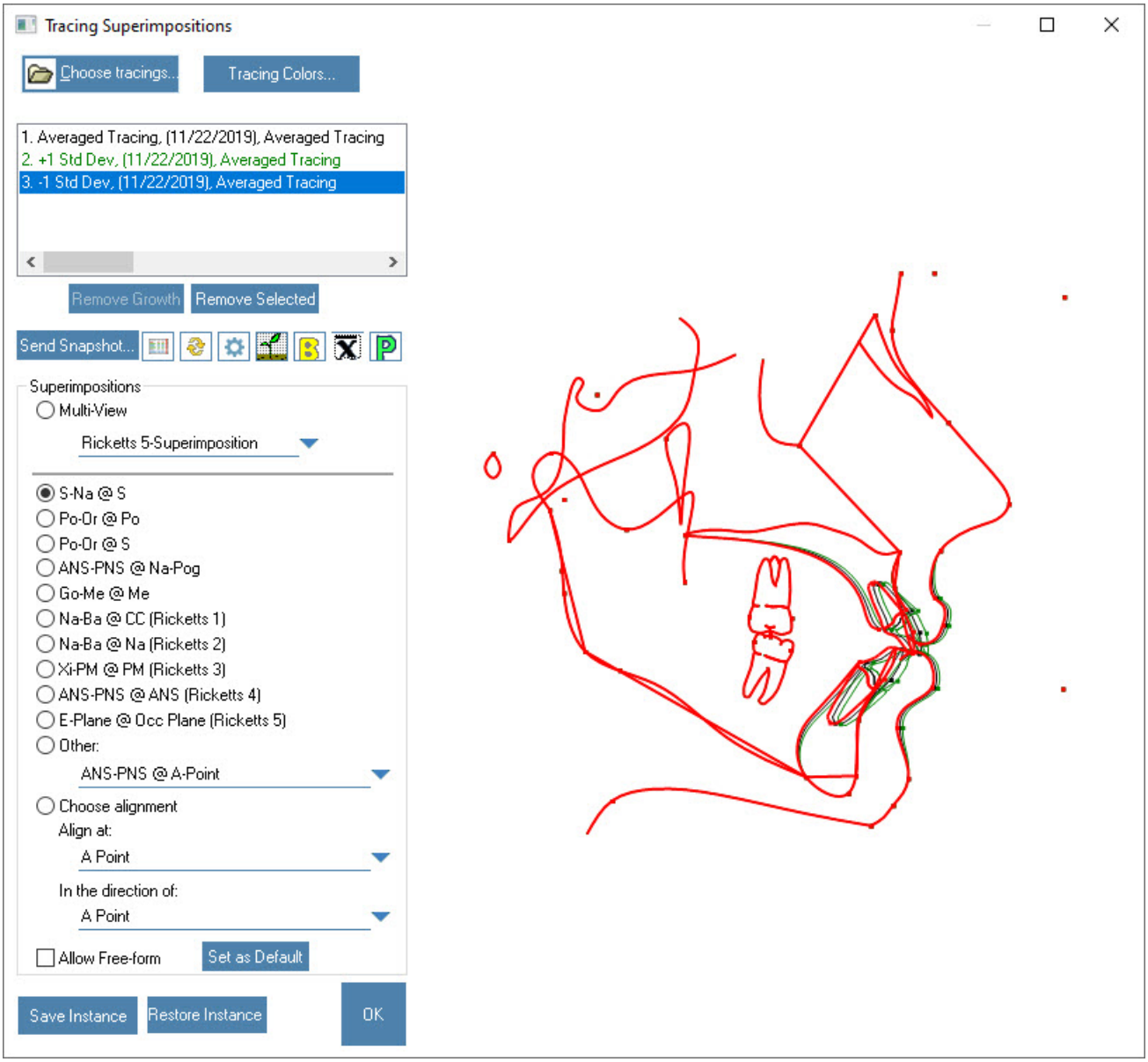
For example, you can:

- Generate averaged tracings from a single patient by superimposing tracings from that patient's record.
- Generate averaged tracings from multiple patients by creating a new patient record to be used as a study record. Then, you can copy and paste the timepoints containing the tracings you want to use as the source data from several patients to the study patient record. Finally, superimpose the tracings that constitute your source data.

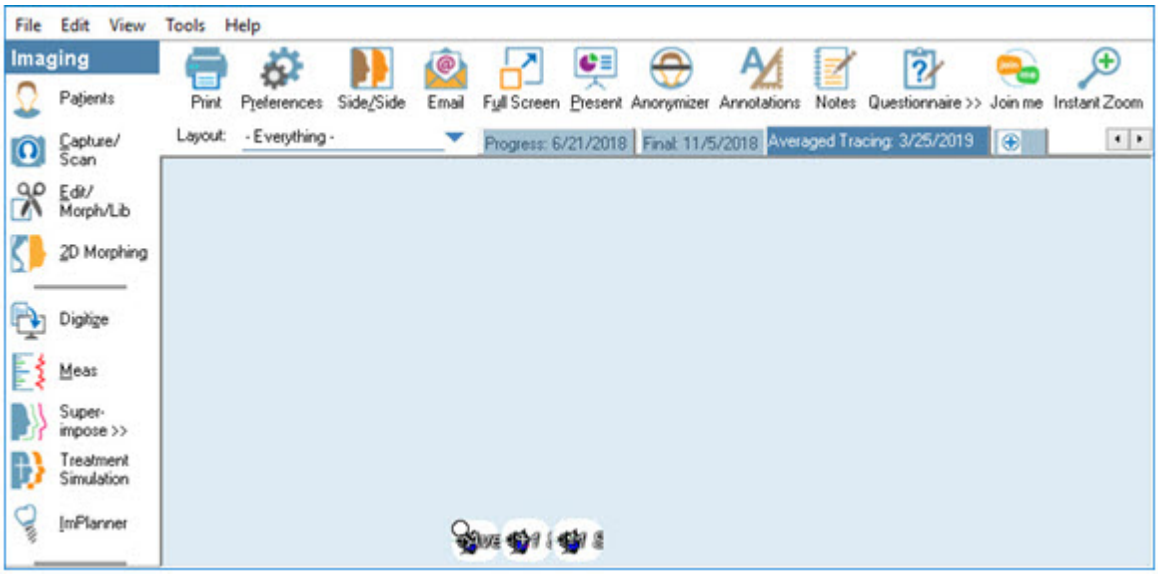
For information on superimposing tracings, see “Superimposing Tracings” on page 9-9. For information on copying and pasting timepoints, see “Copying a Timepoint to Another Patient” on page 4-21.

2 Click .

Dolphin Imaging creates the three new tracings and displays them in the dialog box:



When you close the Tracing Superimpositions dialog box, you see the new Averaged Tracing timepoint on the Dolphin Imaging main screen:



Displaying Profilogram Tracings

If you have digitized the [Profilogram-Osaka] or [Profilogram-TMDU] analysis for the current patient and timepoint, you can superimpose a set of age-based mean tracings over the patient's Profilogram tracing. For information on digitizing patient images, see Chapter 7, Digitize (Medical Device).

To display Profilogram tracings:

1 When you open the Tracing Superimpositions dialog box, select an image digitized the [Profilogram-Osaka] or [Profilogram-TMDU] analysis.

2 Click .

3 Select **Select TMDU Profilograms** if the image was digitized with the [Profilogram-TMDU] analysis.

Or,

Select **Select Osaka University Mean Profilograms** if the image was digitized with the [Profilogram-Osaka] analysis.

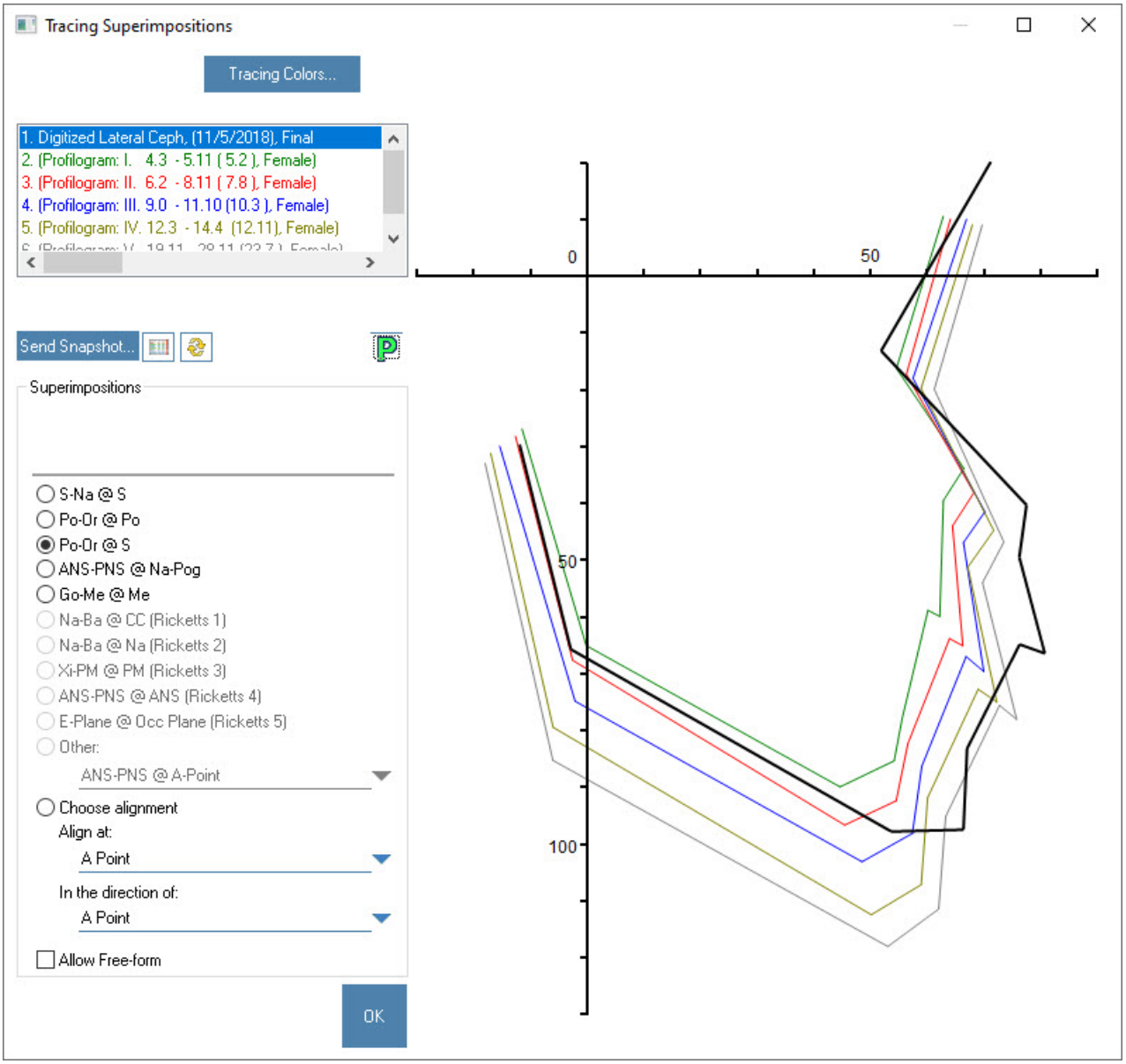
4 On the Profilogram Display Options dialog box, check the box for each of the age-based mean tracings that you want superimpose over the patient's Profilogram tracing.

Or,

Click **Select All** to superimpose all of the age-based mean tracings over the patient's Profilogram tracing.

Dolphin Imaging superimposes the tracings and displays them in the Tracing Superimpositions dialog box.

- For the TMDU Profilogram, the tracings are aligned to the Frankford Horizontal with the Sella overlapping (Po-Or @ Sella).
- For the Osaka Profilogram, the tracings are aligned to the Sella-Nasion plane with the Sella overlapping (S-Na @ S).



To exit from the Profilogram tracing superimposition display:

1 Click .

2 Select **Exit Profilograms Mode**.

Setting Tracing Colors

To set tracing colors:

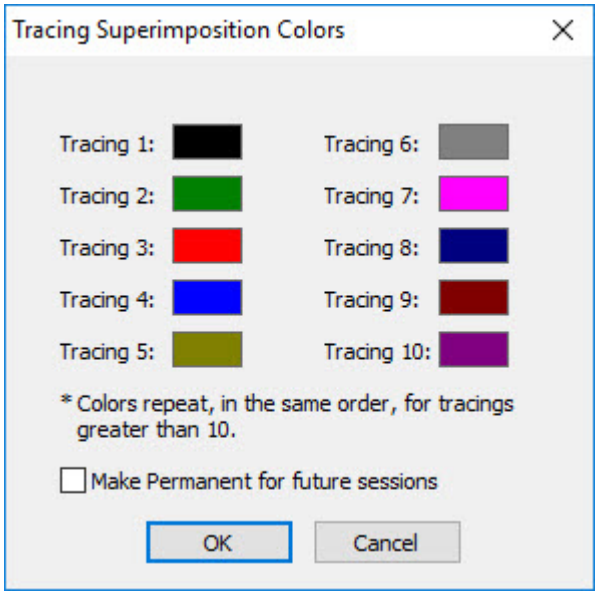
1 Click **Tracing Colors...**.

2 Click the color sample for a tracing to set the color for it.

3 Select the color to use for this tracing from the Color dialog box. Then, click **OK**.

4 Optionally, check the **Make Permanent for Future Sessions** box to use these colors from now on.

5 Click **OK**.



color samples	Color to use for the associated tracing.
Make Permanent for Future Sessions	Uses these colors from now on.

Setting Tracing Display Preferences

For any analysis, you can set tracing preferences to specify the items that you want to display and the colors that you want to use. The tracing preferences that you set apply to all patient images with the selected analysis. In addition, these settings are retained when you exit and restart Dolphin.

To set tracing display preferences:

1 Click .

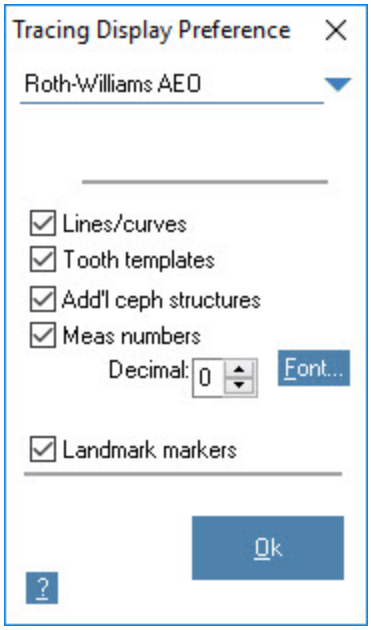
The Tracing Display Preferences dialog box is displayed.

2 Select the analysis for which you want to specify preferences from the drop-down list.

3 Select all the items to display on the tracing.

If you want to set preferences for another analysis, repeat these steps for that analysis.

4 Click **OK**.



drop-down list	Analysis for which you want to set tracing preferences.
Lines/Curves	Displays the tracing as defined in the patient's cephalometric analysis.
Tooth Templates	Displays the templates for the patient's teeth.
Add'l Ceph Structures	Displays the cephalometric structures.
Meas Numbers	Displays measurement numbers as defined in the patient's cephalometric analysis. **Decimal:** Number of digits to display to the right of the decimal point.
Landmarks Markers	Displays the digitized landmarks.

Specifying Landmarks for Superimposition

To use different landmarks for the superimposition:

1 Select a radio button in the Superimpositions group box.

2 If you selected **Multi-View**, select the multi-view superimposition you want to view in the list.

Or,

If you selected **Other**, select a tracing superimposition from the drop-down list.

Or,

If you selected **Choose Alignment**, select landmarks in the two drop-down lists to create a custom superimposition.

The tracings are superimposed according to the option you selected.

Adjusting the Superimposition

To adjust the superimposition using the freeform feature:

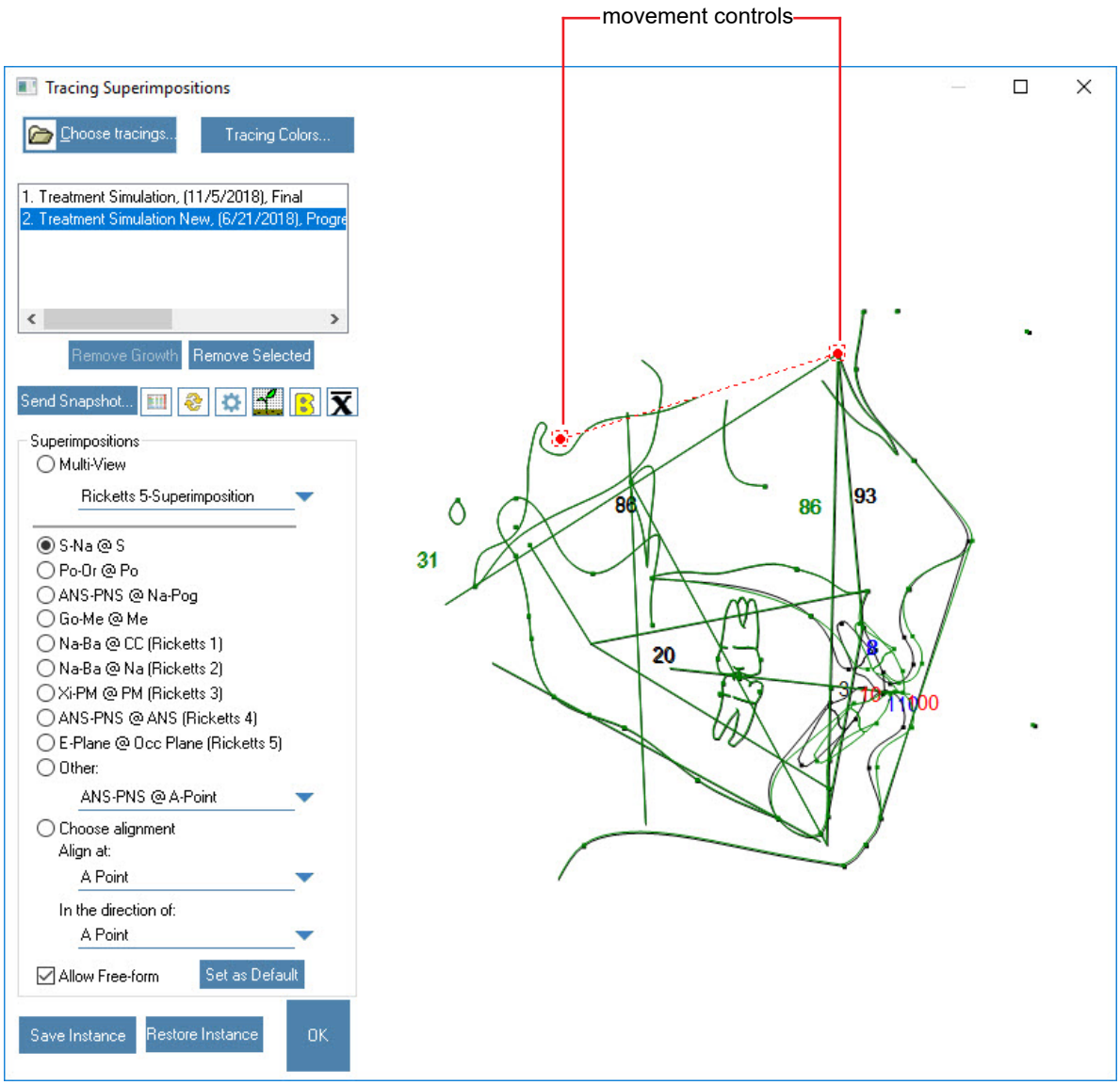
1 Check the **Allow Freeform** box.

Two movement controls appear on the currently selected tracing:

- One movement control enables you to move the tracing. When you place the mouse pointer over this control, it turns into a hand.
- One movement control enables you to rotate the tracing. When you place the mouse pointer over this control, it turns into a circular arrow.

2 Click and drag the movement controls to adjust the alignment of the tracings.

3 If necessary, select another tracing in the list and move or rotate it to adjust the superimposition.

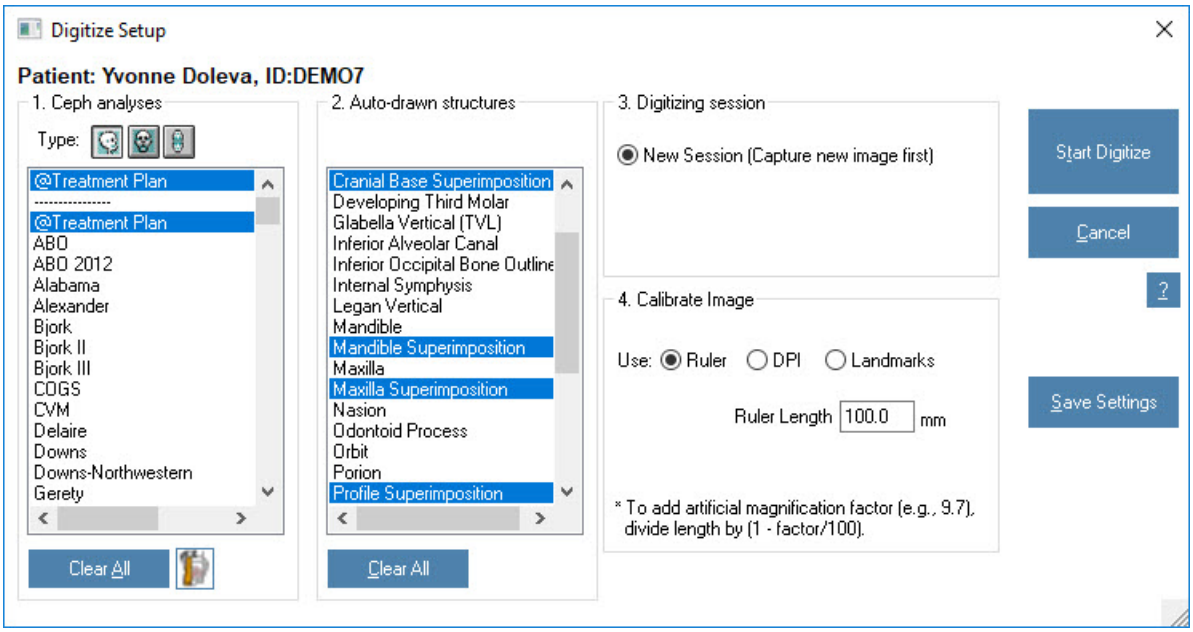

movement controls
Tracing Superimpositions
Choose tracings...
Tracing Colors...
1. Treatment Simulation, (11/5/2018), Final
2. Treatment Simulation New, (6/21/2018), Progre
Remove Growth
Remove Selected
Send Snapshot...
Superimpositions
Multi-View
Ricketts 5-Superimposition
S-Na @ S
Po-Or @ Po
ANS-PNS @ Na-Pog
Go-Me @ Me
Na-Ba @ CC (Ricketts 1)
Na-Ba @ Na (Ricketts 2)
Xi-PM @ PM (Ricketts 3)
ANS-PNS @ ANS (Ricketts 4)
E-Plane @ Occ Plane (Ricketts 5)
Other:
ANS-PNS @ A-Point
Choose alignment
Align at:
A Point
In the direction of:
A Point
Allow Free-form
Set as Default
Save Instance
Restore Instance
OK
86
86
93
31
20

Creating Custom Four-part Multi-view Tracing Superimpositions

To perform a custom four-part multi-view tracing superimposition:

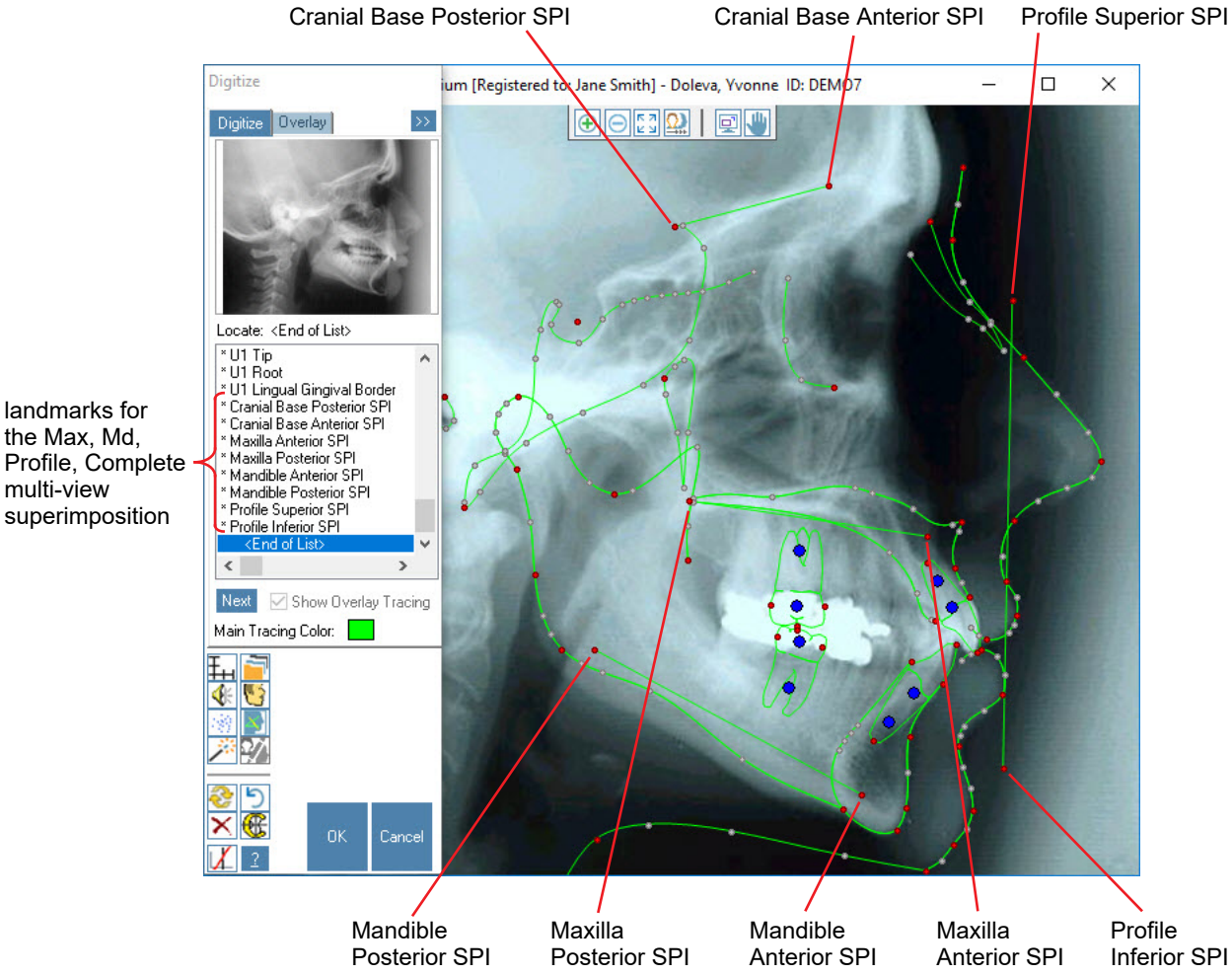
1 Digitize the same x-ray view from two or more of the patient's timepoints, making sure to include the structures needed for this tracing superimposition.

To view the four-part multi-view tracing superimposition, you need to digitize the patient's lateral x-rays from two or more of the patient's timepoints, selecting at least the **Cranial Base Superimposition**, **Mandible Superimposition**, **Maxilla Superimposition**, and **Profile Superimposition** auto-drawn structures on the Digitize Setup dialog box (highlighted in the illustration below). You should also select any other auto-drawn structures to use in your superimposition. For more information, see “Digitize Setup” on page 7-3.

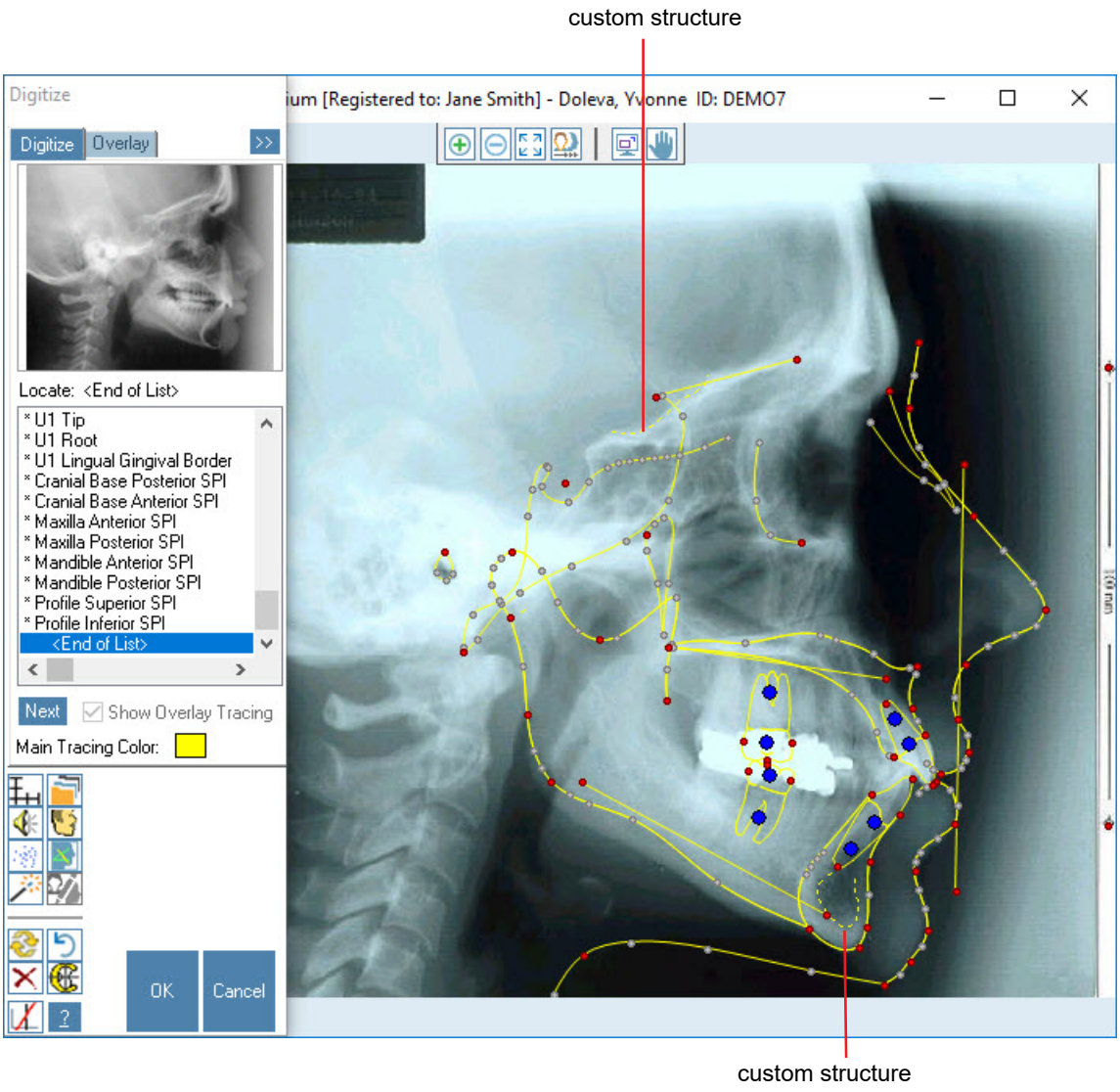


When digitizing the x-rays, you need to digitize the Cranial Base Posterior SPI, Cranial Base Anterior SPI, Maxilla Anterior SPI, Maxilla Posterior SPI, Mandible Anterior SPI, Mandible Posterior SPI, Profile Superior SPI, and Profile Inferior SPI landmarks, as illustrated below. For more information on digitizing landmarks, see “Digitize Landmarks” on page 7-6.

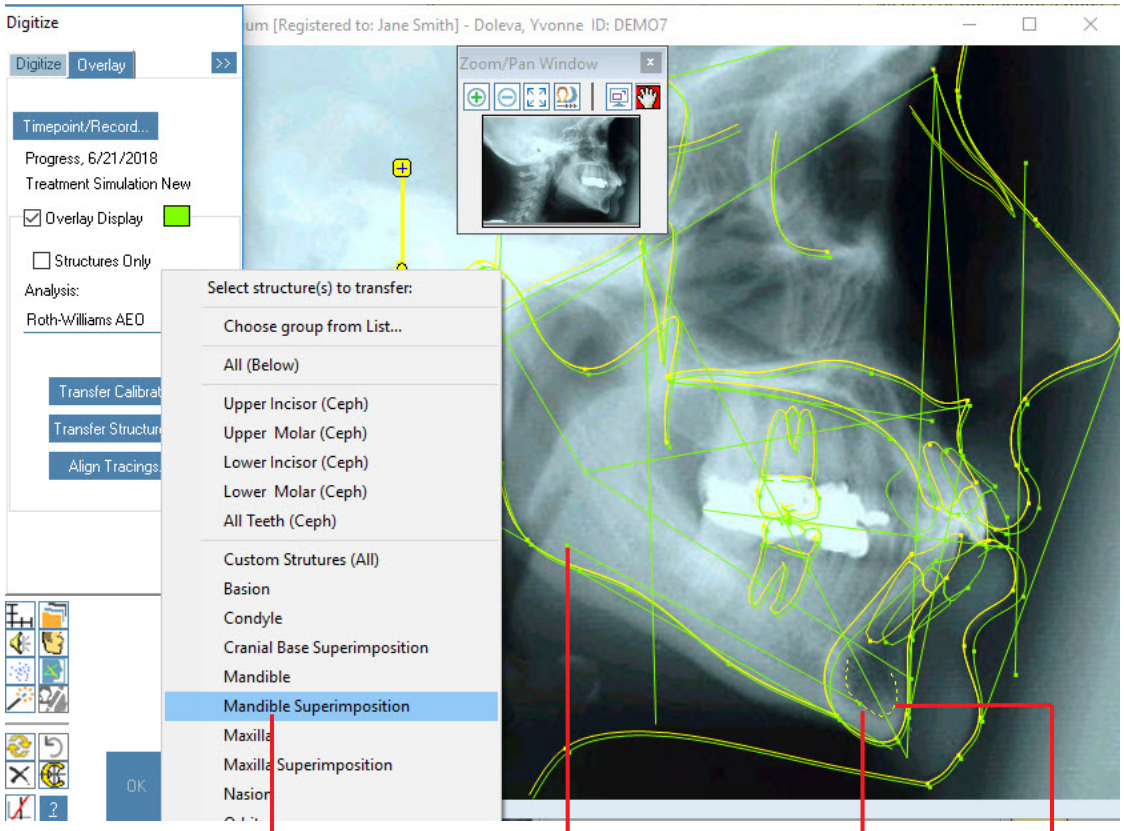
The landmarks used for this superimposition are not defined in any standard analysis, but are proprietary for this particular multi-view superimposition. As such, they are not in any standardized location. You can place them anywhere in the vicinity of the points or structure(s) you are using to define the superimposition. This enables you to align the four parts of the superimposition in any way that you want, creating a custom superimposition.



In addition to digitizing landmarks, you can use standard and/or custom structures to help you align the tracings in the superimposition. The following example illustrates some custom structures that you might add for the four-part multi-view tracing superimposition. For more information on adding custom structures, see “Tracing Custom Structures” on page 7-24.



When digitizing the corresponding x-rays from different timepoints, use the overlay feature to transfer the landmarks and structures for each superimposition from the first digitized x-ray onto subsequently digitized x-rays. You may need to align the tracing with the x-ray each time you transfer a structure. The following example illustrates using a custom structure to align an overlay tracing in order to transfer the landmarks and structures for the Mandible Superimposition part of the four-part multi-view tracing superimposition. For more information, see “Overlaying an Existing Tracing” on page 7-18.



2 Select the corresponding superimposition structure

3 The landmarks and structure for the selected superimposition are transfered from the overlay tracing to this x-ray

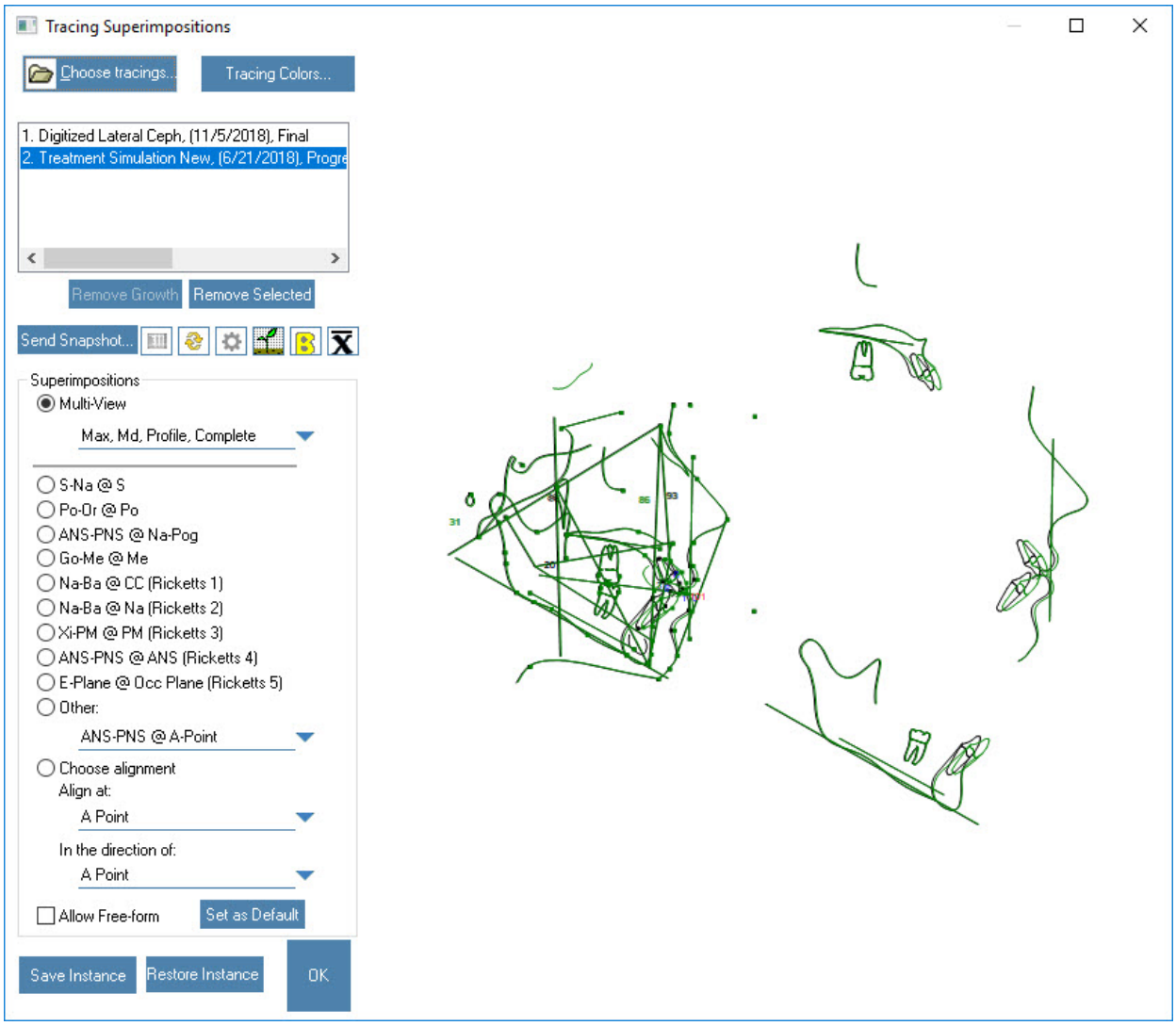
1 Use your custom structure to align the previously created overlay tracing with this x-ray

2 Open the Tracing Superimpositions dialog box and select the digitized x-rays you want to superimpose.

3 Select **Multi-View**.

4 Select **Max, Md, Profile, Complete** from the **Multi-View** drop-down list.

Your custom four-part multi-view tracing superimposition appears.



Viewing the Tracing Differences Analysis

To view the tracing differences analysis:

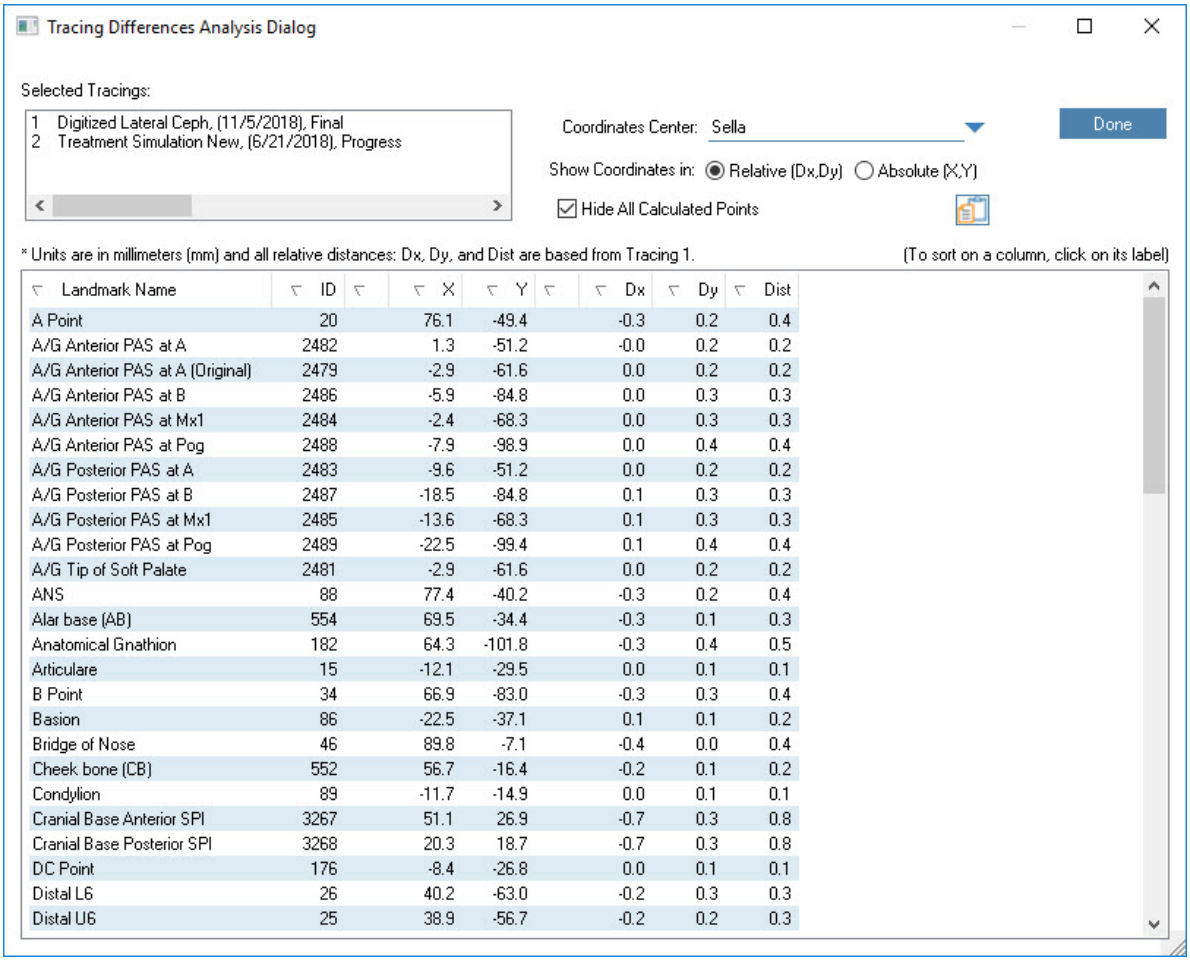
1 Click .

The Tracing Differences Analysis dialog box opens.

2 Optionally, click a column heading to re-sort the analysis using that column.

Click the column heading again to switch between descending and ascending order.

3 Click **Done** to return to the tracing superimpositions.



Landmark Name	ID	X	Y	Dx	Dy	Dist
A Point	20	76.1	-49.4	-0.3	0.2	0.4
A/G Anterior PAS at A	2482	1.3	-51.2	-0.0	0.2	0.2
A/G Anterior PAS at A (Original)	2479	-2.9	-61.6	0.0	0.2	0.2
A/G Anterior PAS at B	2486	-5.9	-84.8	0.0	0.3	0.3
A/G Anterior PAS at Mx1	2484	-2.4	-68.3	0.0	0.3	0.3
A/G Anterior PAS at Pog	2488	-7.9	-98.9	0.0	0.4	0.4
A/G Posterior PAS at A	2483	-9.6	-51.2	0.0	0.2	0.2
A/G Posterior PAS at B	2487	-18.5	-84.8	0.1	0.3	0.3
A/G Posterior PAS at Mx1	2485	-13.6	-68.3	0.1	0.3	0.3
A/G Posterior PAS at Pog	2489	-22.5	-99.4	0.1	0.4	0.4
A/G Tip of Soft Palate	2481	-2.9	-61.6	0.0	0.2	0.2
ANS	88	77.4	-40.2	-0.3	0.2	0.4
Alar base (AB)	554	69.5	-34.4	-0.3	0.1	0.3
Anatomical Gnathion	182	64.3	-101.8	-0.3	0.4	0.5
Articulare	15	-12.1	-29.5	0.0	0.1	0.1
B Point	34	66.9	-83.0	-0.3	0.3	0.4
Basion	86	-22.5	-37.1	0.1	0.1	0.2
Bridge of Nose	46	89.8	-7.1	-0.4	0.0	0.4
Cheek bone (CB)	552	56.7	-16.4	-0.2	0.1	0.2
Condylion	89	-11.7	-14.9	0.0	0.1	0.1
Cranial Base Anterior SPI	3267	51.1	26.9	-0.7	0.3	0.8
Cranial Base Posterior SPI	3268	20.3	18.7	-0.7	0.3	0.8
DC Point	176	-8.4	-26.8	0.0	0.1	0.1
Distal L6	26	40.2	-63.0	-0.2	0.3	0.3
Distal U6	25	38.9	-56.7	-0.2	0.2	0.3

Selected Tracings	Tracings for this superimposition.
Coordinates Center	Landmark to use as the coordinates center of the first tracing in the **Selected Tracings** list.
Show Coordinates in	Options for listing the coordinates in the differences table: • **Relative (Dx,Dy)**: Uses relative distances measured from the first tracing in the **Selected Tracings** list. • **Absolute (X,Y)**: Uses absolute coordinates. Distances are measured from the first tracing in the **Selected Tracings** list.
Hide All Calculated Points	Lists only digitized points in the analysis.
	Copies the analysis to the clipboard using tabs to separate the values into columns. You can then paste the analysis into another program such as Microsoft Excel.
Landmark Name	Names of the landmarks present in the analyzed tracings.
ID	Identifier for the specified landmark.

#1, #2, etc.	Tracing to which the following values relate. For example, #1 refers to the first tracing in the **Selected Tracings** list, #2 refers to the second tracing listed, and so on.
X	Horizontal distance in millimeters between this landmark and the landmark identified in the **Coordinates Center** drop-down list.
Y	Vertical distance in millimeters between this landmark and the landmark identified in the **Coordinates Center** drop-down list.
Dx	Horizontal distance in millimeters between this landmark and the corresponding landmark in the first tracing in the **Selected Tracings** list. This column appears only if you have selected the **Relative (Dx, Dy)** option.
Dy	Vertical distance in millimeters between this landmark and the corresponding landmark in the first tracing in the **Selected Tracings** list. This column appears only if you have selected the **Relative (Dx, Dy)** option.
Dist	Distance in millimeters (taking both horizontal and vertical differences into account) between this landmark and the corresponding landmark in the first tracing in the **Selected Tracings** list.

Saving Your Settings as Defaults

To save your current tracing superimposition settings as defaults:

1 On the Tracing Superimpositions dialog box, click **Set as Default**.

These default settings will be loaded automatically whenever you open the Tracing Superimpositions dialog box.

Saving and Restoring a Superimposition

After creating a superimposition, you can save it to your Dolphin database.

To save a superimposition to the database:

1 Click **Send Snapshot...**. Then, select **Save To Dolphin Layout/Database**.

2 Optionally, change to a different image layout as described below.

3 Click a slot in the image layout to save the image in that slot.

4 Optionally, enter a new image slot title to use for the superimposition in the **Image Title** field.

5 Click **Save...**.

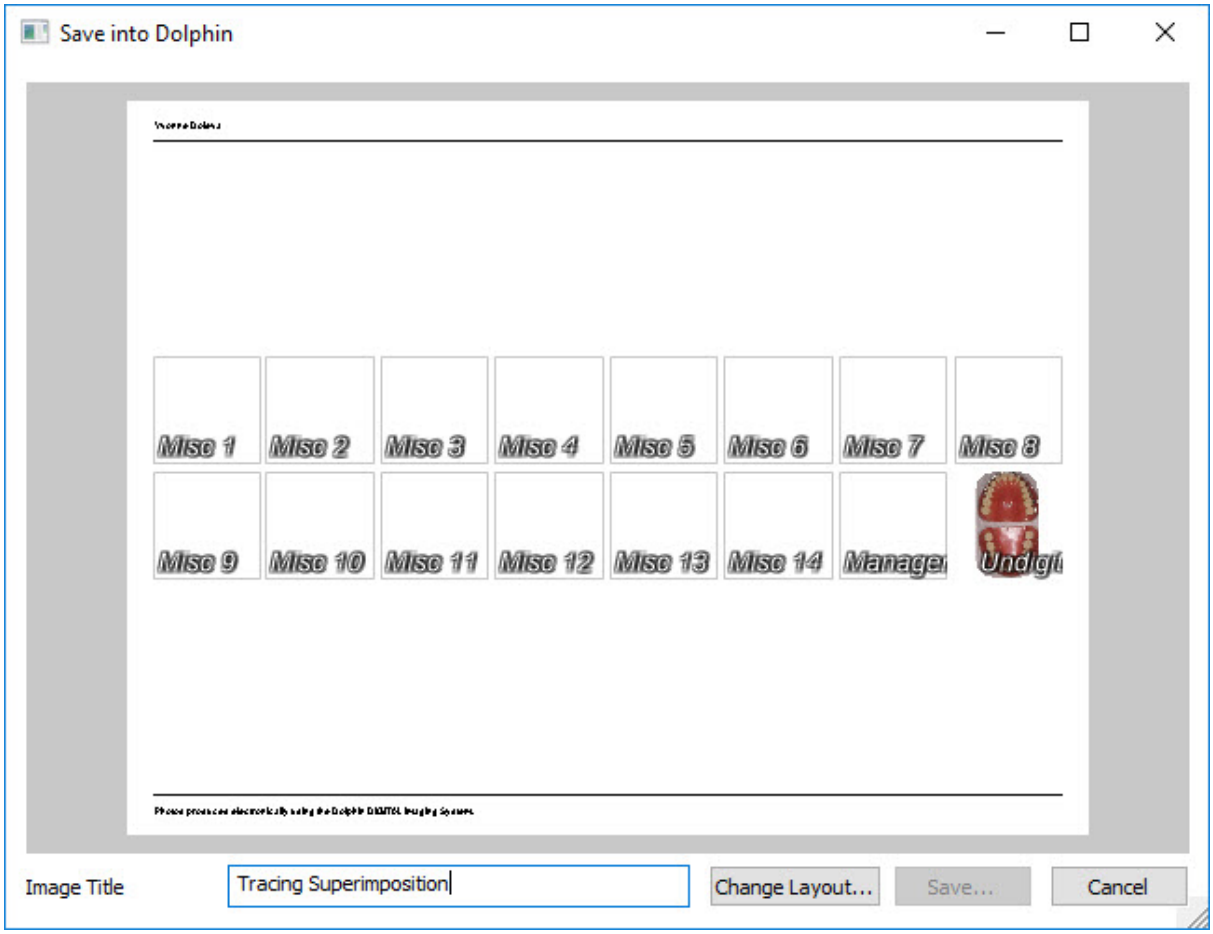


Image Layout	Currently selected image layout.
Image Title	Title to use for the superimposition. Initially, this field contains the title defined in the image layout for the selected image slot.
Change Layout...	Selects a different image layout.
Save...	Saves the superimposition in the selected image slot in the selected layout.

To choose a different image layout:

1 Click **Change Layout...**.

2 Select the image layout in which you want to save this superimposition from the drop-down list. Then, click **OK**.

To save the superimposition to a file:

1 Click **Save Instance**.

The Save As dialog box appears.

2 Specify the directory and file name in which you want to save this superimposition.

3 Click **Save**.

To restore a saved superimposition from a file:

1 Click **Restore Instance**.

The Open dialog box appears.

2 Specify the directory and file name containing the saved superimposition you want to restore.

3 Optionally, check the **Open as Read Only** box to prevent making inadvertent changes to the saved superimposition.

4 Click **Open**.

Exporting a Superimposition

You can easily export a superimposition to a .JPG file on your computer's file system.

To export the superimposition to a file:

1 Click **Send Snapshot...**. Then, select **Export to File...**.

2 Select the resolution for the exported image file.

Or,

Select **Other...** and enter the resolution in pixels in the dialog box that appears. Then, click **OK**.

The Save As dialog box appears. Most options on this dialog box are described in the Microsoft Windows documentation.

3 Specify the directory and file in which you want to save the superimposition.

4 Optionally, select any other options from the drop-down lists.

You can use the **Save As Type** drop-down list to select the graphics file type to use when saving this superimposition. JPEG 24-bit is recommended for producing high quality images with a small file size and maximum compatibility between imaging programs. Typically, you should use the default selections for all other options. Only modify these options if you are very familiar with graphics files types.

Depending on the image type you select in the **Save As Type** drop-down list, additional options may be available in the other drop-down lists.

Note: *If you select one of the JPEG 2000 file types, an additional button appears on the **Save As** dialog box that enables you to set advanced options.*

5 Click **Save**.

Copying a Superimposition to the Clipboard

You can copy the superimposition currently displayed in the window to the clipboard. Then, you can paste it into another application such as Microsoft Word.

To copy the superimposition to the clipboard:

1 Click **Send Snapshot...**. Then, select **Copy To Clipboard**.

Printing a Superimposition

To print the superimposition:

1 Click **Send Snapshot...**. Then, select **Print...**.

The Print dialog box opens.

2 Select any printing options you want, and click **OK**.

Dolphin Imaging offers the following options in addition to the standard Microsoft Windows printing options:

Print 1:1	Prints an image with cephalometric tracings using the **1:1** option. This setting has no effect if you are not printing an image with cephalometric tracings.
Preview	Previews your print job on the computer screen.

Images Over Images

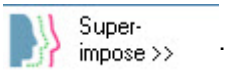
If you have two or more images for a patient, you can superimpose the images for analysis and comparison. You might want to compare:

- images from different timepoints to analyze and monitor before, during, and after treatment progress.
- images from the same timepoint, such as the patient's facial profile picture and lateral x-ray.

Superimposing Images

Before you can superimpose patient images, you need to select a patient for whom you have two or more images using the Patient Lookup dialog box (see Chapter 4, Patient Charts).

To superimpose one image over another:

1 On the Dolphin Imaging main screen, click 

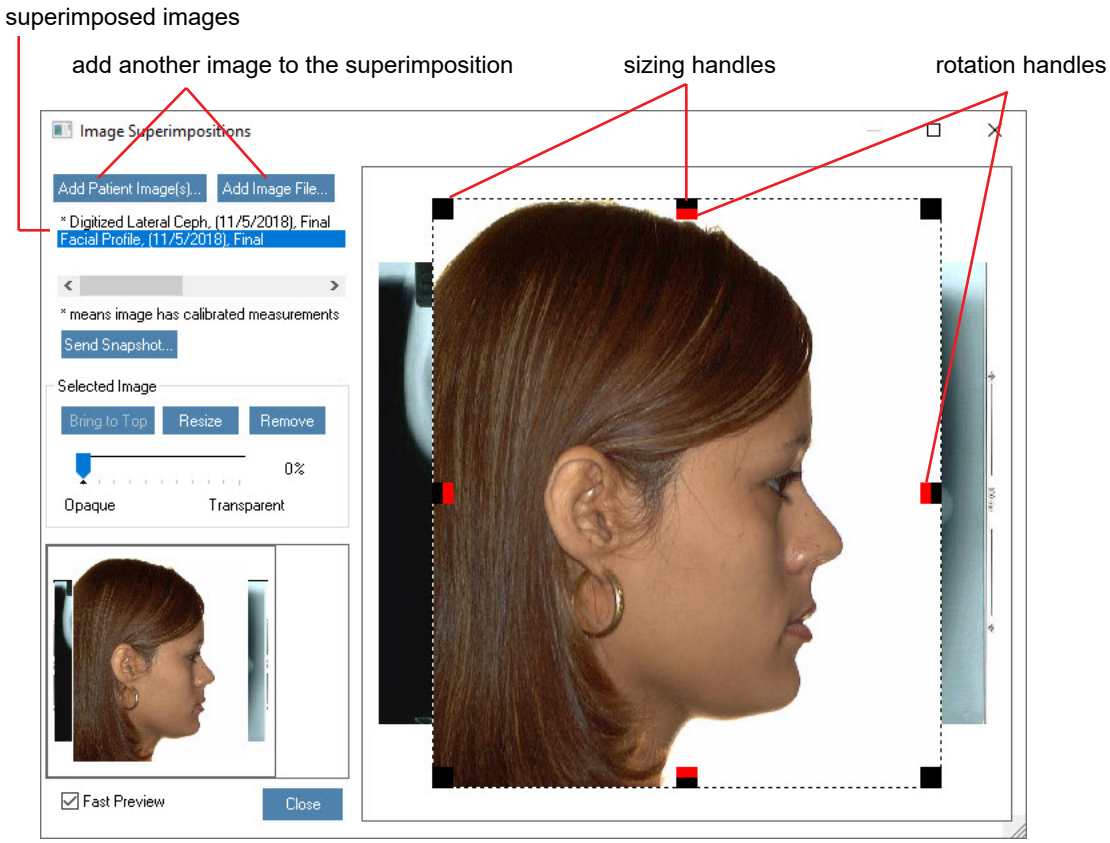
.

2 Select **Image Superimpositions**.

The Image Superimpositions dialog box appears along with the Image/Record Chooser dialog box.

3 Select the images you want to use in your superimposition from the Image/Record Chooser dialog box. Then, click **OK**.

You can superimpose any number of images. The selected images are displayed in the Image Superimpositions dialog box.



Add Patient Images(s)	Opens the Image/Record Chooser dialog box so that you can select another of this patient's images to add to the superimposition (see “Adding or Removing an Image” on page 9-34).
Add Image File	Opens the Select an Image File dialog box so that you can select an image stored in a file to add to the superimposition (see “Adding or Removing an Image” on page 9-34).
list	Images in the superposition. Images that have been calibrated, such as digitized x-ray images, are identified with an asterisk (*).
Send Snapshot...	Opens a menu with the following options: **Close This Menu:** Closes the menu. **Save To Dolphin Layout/Database:** Saves the superimposed images to a slot in an image layout and stores them in your database. For more information, see “Saving and Restoring a Superimposition” on page 9-29. **Copy To Clipboard:** Copies the superimposed images to the clipboard. Then, you can paste them into another application. For more information, see “Copying a Superimposition to the Clipboard” on page 9-31. **Print...:** Prints the superimposed images. For more information, see “Printing a Superimposition” on page 9-32. **Export To File...:** Exports the superimposed images to a file. For more information, see “Exporting a Superimposition” on page 9-31.

Bring to Top	Moves the selected image toward the front of the superimposition (see “Reordering the Images” on page 9-36).
Resize	Resizes the selected image (see “Moving, Resizing, or Rotating” on page 9-34).
Remove	Removes the selected image from the superimposition (see “Adding or Removing an Image” on page 9-34).
slider	Adjusts the transparency of the images in the superimposition (see “Changing the Transparency” on page 9-36).
Preview window	Previews your changes when **Fast Preview** is enabled (see below).
Fast Preview	Displays a preview of the changes you make in the main window. Changes appear in the preview window more quickly than in the main window.

To exit and return to the Dolphin Imaging Main Screen:

1 Click **OK**.

Adding or Removing an Image

To add another Dolphin image to this superimposition:

1 Click **Add Patient Images**.

2 Select another patient image from the Image/Record Chooser dialog box, and click **OK**.

The selected image is added to the superimposition.

To add an image from a file to this superimposition:

1 Click **Add Image File**.

The Select Image File dialog box is displayed.

2 Select the file containing the image, and click **OK**.

The selected image is added to the superimposition.

To remove one of the images from this superimposition:

1 Select the image you want to remove.

2 Click **Remove**.

3 Click **Yes** to confirm that you want to remove the image.

Moving, Resizing, or Rotating

To move, resize, or rotate one of the images:

1 Optionally, check the **Fast Preview** box to preview your changes.

2 Select the image you want to move, resize, or rotate.

Eight black sizing handles and four red rotation handles appear around the edges.

3 Click and drag the image to move it.

Or,

Click and drag one of the black sizing handles to resize the image.

Or,

Click and drag one of the red rotation handles to rotate the image.

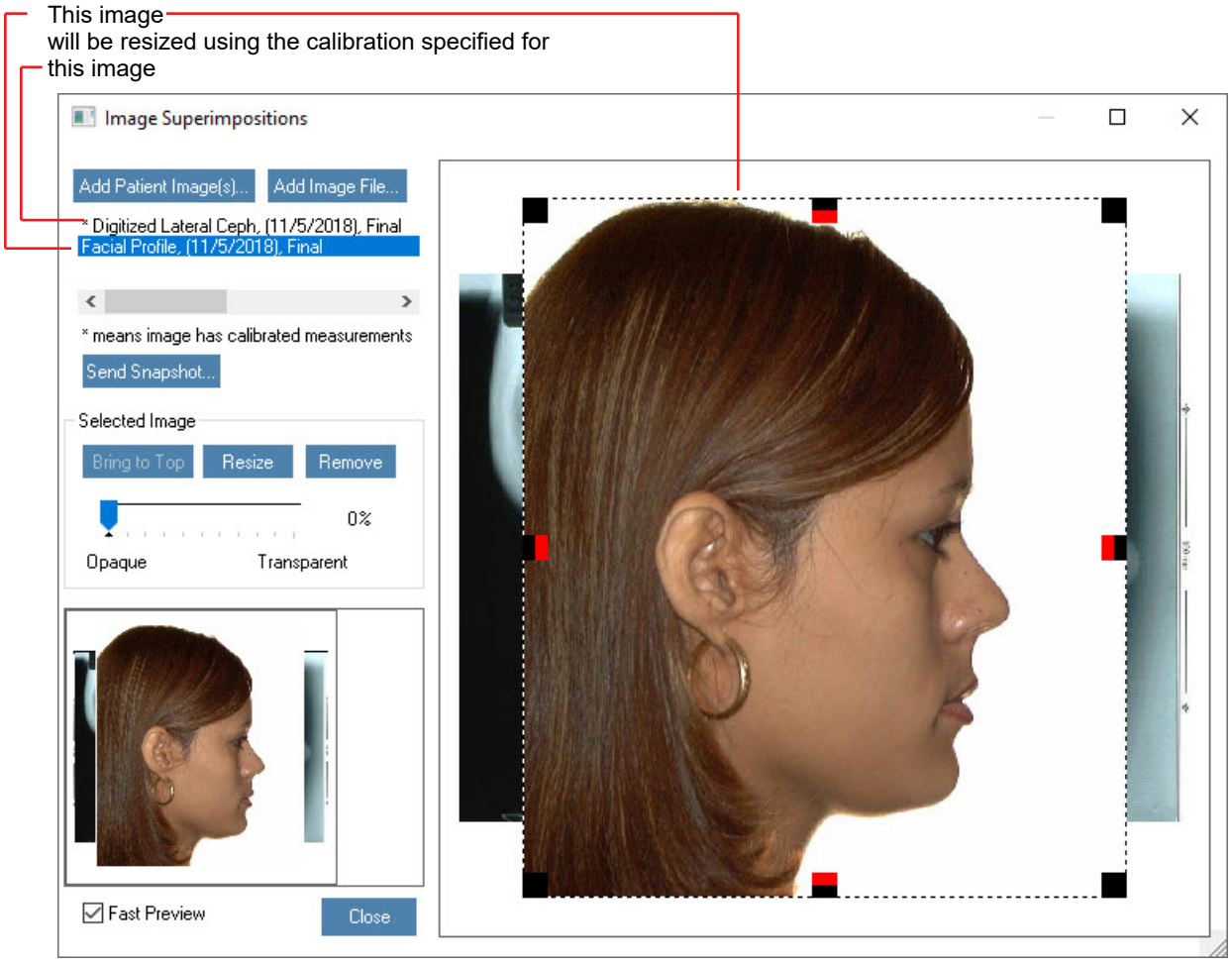
Note: *For best results when rotating the image, keep the mouse down, rotate the image back and forth until you see the desired result, then release the mouse button. If you rotate the image using several, separate rotation operations, the image quality can degrade, especially on lower resolution images.*

To resize an image using another image's calibration:

1 Select the image you want to resize.

2 Click **Resize**.

The image is resized using the calibration specified for the image listed directly above it in the image list. In the example below, the facial profile image will be resized using the calibration for the digitized lateral ceph image listed above it in the image list.



Reordering the Images

To change the order of the images in a superimposition:

1 Select one of the images that is not on top in the superimposition.

2 Click **Bring to Top** to move that image to the top of the superimposition.

Changing the Transparency

To change the transparency of the images:

1 Optionally, check the **Fast Preview** box to preview your changes.

2 Move the transparency slider so that you can see all the images in the superimposition.

10 CO/CR Conversion

The CO/CR feature repositions a patient's condyle from centric occlusion (CO) to centric relation (CR). For some patients, this step is necessary before performing any treatment simulation procedures. From the indicator values obtained from an articulated study model in centric occlusion, Dolphin calculates new cephalometric values with the mandible re-positioned in centric relation. As a result, the patient's cephalometric values are updated from the appropriate amount of condylar adjustment. The indicator value can be either the Condylar Position Indicator value (CPI) for Panadent Articulator systems or Mandibular Position Indicator values (MPI) for SAM Articulator systems.

The head of condyle is repositioned by "fulcruming" (pivoting) about the indicated first tooth contact (as seen on the mounted model). This pivot point is usually (but not necessarily) the most distal tooth (i.e., second molars).

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use the CO/CR Conversion feature only if your Dolphin Imaging user account has the Orthodontic and Surgical Treatment Simulation privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Accessing CO/CR Conversion

To use CO/CR, you typically need the following:

- a lateral x-ray digitized with the Roth-Williams AEO (recommended), Roth-Jarabak, or Jarabak analysis and with traced skeletal structures (see Chapter 7, Digitize (Medical Device))
- a lateral photo of the patient (optional)

Although you can use CO/CR with just a digitized lateral x-ray, it is more difficult to demonstrate the effect of the treatment to the patient without using the profile photo superimposed with the tracing. For patient consultations, we recommend performing CO/CR and other treatment simulations with the patient's profile photo.

To verify that the images you need are available, select the **- Everything -** image layout from the **Layout** drop-down list on the Dolphin Imaging main screen. This layout contains all patient images for the selected timepoint.

Once you have verified that these images are available, you may choose to superimpose the tracings over the patient's profile photo. For more information on creating a superimposed image, see Chapter 9, Superimposition (Medical Device).

To access CO/CR conversion:

1 Select the superimposed or digitized lateral ceph image from the Dolphin Imaging main screen, if it is not already selected.

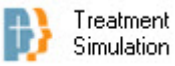
Or,

Select the saved image for a previously-performed CO-CR conversion operation.

If you do not have a superimposed image, you can create one using the superimpose feature (see Chapter 9, Superimposition (Medical Device)). If you already have a superimposed image, you can select it by selecting the **- Everything -** layout from the **Layout** drop-down list on the Dolphin Imaging main screen.

If you have already performed CO-CR conversion for this patient, you can find the saved image for that operation in the **Treatment Forecast** layout on the Dolphin Imaging main screen.

For more information, see “Choosing Another Image Layout” on page 3-26.

2 Click 

on the Dolphin Imaging main screen.

Or,

Select **Treatment Simulation** from the **Tools** menu on the Dolphin Imaging main screen.

Or,

Select **Start Treatment** from the Link Tracing+Image dialog box.

When you enter the Treatment Simulation module, the digitized lateral x-ray or the superimposed image appears in the Edit dialog box along with the **Treatment Simulation** palette and the Load Soft Tissue Rules dialog box.

3 Select the soft tissue rules you want to use as described in “Loading Soft Tissue Rules” on page 12-4.

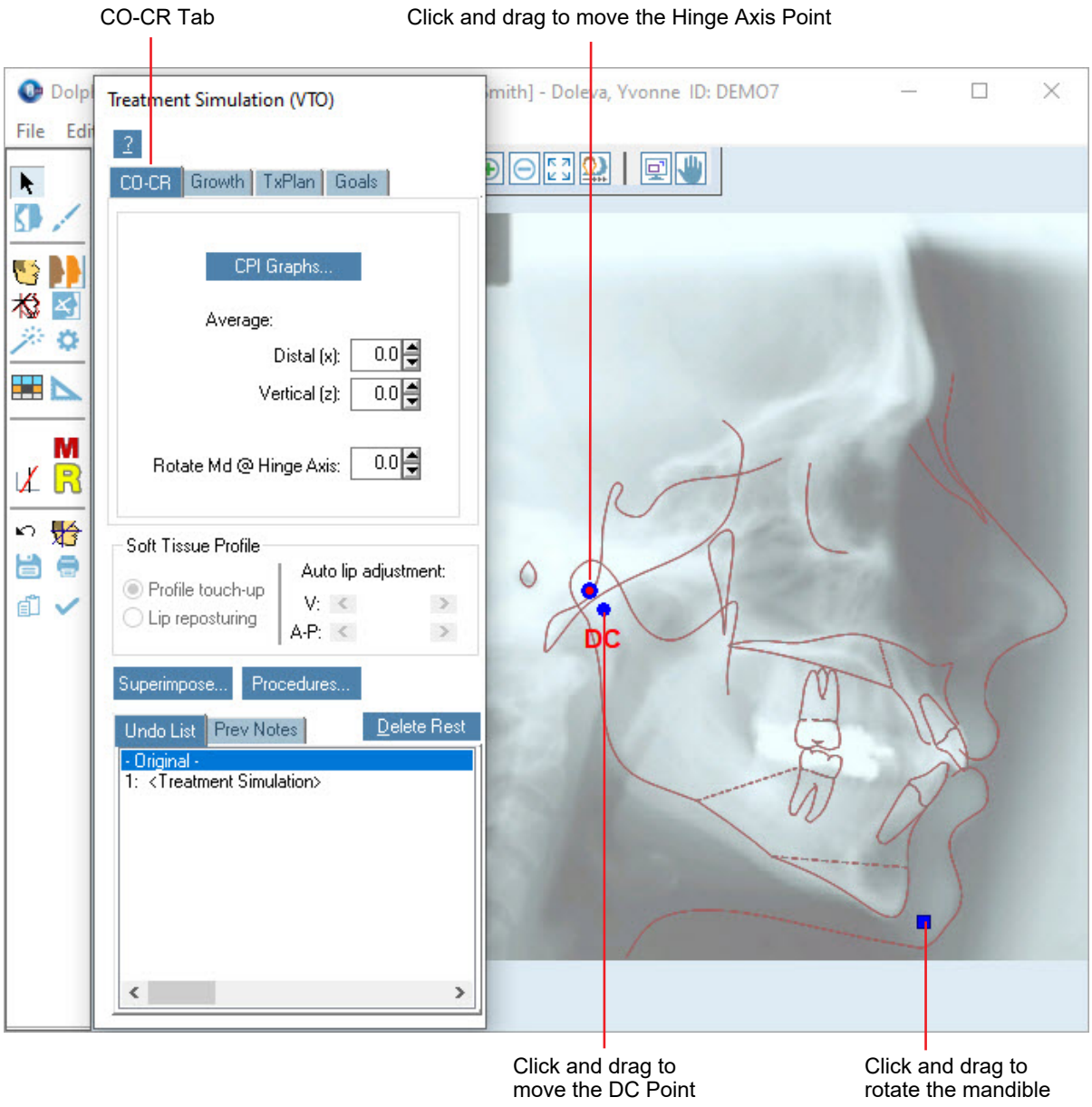
4 Click the **CO-CR** tab on the **Treatment Simulation** palette.

If you have not performed CO-CR conversion for this patient, the CPI Graphs dialog box opens when you select the **CO-CR** tab. For more information, see “Entering Values on the CPI Graphs” on page 10-6.

Otherwise, the **CO-CR** tab summarizes the values for the previously-performed CO-CR conversion operation.

Using the CO-CR Tab

The **CO-CR** tab offers options for CO/CR conversion and summarizes the values for any previously performed CO-CR conversion operation, as shown below.



CO-CR tab	Information about the CO/CR operation to perform. **CPI Graphs...:** Opens Condylar Position Indicator (CPI) graphs (see “Entering Values on the CPI Graphs” on page 10-6). **Average:** Average values for the deviation. Distal (x) indicates the average lateral value, also referred to as Delta x. Vertical (z) indicates the average vertical value, also referred to as Delta z. **Rotate Md @ Hinge Axis:** Number of degrees to rotate the patient’s mandible about the hinge axis. This operation does not take tooth contact into consideration. For information about the **Growth** tab, see Chapter 11, Growth (Medical Device). For information about the **TxPlan** and **Goals** tabs, see Chapter 12, Treatment Simulation (Medical Device).
Soft Tissue Profile	Options for changing the patient’s soft tissue profile. This option is not available when the **CO-CR** tab is selected. For more information, see Chapter 12, Treatment Simulation (Medical Device).
Superimpose...	Superimposes the original and treatment simulation tracings, aligning them using the specified landmarks. For more information on using landmarks to align tracings, see “Specifying Landmarks for Superimposition” on page 9-21. **Advanced…**: Opens the Tracing Superimpositions dialog box with the original and treatment simulation tracings. For more information, see “Tracings Over Tracings” on page 9-8.
Procedures...	Opens a list of the types of procedures you can simulate. **Ortho and Surgical:** Enables features for simulating both orthodontic and surgical procedures. **Ortho only:** Enables features for simulating orthodontic procedures only. Features for simulating surgical procedures are disabled. **Surgical only:** Enables features for simulating surgical procedures only. Features for simulating orthodontic procedures are disabled.
Undo List	Lists treatment simulation operations that you have performed since you last saved so that you can return to any point in your treatment planning session **Original:** Returns to the beginning of your treatment simulation session.
Prev Notes	Displays operations and other notes from previously-saved operations. You cannot delete or jump to any of these operations.
Delete Rest	Deletes all operations in the **Undo List** below the selected operation. Available only when one of the operations on the **Undo List** tab is selected.

To set average CPI values:

1 Enter the average lateral value, also referred to as Delta x, in the **Distal (x)** field.

2 Enter the average vertical value, also referred to as Delta z, in the **Vertical (z)** field.

The Dolphin imaging program remembers these values the next time you open the **CO-CR** tab.

Using the Treatment Simulation Tool Bar

The Treatment Simulation tool bar contains the following buttons:

	Opens the Treatment Simulation module. For more information, see Chapter 12, Treatment Simulation (Medical Device).
	Opens the **Morph** tool. For more information, see “Using the Morph Palette” on page 6-7.
	Opens the **Brushes** tool. For more information, see “Using the Brushes Palette” on page 6-10.
	Sets the display option for the image. For more information, see “Setting the Display Mode” on page 12-28.
	Displays the modified image side-by-side with the original image. For more information, see “Viewing Two Images Side by Side” on page 6-20.
	Toggles display of the original tracing. For more information, see “Overlaying the Original Tracing” on page 12-24.
	Toggles the display of the patient’s tracing.
	Opens the **Enhance** tool. For more information, see “Enhancing an Image” on page 5-16.
	Sets display preferences. For more information, see “Setting Display Preferences” on page 12-28.
	Opens the Original Records window. For more information, see “Using the Original Records Window” on page 12-25.
	Opens the Measurements table. For more information, see Chapter 8, Measurements (Medical Device).
	Opens the McLaughlin Dental VTO Analysis. For more information, see Chapter 13, McLaughlin Dental VTO Analysis (Medical Device).
	Aligns the image to a reference plane. For more information, see “Aligning the Image to a Reference Plane” on page 9-5.
	Opens the Ricketts VTO/Roth-Williams VTO wizard. For more information, see Chapter 14, Ricketts VTO/Roth-Williams AEO VTO (Medical Device).
	Undoes the previous operation. For more information, see “Undoing Your Changes” on page 6-10
	Opens the Link Tracing+Image window. For more information, see “Tracing+Image” on page 9-1.
	Saves the image. For more information, see “Saving the CO/CR Conversion Operation” on page 10-9.
	Prints the image. For more information, see “Printing the Treatment Simulation” on page 12-27.
	Copies the image and/or its tracings to the clipboard.

✓	Returns to the Dolphin Imaging main screen. For more information, see Chapter 3, The Dolphin Imaging Main Screen.

Entering Values on the CPI Graphs

The goal of CO/CR conversion is to create a corrected lateral cephalogram that matches the articulator mounting. To do this, you enter the indicator values obtained from an articulated study model in centric occlusion (CO) on the CPI graphs. Then, Dolphin calculates new cephalometric values with the mandible re-positioned in centric relation (CR).

To enter values on the CPI graphs:

1 Click **CPI Graphs...** if the CPI Graphs dialog box is not already open.

The CPI Graphs dialog box opens.

2 Enter the values from the articulated, mounted study model CPI graphs.

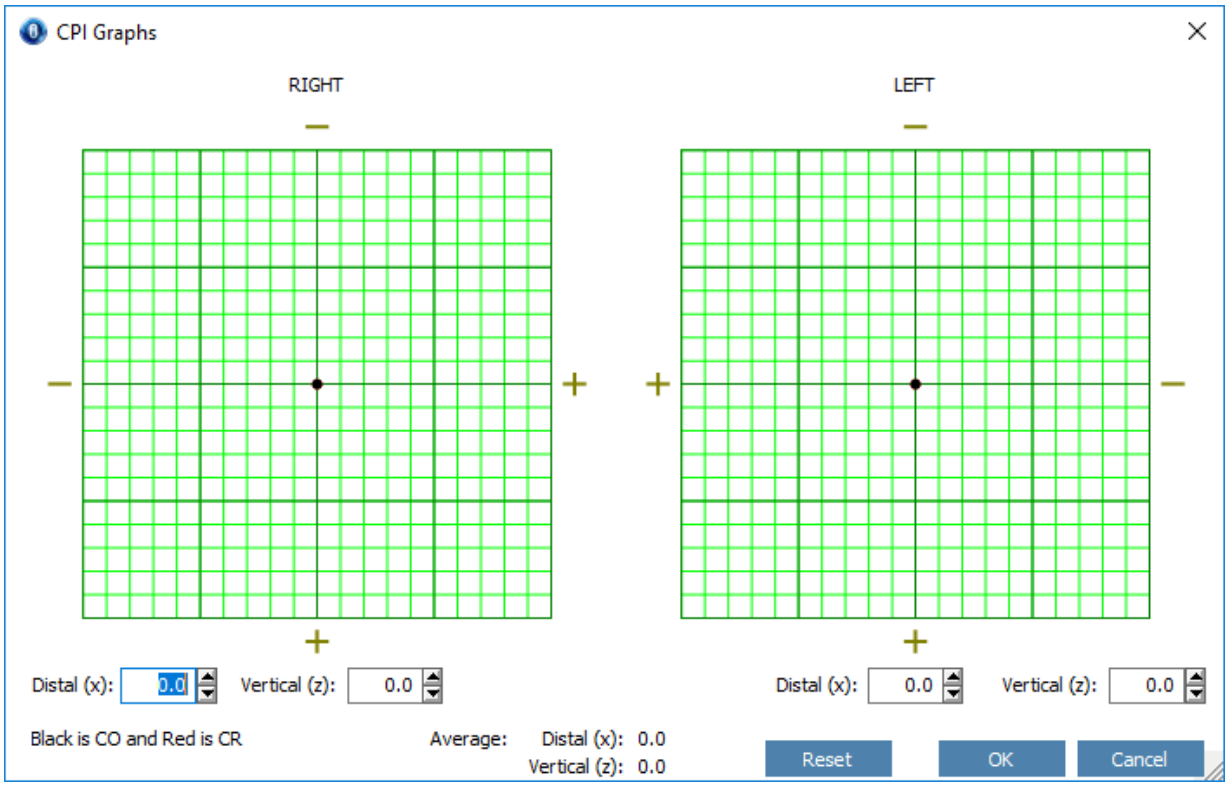
To enter the values, first click and drag the black dot from the center of the graph to the location indicated on the corresponding graph for the articulated, mounted study model. Next, click and drag the red dot.

Alternatively, you can enter values in the **Distal (x)** and **Vertical (z)** fields below the graphs.

When you enter these values, Dolphin calculates and displays the average for each direction.

3 Click **OK**.

Dolphin moves the head of condyle based on the average values, creating a new CR tracing in red superimposed over the original CO tracing, which appears in black.

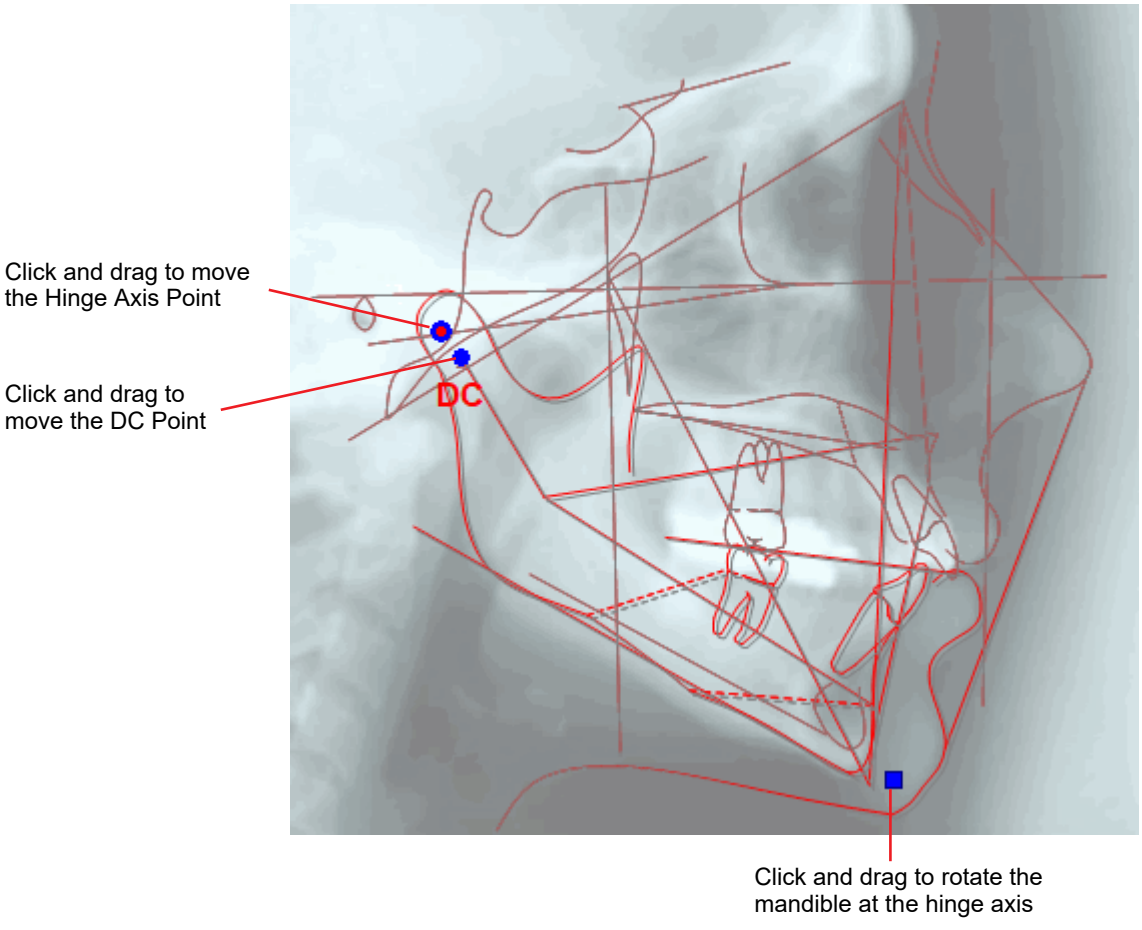


RIGHT	Duplicates the articulated, mounted study model CPI graphs for the right side. **Distal (x):** The head of condyle moves by the horizontal reading (repositioning of condyle). Values greater than zero result in anterior movement. Values less than zero result in posterior movement. For example, if the value is 2.5mm, the head of condyle is moved anteriorly 2.5mm at the condylar axis. **Vertical (z):** The head of condyle moves by the vertical reading (repositioning of condyle). Values greater than zero result in upward movement. Values less than zero result in downward movement. For example, if value is 2.5mm, the head of condyle is moved superiorly 2.5mm at the condylar axis.
LEFT	Duplicates the articulated, mounted study model CPI graphs for the left side. **Distal (x):** The head of condyle moves by the horizontal reading (repositioning of condyle). Values greater than zero result in anterior movement. Values less than zero result in posterior movement. For example, if the value is 2.5mm, the head of condyle is moved anteriorly 2.5mm at the condylar axis. **Vertical (z):** The head of condyle moves by the vertical reading (repositioning of condyle). Values greater than zero result in upward movement. Values less than zero result in downward movement. For example, if value is 2.5mm, the head of condyle is moved superiorly 2.5mm at the condylar axis.

Average	Averages of right and left values. **Distal (x):** The head of condyle (thus the entire mandible) moves by the average horizontal reading (repositioning the condyle). Values greater than zero result in anterior movement. Values less than zero result in posterior movement. For example, if the average value is 2.5mm, the mandible is moved anteriorly 2.5mm at the condylar axis. **Vertical (z):** The head of condyle (thus the entire mandible) moves by the average vertical reading (repositioning the condyle). Values greater than zero result in upward movement. Values less than zero result in downward movement. For example, if the average value is 2.5mm, the mandible is moved superiorly 2.5mm at the condylar axis.
Reset	Moves the black and red dots on both graphs back to the center.

Fine-tuning the Tracing

After you enter values on the CPI graphs, Dolphin creates a new CR tracing in red superimposed over the original CO tracing (see below). You can use the blue movement controls and the **Rotate Md .@ Hinge Axis** field on the **CO-CR** tab of the **Treatment Simulation** palette to fine-tune the CR tracing.



To fine-tune the tracing:

1 Optionally, click and drag the movement control at the hinge axis point to correct its location.

In most analyses, the hinge axis point is a calculated point. Moving this movement control enables you to ensure that the hinge axis point is correctly identified on the tracing.

2 Optionally, click and drag the movement control at the DC point to correct its location.

Based on your changes, Dolphin updates the patient's cephalometric tracings and associated image.

In addition, the operations you performed are added to the **Undo List** box. You can click on the tool bar to view measurements updated to reflect the operation you performed. For more information on measurements, see Chapter 8, Measurements (Medical Device).

3 Click and drag the movement control on the mandible to auto-rotate it.

Or,

Enter a value in the **Rotate Md .@ Hinge Axis** field.

At this point, you can proceed to Treatment Simulation by clicking the **TxPlan** tab on the palette. For more information on Treatment Simulation, see Chapter 12, Treatment Simulation (Medical Device).

Returning to a Point in the History

To return the image to any point in the history:

1 Select the **Undo List** tab if it isn't already selected.

2 Select the operation to return to in the **Undo List**.

3 Click **Delete Rest** to delete all operations performed after the selected operation.

Saving the CO/CR Conversion Operation

When you save the CO/CR conversion operation, Dolphin always saves both of the following:

- the image and data that reflect the CO/CR conversion operation
- the original image and data, for your reference or further treatment simulation

To save the treatment image after you have finished the CO/CR conversion operation:

1 Click .

The Save Image dialog box is displayed.

2 Optionally, modify the image title.

Dolphin automatically provides an appropriate image title, "Treatment Simulation" in most cases. However, you may wish to enter a more specific name (for example, "CO/CR"), as appropriate for this image and data.

3 Select a slot from the **Save As** list in which to save this image, and click **OK**.

For each patient and timepoint, you can save up to eight different treatment simulations.

Note: *If you are viewing two images side by side when you save, the side-by-side view of the two images is saved as a single image.*

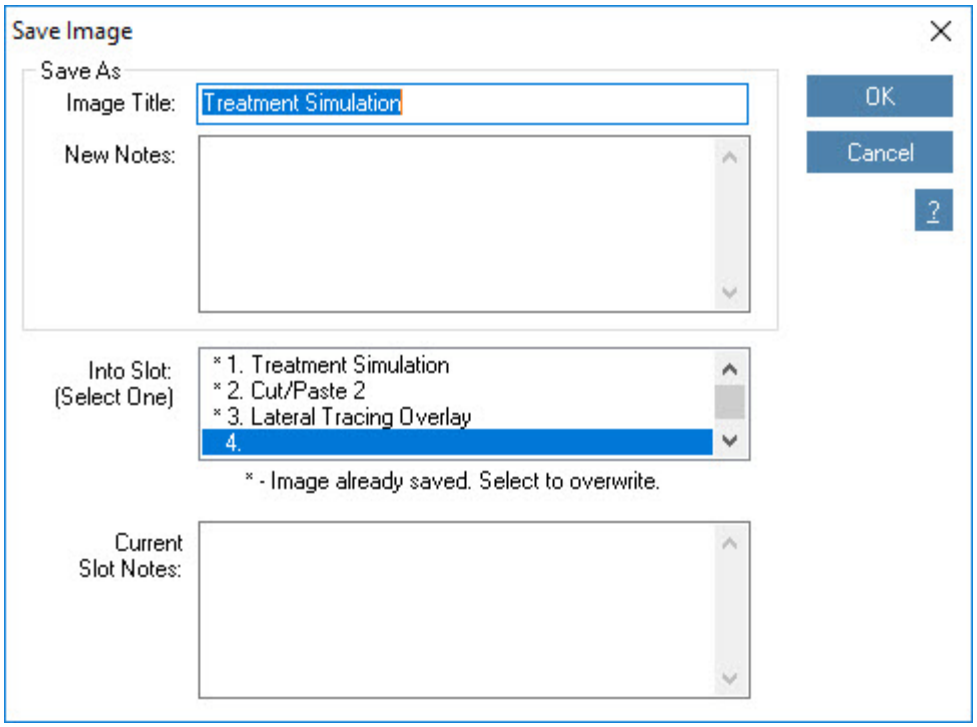


Image Title	Title for this image, up to 25 characters.
New Notes	Notes for this image. This field is automatically completed with a summary of the operations you performed, but you can modify these notes. When you view this treatment simulation again later, you can access these notes using the **Previous Notes** tab on the **Treatment Simulation** palette.
Into Slot	Slots available for each timepoint in which you can save this image. If you select a slot containing an image, the existing image is overwritten with the new image.
Current Slot Notes	Notes previously entered for the selected slot (if any).

11 Growth (Medical Device)

The Growth feature provides a lateral profile growth forecast. The Growth feature forecasts growth on the patient's lateral photo and cephalometric tracings. The data used for the growth prediction is either the Bolton or Ricketts norms.

Before using the growth feature, you need:

- a lateral photo of the patient
- a lateral x-ray digitized with the @Treatment Plan analysis (see Chapter 7, Digitize (Medical Device))

To verify that the images you need are available, select the **- Everything -** image layout from the **Layout** drop-down list on the Dolphin Imaging main screen. It contains all patient images for the selected time-point.

Once you have verified that these images are available, you need to superimpose the tracings over the patient's lateral photo. For more information on creating a superimposed image, see Chapter 9, Superimposition (Medical Device).

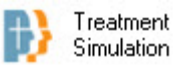
Note: *If you have the Dolphin Imaging Security Utilities installed, you can use the Growth feature only if your Dolphin Imaging user account has the Orthodontic and Surgical Treatment Simulation privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Accessing the Growth Forecast

To access the Growth Forecast:

1 Select the superimposed image from the Dolphin Imaging main screen, if it is not already selected.

If you do not have a superimposed image, you can create one using the superimpose feature (see Chapter 9, Superimposition (Medical Device)). If you already have a superimposed image, you can select it by selecting the **- Everything -** image layout from the **Layout** drop-down list on the Dolphin Imaging main screen.

2 Click 

on the Dolphin Imaging main screen.

Or,

Select **Treatment Simulation** from the **Tools** menu on the Dolphin Imaging main screen.

Or,

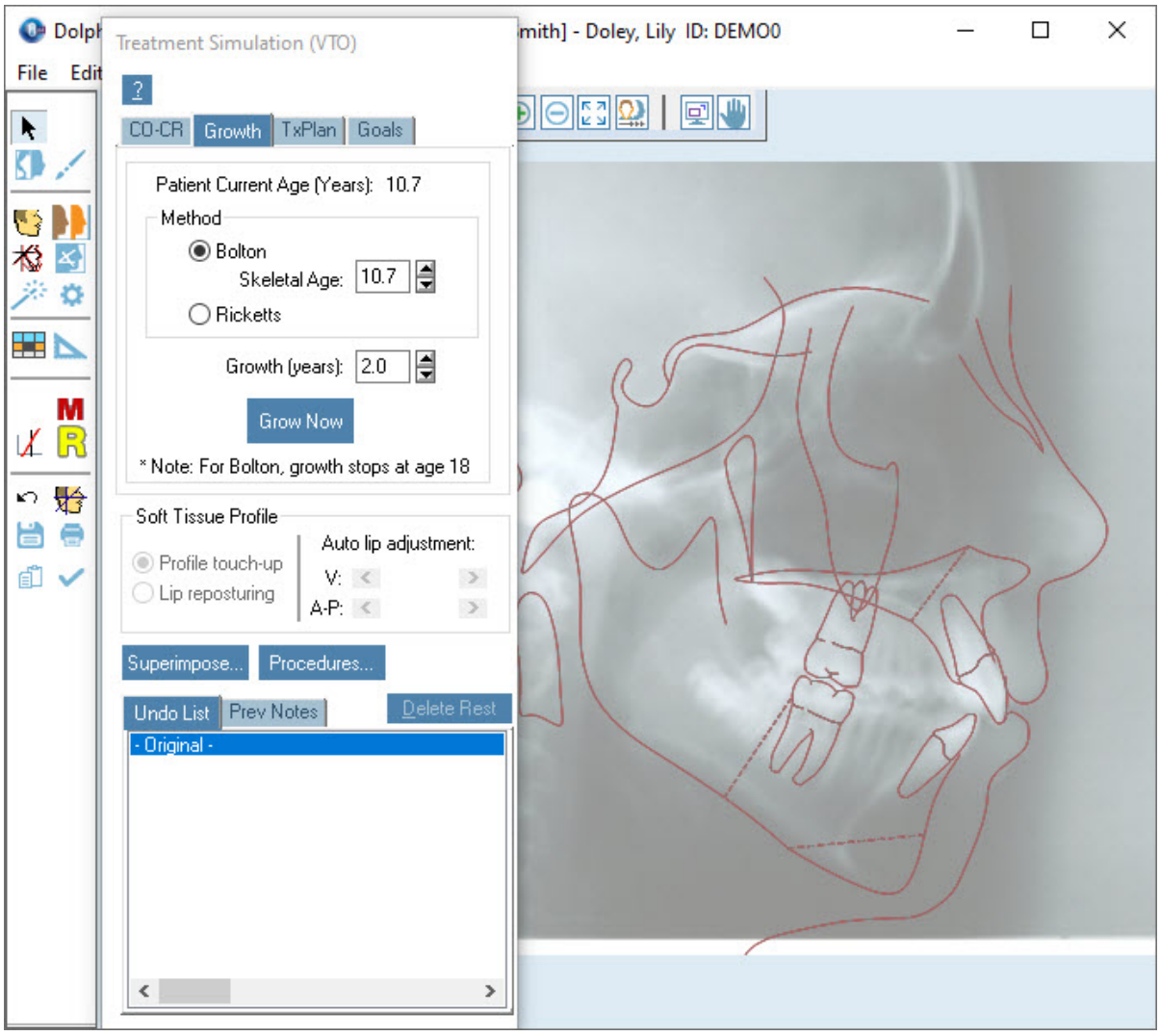
Select **Start Treatment** from the Link Tracing+Image dialog box.

When you enter the Treatment Simulation module, the digitized lateral x-ray or the superimposed image appears in the Edit dialog box along with the **Treatment Simulation** palette and the Load Soft Tissue Rules dialog box.

3 Select the soft tissue rules you want to use as described in “Loading Soft Tissue Rules” on page 12-4.

4 Click the **Growth** tab on the **Treatment Simulation** palette.

When you select the **Growth** tab, the Growth Forecast options appear as shown below.



Growth tab	Information about the growth operation to perform. **Method:** Growth method to use to simulate growth • **Bolton:** Uses the Bolton method for the growth forecast. This method can simulate growth up to age 18. ○ **Patient skeletal age:** Skeletal age obtained from the patient's wrist x-ray. • **Ricketts:** Uses the Ricketts method for the growth forecast. **Growth (years):** Number of years to add to this patient's age for this simulation. **Grow Now:** Begins the growth forecast. For information about the **CO-CR** tab, see Chapter 10, CO/CR Conversion. For information about the **TxPlan** and **Goals** tabs, see Chapter 12, Treatment Simulation (Medical Device).
Soft Tissue Profile	Options for changing the patient's soft tissue profile. This option is not available when the Growth tab is selected. For more information, see Chapter 12, Treatment Simulation (Medical Device).
Superimpose...	Superimposes the original and treatment simulation tracings, aligning them using the specified landmarks. For more information on using landmarks to align tracings, see "Specifying Landmarks for Superimposition" on page 9-21. **Advanced…**: Opens the Tracing Superimpositions dialog box with the original and treatment simulation tracings. For more information, see "Tracings Over Tracings" on page 9-8.
Procedures...	Opens a list of the types of procedures you can simulate. **Ortho and Surgical:** Enables features for simulating both orthodontic and surgical procedures. **Ortho only:** Enables features for simulating orthodontic procedures only. Features for simulating surgical procedures are disabled. **Surgical only:** Enables features for simulating surgical procedures only. Features for simulating orthodontic procedures are disabled.
Undo List	Lists treatment simulation operations that you have performed since you last saved so that you can return to any point in your treatment planning session **Original:** Returns to the beginning of your treatment simulation session.
Prev Notes	Displays operations and other notes from previously-saved operations. You cannot delete or jump to any of these operations.
Delete Rest	Deletes all operations in the **Undo List** below the selected operation. Available only when one of the operations on the **Undo List** tab is selected.

Using the Treatment Simulation Tool Bar

The Treatment Simulation tool bar contains the following buttons:

	Opens the Treatment Simulation module. For more information, see Chapter 12, Treatment Simulation (Medical Device).
	Opens the **Morph** tool. For more information, see “Using the Morph Palette” on page 6-7.
	Opens the **Brushes** tool. For more information, see “Using the Brushes Palette” on page 6-10.
	Sets the display option for the image. For more information, see “Setting the Display Mode” on page 12-28.
	Displays the modified image side-by-side with the original image. For more information, see “Viewing Two Images Side by Side” on page 6-20.
	Toggles display of the original tracing. For more information, see “Overlaying the Original Tracing” on page 12-24.
	Toggles the display of the patient’s tracing.
	Opens the **Enhance** tool. For more information, see “Enhancing an Image” on page 5-16.
	Sets display preferences. For more information, see “Setting Display Preferences” on page 12-28.
	Opens the Original Records window. For more information, see “Using the Original Records Window” on page 12-25.
	Opens the Measurements table. For more information, see Chapter 8, Measurements (Medical Device).
	Opens the McLaughlin Dental VTO Analysis. For more information, see Chapter 13, McLaughlin Dental VTO Analysis (Medical Device).
	Aligns the image to a reference plane. For more information, see “Aligning the Image to a Reference Plane” on page 9-5.
	Opens the Ricketts VTO/Roth-Williams VTO wizard. For more information, see Chapter 14, Ricketts VTO/Roth-Williams AEO VTO (Medical Device).
	Undoes the previous operation. For more information, see “Undoing Your Changes” on page 6-10
	Opens the Link Tracing+Image window. For more information, see “Tracing+Image” on page 9-1.
	Saves the image. For more information, see “Saving the Growth Prediction” on page 11-5.
	Prints the image. For more information, see “Printing the Treatment Simulation” on page 12-27.
	Copies the image and/or its tracings to the clipboard.

✓	Returns to the Dolphin Imaging main screen. For more information, see Chapter 3, The Dolphin Imaging Main Screen.

Forecasting the Patient's Growth

To forecast the patient's growth:

1 Select the method you want to use to simulate growth (either **Bolton** or **Ricketts**).

2 If you are using the Bolton growth method, enter or correct the patient's skeletal age.

The patient's skeletal age is typically determined from a wrist x-ray. The default value for skeletal age is the patient's chronological age, determined from the patient's birth date entered on the Patient Lookup dialog box.

3 Enter the number of years to add to the patient's age in this growth forecast.

4 Click **Grow Now**.

The patient's image updates to simulate growth.

Returning to a Point in the History

To return the image to any point in the history:

1 Select the **Undo List** tab if it isn't already selected.

2 Select the operation to return to in the **Undo List**.

3 Click **Delete Rest** to delete all operations performed after the selected operation.

Saving the Growth Prediction

When you save the growth prediction, Dolphin always saves both of the following:

- the image and data that comprise the growth prediction
- the original image and data, for your reference or further treatment simulation

To save the growth prediction:

1 Click .

The Save Image dialog box is displayed.

2 Optionally, modify the image title.

Dolphin automatically provides an appropriate image title, "Treatment Simulation" in most cases. However, you may wish to enter a more specific name (for example, "Growth Prediction"), as appropriate for this image and data.

3 Select a slot from the **Save As** list in which to save this image, and click **OK**.

For each patient and timepoint, you can save up to eight different simulations.

Note: *If you are viewing two images side by side when you save, the side-by-side view of the two images is saved as a single image.*

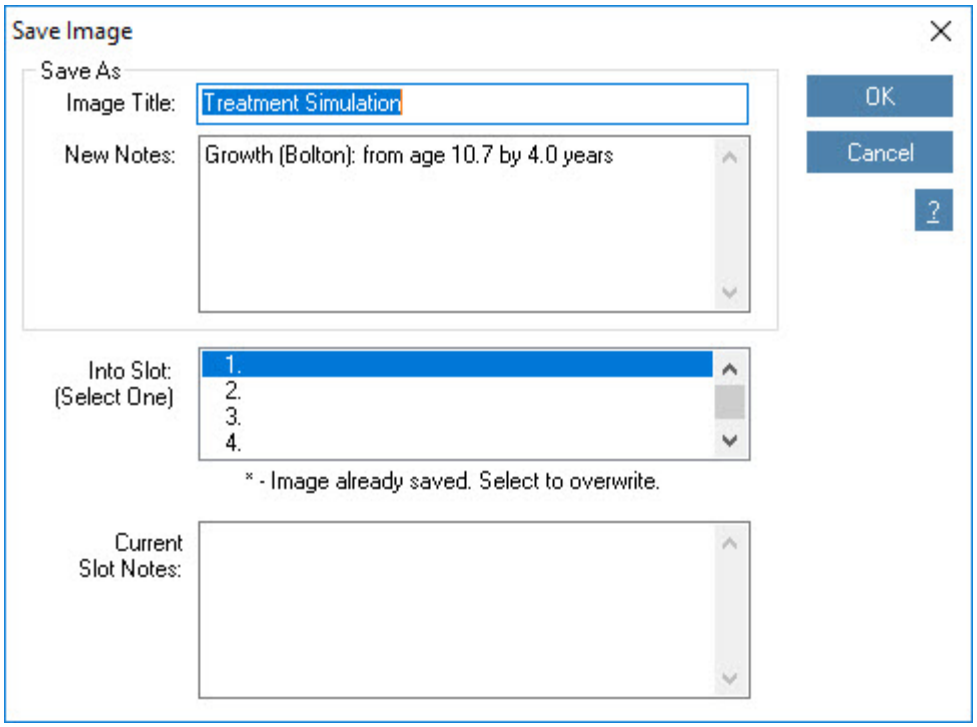


Image Title	Title for this image, up to 25 characters.
New Notes	Notes for this image. This field is automatically completed with a summary of the operations you performed, but you can modify these notes. When you view this treatment simulation again later, you can access these notes using the **Previous Notes** tab on the **Treatment Simulation** palette.
Into Slot	Slots available for each timepoint in which you can save this image. If you select a slot containing an image, the existing image is overwritten with the new image.
Current Slot Notes	Notes previously entered for the selected slot (if any).

12 Treatment Simulation (Medical Device)

The Treatment Simulation feature provides a scientifically-based orthodontic and surgical treatment simulation and prediction tool. When you enter treatment simulation information, the Treatment Simulation program simulates the treatment results on the patient's lateral cephalometric tracings, with the option of updating the patient's soft tissue image. The Treatment Simulation program works only in the lateral view.

Using the Treatment Simulation feature, you can simulate:

- tooth and skeletal movement based on orthodontic treatment.
- skeletal and soft tissue changes as a result of oral maxillo-facial surgery.

If you have purchased the Consultation and Image Library module, you may find that using use the **Morph** tool on the Image Edit dialog box is adequate for patient presentation purposes, which provides a fast and more artistic method for communicating treatment options. The Treatment Simulation feature, of course, provides more consistent results, but this level of accuracy may not be necessary for merely communicating treatment options to the patient. You also may want to augment the images resulting from treatment simulation using the **Morph** and **Brush** tools. For more information, see Chapter 6, Image Edit.

To use treatment simulation, you typically need the following:

- a lateral x-ray digitized with the @Treatment Plan analysis (see Chapter 7, Digitize (Medical Device))
- a lateral photo of the patient (optional)

You can use treatment simulation with only a digitized lateral x-ray. However, for treatment presentations, we highly recommend that you perform treatment simulation operations using a digitized x-ray overlaid with the patient's profile image.

To verify that the pictures you need are available, select the **- Everything -** image layout from the **Layout** drop-down list on the Dolphin Imaging main screen. This layout contains all patient images for the selected timepoint.

Once you have verified that these images are available, you need to superimpose the tracings over the patient's lateral photo if you wish to perform treatment simulation using the patient's image. For more information on creating a superimposed image, see Chapter 9, Superimposition (Medical Device).

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use the Treatment Simulation feature only if your Dolphin Imaging user account has the Orthodontic and Surgical Treatment Simulation privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Accessing Treatment Simulation

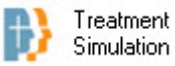
To access Treatment Simulation:

1 On the Dolphin Imaging main screen, select the **- Everything -** image layout.

The **- Everything -** layout contains all patient images for the selected timepoint. To perform treatment simulation, you need either a lateral x-ray digitized with the @Treatment Plan analysis or a profile photo of the patient superimposed with the patient's tracing. If either of these images is available for this patient and timepoint, it will be available from this image layout.

For more information on superimposing the patient's profile photo and tracing, see Chapter 9, Superimposition (Medical Device).

2 Select the image you want to use for your treatment simulation.

3 Click 

on the Dolphin Imaging main screen.

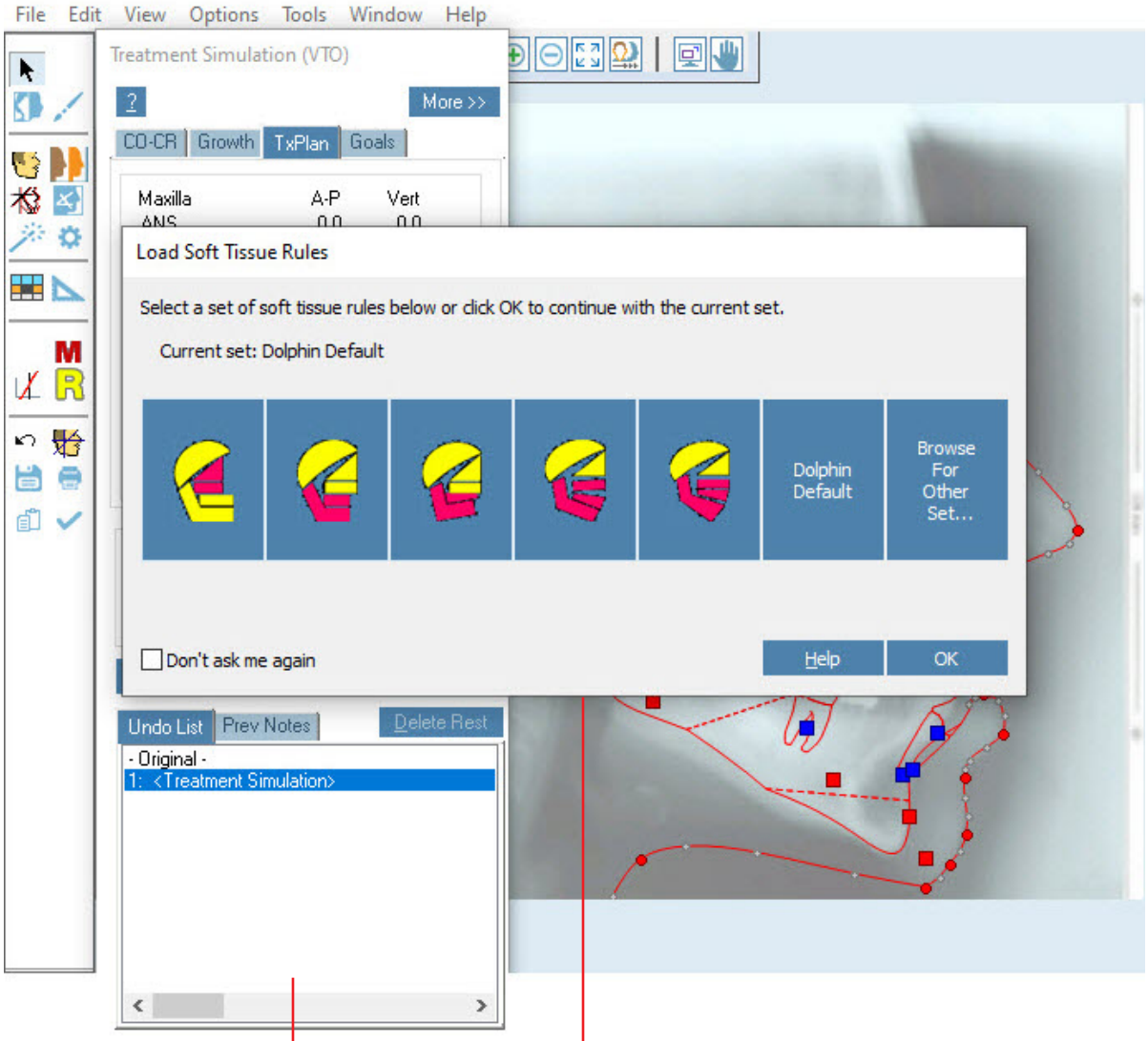
Or,

Select **Treatment Simulation** from the **Tools** menu on the Dolphin Imaging main screen.

Or,

Select **Start Treatment** from the Link Tracing+Image dialog box.

When you enter the Treatment Simulation module, the digitized lateral x-ray or the superimposed image appears in the Edit dialog box along with the **Treatment Simulation** palette and the Load Soft Tissue Rules dialog box (see below).



Load Soft Tissue Rules	Soft tissue rules you can use when simulating treatment. For more information, see "Loading Soft Tissue Rules" below and "Customizing Soft Tissue Rules" on page 12-30.
Treatment Simulation palette	Tools used to enter information about the treatment you want to simulate. For more information, see "Using the Treatment Simulation Palette" on page 12-7. ***Note:*** *If you previously performed CO/CR or Growth operations for this patient, the results of those operations are taken as the starting point for your treatment simulation. For this reason, all values on the Treatment Simulation palette are zero.*
image	Image you selected on the Dolphin Imaging main screen. Initially, the image is in draft mode. For more information, see "Setting the Display Mode" on page 12-28.

Loading Soft Tissue Rules

The Dolphin Treatment Simulation module calculates changes to the patient's soft tissue image based rules that translate changes in the cephalometric data to soft tissue movement. The Dolphin program includes several sets of commonly-used soft tissue rules and enables you to create your own customized soft tissue rules.

When you enter the Treatment Simulation module, the Load Soft Tissue Rules dialog box typically opens automatically so that you can select the set of rules you want to use. You can also change the rules you are using at any time. The rules you select apply to all patients; soft tissue rules are not saved individually for each patient.

To open the Load Soft Tissue Rules dialog box:

1 Select **Load Saved Soft Tissue Rules...** from the **Tools** menu.

The Load Soft Tissue Rules dialog box opens. It indicates the soft tissue rule set currently in use and enables you to select a different set of rules.

To load a set of soft tissue rules other than the default set:

1 Click the icon for a pre-defined soft tissue rules.

Or,

Click **Browse for Other Set...** and browse to the file containing a custom set of soft tissue rules. Then, click **Open**.

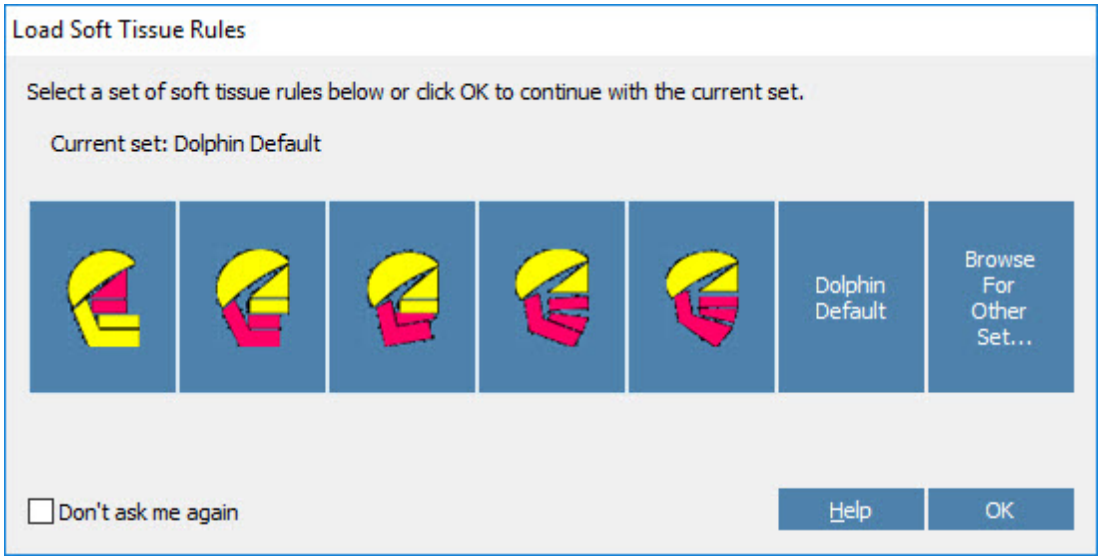
2 Click **OK** to load the selected set of rules.

To return to Dolphin's default set of soft tissue rules:

1 On the Load Soft Tissue Rules dialog box, click **Dolphin Default**. Then, click **OK**.

Or,

Select **Load Dolphin Installed Soft Tissue Rules** from the **Tools** menu. Then, click **Yes**.



	Uses the sagittal soft tissue rules set.
	Uses the mandibular deficient lip incompetent soft tissue rules set.
	Uses the mandibular deficient lip eversion soft tissue rules set.
	Uses the long face lip incompetent soft tissue rules set.
	Uses the mentalis strain soft tissue rules set.
Dolphin Default	Uses the Dolphin default soft tissue rules set.
Browse for Other Set...	Uses a custom soft tissue rules set. For information on defining custom rules sets, see “Customizing Soft Tissue Rules” on page 12-30.
Don't ask me again	Prevents this dialog box from appearing when you open the Treatment Simulation module. If you check this box, you can still change the soft tissue rule set by selecting **Load Saved Soft Tissue Rules...** from the **Tools** menu.

Using the Treatment Simulation Tool Bar

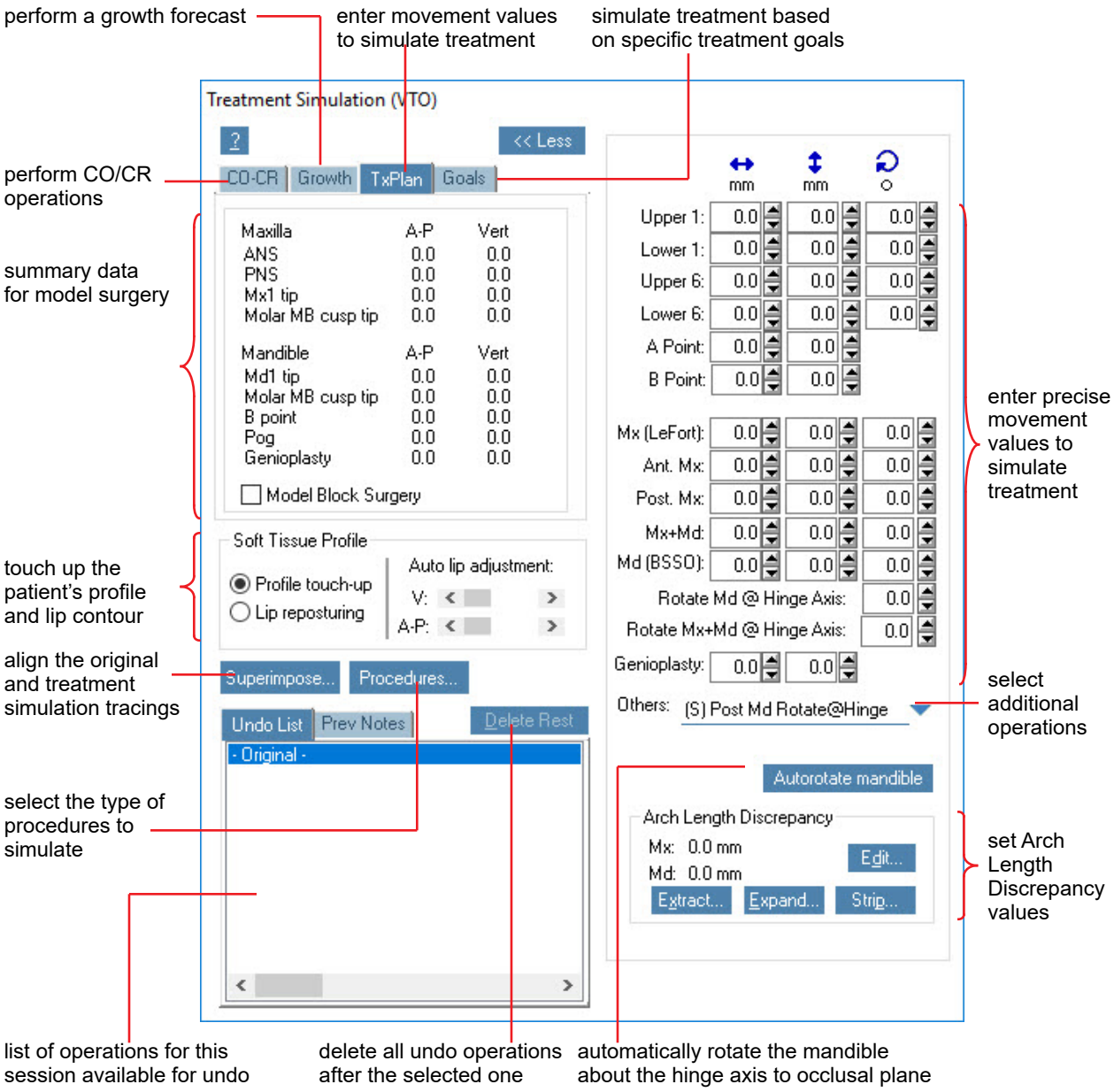
The Treatment Simulation tool bar contains the following buttons:

	Opens the Treatment Simulation module.
	Opens the **Morph** tool. For more information, see “Using the Morph Palette” on page 6-7.
	Opens the **Brushes** tool. For more information, see “Using the Brushes Palette” on page 6-10.
	Sets the display option for the image. For more information, see “Setting the Display Mode” on page 12-28.
	Displays the modified image side-by-side with the original image. For more information, see “Viewing Two Images Side by Side” on page 6-20.
	Toggles display of the original tracing. For more information, see “Overlaying the Original Tracing” on page 12-24.
	Toggles the display of the patient’s tracing.
	Opens the **Enhance** tool. For more information, see “Enhancing an Image” on page 5-16.
	Sets display preferences. For more information, see “Setting Display Preferences” on page 12-28.
	Opens the Original Records window. For more information, see “Using the Original Records Window” on page 12-25.
	Opens the Measurements table. For more information, see Chapter 8, Measurements (Medical Device).
	Opens the McLaughlin Dental VTO Analysis. For more information, see Chapter 13, McLaughlin Dental VTO Analysis (Medical Device).
	Aligns the image to a reference plane. For more information, see “Aligning the Image to a Reference Plane” on page 9-5.
	Opens the Ricketts VTO/Roth-Williams VTO wizard. For more information, see Chapter 14, Ricketts VTO/Roth-Williams AEO VTO (Medical Device).
	Undoes the previous operation. For more information, see “Undoing Your Changes” on page 6-10
	Opens the Link Tracing+Image window. For more information, see “Tracing+Image” on page 9-1.
	Saves the image. For more information, see “Returning to a Point in the History” on page 12-24.

	Opens a menu with the following printing options: **With Operation History List:** Prints the patient image, the treatment simulation information, and the operation history list (listed on the **Undo List**). **Without Operation History List:** Prints only the patient image and treatment simulation information. The history list is *not* included. **Close This Menu:** Closes the menu without making a selection. For more information, see “Printing the Treatment Simulation” on page 12-27.
	Copies the image and/or its tracings to the clipboard.
	Returns to the Dolphin Imaging main screen. For more information, see Chapter 3, The Dolphin Imaging Main Screen.

Using the Treatment Simulation Palette

The following figure illustrates the tools available on the **Treatment Simulation** palette. In this figure, the palette has been expanded by clicking **More>>**.



More>> or <<Less	Toggles display of the expanded version of the **Treatment Simulation** palette, which includes fields in which you can enter exact values or increment values of treatment operations.

Treatment Simulation tabs	Tabs used to simulate treatment operations. **CO-CR:** Options to reposition a patient's condyle and bite from centric occlusion to centric relation. For some patients, this step is necessary before performing any treatment simulation procedures. For more information, see Chapter 10, CO/CR Conversion. **Growth:** Options to forecast the patient's growth. For more information, see Chapter 11, Growth (Medical Device). **TxPlan:** Options to perform treatment simulation. For more information, see "Simulating Treatment" on page 12-10. **Goals:** Options to set the desired orthodontic values to specific common orthodontic cephalometric measurements. For more information, see "Using the Goals Feature" on page 12-12.
Model Block Surgery	Perform treatment simulation based on the physical occlusal model of the patient. For more information, see "Simulating Model Block Surgery" on page 12-16.
Soft Tissue Profile	Options to fine-tune the patient's soft tissue profile after the other treatment simulation processes. **Profile touch-up:** Fine-tunes the patient's profile outline and soft tissue. For more information, see "Touching up the Patient's Profile" on page 12-17. **Lip reposturing:** Quickly repositions the patient's lip area. For more information, see "Reposturing the Lips" on page 12-18. **Auto Adjust Lips:** Make automated, idealized adjustments in both anterior/posterior and vertical directions to the appearance of the patient's lip outline.
Superimpose...	Superimposes the original and treatment simulation tracings, aligning them using the specified landmarks. For more information on using landmarks to align tracings, see "Specifying Landmarks for Superimposition" on page 9-21. **Advanced…**: Opens the Tracing Superimpositions dialog box with the original and treatment simulation tracings. For more information, see "Tracings Over Tracings" on page 9-8.
Procedures...	Opens a list of the types of procedures you can simulate. **Ortho and Surgical:** Enables features for simulating both orthodontic and surgical procedures. **Ortho only:** Enables features for simulating orthodontic procedures only. Features for simulating surgical procedures are disabled. **Surgical only:** Enables features for simulating surgical procedures only. Features for simulating orthodontic procedures are disabled.
Undo List	Lists treatment simulation operations that you have performed since you last saved so that you can return to any point in your treatment simulation session **Original:** Returns to the beginning of your treatment simulation session.
Prev Notes	Displays operations and other notes from previously-saved operations. You cannot delete or jump to any of these operations.
Delete Rest	Deletes all operations in the **Undo List** below the selected operation. Available only when one of the operations on the **Undo List** tab is selected.

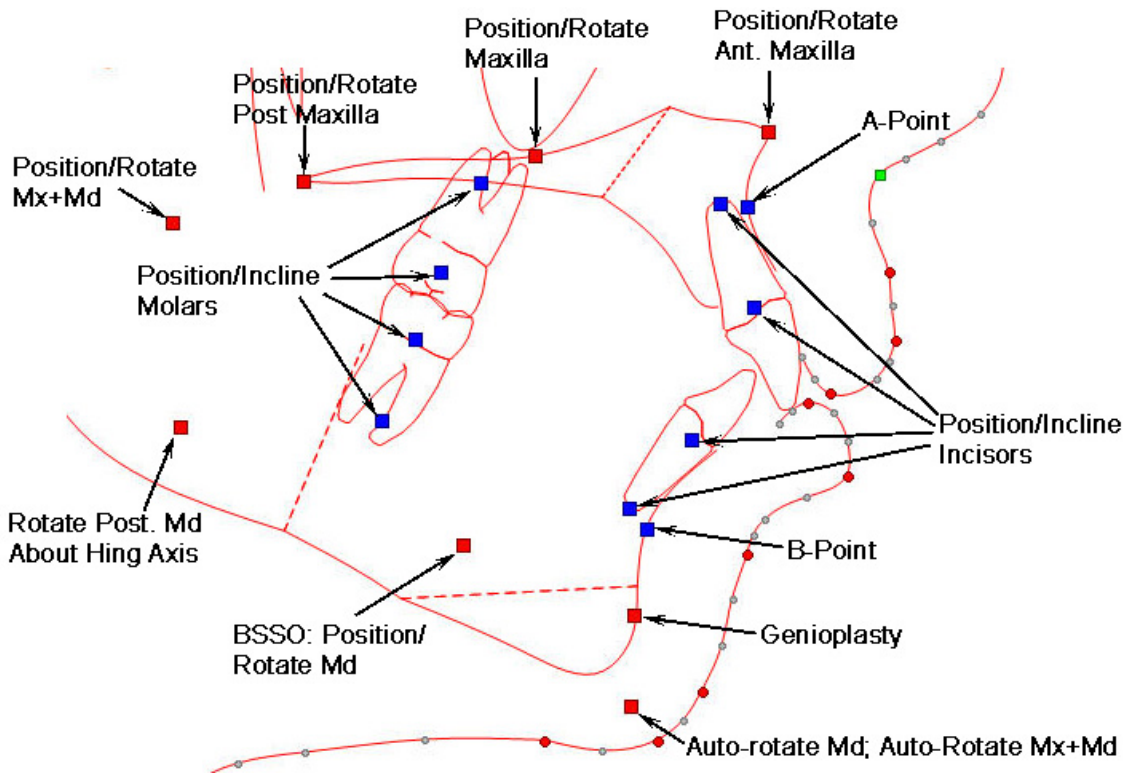
Simulating Treatment

The following procedures describe how to:

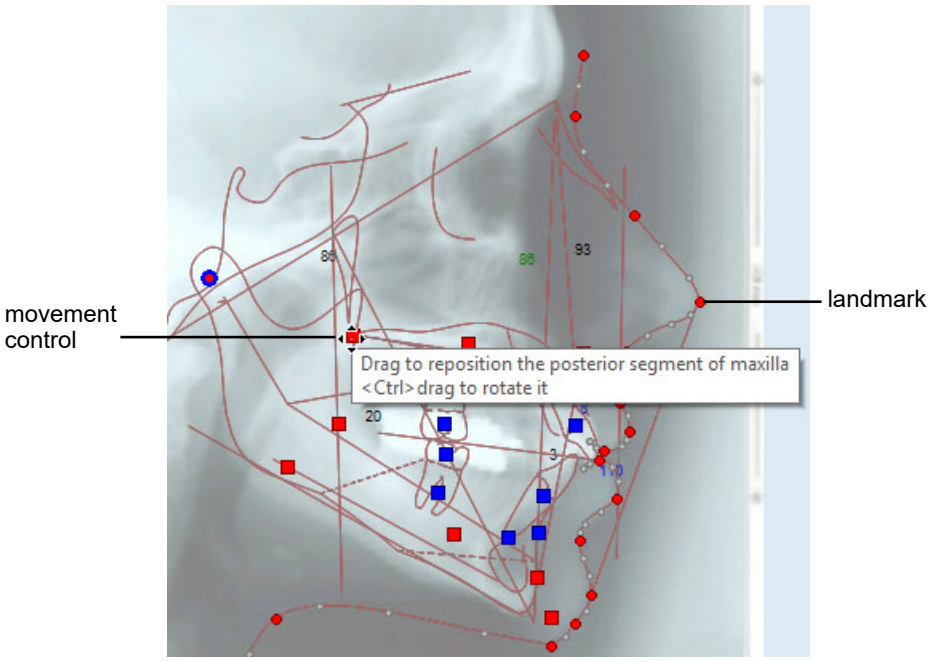
- use movement controls to simulate treatment
- stimulate airway treatment
- use the Goals feature to simulate treatment
- enter movement values to simulate treatment
- simulate model block surgery
- return to an earlier operation in the history
- overlay the patient's original tracing on the current treatment simulation
- view a different image in the Original Records window

Using the Movement Controls

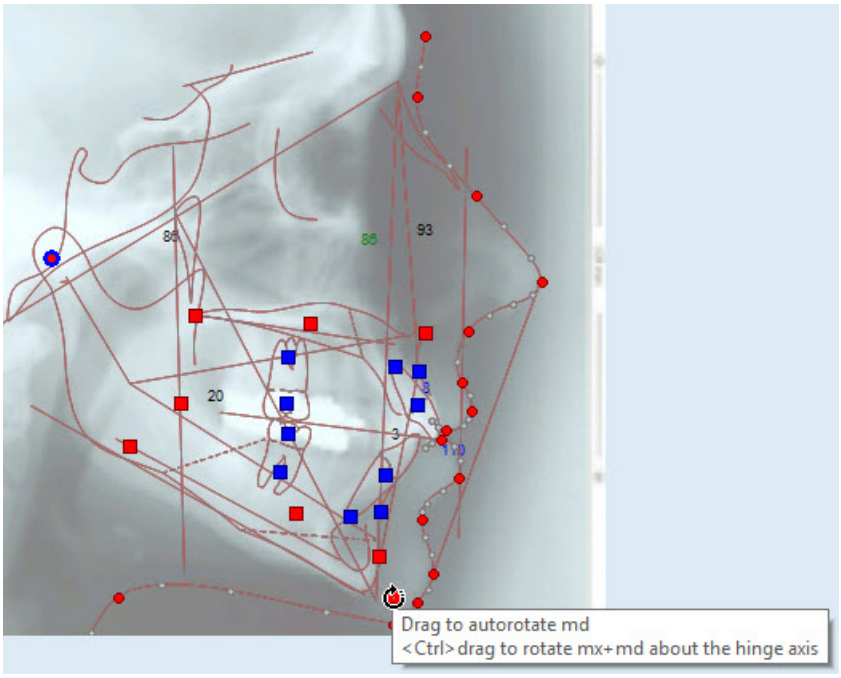
The following figure illustrates the movement controls:



When you place the cursor over one of the movement controls, a tool tip appears indicating the movement that you can perform using that control, as shown below.



If the movement control is for lateral and vertical movement, red triangles appear around the control (as shown above). If the movement control is rotational, a circular arrow appears around the control, as shown below.



Some movement controls enable you to perform both positional and rotational movement. Click and drag for linear movement. CTRL+click and drag for rotational movement. When you click a movement control for rotation, a circle appears on the image depicting the radius.

As you make changes, the patient's soft tissue and cephalometric data are updated automatically to simulate the effect of treatment.

Note: *The amount and ratio of hard tissue to soft tissue movement can be customized. For more information, see "Customizing Soft Tissue Rules" on page 12-30.*

After treatment simulation and soft tissue profile operations (see "Touching up the Patient's Profile" on page 12-17), it may still be necessary to further touch-up the profile. Use the image editing tools such as Morph and Brush to perform those operations. In addition, you might want to display the before and after pictures side-by-side to compare the patient's appearance before and after treatment. For more information on editing images and viewing them side-by-side, see "Viewing Two Images Side by Side" on page 6-20.

You can click on the tool bar to view measurements updated to reflect the operation you performed. For more information on measurements, see Chapter 8, Measurements (Medical Device).

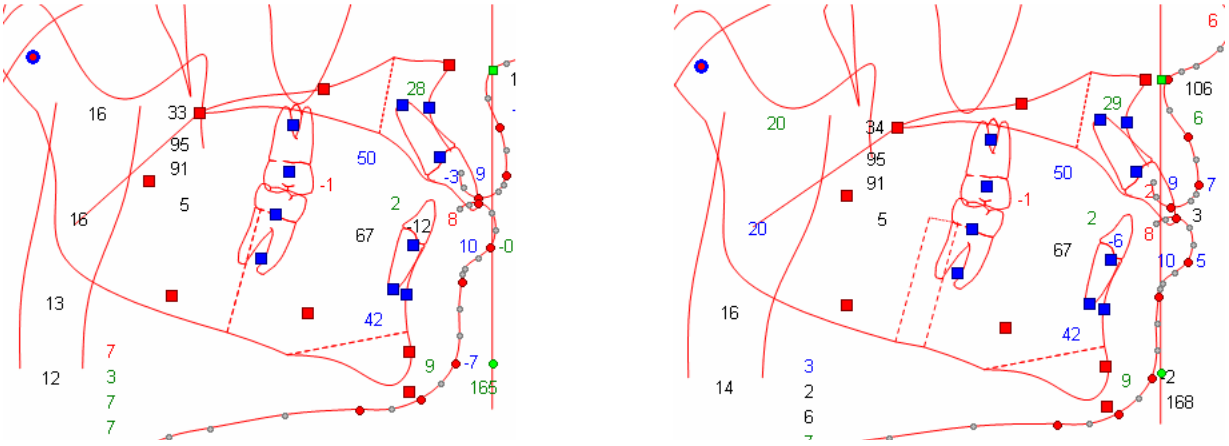
To use the movement controls to simulate treatment:

1 Click and drag one or more of the movement controls.

Simulating Airway Treatment

If you digitized one of the analyses that includes the patient's airway, you can perform treatment simulation for the patient's airway. The following figure illustrates how the patient's airway can change on the tracing during treatment simulation. For the purposes of this example, the mandible and maxilla were advanced, which resulted in widening the airway.

Before **After**



Using the Goals Feature

Using the Goals feature, you specify the goals of the treatment plan in terms of common orthodontic cephalometric measurements. Dolphin Imaging automatically alters the appropriate skeletal structures and soft-tissue profile to get the closest value specified. Please contact Dolphin if you want to see other values listed here.

To use the Goals feature:

1 Click the **Goals** tab on the **Treatment Simulation** palette.

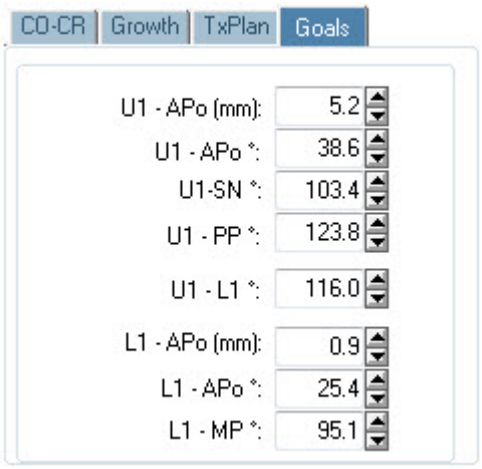
The figure below illustrates the **Goals** tab.

2 Enter the desired values in the field.

Dolphin automatically alters the appropriate skeletal structures and soft-tissue profile to get the closest value specified. As you make changes, the patient's soft tissue and cephalometric data are updated to simulate the effect of the treatment.

After treatment simulation and soft tissue profile operations, it may still be necessary to further touch-up the profile. Use the image editing tools such as Morph and Brush to perform those operations. In addition, you might want to display the before and after pictures side-by-side to compare the patient's appearance before and after treatment. For more information on editing images and viewing them side-by-side, see "Viewing Two Images Side by Side" on page 6-20.

You can click on the tool bar to view measurements updated to reflect the operation you performed. For more information on measurements, see Chapter 8, Measurements (Medical Device).



U1-APo (mm)	Distance in millimeters between the upper incisor and the A-Point-Pogonion (APo) plane. Moves the upper incisor in the anterior-posterior direction.
U1-APo°	Angle between the upper incisor and the A-Point-Pogonion (APo) plane. Rotates the upper incisor to achieve the goal value.
U1-SN°	Angle for the upper incisor to Sella-Nasion (SN) plane. Rotates the upper incisor to achieve the goal value.
U1-PP°	Angle for the upper incisor to Palatal Plane (PP). Rotates the upper incisor to achieve the goal value.
U1-L1°	Angle between the upper and lower incisors. Rotates the upper incisor to achieve the goal value.
L1-APo (mm)	Distance in millimeters between the lower incisor and the A-Point-Pogonion (APo) plane. Moves the lower incisor in the anterior-posterior direction.

L1-APo°	Angle between the lower incisor and the A-Point-Pogonion (APo) plane. Rotates the lower incisor to achieve the goal value.
L1-Mp°	Angle between the lower incisor and the Mandibular plane (Gonion-Menton). Rotates the lower incisor to achieve the goal value.

Entering Movement Values

On the expanded **Treatment Simulation** palette, you can enter values for horizontal, vertical, and rotational movement. As you make changes, the patient's soft tissue and cephalometric data are updated to simulate the effect of the treatment.

To enter movement values to simulate treatment:

1 On the **Treatment Simulation** palette, click **More>>**.

The **Treatment Simulation** palette expands to provide you with more options for simulating treatment, as shown below.

2 Enter new values in the fields to simulate movement of the patient's teeth based on orthodontic or dentofacial surgical treatment.

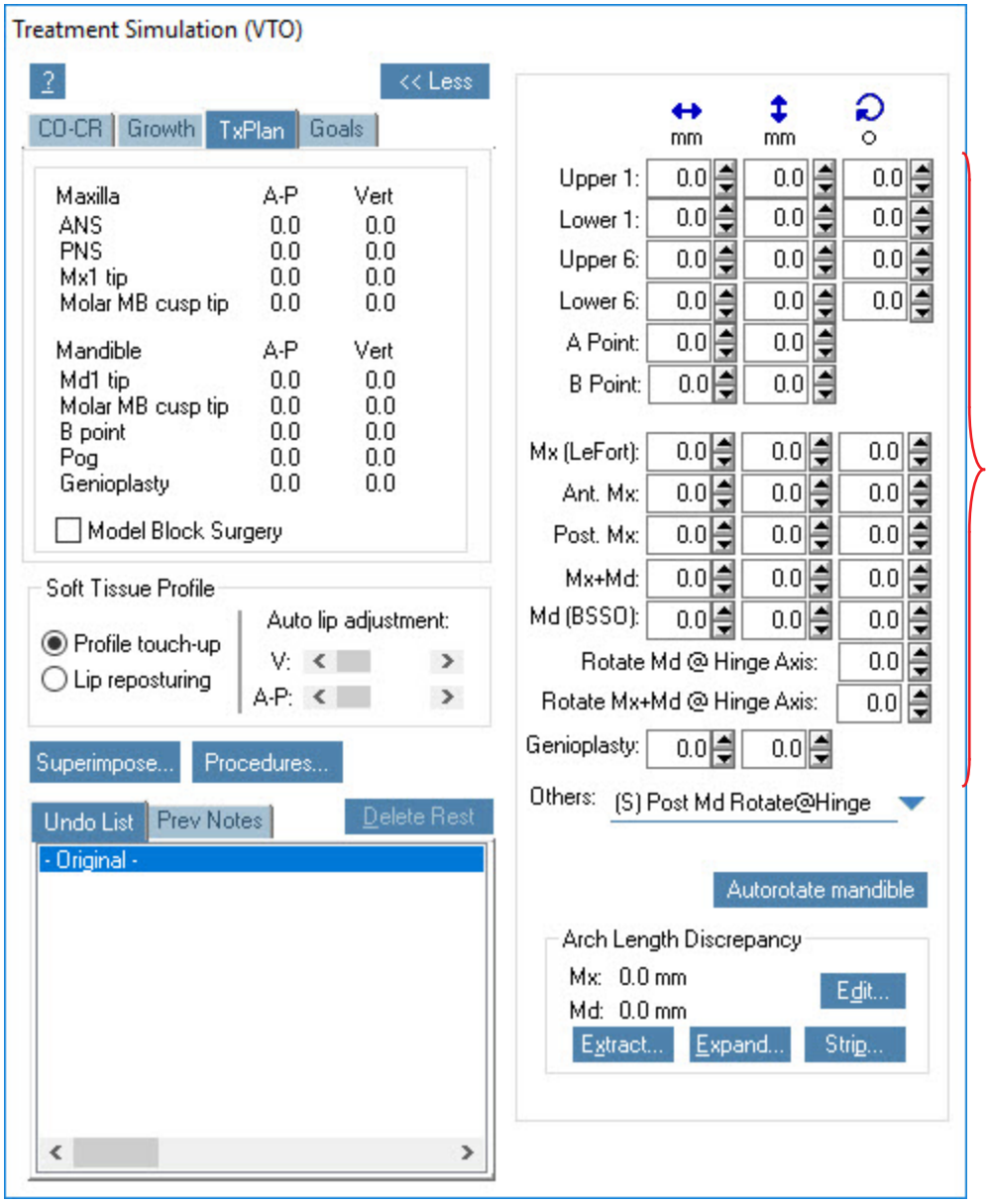
Or,

Click **Auto Rotate** to automatically rotate the mandible about Hinge Axis to assure a proper bite.

In the first column of fields, you can enter values for horizontal movement. In the second column, you can enter values for vertical movement. In the third column, you can enter values for rotational movement (if appropriate).

You may want use the image editing tools such as Morph and Brush to touch up the patient's profile after the changes for an even better appearance. In addition, you might want to display the before and after pictures side-by-side to compare the patient's appearance before and after treatment. For more information on editing images and viewing them side-by-side, see "Viewing Two Images Side by Side" on page 6-20.

You can click on the tool bar to view measurements updated to reflect the operation you performed. For more information on measurements, see Chapter 8, Measurements (Medical Device).



Upper 1	Values for movement of the patient's upper incisors.
Lower 1	Values for movement of the patient's lower incisors.
Upper 6	Values for movement of the patient's upper molar.
Lower 6	Values for movement of the patient's lower molar.
A point	Values to simulate movement from a reverse headgear.
B point	Values for movement of the patient's B point.
Mx (LeFort)	Values for movement of the patient's entire maxilla. Simulates a Le Fort Osteotomy. In a rotational movement, the maxilla and the upper incisor are rotated about the upper incisal tip.

Ant. Mx.	Values for movement of the anterior segment of the patient's maxilla. In a rotational movement, the maxilla and the upper incisor are rotated about the upper incisal tip.
Post. Mx.	Values for movement of the posterior segment of the maxilla and the upper first molar. In a rotational movement, the posterior segment of maxilla and the upper first molar are rotated about the lower incisal tip.
Mx+Md	Values for movement of the maxilla and mandible simultaneously (a "double-jaw surgery"). Moves the maxilla, the corpus of the mandible, and the upper and lower dentition. In a rotational movement, the maxilla, the corpus mandible, and the dentition are rotated about the lower incisal tip.
Md (BSSO)	Values for movement of the distal segment of the mandible and the lower incisor. Simulates a bilateral sagittal split osteotomy. In a rotational movement, the distal mandibular segment and the lower incisor are rotated about the lower incisal tip.
Rotate Md @ Hinge Axis	Values for rotation of the mandible. Pivots the entire mandible and lower dentition about the hinge axis.
Rotate Mx+Md @ Hinge Axis	Values for rotation of the maxilla and mandible. Pivots both the maxilla and mandible simultaneously about the hinge axis.
Genioplasty	Values for chin augmentation. Simulates a genioplasty and segments the patient's chin.
Others	Other treatment simulation operations to apply: **(S) Post Md Rotate@Hinge:** Surgical procedure that rotates the posterior portion of the mandible about the hinge axis. **(O) Occ. Plane Rotate:** Orthodontic procedure that rotates the occlusal plane. **(O) Facial Axis Change:** Orthodontic procedure that rotates the facial axis. **(OS) TLV Rotate:** Orthodontic or surgical procedure that rotates the true vertical line.
Autorotate Mandible	Automatically rotates and closes the mandible about Hinge Axis to the patient's occlusal plane.
Arch Length Discrepancy	Values for arch length discrepancy and extractions, arch expansion, and arch stripping. For more information, see "Arch Length Discrepancy" on page 12-19.

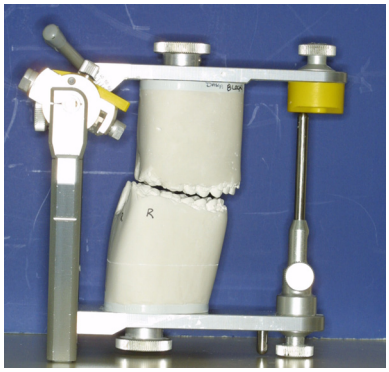
Simulating Model Block Surgery

When you check the **Model Block Surgery** box on the **Treatment Simulation** palette, the signed offset value in the Vert column for a landmark on the maxilla is positive if it is moved towards the mandible (downward). When this box is not checked (the default), the signed offset value of a landmark in the Vert column is positive if it is moved upward and negative if it is moved downward regardless of whether the landmark is on the maxilla or mandible.

You can use one of the following coordinate systems for surgery simulation:

- If you are simulating a surgery using a tracing, you use a coordinate system in which up is negative and down is positive, regardless of whether you are moving the maxilla or the mandible. In this system, up is always negative. In this case, the **Model Block Surgery** box should be *unchecked*.
- If you are simulating a surgery using a plaster model (see below), you use a coordinate system in which positive is always toward the occlusal plane. In this coordinate system, a positive number indicates a downward movement of the maxilla and an upward movement of the mandible. A negative number is away from the occlusal plane. A negative number indicates upward movement

of the maxilla and downward movement of the mandible. In this case, the **Model Block Surgery** box should be *checked*.



Horizontal movement is always the same in both coordinate systems, with positive numbers for anterior movement and negative numbers for posterior movement.

With the **Model Block Surgery** box checked, the vertical coordinates of any mandibular movement are reversed. Maxillary vertical movement is the same in both coordinate systems.

Soft Tissue Profile

The profile touch-up and lip reposturing functions provide powerful tools to “finish” your treatment simulation process. With these features, you can perform manual adjustments to the patient’s profile to take into account changes that were not automatically predicted by the treatment simulation process. For example, you might want to indicate slight variations in a patient’s lip profile based on specific lip therapy needed for the case.

Note: *We recommend that you use these features after completing all orthodontic and surgical operations.*

Touching up the Patient's Profile

To touch up the patient’s profile:

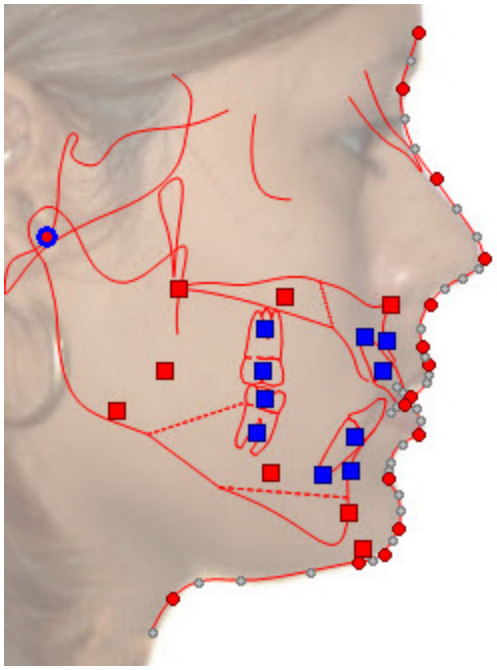
1 Select **Profile Touch-up** on the **Treatment Simulation** palette to change the patient’s profile outline.

When you select this option, detailed points appear along the patient’s profile identifying key landmarks that describe the profile. When you move these points, Dolphin changes the location for the associated soft tissue profile. When you move points, the profile curve changes in different ways depending on the color of the point:

- When you click and drag a red point (a manually-digitized landmark), the curve and all the gray points (calculated landmarks) between it and the next red point (but not including the adjacent red point) move to accommodate the new location of the red point you are moving.
- When you hold down the CTRL key while clicking and dragging a red point, only the red point moves. The adjacent gray points do not move.

- When you move a gray point, only that point moves. The adjacent gray and red points do not move.

2 Click and drag the points to re-contour the patient's profile.

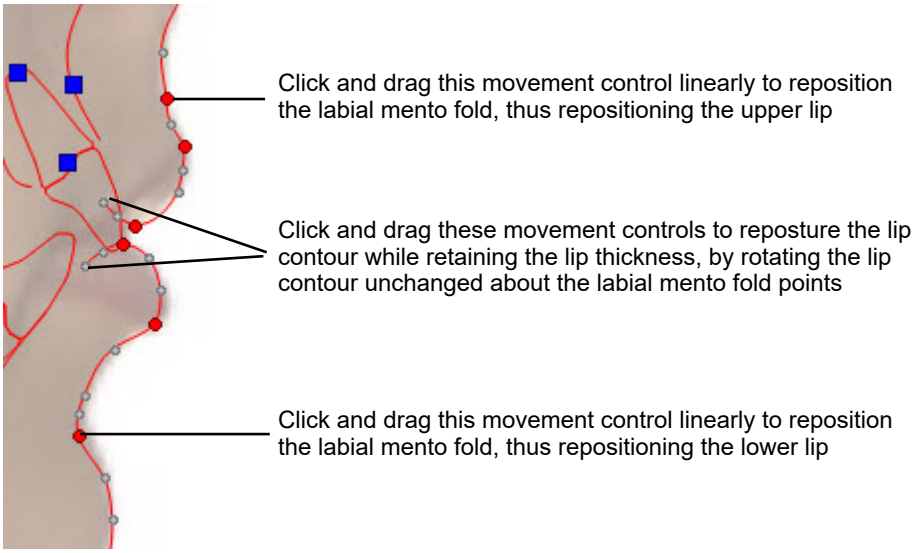


Reposturing the Lips

To reposture the lips:

1 Select **Lip Reposturing** on the **Treatment Simulation** palette to re-contour the patient's lips.

Points appear on the patient's lips so that you can re-contour them, as shown below.



2 Click and drag the points to re-contour the patient’s lips.

Or,

Drag the Auto Lip Adjustment sliders to re-contour the patient's lips.

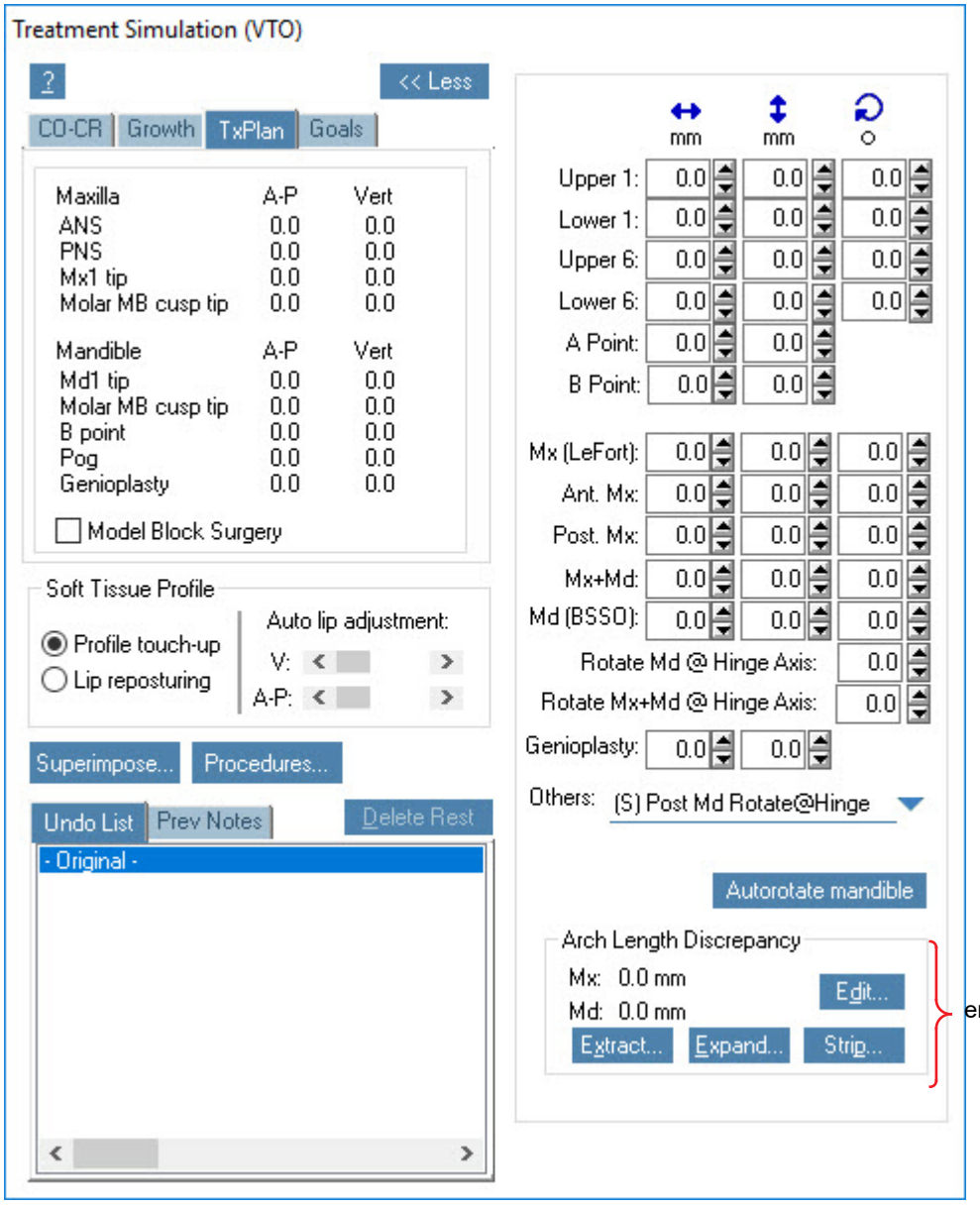
Arch Length Discrepancy

The following figure illustrates the group box on the **Treatment Simulation** palette used for arch length discrepancy operations. In this group box, values greater than zero indicate crowded teeth, and values less than zero indicate spaced teeth.

Dolphin calculates the arch length discrepancy values in this group box based on:

- information from the patient’s digitized x-ray and arch model (if available)
- the values you enter for the patient’s initial arch length discrepancy (see “Setting the Initial ALD” below)
- any extractions, arch expansions, and arch stripping values you enter for the patient (see “Simulating Tooth Extraction” on page 12-22, “Simulating Arch Expansion” on page 12-23, and “Simulating Arch Stripping” on page 12-23)
- any tooth movements that you have specified as part of your treatment simulation.

For example, if you specify rotation for a tooth in your treatment simulation, the arch length discrepancy is adjusted based on the angle of rotation and the length of the tooth as digitized on the patient’s lateral x-ray.



Mx	ALD for the patient's upper teeth.
Md	ALD for the patient's lower teeth.
Edit...	Enter initial ALD values (see "Setting the Initial ALD" below).
Extract...	Simulates tooth extraction (see "Simulating Tooth Extraction" on page 12-22).
Expand...	Simulates an arch expansion (see "Simulating Arch Expansion" on page 12-23).
Strip...	Simulated an arch stripping (see "Simulating Arch Stripping" on page 12-23).

Setting the Initial ALD

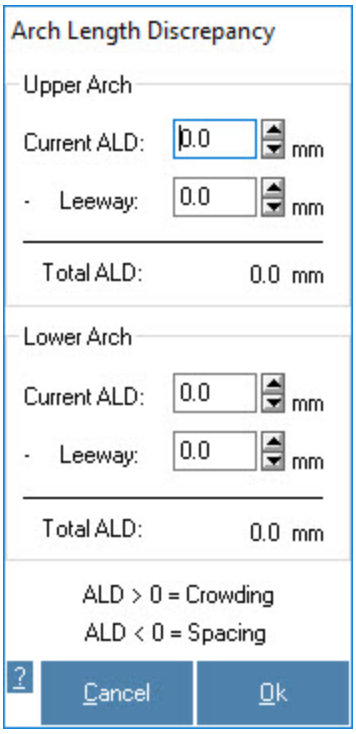
To set the patient's initial arch length discrepancy (ALD):

1 Click **Edit...** on the Treatment Simulation palette.

The dialog box shown below is displayed.

2 Enter initial ALD and leeway values for this patient, and click **OK**.

Values greater than zero indicate crowded teeth. Values less than zero indicate spaced teeth.



Upper Arch	Values for the current ALD and leeway for the upper arch. Dolphin Imaging calculates and displays the total ALD for the upper arch.
Lower Arch	Values for the current ALD and leeway for the lower arch. Dolphin Imaging calculates and displays the total ALD for the lower arch.

Simulating Tooth Extraction

To simulate tooth extraction:

1 Click **Extract...** on the **Treatment Simulation** palette.

Or,

Select **Tooth Chart...** from the **Tools** menu on the Dolphin Imaging main screen.

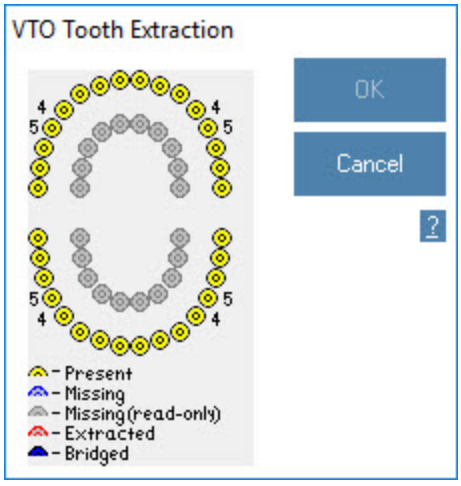
A tooth chart for this patient opens. On the chart, the inner diagram is for baby teeth.

2 Click the teeth to extract, and click **OK**.

If you are using **Treatment Simulation**, the palette indicates the new ALD values. Dolphin adds spacing to the ALD using the width of each extracted tooth as digitized on the patient's arch model. If the patient's arch model hasn't been digitized, Dolphin uses the following default values.

Upper Arch		Lower Arch	
Tooth (Left or Right)	Default Width (mm)	Tooth (Left or Right)	Default Width (mm)
1	8.82	1	5.42
2	6.96	2	5.94
3	7.91	3	6.93
4	7.04	4	7.15
5	6.84	5	7.27
6	10.4	6	11.4

The Treatment Simulation program does not move any of the patient's teeth for you. You need to enter the appropriate values in the fields on the **Treatment Simulation** palette to indicate how you want to move the patient's teeth after the extraction.



Tooth Diagram	Identifies the teeth you want to extract. The inner diagram is for baby teeth.

Simulating Arch Expansion

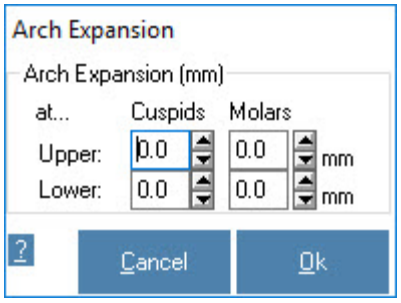
To simulate arch expansion:

1 Click **Expand...** on the **Treatment Simulation** palette.

The Arch Expansion dialog box is displayed.

2 Enter values for arch expansion, either at the cuspids or molars, for the upper or lower arch. Then, click **OK**.

The **Treatment Simulation** palette indicates the new ALD values. However, the Treatment Simulation program does not move any of the patient's teeth. You need to enter the appropriate values in the fields on the **Treatment Simulation** palette to indicate how you want to move the patient's teeth after the arch expansion.



Upper	Values in millimeters for upper arch expansion at the cuspids and molars.
Lower	Values in millimeters for lower arch expansion at the cuspids and molars.

Simulating Arch Stripping

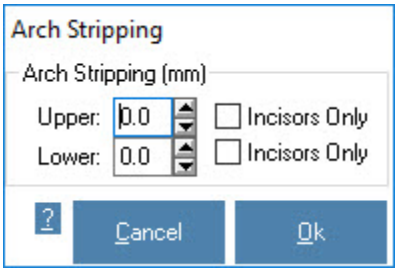
To simulate arch stripping:

1 Click **Strip...** on the **Treatment Simulation** palette.

The Arch Stripping dialog box is displayed.

2 Enter values for arch stripping for the upper or lower arch. Then, click **OK**.

The **Treatment Simulation** palette indicates the new ALD values. However, the Treatment Simulation program does not move any of the patient's teeth. You need to enter the appropriate values in the fields on the **Treatment Simulation** palette to indicate how you want to move the patient's teeth after the arch stripping.



Upper	Values in millimeters for upper arch stripping. **Incisors Only:** Applies the arch stripping value only to the patient's upper incisors.
Lower	Values in millimeters for lower arch stripping. **Incisors Only:** Applies the arch stripping value only to the patient's lower incisors.

Returning to a Point in the History

To return the simulation to an earlier operation in the history:

1 Select the **Undo List** tab if it isn't already selected.

2 Select the operation to return to in the **Undo List**.

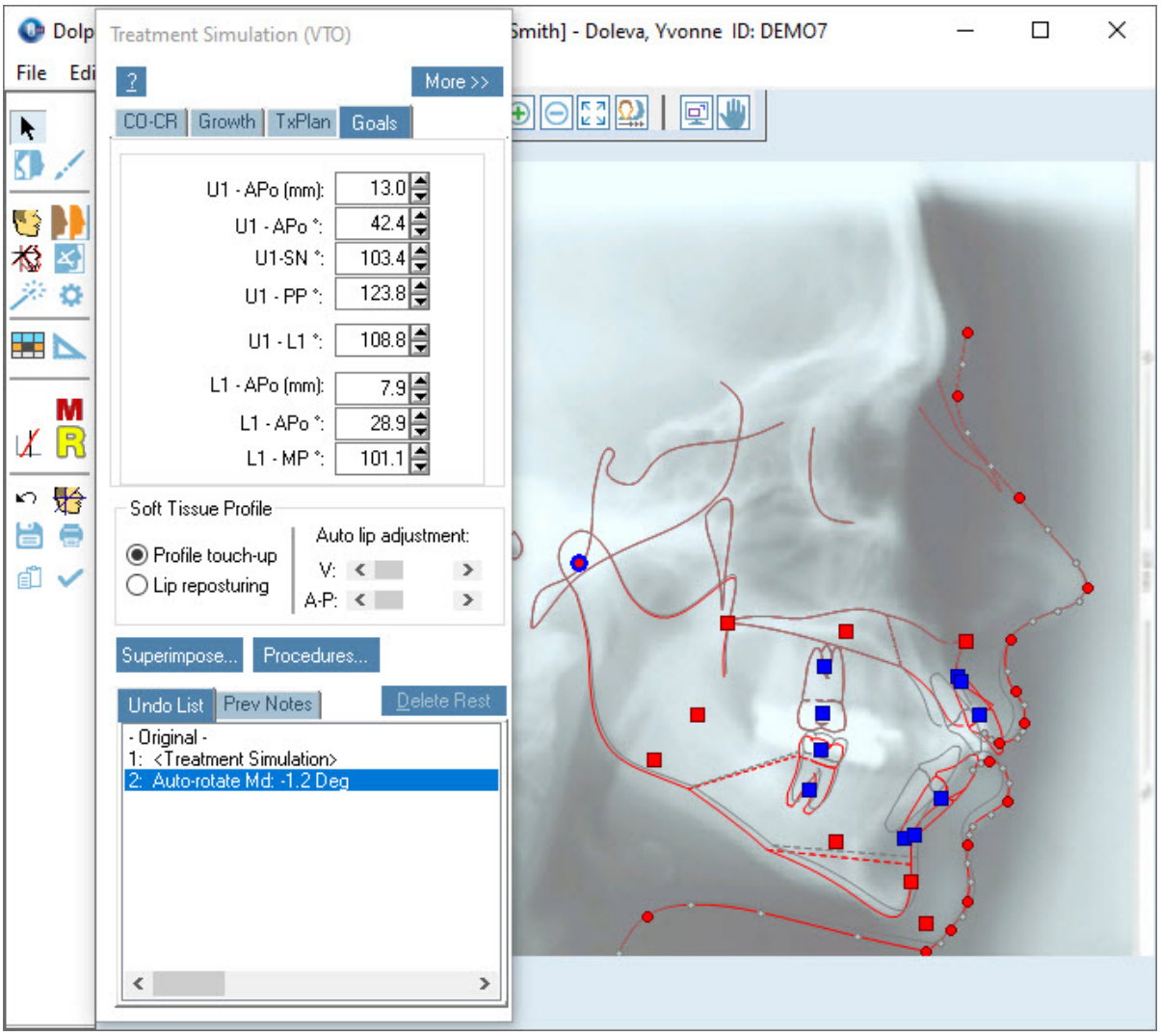
3 Click **Delete Rest** to delete all operations performed after the selected operation.

Overlaying the Original Tracing

To toggle display of the patient's original tracing over the tracing you are modifying with Treatment Simulation:

1 Click on the tool bar.

The following figure illustrates an original tracing in black overlaying a treatment simulation tracing in red. You can choose the color of the current and original tracings. For more information, see "Setting Display Preferences" on page 12-28.



Using the Original Records Window

This feature is extremely helpful in comparing and contrasting your current results with the original records, or to simply examine another image while performing a treatment plan.

To view the patient's other images in an Original Records window:

1 Click on the tool bar.

The patient's original tracing appears in a separate window.

To view a different image in the Original Records window:

1 Right-click the Original Records window.

A context menu displays the following options:

Original	Displays the patient's original photo.
Original X-ray	Displays the patient's original x-ray.
Find/display another image	Displays a list of images for this patient and timepoint.
Show image	Toggles display of the patient's image.
Show tracing	Toggles display of the patient's tracing.
Close This Menu	Closes the menu without making a selection.

2 Pick an option from the menu.

3 If you selected **Find/Display Another Image**, select the image from the dialog box that appears listing patient images. Then, click **OK**.

To toggle display of the image and tracing in the Original Records window:

1 Right-click the Original Records window, and pick Show image or Show tracing from the context menu to toggle the display.

If you close the Original Records window, the last selection you chose is retained.

Saving the Treatment Simulation

When you save the treatment simulation, Dolphin always saves both of the following:

- the image and data that comprise the treatment simulation
- the original image and data, for your reference or further treatment simulation

To save the treatment image after you have finished the treatment simulation operations:

1 Click .

The Save Image dialog box is displayed.

2 Optionally, modify the image title.

Dolphin automatically provides an appropriate image title, "Treatment Simulation" in most cases. However, you may wish to enter a more specific name (for example, "orth only," "mx only," or "mx+md"), as appropriate for your treatment simulation.

3 Select a slot from the **Save As** list in which to save this image, and click **OK**.

For each patient and timepoint, you can save up to eight different treatment simulations.

Note: *If you are viewing two images side by side when you save, the side-by-side view of the two images is saved as a single image.*

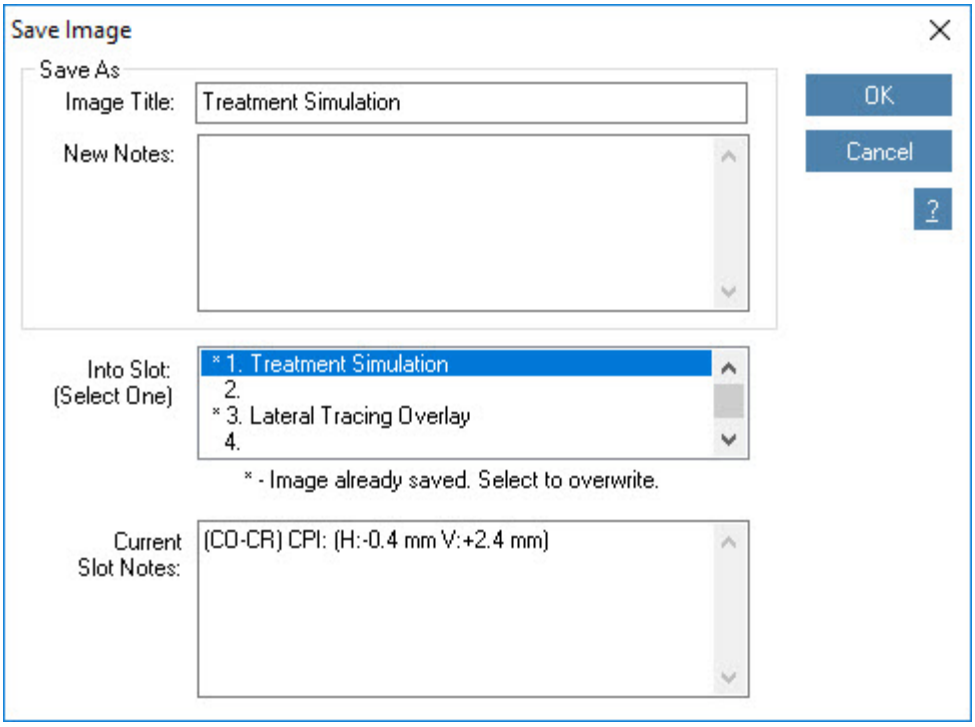


Image Title	Title for this image, up to 25 characters.
New Notes	Notes for this image. Automatically completed with a summary of the operations you performed, but you can modify these notes. When you view this treatment simulation again later, you can access these notes using the **Previous Notes** tab on the **Treatment Simulation** palette.
Into Slot	Slots available for each timepoint in which you can save this image. If you select a slot containing an image, the existing image is overwritten with the new image.
Current Slot Notes	Notes previously entered for the selected slot (if any).

Printing the Treatment Simulation

To print the treatment simulation:

1 Click on the tool bar.

A menu displays the following options:

With Operation History List	Prints the patient image, the treatment simulation information, and the operation history list (listed on the **Undo List**).
Without Operation History List	Prints only the patient image and treatment simulation information. The history list is *not* included.

Close This Menu	Closes the menu without making a selection.

2 Select a printing option.

The Print dialog box appears.

3 Select any printing options you want and click **OK**.

Dolphin Imaging offers the following options in addition to the standard Microsoft Windows printing options (see “Printing” on page 16-4):

Print 1:1	Prints an image with cephalometric tracings using the **1:1** option. This setting has no effect if you are not printing an image with cephalometric tracings.
Preview	Previews your print job on the computer screen.

Setting the Display Mode

When you open the Treatment Simulation dialog box, the patient’s image or x-ray is in draft mode. In this mode, Dolphin Imaging can apply the treatment operations quickly, so that you do not need to wait for the computer to process any image morphing

To set the display mode for the patient’s image:

1 Click on the tool bar.

A menu displays the following options:

Presentation Mode	Provides the highest resolution image, but slower performance in display. If your images have a resolution greater than 1000x1000 pixels, we recommend that you switch to this mode when you finish treatment simulation operations.
Draft Mode	Displays a slightly lower resolution image that is faded by 50% for faster performance in display. This option is the default and recommended option, because it provides a quick display of the tracings and image while updating the soft tissue image.
Hide Image	Hides the image entirely, showing only the profile tracing. This option provides the fastest performance in display since no image re-calculation is necessary.

2 Select a display mode option.

Setting Display Preferences

To set display preferences:

1 Click on the tool bar.

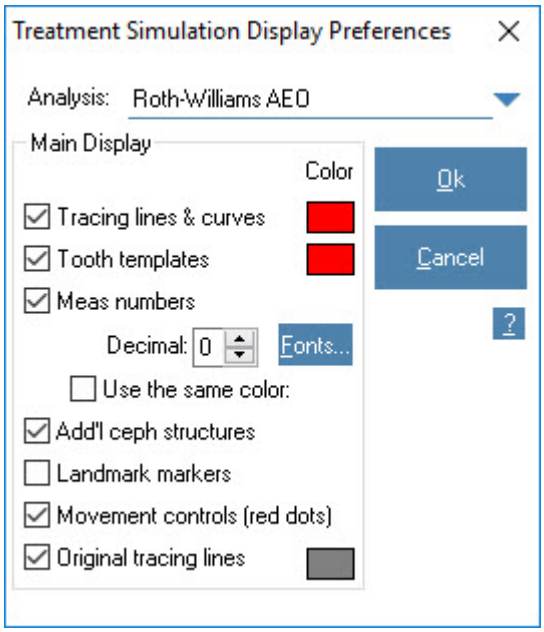
2 Select the analysis for which you want to specify tracing preferences from the **Analysis** drop-down list.

3 In the Main Display group box, select all the items to display on the tracing.

4 To change the color for any of the items listed in the Main Display group box, click the color sample and select a new color.

If you want to set preferences for another analysis, repeat these steps for that analysis.

Note: *The settings you make on this dialog box apply to all patient images with the selected analysis. In addition, these settings are retained when you exit and restart Dolphin.*



Analysis	Analysis for which you want to set tracing preferences.
Tracing Lines/Curves	Displays the tracing as defined in the patient's cephalometric analysis.
Tooth Templates	Displays the templates for the patient's teeth.
Meas Numbers	Displays measurement numbers as defined in the patient's cephalometric analysis. **Decimal:** Number of digits to display to the right of the decimal point. **Fonts...:** Opens the Font dialog box so you can change the font for the measurement numbers. For more information, see "Setting Font Options" on page 3-50. **Use the Same Color:** Uses the same color for all measurement numbers. By default, the color of each measurement number is determined by that measurement's deviation from the norm.
Add'l Ceph Structures	Displays the cephalometric structures.
Landmarks Markers	Displays the digitized landmarks.
Movement Controls	Displays the movement controls.

Original Tracing Lines	Displays the original tracing lines.
Color Samples	Change the color in which the associated element is displayed.

Customizing Soft Tissue Rules

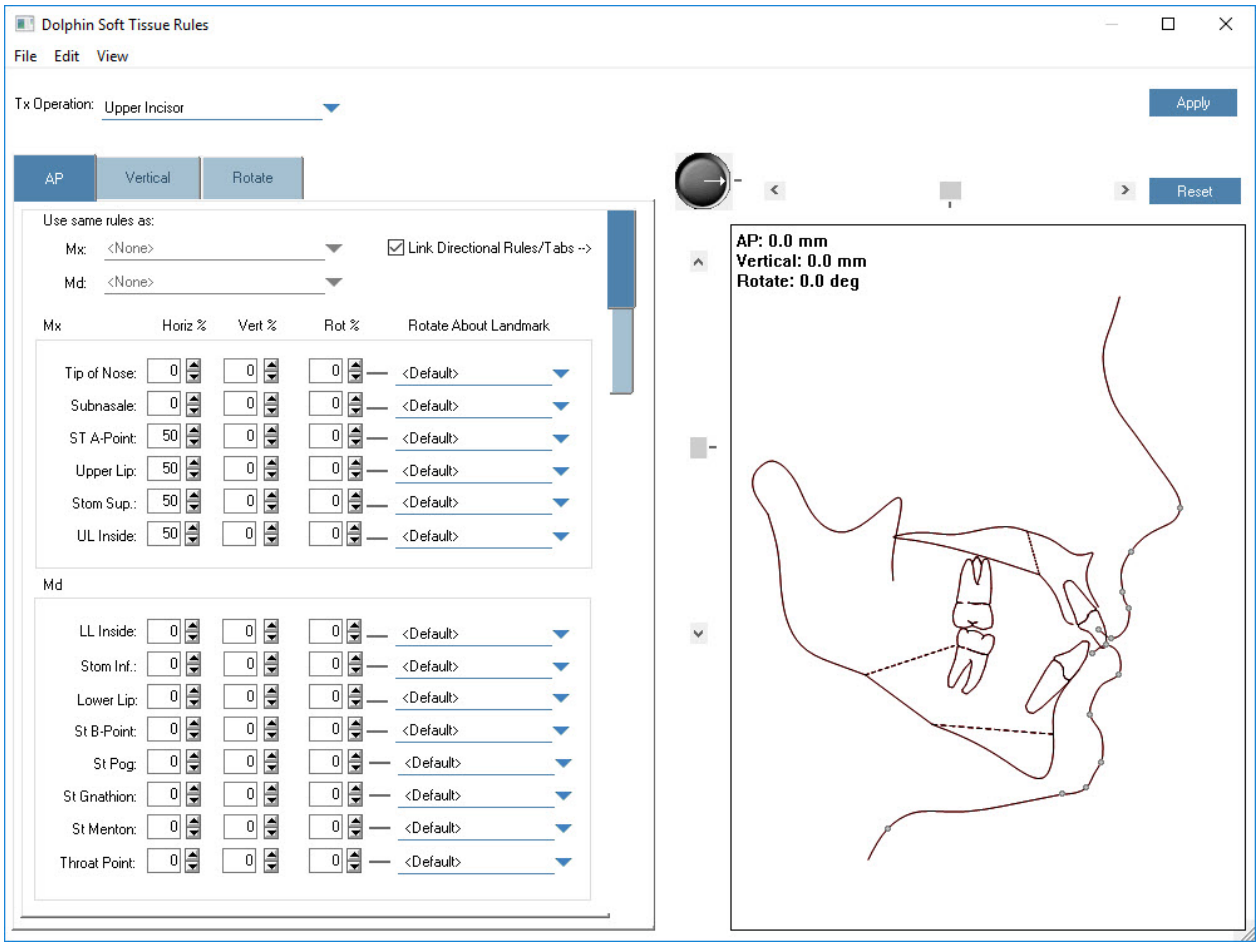
The Dolphin Treatment Simulation module calculates changes to the patient's soft tissue image based rules that translate changes in the cephalometric data to soft tissue movement. The Dolphin program includes several sets of commonly-used soft tissue rules and enables you to create your own customized soft tissue rules.

When you enter the Treatment Simulation module, the Load Soft Tissue Rules dialog box typically opens automatically so that you can select the set of rules you want to use. You can also change the rules you are using at any time. For more information, see "Loading Soft Tissue Rules" on page 12-4.

To open the Soft Tissue Rules dialog box:

1 Select **Edit/Create Soft Tissue Rules** from the **Tools** menu.

The Soft Tissue Rules dialog box opens and displays the rules currently being used for Treatment Simulation.



Tx Operation	Treatment simulation operation to which these soft tissue rules apply.
Movement Type	Tabs to set soft tissue rules for the various types of movement relating to the selected treatment simulation operation. **AP:** Sets soft tissue rules for horizontal movement. **Vertical:** Sets soft tissue rules for vertical movement. **Rotate:** Sets soft tissue rules for rotational movement.
Use Same Rules As	Uses the rules for the selected treatment simulation operation (see “Reusing Soft Tissue Rules” on page 12-37). Only available for some treatment simulation operations. **Mx:** Treatment simulation operation’s soft tissue rules to use for the patient’s maxilla. **Md:** Treatment simulation operation’s soft tissue rules to use for the patient’s mandible.
Link Directional Rules/Tabs	Uses the same soft tissue movement percentage settings for both directional tabs (see “Linking or Unlinking Soft Tissue Rules” on page 12-36).
Directional Tabs	Movement direction for the treatment simulation operation. The labels on these tabs change based on the movement type tab selected. **Advance and Retract:** When the **AP** movement type tab is selected, sets soft tissue rules for horizontal movements relating to the selected treatment simulation operation. **Upward and Downward:** When the **Vertical** movement type tab is selected, sets soft tissue rules for vertical movements relating to the selected treatment simulation operation. **Rotate + and Rotate -:** When the **Rotate** movement type tab is selected, sets soft tissue rules for rotational movements relating to the selected treatment simulation operation.
Tip of Nose	Soft tissue movement for the tip of nose as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the tip of nose.
SubNasale	Soft tissue movement for the subnasale as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the subnasale.
ST A-Point	Soft tissue movement for the soft tissue A-point as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the soft tissue A-point.
Upper Lip	Soft tissue movement for the upper lip as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the upper lip.
Stom Sup	Soft tissue movement for the stomion superius as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the stomion superius.
UL Inside	Soft tissue movement for the inside of the upper lip as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the inside of the upper lip.

LL Inside	Soft tissue movement for the inside of the lower lip as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the inside of the lower lip.
Stom Inf	Soft tissue movement for the stomion inferius as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the stomion inferius.
Lower Lip	Soft tissue movement for the lower lip as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the lower lip.
St B-Point	Soft tissue movement for the soft tissue B-point as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the soft tissue B-point.
St Pog	Soft tissue movement for the soft tissue pogonion as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the soft tissue pogonion.
St Gnathion	Soft tissue movement for the soft tissue gnathion as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the soft tissue gnathion.
St Menton	Soft tissue movement for the soft tissue menton as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the soft tissue menton.
Throat Point	Soft tissue movement for the throat point as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation. For rotational movement, the landmark around which to rotate the throat point.
Horizontal Slider	Simulates horizontal movement for the selected treatment simulation operation on the preview image.
Vertical Slider	Simulates vertical movement for the selected treatment simulation operation on the preview image.
Rotation Knob	Simulates rotational movement for the selected treatment simulation operation on the preview image.
Apply	Applies the selected soft tissue rules to the treatment simulation.
Reset	Resets the preview image to its initial state (before any treatment and soft tissue movement simulation).
Preview Image	Displays a patient tracing (the currently-selected patient's cephalometric tracing by default) so that you can simulate treatment operations and see the result of your selected soft tissue rules.

Using the Menu Bar

At the top of the Soft Tissue Rules dialog box, there are several menus that you can use to access program features.

- **File** menu
- **Edit** menu
- **View** menu

This section describes each of these menus

The File Menu

The **File** menu contains the following choices:

Open	Opens a previously-saved set of soft tissue rules. For more information, see “Opening a Saved Set of Soft Tissue Rules” on page 12-38.
Save	Saves the current set of soft tissue rules. For more information, see “Saving Soft Tissue Rules” on page 12-38.
Save As...	Saves the current set of soft tissue rules using a new file name. For more information, see “Saving Soft Tissue Rules” on page 12-38.
Print Ratio Summary to File...	Prints the current set of soft tissue rules to a file so that you can easily review them. For more information, see “Printing a Soft Tissue Rules Summary” on page 12-39.
Exit	Closes the Soft Tissue Rules dialog box.

The Edit Menu

The **Edit** menu contains the following choices:

Refresh with Dolphin Installed Rules	Returns the current set of soft tissue rules to the factory default settings. For more information, see “Reverting to the Dolphin-installed Rules” on page 12-39.
Check/Set All Directional Links	Checks the **Link Directional Rules/Tabs** box on all three movement type tabs (**AP**, **Vertical**, and **Rotate**) for all treatment simulation operations. For more information, see “Linking or Unlinking Soft Tissue Rules” on page 12-36.
Uncheck/Clear All Directional Links	Unchecks (clears) the **Link Directional Rules/Tabs** box on all three movement type tabs (**AP**, **Vertical**, and **Rotate**) for all treatment simulation operations. For more information, see “Linking or Unlinking Soft Tissue Rules” on page 12-36.
Break All Links Between Tx Operations	Sets both the **Mx** and Md drop-down lists under the Use Same Rule As heading to **<None>** on all three movement type tabs (**AP**, **Vertical**, and **Rotate**) for all treatment simulation operations. For more information, see “Unlinking Soft Tissue Rules Between Operations” on page 12-38.

The View Menu

The **View** menu contains the following choices:

Ceph from Current Patient	Simulates treatment operations and soft tissue rules using the current patient's cephalometric tracing.
Class 1 Ceph Template	Simulates treatment operations and soft tissue rules using a class 1 cephalometric template. This option is currently unavailable.
Ceph 2 Ceph Template	Simulates treatment operations and soft tissue rules using a class 2 cephalometric template. This option is currently unavailable.
Ceph 3 Ceph Template	Simulates treatment operations and soft tissue rules using a class 3 cephalometric template. This option is currently unavailable.

Setting Soft Tissue Rules

This section describes how to set soft tissue rules and simulate treatment operations to view the effect of the soft tissue movement rule settings. In addition, this section describes other features relating to soft tissue rules, such as saving your soft tissue rules, opening previously-saved soft tissue movement rule settings, and printing a soft tissue rules summary.

To set soft tissue rules:

1 Select the treatment simulation operation for which you want to set soft tissue rules from the **Tx Operation** drop-down list.

For example, if you want to set soft tissue rules for treatment simulation operations that involve the patient's lower incisor, select **Lower Incisor** from the **Tx Operation** drop-down list.

2 Select the movement type tab (**AP**, **Vertical**, or **Rotate**) for the type of movement for which you want to set soft tissue rules.

For example, to set soft tissue rules to apply when the patient's lower incisor is moved horizontally, you would select **Lower Incisor** from the **Tx Operation** drop-down list. Then, you would select the **AP** tab.

3 Optionally, check the **Link Directional Rules/Tabs** box to use the same soft tissue rules for both movement directions.

For example, suppose you selected **Lower Incisor** from the **Tx Operation** drop-down list, selected the **AP** tab, and checked the **Link Directional Rules/Tabs** box. Then, you entered 50 in the **Horiz %** field for the **Lower Lip** on the **Advance** tab. Dolphin would automatically enter 50 in the **Horiz %** field for the **Lower Lip** on the **Retract** tab. Using this example, moving the patient's lower incisor would cause the patient's lower lip to move half as quickly, whether you advance or retract the incisor.

4 Select the directional tab for the movement direction for which you want to set soft tissue rules.

The labels on the directional tabs change based on the movement type tab selected. For example, if you selected **AP (horizontal)** as the movement type, you can select either advance or retract as the horizontal movement direction. You can set both directions at once by checking the **Link Directional Rules/Tabs** box.

5 Enter movement rules for any of the listed soft tissue landmarks as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.

For example, suppose you selected **Lower Incisor** from the **Tx Operation** drop-down list, and selected the **AP** tab. Then, you entered 50 in the **Horiz %** field for the **Lower Lip** on the **Advance** tab. Using this example, advancing the patient's lower incisor would cause the patient's lower lip to move half as quickly. If you entered 33 in the **Horiz %** field for the **Lower Lip**, advancing the patient's lower incisor would cause the patient's lower lip to move one-third as quickly.

6 If you specified a percentage for soft tissue rotational movement in the **Rot %** column for any soft tissue landmark, select the landmark around which to rotate the soft tissue landmark.

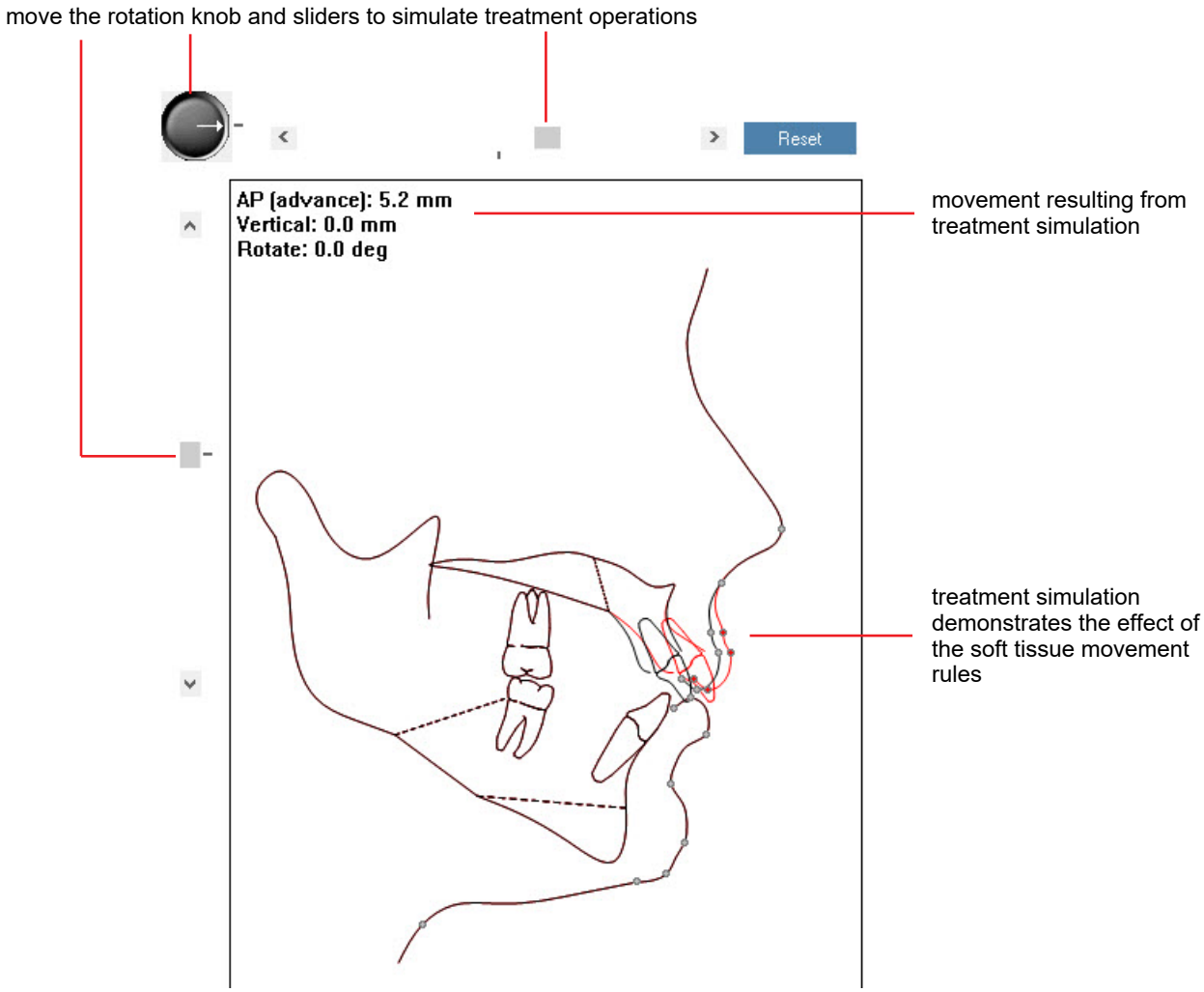
Checking Soft Tissue Rules

To check your soft tissue rules:

1 Use the horizontal slider, the vertical slider, and the rotation knob to simulate movement relating to the selected treatment simulation operation.

For example, suppose Lower Incisor is selected from the **Tx Operation** drop-down list. You can move the horizontal slider to simulate advancing and retracting the lower incisor. You can move the vertical slider to simulate moving the lower incisor up and down. You can move the rotation knob to simulate rotating the lower incisor.

When you simulate the selected treatment operation, a red outline on the preview image indicates both hard tissue and soft tissue movement (as specified by your soft tissue rules), as shown below.



2 To return the preview image to its initial state, click **Reset**.

The sliders and rotation knobs return to their initial positions.

Linking or Unlinking Soft Tissue Rules

To link or unlink soft tissue rules for the directional tabs:

1 Check the **Link Directional Rules/Tabs** box.

Or,

Select **Check/Set All Directional Links** from the **Edit** menu to check the **Link Directional Rules/Tabs** box on all three movement type tabs (**AP**, **Vertical**, and **Rotate**) for all treatment simulation operations.

Or,

Select **Uncheck/Clear All Directional Links** from the **Edit** menu to uncheck (clear) the **Link Directional Rules/Tabs** box on all three movement type tabs (**AP**, **Vertical**, and **Rotate**) for all treatment simulation operations.

By checking the **Link Directional Rules/Tabs** box, you can set the same values for soft tissue rules for both directional tabs at the same time. For example, suppose you selected **Lower Incisor** from the **Tx Operation** drop-down list, selected the **AP** tab, and checked the **Link Directional Rules/Tabs** box. Then, you entered 50 in the **Horiz %** field for the Lower Lip on the **Advance** tab. Dolphin would automatically enter 50 in the **Horiz %** field for the Lower Lip on the **Retract** tab. Using this example, moving the patient's lower incisor would cause the patient's lower lip to move half as quickly, whether you advance or retract the incisor.

Reusing Soft Tissue Rules

To use the same soft tissue rules for two treatment simulation operations:

1 Select the treatment simulation operation for which you want to set soft tissue rules from the **Tx Operation** drop-down list.

If there is another treatment simulation operation whose rules would be appropriate for the selected treatment simulation operation, one or both of the drop-down lists under **Use Same Rules As**: becomes active.

For example, if you select **Mx+Md** from the **Tx Operation** drop-down list, both of the drop-down lists under **Use Same Rules As** become active. The **Mx** drop-down list contains **Mx (LeFort)**, and the **Md** drop-down list contains **Md (BSSO)**. Using these two selections, you can automatically set the soft tissue rules for the Mx+Md operation as follows:

- Soft tissue rules for the patient's maxilla will be set to the rules specified for the Mx (LeFort) operation. Therefore, the soft tissue landmarks in the Mx group box are all disabled.
- Soft tissue rules for the patient's mandible will be set to the rules specified for the Md (BSSO) operation. Therefore, the soft tissue landmarks in the Md group box are all disabled.

If both the **Mx** and **Md** drop-down lists are active, you can select an operation in only one of them. Then, you can manually set soft tissue rules for the group box relating to the other drop-down list.

2 If more than one operation appears in either of the **Use Same Rules As** drop-down lists, select the treatment simulation operation whose soft treatment simulation rules you want to use for this operation.

For example, if you select **Rotate Mx+ Md @ Hinge Axis**, the **Md** drop-down list under **Use Same Rules As** lists several treatment simulation operations. In this case, you should choose one of these treatment simulation operations to use its mandible soft tissue movement settings for the Rotate Mx+ Md @ Hinge Axis operation.

Unlinking Soft Tissue Rules Between Operations

To unlink soft tissue rules between treatment simulation operations:

1 In one or both of the **Use Same Rules As** drop-down lists, select **<None>**.

Or,

Select **Break All Links Between Tx Operations** from the **Edit** menu to remove all links between treatment simulation operations.

If you select **<None>** from one of the **Use Same Rules As** drop-down lists, the soft tissue landmarks in the group box relating to that option (Mx or Md) are all enabled. Then, you can manually set soft tissue rules in that group box.

If you select **Break All Links Between Tx Operations** from the **Edit** menu, the Mx and Md group boxes on all tabs for all treatment simulation operations are enabled so that you can manually set all the soft tissue rules.

Saving Soft Tissue Rules

To save your soft tissue rules:

1 Select **Save** or **Save As...** from the **File** Menu.

If you have not previously saved these soft tissue rules or if you selected **Save As...**, the Save As dialog box opens so that you can specify a file name for these rules. By default, soft tissue rules are saved with the file extension .TxS.

2 Specify the directory and file in which you want to save the soft tissue rules, and click **Save**.

Note: *You must apply the soft tissue rules in order to use them in Treatment Simulation. Simply setting or saving the rules will not automatically apply them. For more information, see "Applying Soft Tissue Rules" on page 12-39.*

Opening a Saved Set of Soft Tissue Rules

To open a previously-saved set of soft tissue rules:

1 Select **Open** from the **File** Menu.

The Open dialog box appears.

2 Select the file containing the soft tissue rules you want to use.

3 Optionally, check the **Open as Read Only** box.

Use this option if you just want to apply the soft tissue rules in the file, not change them. Opening the file as read only will prevent accidental changes to the rules in the file.

4 Click **Open**.

Applying Soft Tissue Rules

To apply a set of soft tissue rules:

1 On the Soft Tissue Rules dialog box, click **Apply**.

Note: *You must apply the soft tissue rules in order to use them in Treatment Simulation. Simply setting or saving the rules will not automatically apply them.*

Closing the Soft Tissue Rules Dialog Box

To close the Soft Tissue Rules dialog box without applying the rules:

1 Select **Exit** from the **File** menu.

If you have changed the soft tissue rules, a dialog box appears asking whether you would like to use the new rules.

2 If you do *not* wish to use the new rules, click **No**.

Reverting to the Dolphin-installed Rules

To revert to the Dolphin-installed soft tissue rules:

1 Select **Refresh with Dolphin Installed Rules** from the **Edit** menu.

If you have changed the soft tissue rules, a dialog box appears asking you whether you would like to revert back to the Dolphin-installed rules. Reverting to the Dolphin-installed rules will discard any changes to the soft tissue rules that you have not already saved.

2 Click **Yes** to discard your changes and revert to the Dolphin-installed rules.

Or,

Click **No** to keep any changes you have made to the soft tissue rules and return to the Soft Tissue Rules dialog box.

Printing a Soft Tissue Rules Summary

To print a summary of the soft tissue rules to a file:

1 Select **Print Ratio Summary to File...** from the **File** menu.

A Save As dialog box appears. The summary file is created with a .TXT extension by default.

2 Enter a file name for the summary file. Then, click **Save**.

The summary file is saved. The following figure illustrates format of the soft tissue rules summary file. This figure contains only a small part of the file.

You may wish to print this file to review the soft tissue rules.

Rules for Upper Incisor movement:

AP-Advance	Horiz%	Vert%	Rot%	Rot About Landmark
Tip of Nose	10	0	0	N/A
ST A-Point	50	0	0	N/A
Upper Lip	50	0	0	N/A
Stomion superius	50	0	0	N/A
Upper Lip Inside	50	0	0	N/A
AP-Retract	Horiz%	Vert%	Rot%	Rot About Landmark
Tip of Nose	<Same as AP-Advance>			
ST A-Point	<Same as AP-Advance>			
Upper Lip	<Same as AP-Advance>			
Stomion superius	<Same as AP-Advance>			
Upper Lip Inside	<Same as AP-Advance>			
Rotate (+)	Horiz%	Vert%	Rot%	Rot About Landmark
ST A-Point	0	0	13	<Default>
Upper Lip	0	0	13	<Default>
Stomion superius	0	0	13	<Default>
Upper Lip Inside	0	0	13	<Default>
Rotate (-)	Horiz%	Vert%	Rot%	Rot About Landmark
ST A-Point	<Same as Rotate (+)>			
Upper Lip	<Same as Rotate (+)>			
Stomion superius	<Same as Rotate (+)>			
Upper Lip Inside	<Same as Rotate (+)>			

13 McLaughlin Dental VTO Analysis (Medical Device)

The McLaughlin Dental VTO Analysis enables clinicians to plan precise, quantifiable movement of dentition based on clinical examinations and treatment simulation values entered into the worksheet. The McLaughlin Dental VTO Analysis provides specific information concerning the movement of midlines, cupids, and molars once the desired incisor position has been established using the cephalometric analysis. The program gives a visual result of the treatment simulation and can be used for both orthodontic and surgical-orthodontic cases. Before using this feature, you should be familiar with the treatment simulation features described in Chapter 12, Treatment Simulation (Medical Device).

To use the McLaughlin Dental VTO Analysis, you must have a patient and a timepoint. In addition, you can optionally use the following:

- photos of the patient's intraoral and occlusal views are highly recommended
- a lateral cephalometric tracing digitized with the McLaughlin analysis (see Chapter 7, Digitize (Medical Device))

To verify that the images you need are available, select the **- Everything -** image layout from the **Layout** drop-down list on the Dolphin Imaging main screen. This layout contains all patient images for the selected timepoint.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Orthodontic and Surgical Treatment Simulation privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To open the McLaughlin Dental VTO Analysis without photos:

1 On the Dolphin Imaging main screen, select the patient and timepoint.

2 Select **McLaughlin Dental VTO** from the **Tools** menu.

The McLaughlin Dental VTO Analysis dialog box opens. The McLaughlin Dental VTO analysis creates timepoint default values used for subsequent McLaughlin Dental VTO analysis treatment simulation sessions. If you access McLaughlin Dental VTO from the **Tools** menu for this timepoint in future, you will access the treatment simulation information without photos.

To open the McLaughlin Dental VTO Analysis with photos:

1 On the Dolphin Imaging main screen, select the **- Everything -** layout.

The **- Everything -** layout contains all patient images for the selected timepoint. You need either a lateral x-ray digitized with the McLaughlin analysis or a profile photo of the patient superimposed with

the patient's tracing created from the McLaughlin analysis. If either of these images is available for this patient and timepoint, it will be available from this image layout.

For more information on superimposing the patient's profile photo and tracing, see Chapter 9, Superimposition (Medical Device)

2 Select the image you want to use for your treatment simulation.

3 Start the Treatment Simulation module as described in "Accessing Treatment Simulation" on page 12-2.

4 If necessary, select the set of soft tissue rules to use as described in "Loading Soft Tissue Rules" on page 12-4.

5 Click on the tool bar to open the Display Preferences dialog box.

6 Select **McLaughlin** from the **Analysis** drop-down list.

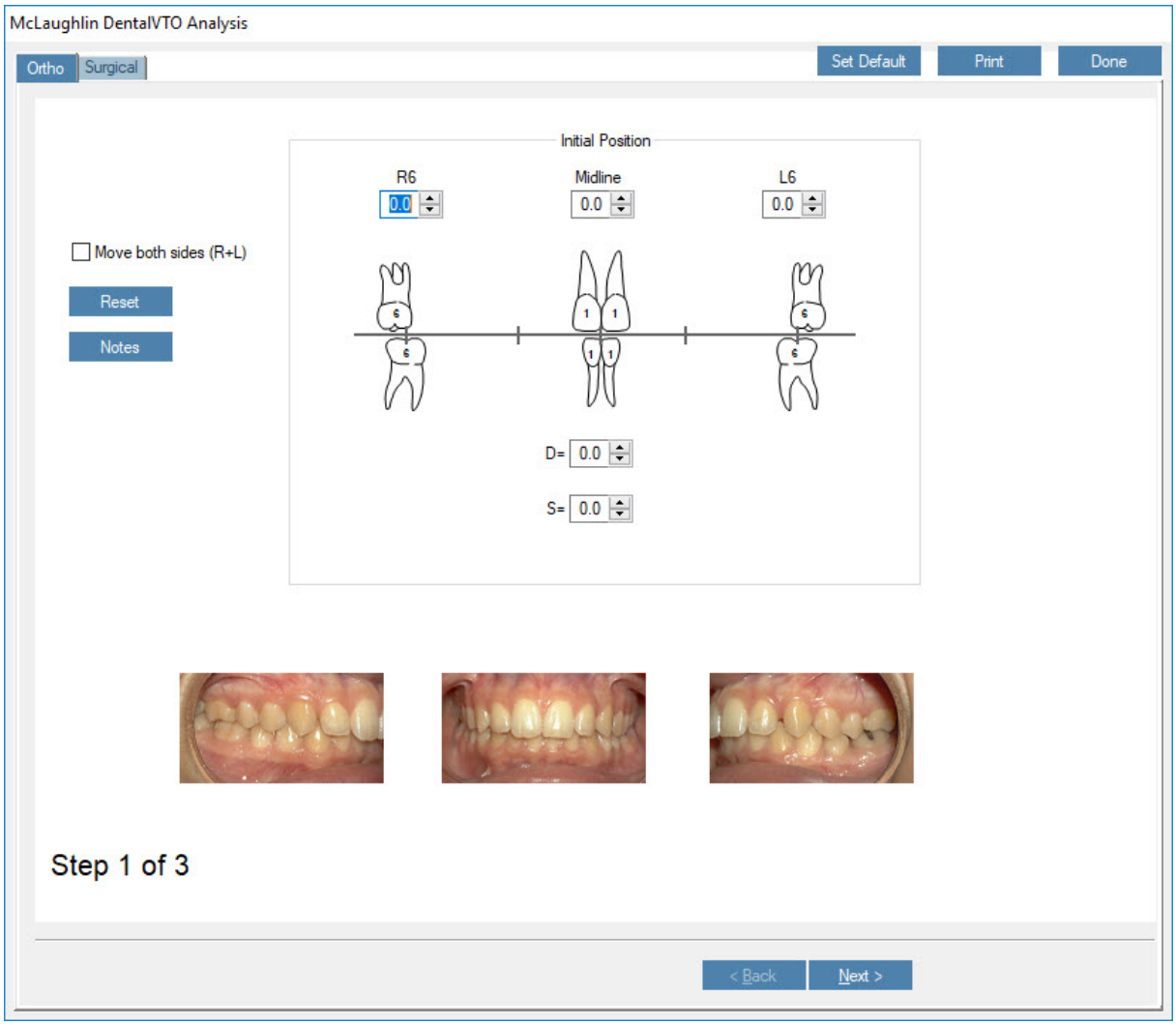
7 Make sure that the following check boxes are checked in the Main Display group box **Tracing Lines & Curves**, **Tooth Templates**, **Meas Numbers**, **Add'l Ceph Structures**, and **Movement Controls**.

For information on how to set display preferences, see "Setting Display Preferences" on page 12-28.

8 Click **OK**.

9 Click on the tool bar to open the **McLaughlin Dental VTO Analysis**.

The McLaughlin Dental VTO Analysis dialog box opens as shown below.



Ortho	Orthodontic treatment simulation (see “Orthodontic Dental VTO” on page 13-4).
Surgical	Dental surgical treatment simulation (see “Surgical Dental VTO” on page 13-12).
Set Default	Sets the default values for this timepoint to the values entered on the chart.
Print	Prints a report of the McLaughlin Dental VTO Analysis for this patient (see “Printing the Treatment Prediction” on page 13-19).
Done	Exits the McLaughlin Dental VTO Analysis.
< Back	Returns to the previous chart.
Next >	Goes to the next chart.

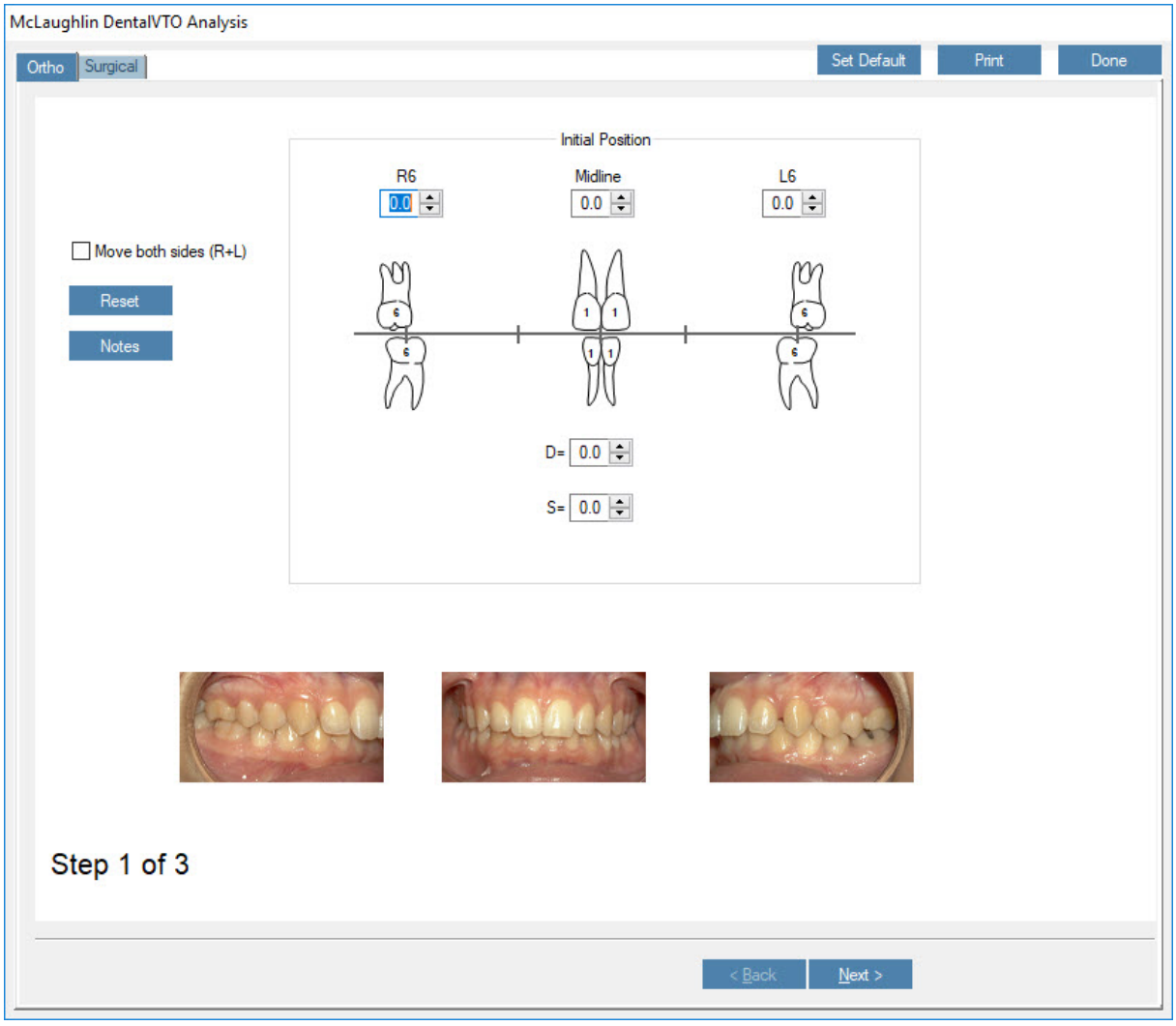
If you access McLaughlin Dental VTO from Treatment Simulation for this timepoint in future, you will access the treatment simulation information with photos.

Orthodontic Dental VTO

The **Ortho** tab includes three charts: Initial Position, Lower Arch Discrepancy, and Dental VTO (Proposed Dental Movement). This section describes each of these charts.

Initial Position

You use the Initial Position chart to record midline and molar relationships in millimeters. It is essential that these numbers be recorded with the mandible in centric relation. The following figure illustrates this chart:



R6	Measurement values in millimeters for the upper R6 molar.
Midline	Measurement values in millimeters for the upper midline.
L6	Measurement values in millimeters for the upper L6 molar.
D	Dental measurement values in millimeters for the lower arch
S	Skeletal measurement values in millimeters for the lower arch
Move Both Sides (R+L)	Uses the same values for both the left and right sides. When you enter a value for one side, Dolphin Imaging automatically enters the same value for the other side.
Reset	Resets all values on this chart to their initial values.
Notes	Opens a dialog box where you can enter notes.

To record the initial position:

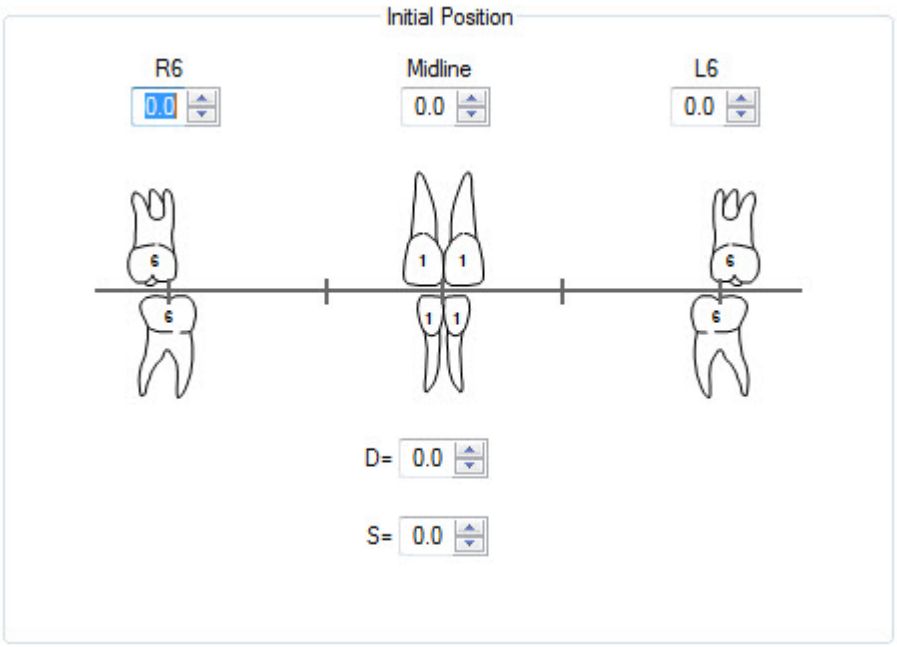
1 Click the up or down arrows to change the values in the fields to record measurements in millimeters.

Or,

Type new values in the fields to record measurements in millimeters.

When you enter values in the fields, arrows appear on the chart in the direction of Class II or Class III for the molar relationships and left and right for the midline relationships, as shown below.

In the lower arch, midline relationships can be recorded as dental and/or skeletal.



To go on to the next step:

1 Click **Next>**.

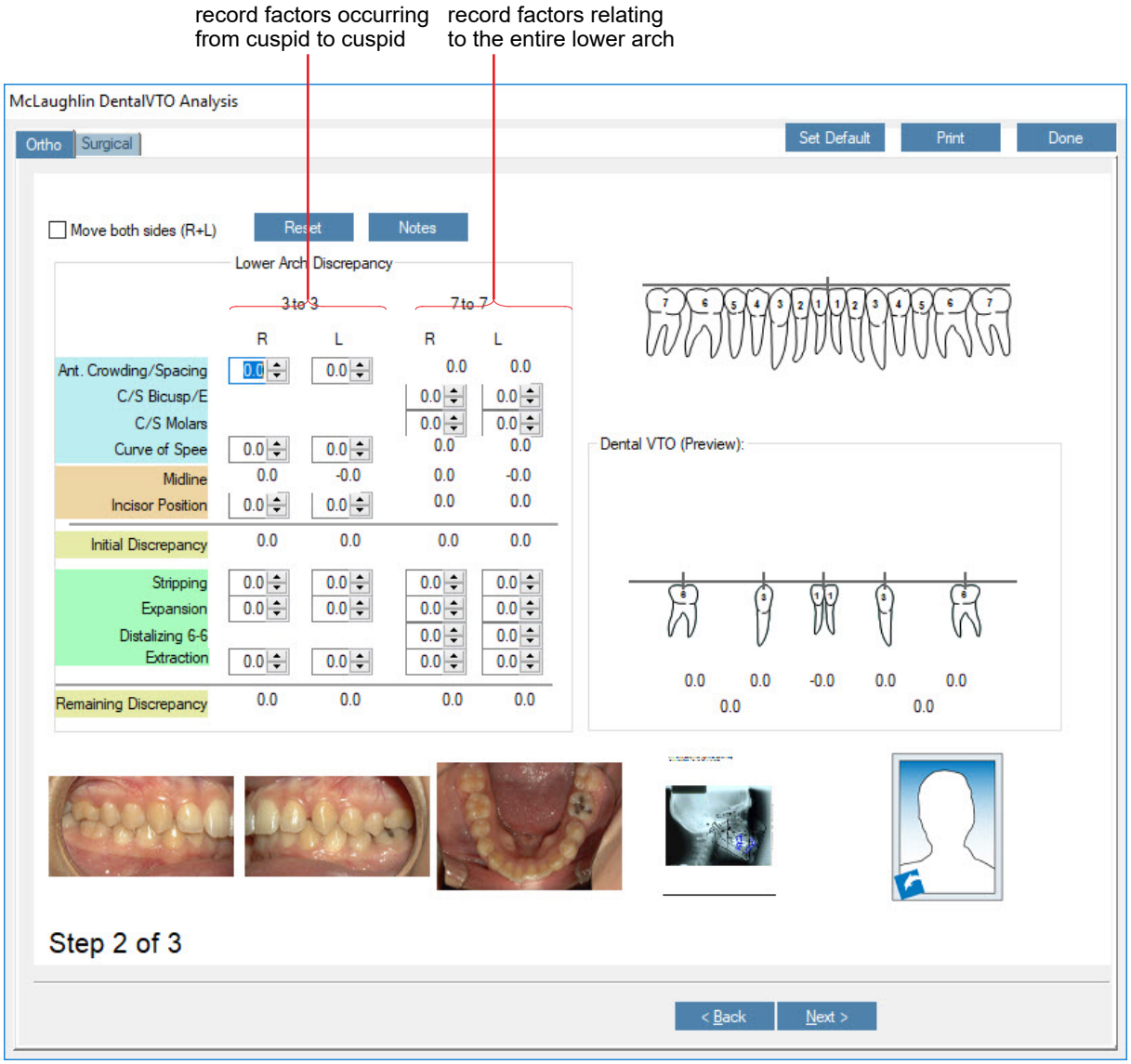
To enter notes on this step:

1 Click **Notes**.

2 Enter any notes in the resulting dialog box. Then, click **Close**.

Lower Arch Discrepancy

You use the Lower Arch Discrepancy chart to record lower arch discrepancies from both cuspid to cuspid and second molar to second molar. This breakdown is required to provide specific information concerning movement of the canines and the molars. This chart contains two columns, as illustrated below.



Move Both Sides (R+L)	Uses the same values for both the left and right sides. When you enter a value for one side, Dolphin Imaging automatically enters the same value for the other side.
Reset	Resets all values on this chart to their initial values.
Notes	Opens a dialog box where you can enter notes.
3 to 3 column	Factors occurring from cuspid to cuspid. R: Factors relating to the right side. L: Factors relating to the left side.
7 to 7 column	Factors related to the entire lower arch. R: Factors relating to the right side. L: Factors relating to the left side.

Record the following factors on this chart:

Crowding/ Spacing	Crowding or spacing in the anterior segment. In the 3 to 3 column, enter a negative number for crowding or a positive number for spacing.
C/S Bicusp/E	Crowding or spacing in the bicuspid region. In the 7 to 7 column, enter a negative number for crowding or a positive number for spacing.
C/S Molars	Crowding or spacing in the molar area. In the 7 to 7 column, enter a negative number for crowding or a positive number for spacing.
Curve of Spee	Determine this value by placing a ruler from the most distal molar to the incisor, the deepest point of the Curve of Spee (usually in the bicuspid region). Divide the measurement in millimeters in half. Record the result in both the left and right side of the 3 to 3 column, and the measurements are automatically recorded in the 7 to 7 column. The curve of Spee may be different on the left and right side.
Midline	Negative and positive figures are automatically recorded in both the 3 to 3 and 7 to 7 columns.
Incisor Position	Number of millimeters required or gained relative to incisor position. This figure is based on the cephalometric evaluation.
Initial Discrepancy	Total of the information gathered at this point in the lower arch analysis.
Stripping	If interproximal reduction is determined to be necessary, record this figure as positive values in the 3 to 3 and 7 to 7 columns.
Expansion	If expansion can be used in a particular case, enter positive values in the 3 to 3 and 7 to 7 columns.
Distalizing 6-6	If an attempt will be made to upright or distalize the lower first molars, record positive numbers in the 7 to 7 column only.
Extraction	If a lower incisor is to be extracted, record the number of millimeters gained in the left and right sides of the 3 to 3 column. If bicuspids will be extracted, record positive numbers in the 7 to 7 column.
Remaining Discrepancy	Initial discrepancy as well as the treatment methods used in the lower half of the chart.

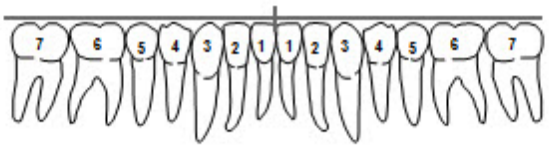
To record the lower arch discrepancy:

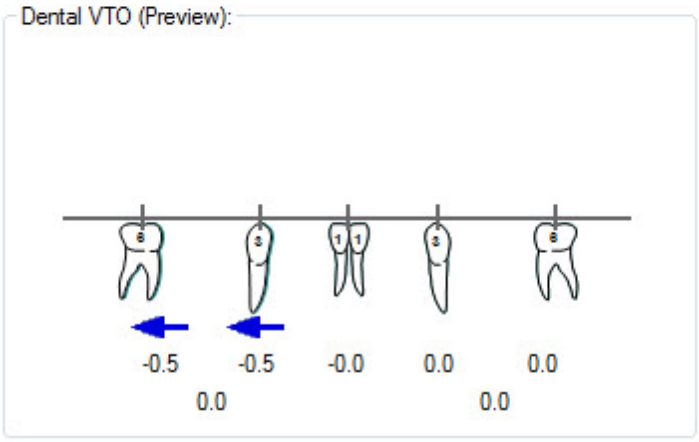
1 Click the up or down arrows to change the values in the fields to record measurements.

Or,

Type new values in the fields to record measurements.

Initially, the Dental VTO (Preview) shows the values that you entered on the Initial Position chart. When you enter values in the fields on this chart, both the tooth diagram and the Dental VTO (Preview) group box are updated to reflect those values.

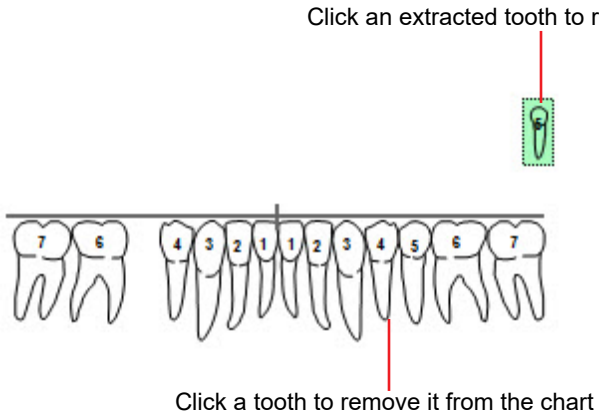




To record tooth extractions:

1 On the tooth chart, click the extracted tooth.

The tooth is removed from the tooth chart, and a green representation of it appears above the chart. If you make a mistake, you can click the green tooth representation to return it to the tooth chart.



To enter notes on this step:

1 Click **Notes**.

2 Enter any notes in the resulting dialog box. Then, click **Close**.

To go on to the next step:

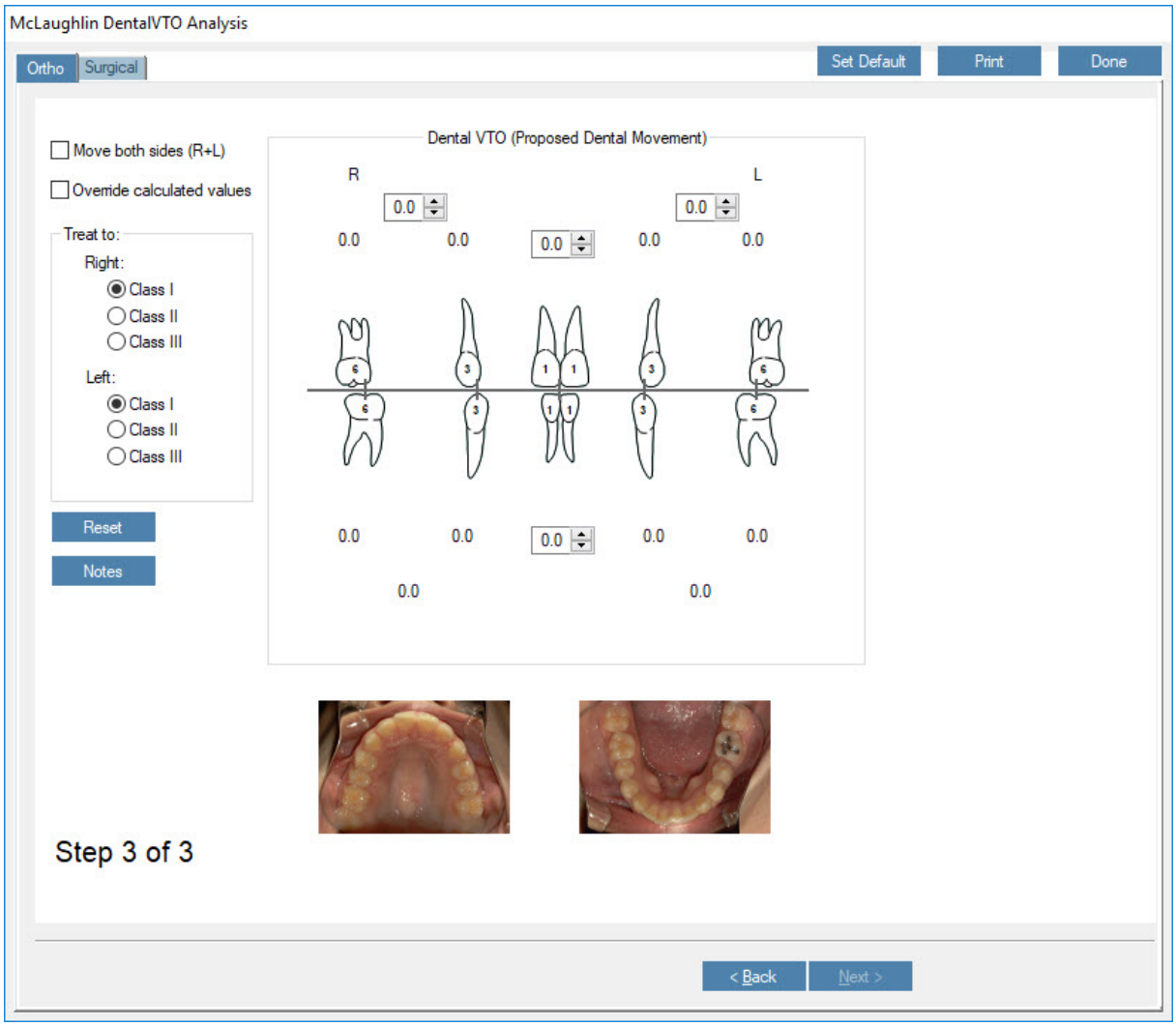
1 Click **Next>**.

Dental VTO (Proposed Dental Movements)

The Dental VTO (Proposed Dental Movements) chart provides specific information on the movement of the midlines, canines, and molars. On this chart, you enter some figures manually, and some figures are automatically entered based on the values entered on the other two charts. The values on this chart are listed below:

- The amount and direction of movement of the lower canines is automatically recorded based on the total discrepancy in the 3 to 3 column of the Lower Arch Discrepancy chart.
- The number just behind the recorded lower canine movement represents the potential space gain in the bicuspid region as a result of spacings and extractions.
- The movement of the molars is recorded based on the available space in the bicuspid region and necessary movement of the canines.
- The lower midline movement is recorded based on the initial position of the midline.
- Movement of the upper molar is determined based on the original molar relationship and the movement determined for the lower molar.
- The number just in front of upper molar movement relates to the available space in the bicuspid region in the upper arch.
- Upper canine movement needed is then determined by the space available in the bicuspid region and the necessary movement of the upper molar.
- The upper midline is corrected based on the original midline position.

The following figure illustrates this chart:



Move Both Sides (R+L)	Uses the same values for both the left and right sides. When you enter a value for one side, Dolphin Imaging automatically enters the same value for the other side.
Override Calculated Values	Overrides the values calculated based on the values entered in the Lower Arch Discrepancy chart. When you check this box, the calculated values are replaced by entry fields.
Treat To	**Class I**, **Class II**, or **Class III** for the right and left side.
Reset	Resets all values on this chart to their initial values.
Notes	Opens a dialog box where you can enter notes.

To record values on this chart:

1 Select **Class I**, **Class II**, or **Class III** for the right and left side in the Treat To group box.

2 Click the up or down arrows to change the values in the fields to record measurements.

Or,

Type new values in the fields to record measurements.

To enter notes for this step:

1 Click **Notes**.

2 Enter any notes in the resulting dialog box. Then, click **Close**.

To finish Orthodontic Dental VTO:

1 Save your treatment simulation.

For more information, see “Saving the Treatment Prediction” on page 13-20.

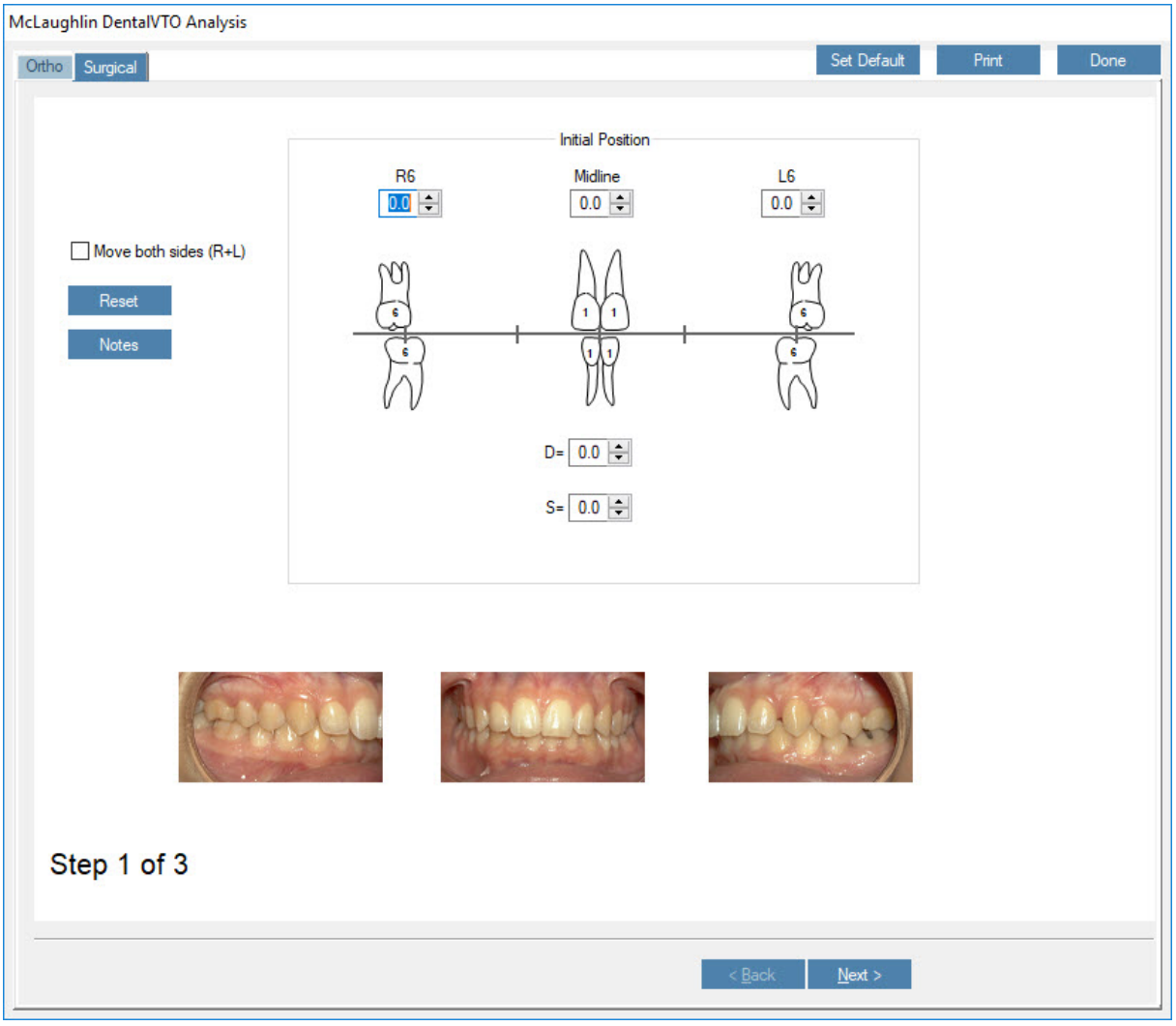
2 Click **Done**.

Surgical Dental VTO

The Surgical Dental VTO tab includes three charts: Initial Position, Lower Arch Discrepancy, and Upper Arch Discrepancy. This section describes each of these charts.

Initial Position

You use the Initial Position chart to record midline and molar relationships in millimeters. It is essential that these numbers be recorded with the mandible in centric relation. The following figure illustrates this chart:



R6	Measurement values in millimeters for the upper R6 molar.
Midline	Measurement values in millimeters for the upper midline.
L6	Measurement values in millimeters for the upper L6 molar.
D	Dental measurement values in millimeters for the lower arch

S	Skeletal measurement values in millimeters for the lower arch
Move Both Sides (R+L)	Uses the same values for both the left and right sides. When you enter a value for one side, Dolphin Imaging automatically enters the same value for the other side.
Reset	Resets all values on this chart to their initial values.
Notes	Opens a dialog box where you can enter notes.

To record the initial position:

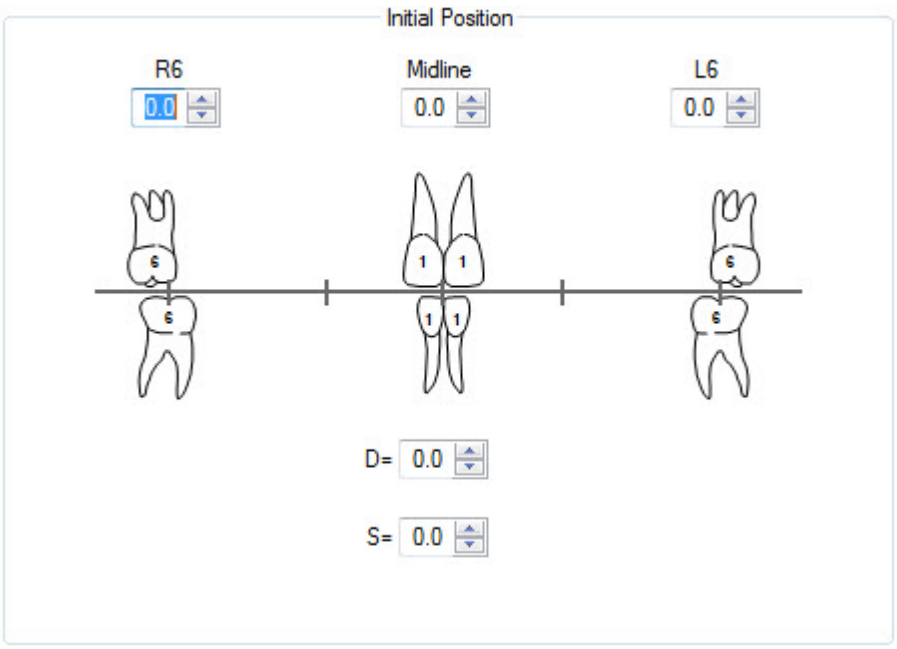
1 Click the up or down arrows to change the values in the fields to record measurements in millimeters.

Or,

Type new values in the fields to record measurements in millimeters.

When you enter values in the fields, arrows appear on the chart in the direction of Class II or Class III for the molar relationships and left and right for the midline relationships, as shown below.

In the lower arch, midline relationships can be recorded as dental and/or skeletal.



To enter notes on this step:

1 Click **Notes**.

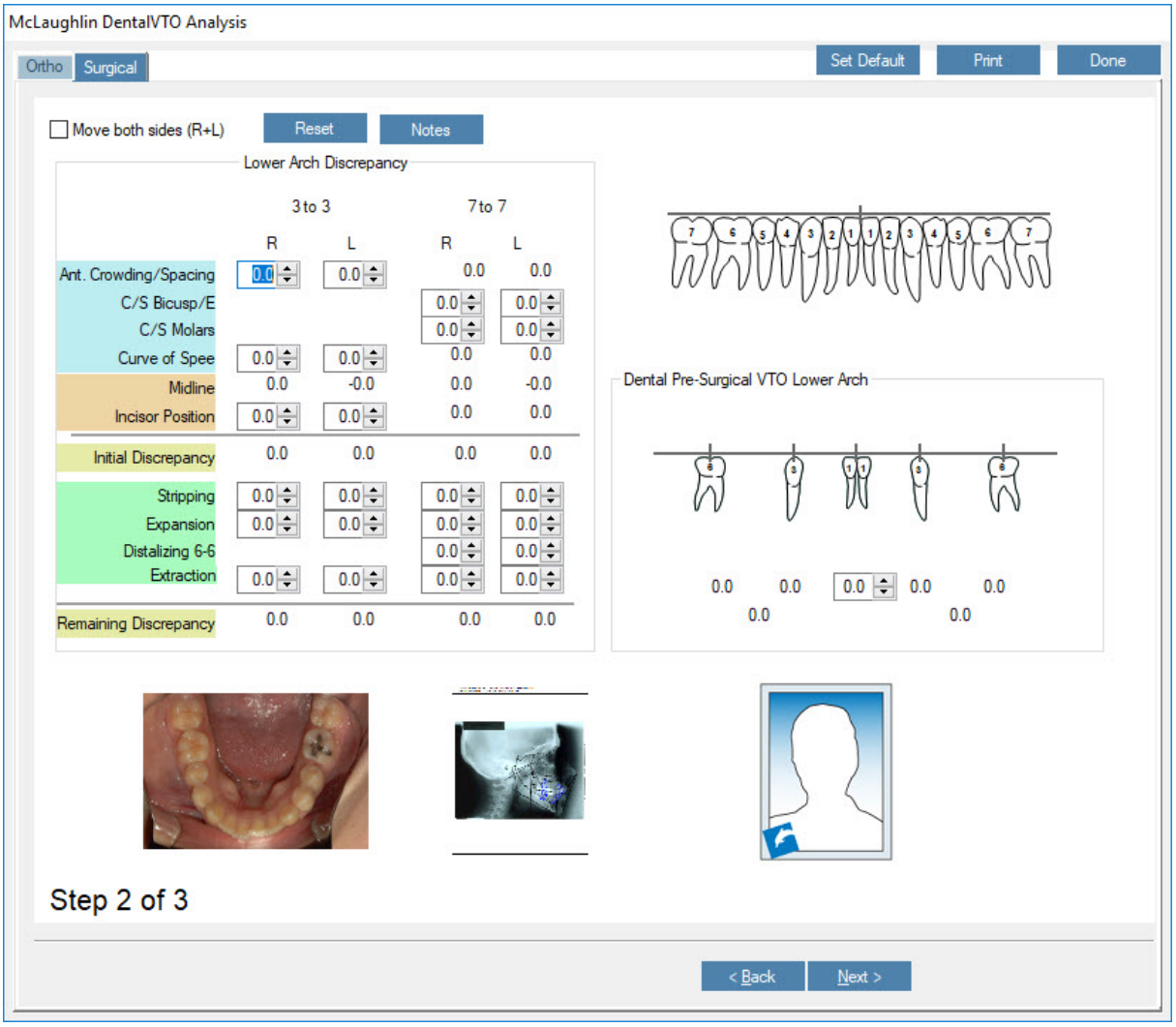
2 Enter any notes in the resulting dialog box. Then, click **Close**.

To go on to the next step:

1 Click **Next>**.

Lower Arch Discrepancy

You use the Lower Arch Discrepancy chart to record lower arch discrepancies from both cuspid to cuspid and second molar to second molar. This breakdown is required to provide specific information concerning movement of the canines and the molars. This chart contains two columns, as illustrated below.



3 to 3 column	Factors occurring from cuspid to cuspid. R: Factors relating to the right side. L: Factors relating to the left side.
7 to 7 column	Factors related to the entire lower arch. R: Factors relating to the right side. L: Factors relating to the left side.
Move Both Sides (L+R)	Uses the same movement values to both the left and right sides. When you enter a value for one side, Dolphin imaging automatically enters the same value for the other side.

Reset	Resets all values on this chart to their initial values.
Notes	Opens a dialog box where you can enter notes.

The following factors are recorded on this chart:

Crowding/ Spacing	Crowding or spacing in the anterior segment. In the 3 to 3 column, enter a negative number for crowding or a positive number for spacing.
C/S Bicusp/E	Crowding or spacing in the bicuspid region. In the 7 to 7 column, enter a negative number for crowding or a positive number for spacing.
C/S Molars	Crowding or spacing in the molar area. In the 7 to 7 column, enter a negative number for crowding or a positive number for spacing.
Curve of Spee	Determine this value by placing a ruler from the most distal molar to the incisor, the deepest point of the Curve of Spee (usually in the bicuspid region). Divide the measurement in millimeters in half. Record the result in both the left and right side of the 3 to 3 column, and the measurements are automatically recorded in the 7 to 7 column. The curve of Spee may be different on the left and right side.
Midlines	Negative and positive figures are automatically recorded in both the 3 to 3 and 7 to 7 columns.
Incisor Position	Number of millimeters required or gained relative to incisor position. This figure is based on the cephalometric evaluation.
Initial discrepancy	Total of the information gathered at this point in the lower arch analysis.
Stripping	If interproximal reduction is determined to be necessary, record this figure as positive values in the 3 to 3 and 7 to 7 columns.
Expansion	If expansion can be used in a particular case, enter positive values in the 3 to 3 and 7 to 7 columns.
Distalizing 6-6	If an attempt will be made to upright or distalize the lower first molars, record positive numbers in the 7 to 7 column only.
Extraction	If a lower incisor is to be extracted, record the number of millimeters gained in the left and right sides of the 3 to 3 column. If bicuspids will be extracted, record positive numbers in the 7 to 7 column.
Remaining Discrepancy	Initial discrepancy as well as the treatment methods used in the lower half of the chart.

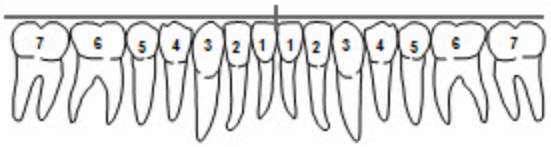
To record the lower arch discrepancy:

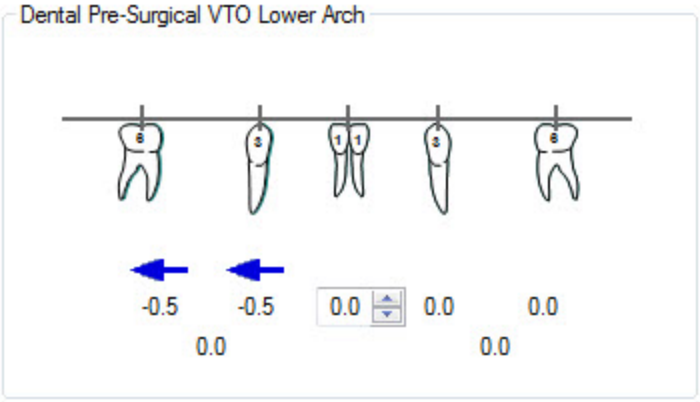
1 Click the up or down arrows to change the values in the fields to record measurements.

Or,

Type new values in the fields to record measurements.

Initially, the Dental Pre-Surgical VTO Lower Arch group box shows the values that you entered on the Initial Position chart. When you enter values in the fields on this chart, both the tooth diagram and the Dental Pre-Surgical VTO Lower Arch group box are updated to reflect those values.

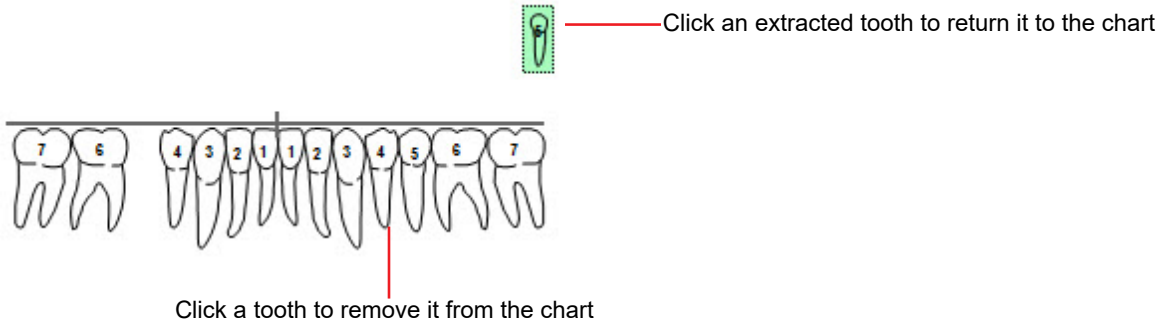




To record tooth extractions:

1 On the tooth chart, click the extracted tooth.

The tooth is removed from the tooth chart, and a green representation of it appears above the chart. If you make a mistake, you can click the green tooth representation to return it to the tooth chart.



To enter notes on this step:

1 Click **Notes**.

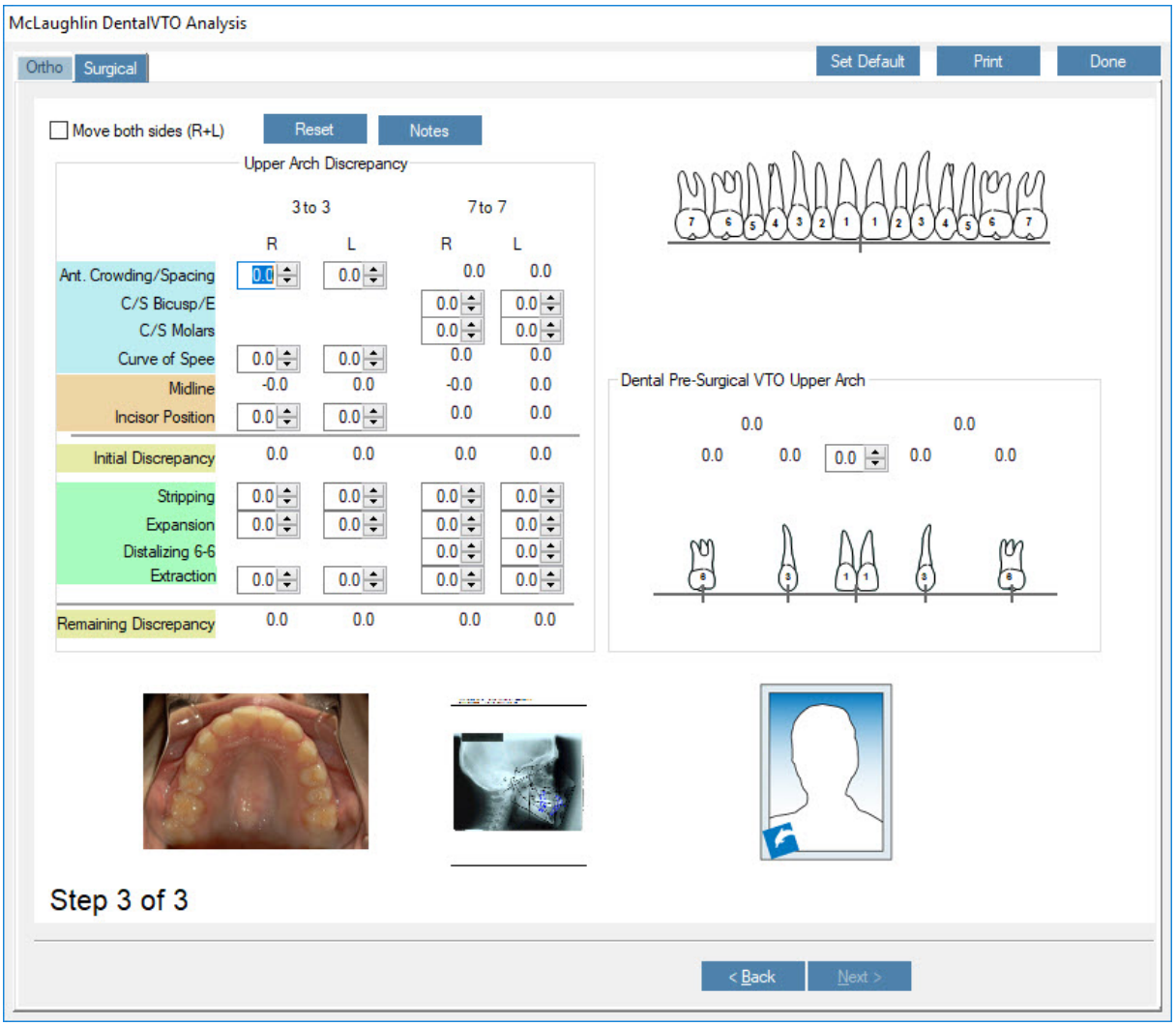
2 Enter any notes in the resulting dialog box. Then, click **Close**.

To go on to the next step:

1 Click **Next>**.

Upper Arch Discrepancy

You complete this chart using the same procedure as the Lower Arch Discrepancy chart, except that you record values for the upper arch only. Inter-arch movements are then carried out by the surgeon.



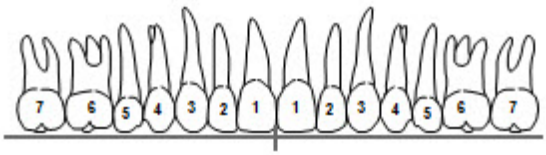
To record the upper arch discrepancy:

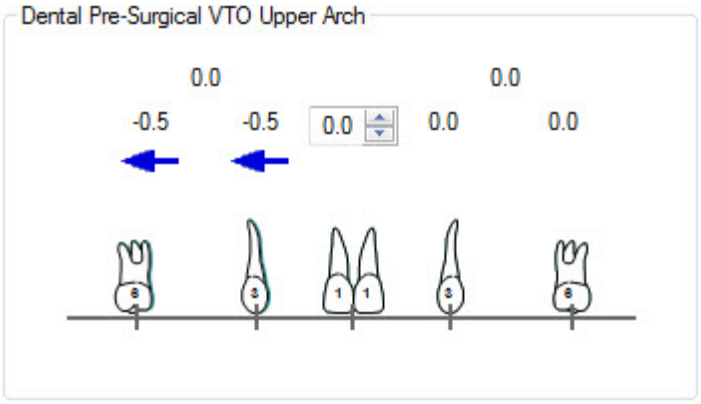
1 Click the up or down arrows to change the values in the fields to record measurements.

Or,

Type new values in the fields to record measurements.

Initially, the Dental Pre-Surgical VTO Upper Arch group box shows the values that you entered on the Initial Position chart. When you enter values in the fields on this chart, both the tooth diagram and the Dental Pre-Surgical VTO Upper Arch group box are updated to reflect those values.

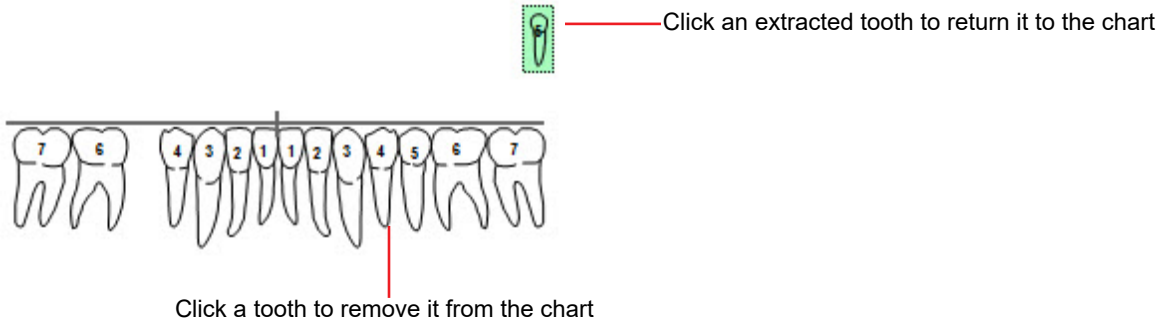




To record tooth extractions:

1 On the tooth chart, click the extracted tooth.

The tooth is removed from the tooth chart, and a green representation of it appears above the chart. If you make a mistake, you can click the green tooth representation to return it to the tooth chart.



To enter notes on this step:

1 Click **Notes**.

2 Enter any notes in the resulting dialog box. Then, click **Close**.

To finish Surgical Dental VTO:

1 Save your treatment simulation.

For more information, see “Saving the Treatment Prediction” on page 13-20.

2 Click **Done**.

Printing the Treatment Prediction

When you print the treatment prediction, Dolphin prints a report of the treatment work-up, cephalometric data, tooth chart, and any notes.

To print the treatment prediction:

1 Click **Print**.

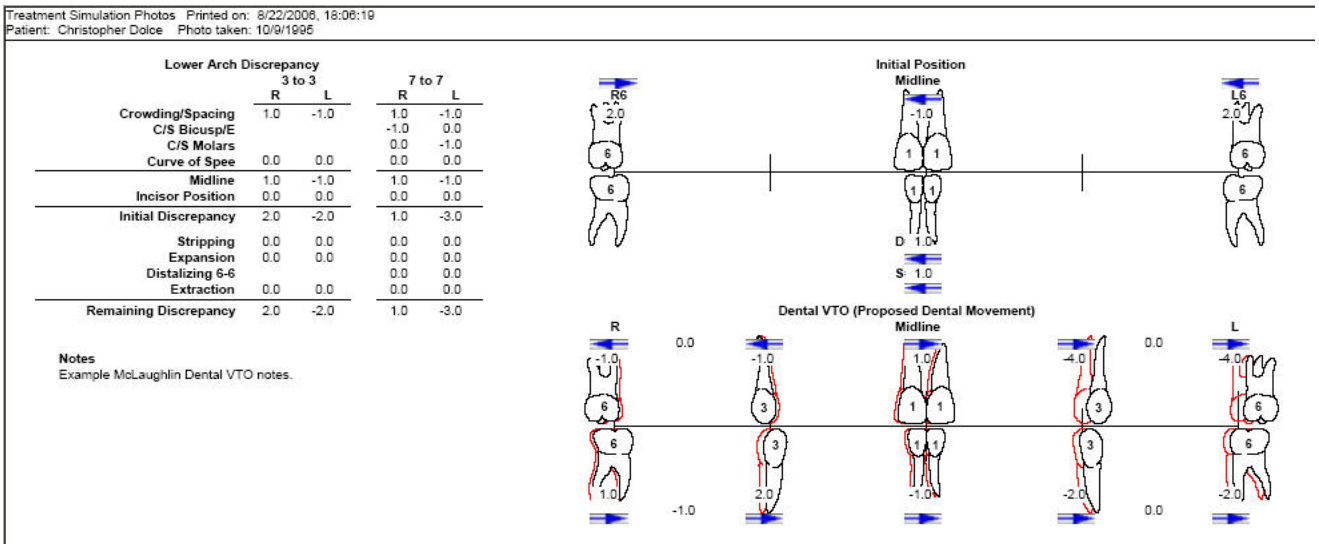
The Print dialog box appears.

2 Select any printing options you want and click **OK**.

Dolphin Imaging offers the following options in addition to the standard Microsoft Windows printing options (see “Printing” on page 16-4):

Print 1:1	Prints an image with cephalometric tracings using the **1:1** option. This setting has no effect if you are not printing an image with cephalometric tracings.
Preview	Previews your print job on the computer screen.

The following figure illustrates an example printed treatment prediction.



Saving the Treatment Prediction

When you save the treatment prediction, Dolphin always saves both of the following:

- the image and data that comprise the treatment simulation
- the original image and data, for your reference or further treatment simulation

Each Dental VTO (both orthodontic and surgical) is saved with the treatment work-up, the image (facial or x-ray), and the cephalometric data.

To save the treatment image after you have finished the treatment simulation operations:

1 Click .

The Save Image dialog box is displayed.

2 Optionally, modify the image title.

Dolphin automatically provides an appropriate image title, “Treatment Simulation” in most cases. However, you may wish to enter a more specific name (for example, “orth only,” “mx only,” or “mx+md”), as appropriate for your treatment simulation.

3 Select a slot from the **Save As** list in which to save this image, and click **OK**.

For each patient and timepoint, you can save up to eight different treatment simulations.

Note: *If you are viewing two images side by side when you save, the side-by-side view of the two images is saved as a single image.*

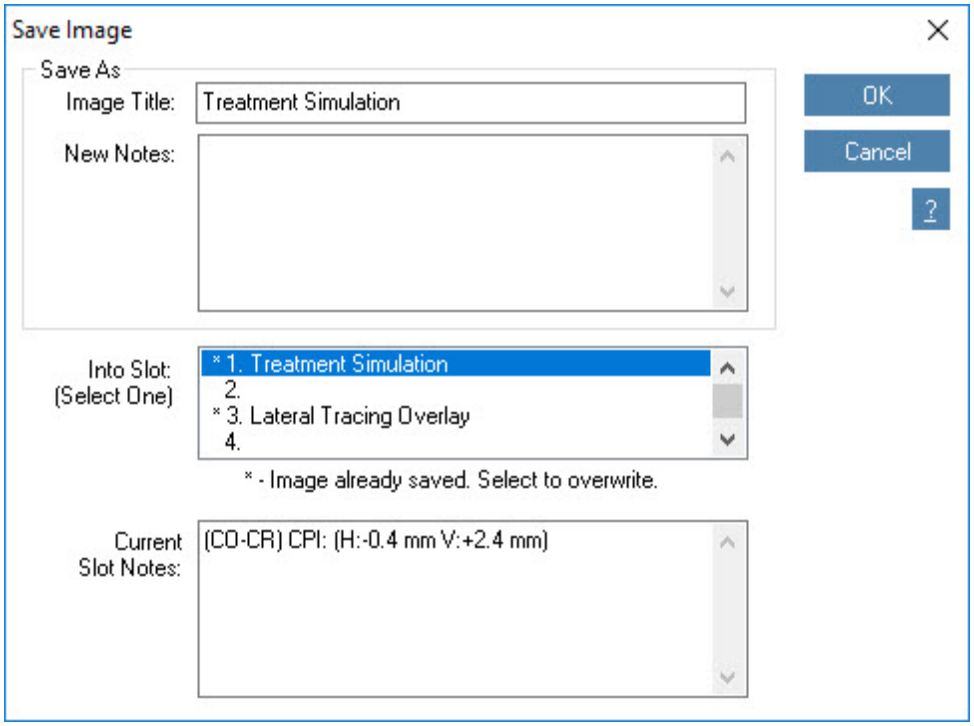


Image Title	Title for this image, up to 25 characters.
New Notes	Notes for this image. Automatically completed with a summary of the operations you performed, but you can modify these notes. When you view this treatment simulation again later, you can access these notes using the **Previous Notes** tab on the **Treatment Simulation** palette.
Into Slot	Slots available for each timepoint in which you can save this image. If you select a slot containing an image, the existing image is overwritten with the new image.
Current Slot Notes	Notes previously entered for the selected slot (if any).

14 Ricketts VTO/Roth-Williams AEO VTO (Medical Device)

The Ricketts VTO and Roth-Williams AEO VTO are constructed using tracing sequences performed on various superimpositions that simulate the combination of changes taking place with growth and the outcome of orthodontic treatment. These simulations enable the clinician to quickly predict, plan, and visualize the sequence of treatment to be performed. Before using this feature, you should be familiar with the treatment simulation features described in Chapter 12, Treatment Simulation (Medical Device).

The Ricketts VTO/Roth-Williams AEO VTO Interactive Analysis consists of a wizard that greatly simplifies construction of the necessary superimpositions and tracing sequences. The wizard only stops at steps that require your input. It automatically performs all steps that do not require your input, such as the growth steps.

The Ricketts VTO and the Roth-Williams AEO VTO methods are very similar, but the Roth-Williams AEO VTO provides more flexibility.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Orthodontic and Surgical Treatment Simulation privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Starting the Wizard

To use the Ricketts VTO/Roth-Williams AEO VTO wizard, you must have selected a patient and a timepoint. In addition, you need one of the following:

- a lateral x-ray digitized with an appropriate analysis (see Chapter 7, Digitize (Medical Device))
- a profile photo of the patient superimposed with the patient's tracing created from the analysis (see Chapter 9, Superimposition (Medical Device))

To verify that the images you need are available, select the **- Everything -** image layout from the **Layout** drop-down list on the Dolphin Imaging main screen. This layout contains all patient images for the selected timepoint.

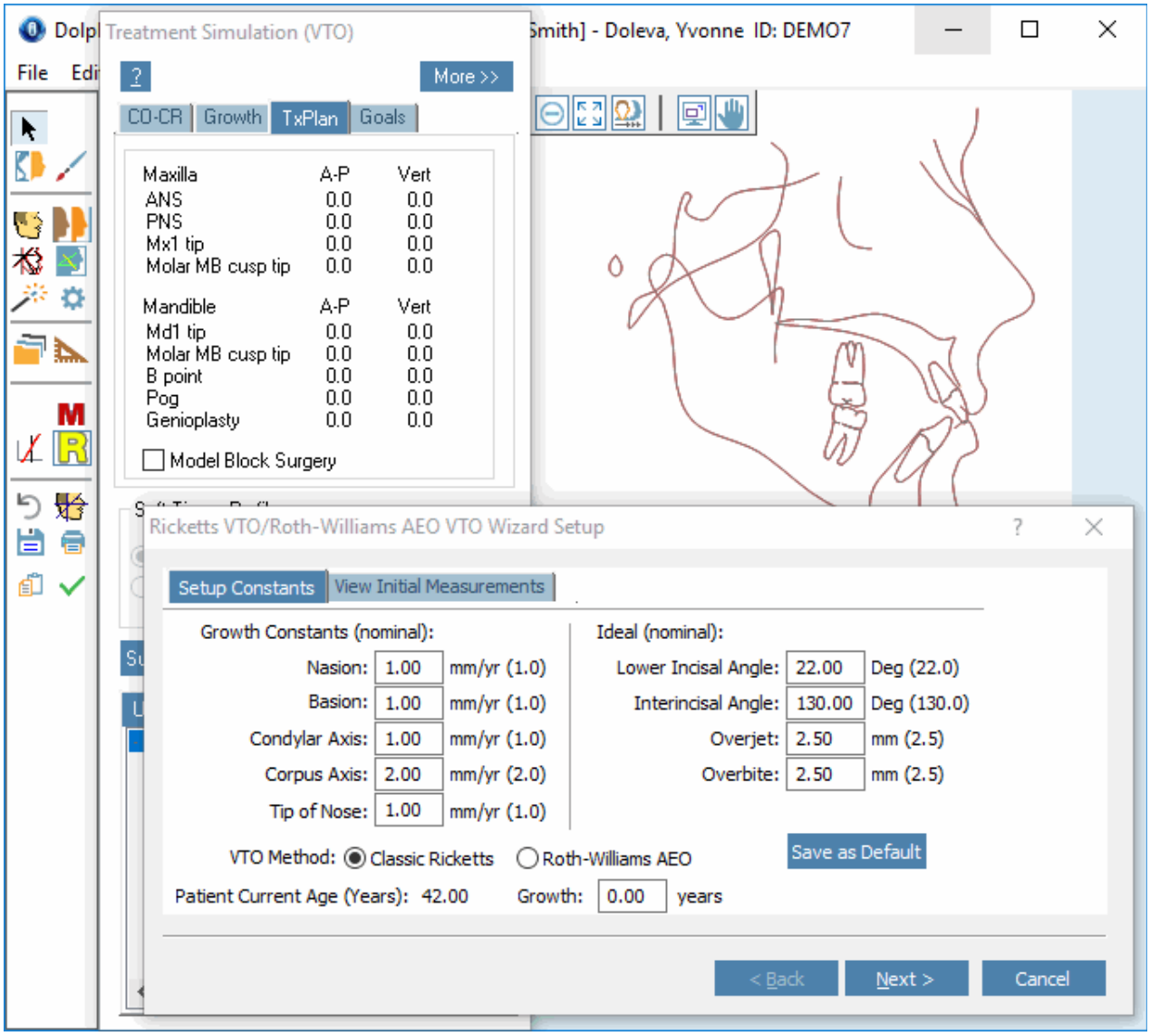
To start the Ricketts VTO/Roth-Williams AEO VTO wizard:

1 Start the Treatment Simulation module as described in "Accessing Treatment Simulation" on page 12-2.

2 If necessary, select the set of soft tissue rules to use as described in "Loading Soft Tissue Rules" on page 12-4.

3 Click R on the Treatment Simulation tool bar.

The wizard starts and displays its Setup step. In the Treatment Simulation window, the patient's image is hidden and the tracing is set to the Ricketts analysis.



Navigating in the Wizard

The Ricketts VTO/Roth-Williams AEO VTO Interactive Analysis consists of many steps, only some of which require your input. When you use the wizard, Dolphin automatically performs all steps that do not require input, such as the growth steps. The wizard groups the steps that require your interaction into a Setup step and five main treatment steps. Each treatment step includes:

- sub-steps in the form of list items, each of which has an associated superimposition

- other relevant superimpositions, which are part of the current step, but are rendered unnecessary by Dolphin Imaging's growth automation

To navigate among the Setup step and the five main treatment steps:

1 Click **Next >** to go to the next step.

Or,

Click **< Back** to return to the previous step.

Or,

Click **Restart** (if available) to return to the Setup step.

Or,

Click **Finish** to close the wizard, applying growth without treatment for all the subsequent steps you skipped.

To navigate among the sub-steps within a treatment step:

1 Click the list item for a sub-step.

The patient's tracings are automatically superimposed as appropriate for that sub-step.

To view one of the other relevant superimpositions for verification purposes:

1 Click the superimposition you want to view in the list of other relevant superimpositions.

Wizard Setup

When you start the wizard, it opens its Setup step. This step consists of two tabs:

Setup Constants	Used to set values for the growth operation, set ideal incisal measurements, and choose the VTO method (**Classic Ricketts** or **Roth-Williams AEO**). For more information, see “Setup Constants Tab” below.
View Initial Measurements	Used to view a measurement table for this patient with initial values. For more information, see “View Initial Measurements Tab” on page 14-5.

Setup Constants Tab

On this tab, you can set values for the growth operation, set ideal incisal measurements, and choose the VTO method (**Classic Ricketts** or **Roth-Williams AEO**). Except for the number of years for the growth operation, all of the values on this tab are initially set to defaults.

To enter setup constants:

1 Enter the number of years to use for the growth operation.

2 Optionally, select either **Classic Ricketts** or **Roth-Williams AEO** as your VTO method.

3 Optionally, change any of the **Growth** constants.

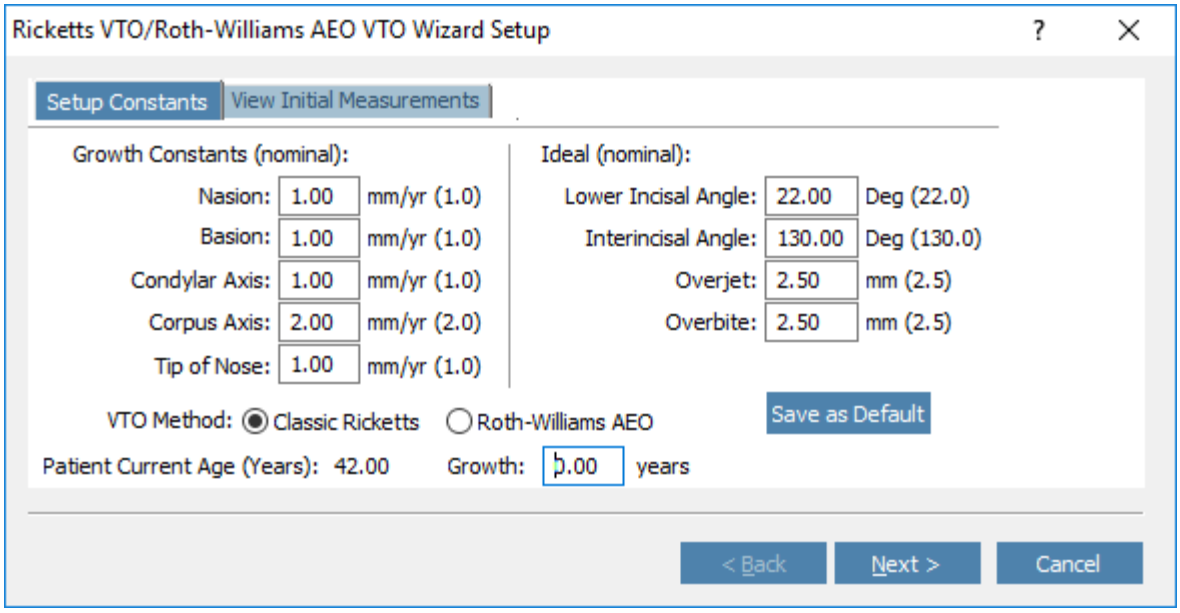
4 Optionally, set any ideal incisal measurements.

5 Optionally, click **Save as Default** to use your modified values (except the years of growth) as the default values whenever you use this wizard in the future.

6 Click **Next >** to go to the next step of the wizard.

Or,

Click **View Initial Measurements** to view a table of initial measurements for this patient.



Growth Constants (nominal)	Number of millimeters that each measurement should change each year during a growth operation. The default values appear in parentheses. **Nasion:** Change for the Nasion in millimeters. **Basion:** Change for the Basion in millimeters. **Condylar Axis:** Change for the Condylar Axis in millimeters. **Corpus Axis:** Change for the Corpus Axis in millimeters. **Tip of Nose:** Change for the Nasion in millimeters.
Ideal (nominal)	Ideal incisal measurements. The default values appear in parentheses. **Lower Incisal Angle:** Number of degrees for the ideal lower incisal angle. **Interincisal Angle:** Number of degrees for the ideal interincisal angle. **Overjet:** Ideal overjet amount in millimeters. **Overbite:** Ideal overbite amount in millimeters.
VTO Method	VTO method to use, either Classic Ricketts or Roth-Williams AEO.
Save as Default	Uses your modified values (except the years of growth) as the default values whenever you use this wizard in the future.

Patient Current Age (Years)	Patient's current age. The Classic Rickets method only stimulates growth only for patients under 18.
Growth	Number of years to stimulate growth for this patient.

View Initial Measurements Tab

On this tab, you can view a table of the initial measurements for this patient.

To view initial measurements:

1 Click the **View Initial Measurements** tab, if it isn't already selected.

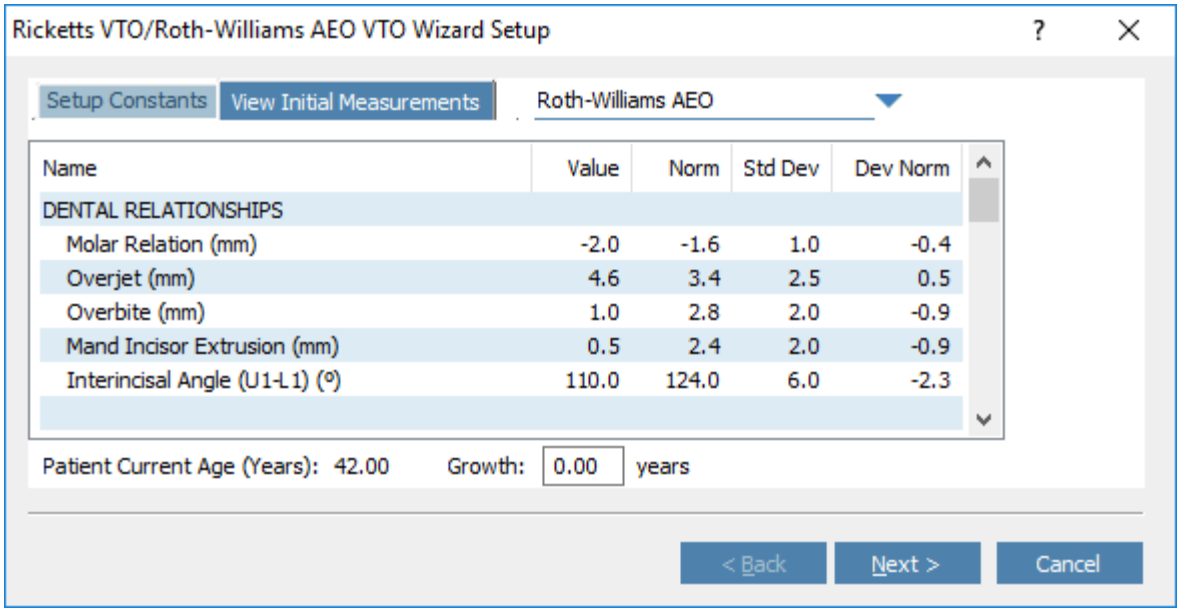
2 Optionally, select an analysis from the drop-down list.

3 Optionally, enter the number of years to use for the growth operation.

4 Click **Next >** to go to the next step of the wizard.

Or,

Click **Setup Constants** to return to the **Setup Constants** tab

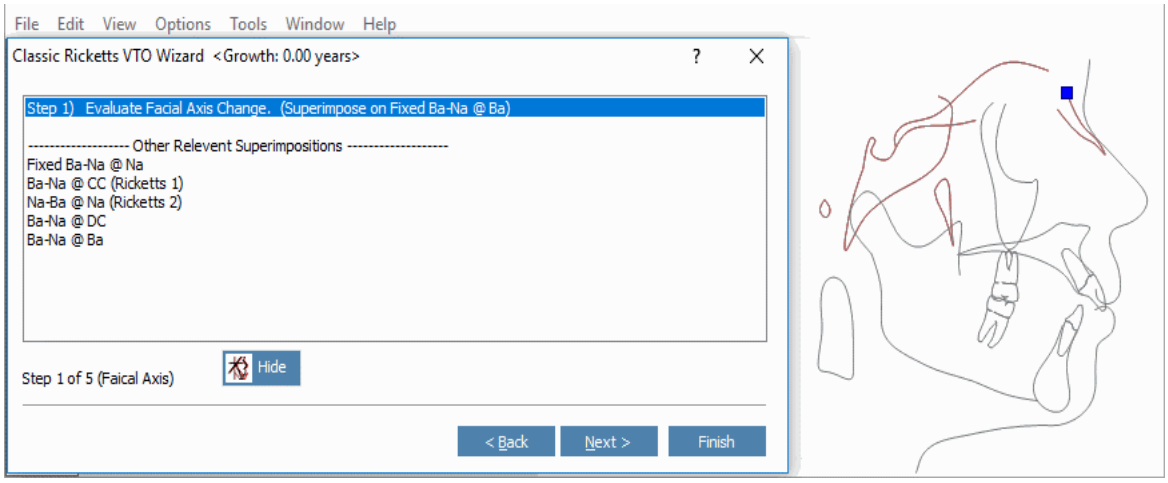


drop-down list	Analysis for which you want to view the measurements table.
Name	Name of the measurement.
Value	Value for each measurement is listed in this column.
Norm	Norm for the patient's age, gender, and racial classification is listed in this column. This value is considered normal or average for this measurement.

Std Dev	Standard deviation for this measurement is listed in this column. Standard deviation is a statistical term that indicates the expected variation of data from the norm. For instance, if a measurement has a small standard deviation, the measurements for most patients are expected to be close to the norm. If a measurement has a large standard deviation, it is not expected that most patient's measurement will be close to the norm.
Dev Norm	Patient's deviation from the norm is listed in this column, calculated as follows: Dev Norm = (Value - Norm) / Std Dev. For example, suppose a patient's value for SNA is 84 degrees, the norm is 82 degrees, and the standard deviation is 3.5. The patient's deviation from the norm would be: (84 - 82) / 3.5 = 0.6 This means this patient is 2 degrees above norm (84 - 82 = 2) for this measurement. Every 3.5 degrees above normal is one standard deviation. So, the patient is 0.57 standard deviations above normal (2 / 3.5 = 0.57) In the measurements table above, 0.57 is rounded up to 0.6.
Growth	Number of years for which you want to stimulate growth for this patient.

Step 1: Evaluate Facial Axis Change

When you enter this step, the growth you specified on the Setup step is applied automatically to the Nasion and Basion, and the tracing superimposition for this step is displayed. The patient's tracing displays the Facial Axis measurement and the angle of Facial Axis change.



Steps/sub-steps	Steps and sub-steps for operations you can perform. This step has no sub-steps.
Other Relevant Superimpositions	Superimpositions to view for verification purposes.
	Toggles the display of the patient's original tracing.

To change the Facial Axis:

1 Click and drag the blue movement control.

To go to the next step:

1 Click **Next >**.

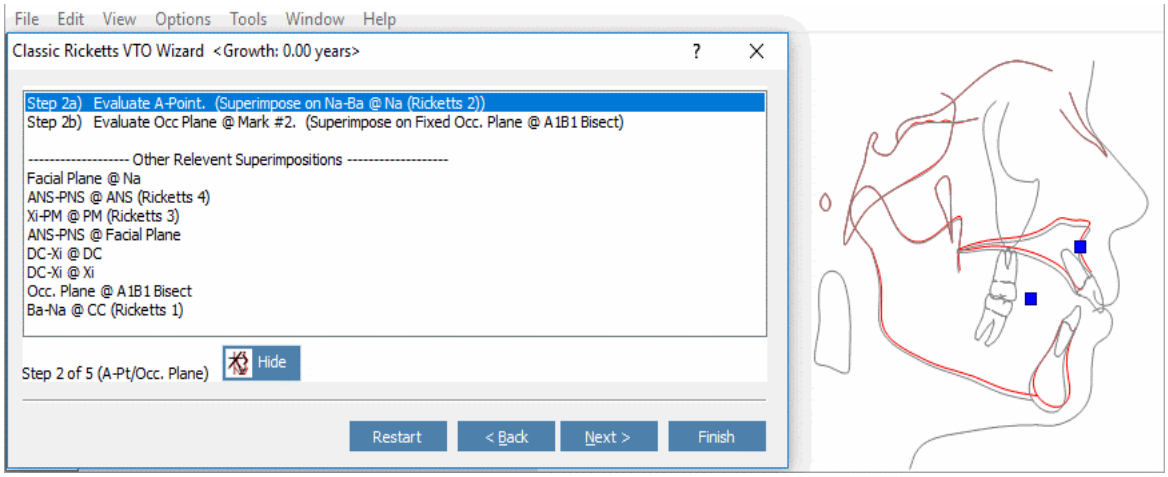
To simulate growth without treatment:

1 Without making any changes to the blue movement control, click **Finish**.

The wizard dialog box closes and the Treatment Simulation window shows the patient's tracing with the growth operation you specified on the Setup step applied. You can then use the options on the Treatment Simulation tool bar (described in Chapter 12, Treatment Simulation (Medical Device)) to plan treatment for this patient.

Step 2: Evaluate A-Point and Occlusal Plane

When you enter this step, the growth you specified on the Setup step is applied automatically to the Condylar Axis and the Corpus Axis, and the Mandible and Maxilla are placed automatically. The tracing superimposition for the first sub-step is displayed. The patient's tracing displays the Occlusal Plane/Facial Axis measurement, the A-Point Convexity measurement, and the angle of Occlusal Plane change.



Steps/sub-steps	Steps or sub-steps for operations you can perform. This step has two sub-steps: **Step 2a) Evaluate A-Point:** Modify the A-Point. **Step 2b) Evaluate Occ Plane @ Mark #2 (Classic Ricketts method) or Evaluate Occlusal Plane (Roth-Williams AEO method):** Tilt the Occlusal Plane at the A1B1 Bisect. The superimpositions used for these two sub-steps depend on whether you are using the Classic Rickets or the Roth-Williams AEO method. ***Note:*** *Although the Roth-Williams AEO method does not include tilting the Occlusal Plane, Dolphin includes this sub-step to offer you greater flexibility.*

Other Relevant Superimpositions	Superimpositions to view for verification purposes.
	Toggles the display of the patient's original tracing.

To modify the A-Point:

1 Click **Step 2a) Evaluate A-Point**.

2 Click and drag the blue movement control at the A-Point.

To tilt the Occlusal Plane:

1 Click **Step 2b) Evaluate Occ Plane @ Mark #2** if you are using the Classic Ricketts method.

Or,

Click **Step 2b) Evaluate Occlusal Plane** if you are using the Roth-Williams AEO method.

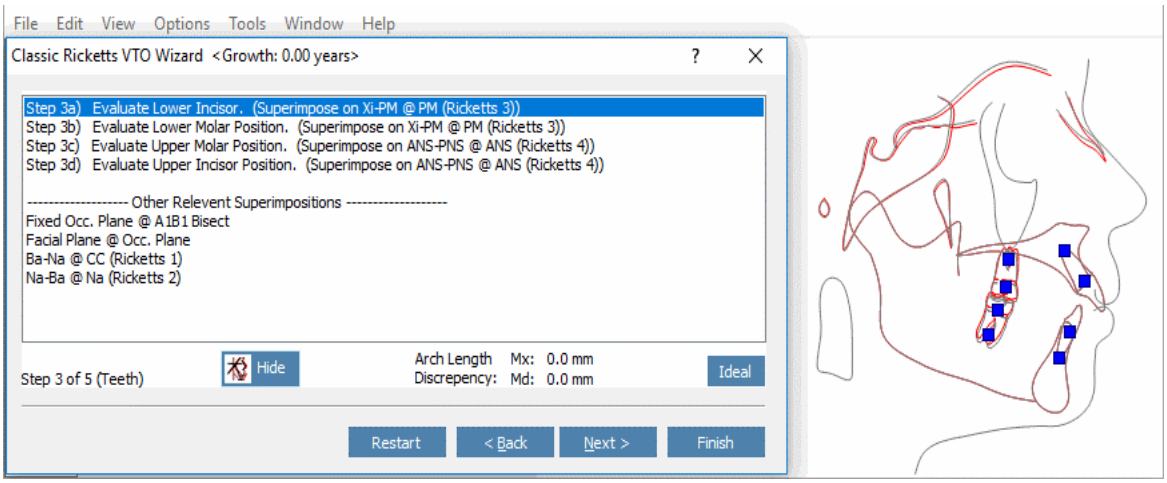
2 Click and drag the blue movement control at the Occlusal Plane.

To go to the next step:

1 Click **Next >**.

Step 3: Evaluate Incisors and Molars

When you enter this step, the growth you specified on the Setup step is applied automatically, and the teeth are placed in their natural position (growth without treatment). The tracing superimposition for the first sub-step is displayed. The patient's tracing displays the Interincisal Angle measurement, L1 Protrusion distance, L1/Facial Plane Angle measurement, Overbite measurement, and Overjet measurement.



Steps/sub-steps	Steps or sub-steps for operations you can perform.This step has four sub-steps: **Step 3a) Evaluate Lower Incisor:** Modify the lower incisor location. **Step 3b) Evaluate Lower Molar:** Modify the lower molar location. **Step 3c) Evaluate Upper Molar:** Modify the upper molar location. **Step 3d) Evaluate Upper Incisor:** Modify the upper incisor location.
Other Relevant Superimpositions	Superimpositions to view for verification purposes.
	Toggles the display of the patient's original tracing.
Arch Length Discrepancy	Arch Length Discrepancy values for your current operation. **Mx:** ALD for the patient's upper teeth in the current simulation. **Md:** ALD for the patient's lower teeth in the current simulation.
Ideal	Automatically applies the following movements: • The lower incisor is placed with the tip at its ideal position and the tooth at its ideal inclination. • The upper incisor is placed at the ideal interincisal angle with respect to the lower incisor, with ideal overbite and overjet. • The molars are repositioned so that they are upright and pushed up/down against the occlusal plane. This operation uses the ideal values you specified on the Setup step (see "Wizard Setup" on page 14-3).

To reposition the teeth:

1 Click the sub-step for the tooth you want to move.

2 Click and drag the blue movement control at a tooth's root to rotate the tooth.

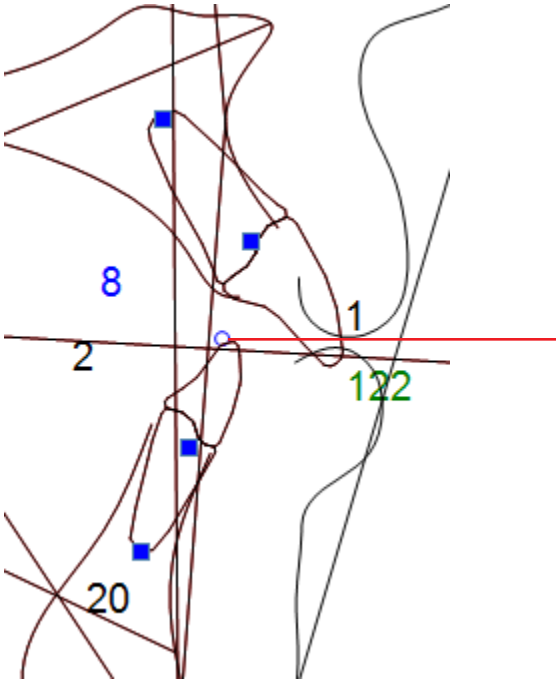
Or,

Click and drag the blue movement control at a tooth's crown to move the tooth laterally.

Or,

Click **Ideal** to automatically move the teeth to their ideal positions based on the values you entered on the Setup step.

The tracings also display the "1mm-1mm" ideal position marker for the lower incisor tip. You may need to zoom in on the tracing to see this marker.



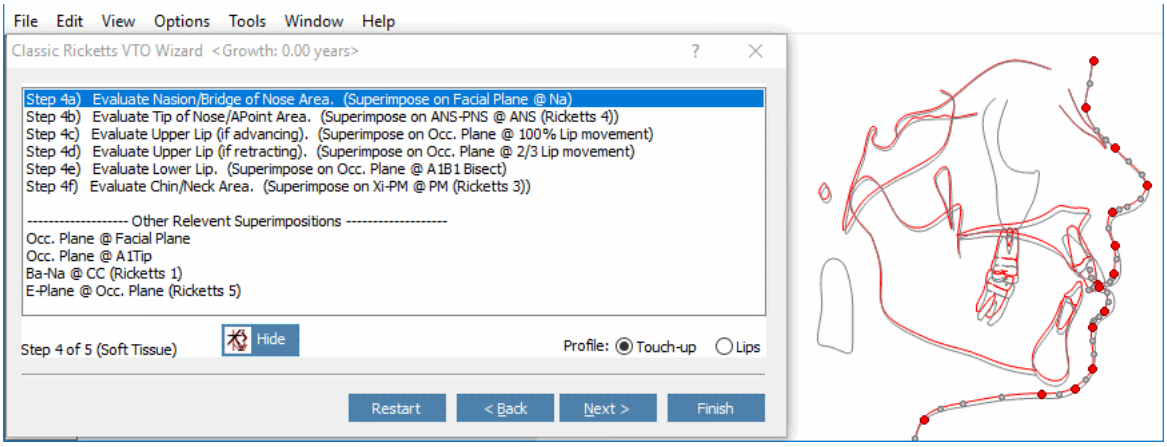
"1mm-1mm" ideal position marker for the lower incisor tip

To go to the next step:

1 Click **Next >**.

Step 4: Evaluate Soft Tissue Profile

When you enter this step, the growth you specified on the Setup step is applied automatically, and the soft tissue is placed in its natural position. The upper lip is moved automatically by 66% if the upper incisor was retracted and by 100% if it was advanced. The tracing superimposition for the first sub-step is displayed.



Steps/sub-steps	Steps or sub-steps for operations you can perform. **Classic Ricketts Sub-steps:** **Step 4a) Evaluate Nasion/Bridge of Nose Area:** Modify the soft tissue profile points in the area of the Nasion and bridge of the nose. **Step 4b) Evaluate Tip of the Nose/APoint Area:** Modify the soft tissue profile points in the area of the tip of the nose and the A-Point. **Step 4c) Evaluate Upper Lip (if advancing):** Modify the soft tissue profile points to advance the upper lip. This superimposition uses 100% of the upper lip movement. **Step 4d) Evaluate Upper Lip (if retracting):** Modify the soft tissue profile points to retract the upper lip. This superimposition uses 2/3 of the upper lip movement. **Step 4e) Evaluate Lower Lip:** Modify the soft tissue profile points for the lower lip. **Step 4f) Evaluate Chin/Neck Area:** Modify the soft tissue profile points in the chin and neck area. **Roth-Williams AEO Sub-steps:** **Step 4a) Evaluate Nasion Area:** Modify the soft tissue profile points in the area of the Nasion. **Step 4b) Evaluate Bridge of Nose Area:** Modify the soft tissue profile points in the area of the bridge of the nose. **Step 4c) Evaluate Tip of the Nose/A Point Area:** Modify the soft tissue profile points in the area of the tip of the nose and the A-Point. **Step 4d) Evaluate Upper Lip (if advancing):** Modify the soft tissue profile points to advance the upper lip. This superimposition uses 100% of the upper lip movement. **Step 4e) Evaluate Upper Lip (if retracting):** Modify the soft tissue profile points to retract the upper lip. This superimposition uses 2/3 of the upper lip movement. **Step 4f) Evaluate Lower Lip:** Modify the soft tissue profile points for the lower lip. **Step 4g) Evaluate Chin/Neck Area:** Modify the soft tissue profile points in the chin and neck area.
Other Relevant Superimpositions	Superimpositions to view for verification purposes.
	Toggles the display of the patient's original tracing.
Profile	Part of the profile you want to touch up. **Touch-up:** Touch up areas of the profile other than the lips. **Lips:** Touch up the lips.

To touch up areas of the profile other than the lips:

1 Click the sub-step for the area you want to touch up.

2 Select the **Touch-up** option for the profile.

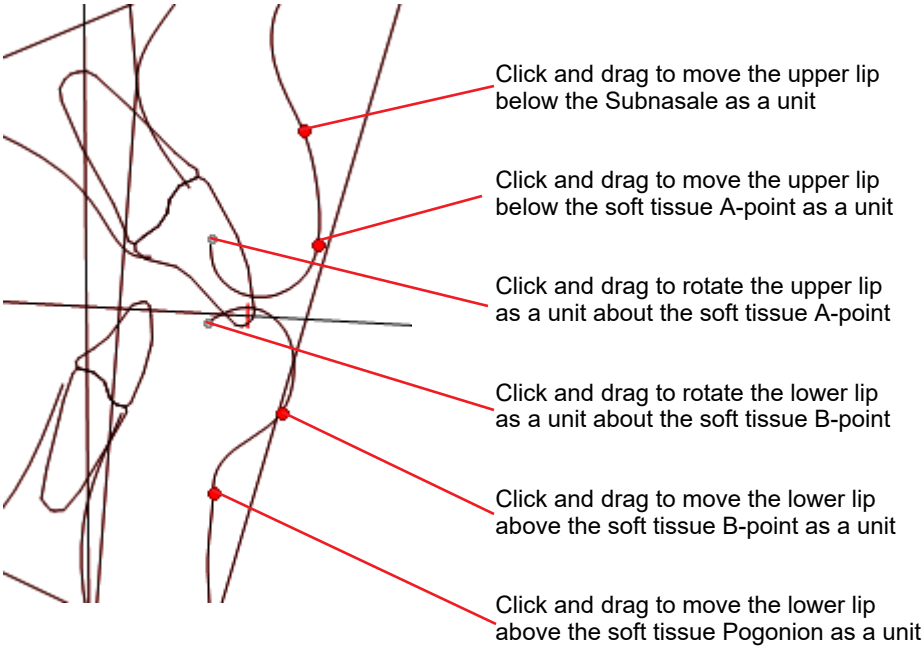
3 Click and drag the red and gray movement controls to touch up the profile.

To touch up the lips:

1 Click the sub-step for the touch-up option you want to perform.

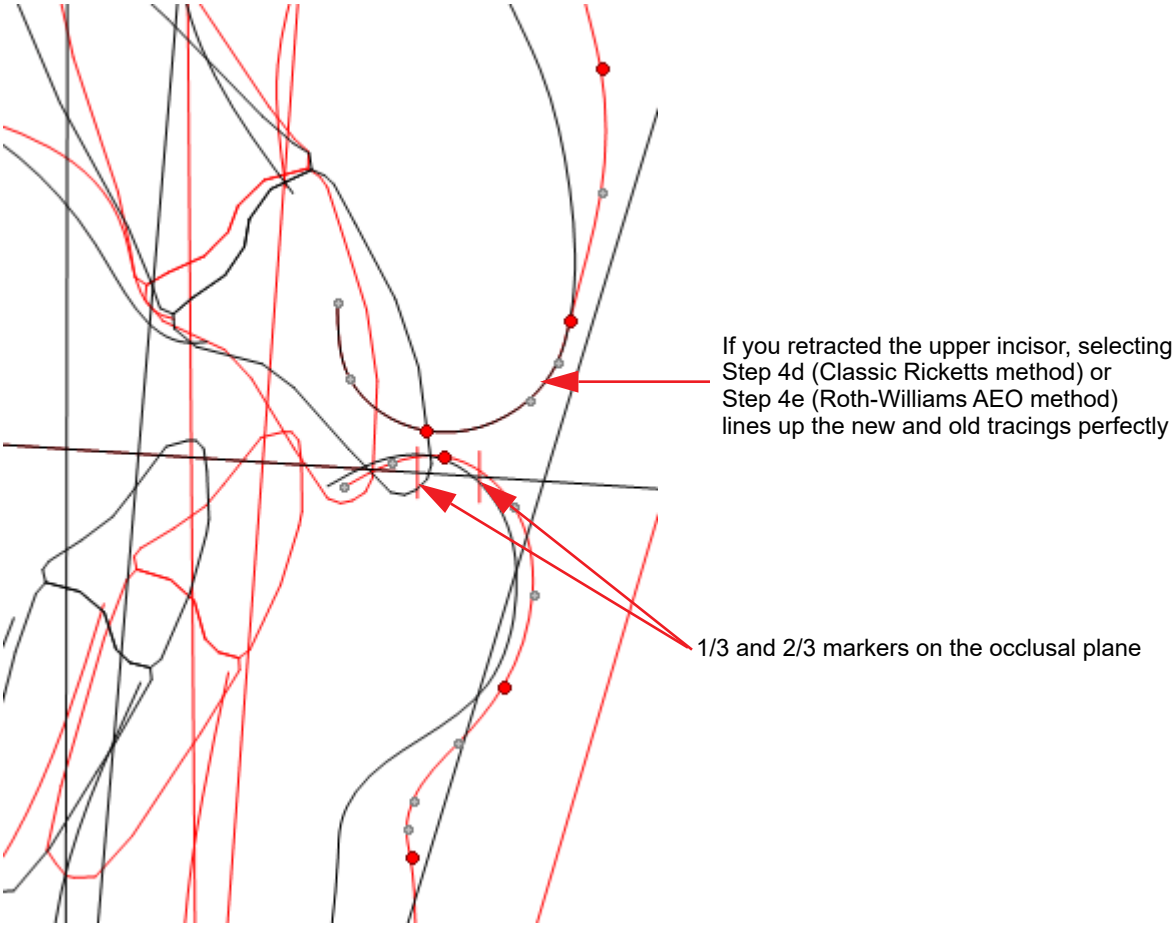
2 Select the **Lips** option for the profile.

Points for touching up the patient's lips appear, as illustrated in the figure below. In this illustration, the original tracing is not displayed so that you can easily see the touch-up movement controls for the patient's lips.



3 Click and drag the red and gray movement controls to touch up the lips.

If you zoom in, you can see 1/3 and 2/3 markers on the Occlusal Plane. If you retracted the upper incisor and select **Step 4d** (Classic Ricketts method) or **Step 4e** (Roth-Williams AEO method), which superimposes on the 2/3 marker, you should see the new and old upper lip tracings superimposed perfectly, as illustrated below.



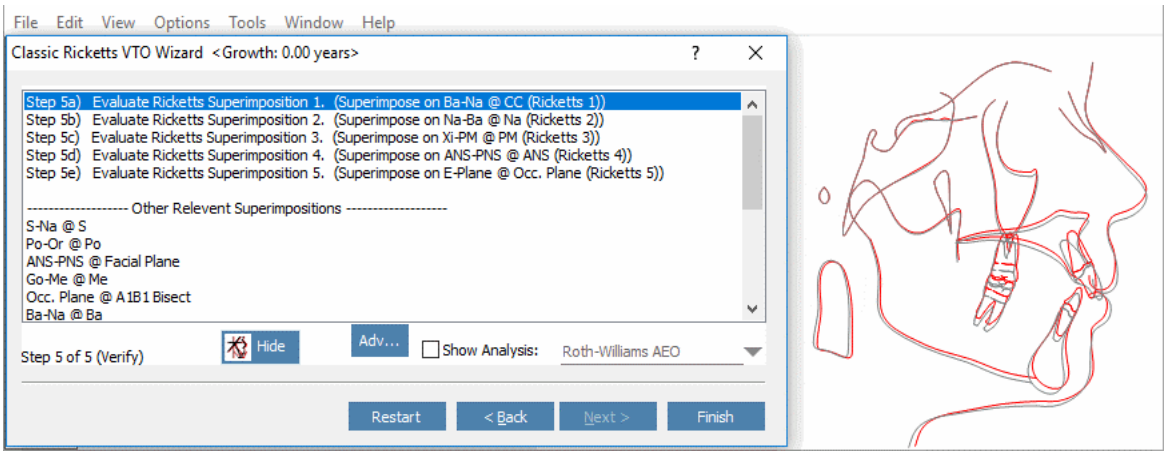
Similarly, if you advanced the upper incisor and selected **Step 4c** (Classic Ricketts method) or **Step 4d** (Roth-Williams AEO method) (superimposing on 100% lip movement), the upper lip tracings would match exactly.

To go to the next step:

1 Click **Next >**.

Step 5: Evaluate Superimpositions

When you enter this step, the results of your treatment simulation up to this point appear. The Ricketts analysis is shown by default, but you can change the analysis if you wish to view a different one.



Steps/sub-steps	Steps or sub-steps for operations you can perform. **Classic Ricketts Sub-steps:** **Step 5a) Evaluate Ricketts Superimposition 1:** In this sub-step, you verify the planned outcome by viewing a superimposition on Ba-Na @ CC. **Step 5b) Evaluate Ricketts Superimposition 2:** In this sub-step, you verify the planned outcome by viewing a superimposition on Na-Ba @ Na. **Step 5c) Evaluate Ricketts Superimposition 3:** In this sub-step, you verify the planned outcome by viewing a superimposition on Xi-PM @ PM. **Step 5d) Evaluate Ricketts Superimposition 4:** In this sub-step, you verify the planned outcome by viewing a superimposition on ANS-PNS @ ANS. **Step 5e) Evaluate Ricketts Superimposition 5:** In this sub-step, you verify the planned outcome by viewing a superimposition on E-Plane @ Occ. Plane. **Roth-Williams AEO Sub-steps:** **Step 5a) Adjust TLV line if applicable:** In this sub-step, you can adjust the true vertical line. **Step 5b) Evaluate Ricketts Superimposition 1:** In this sub-step, you verify the planned outcome by viewing a superimposition on Ba-Na @ CC. **Step 5c) Evaluate Ricketts Superimposition 2:** In this sub-step, you verify the planned outcome by viewing a superimposition on Na-Ba @ Na. **Step 5d) Evaluate Ricketts Superimposition 3:** In this sub-step, you verify the planned outcome by viewing a superimposition on Xi-PM @ PM. **Step 5e) Evaluate Ricketts Superimposition 4:** In this sub-step, you verify the planned outcome by viewing a superimposition on ANS-PNS @ ANS. **Step 5f) Evaluate Ricketts Superimposition 5:** In this sub-step, you verify the planned outcome by viewing a superimposition on E-Plane @ Occ. Plane.
Other Relevant Superimpositions	Superimpositions to view for verification purposes.
	Toggles the display of the patient's original tracing.
Adv...	Displays the Rickets 5 superimpositions in the Tracing Superimpositions dialog box. For more information, see “Tracings Over Tracings” on page 9-8.
Show Analysis	Analysis you want to view.

To adjust the true vertical line (Roth-Williams AEO method only):

1 Click and drag the blue movement control.

To view the five Ricketts superimpositions:

1 Click the sub-step for each Ricketts superimposition.

2 Verify the planned outcome.

Finishing the Wizard

When you exit the wizard, the Treatment Simulation window returns to the settings that were in effect before you started the wizard. For example, if the patient's image was displayed before you started the wizard, the patient's image returns when you exit. In addition, the patient's tracing reverts back to the analysis that was selected when you started the wizard. The only difference is that the patient's image and tracing reflect the treatments and growth operations that you applied using the wizard.

Note: *If you exit the wizard before completing all the steps, Dolphin Imaging applies the treatments for the steps that you completed and applies growth without treatment for all the steps that you skipped.*

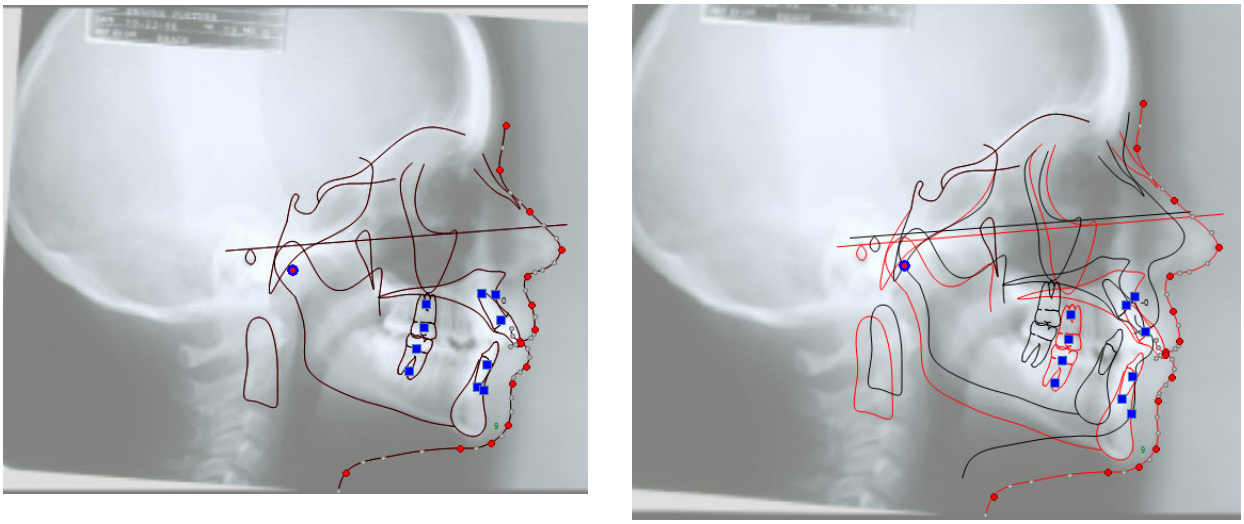
To exit the wizard:

1 Click **Finish**.

The wizard dialog box closes, and the Treatment Simulation window shows the final tracing. At this point, you may wish to save this treatment simulation. For more information, see “Returning to a Point in the History” on page 12-24.

The following figure illustrates the patient's image and tracings before and after Roth-Williams AEO:

Before **After**



15 ImPlanner (Medical Device)

You can use the Dolphin ImPlanner to assist you in implant case evaluation, creating individualized treatment simulations, and patient presentation. The ImPlanner facilitates patient education, generates precise documentation, and streamlines communication. It performs implant placement and related procedures on a patient's x-ray. Within minutes, your patients and referring doctors can fully understand your treatment process.

The Dolphin ImPlanner provides the following tools:

- A library of high-quality implant images for a variety of manufacturers, types, and dimensions.
- Simulation of implant placement.
- A tool to draw bone grafts, sinus grafts, and anatomical structures on the x-ray image to aid you when placing the implants.
- Tools to calibrate the size of the implant images appropriately for the scale of the patient's image and to take other measurements on the patient's image.
- Support for printing and emailing detailed treatment simulation reports.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use the ImPlanner feature only if your Dolphin Imaging user account has the ImPlanner privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Accessing ImPlanner

To use ImPlanner, you typically use an intraoral x-ray image. To verify that an intraoral x-ray image is available, select the **- Everything -** image layout from the **Layout** drop-down list on the Dolphin Imaging System main screen. This layout contains all patient images for the selected timepoint. If an intraoral x-ray image is available for this patient and timepoint, the image will be available from this image layout.

To access ImPlanner:

1 Select a patient image on the Dolphin Imaging main screen.

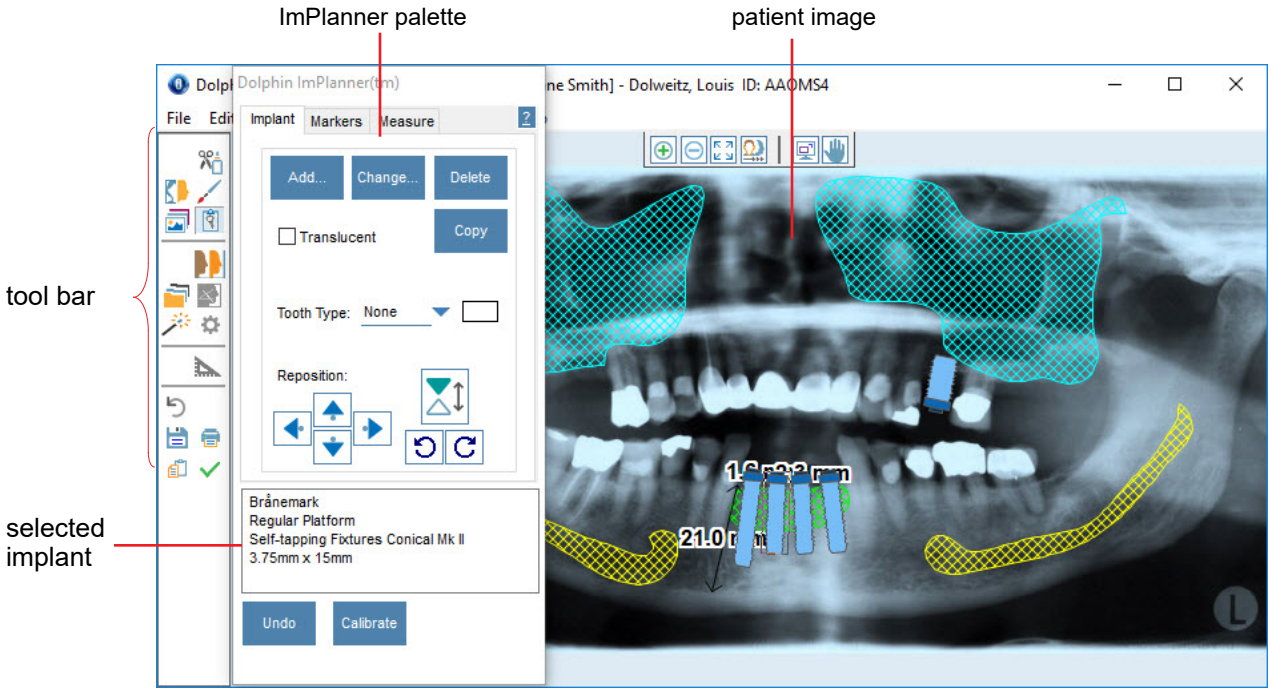
2 Click ImPlanner on the Dolphin Imaging main screen.

Or,

Click on the Edit dialog box (see Chapter 6, Image Edit).

If this is the first time you are using this patient image with ImPlanner (if you have not yet calibrated it), the **Calibration** palette opens. At this point, you should enter calibration settings as described in “Calibration” on page 15-4.

If the patient image has already been calibrated, the patient’s image appears with the **ImPlanner** palette, as shown below.



tool bar	Buttons for accessing image editing tools (see “Using the Edit Tool Bar” below).
Implant	Adds implants to the patient’s image (see “Adding Implants” on page 15-7).
Markers	Adds markers that represent specific anatomical structures, to indicate treatment operations, or to emphasize various areas of the patient’s image (see “Using Markers” on page 15-12).
Measure	Measures distances on the patient’s image (see “Taking Measurements” on page 15-14).
Add...	Adds a new implant from the library (see “Adding an Implant” on page 15-7).
Change...	Changes the selected implant to a different implant from the library (see “Changing an Implant” on page 15-9).
Delete	Deletes the selected implant (see “Deleting an Implant” on page 15-10).
Copy	Copies the selected implant (see “Copying an Implant” on page 15-9).
Translucent	Makes the implants translucent so that you can see the underlying image.
Tooth Type	Type of tooth to add to the selected implant (see “Adding a Tooth” on page 15-10).

	Move the selected implant (see “Adding an Implant” on page 15-7).
	Rotates the selected implant 180 degrees (see “Adding an Implant” on page 15-7).
	Rotate the selected implant by one degree (see “Adding an Implant” on page 15-7).
Selected Implant	Detailed information about the currently-selected implant.
Undo	Undoes changes to the image in the reverse of the order in which they were performed.
Calibrate	Calibrates the actual size and magnification of the image so that the implants are properly scaled (see “Calibration” on page 15-4).

Using the Edit Tool Bar

The Edit tool bar contains the following buttons:

	Opens the **Cut** tool (see “Using the Cut Palette” on page 6-4).
	Opens the **Morph** tool (see “Using the Morph Palette” on page 6-7).
	Opens the **Brushes** tool (see “Using the Brushes Palette” on page 6-10).
	Opens the Image Library (see “Using the Image Library” on page 6-12).
	Opens the ImPlanner feature.
	Displays the modified and original images side by side (see “Viewing Two Images Side by Side” on page 6-20).
	Opens the Original Records window (see “Using the Original Records Window” on page 12-25).
	Toggles the display of the patient’s tracing).
	Opens the **Enhance** tool (see “Enhancing an Image” on page 5-16).
	Sets display preferences (see “Setting General Preferences” on page 3-63).
	Opens the measurements table (see Chapter 8, Measurements (Medical Device)).
	Undoes the previous operation (see “Undoing Your Changes” on page 6-10).

	Saves the image (see “Saving the Image” on page 15-16).
	Prints the image (see “Printing” on page 16-4).
	Copies the image and/or its tracings to the clipboard.

Calibration

The first time you use a particular patient image with ImPlanner (if you have not yet calibrated it), the **Calibration** palette opens automatically. You can also open it at any time as described in “Starting Calibration” below.

Using the calibration feature, you specify information that Dolphin ImPlanner uses to size the implant objects appropriately to the scale of the patient’s image. You can even create calibration settings, save them, and reuse them later. This is especially useful if you routinely receive x-rays from multiple sources, such as different referring doctors or laboratories.

Note: *The accuracy of your treatment simulation depends upon the accuracy of the calibration process. It is very important that you enter accurate calibration information.*

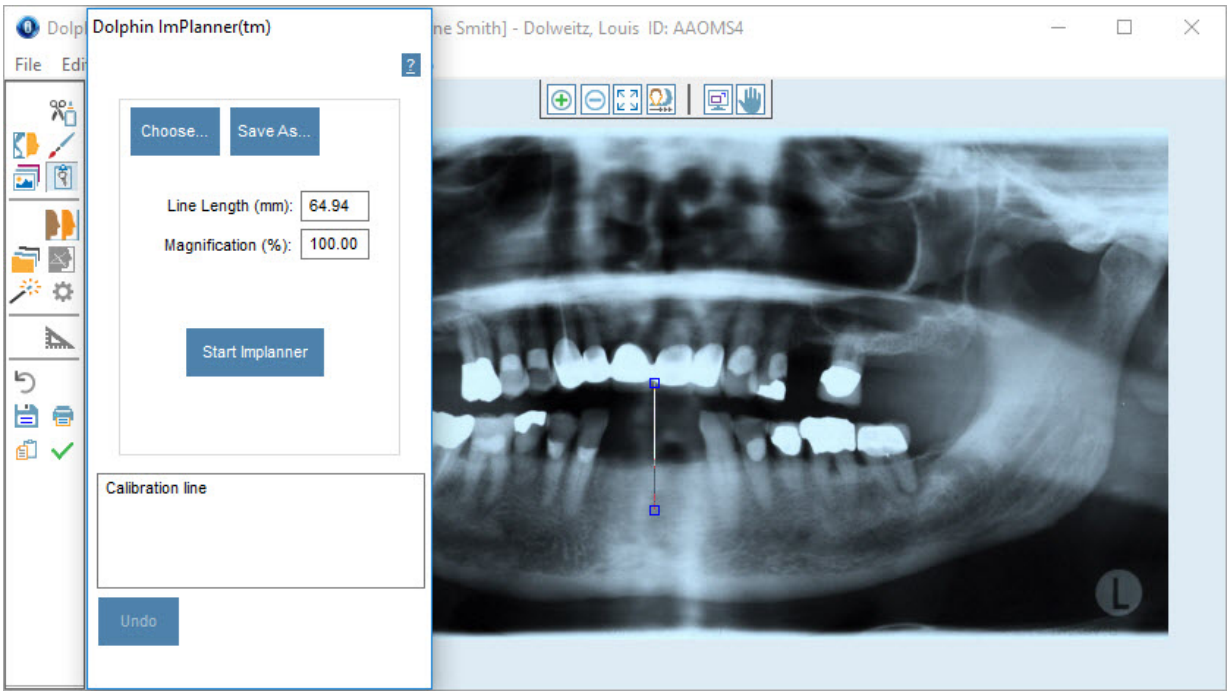
Calibration is necessary, because x-ray systems magnify their output. For instance, suppose you tape a 100mm ruler with lead beads at each end to a patient's face. Then, you take an x-ray using an x-ray system that magnifies by 25%. If you measure the lead-bead ruler on the x-ray film output, you will find that it measures 125mm, or 25% longer than the actual ruler you used when taking the x-ray. Then, suppose you tape a 100mm Dolphin calibration ruler to the x-ray film and scan it using a flat-bed scanner. In Dolphin, you will see two rulers on the x-ray image labeled 100mm, but the two rulers are different lengths on screen. The ruler taped to the patient's face when the x-ray was taken appears 25% longer than the one taped to the x-ray film when it was scanned.

Starting Calibration

To open the **Calibration** palette:

1 Click **Calibrate** on the **ImPlanner** palette.

The **Calibration** palette opens, and a line appears on the patient’s image, as shown below.



Choose...	Select calibration settings that you have previously saved (see below).
Save As...	Saves your current calibration settings. For more information, see “Saving Calibration Settings” on page 15-6.
Line Length (mm)	Length in millimeters (mm) of the calibration ruler.
Magnification (%)	Magnification factor of the x-ray system used for the x-ray image.
Start ImPlanner	Starts ImPlanner.

To use previously-saved calibration settings:

1 On the **Calibration** palette, click **Choose**.

The Select Saved Calibration Settings dialog box appears listing the saved settings.

2 Select one of the saved settings. Then, click **OK**.

Calibrating Implants to the Image

To calibrate the size of implants to the scale of the x-ray image:

1 On the patient’s image, click and drag each of the calibration line’s boxes to the ends of the calibration ruler.

When the mouse is over one of the boxes, triangles appear around that box, and the box turns red.

If you used a “before magnification” ruler (i.e., a ruler is on the image of the x-ray), position the calibration points at the ends of that ruler.

If you used an “after magnification” ruler (i.e., you laid a “Dolphin 100mm ruler” on the scanner when you scanned the x-ray), position the calibration points at the ends of that “scanned-in” ruler.

2 Enter the length of the calibration ruler in the Line Length field, without taking into account any magnification by the x-ray system.

3 Enter the magnification factor of the x-ray system used for the x-ray image.

If you used a “before magnification” ruler, enter 100% (no magnification correction) in the Magnification (%) field. This is because the length entered in step 3 is the length of that ruler, and the ruler and the patient’s x-ray were magnified by the same factor by the x-ray system.

If you used an “after magnification” ruler, enter a magnification percentage in the Magnification (%) field. For example, if the x-ray machine magnifies by 25%, enter 125% in the Magnification (%) field. This is because the length entered in step 3 is the length of a ruler that was not magnified by the x-ray system.

For instance, a 100mm Dolphin ruler placed next to the x-ray during scanning actually represents 100mm divided by 125%, or 80mm, on the patient's skull. In other words, an 80mm length on patient’s skull was magnified by the x-ray machine to 100mm on the x-ray film, as measured by the 100mm Dolphin ruler.

If you enter a magnification factor other than 100%, the length reported by the calibration line’s label is adjusted for the magnification factor. For instance, a calibration line measured against the 100mm Dolphin ruler with a magnification factor of 125% is labeled 80mm.

To complete the calibration and start ImPlanner:

1 Click **Start ImPlanner**.

Saving Calibration Settings

To save your current calibration settings so that you can re-use them in the future:

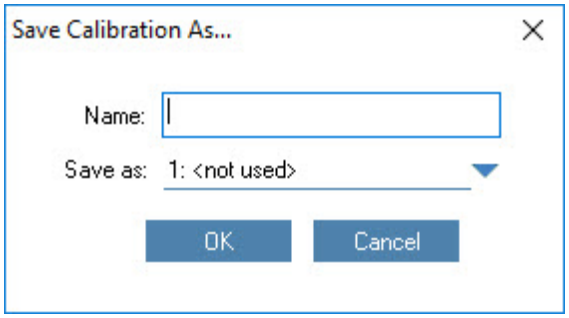
1 Click **Save As** on the **Calibration** palette.

The Save Calibration As dialog box appears.

2 Enter a name to identify these saved calibration settings.

3 Select one of the available ten slots in which to save these calibration settings. Then, click **OK**.

If a slot has a name assigned, it already contains saved calibration settings. If you select a slot containing saved settings, the existing settings are overwritten with the new settings.



Name	Name to identify these calibration settings.
Save As	Saves these calibration settings in one of the ten available slots.

Adding Implants

Once you have calibrated the image, you can begin adding implants. You use the **Implant** tab of the **ImPlanner** palette to add implants.

Note: *Before you add implants, you may wish to add markers to the image to identify sinuses, nerves, bone grafts, extractions, and bridges. For more information, see "Using Markers" on page 15-12.*

Adding an Implant

To add an implant:

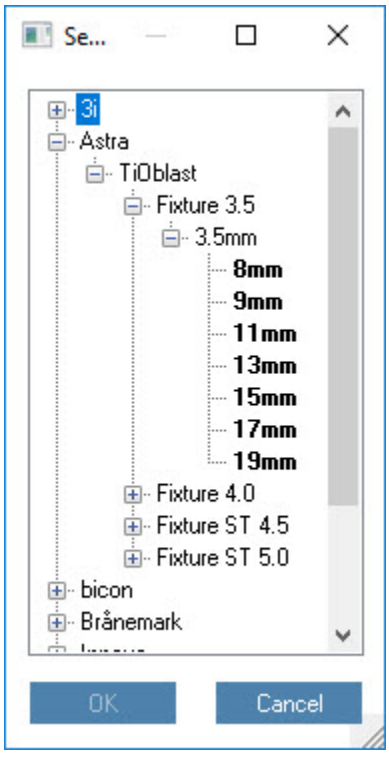
1 With the **Implant** tab selected on the **ImPlanner** palette, click **Add...**.

Or,

Right-click an existing implant on the patient's image, and select **Add New Screw** from the context menu.

The **Select Implant** palette opens.

If this is the first time you have used the ImPlanner, loading the implant library may take a moment, and this dialog box may not appear immediately.



2 Click the plus signs (**+**) to expand the categories in the list.

Whenever you open the **Select Implant** palette, it remembers the categories that were open when you last used it. This way, your most commonly-used implants are always quickly accessible.

In addition, you can click and drag the corners of the **Select Implant** palette to resize it. The next time you open the **Select Implants** palette, it remembers the size you selected.

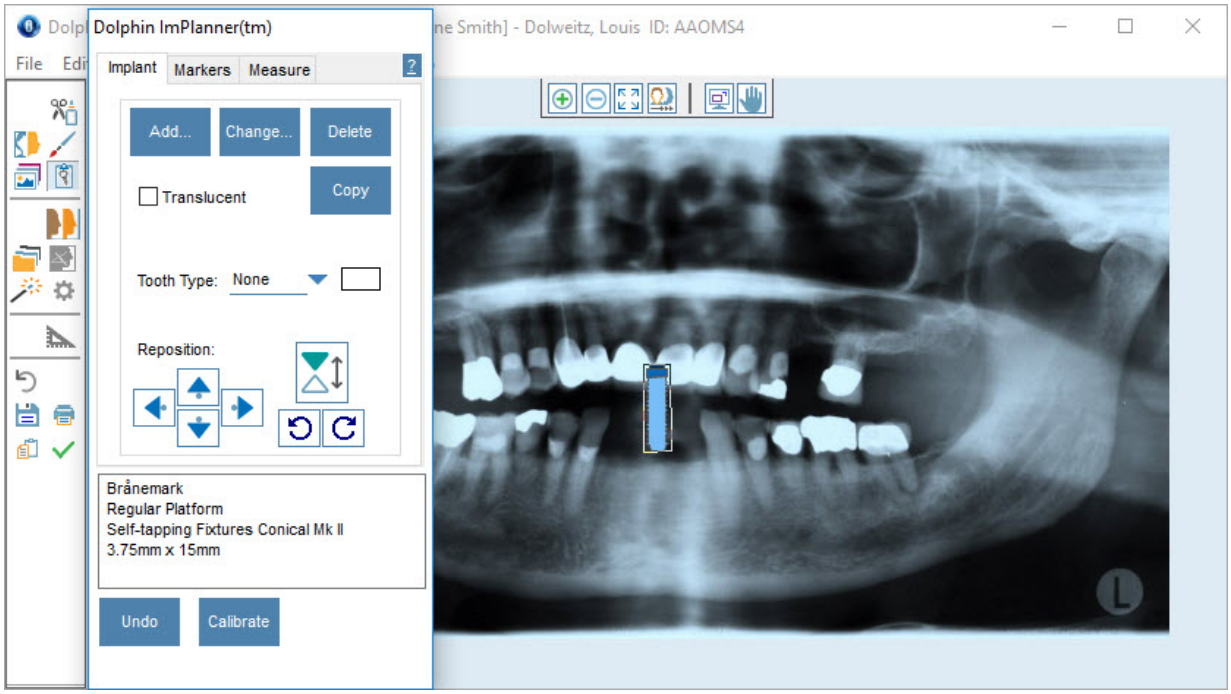
The implants are arranged in a hierarchy. They are grouped first by manufacturer, then by model, then type of implant, then implant diameter, and finally implant length. You must expand all these levels and select an implant at the bottom level (length) before your selection is valid.

3 When you see the implant you want to add, select it and click **OK**.

Or,

Double-click the implant you want to add.

The implant image you picked appears on the patient's image.



4 Reposition the implant by clicking and dragging it with the mouse, by using the arrow keys, by using the arrow buttons on the palette.

Whenever you select an implant, the **ImPlanner** palette displays information about it. You can select the information about the implant from the **ImPlanner** palette, copy it to the clipboard, and paste it into another application.

5 Click to rotate the implant 180 degrees.

Or,

Click to rotate the implant one degree counter-clockwise.

Or,

Click to rotate the implant one degree clockwise.

For example, you can click to move the implant from a maxillary to a mandibular position.

At this point, you can perform any other Dolphin ImPlanner functions, such as adding more implants, copying this implant, adding more markers, and so on. When you finish using the Dolphin ImPlanner, you can save the image to save the implants you have added. For more information on saving images, see “Saving the Image” on page 15-16.

Changing an Implant

To change an implant:

1 On the patient's image, select the implant you want change. Then, click **Change...** on the **ImPlanner** palette.

Or,

Right-click the implant you want to change, and select **Change This Screw** from the context menu.

The **Select Implant** palette appears.

2 Select the name of the implant image you want to use from the **Name** list.

The newly-selected implant replaces the existing implant on the patient's image.

3 Click **OK** to close the Select Implant dialog box.

Copying an Implant

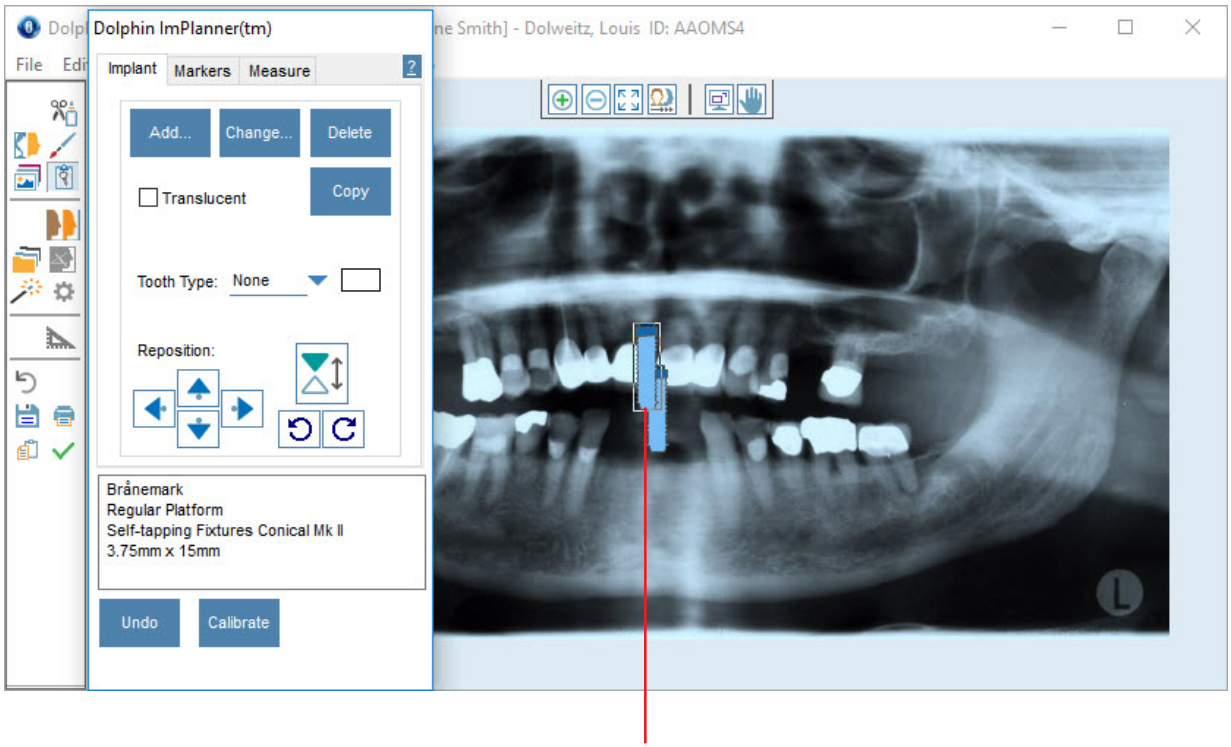
To copy an implant:

1 On the patient's image, select the implant you want to copy. Then, click **Copy** on the **ImPlanner** palette.

Or,

Right-click the implant you want to copy, and select **Copy This Screw** from the context menu.

A second copy of the implant appears on the patient's image, as shown below.



A second copy of the implant appears

Deleting an Implant

To delete an implant:

1 Select the implant you want to delete. Then, click **Delete** on the **ImPlanner** palette.

Or,

Right-click the implant you want to delete, and select **Delete This Screw** from the context menu.

The implant is removed from the patient's image.

Adding a Tooth

To add a tooth to an implant:

1 Select the implant to which you want to add a tooth. Then, select the type of tooth you want to add from the **Tooth Type** drop-down list on the **ImPlanner** palette.

Or,

Right-click the implant to which you want to add a tooth. Then, select **Change Tooth Type** from the context menu, and select the type of tooth you want to add from the sub-menu.

The tooth appears on top of the implant on the patient's image.

Setting Tooth Properties

To set properties for the tooth:

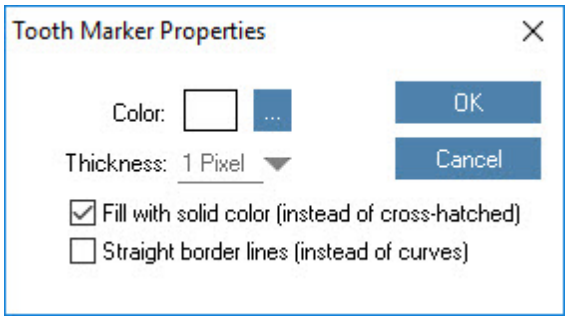
1 Select the tooth for which you want to set properties. Then, click the color sample next to the **Tooth Type** drop-down list on the **ImPlanner** palette.

Or,

Right-click the tooth for which you want to set properties. Then, select **Change Tooth Properties** from the context menu.

The Tooth Marker Properties dialog box appears.

2 Set any properties for the tooth, and click **OK**.



Color	Sets the color to use for the tooth.
Thickness	Thickness of the line defining the tooth shape.
Fill with solid color	Fills the tooth shape with a solid color. Otherwise, the tooth shape is filled with a cross-hatched design.
Straight border lines	Uses straight lines rather than curves to define the tooth shape.

Moving a Tooth

To move the tooth in relation to the implant:

1 Click the tooth you want to move.

2 Move the cursor over the tooth until the cursor turns into a hand.

3 Click and drag the tooth until its location is correct in relation to the implant.

Reshaping a Tooth

To stretch the tooth:

1 Click the tooth you want to stretch.

2 Move the cursor over the tooth until the cursor turns into a double-headed arrow.

3 Click and drag the tooth's outline to stretch the tooth.

To move a point on the tooth's outline:

1 Click the tooth you want to change.

2 Move the mouse over one of the points on the tooth's outline.

When the mouse is over one of the points, triangles appear around that point, and the point turns red.

3 Click and drag the point to a new location.

The tooth's outline changes shape to accommodate the point's new location.

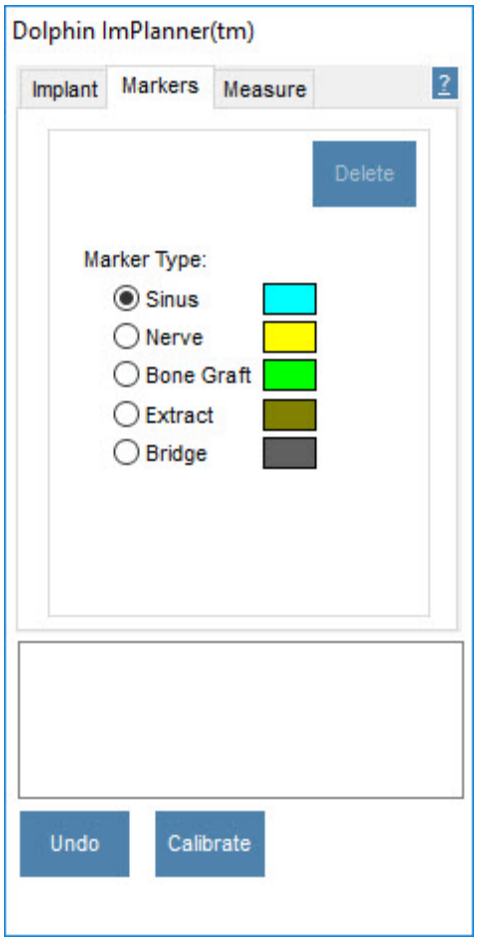
Using Markers

Using the **Markers** tab on the **ImPlanner** palette, you can draw anatomical structures and indicate some surgical procedures on the patient's image to aid you when placing the implants and when presenting your treatment simulations to patients or other clinicians.

To access the **Markers** tab:

1 Click the **Markers** tab on the **ImPlanner** palette.

The **Marker** tab opens, as shown below.



Marker Type	Type of marker to add to the x-ray image. You can add sinuses and nerves, or indicate bone grafts, extractions, or bridges.
Color Sample	Sets the color and other properties for this marker. For more information, see "Setting Marker Properties" on page 15-13.
Delete	Removes a marker. For more information, see "Removing a Marker" on page 15-14.
Undo	Undoes changes to the image in the reverse of the order in which they were performed.
Calibrate	Calibrates the size and magnification of the image so that the implants are properly scaled. For more information, see "Calibration" on page 15-4

Adding a Marker

To add a marker to the x-ray image:

1 Select the type of marker to add.

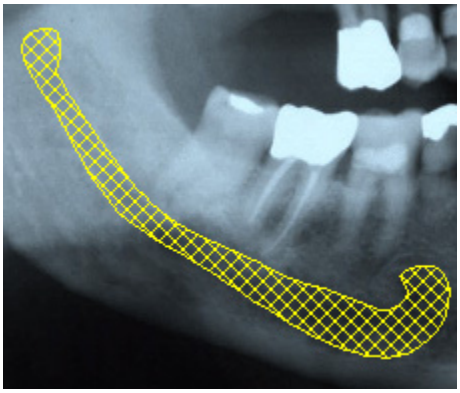
Or,

Right-click an existing marker on the patient's image, and select one of the options for adding a marker from the context menu.

2 Draw a line or polygon on the patient's x-ray image to represent a marker.

The line or polygon appears in the color next to that marker type on the **ImPlanner** palette. When you draw a polygon, ImPlanner fills it in with the color you chose. By default, the fill is cross-hatched instead of a solid color. For information on drawing a polygon, see "Selecting an Area of an Image" on page 6-4.

The figure below illustrates a marker drawn on a patient's x-ray image.



At this point, you might want to save the image to save the markers you have drawn. For more information on saving images, see "Saving the Image" on page 15-16.

Setting Marker Properties

To change properties for a marker:

1 Click the color sample next to the marker type for which you want to set properties.

Or,

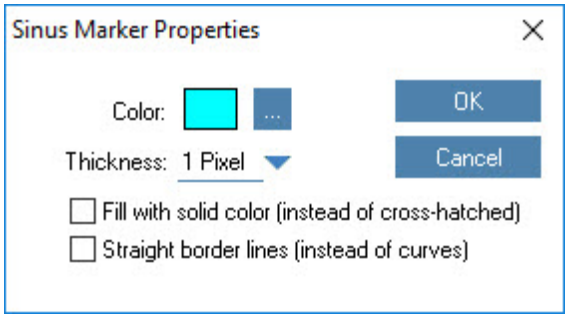
Right-click a marker of the type for which you want to set properties. Then, select **Change Properties of This Marker** from the context menu.

The Marker Properties dialog box opens.

2 Click the button next to the color sample to select the color to use for this marker.

When you print or export an image layout with markers, a color legend indicates the color used for each type of marker.

3 Select any other options, and click **OK**.



Color	Color to use for this type of marker.
Thickness	Line thickness to use for this type of marker.
Fill with Solid Color	Fills the marker shape with a solid color. Otherwise, the marker shape is filled with a cross-hatched design.
Straight Border Lines	Uses lines rather than a curve to draw this type of marker. ***Note:*** *Splines create smoother curves than lines. Using lines is more appropriate for marker shapes that do not have many curves.*

Removing a Marker

To remove a marker:

1 Select the marker you want to delete. Then, click **Delete** on the **ImPlanner** palette.

Or,

Right-click the marker you want to delete. Then, select **Delete This Marker** from the context menu.

Reshaping a Marker

To move a point on a marker:

1 Select the marker you want to change.

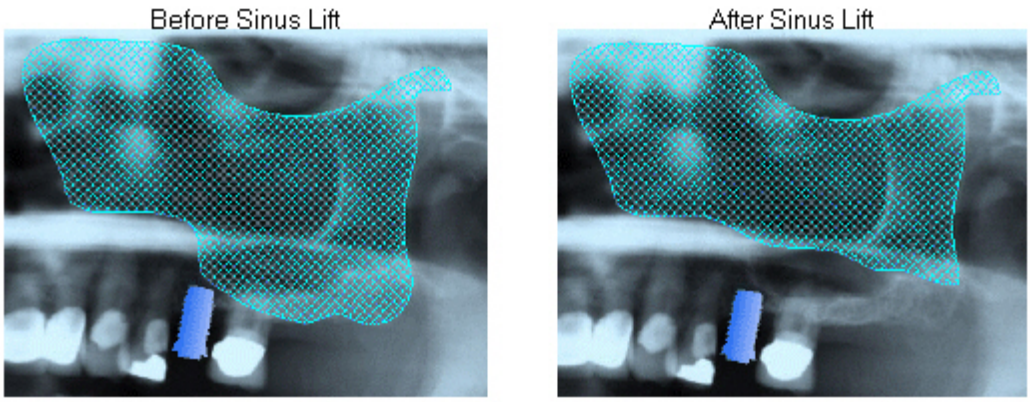
2 Move the mouse over one of the points on the marker.

When the mouse is over one of the points, triangles appear around that point, and the point turns red.

3 Click and drag the point to a new location.

The line changes shape to accommodate the point's new location.

Note: *Moving a point on a marker is extremely useful in depicting a sinus lift procedure. You can draw the sinus on the patient's x-ray image as it currently exists and save that image. Then, you can move some of the points on the sinus marker to show the sinus after the sinus lift. The following figure illustrates moving points to depict a sinus lift procedure.*



Taking Measurements

Using the measure feature, you can add calipers to the patient's x-ray image to measure any distances on it. You use the **Measure** tab on the **ImPlanner** palette to add calipers.

Adding a Caliper

To add a caliper to the x-ray image to take measurements

1 Click the **Measure** tab on the **ImPlanner** palette.

2 Click and drag to draw the caliper on the patient's x-ray image.

Or,

Click **Add...**. Then, click and drag each of the caliper's boxes so that it spans the distance you want to measure.

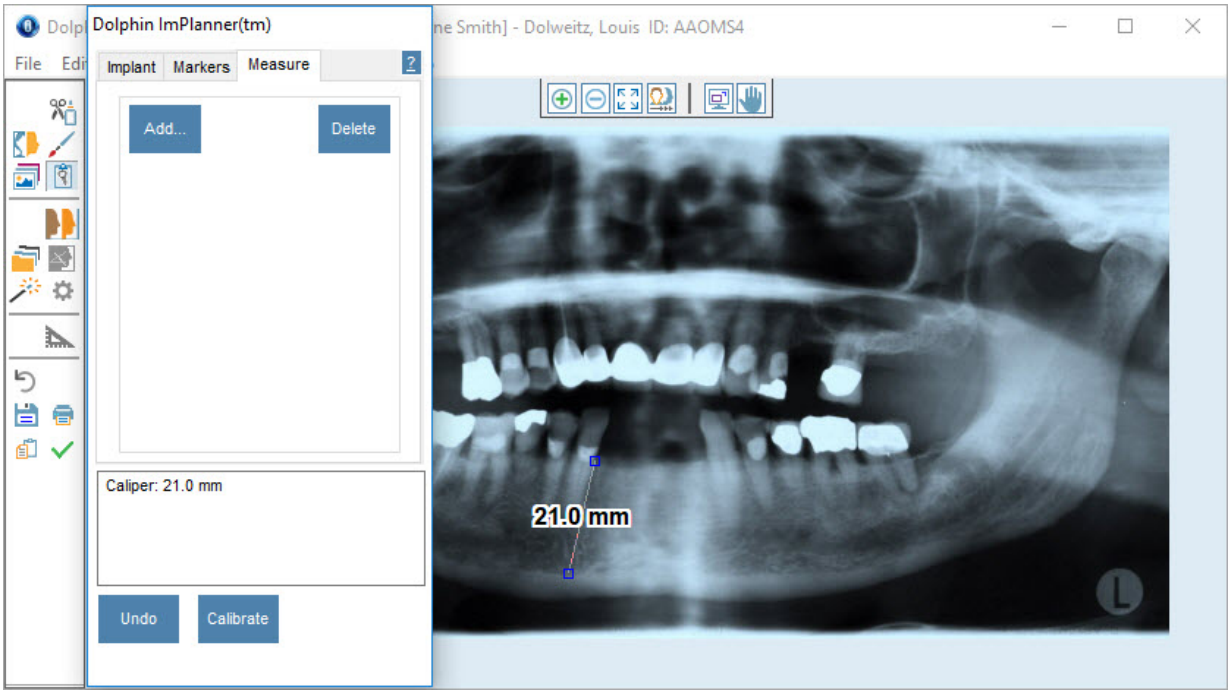
Or,

Right-click an existing caliper on the patient's image, and select **Add New Caliper** from the context menu. Then, click and drag each of the new caliper's boxes so that it spans the distance you want to measure.

The caliper appears as a line on the patient's x-ray image. When a caliper is selected, it has a box at each end, which you use to reposition it. When the mouse is over one of the boxes, triangles appear around that box, and the box turns red.

When a caliper is not selected, arrow heads appear at the end of the caliper instead of boxes.

The caliper indicates the measurement, as shown below.



At this point, you might want to save the image to save the measurements. For more information on saving edited images, see "Saving the Image" on page 15-16.

Deleting a Caliper

To delete a caliperr from the patient's x-ray image:

1 Select the caliper you want to delete. Then, click **Delete**.

Or,

Right-click the caliper you want to delete. Then, select **Delete This Caliper** from the context menu.

Saving the Image

When you save the image, Dolphin always saves both of the following:

- the image and data that comprise the ImPlanner simulation
- the original image and data, for your reference or further treatment simulation

To save the image:

1 Click .

The Save Image dialog box appears.

2 Optionally, modify the image title.

Dolphin automatically provides an appropriate image title, "Treatment Simulation" in most cases. However, you may wish to enter a more specific name (such as "implants") as appropriate, for your ImPlanner image.

3 Select a slot from the **Save As** list in which to save this image, and click **OK**.

For each patient and timepoint, you can save up to eight different ImPlanner images.

Note: *If you are viewing two images side by side when you save, the side-by-side view of the two images is saved as a single image.*

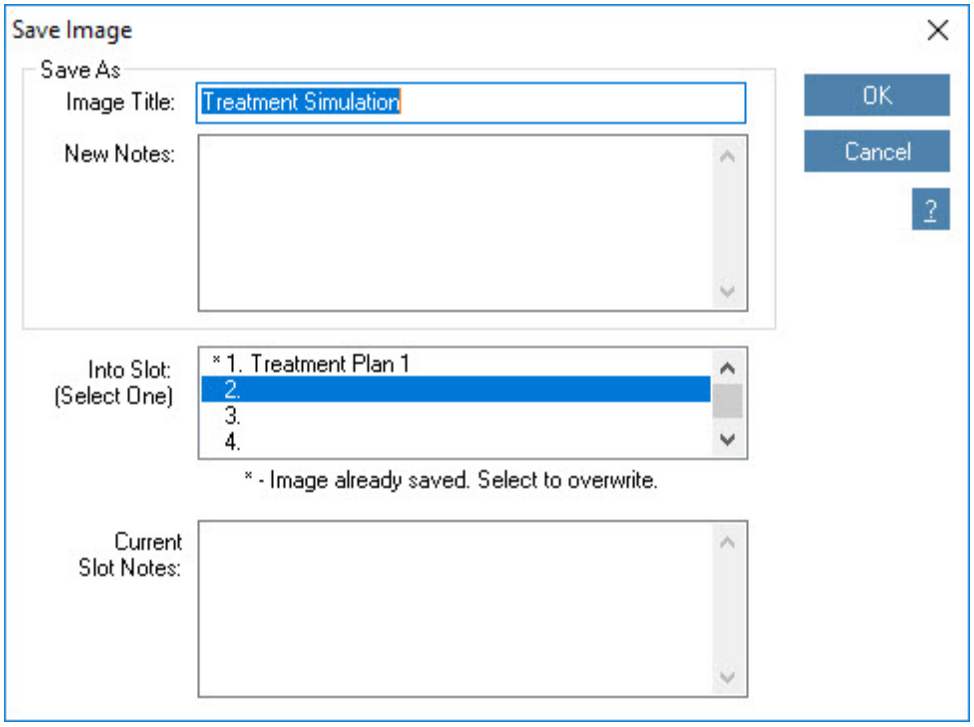


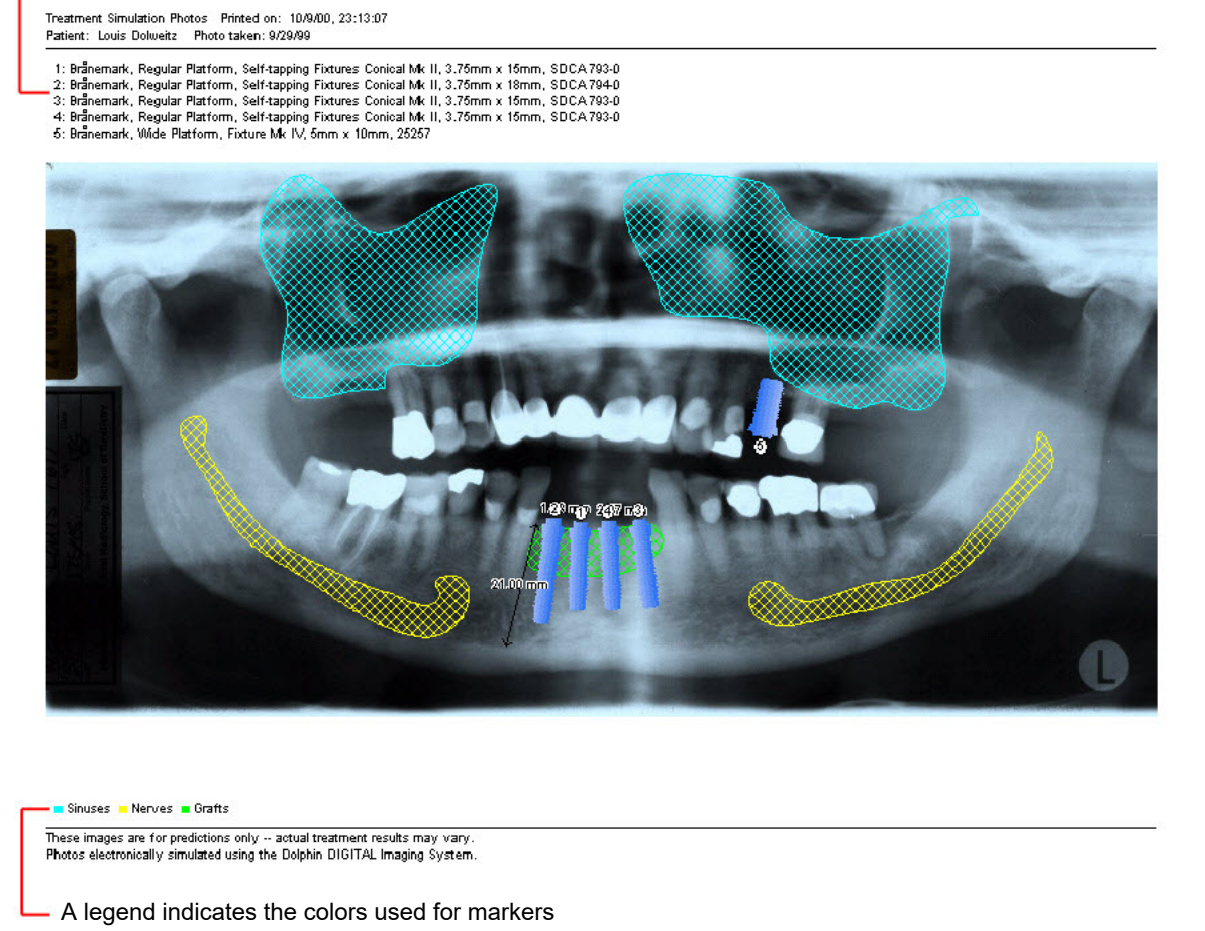
Image Title	Title for this image, up to 25 characters.
New Notes	Notes for this image. This field is automatically completed with a summary of the operations you performed. However, you can freely modify the content of these notes.
Into Slot	Slots available for the timepoint in which you can save this image. If you select a slot containing an image, the existing image is overwritten with the new image.
Current Slot Notes	Notes entered for an image previously saved in the selected slot.

Printing or Emailing Images with Implants

Once you have added implants or markers to an x-ray image, you can print it for your records or to send to the patient or referring doctor. In addition, you can email the x-ray image with implants and markers.

When you print or email an x-ray image with implants and markers, the printed or emailed image includes a legend that indicates the types of implants and the colors used for markers, as shown below:

A legend indicates the types of implants used



A legend indicates the colors used for markers

Exiting ImPlanner

To exit ImPlanner and return to the Dolphin Imaging main screen:

1 Click ✓ .

If you have not saved your ImPlanner simulation, a dialog box appears asking whether you want to save the modified image.

2 Click **Yes** to save the image.

Or,

Click **No** if you do not want to save the image.

For more information, see “Saving the Image” on page 15-16.

16 Sharing and Presenting Patient Images

This chapter describes the following Dolphin Imaging features:

- sharing patient images via email
- printing images
- creating movies that morph between two patient images (such as before and after treatment images)
- creating online slide shows
- transferring images into other applications (such as Microsoft Word and PowerPoint)

Emailing Images

Using the Dolphin Email feature, you can email the current image layout. The Dolphin email feature automatically attaches the displayed image layout as one JPEG image to an email message and sends the message to any recipients you choose.

Note: *The Email feature only emails a JPEG image of the image layout. It does not email movies or 3D volume data (for patients with 3D images).*

Dolphin Imaging creates a list of recipients using the email addresses you have entered in the patient's chart. Specifically, it supports storing email addresses for the patient, the patient's billing party, the referring doctor, or the patient's insurance company.

To use the Dolphin Imaging email feature, you must have a properly configured Messaging Application Programming Interface (MAPI) email program (such as Microsoft Outlook Express) and a valid email account set up.

If you use Microsoft Outlook for your email, you can download and integrate the Protected Trust Email Encryption tool with Microsoft Outlook and send HIPAA-compliant emails directly from Dolphin Imaging. For more information, see www.protectedtrust.com/partners/dolphin/.

Emailing an Image Layout

To send an email message containing the current image layout:

1 Click

on the Dolphin Imaging main screen's horizontal tool bar.

Or,

Select **Email** from the **Tools** menu.

The Email dialog box appears.

2 Select the recipients to whom you want to send this email message from the recipient list.

3 Optionally, modify the email message subject in the **Message Subject** field.

4 Enter any notes that you want to accompany the image layout in the **Notes** field.

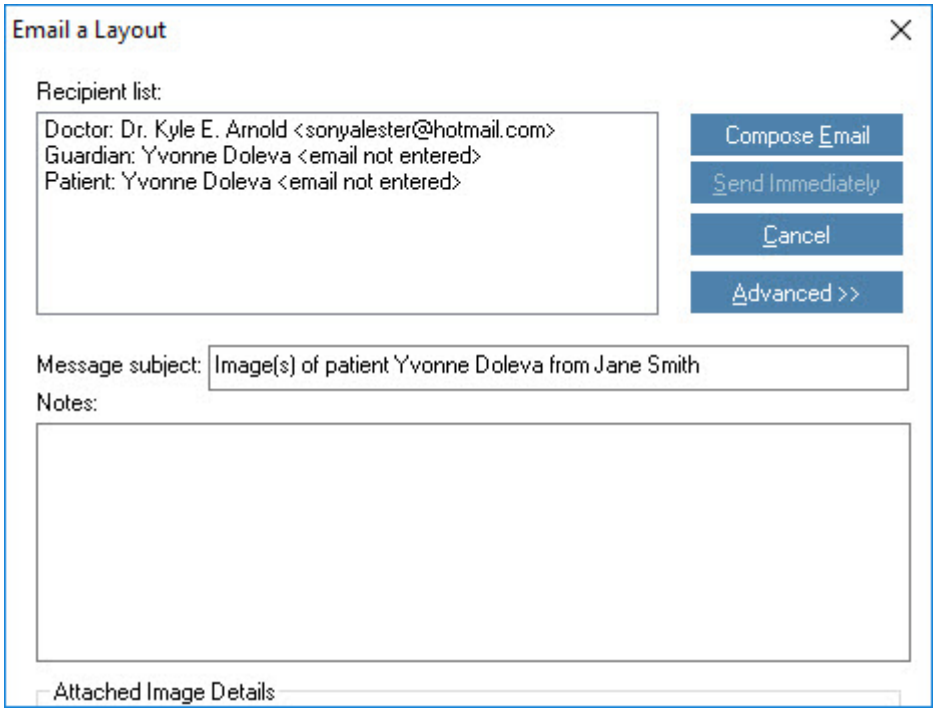
5 Click **Compose Email** to launch your email program and make additional changes to this email message before sending it.

Or,

Click **Send Immediately** to send this message immediately.

If you selected a recipient for whom no email address is entered in the patient's record, Dolphin prompts for an email address. When you enter the email address, Dolphin adds it to the patient's record.

If you click **Compose Email**, your email program launches with a new email message containing the current image layout and the information entered in this dialog box. You can then add recipients, type more text to accompany the image layout, or add other email attachments.



Recipient List	Recipients to whom you want to send this email message. This list contains the email addresses entered in this patient's chart.
Message Subject	Subject of this email message.
Notes	Text notes to accompany the image layout.
Compose Email	Launches your email program with a new email message containing the current image layout and the information entered in this dialog box.
Send Immediately	Sends the email message composed in this dialog box immediately without first launching your email program.
Advanced >>	Expands this dialog box to specify more options (see "Specifying Advanced Options" below).

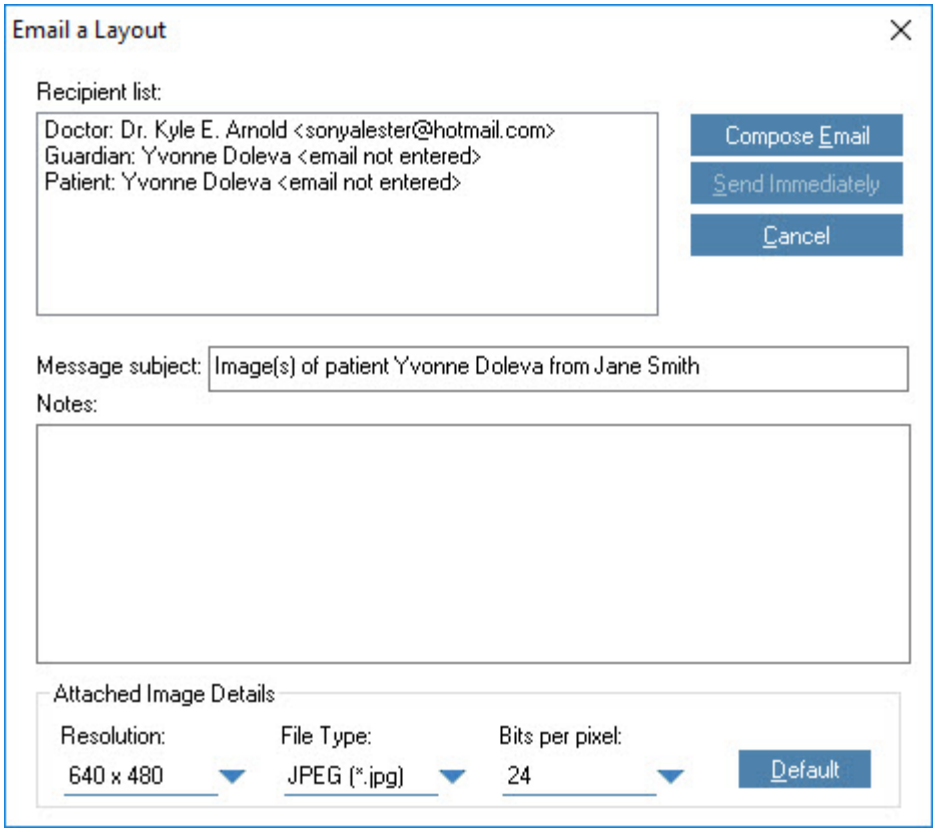
Specifying Advanced Options

To specify advanced email options:

1 Click **Advanced>>** on the Email dialog box.

The Email dialog box expands to show additional features.

2 Set any of the options in the Attached Image Details group box.



Resolution	Resolution to use for the image layout.
File Type	Image file type to use for the image layout.
Bits per Pixel	Number of bits to use to represent each pixel in the image layout.
Default	Returns the **Attached Image Details** to their default values.

Printing

From Dolphin Imaging, you can print an image or layout, or preview a print job before actually printing it. You can also set up your printer.

Printing an Image or Layout

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Print images, tracings, measurements privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To print an image or image layout:

1 Click

on the Dolphin Imaging main screen's horizontal tool bar.

Or,

Select **Print** from the **File** menu. Then, select **Print...** from the sub-menu.

Or,

Click on the Edit or Treatment Simulation tool bar.

The Print dialog box is displayed.

2 Select any printing options you want, and click **OK**.

In addition to the standard Microsoft Windows printing options, Dolphin Imaging offers a **Print 1:1** option. Check this box to scale the image according to the calibration specified for it. This option is selected by default if the image has been calibrated. Images with cephalometric tracings are calibrated when they are digitized. Images without cephalometric tracings can be calibrated using the **Annotations and Measurements** option on the **Image** context menu. For more information, see "The Image Context Menu" on page 3-29.

Previewing the Print Job

To preview your print job:

1 Check the **Preview** box on the Print dialog box, and click **OK**.

Or,

Select **Print** from the **File** menu. Then, select **Print Preview** from the sub-menu.

A preview of the print job appears in the Dolphin Layout Editor window.

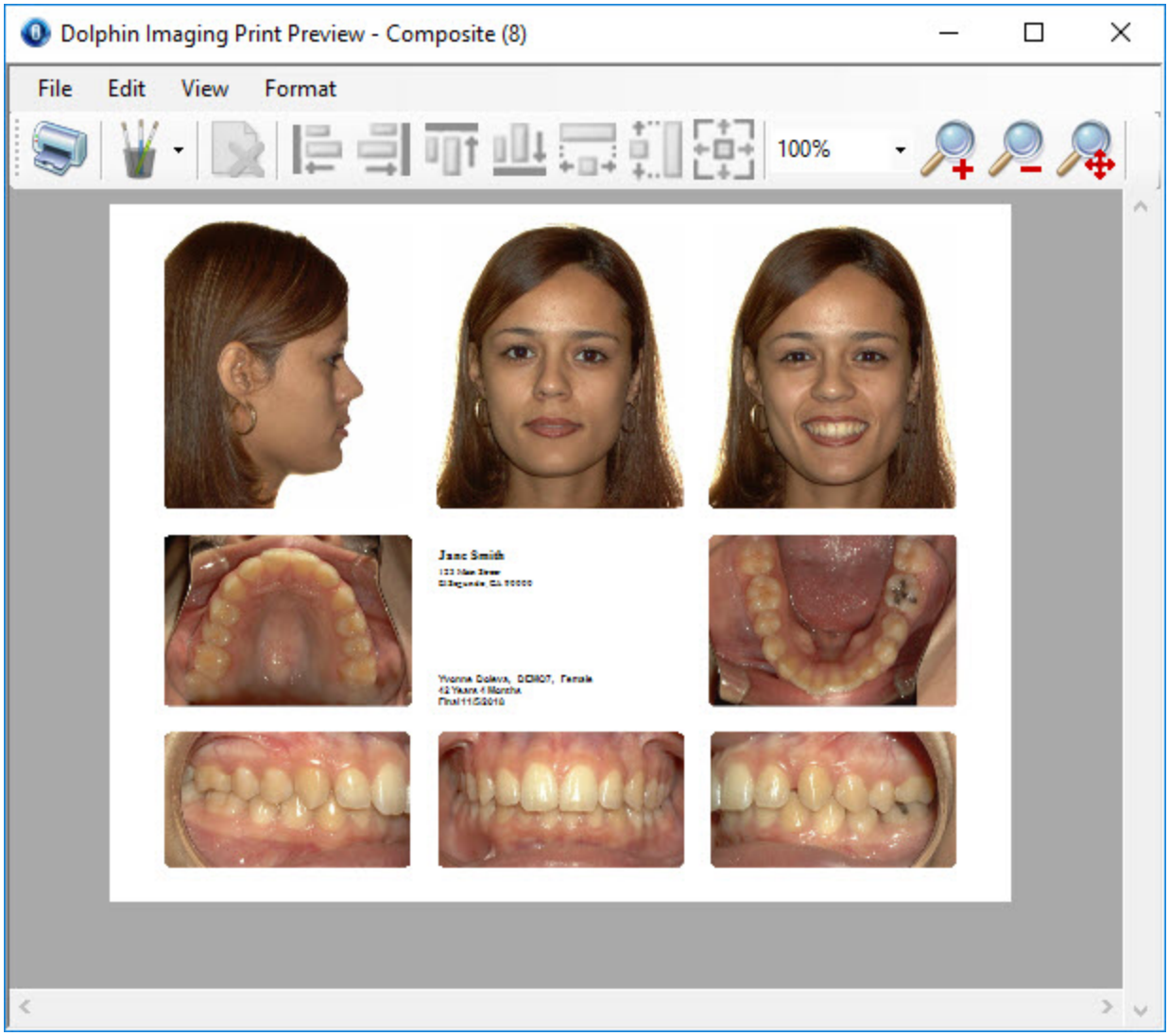
Note: *Any changes you make to the print preview using the Dolphin Layout Editor apply to this print job only. They are not saved to the Dolphin image layout.*

For more information on the options the Dolphin Layout Editor offers, see Chapter 17, Layout Editor.

2 Click to print the print job.

Or,

Select **Exit** from the **File** menu to close this dialog box.



Setting Up Your Printer

To set up your printer:

1 Select **Printer Setup...** from the **File** menu.

The Microsoft Windows Print Setup dialog box is displayed.

2 Select any options you want and click **OK**.

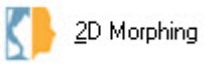
For more information on setting up your printer, refer to the documentation for Microsoft Windows and your printer.

2D Morphing

With this feature, you can create a movie that morphs between any two images of a patient. For example, you can morph between before and after treatment images. You can save the movies generated with this feature in your Dolphin database and export them as AVI movies.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Edit/Morph Images privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To access the 2D Morphing module:

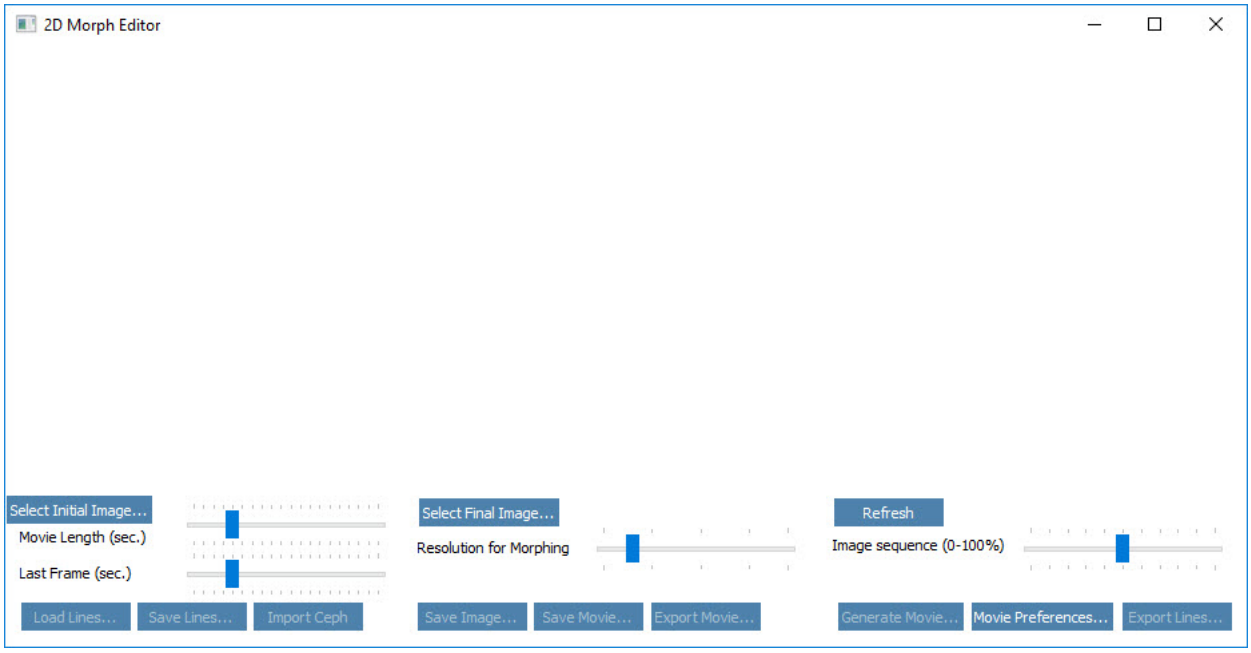
1 Click 

on the Dolphin main screen.

Or,

Select **2D Image Morph** from the **Tools** menu.

The 2D Morph Editor window opens.



Select Initial Image...	Used to select the image to use as the starting point for the morphing operation. For more information, see “Selecting the Images” on page 16-9.
Select Final Image...	Used to select the image you want to use as the end point for the morphing operation. For more information, see “Selecting the Images” on page 16-9.
Refresh	Creates a preview of the morph operation that you can use to see whether you have added enough feature lines. For more information, see “Checking the Result” on page 16-11.
Movie Length (sec.)	Length of the morph movie in seconds. For more information, see “Generating a Morph Movie” on page 16-12.
Resolution Mapping	Resolution to use for the morph movie and the preview image. A lower resolution results in faster movie generation but a lower image quality. For more information, see “Generating a Morph Movie” on page 16-12.
Image Sequence (0-100%)	Percentage of the morph operation to view as a preview. For more information, see “Checking the Result” on page 16-11.
Last Frame (sec.)	Duration of the last frame in the morph movie in seconds. For more information, see “Generating a Morph Movie” on page 16-12.
Load Lines...	Loads a previously saved set of feature lines. For more information, see “Saving, Exporting, and Loading Feature Lines” on page 16-14
Save Lines...	Saves the current set of feature lines in a file. For more information, see “Saving, Exporting, and Loading Feature Lines” on page 16-14.
Import Ceph	Imports the patient's cephalometric tracings to use as a set of feature lines. Only available if the initial and final images contain cephalometric tracings. For more information, see “Importing Cephalometric Tracings” on page 16-10.
Save Image...	Saves your current preview image in your Dolphin database. For more information, see “Saving, Exporting, and Loading Feature Lines” on page 16-14
Save Movie...	Saves the generated morph movie in your Dolphin database. For more information, see “Saving a Morph Movie” on page 16-12.
Export Movie...	Exports the generated morph movie to a file. For more information, see “Exporting a Morph Movie” on page 16-14.
Generate Movie...	Generates a morph movie using your current settings. For more information, see “Generating a Morph Movie” on page 16-12.
Movie Preferences...	Changes the codec to use to create the movie. The codec is the program that compresses and decompresses the movie data. Changing the codec is an advanced operation. In most cases, you can simply use the default codec selection. For more information, see “Setting Movie Preferences” on page 16-15.
Export Lines…	Exports the current set of feature lines in a file. You can then load the exported feature lines for use with another pair of images for which you don't already have a set of saved feature lines. For more information, see “Saving, Exporting, and Loading Feature Lines” on page 16-14.

Morphing Between Two Images

To morph between two images, you need to:

- Select the images you want to use as the starting and end points for the morphing operation.
- Draw feature lines that Dolphin uses as guides to perform the morphing operation, or import the patient's cephalometric tracings to use as feature lines.
- Check the result to make sure that you have added enough feature lines for smooth morphing between the two images.

Then, you can generate a movie that morphs between the two images.

Selecting the Images

To select the images you want to use as the start and end points for the morphing operation:

1 Click **Select Initial Image...**.

The Image/Record Chooser dialog box opens.

2 Select the image you want to use as the starting point for the morphing operation. Then, click **OK**.

For example, you might pick a pre-treatment image as the starting point.

3 Click **Select Final Image...**.

The Image/Record Chooser dialog box opens again.

4 Select the image you want to use as the end point for the morphing operation. Then, click **OK**.

For example, you might pick a simulated-treatment image or an actual post-treatment image as the end point.

Drawing Feature Lines

To draw a feature line:

1 On the initial image, click where you want the feature line to start.

2 Click again wherever you want to place a point or change the direction of the feature line.

3 Double-click where you want the feature line to end.

For example, you might draw feature lines along parts of the profile, across the front of the ear, and so on.

4 On the final image, move the feature lines so that they are in corresponding locations on both images.

To move the feature lines:

- Click and drag the red dot on the left to move the feature lines left, right, up, or down.
- Click and drag the red dot on the right to rotate the feature lines.
- Click and drag a green dot to move a single point on a line.

If necessary, you can zoom in, zoom out, or pan to assist in locating the feature lines properly. For more information, see “Using the Zoom and Align Tool Bar” on page 3-19.

Note: *If the initial and final images contain cephalometric tracings, you can import the tracings to use as feature lines (see “Importing Cephalometric Tracings” below).*

Importing Cephalometric Tracings

To import a patient's cephalometric tracings to use as feature lines:

1 Select initial and final images that contain cephalometric tracings.

For example, you can select a the patient's profile photo superimposed with the patient's tracing. For more information on selecting the initial and final images for a morphing operation, see “Selecting the Images” on page 16-9. For more information on superimposing a patient's tracing over the profile photo, see “Tracing+Image” on page 9-1.

2 Click **Import Ceph**.

The tracing of the patient's soft tissue profile appears on each image.

3 On the final image, move the tracing of the patient's soft tissue profile so that it is properly aligned with the image.

To move the tracing:

- Click and drag the red dot on the left to move the tracing left, right, up, or down.
- Click and drag the red dot on the right to rotate the tracing.
- Click and drag a green dot to move a single point on the tracing.

If necessary, you can zoom in, zoom out, or pan to assist in locating the tracing properly. For more information, see “Using the Zoom and Align Tool Bar” on page 3-19.

Checking the Result

To check the result:

1 Optionally, use the **Resolution Mapping** slider to set the resolution to use for the preview image.

2 Move the **Image Sequence** slider to the 50% (half-way) point.

3 Click **Refresh**.

An image that is morphed half-way between initial and final images appears. If you see any ghosting, as opposed to smooth morphing, you need to add more feature lines at that part of the anatomy.

Generating a Morph Movie

To generate a morph movie:

1 Use the **Movie Length (sec.)** slider to set the duration of the movie in seconds.

2 Use the **Resolution Mapping** slider to set the resolution to use for the morph movie.

A lower resolution results in faster movie generation but a lower image quality.

3 Use the **Last Frame (sec.)** slider to set the duration of the movie's last frame in seconds.

4 Click **Generate Movie..**.

Depending on the resolution you selected, generating the movie may take a few moments. When the movie generation process finishes, the movie opens and plays in your default movie player (Windows Media Player, for example).

Saving and Exporting Morph Movies

Once you have generated a morph movie, you can save it in your Dolphin database or export it to a file on your computer. You can save a preview image in your Dolphin database.

Saving a Morph Movie

To save a morph movie you have created:

1 Click **Save Movie...**.

2 Optionally, change to a different image layout as described below.

3 Click a slot in the image layout to save the movie in that slot.

4 Optionally, enter a new image slot title to use for the movie in the **Image Title** field.

5 Click **Save...**

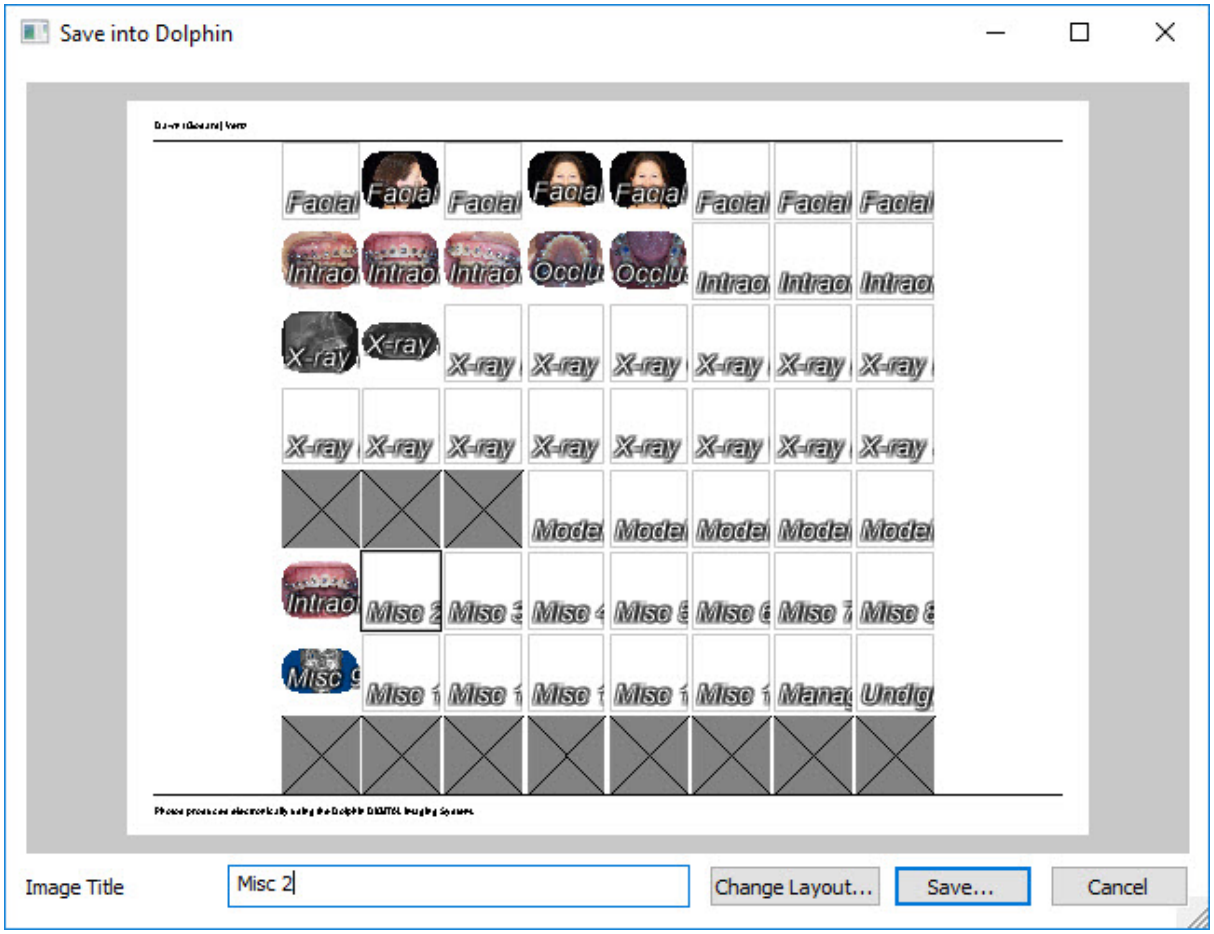


Image Layout	Currently selected image layout.
Image Title	Image title to use for the movie. Initially, this field contains the title defined in the image layout for the selected image slot.
Change Layout...	Selects a different image layout.
Save...	Saves the movie in the selected image slot in the selected layout.

To choose a different image layout:

1 Click **Change Layout...**.

2 Select the image layout in which you want to save this movie from the drop-down list. Then, click **OK**.

Exporting a Morph Movie

To export a morph movie to a file:

1 Click **Export Movie...**.

The **Save As** dialog box appears.

2 Specify the directory and file in which you want to save the movie.

3 Click **Save**.

Saving, Exporting, and Loading Feature Lines

Once you have drawn feature lines on the patient's image, you can save or export them so that you can load them later.

- You can use a set of saved feature lines only with the pair of images from which they were originally saved.
- You can use a set of exported feature lines only with a pair of images for which you don't already have a set of saved feature lines.

Using previously saved or exported feature lines can save time when performing future morph operations. For more information on drawing feature lines, see “Drawing Feature Lines” on page 16-9.

To save the feature lines:

1 Click **Save Lines...**.

The feature lines are saved for this pair of images.

To export the feature lines to a file:

1 Click **Export Lines...**.

2 Specify the file in which you want to save the feature lines.

3 Click **Save**.

To load a set of feature lines:

1 Select initial and final images for a morph operation.

For more information, see “Selecting the Images” on page 16-9.

2 Click **Load Lines...**.

3 If a warning dialog box appears, click **Yes** to load your current feature lines with the feature lines stored in your database for this set of images.

4 If no previously saved feature lines exist for this pair of images, select a file containing an exported set of feature lines. Then, click **Open**.

The previously saved or exported feature lines are applied to the initial and final images in the **2D Morph Editor** dialog box.

Setting Movie Preferences

To use a different codec to generate the movie:

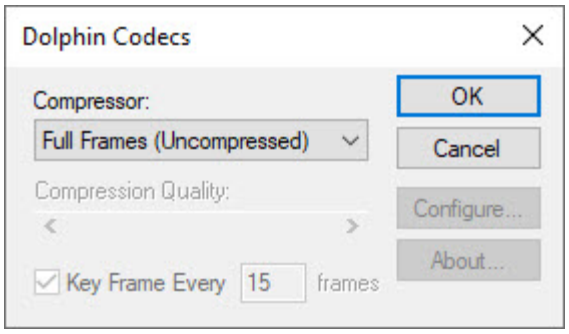
1 Click **Movie Preferences...**.

The Dolphin Codecs dialog box opens. On this dialog box, you can select the codec you want to use to generate the movie and enter options for it.

2 Select a codec from the **Compressor** drop-down list.

Note: *The computer or other device that you use to play the resulting movie must support the codec that you select.*

3 Set any other options for the codec, and click **OK**.



Compressor	Codec you want to use. Some codecs may not be supported by your computer, depending on your computer's hardware and software configuration.
Compression Quality	Quality value to use when compressing the movie. A lower value results in a lower quality movie and a smaller file size (due to higher compression). Not available for all codecs.
Key Frame Every *n* frames	Number of frames that the movie will take to transition from one frame in your script to the next. Not available for all codecs.
Configure	Additional configuration options for the selected codec. These configurable options depend on the codec you selected. Not available for all codecs.

Setting Up a Slide Show Presentation

You can easily set up a slide show of patient images for presentation purposes. You can select any combination of patient images from any timepoints to show the patient's progress over time.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can set up a slide show only if your Dolphin Imaging user account has the Edit Slide Show Sequences privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To use the slide show presentation feature:

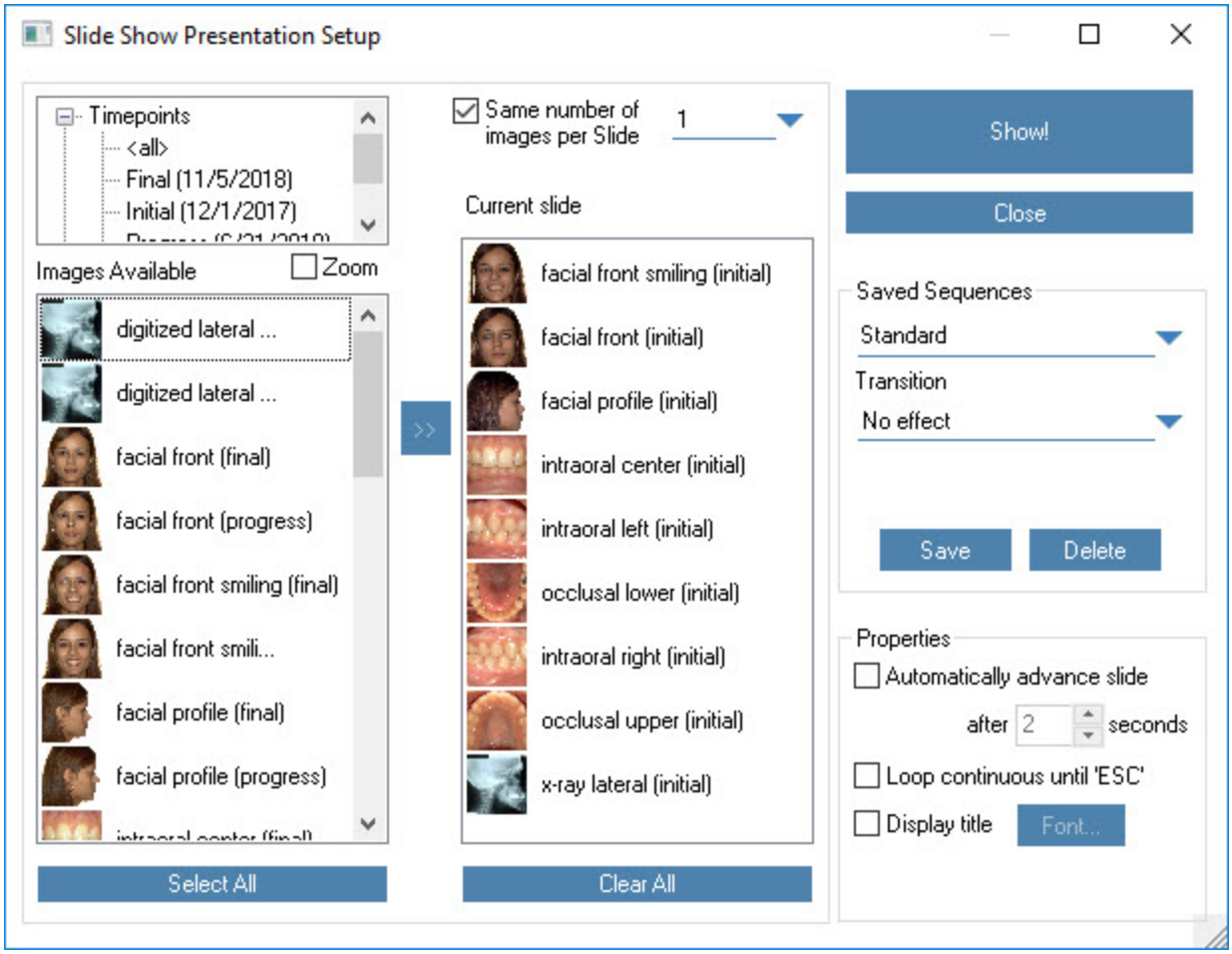
1 Click on the Dolphin Imaging main screen's horizontal tool bar.

Present

Or,

Select **Presentation** from the **Tools** menu.

The Slide Show Presentation Setup dialog box is displayed. Using this dialog box, you can set up a new slide show or load an existing slide show you have already set up and saved.



list	Available sources for the image that you can use in this slide show. You can add images from the timepoints for this patient or from the Image Library.
Images Available	Images from the selected image source (either the timepoints in the patient's record or the Image Library).
Zoom	Shows a close up view of the last image selected in the **Images Available** list.
Select All	Adds all the images in the **Images Available** list to the slide show.
>> or <<	Moves images between the **Images Available** and **Current Slide** lists.

Same Number of Images Per Slide	Uses the selected number of images for each slide in the slide show. Use the associated drop-down list to specify the number of images to use for each slide. This box is checked by default.
Current Slide	Slides in the slide show. • If the **Same Number of Images Per Slide** box is checked, this list contains all the images in the slide show. • If the **Same Number of Images Per Slide** box is not checked, this list contains only the images for the current slide. In this case, the following additional controls appear that you use to add images to individual slides: **Slider:** Selects a particular slide in the slide show. **Ins:** Inserts a new, blank slide before the current slide in the slide show. **:** Inserts a new, blank slide at the end of the slide show.
Clear All	Moves all the images from the **Current Slide** list to the **Images Available** list.
Show!	Plays the current slide show.
Close	Closes this dialog box.
Saved Sequences	Previously saved slide shows.
Transition	Types of transition that you can use between slides.
Save	Saves the current slide show.
Delete	Deletes the current slide show.
Automatically Advance Slide	Automatically advance the slide after the specified number of seconds when playing a slide show. If you do not check this box, you can manually control the slide advance by clicking the slide when you are ready to transition to the next slide.
Loop Continuous Until "ESC"	Specifies that the slide show should loop until you press ESC. Otherwise, the slide show stops playing when it reaches the last slide.
Display Title	Displays the image titles during the slide show.
Font...	Opens the Font dialog box so you can change the font for the image titles. For more information, see "Setting Font Options" on page 3-50.

Creating or Opening a Slide Show

To set up a new slide show:

1 Select the source for the images you want to add to this slide show from the list in the upper left corner of the Slide Show Setup dialog box.

You can add images from the current patient's timepoints or from the Image Library.

2 Specify how you want to assign images to slides in the slide show.

- ○ You can use the same number of images for each slide. In this case, Dolphin automatically assigns images to slides.
- ○ You can manually assign images to slides.

Each of these options is described in “Assigning Images to Slides” below.

3 Add images to this slide show.

4 Select any other options you want for this slide show.

5 Save the slide show as described in “Saving a Slide Show” on page 16-21.

6 When you are finished using the Slide Show Setup dialog box, click **Close** to close it.

To open an existing slide show:

1 Select a previously-saved slide show from the **Saved Sequences** list.

Once you have opened a slide show, you can make any modifications to it such as adding images, removing images, and changing other options.

Assigning Images to Slides

To automatically assign images to slides:

1 Check the **Same Number of Images Per Slide** box.

2 Specify the number of images to use for each slide.

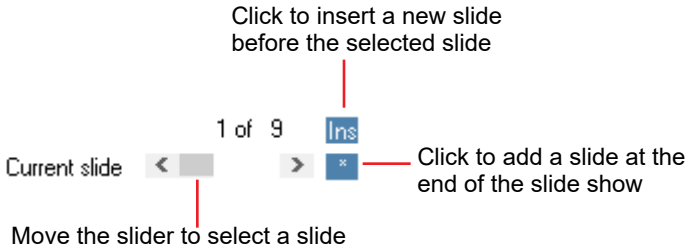
3 Add images to this slide show, as described in “Adding Images to a Slide Show” on page 16-19.

When you use this option, the **Current Slide** list contains all the slides in the slide show. When you play the slide show, Dolphin automatically assigns the images to slides. For example, if you specify that each slide should contain two images, Dolphin automatically assigns the first two images in the **Current Slide** list to the first slide, the third and fourth images in the **Current Slide** list to the second slide, and so on. Dolphin automatically creates as many slides as needed to show all the images in the **Current Slide** list.

To manually assign images to slides:

1 Uncheck the **Same Number of Images Per Slide** box.

When you uncheck the **Same Number of Images Per Slide** box, the options illustrated below are added to the Slide Show Setup dialog box.



2 Using the slider, select the slide to which you want to add images.

3 Add images to this slide as described in “Adding Images to a Slide Show” below.

To add a new, blank slide before the current slide:

1 Click **Ins**.

To add a new, blank slide at the end of the slide show:

1 Click .

Using Images in a Slide Show

This section describes how to add images to a slide show, view close-ups of images in a slide show, and remove images from a slide show.

Adding Images to a Slide Show

To add images to a slide show:

1 If you have not already done so, select the source for the images you want to add to this slide show from the list in the upper left corner of the Slide Show Presentation Setup dialog box.

You can add images from the current patient's timepoints or from the Image Library.

2 Click the images you want to include in the slide show from the **Images Available** list.

You can click a single image or several images. To deselect an image, click a highlighted image again.

3 Click **>>** to move the selected image (or images) into the **Current Slide** list.

If you checked the **Same Number of Images Per Slide** box, moving an image to the **Current Slide** list adds that image to the slide show. When you play the slide show, Dolphin automatically assigns the image to a particular slide.

If you did not check the **Same Number of Images Per Slide** box, moving an image to the **Current Slide** list adds that image to the current slide in the slide show.

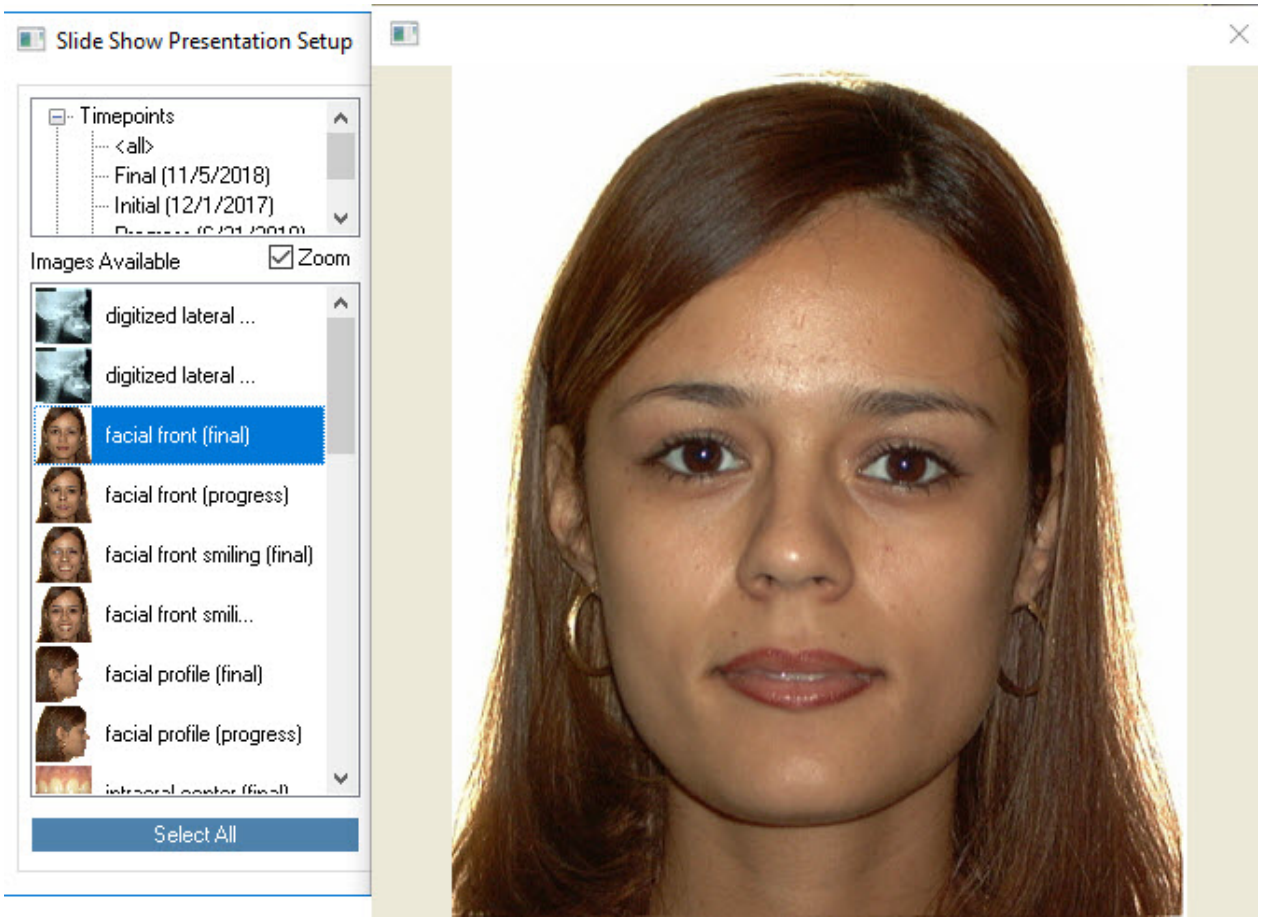
Viewing Close-ups

To view close-ups of the available images

1 Check the **Zoom** box.

2 Select an image in the **Images Available** list.

A window opens that displays a close-up view of the selected image. If you continue selecting images in the **Images Available** list, the close-up view window shows each image as you select it.



To close the close-up view window:

1 Uncheck the **Zoom** box.

Removing Images from a Slide Show

To remove images from a slide show:

1 If necessary, select the individual slide containing the image you want to remove.

You only need to select the slide if the **Same Number of Images Per Slide** box is not checked.

2 Click one or more images to remove from the slide show from the **Current Slide** list.

You can click a single image or several images. To deselect an image, click a highlighted image again.

3 Click **<<** to move the selected image (or images) into the **Images Available** list.

Saving a Slide Show

To save a slide show:

1 On the Slide Show Presentation Setup dialog box, click **Save**.

A dialog box opens where you can type a name for this slide show.

2 Type a name for this slide show. Then, click **OK**.

Deleting a Slide Show

To delete a slide show:

1 Open the slide show you want to delete if it is not already open.

2 Click **Delete**.

A dialog box opens asking you to confirm the deletion.

3 Click **Yes** to delete the slide show.

Playing a Slide Show

To play a slide show:

1 Open the slide show you want to show if it is not already open.

2 Click **Show!**

When all the images in the slide show have been displayed, the Slide Show Setup dialog box appears.

3 When you are finished using the Slide Show Presentation Setup dialog box, click **Close**.

To control slide transitions during a show:

1 Click the currently displayed image, press ENTER, the SPACE BAR, or the RIGHT ARROW key to transition to the next image in the slide show.

These controls work even if the **Automatically Advance Slide** box is checked for this slide show.

2 Press the LEFT ARROW or the BACKSPACE key, or right-click to transition to the previous image in the slide show.

3 Press the PAUSE key to freeze a slide show in Auto Show mode.

Press the PAUSE key again to resume the slide show. Alternatively, press ENTER, the SPACE BAR, the RIGHT ARROW, or the LEFT ARROW key to resume the slide show.

4 Press ESC to end the slide show at any time.

Transferring Images and Layouts to Other Applications

This section describes the following ways to transfer Dolphin Imaging images and image layouts to another application:

- You can drag and drop an image from the Dolphin Imaging main screen into any application that supports drag-and-drop, such as Microsoft Word or PowerPoint.
- You can copy an image to the clipboard and paste it into another application.
- You can add a Dolphin Image Control to add a patient image to a Microsoft Word document, PowerPoint presentation, or Excel spreadsheet.
- You can add a Dolphin Layout Object to add an image layout to a Microsoft Word document, PowerPoint presentation, or Excel spreadsheet.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use the drag-and drop and copy/paste features only if your Dolphin Imaging user account has the Export (copy/save/drag) Imaging Data privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Dragging and Dropping Images

To drag and drop an image from the Dolphin Imaging main screen into another application:

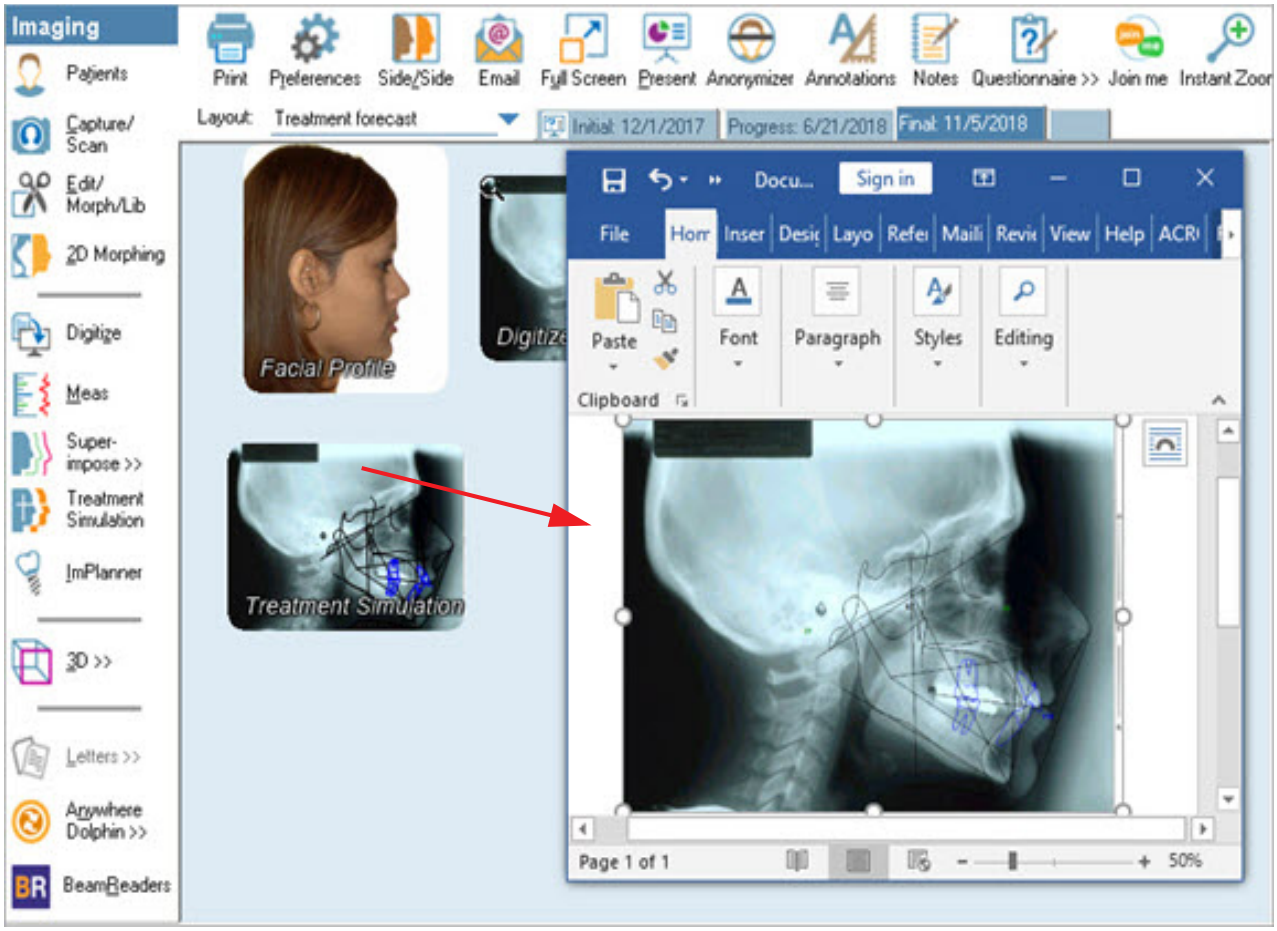
1 Start the application into which you want to drag and drop a Dolphin Imaging image, if it isn't already started.

2 Arrange the Dolphin Imaging main screen and the other application window so that both are visible on your Microsoft Windows desktop.

3 Drag and drop an Image from the Dolphin Imaging main screen into the other application's window.

The Dolphin Imaging image appears in the other application's window.

Note: *If the image contains tracings (such as a digitized x-ray image or a tracing superimposed over the patient's profile photo), both the image and the tracing appear.*



Copying and Pasting Images

To copy an image to the clipboard and paste it into another application:

1 Right-click the image, and select **Copy Image** (or **Copy Image To Resolution**, if you want to specify the resolution used) from the **Image** context menu to copy the image to the clipboard.

Or,

Right-click the image, and select **Copy Uncropped Image** from the **Image** context menu to copy the uncropped version of image (if it exists) to the clipboard.

Or,

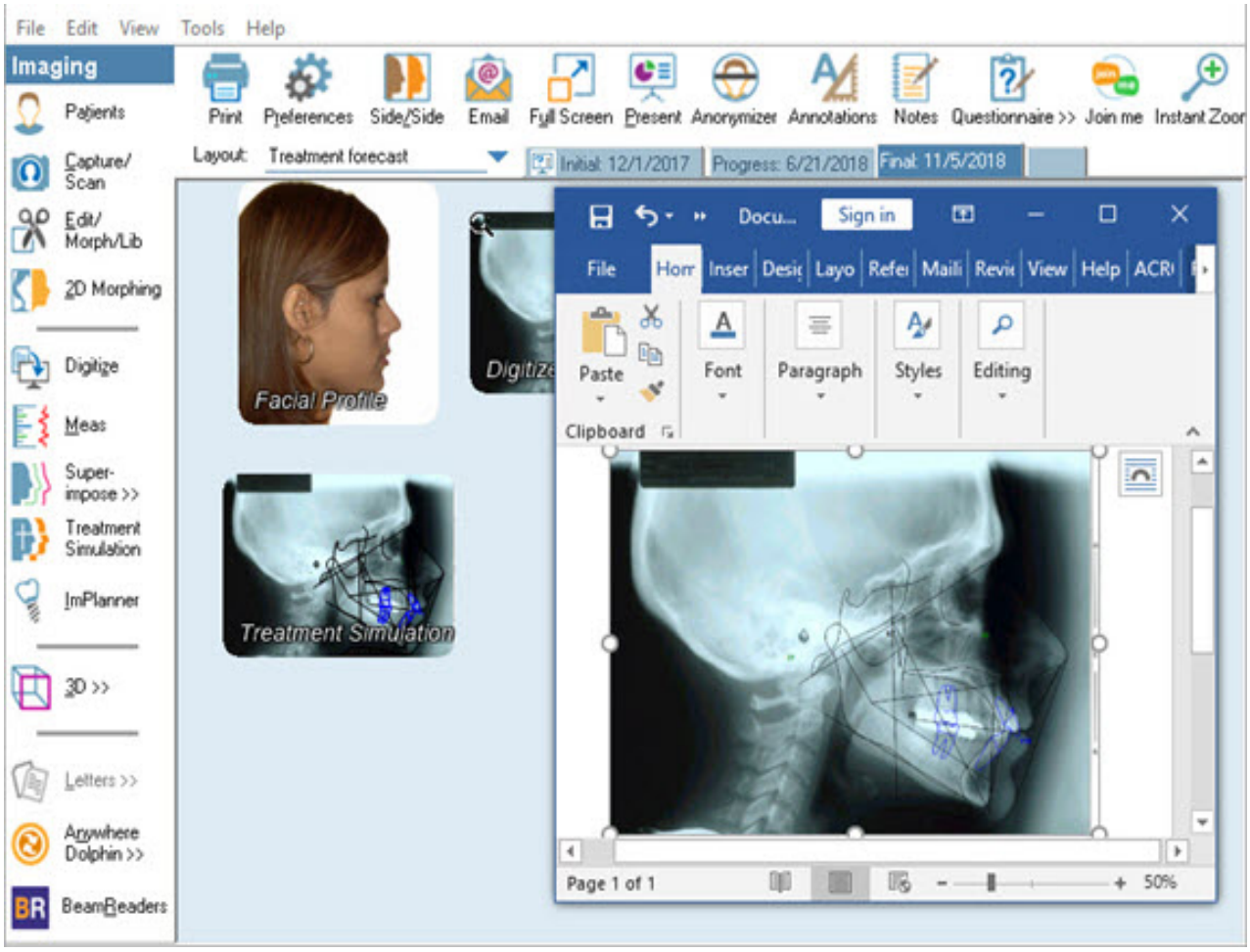
Right-click the image, and select **Copy Layout** (or **Copy Layout To Resolution** if you want to specify the resolution used) from the **Image** context menu to copy the entire image layout to the clipboard.

2 Paste the image or image layout into the other application's window.

Typically, you can paste from the clipboard using a context menu option (right-click and select **Paste** from the context menu) or by pressing CTRL+V. When you paste the image, it appears in the other application's window.

If you have pasted the image and tracing into Microsoft Word or PowerPoint, you can then edit the image and manipulate it. For instance, you can ungroup the image and the tracing, and manipulate the elements independently.

Note: *You may need to perform the ungroup operation more than once before you can independently move the lines, curves, and numbers that make up the tracing.*



Using Dolphin Image Controls

You can use the Dolphin Image Control to insert patient images into Microsoft Word documents, Power-Point presentations, and Excel spreadsheets. To use the Dolphin Image Control, you perform the following basic steps:

1 Insert a Dolphin Image Control into the document, presentation, or spreadsheet.

2 Specify the patient image to use for the Dolphin Image Control.

This section describes each of these tasks.

Adding a Dolphin Image Control

To insert a Dolphin Image Control into a document, presentation, or spreadsheet:

1 Open the document, presentation, or spreadsheet into which you want to insert the Dolphin Image Control.

2 On the Microsoft Word **Developer** tab, click in the Controls section. Then, click under ActiveX Controls.

Or,

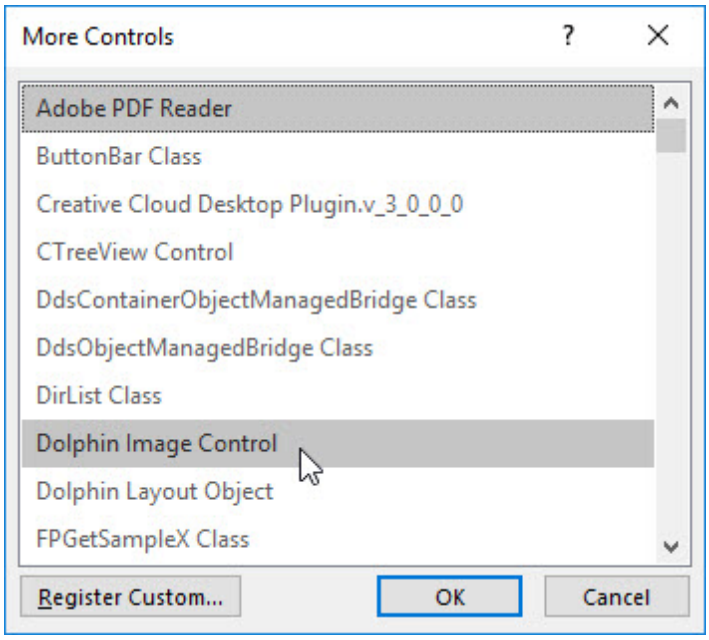
On the Microsoft Excel **Developer** tab, click in the Controls section. Then, click under ActiveX Controls.

Or,

On the Microsoft PowerPoint **Developer** tab, click in the Controls section.

Note: *You may need to customize the ribbon in order for the **Developer** tab to appear. For more information, refer to the Microsoft documentation for the appropriate applications.*

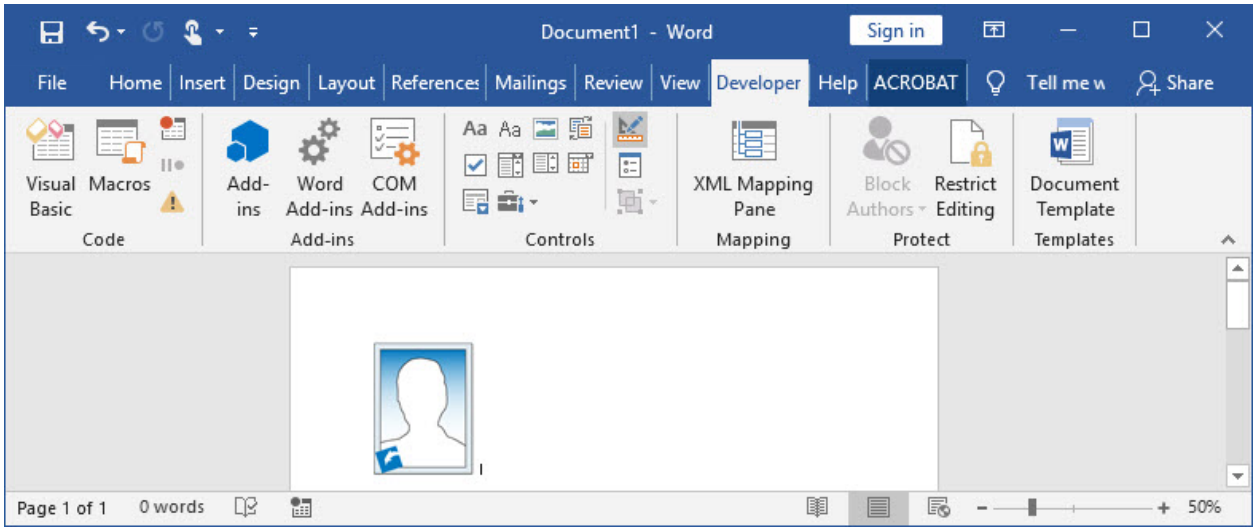
The More Controls dialog box is displayed. For more information on this dialog box, refer to the documentation for the Microsoft application you are using.



3 Select **Dolphin Image Control** from the Object dialog box, and click **OK**.

The Dolphin Image Control appears in your document, presentation, or spreadsheet .

4 Click somewhere other than the Dolphin Image Control to deselect it.



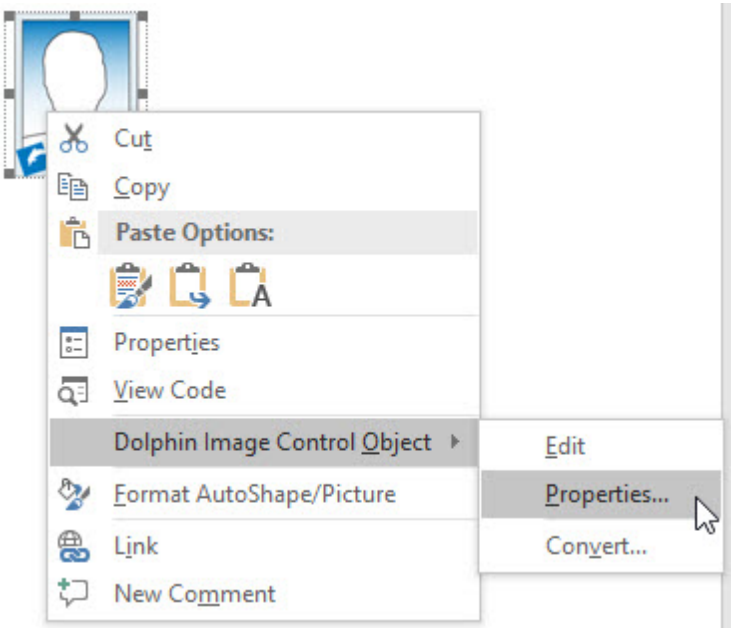
Specifying the Image to Use

To specify the patient image for a Dolphin Image Control:

1 Right-click the Dolphin Image Control.

A context menu is displayed. If the context menu does not appear, click somewhere other than the Dolphin Image Control to deselect it. Then, right-click the Dolphin Image Control again.

2 From the context menu, select **Dolphin Image Control Object.** Then, select **Properties** from the sub-menu.



The Dolphin Image Control Properties dialog box is displayed.

3 Enter the patient ID for the patient whose image you want to use.

Or,

Select the patient ID from the drop-down list.

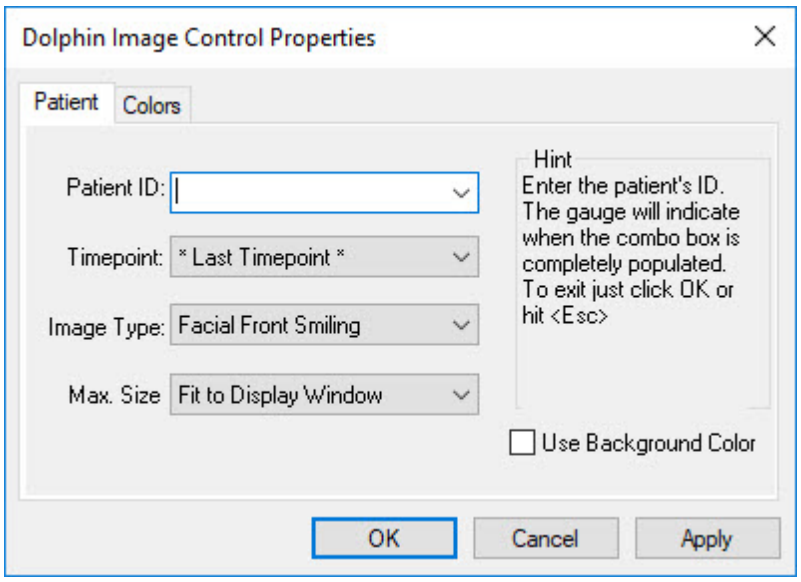
4 Select the timepoint and image you want to use from the drop-down lists.

5 Optionally, select an image resolution from the Max Size drop-down list.

Selecting a lower resolution for images results in a smaller file for your document, presentation, or spreadsheet. If you import several Dolphin images, you may want to use lower resolution images, especially if you plan to email the resulting document, presentation, or spreadsheet.

6 Click **OK**.

The Dolphin logo is replaced with the patient image you specified.



Patient ID	Patient ID for the patient whose image you want to use
Timepoint	Timepoint for the image you want to use.
Image Type	Image you want to use.
Max Size	Image resolution. Lower resolution images result in a smaller file.
Use Background Color	Background color used to fill any space within the Dolphin Image Control not occupied by the patient's image.
Colors tab	Sets a background color.

If the patient's image does not take up the entire Dolphin Image Control, you can fill the unused space with a background color.

To use a background color:

1 Check **Use Background Color** on the Dolphin Image Control Properties dialog box.

2 Click the **Colors** tab.

3 Select the background color you want. Then, click **OK**.

Using Dolphin Layout Objects

You can use the Dolphin Layout Object to insert patient image layouts into Microsoft Word documents, PowerPoint presentations, and Excel spreadsheets. To use the Dolphin Layout Object, you perform the following basic steps:

1 Insert a Dolphin Layout Object into the document, presentation, or spreadsheet.

2 Set properties for the Dolphin Layout Object.

This section describes each of these tasks.

Adding a Dolphin Layout Object

To insert a Dolphin Layout Object into a document, presentation, or spreadsheet:

1 Open the document, presentation, or spreadsheet into which you want to insert the Dolphin Layout Object.

2 On the Microsoft Word **Developer** tab, click in the Controls section. Then, click under ActiveX Controls.

Or,

On the Microsoft Excel **Developer** tab, click

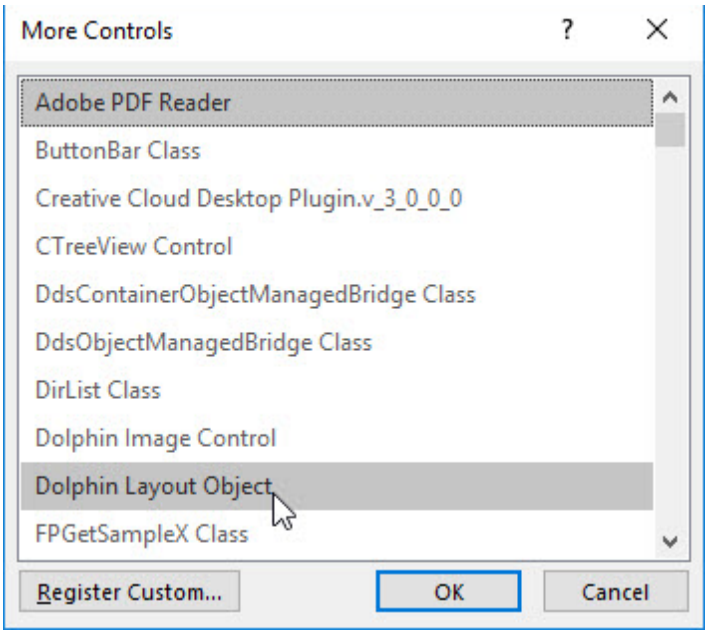
in the Controls section. Then, click under ActiveX Controls.

Or,

On the Microsoft PowerPoint **Developer** tab, click in the Controls section.

Note: *You may need to customize the ribbon in order for the **Developer** tab to appear. For more information, refer to the Microsoft documentation for the appropriate applications.*

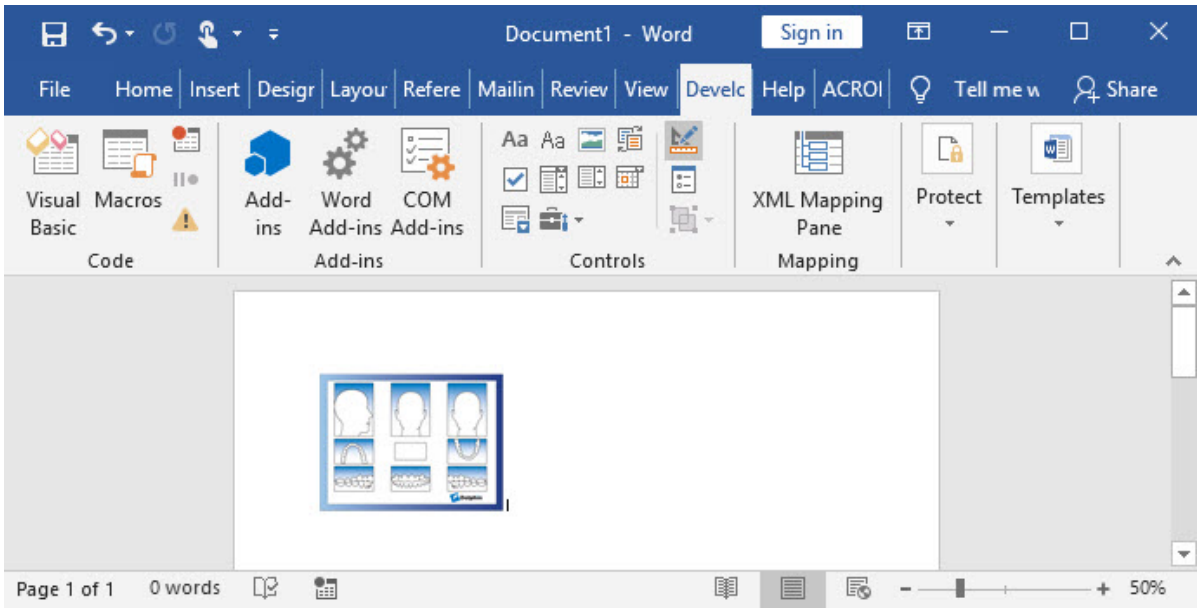
The More Controls dialog box is displayed. For more information on this dialog box, refer to the documentation for the Microsoft application you are using.



3 Select **Dolphin Layout Object** from the Object dialog box and click **OK**.

The Dolphin Layout Object appears in your document, presentation, or spreadsheet.

4 Click somewhere other than the Dolphin Layout Object to deselect it.



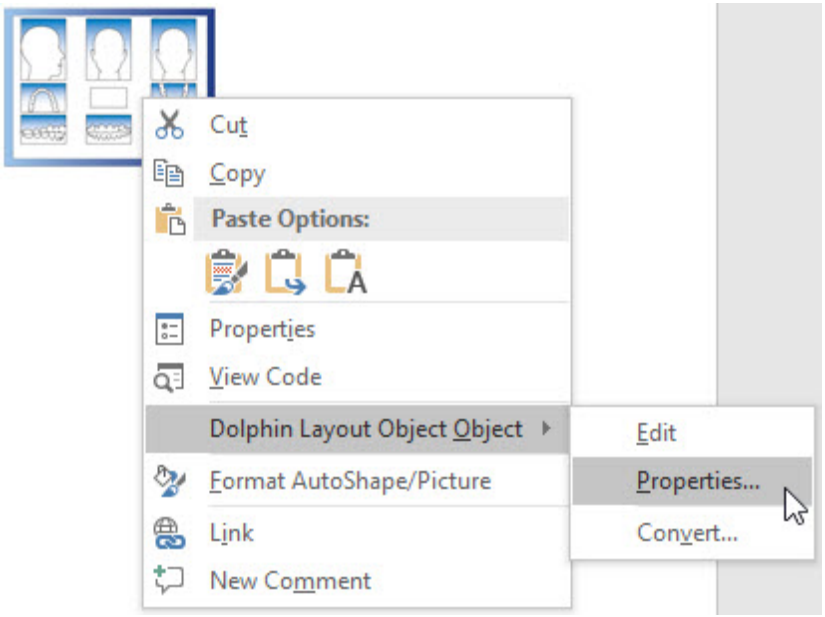
Setting Properties

To open the Dolphin Layout Object Properties dialog box:

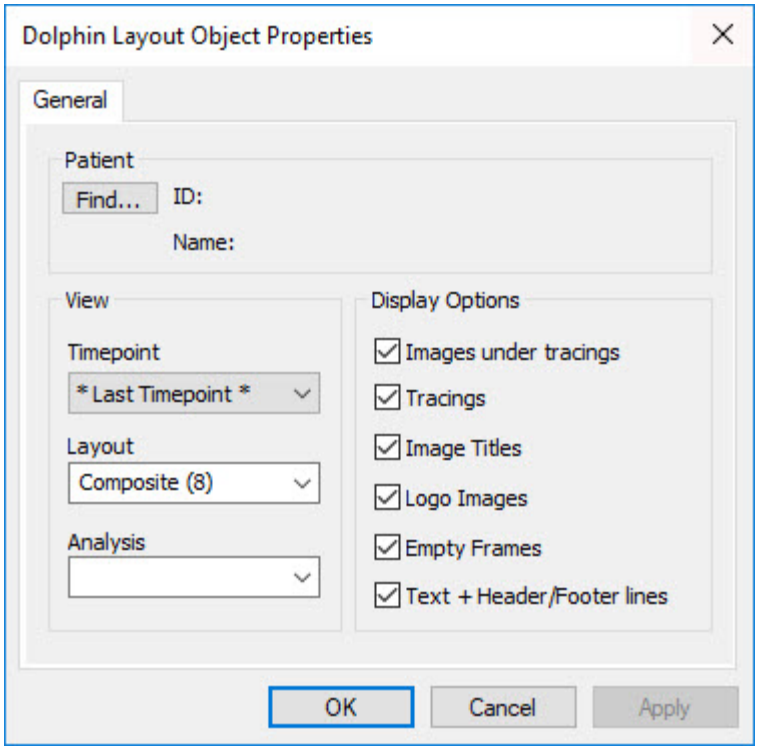
1 Right-click the Dolphin Layout Object.

A context menu is displayed. If the context menu does not appear, click somewhere other than the Dolphin Layout Object to deselect it. Then, right-click the Dolphin Layout Object again.

2 From the context menu, select **Dolphin Layout Object Object**. Then, select **Properties** from the sub-menu.



The Dolphin Layout Object Properties dialog box opens.



Find...	Gets the patient information from Dolphin Imaging. The Patient Lookup dialog box opens (see Chapter 4, Patient Charts).
Timepoint	Timepoints from which you can get the images you want to use
Layout	Image layouts you can use.
Analysis	Cephalometric analyses you can use.
Images Under Tracings	Includes the patient images (rather than just tracings) in the selected image layout.
Tracings	Includes tracings on the images in the selected image layout.
Image Titles	Includes titles on the images in the selected image layout.
Logo Images	Includes any logo images defined as part of the selected image layout.
Empty Frames	Includes empty image or text frames defined in the selected image layout.
Text +Header/ Footer lines	Includes all text as well as any header and footer lines defined in the selected image layout.

To set properties for a Dolphin Layout Object:

1 Click **Find...** to select the patient information to use for this Layout Object.

The Patient Lookup dialog box opens (see Chapter 4, Patient Charts).

After you select the patient, the patient's name and ID are displayed in the Patient group box. Additionally, that patient's timepoint, image layout, and cephalometric analysis information are imported into the **Timepoint**, **Layout**, and **Analysis** drop-down lists.

2 Use the **Timepoint** drop-down list to select the timepoint you want to use.

3 Use the **Layout** drop-down list to select from the available layout options.

4 Use the **Analysis** drop-down list to select from the available cephalometric analyses.

5 Optionally, check the boxes for any other options you want to use.

6 Click **OK** or **Apply** to use the settings and close the Dolphin Layout Object Properties dialog box.

The Dolphin Layout Object changes to indicate the patient, timepoint, and image layout you have assigned to it. The Dolphin Layout Object will be replaced by the appropriate image layout when you print the Microsoft Word document or Excel spreadsheet, or run the PowerPoint presentation.

17 Layout Editor

Using the Layout Editor, you can create and edit the image layouts used when viewing and printing images.

Note: *The Layout Editor is an advanced feature of the Dolphin Imaging program. Please proceed with caution when making any changes in the Layout Editor.*

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Imaging Configuration (Page Setup, Layout, Custom Analysis, etc.) privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Dolphin Imaging layouts are automatically shared among all the computers on the same network. So, any new layouts and revisions to existing layouts are automatically shared to the rest of your network when you save them.

To open the Layout Editor:

1 Click **Edit** in the Image Layout group box of the Capture Setup dialog box.

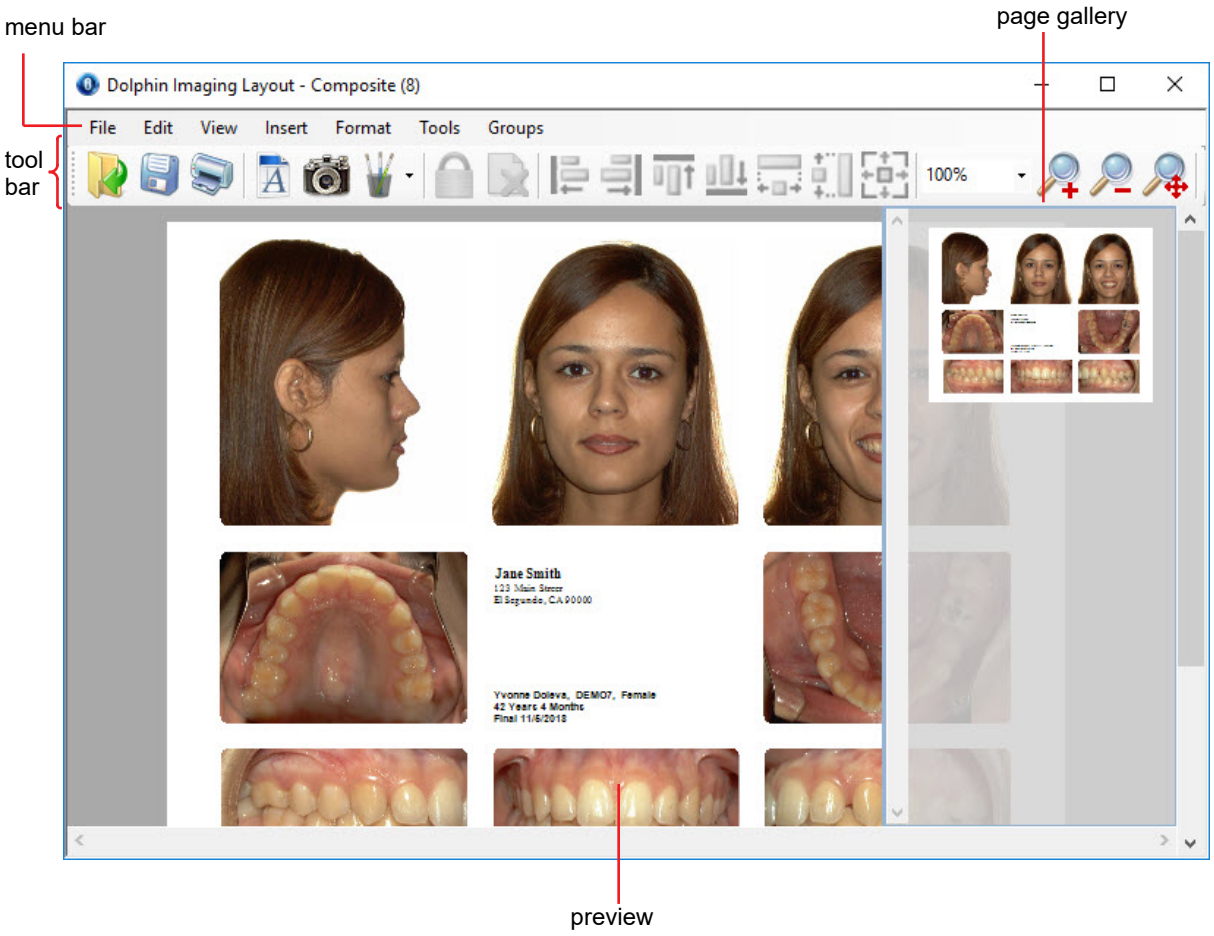
Or,

Select **Page Setup...** from the **File** menu.

Or,

Select **Edit Layouts...** from the **Edit** menu.

The Layout Editor dialog box is displayed using the current image layout.



Menu Bar	Menus used to access program features.
Tool Bar	Buttons used to access program features.
Preview	Preview of the layout.
Page Gallery	Thumbnails of the pages in this layout.

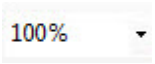
To exit from the Layout Editor:

1 Select **Exit** from the **File** menu.

Using the Tool Bar

The Layout Editor tool bar contains the following buttons:

	Opens an existing layout for editing. For more information, see “Opening a Layout” on page 17-10.
	Saves the current layout. For more information, see “Saving the Layout” on page 17-10.
	Prints the current layout. For more information, see “Printing Layouts” on page 17-39.
	Adds a new text label to this layout. For more information, see “Using Text Labels” on page 17-20.
	Adds a new image to this layout. For more information, see “Using Images” on page 17-14.
	Toggles locking for the selected objects. When an object is locked it cannot be moved or resized, avoiding accidental misalignment of images. For more information, see “Locking and Unlocking Objects” on page 17-38
	Deletes the selected objects from the layout. For more information, see “Deleting Objects” on page 17-34.
	Aligns the selected objects with the left side of the first object selected. For more information, see “Aligning Objects” on page 17-31.
	Aligns the selected objects with the right side of the first object selected. For more information, see “Aligning Objects” on page 17-31.
	Aligns the selected objects with the top of the first object selected. For more information, see “Aligning Objects” on page 17-31.
	Aligns the selected objects with the bottom of the first object selected. For more information, see “Aligning Objects” on page 17-31.
	Resizes the selected objects to be the same width as the first object selected. For more information, see “Making Several Objects the Same Size” on page 17-29.
	Resizes the selected objects to be the same height as the first object selected. For more information, see “Making Several Objects the Same Size” on page 17-29.

	Resizes the selected objects to be the same width and height as the first object selected. For more information, see “Making Several Objects the Same Size” on page 17-29.
	Sets the magnification to the selected percentage.
	Zooms in on the layout.
	Zooms out from the layout.
	Changes the magnification so that the layout fits in the window.

Using the Menu Bar

At the top of the Layout Editor window, there are menus used to access program features. This section describes each of these menus.

The File Menu

The **File** menu contains the following choices:

New Layout	Creates a new layout. For more information, see “Creating a New Layout” on page 17-9.
Open Layout...	Opens an existing layout for editing. For more information, see “Opening a Layout” on page 17-10.
Save Layout	Saves the current layout. For more information, see “Saving the Layout” on page 17-10.
Save Layout As...	Saves the current layout under a new name. For more information, see“Saving the Layout” on page 17-10
Import Layout...	Imports a layout previously exported to a file. For more information, see“Importing and Exporting a Layout” on page 17-11
Export Layout...	Exports a layout to a file. For more information, see“Importing and Exporting a Layout” on page 17-11
Export Page to Image...	Exports the currently selected page in the layout to an image file on your computer. For more information, see “Exporting a Page to an Image File” below.
Page Setup...	Opens the Page Setup dialog box so that you can adjust the paper size, background color, margins, page orientation, and preset printer for the currently selected page. For more information, see “Setting Up the Page” on page 17-12.
Print...	Prints the current layout. For more information, see “Printing Layouts” on page 17-39.
Exit	Exits the Layout Editor.

Exporting a Page to an Image File

To export a page to an image file:

1 Select **Export Page to Image...** from the **File** menu.

The Save Page to Image File dialog box opens.

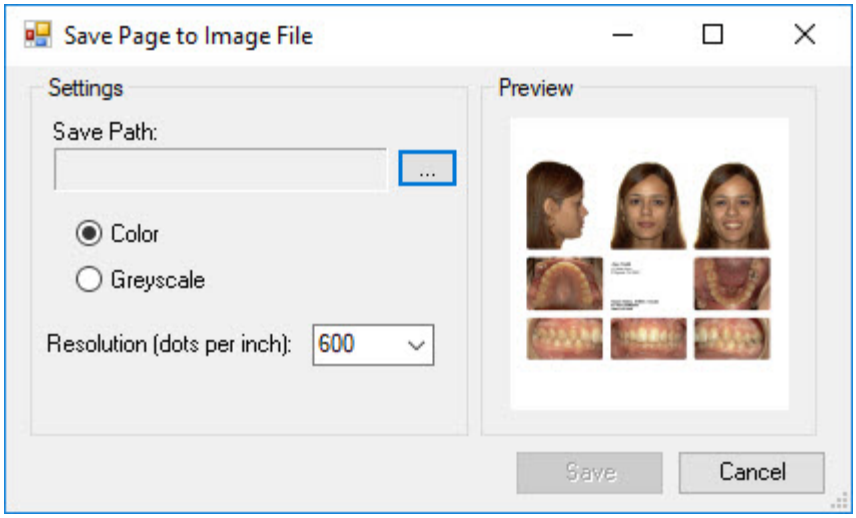
2 Click the button labeled **....**

The **Save As** dialog box opens.

3 Specify the image file in which you want to save the current page.

4 Optionally, select the type of image (JPEG, PNG, or bitmap) from the **Save As Type** drop-down list. Then, click **Save**.

5 Set any other options on the Save Page to Image File dialog box. Then, click **Save**.



Save Path	Image file in which to save the current page.
Color	Saves this page as a color image.
Greyscale	Saves this page as a gray-scale image.
Resolution (dots per inch)	Sets the resolution for this page as a number of Dots Per Inch (DPI).
Preview	Displays a preview of the page you are exporting.

The Edit Menu

The **Edit** menu contains the following choices:

Undo	Undoes previous operations in order. You can undo any number of operations.
Redo	Redoes undone operations. You can redo any number of operations as long as you did not make any changes to the layout after the undo operation.
Copy page to Clipboard	Copies the current page and places it on the clipboard as an image.
Cut	Cuts the selected objects and places them on the clipboard. For more information, see “Cutting, Copying, and Pasting Objects” on page 17-35.
Copy	Copies the selected objects to the clipboard. For more information, see “Cutting, Copying, and Pasting Objects” on page 17-35.
Paste	Pastes previously cut or copied objects from the clipboard. For more information, see “Cutting, Copying, and Pasting Objects” on page 17-35.
Delete	Deletes the selected objects. For more information, see “Deleting Objects” on page 17-34.
Select All	Selects all objects in the layout.

The View Menu

The **View** menu contains the following choices:

Margins	Toggles the display of the green margin lines.
Printable Area	Toggles the display of the red “printable area” guidelines.
Image Titles	Opens a sub-menu used to show or hide the title labels for all images.
Image Borders	Opens a sub-menu used to show or hide the borders around all images.
Page Gallery	Toggles display of the page gallery.
Hide Labels	Toggles display of all the labels in a layout.

The Insert Menu

The **Insert** menu contains the following choices:

Label	Places a label on the layout. For more information, see “Using Text Labels” on page 17-20.
Image	Places an image on the layout. For more information, see “Using Images” on page 17-14.

Measurements Table	Places a measurements table on the layout. For more information, see “Using Measurements Tables” on page 17-25
Group	Displays a list of previously saved groups of objects so that you can choose one to insert into the layout. For more information, see “Using Object Groups” on page 17-36.

The Format Menu

The **Format** menu contains the following choices:

Background Color...	Sets the background color of the currently selected page.
Image Corner Rounding...	Toggles rounded corners on the images
Align	Opens a sub-menu used to align the selected objects on the left, right, top, or bottom. For more information, see “Aligning Objects” on page 17-31.
Make Same Size	Opens a sub-menu used to resize the selected objects to be the same height, same width, or both the same height and width. For more information, see “Making Several Objects the Same Size” on page 17-29.
Center	Opens a sub-menu used to center the selected objects horizontally or vertically on the page. For more information, see “Centering Objects” on page 17-32.
Horizontal Spacing	Opens a sub-menu used to adjust the horizontal spacing of the selected objects as follows: **Make Equal:** Spaces the selected objects evenly. **Increase:** Increases the space between the selected objects. **Decrease:** Decreases the space between the selected objects. **Remove:** Removes the space between the selected objects, making them flush with each other. For more information, see “Changing Object Spacing” on page 17-33.
Vertical Spacing	Opens a sub-menu used to adjust the vertical spacing of the selected objects as follows: **Make Equal:** Spaces the selected objects evenly. **Increase:** Increases the space between the selected objects. **Decrease:** Decreases the space between the selected objects. **Remove:** Removes the space between the selected objects, making them flush with each other. For more information, see “Changing Object Spacing” on page 17-33.
Order	Opens a sub-menu used to adjust the ordering of the selected objects as follows: **Bring to Front:** Places the selected object in front of other objects. **Send to Back:** Places the selected object behind other objects. For more information, see “Changing Object Layering” on page 17-34.

Snap To	Opens a sub-menu used to align the selected objects as follows: **Margin:** Opens a further sub-menu used to align the selected objects along the left, right, top, or bottom page margin. **Printer Hard Margin:** Opens a further sub-menu used to align the selected objects along the left, right, top, or bottom hard margin. If you have specified a printer on the Page Setup dialog box, the hard margins specify how close to the paper edge the specified printer can print. Otherwise, the hard margins are at the paper edges. For more information, see “Aligning Objects” on page 17-31.

The Tools Menu

The **Tools** menu contains the following choices:

Link Labels to Image	Links the selected labels and image so that data tokens such as the image title, timepoint information, and so on can be read from that image when rendering the label text. For more information, see “Linking Labels to an Image” on page 17-24.
Unlink Labels from Image	Breaks the linkage between labels and an image. For more information, see “Linking Labels to an Image” on page 17-24.

The Groups Menu

The **Groups** menu contains the following choices:

Group Objects	Groups the selected objects into a single object. For more information, see “Using Object Groups” on page 17-36.
Ungroup Objects	Splits the selected object group into individual objects. For more information, see “Using Object Groups” on page 17-36.
Save Group As...	Stores a group of objects for later reuse. For more information, see “Using Object Groups” on page 17-36.
Insert Group	Inserts a previously stored object group on the current design. For more information, see “Using Object Groups” on page 17-36.

Using the Page Gallery

The page gallery displays thumbnails of the layout's pages. Most layouts have a single page.

To scroll through the pages in the gallery:

1 Click and drag the scroll bar to the left of the page gallery.

To view a page from the gallery:

1 Double-click a page in the gallery to display it in the center pane in the window.

To toggle display of the page gallery:

1 Select **Page Gallery** from the **View** menu.

Or,

Right-click the page gallery. Then, select **Hide Page Previews** from the context menu to hide it.

To delete a page from the layout:

1 Click and drag the scroll bar to the right of the page gallery until the page you want to delete appears.

2 Click the page to select it.

A red outline appears around the page.

3 Click .

Or,

Select **Delete** from the **Edit** menu.

Alternatively, you can right-click the page and select **Delete** from the context menu.

4 Click **Yes** to delete the page.

To change the order of the pages in a multi-page layout:

1 Right-click the page you want to move in the page gallery.

2 Select **Move Page to Number** from the context menu.

3 Select the new page number for the selected page from the sub-menu.

Managing Layouts

This section describes how to create a new layout, open an existing layout, save a layout, import and export layouts, and delete a layout.

Creating a New Layout

To create a new layout:

1 Select **New Layout...** from the **File** menu.

The Page Setup dialog box opens.

2 Enter page setup options for the new layout.

For information on setting these options, see “Setting Up the Page” on page 17-12.

3 Click **OK**.

The new layout appears in the Layout Editor window.

Opening a Layout

To open an existing layout:

1 Click .

Or,

Select **Open Layout...** from the **File** menu.

A dialog box appears where you can select the layout that you want to open.

2 Select a layout from the list, and click **Open**.

Saving the Layout

Saving your layout automatically shares your design among all Dolphin workstations on your network.

To save the layout:

1 Click .

Or,

Select **Save Layout** or **Save Layout As...** from the **File** menu.

If you had previously saved this layout and you did not select **Save Layout As...**, the layout is saved, overwriting the old version.

If you have not previously saved this layout or if you selected **Save Layout As...**, a dialog box opens where you can specify a name for this layout.

2 Select an existing layout name that you want to use for this layout from the list.

Or,

Type the name that you want to use for this layout in the field.

3 Click **Save**.

If you selected an existing layout name, your new layout is written over the existing layout.

Layouts are saved in the **`Dolphin\Working`** folder on your server, so that saved layouts are available to all computers on your network, and they are backed up along with the rest of your Dolphin Imaging data.

Importing and Exporting a Layout

You can export a layout to save it to a file on your computer. The exported layout can later be imported from the export file.

To import a layout previously exported to a file:

1 Select **Import Layout...** from the **File** menu.

2 On the Import Layout dialog box, enter the directory and file name for the file containing the layout.

Or,

Click **...** to browse to the file containing the layout.

Typically, a layout export file is named ***layout*.dlt.zip**, where ***layout*** is the name of the layout. By default, Dolphin Imaging saves layout export files in the **Data\Layouts\Export** sub-directory of your Dolphin working directory (for example, **C:\Dolphin\Working\Data\Layouts\Export\myCustomLayout.dlt.zip**).

3 Click **Import**.

4 Click **Close** on n the Import Layout dialog box

To export a layout to a file:

1 Select **Export Layout...** from the **File** menu.

2 On the Export Layout dialog box, select the layout from the drop-own list.

3 Click **Export**.

The layout is saved to a file named ***layout*.dlt.zip**, where ***layout*** is the name of the layout, in the **Data\Layouts\Export** sub-directory of your Dolphin working directory (for example, **C:\Dolphin\Working\Data\Layouts\Export\myCustomLayout.dlt.zip**).

4 Click **Close** on n the Export Layout dialog box

Deleting a Layout

To delete a layout:

1 Click .

Or,

Select **Open Layout...** from the **File** menu.

A dialog box appears where you can select a layout that you want to open. This dialog box also offers the option to delete a layout.

2 Select the layout you want to delete from the list. Then, click **Delete**.

A dialog box appears asking you to confirm the deletion.

3 Click **Yes** to delete the layout.

Editing Layouts

This section describes how to edit a layout. It describes:

- setting up the layout page
- using images, text labels, measurements tables, and annotations (such as lines, arrows, ellipses, and rectangles)
- resizing and repositioning objects
- deleting objects
- cutting, copying, and pasting objects
- using object groups
- locking and unlocking objects
- printing layouts

Setting Up the Page

You use the Page Setup dialog box to set a layout's basic properties. The first step in creating a new layout is to enter page setup options. After creating the layout initially, you can change these options at any time.

You also use the Page Setup dialog box to set basic properties for a report or individual report pages. For more information on reports, see Chapter 29, Reports.

To set up the page:

1 Select **Page Setup...** from the **File** menu to set options for the layout or report on which you are currently working.

Or,

Select **New Layout** from the **File** menu to create a new layout.

Or,

Select **New Template** from the **File** menu to create a new report template.

Or,

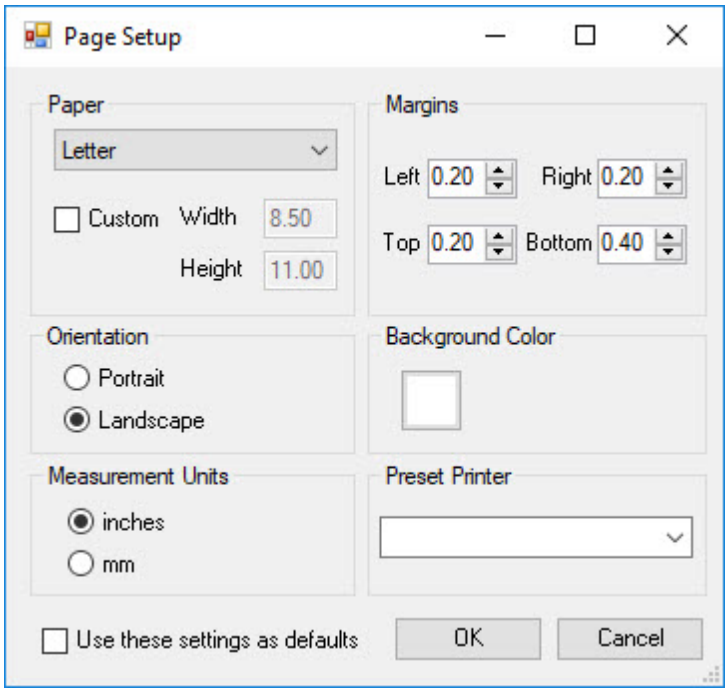
Right-click the layout. Then, select **Page Setup...** from the context menu.

Or,

Right-click a report page. Then, select **Page Setup...** from the context menu to set options just for that page.

The Page Setup dialog box opens.

2 Enter page setup options. Then, click **OK**.



Paper	Sets the paper size. **drop-down list:** Lists standard paper sizes. **Custom:** Use a custom paper size. • **Width:** Width for a custom paper size. The units for this measurement depend on the **Measurement Units** selection (see below). • **Height:** Height for a custom paper size. The units for this measurement depend on the **Measurement Units** selection (see below).
Margins	Page margins. The units for these measurements depend on the **Measurement Units** selection (see below). Margins act as guidelines. You can place objects outside the margins.
Orientation	Page orientation, either portrait or landscape.
Background Color	Background color for the layout.
Measurement Units	Units, either inches or millimeters (mm), to use when entering measurements such as margin dimensions for this layout.
Preset Printer	Printer to use by default when printing this layout. You can change to a different printer when printing a layout.
Use these settings as defaults	Use these settings as defaults for all layouts.

To zoom in:

1 Click .

To zoom out after zooming in:

1 Click .

To fit the design in the window:

1 Click .

To select a magnification factor:

1 Select a magnification percentage from the drop-down list on the tool bar.

To toggle display of the green margin lines:

1 Select **Margins** from the **View** menu.

To toggle display of the red “printable area” guidelines:

1 Select **Printable Area** from the **View** menu.

Using Images

To add an image to your layout:

1 Click .

Or,

Select **Image** from the **Insert** menu.

Or,

Right-click the layout, and select **Add Image** from the context menu.

Your cursor changes to a placeholder-drawing icon ( ).

2 Click and drag to draw an image placeholder of the size you want for this image.

3 Right-click the image placeholder.

4 Select **Image Type** from the context menu. Then, select the type of image you want to use from the sub-menu.

You can also set the image type for a placeholder by setting its properties. You would do this, for example, to add a logo or other image file from your computer to a layout. For more information, see “Setting Image Properties” on page 17-16.

To toggle rounded corners for the images:

1 Select **Image Corner Rounding...** from the **Format** menu.

Sizing Images Within Placeholders

Two options determine how to size images within placeholders:

Draw 1:1	Scales the image according its resolution. Depending on the placeholder size, the image may be too large or small for the placeholder.
Show Whole Image	Scales the image so that it is as large as possible and still fit entirely within the placeholder.

To change the sizing option:

1 Right-click the image.

2 Select the sizing option from the context menu.

To change the placeholder size to match the image size:

1 Right-click the image.

2 Select **Snap to Image Size** from the context menu.

Displaying Image Borders

You can display an image border that is the same size and shape as the image placeholder.

To toggle display of an image's borders:

1 Right-click the image.

2 Select **Show Border** from the context menu.

3 Deselect the image by clicking somewhere else on the page.

When you deselect the image, the placeholder boundary disappears, and you can whether the image border displays.

Note: *You can specify whether you want to display the borders for an image and set the image border's color and width by setting image properties. For more information, see “Setting Image Properties” on page 17-16.*

To toggle display of all image borders:

1 Select **Image Borders** from the **View** menu.

2 Select **Show All** from the sub-menu to show the borders on all the images.

Or,

Select **Hide All** from the sub-menu to hide the borders on all the images.

Displaying Image Titles

You can display an image title for each of the images.

On the properties for an image, you can specify whether you want to display its title. For more information, see “Setting Image Properties” on page 17-16.

To toggle display of all image titles:

1 Select **Image Titles** from the **View** menu.

2 Select **Show All** from the sub-menu to show the titles for all the images.

Or,

Select **Hide All** from the sub-menu to hide the titles for all the images.

Setting Image Properties

By setting image properties, you can specify the following information:

- Layout options for formatting the image
- Image source and title
- Options for displaying a tracing on the image

To set image properties:

1 Right-click the image, and select **Properties** from the context menu.

Or,

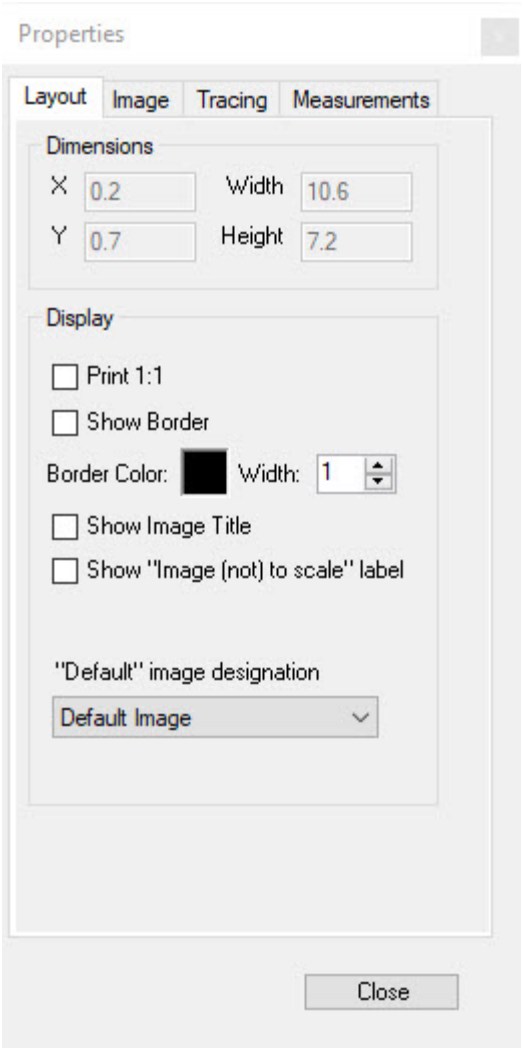
Double-click the image.

2 Click a tab, and set any options on that tab.

3 When you finish setting properties, click **Close**.

Layout Tab

On this tab, you can view and set options that determine the formatting of the image.

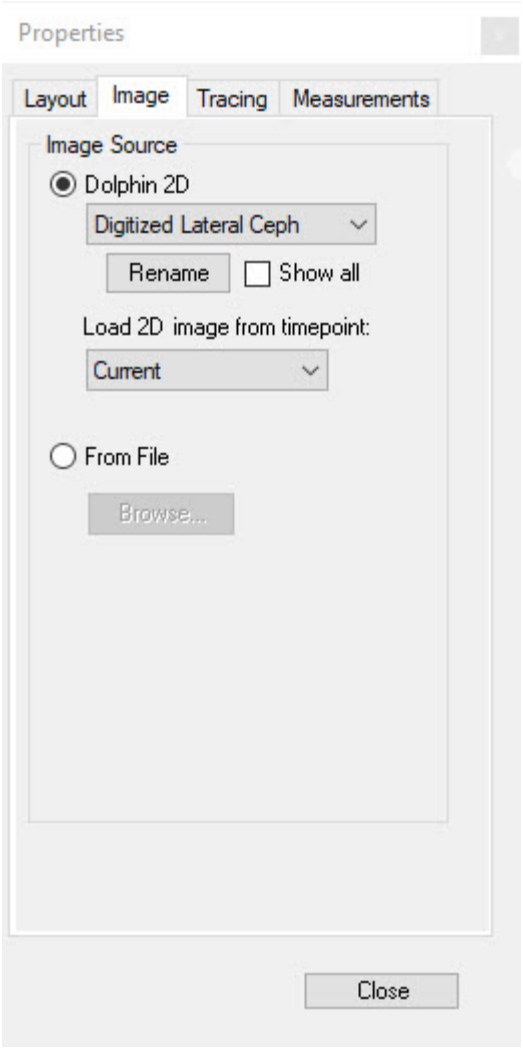


Dimensions	Current position, height, and width of the image. **X:** Horizontal distance, in inches, from the left side of the image to the left side of the page. **Y:** Vertical distance, in inches, from the top of the image to the top of the page. **Width:** Width of the image in inches. **Height:** Height of the image in inches.
Display	Display options for this image: **Print 1:1:** Displays the image according to its resolution. **Show Border:** Displays a border around the image. **Border Color:** Color of the image border. **Width:** Width of the border in millimeters (mm). **Show Image Title:** Displays the title of the image. You can customize this title on the **Image** tab (see “Image Tab” below). **Show “image (not) to scale” label:** Displays “Image drawn to size” on images using the Print 1:1 option and “Image not drawn to size” on images that don't use the Print 1:1 option. **“Default” image designation:** For use by Dolphin Support only.

Image Tab

On this tab, you can set the image source and customize the image slot name.

Dolphin 2D	Loads the selected Dolphin 2D image into this image placeholder.
Rename	Changes the selected image slot's name. Image slot names are automatically shared among all the computers on the same network.
Show All	Includes all Dolphin 2D image slots in the drop-down list. Otherwise, the drop-down list only includes the images that are actually available for this patient.
Load 2D image from timepoint	timepoint for the image.
From File	Image file (such as a logo) to load into this image placeholder.
Browse...	Navigates to an image file on your computer.



To rename the image slot:

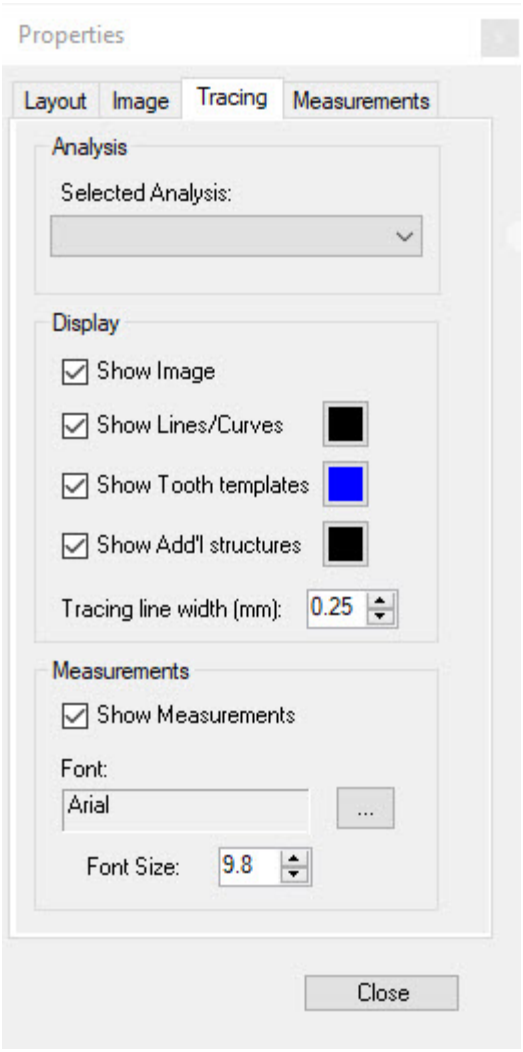
1 On the **Image** tab, click **Rename**.

2 Enter a new name for the image slot. Then, click **OK**.

Image slot names are automatically shared among all the computers on the same network.

Tracing Tab

On this tab, you can set options for displaying a tracing on the image. The options you set here are also reflected on the Tracing Display Preferences dialog box (see “Setting Tracing Preferences” on page 3-66).

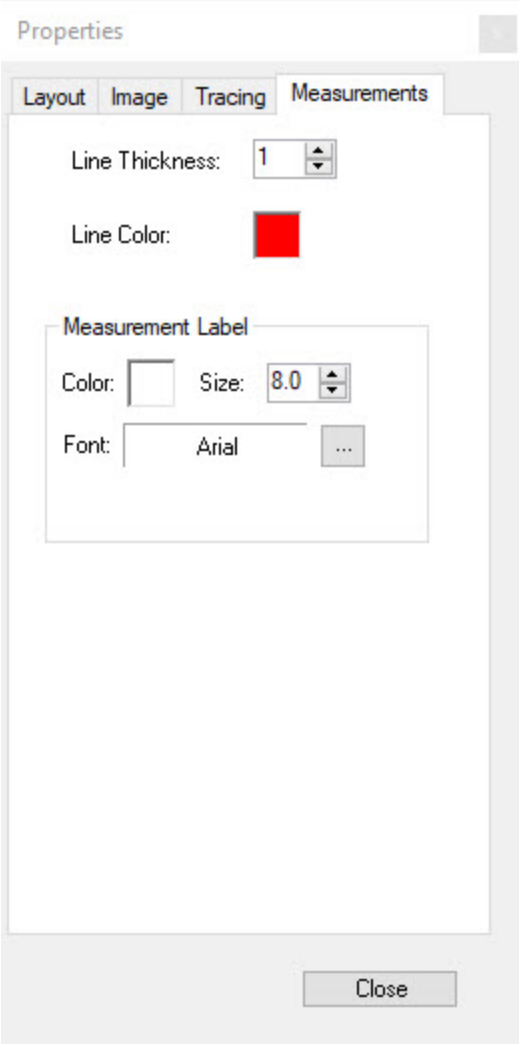


Analysis	Analysis for which to set tracing preferences.
Display	Options for each item on the tracing. **Show Image:** Displays the image along with the tracing. **Show Lines/Curves:** Displays the tracing as defined in the patient’s cephalometric analysis. **Show Tooth Templates:** Displays the templates for the patient’s teeth. **Show Add’l Ceph Structures:** Displays the cephalometric structures. **Color Samples:** Color in which the associated element is displayed. **Tracing line width (mm):** Width in millimeters (mm) for the tracing lines.
Measurements	Options for displaying measurements on the tracing: **Show Measurements:** Displays measurement numbers as defined in the patient’s cephalometric analysis. **Font:** Font for the measurement numbers. • **...:** Opens the Font dialog box so you can change the font. For more information, see “Setting Font Options” on page 3-50. **Font Size:** Font size for the measurement numbers.

Measurements Tab

On this tab, you can set options for displaying measurements on the image.

Line Thickness	Thickness of the measurement lines.
Line Color	Color to use for the measurement lines.
Measurements Label	Options for displaying measurement labels on the image: **Color:** Color of the label text. **Size:** Font size for the label text. **Font:** Font selected for the label text. **...:** Opens the Font dialog box so you can change the font. For more information, see "Setting Font Options" on page 3-50.



Using Text Labels

With text labels, you can add static text to your layout and you can pull in data from the current patient's record, such as the patient's name and age. You can also add other variable information such as a print date.

To add a text label:

1 Click .

Or,

Select **Label** from the **Insert** menu.

Or,

Right-click the layout, and select **Add Label** from the context menu.

Your cursor changes to a label-drawing icon ( ).

2 Click and drag to draw a text label placeholder of the size you want.

3 Double-click the text label placeholder.

Or,

Right-click the text label placeholder, and select **Properties** from the context menu.

The Properties dialog box opens.

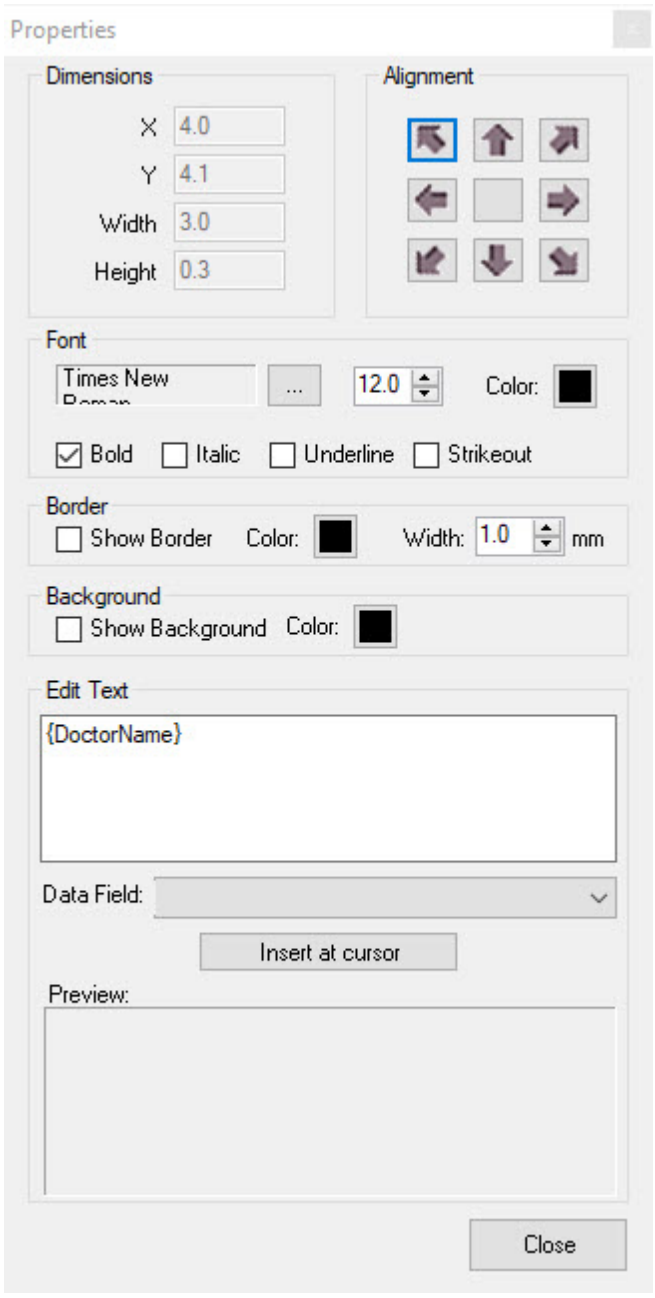
4 (Optional) Enter any static text you want to appear for this label in the **Edit Text** box.

5 (Optional) In the **Edit Text** box, place the cursor where you want to insert data from the patient record or other variable information (such as the date). Then, select a data field from the **Data Field** drop-down list, and click **Insert at cursor** to insert that data field at the current cursor location.

The **Preview** box shows the text that will appear for this text label when the selected data fields are replaced with the appropriate data.

Note: *If one or more data fields in a label reference data in a patient's record (such as the patient's name, age, or doctor) or data specific to a particular image (such as the image title or analysis), you need to link the label to a patient image so that the data fields can be replaced by the appropriate information. For more information, see "Linking Labels to an Image" on page 17-24.*

6 Set any other properties for the text label. Then, click **Close**.



Dimensions	Current position, height, and width of the text label. **X:** Horizontal distance, in inches, from the left side of the text label to the left side of the page. **Y:** Vertical distance, in inches, from the top of the text label to the top of the page. **Width:** Width of the text label in inches. **Height:** Height of the text label in inches.
Alignment	Aligns the text label within its placeholder.

Font	Font for the text label. **Text box:** Displays the font selected for the text label. **...:** Opens the Font dialog box so you can change the font. For more information, see “Setting Font Options” on page 3-50. **spinner:** Sets the font size. **Color:** Color of the text. **Bold:** Applies boldface to the text label. **Italic:** Applies italics to the text label. **Underline:** Underlines the text label. **Strikeout:** Strikes out the text label.
Border	Options for placing a border around the text label. **Show Border:** Displays a border around the text label. **Border Color:** Color of the text label border. **Width:** Width of the border in millimeters (mm).
Background	Options for using a background color to set off the label. **Show Background:** Adds a background color. **Color:** Background color to use.
Edit Text	Text for this label. **Text Box:** Text for this label. **Data Field:** Data field from the patient record or other variable data. **Insert at cursor:** Inserts the selected data field at the current cursor location in the field. **Preview:** Shows a preview of the text that will appear for this text label when the data fields are replaced with the appropriate data.

To toggle display of all text labels:

1 Select **Show Labels** from the **View** menu to show all the text labels.

Or,

Select **Hide Labels** from the **View** menu to hide all the text labels.

Hiding labels is useful, for example, to hide patient information for privacy reasons.

To set the horizontal alignment of the text in a label placeholder:

1 Right-click the text label.

2 Select **Horizontal Alignment** from the context menu.

3 Select **Left** from the sub-menu to align the text to the left.

Or,

Select **Center** from the sub-menu to align the text in the center.

Or,

Select **Right** from the sub-menu to align the text to the right.

To set the vertical alignment of the text in a label placeholder:

1 Right-click the text label.

2 Select **Vertical Alignment** from the context menu.

3 Select **Top** from the sub-menu to align the text on the top.

Or,

Select **Center** from the sub-menu to align the text in the center.

Or,

Select **Bottom** from the sub-menu to align the text on the bottom.

Linking Labels to an Image

If one or more data fields in a label reference data in a patient's record (such as the patient's name, age, or doctor) or data specific to a particular image (such as the image title or analysis), you need to link the label to a patient image so that the data fields can be replaced by the appropriate information. You can link more than one text label to a particular image in a single step.

To link one or more text labels to an image:

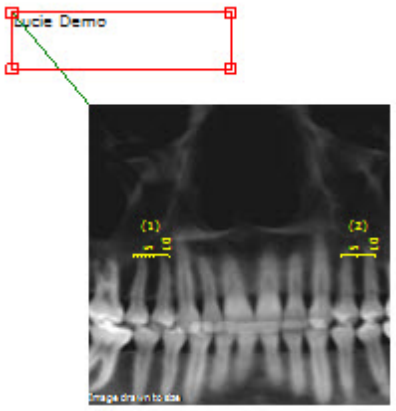
1 Click an object that you want to link. Then, CTRL+click other objects to select them as well.

You can select several text labels, but only one image.

Note: *If you select a label that is already linked to an image, the existing link will be replaced by the new link you are creating.*

2 Select **Link Labels** to Image from the **Tools** menu.

A line appears between each text label and the image.



To remove the link between one or more text labels and an image:

1 Click a text label that you want to unlink.

2 Optionally, CTRL+click other text labels to select them as well.

3 Select **Unlink Labels** from Image from the **Tools** menu.

Using Measurements Tables

To add a measurements table to your layout:

1 Select **Measurements Table** from the **Insert** menu.

Your cursor changes to a placeholder-drawing icon ( ).

2 Click and drag to draw an placeholder of the size you want for this measurements table.

3 Right-click the placeholder.

4 Select **Analysis** from the context menu. Then, select the type of analysis you want to use from the cascade menu.

5 Optionally, right-click the placeholder, and select any other options you want for this table from the context menu.

For example, you can toggle the display of measurement values and the polygon/wiggle-gram on the table.

You can also set the analysis and other options for a measurements table placeholder by setting its properties.

To set properties for a measurements table:

1 Right-click the placeholder, and select **Properties** from the context menu

2 Set any properties for the measurements table.

For more information, see “Setting Measurement Table Properties” on page 8-8.

Using Annotations

With annotations, you can add lines, arrows, ellipses, and rectangles to your layout. You can also add text labels as described in “Using Text Labels” on page 17-20

To add a line:

1 Click . Then, select **Line** from the context menu.

Your cursor changes to a drawing icon ( ).

2 Click and drag to draw the line.

You can set the line's color, thickness, or style (solid, dashed, or dashed-dotted) by setting its properties. For more information, see “Setting Image Properties” on page 17-16.

To make the line horizontal or vertical and lock it that way:

1 Right-click the line, and select **Lock Orientation** from the context menu.

2 Select **Horizontal** from the sub-menu to lock the line in a horizontal orientation.

Or,

Select **Vertical** from the sub-menu to lock the line in a vertical orientation.

At this point, you can move the line and it will stay in its locked orientation.

To add an arrow:

1 Click . Then, select **Arrow** from the context menu.

Your cursor changes to a drawing icon ( ).

2 Click and drag to draw the arrow.

You can set the arrow's color, thickness, style (solid, dashed, or dashed-dotted), and arrowhead characteristics by setting its properties. For more information, see “Setting Image Properties” on page 17-16.

To make the arrow horizontal or vertical and lock it that way:

1 Right-click the arrow, and select **Lock Orientation** from the context menu.

2 Select **Horizontal** from the sub-menu to lock the arrow in a horizontal orientation.

Or,

Select **Vertical** from the sub-menu to lock the arrow in a vertical orientation.

At this point, you can move the arrow and it will stay in its locked orientation.

To add an ellipse:

1 Click . Then, select **Ellipse** from the context menu.

Your cursor changes to a drawing icon ( ).

2 Click and drag to draw the ellipse.

You can set the ellipse's line color, thickness, or style (solid, dashed, or dashed-dotted) by setting its properties. For more information, see “Setting Image Properties” on page 17-16.

To add a rectangle:

1 Click . Then, select **Rectangle** from the context menu.

Your cursor changes to a drawing icon ( ).

2 Click and drag to draw the rectangle.

You can set the rectangle's line color, thickness, or style (solid, dashed, or dashed-dotted) by setting its properties. For more information, see “Setting Image Properties” on page 17-16.

To change the shape of an annotation:

1 Right-click the annotation.

2 Select **Shape** from the context menu. Then, select the shape you want from the sub-menu.

You can also change an annotation's shape by setting its properties (see “Setting Annotation Properties” below).

Setting Annotation Properties

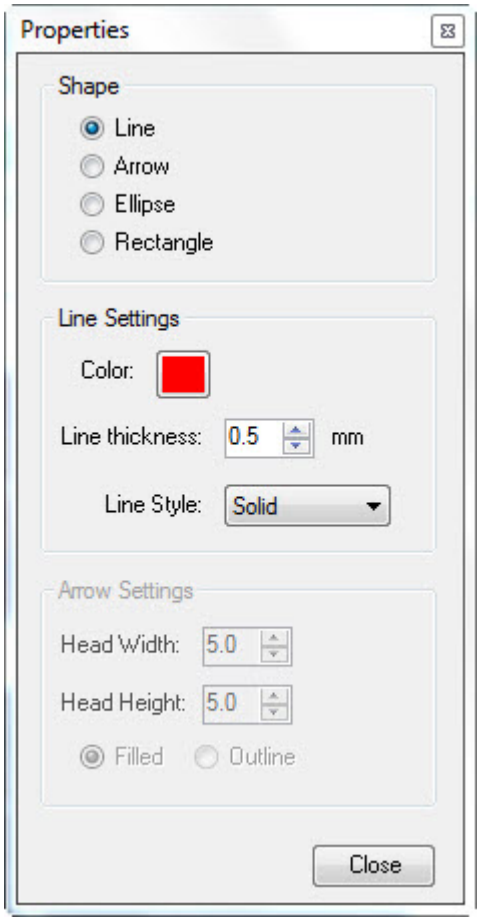
Once you have drawn a line, arrow, ellipse, or rectangle, you can set its properties to specify the line color, thickness, or style (solid, dashed, or dashed-dotted). In the case of arrows, you also can set the arrowhead characteristics.

To set annotation properties:

1 Double-click the annotation.

The Properties dialog box opens.

2 Set any properties for the annotation. Then, click **Close**.



Shape	Annotation shape (line, arrow, ellipse, or rectangle).
Line Settings	Options for the line or lines used to draw the annotation. **Color:** Annotation's color. **Thickness:** Width of the line or lines in millimeters (mm). **Line Style:** Line style (solid, dashed, or dashed-dotted).
Arrow Settings	Arrowhead characteristics. Available for arrows. **Head Width:** Width of the arrowhead in millimeters (mm). **Head Length:** Length of the arrowhead in millimeters (mm). **Filled:** Solid arrowhead. **Outline:** Outlined arrowhead.

Resizing Objects

To resize a single object, you can click and drag its resizing handles as described in “Using the Resizing Handles” below, or you can set its properties. You also can set several objects to be the same size.

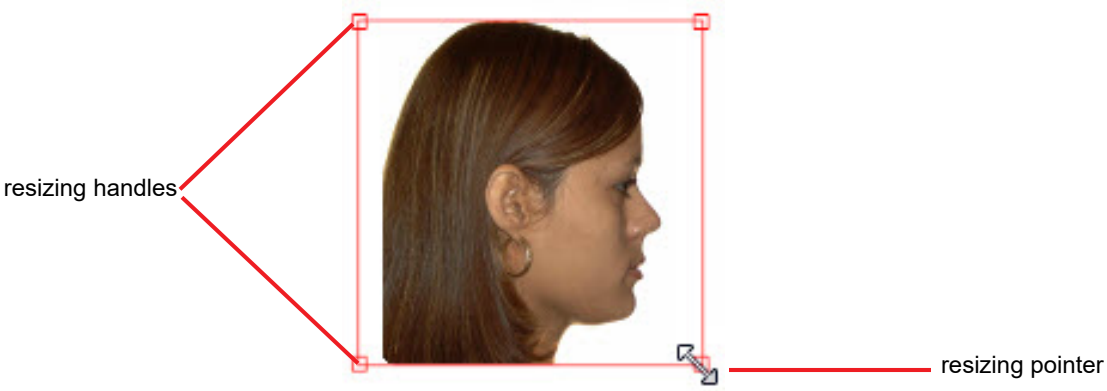
Note: *You can also use the object properties to specify the size of an object. For more information, see “Using Text Labels” on page 17-20 and “Setting Image Properties” on page 17-16.*

Using the Resizing Handles

To resize an object using the resizing handles:

1 Click and drag one of the resizing handles to resize the object.

When you place your mouse pointer over a resizing handle, the pointer turns into a double-headed arrow.



Making Several Objects the Same Size

To make several objects the same size:

1 Click one of the objects that you want to resize.

2 CTRL+click the other objects that you want to resize.

Select the object to which you want to resize the other objects first. The objects you subsequently select will be resized to match the object you selected first.

3 Click to make the objects the same width.

Or,

Select **Make Same Size** from the **Format** menu. Then, select **Width** from the sub-menu to make the objects the same width.

Or,

Click to make the objects the same height.

Or,

Select **Make Same Size** from the **Format** menu. Then, select **Height** from the sub-menu to make the objects the same height.

Or,

Click to make the objects the same width and height.

Or,

Select **Make Same Size** from the **Format** menu. Then, select **Both** from the sub-menu to make the objects the same width and height.

Repositioning Objects

To reposition objects, you can click and drag them, align them with each other, or center them on the page. You can reposition a single object by clicking and dragging or by setting its properties (see “Using Text Labels” on page 17-20).

You can also use the object properties to reposition an object. For more information, see “Using Text Labels” on page 17-20 and “Setting Image Properties” on page 17-16.

You also can change the layering of objects to control how they overlap. For more information, see “Changing Object Layering” on page 17-34.

Clicking and Dragging Objects

To move a single object:

1 Click and drag the object to a new position.

To move several objects:

1 Click one of the objects that you want to move. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects in this layout.

2 Click and drag the objects to a new position.

Aligning Objects

You can align several objects with each other or with the page margins.

To align two or more objects:

1 Click one of the objects that you want to align.

2 CTRL+click the other objects that you want to align.

Select the object to which you want to align the other objects first.

3 Click to align the left sides of the objects.

Or,

Select **Align** from the **Format** menu. Then, select **Left** from the sub-menu to align the left sides of the objects.

Or,

Click to align the right sides of the objects.

Or,

Select **Align** from the **Format** menu. Then, select **Right** from the sub-menu to align the right sides of the objects.

Or,

Click to align the tops of the objects.

Or,

Select **Align** from the **Format** menu. Then, select **Top** from the sub-menu to align the tops of the objects.

Or,

Click to align the bottoms of the objects.

Or,

Select **Align** from the **Format** menu. Then, select **Bottom** from the sub-menu to align the bottoms of the objects.

To align the objects to that page margin:

1 Click the object that you want to align to the page margin.

2 Optionally, CTRL+click the other objects that you want move when aligning the first-selected object to the page margin.

If you select more than one object, the objects retain their placement relative to each other when the object selected first is aligned to the margin.

3 Select **Snap To** from the **Format** menu.

4 Select **Margin**, then select **Left**, **Right**, **Top**, or **Bottom** to align to that page margin.

Or,

Select **Printer Hard Margin**. Then, select **Left**, **Right**, **Top**, or **Bottom** to align to that printer hard margin.

If you have specified a printer on the Page Setup dialog box, the hard margins specify how close to the paper edge the specified printer can print. Otherwise, the hard margins are at the paper edges.

Centering Objects

You can center one or more objects horizontally or vertically.

To center objects:

1 Click an object that you want to center.

Or,

Click an object that you want to center. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects.

2 Select **Center** from the **Format** menu.

3 Select **Horizontally** from the sub-menu to center horizontally.

Or,

Select **Vertically** from the sub-menu to center vertically.

Changing Object Spacing

You can change the spacing of objects either horizontally or vertically.

To change the horizontal spacing of several objects:

1 Click and drag to select several adjacent objects.

Or,

Click one of the objects that you want to select. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects.

2 Select **Horizontal Spacing** from the **Format** menu.

3 Select **Make Equal** to space the selected objects evenly.

Or,

Select **Increase** to increase the space between the selected objects.

Or,

Select **Decrease** to decrease the space between the selected objects.

Or,

Select **Remove** to remove the space between the selected objects, making them flush with each other.

To change the vertical spacing of several objects:

1 Click and drag to select several adjacent objects.

Or,

Click one of the objects that you want to select. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects.

2 Select **Vertical Spacing** from the **Format** menu.

3 Select **Make Equal** to space the selected objects evenly.

Or,

Select **Increase** to increase the space between the selected objects.

Or,

Select **Decrease** to decrease the space between the selected objects.

Or,

Select **Remove** to remove the space between the selected objects, making them flush with each other.

Changing Object Layering

You can change the layering of objects to control how they overlap.

To change the layering of objects:

1 Click the object that you want to move to the front or back.

2 Select **Order** from the **Format** menu.

3 Select **Bring to Front** from the sub-menu to bring the selected object to the front.

Or,

Select **Send to Back** to send the selected object to the back.

Deleting Objects

You can delete a single object, or you can delete several objects simultaneously.

To delete a single object:

1 Click an object, and click .

Or,

Right-click an object, and select **Delete** from the context menu to delete it.

Or,

Click an object to select it. Then, press DEL on your keyboard.

Or,

Click an object to select it. Then, select **Delete** from the **Edit** menu.

A dialog box opens asking you to confirm the deletion.

2 Click **Yes** to delete the object.

To delete several objects:

1 Click and drag to select several adjacent objects.

Or,

Click one of the objects that you want to select. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects.

2 Click .

Or,

Select **Delete** from the **Edit** menu.

Or,

Press DEL on your keyboard.

A dialog box opens asking you to confirm the deletion.

3 Click **Yes** to delete the selected objects.

Cutting, Copying, and Pasting Objects

You can cut or copy one or more objects to the clipboard. Then, you can paste them elsewhere in your design.

To cut or copy objects to the clipboard:

1 Click an object to select it.

Or,

Click and drag to select several adjacent objects.

Or,

Click one of the objects that you want to select. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects.

2 Select **Cut** from the **Edit** menu to cut the objects to the clipboard, removing them from their present locations.

Or,

Select **Copy** from the **Edit** menu to copy the objects to the clipboard, leaving them in their present locations.

To paste objects from the clipboard:

1 Select **Paste** from the **Edit** menu to paste the objects from the clipboard into the current location.

Using Object Groups

Grouping objects enables you to combine several objects into a single object. Then, you can use the objects in the group as a unit, or save the object group for later reuse.

To group several objects:

1 Click and drag to select several adjacent objects.

Or,

Click one of the objects that you want to select. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects.

2 Select **Group Objects** from the **Group** menu.

To ungroup the objects in an object group:

1 Click one of the objects in the object group to select the group.

2 Select **Ungroup Objects** from the **Group** menu.

To save an object group for later reuse:

1 Click one of the objects in the object group to select the group.

2 Select **Save Group As...** from the **Group** menu.

The Save Group As dialog box opens.

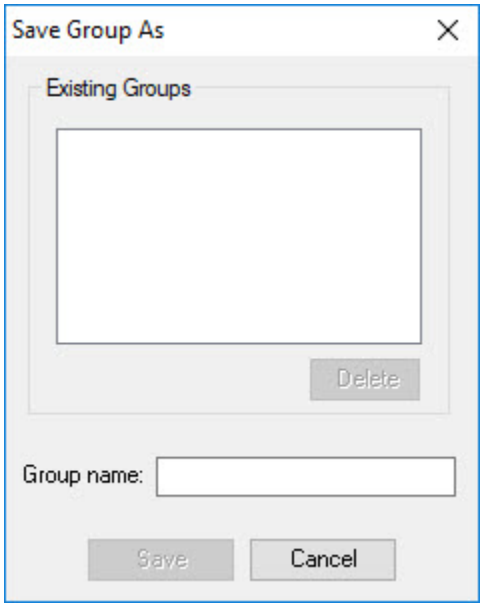
3 Enter a name for this object group in the Group name field.

Or,

Select an object group from the **Existing Groups** list to overwrite an existing object group.

4 Click **Save**.

5 If you are overwriting an existing group, click **Yes** on the confirmation dialog box that appears.



Existing Groups	Lists existing object groups.
Delete	Deletes the selected object group.
Group name	Name to use when saving this object group.
Save	Saves the object group.

To insert a previously saved object group into your design:

1 Select **Insert Group** from the **Groups** menu.

Or,

Select **Group** from the **Insert** menu.

2 Select the object group you want to insert from the sub-menu.

To delete a previously saved object group:

1 Click an object group.

2 Select **Save Group As...** from the **Group** menu.

The Save Group As dialog box opens.

3 Select the object group you want to delete from the **Existing Groups** list.

4 Click **Delete**.

Locking and Unlocking Objects

Locking objects prevents them from being moved or resized, avoiding accidental misalignment of images. You can still change a locked object's properties.

To lock one or more objects:

1 Click an unlocked object to select it.

Or,

Click and drag to select several adjacent unlocked objects.

Or,

Click one of the unlocked objects that you want to select. Then, CTRL+click other unlocked objects to select them as well.

2 Click .

Or,

Right-click and select **Locked** from the context menu.

To unlock one or more objects:

1 Click a locked object to select it.

Or,

Click and drag to select several adjacent locked objects.

Or,

Click one of the locked objects that you want to select. Then, CTRL+click other locked objects to select them as well.

When you select a locked object, the tool bar button has a blue outline.

2 Click .

Or,

Right-click and select **Locked** from the context menu.

Printing Layouts

To print a layout:

1 Click .

Or,

Select **Print** from the **File** menu.

The Print dialog box is displayed.

2 Select any printing options you want, and click **OK**.

For information on the printing options, see “Printing” on page 16-4.

If your layout has multiple pages, you can suppress printing of one or more of them.

To suppress printing of a page:

1 Right-click the page you want to suppress in the page gallery.

2 Select **Exclude Page from Printout** from the context menu.

The icon appears on the page to indicate that the page will not print when you print the layout.

To remove printing suppression for a page:

1 Right-click a page with a icon.

2 Select **Include Page in Printout** from the context menu.

18 Custom Analysis Editor (Medical Device)

You can use the Custom Analysis Editor to create your own 2D or 3D analyses or to specify the landmark digitizing order for any standard or custom analyses.

To create a custom analysis, you select from the following types of analysis items that are currently defined for use in Dolphin Imaging analyses:

- Groups and Measurements: These items are typically listed on measurements tables. Measurements can be the distances between particular landmarks, angles, ratios, and so on. The groups categorize related measurements.
- Tracing Lines: These lines identify the structures that Dolphin Imaging can automatically draw when you digitize a patient's x-ray using a particular analysis.
- Misc. Landmarks: These landmarks are included in the analysis but are not used to create measurements and tracing lines.

You can also create your own custom measurements, tracing lines, and landmarks.

Using the Custom Analysis Editor, you can arrange and group these items, define custom norms for them, define properties for them such as whether they should appear on the measurements tables and tracings, where they should appear on tracings, and what colors to use for them.

Your custom analyses are stored on your Dolphin server, so the custom analyses you create are available on all workstations on your network. Upgrading Dolphin Imaging does not overwrite your custom analyses.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Imaging Configuration (Page Setup, Layout, Custom Analysis, etc.) privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Opening the Custom Analysis Editor

To open the Custom Analysis Editor:

1 Select **Custom Analysis** from the **Edit** menu or the **Tools** menu on the main screen.

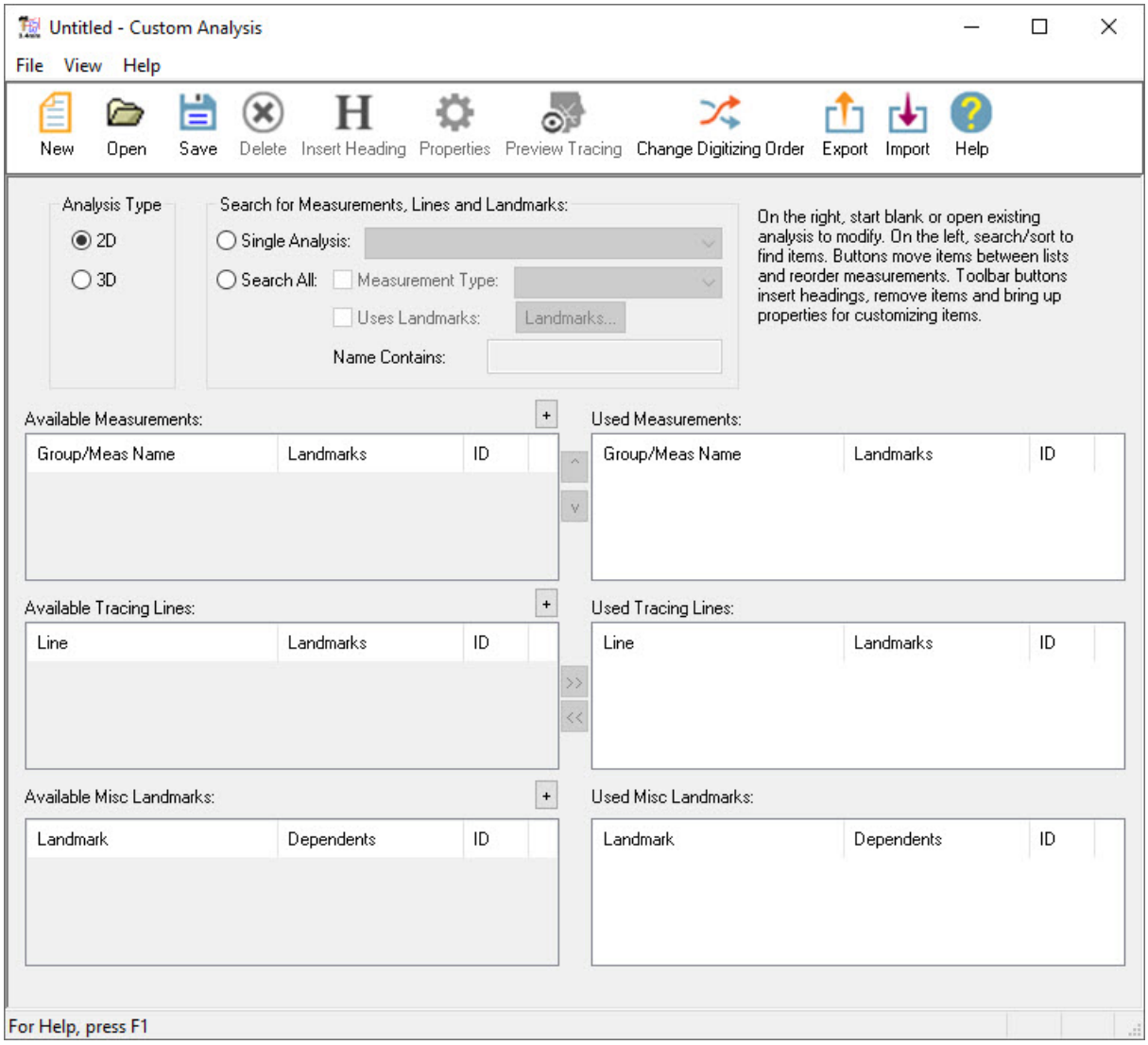
Or,

Click on the Digitize Setup dialog box.

Or,

Click on the Measurements dialog box.

The following figure illustrates the Custom Analysis Editor dialog box:



Analysis Type	The type (**2D** or **3D**) of the custom analysis you are editing.
Search for Measurements, Lines and Landmarks	Searches through the existing analyses for the measurements, tracing lines, and landmarks to use in your custom analysis.
Available Measurements	Measurements that you can add to your custom analysis. + : Add a custom measurement. For more information, see “Creating a Custom Measurement” on page 18-15.

Available Tracing Lines	Tracing lines that you can add to your custom analysis. +: Add a custom tracing line. For more information, see “Creating a Custom Tracing Line” on page 18-21.
Available Misc. Landmarks	Miscellaneous landmarks that you can add to your custom analysis. +: Add a custom landmark. For more information, see “Creating a Custom Landmark for a 2D Analysis” on page 18-22.
^	Moves the selected measurement up in the list.
v	Moves the selected measurement down in the list.
>>	Adds the selected item to your custom analysis.
<<	Removes the selected item from your custom analysis.
Used Measurements	Measurements selected for your custom analysis.
Used Tracing Lines	Tracing lines selected for your custom analysis
Used Misc. Landmarks	Landmarks selected for your custom analysis.

Using the Custom Analysis Editor Tool Bar

The Custom Analysis Editor tool bar contains the following buttons:

New	Creates a new custom analysis. For more information, see “Creating a New Custom Analysis” on page 18-6.
Open	Opens an existing analysis. For more information, see “Opening an Existing Analysis” on page 18-6.
Save	Saves the current custom analysis. For more information, see “Saving a Custom Analysis” on page 18-13.
Delete	Removes the selected item from your custom analysis, or deletes the selected custom measurement, tracing line, or landmark. For more information, see “Removing Items from a Custom Analysis” on page 18-12 and “Deleting a Custom Measurement, Tracing Line, or Landmark” on page 18-25.
H Insert Heading	Inserts a group heading into your custom analysis above the currently selected measurement item. This heading appears on the measurements table. For more information, see “Adding Custom Headings” on page 18-12.

Properties	Opens the properties dialog box for the selected item. For more information, see “Setting Analysis Item Properties” on page 18-26.
Preview Tracing	Previews a tracing using your custom analysis. For more information, see “Previewing a Custom Analysis” on page 18-14.
Change Digitizing Order	Sets the landmark digitizing order for any standard or custom analysis. For more information, see “Specifying the Digitize Order” on page 18-10.
Export	Exports a custom analysis and its associated measurements, lines, and landmarks to a file so that they can be imported into Dolphin Imaging on another computer. For more information, see “Exporting and Importing Custom Analyses” on page 18-32.
Import	Imports a previously exported custom analysis. For more information, see “Exporting and Importing Custom Analyses” on page 18-32.
Help	Provides general information about the Custom Analysis Editor.

Using the Menu Bar

At the top of the Custom Analysis Editor dialog box, there are three menus that you can use to access program features.

- **File** menu
- **View** menu
- **Help** menu

The File Menu

The **File** menu contains the following choices:

New	Creates a new, blank custom analysis. For more information, see “Creating a New Custom Analysis” on page 18-6.
Open	Opens an existing custom analysis. For more information, see “Opening an Existing Analysis” on page 18-6.
Save	Saves the current custom analysis. For more information, see “Saving a Custom Analysis” on page 18-13.

Save As...	Saves the current custom analysis using a new file name. For more information, see “Saving a Custom Analysis” on page 18-13.
Delete	Removes the selected item from your custom analysis. For more information, see “Removing Items from a Custom Analysis” on page 18-12.
Insert Heading	Inserts a group heading into your custom analysis above the currently selected measurement item. This heading appears on the measurements table. For more information, see “Adding Custom Headings” on page 18-12.
Properties	Opens the properties dialog box for the selected item. For more information, see “Setting Analysis Item Properties” on page 18-26.
Preview	Previews a tracing using your custom analysis. For more information, see “Previewing a Custom Analysis” on page 18-14.
Digitize Order	Sets the landmark digitizing order for any standard or custom analysis. For more information, see “Specifying the Digitize Order” on page 18-10.
Export Custom Analyses	Exports a custom analysis and its associated measurements, lines, and landmarks to a file so that they can be imported into Dolphin Imaging on another computer. For more information, see “Exporting and Importing Custom Analyses” on page 18-32.
Import Custom Analyses	Imports a previously exported custom analysis. For more information, see “Exporting and Importing Custom Analyses” on page 18-32.
Recent File	Opens the identified, previously created custom analysis. For more information, see “Opening an Existing Analysis” on page 18-6
Exit	Closes the Custom Analysis Editor dialog box.

The View Menu

The **View** menu contains the following choices:

Toolbar	Toggles display of the tool bar.
Status Bar	Toggles display of the status bar.

The Help Menu

The **Help** menu contains the following choices:

Help Topics	Opens the online help.
About Dolphin Imaging	Opens a dialog box that provides the Dolphin Imaging program version and information on contacting Dolphin.

Editing Analyses

On the Custom Analysis Editor dialog box, you can create a new custom analysis or open and edit an existing one.

Creating a New Custom Analysis

To create a new custom analysis:

1 Click

to create a new custom analysis.

Or,

Select **New** from the **File** menu.

At this point, you can define your analysis by adding items to it.

Opening an Existing Analysis

To open an existing analysis:

1 Click

.

Or,

Select **Open...** from the **File** menu.

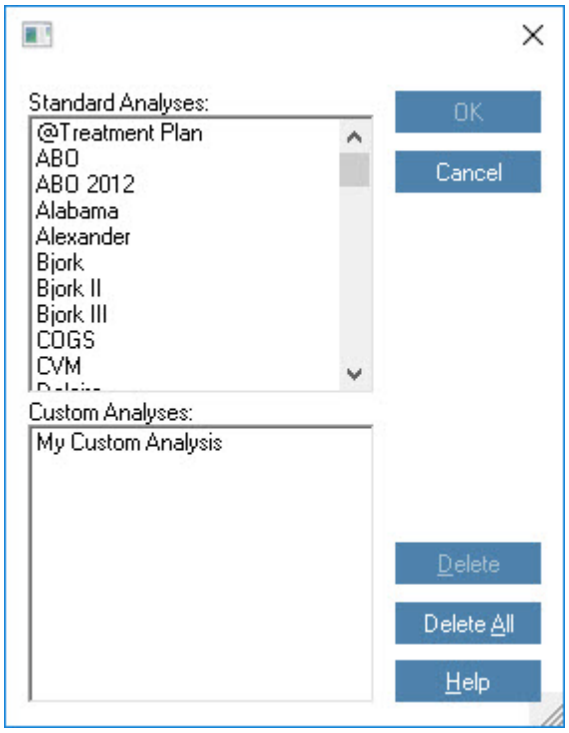
Or,

Select the analysis from the list of recently opened files on the **File** menu.

If you selected the analysis from the list of recently opened files on the **File** menu, the analysis opens and you should skip the next step. Otherwise, the Open Analysis dialog box appears listing the standard analyses and any custom analyses you have created.

2 Select the analysis you want to open, and click **OK**.

When you open an existing analysis, the **Used Measurements**, **Used Tracing Lines**, and **Used Misc. Landmarks** lists show the analysis items that the analysis currently contains. At this point, you can add items to or remove items from the analysis.



Selecting the Analysis Type

The first step in creating a custom analysis is to select the type of analysis you want to create. You can create 2D or 3D custom analyses.

To select the analysis type:

1 Select **2D** to create a 2D analysis.

Or,

Select **3D** to create a 3D analysis.

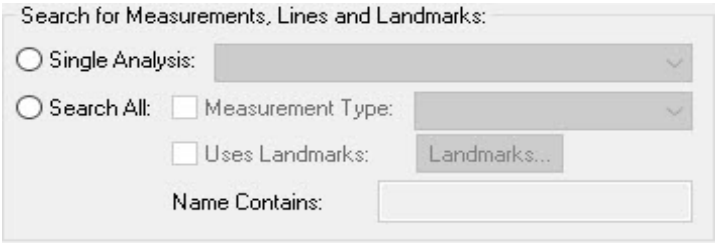
Finding an Analysis Item

Your custom analysis can include analysis items that are currently defined for use in Dolphin Imaging analyses or custom analysis items that you have defined (see “Creating Custom Analysis Items” on page 18-15). Analysis items are grouped into the following categories:

- Groups and Measurements: These items are typically listed on measurements tables. Measurements can be the distances between particular landmarks, angles, ratios, and so on. The groups categorize related measurements.
- Tracing Lines: These lines identify the structures that Dolphin Imaging can automatically draw when you digitize a patient's x-ray using a particular analysis.
- Misc. Landmarks: These landmarks are included in the analysis but are not used to create measurements and tracing lines.

If you need an analysis item that is not currently defined for use in Dolphin Imaging analyses, you can create a custom one as described in “Creating Custom Analysis Items” on page 18-15.

To find an analysis item, you use the Search for Measurements, Lines and Landmarks group box.



Single Analysis	Lists the available analysis items used in the selected analysis.
Search All	Finds an analysis item based on one or more of the following criteria: **Measurement Type:** Finds measurements of a particular type. You can view measurements that are distances, angles, percentages (ratios), or measurements of any other type. **Uses Landmarks:** Finds an analysis item that uses one or more landmarks. **Name Contains:** Finds an analysis item based on a partial name.

To find an analysis item if you know the name of an existing analysis that includes it:

1 Select **Single Analysis**.

2 Select the analysis containing the item you want to use from the drop-down list.

To find a measurement based on measurement type:

1 Select **Search All**.

2 Check the **Measurement Type** box.

3 Select the type of measurement from the **Measurement Type** drop-down list.

The **Available Measurements** list shows measurements of the type you selected.

To find an analysis element that uses particular landmarks:

1 Select **Search All**.

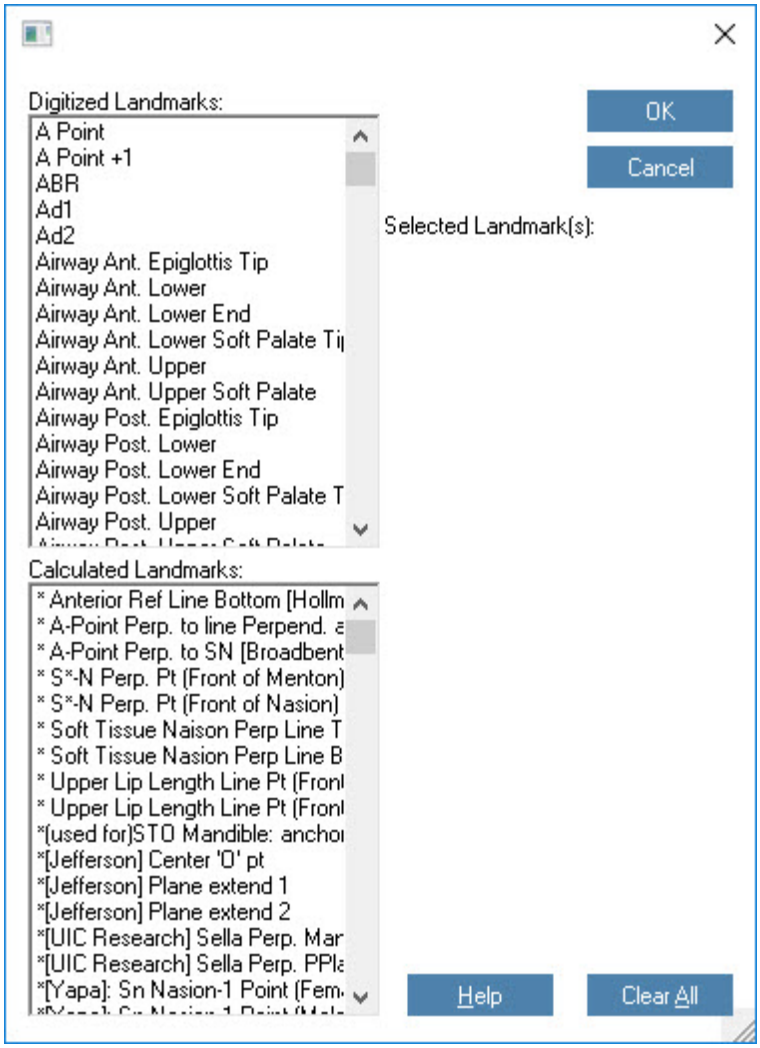
2 Check the **Uses Landmarks** box.

3 Click **Landmarks...**.

The Select Landmark(s) dialog box is displayed.

4 Select one or more landmarks, and click **OK**.

The **Available Measurements**, **Available Tracing Lines**, and **Available Misc. Landmarks** lists display analysis items that use the landmarks you selected.



Landmarks	Landmarks for which you can search.
Clear All	Deselects all selected landmarks.

To find an analysis item based on its name:

1 Enter a partial name in the **Name Contains** field.

The **Available Measurements**, **Available Tracing Lines**, and **Available Misc. Landmarks** lists show analysis items whose names match your entry.

To find an analysis item based on several criteria:

1 Select **Search All**.

2 Use any combination of the three searching strategies described above.

The **Available Measurements**, **Available Tracing Lines**, and **Available Misc. Landmarks** lists show analysis items that meet all the search criteria you entered.

To re-sort available analysis items in the lists:

1 Click the column heading in the **Available Measurements**, **Available Tracing Lines**, or **Available Misc. Landmarks** list to re-sort the analysis items in that list using that property.

For example, to sort the available tracing lines by ID, click the **ID** column heading in the **Available Tracing Lines** list.

Specifying the Digitize Order

For any standard or custom analysis, you can specify the order in which the landmarks are digitized. The order that you specify applies to all workstations on your network.

To specify the digitize order:

1 Click

on the Custom Analysis Editor tool bar.

Or,

Select **Digitize Order** from the **File** menu.

The Landmark Digitizing Order dialog box appears.

2 Drag and drop landmarks in the list to reorder them.

Or,

Select a landmark, and click to move it up in the list.

Or,

Select a landmark, and click to move it down in the list.

To return to the default landmark digitizing order:

1 Click **Restore Default Order**.

Adding Items to a Custom Analysis

Your custom analysis can include analysis items that are currently defined for use in Dolphin Imaging analyses or custom analysis items that you have defined. For information on how to find an Dolphin-defined analysis item, see “Finding an Analysis Item” on page 18-7. For information on how to define your own analysis item, see “Creating Custom Analysis Items” on page 18-15).

To add an item to a custom analysis:

1 Select the analysis item from the **Available Measurements**, **Available Tracing Lines**, or **Available Misc. Landmarks** list. Then, click >> to add the selected analysis item to your custom analysis.

Or,

Double-click the analysis item in the **Available Measurements**, **Available Tracing Lines**, or **Available Misc. Landmarks** list.

Or,

Drag the analysis item from the **Available Measurements**, **Available Tracing Lines**, or **Available Misc. Landmarks** list and drop it in the **Used Measurements**, **Used Tracing Lines**, or **Used Misc. Landmarks** list.

Or,

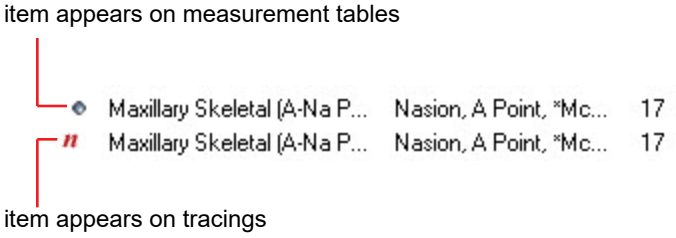
Right-click the analysis item in the **Available Measurements**, **Available Tracing Lines**, or **Available Misc. Landmarks** list. Then, select **Add** from the context menu to add the selected analysis item to your custom analysis.

If the analysis item you want to add is not listed in one of these lists, you can search existing analyses for it as described in “Finding an Analysis Item” on page 18-7. If you need an analysis item that is not already defined for use in an existing analysis, you can create a custom analysis item as described in “Creating Custom Analysis Items” on page 18-15.

To select several items that are adjacent in a list, click the item at the top of the group. Then, SHIFT+click the item at the bottom of the group.

To select several item that are not adjacent in a list, click the first item. Then, CTRL+click the other items you want to select.

When you add an item to your custom analysis, the selected item moves to the **Used Measurements**, **Used Tracing Lines**, or **Used Misc. Landmarks** list, as appropriate. If the item is a measurement, a symbol in the left column indicates whether the item will appear on measurement tables or tracings. If the measurement's properties specify that it should appear on both, the item appears twice in the list.



Removing Items from a Custom Analysis

To remove an item from a custom analysis:

1 Select the analysis item from the **Used Measurements**, **Used Tracing Lines**, or **Used Misc. Landmarks** list.

2 Click << to remove the selected analysis item from your custom analysis.

Or,

Click

to remove the selected analysis item from your custom analysis.

Or,

Drag the analysis item from the **Used Measurements**, **Used Tracing Lines**, or **Used Misc. Landmarks** list and drop it in the **Available Measurements**, **Available Tracing Lines**, or **Available Misc. Landmarks** list.

Alternatively, right-click an analysis item from the **Used Measurements**, **Used Tracing Lines**, or **Used Misc. Landmarks** list. Then, select **Remove** from the context menu.

The selected item moves to the **Available Measurements**, **Available Tracing Lines**, or **Available Misc. Landmarks** list, as appropriate.

Adding Custom Headings

To add a custom heading:

1 Select the item in the **Used Measurements** list above which you want to add the custom heading.

You must have at least one item in the **Used Measurements** list before you can add a custom heading.

2 Click

.

Or,

Select **Insert Heading** from the **File** menu.

The Measurement Group Heading dialog box is displayed.

3 Type the name for this heading, and click **OK**.

The custom heading is added to the **Used Measurements** list.

Note: *If a heading is already in an existing analysis, you can find it and add it to your custom analysis just like any other analysis item.*

To change a custom heading, you can set its properties. For more information, see “Setting Properties for a Custom Heading” on page 18-26.

Reordering Measurements

To change the order of measurements in your custom analysis:

1 Drag and drop measurement in the **Used Measurements** list.

Or,

Select a measurement in the **Used Measurements** list. Then, click to move it up in the list.

Or,

Select a measurement in the **Used Measurements** list. Then, click to move it down in the list.

Or,

Right-click a measurement in the **Used Measurements** list. Then, select **Move Up** from the context menu to move it up in the list.

Or,

Right-click a measurement in the **Used Measurements** list. Then, select **Move Down** from the context menu to move it up in the list.

Saving a Custom Analysis

When you save a custom analysis, you save all the settings, give the analysis a name, and make it available for use in other parts of the Dolphin Imaging program such as Digitize Setup, Measurements, and so on.

To save a custom analysis:

1 Click

.

Or,

Select **Save** from the **File** menu.

Or,

Select **Save As...** from the **File** menu.

If you have not previously saved this custom analysis or you selected **Save As...** from the **File** menu, the Analysis Save As dialog box opens so that you can provide a name for this analysis.

2 In the Analysis Save As dialog box, enter a name for this custom analysis. Then, click **OK**.

Note: *You cannot save a custom analysis using the same name as one of the existing Dolphin-provided or custom analyses. This feature prevents you from accidentally modifying an existing analysis.*

Previewing a Custom Analysis

To preview your custom analysis:

1 Save your custom analysis if you haven't already done so.

2 Click

.

Or,

Select **Preview** from the **File** menu.

The Tracing Preview window opens. It shows a tracing created using your custom analysis. You can resize the window for a larger view.

The Tracing Preview window uses a Dolphin layout object to display the preview. If you want, you can set properties for this Dolphin layout object. For example, you can select a different patient or timepoint to use for the preview, set different display options, and so on.

To open the Layout Control Properties dialog box:

1 Click the Tracing Preview window.

The Layout Control Properties dialog box opens. For more information, see “Setting Properties” on page 16-30.

Creating Custom Analysis Items

If you need an analysis item that is not currently defined for use in Dolphin Imaging analyses, you can create one of the following:

- A custom measurement: Measurements are typically listed on measurements tables. Custom measurements can be the distances or angles. For information on creating custom measurements, see “Creating a Custom Measurement” below.
- A custom tracing line: Tracing lines identify the structures that Dolphin Imaging can automatically draw when you digitize a patient's x-ray using a particular analysis. For information on creating custom tracing lines, see “Creating a Custom Tracing Line” on page 18-21.
- A custom landmark: Landmarks identify a particular location on the patient’s anatomy. You can include your custom landmarks in your custom analyses, but they are not used to create measurements and tracing lines. For information on creating custom landmarks, see “Creating a Custom Landmark for a 2D Analysis” on page 18-22.

For information on using analysis items that are already defined for use in Dolphin Imaging analyses, see “Finding an Analysis Item” on page 18-7.

Creating a Custom Measurement

Measurements are typically listed on measurements tables. A custom measurement can be

- the distance between two landmarks
- the angle between two lines that don’t necessarily meet
- a perpendicular distance, which is the distance between a landmark and a line drawn between two other landmarks

To create a custom measurement:

1 Click + above the **Available Measurements** list.

The Custom Measurement dialog box appears.

2 Enter a name for this measurement.

3 Select the type of measurement (**Angle**, **Distance**, or **Perpendicular Distance**).

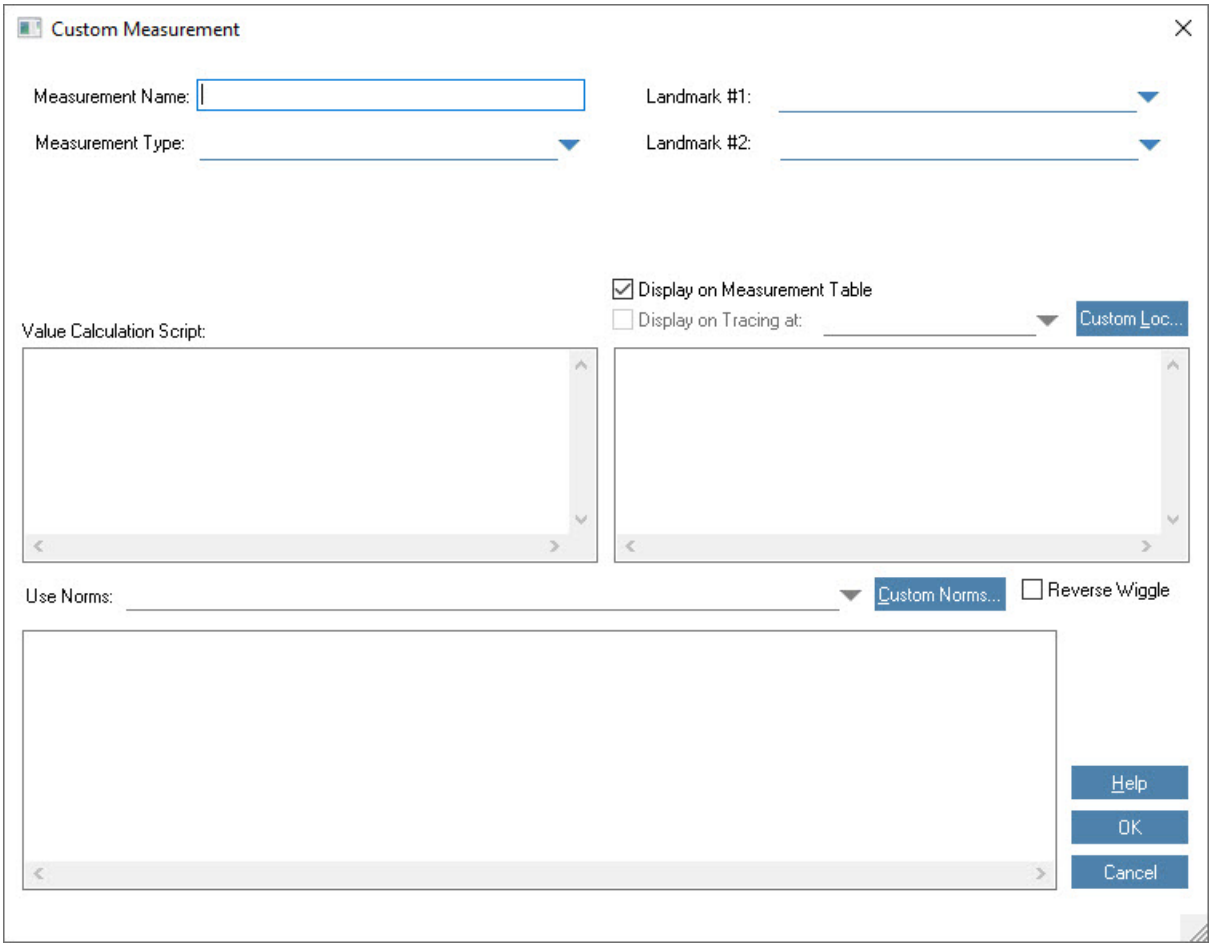
4 Select the landmarks to use when calculating this measurement.

- If you selected **Angle** as the measurement type, select the end points of one line as **Landmark #1** and **Landmark #2**, and the end points of a second line as **Landmark #3** and **Landmark #4**.
- If you selected **Distance** as the measurement type, select two landmarks to use as end points for the distance measurement.
- If you selected **Perpendicular Distance** as the measurement type, select two landmarks to use as end points for a line as **Landmark #1** and **Landmark #2**. Select the landmark to use when measuring the distance from that line as **Landmark #3**.

5 Click **Custom Norms...** to define a set of norms to use for this measurement as described in “Defining a Set of Custom Norms” on page 18-19.

6 Click **OK**.

Your custom measurement is added to the **Available Measurements** list so that you can use it in your custom analysis.



Measurement Name	Name for this custom measurement.
Measurement Type	Type of value being measured: **Angle:** The number of degrees between two lines, each of which is defined by two landmarks. **Distance:** The distance between two identified landmarks. **Perpendicular Distance:** The distance from one landmark to a line drawn between two other landmarks.
Landmark *n*	A landmark used in calculating this measurement. The number of landmarks you need to specify depends on the measurement type (see above).
Display on Measurement Table	Displays this measurement on the measurement table for this analysis.
Display on Tracing At	Displays this measurement on the tracing for this analysis. **Drop-down list:** Tracing locations for this measurement. **Custom Loc...**: Define a custom location where the value of this measurement should appear on tracings. For more information, see “Defining a Custom Location” below.
Value Calculation Script	Calculation used to arrive at this measurement. ***Note:*** *Although you cannot change this script, you can select it, copy it to the clipboard, and paste it elsewhere (such as in an email message).*
Location Calculation Script	Calculation used to arrive at a landmark location. ***Note:*** *Although you cannot change this script, you can select it, copy it to the clipboard, and paste it elsewhere (such as in an email message).*
Use Norms	Gender or racial norms to use for this analysis. **Drop-down list:** Norm sets available for this measurement. **Custom Norms...**: Define a set of custom norms. For more information, see “Defining a Set of Custom Norms” on page 18-19. **Reverse Wiggle:** Reverses the direction of the measurement table Polygon/Wiggle-gram. By default, the graph wiggles left for measurements below the norm and right for measurements above the norm.
List of Norms	Norms for the currently selected norm set. You can select the text in this box, copy it to the clipboard, and paste it elsewhere (such as in an email message).

Defining a Custom Location

By default, measurement numbers are displayed on tracings in the following locations:

- angle: at the mid-point between landmarks specified as **Landmark #1** and **Landmark #3**
- distance: at the mid-point of distance
- perpendicular distance: at the perpendicular point.

If you want a measurement number to appear in a different location, you can define a custom location for it.

To define a custom location:

1 If you are setting properties for a measurement that is already defined, check the **Display on Tracing at** box on the **Measurement Properties** dialog box.

If you are creating a new custom measurement, this check box is disabled.

2 Click **Custom Loc...**.

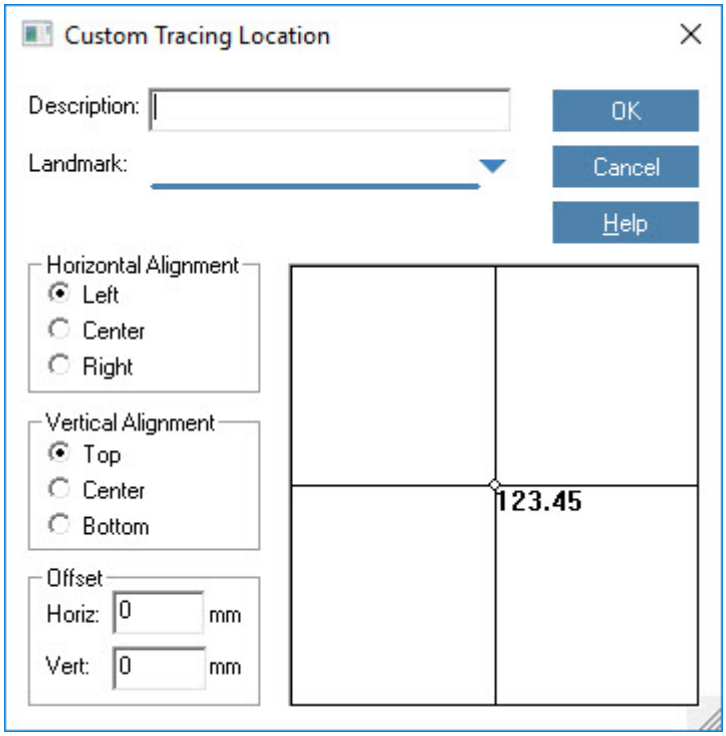
The Custom Tracing Location dialog box is displayed.

3 Enter a description for this location.

4 From the **Landmark** drop-down list, select the landmark near which you want this measurement to appear on the patient's tracing.

5 Specify where you want this measurement to appear in relation to the landmark using the Horizontal Alignment, Vertical Alignment, and Offset group boxes. Then, click **OK**.

When you change the selections in these group boxes, the preview window shows how the measurement (the numbers) will appear in relation to the landmark (the circle) on the patient's tracing.



Description	Description to identify the location in the **Display on Tracing At** drop-down list on the Measurement Properties dialog box.
Landmark	Landmark near which you want this measurement to appear on tracings.
Horizontal Alignment	Horizontal alignment of the measurement in relation to the selected landmark.

Vertical Alignment	Vertical alignment of the measurement in relation to the selected landmark.
Offset	Offset in millimeters. To update the preview, click another control in this dialog box. **Horiz:** Horizontal offset from the alignment specified in the Horizontal Alignment group box. Enter a positive number to offset the measurement to the right. Enter a negative number to offset the measurement to the left. For example, if you selected **Center** in the Horizontal Alignment group box and entered -10 in this field, the measurement will appear 10mm to the left of the landmark's center on the patient's tracing. **Vert:** Vertical offset from the alignment specified in the Vertical Alignment group box. Enter a positive number to offset the measurement up. Enter a negative number to offset the measurement down. For example, if you selected **Center** in the Vertical Alignment group box and entered -10 in this field, the measurement will appear 10mm below the landmark's center on the patient's tracing.
preview	Preview of the location. The numbers indicate the measurement's location, and the circle indicates the location of the selected landmark.

Defining a Set of Custom Norms

Norm sets list the measurement values considered normal or average based on age, gender, and racial classifications.

To define a set of custom norms:

1 Optionally, select a norm set to edit or use as the basis of a new norm set from the **Use Norms** drop-down list on the Measurement Properties dialog box.

You can only select a norm set if you are setting properties for a measurement that is already defined. If you are creating a new custom measurement, this drop-down list is disabled.

2 Click **Custom Norms...**.

The Custom Norms dialog box is displayed.

Note: *Some norm sets are not editable. If you selected one of these from the* **Use Norms** *drop-down list on the Measurement Properties dialog box, the Custom Norms dialog box is not populated with any data.*

3 If you are creating a new custom norm set, enter a descriptive name for this norm set.

If you do not enter a name, the Custom Analysis Editor selects a name to use for this norm set as follows:

- If you selected an existing custom norm set from the **Use Norms** drop-down list on the Measurement Properties dialog box, the Custom Analysis Editor assumes you simply want to edit that existing norm set. The new information you enter overwrites the settings for that existing norm set.
- If you selected a standard norm set from the **Use Norms** drop-down list on the Measurement Properties dialog box, the Custom Analysis Editor does not overwrite the standard norm set. Instead, it creates a new custom norm set and assigns the default name “Set” plus a number. For example, if Set 1, Set 2, and Set 3 already exist, the Custom Analysis Editor would assign Set 4 as the default name of a new custom analysis.

4 Specify whether the norms in this set vary by age or race by checking or unchecking the appropriate boxes.

5 Complete the table to specify the norm set.

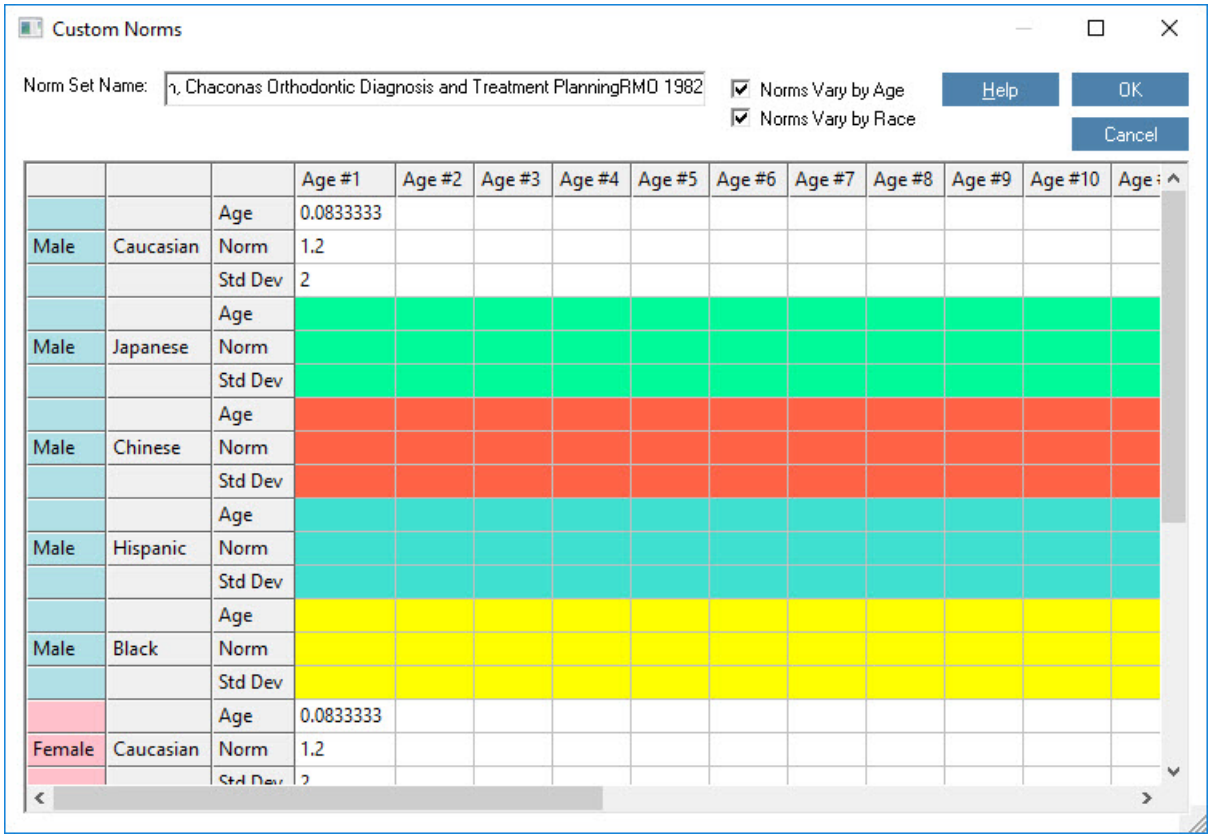
For example, if both the **Norms Vary by Age** and **Norms Vary by Race** boxes are checked, you would enter the following information in the table:

- In the **Age** row, enter the ages in years for which you want to specify norms.
- In the **Norm** row, enter a norm in each column in which you entered an age.
- In the **Std Dev** row, enter a standard deviation in each column in which you entered an age.

The following table illustrates a norm for Male Caucasians at ages 10, 15, and 20:

			Age #1	Age #2	Age #3
		Age	10	15	20
Male	Caucasian	Norm	55.25	60.49	65.3
		Std Dev	2.5	2.5	2.5

6 Click **OK**.



Norm Set Name	Descriptive name for this norm set.
Norms Vary by Age	Adds cells to the table to accommodate norm values for different ages.
Norms Vary by Race	Adds cells to the table to accommodate norm values for different races.
Table	Table of norm values. The number of table cells depends on whether the **Norms Vary by Age** and **Norms Vary by Race** boxes are checked.

Creating a Custom Tracing Line

To create a custom tracing line:

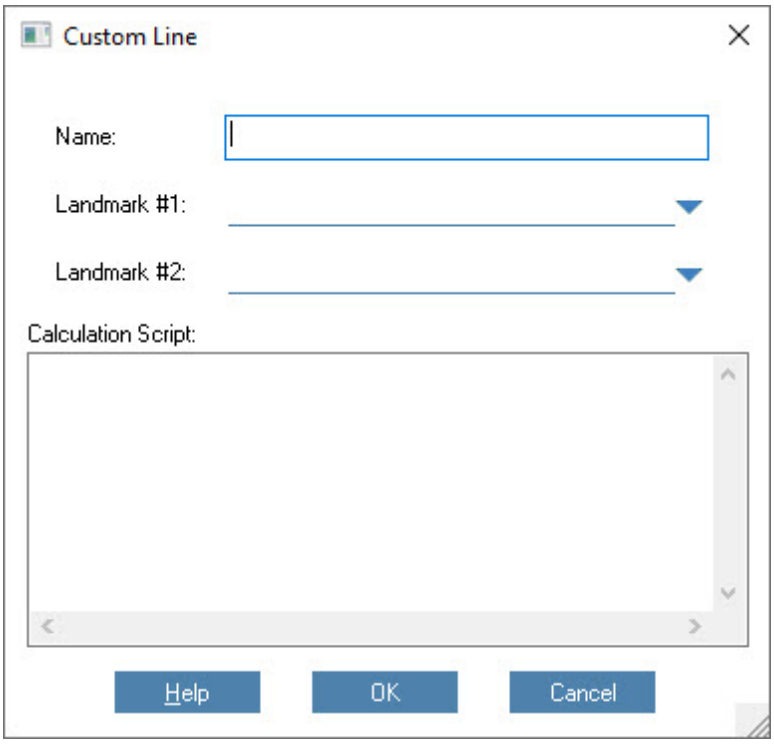
1 Click + above the **Available Tracing Lines** list.

The Custom Line dialog box appears.

2 Enter a name for your custom tracing line.

3 Select the two landmarks to use as end points for your custom tracing line. Then, click **OK**.

Your custom tracing line is added to the **Available Tracing Lines** list so that you can use it in your custom analysis.



Name	Name for this custom tracing line.
Landmark #1	Landmark to use as an end point for this tracing line.

Landmark #2	Landmark to use as an end point for this tracing line.
Calculation Script	Calculation used to arrive at this tracing line. ***Note:*** *Although you cannot change this script, you can select it, copy it to the clipboard, and paste it elsewhere (such as in an email message).*

Creating a Custom Landmark for a 2D Analysis

To create a custom landmark:

1 Click + above the **Available Landmarks** list.

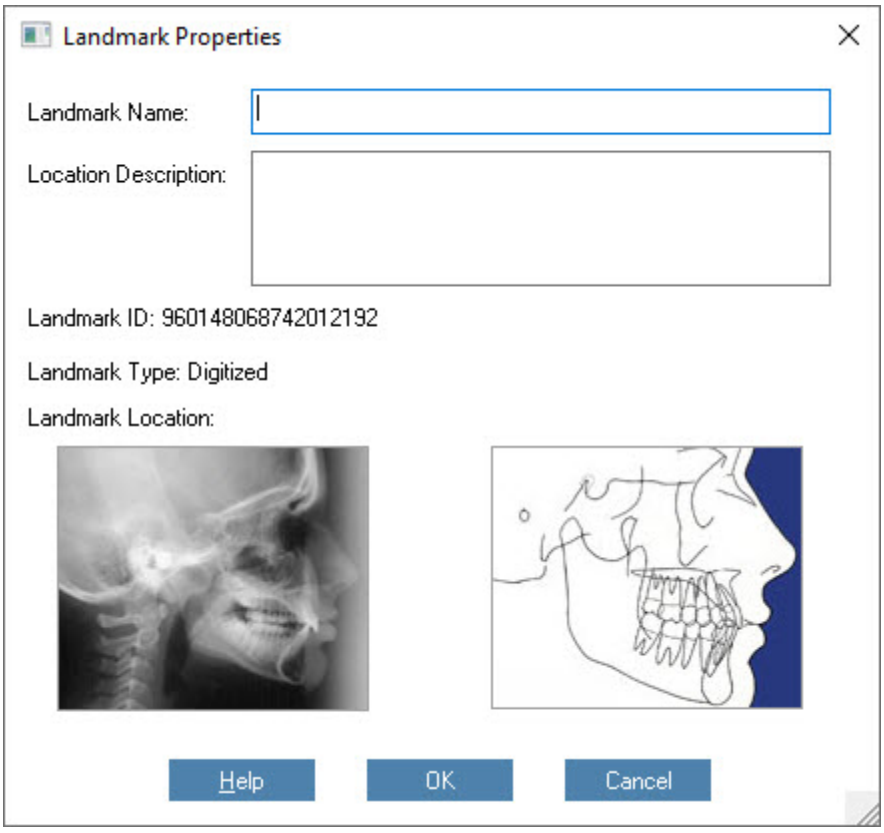
The Custom Landmark dialog box appears.

2 Enter a name for your custom landmark.

3 Enter a description of your custom landmark's location.

4 Click the location of your custom landmark on either of the two images. Then, click **OK**.

Your custom landmark is added to the **Available Misc Landmarks** list so that you can use it in your custom analysis.



Landmark Name	Name for this custom landmark.
Location Description	Description of this custom landmark's location.
Tissue Type	Type of tissue (**Soft Tissue**, **Hard Tissue**, or **N/A**) for this custom landmark. Only available for 3D analyses.
Landmark ID	Identifier assigned by Dolphin Imaging to this custom landmark.
Landmark Type	Type of landmark, which is always **Digitized** (rather than **Calculated**) for custom landmarks.
Landmark Location	Location of this custom landmark identified on the two images.

Creating a Custom Landmark for a 3D Analysis

To create a custom landmark:

1 Click + above the **Available Landmarks** list.

The Custom Landmark dialog box appears.

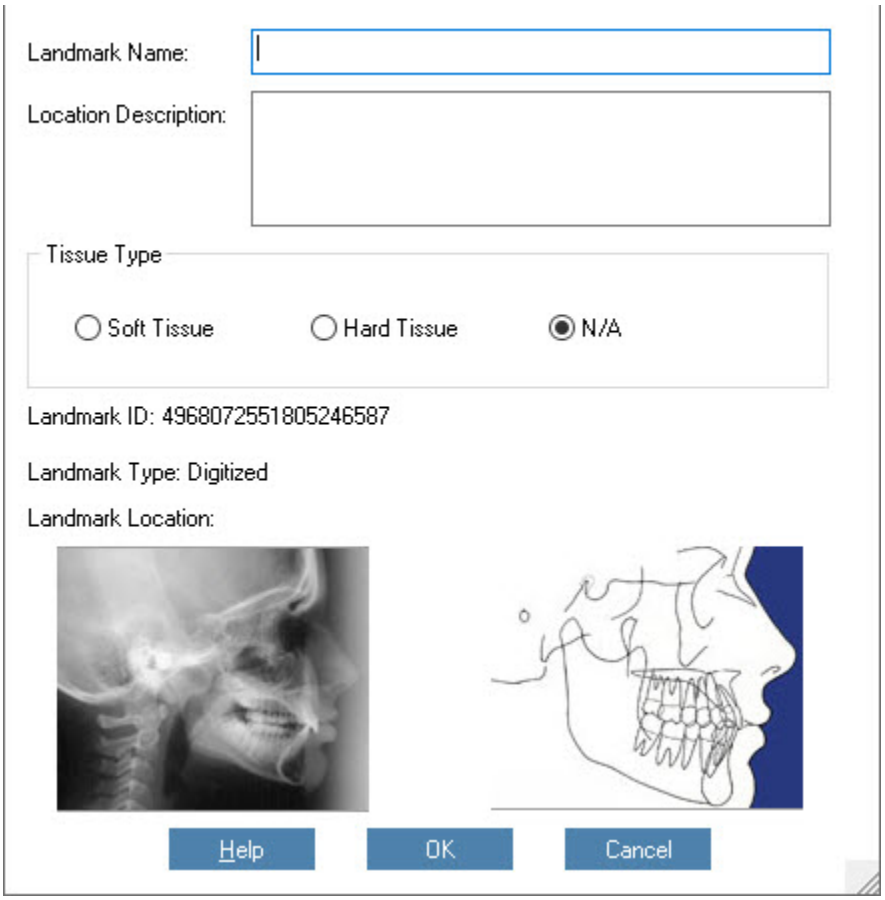
2 Enter a name for your custom landmark.

3 Enter a description of your custom landmark's location.

4 Specify whether the landmark is on the soft tissue or hard tissue, or select **N/A**.

5 Click the location of your custom landmark on either of the two images. Then, click **OK**.

Your custom landmark is added to the **Available Misc Landmarks** list so that you can use it in your custom analysis.



Landmark Name	Name for this custom landmark.
Location Description	Description of this custom landmark's location.
Tissue Type	Type of tissue (**Soft Tissue**, **Hard Tissue**, or **N/A**) for this custom landmark. Only available for 3D analyses.
Landmark ID	Identifier assigned by Dolphin Imaging to this custom landmark.
Landmark Type	Type of landmark, which is always **Digitized** (rather than **Calculated**) for custom landmarks.
Landmark Location	Location of this custom landmark identified on the two images.

Deleting a Custom Measurement, Tracing Line, or Landmark

To delete a custom analysis item that you have added:

1 Click a custom measurement in the **Available Measurements** list, then click

.

Or,

Click a custom tracing line in the **Available Tracing Lines** list, then click

.

Or,

Click a custom landmark in the **Available Landmarks** list, then click

.

Or,

Click a custom measurement in the **Available Measurements** list, then select **Delete** from the **File** menu.

Or,

Click a custom tracing line in the **Available Tracing Lines** list, then select **Delete** from the **File** menu.

Or,

Click a custom landmark in the **Available Landmarks** list, then select **Delete** from the **File** menu.

Or,

Right-click a custom measurement in the **Available Measurements** list, then select **Delete** from the context menu.

Or,

Right-click a custom tracing line in the **Available Tracing Lines** list, then select **Delete** from the context menu.

Or,

Right-click a custom landmark in the **Available Landmarks** list, then select **Delete** from the context menu.

Setting Analysis Item Properties

You can set properties for any of the items in the **Used Measurements**, **Used Tracing Lines**, or **Used Misc. Landmarks** lists. The properties you can set depend on the type of item.

Setting Properties for a Custom Heading

To set properties for a group heading:

1 Double-click a group heading in the **Used Measurements** list.

Or,

Select a group heading in the **Used Measurements** list. Then, select **Properties** from the **File** menu.

Or,

Right-click a group heading in the **Used Measurements** list. Then, select **Properties** from the context menu.

Or,

Select a group heading in the **Used Measurements** list. Then, click

.

The Measurement Group Heading dialog box is displayed.

2 Type a new name for this group, and click **OK**.

Viewing and Setting Measurement Properties

For standard measurements, you can set properties from the **Used Measurements** list. From the **Available Measurements** list, you can only view a standard measurement's properties.

For a custom measurement, you can set properties from either list.

To view or set properties for a measurement:

1 Double-click a measurement in the **Used Measurements** list.

Or,

Select a measurement in either the **Available Measurements** or the **Used Measurements** list. Then, select **Properties** from the **File** menu.

Or,

Right-click a measurement in either the **Available Measurements** or the **Used Measurements** list. Then, select **Properties** from the context menu.

Or,

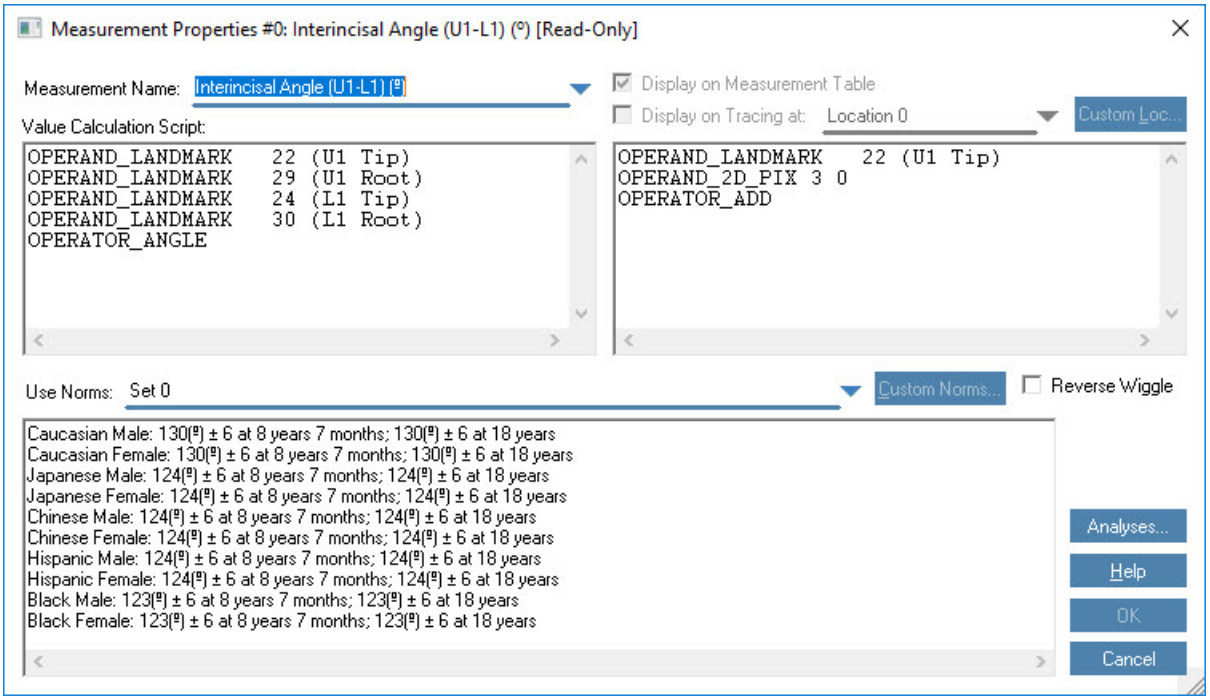
Select a measurement in either the **Available Measurements** or the **Used Measurements** list.

Then, click

.

The Measurement Properties dialog box is displayed.

2 If you are viewing properties for a custom measurement or a standard measurement selected in the **Used Measurements** list, set any properties for this measurement. Then, click **OK**.



Measurement Name	Name currently defined for this measurement. To customize this measurement's name, select from this drop-down list or type in a new name.
Display on Measurement Table	Displays this measurement on the measurement table for this analysis.
Display on Tracing At	Displays this measurement on the tracing for this analysis. **Drop-down list:** Tracing locations currently defined for this measurement. **Custom Loc...**: Define a custom location where the value of this measurement should appear on tracings. For more information, see “Defining a Custom Location” on page 18-17.
Value Calculation Script	Calculation used to arrive at this measurement. ***Note:*** *Although you cannot change this script, you can select it, copy it to the clipboard, and paste it elsewhere (such as in an email message).*

Location Calculation Script	Calculation used to arrive at a landmark location. ***Note:*** *Although you cannot change this script, you can select it, copy it to the clipboard, and paste it elsewhere (such as in an email message).*
Use Norms	Age, gender, or racial norms to use for this analysis. In some cases, a bibliographic citation is provided for your reference. **Drop-down list:** Norm sets currently defined for this measurement. **Custom Norms...**: Define a set of custom norms. For more information, see “Defining a Set of Custom Norms” on page 18-19. **Reverse Wiggle:** Reverses the direction of the measurement table Polygon/Wiggle-gram. By default, the graph wiggles left for measurements below the norm and right for measurements above the norm.
List of Norms	Norms for the currently selected norm set. You can select the text in this box, copy it to the clipboard, and paste it elsewhere (such as in an email message).
Analyses...	Analyses that use this measurement. Does not appear for custom measurements.

To view the analyses that use a standard measurement:

1 Click **Analyses...**.

The Used in Analyses dialog box opens listing the analyses that use this measurement.

2 Click **Close** to close the Used in Analyses dialog box.

Viewing and Setting Tracing Line Properties

For standard tracing lines, you can set properties from the **Used Tracing Lines** list. From the **Available Tracing Lines** list, you can only view a tracing line’s properties.

For a custom tracing line, you can set properties from either list.

To set properties for a tracing line:

1 Double-click a tracing line in the **Used Tracing Lines** list.

Or,

Select a tracing line in either the **Available Tracing Lines** or the **Used Tracing Lines** list. Then, select **Properties** from the **File** menu.

Or,

Right-click a tracing line in either the **Available Tracing Lines** or the **Used Tracing Lines** list. Then, select **Properties** from the context menu.

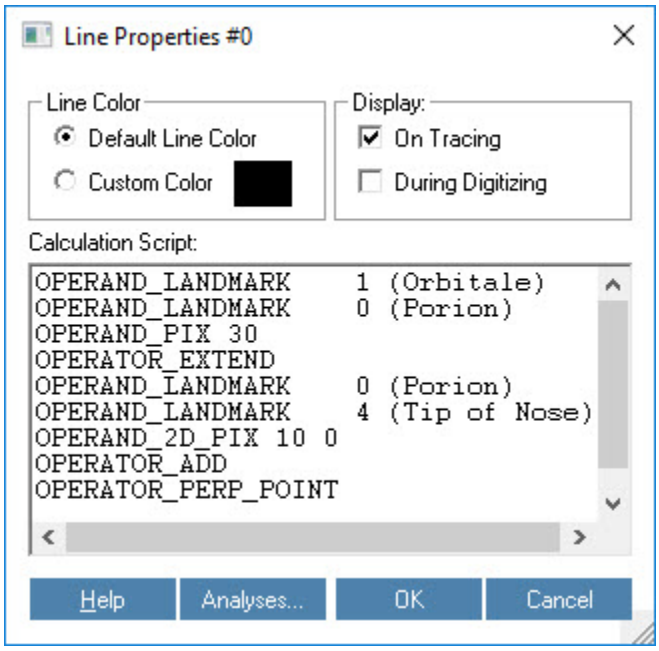
Or,

Select a tracing line in either the **Available Tracing Lines** or the **Used Tracing Lines** list. Then, click

.

The Line Properties dialog box is displayed.

2 If you are viewing properties for a custom tracing line or a standard tracing line selected in the **Used Tracing Lines** list, set any properties for this tracing line. Then, click **OK**.



Line Color	Color to use for this tracing line. **Default Line Color:** Uses the default color set on the Tracing Preferences dialog box. **Custom Color:** Uses the custom color indicated by the color sample. **Color Sample:** Custom color to use.
Display	Location where you want this tracing line to appear. If you check **During Digitizing**, a red asterisk (*) appears next to the pencil line icon ( ) for the tracing line on the Custom Analysis Editor dialog box.
Calculation Script	Calculation used to arrive at this tracing line. ***Note:*** *Although you cannot change this script, you can select it, copy it to the clipboard, and paste it elsewhere (such as in an email message).*
Analyses...	Displays the analyses that use this tracing line. Does not appear for custom tracing lines.

To view the analyses that use a standard tracing line:

1 Click **Analyses...**.

The Used in Analyses dialog box opens and lists the analyses that use this tracing line.

2 Click **Close** to close the Used in Analyses dialog box.

Viewing and Setting Properties for a Landmark

The Landmark Properties dialog box lists the properties for this landmark. If you are viewing the properties of a calculated landmark (identified on the Custom Analysis dialog box using a funnel icon), this dialog box shows the script used to arrive at the landmark location.

Note: *You can only change properties for custom landmarks you have added.*

To view properties for a landmark:

1 Double-click a landmark in the **Used Misc. Landmarks** list.

Or,

Select a landmark in either the **Available Misc. Landmarks** or the **Used Misc. Landmarks** list. Then, select **Properties** from the **File** menu.

Or,

Right-click a landmark in either the **Available Misc. Landmarks** or the **Used Misc. Landmarks** list. Then, select **Properties** from the context menu.

Or,

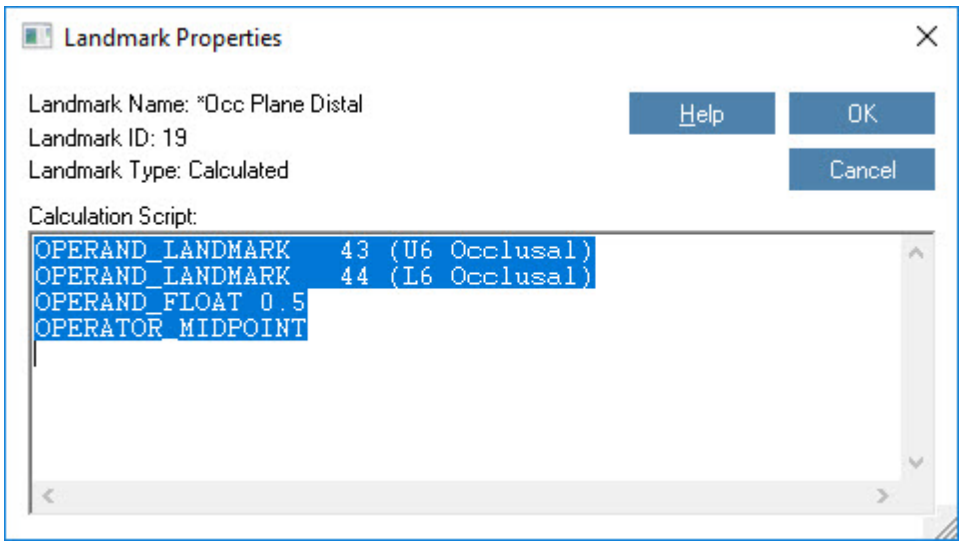
Select a landmark in either the **Available Misc. Landmarks** or the **Used Misc. Landmarks** list.

Then, click

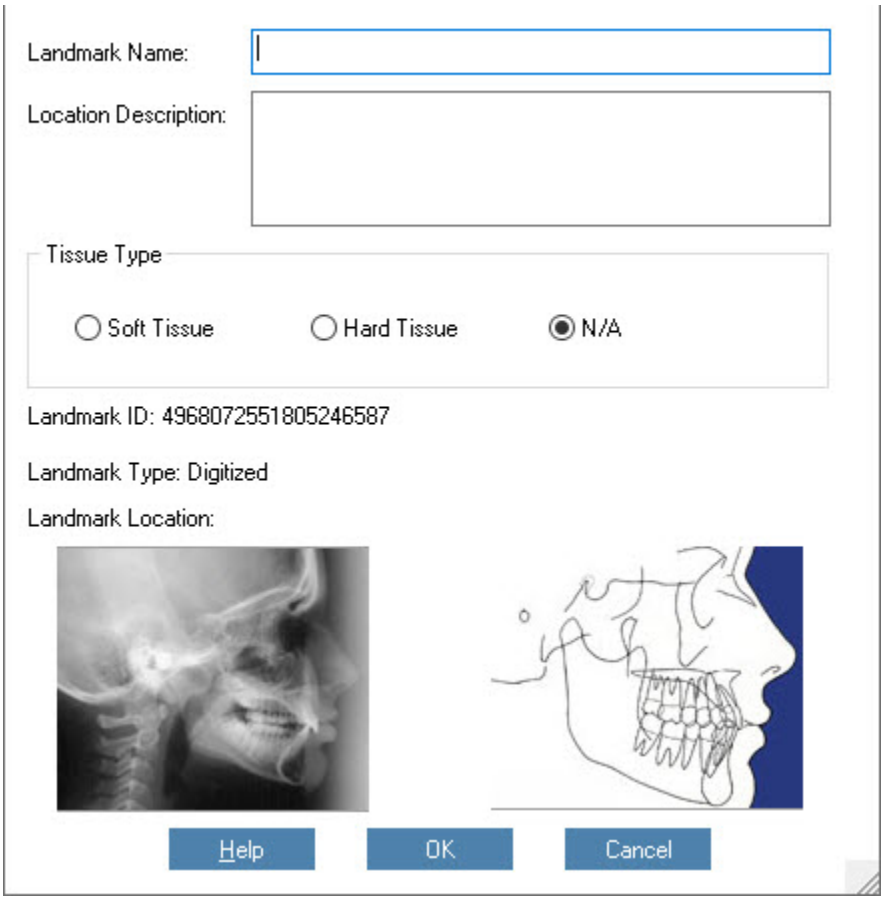
.

2 If you are viewing properties for a custom landmark, set any properties for this landmark. Then, click **OK**.

The following figure shows properties for a calculated 2D landmark. For calculated landmarks, you can select the calculation script on this dialog box, copy it to the clipboard, and paste it elsewhere (such as in an email message).



The following figure illustrates the properties for a 3D landmark:



Landmark Name	Name for this custom landmark.
Location Description	Description of this custom landmark's location.
Tissue Type	Type of tissue (**Soft Tissue**, **Hard Tissue**, or **N/A**) for this custom landmark. Only available for 3D analyses.
Landmark ID	Identifier assigned by Dolphin Imaging to this custom landmark.
Landmark Type	Type of landmark, which is always **Digitized** (rather than **Calculated**) for custom landmarks.
Landmark Location	Location of this custom landmark identified on the two images.

Exporting and Importing Custom Analyses

Dolphin Imaging custom analyses are automatically shared among all the computers on the same network. However, if you need to share your custom analyses with a colleague who is not on the same network, you can export them and their associated measurements, tracing lines, and landmarks to a file that can be imported into Dolphin Imaging on another computer.

To export your custom analyses:

1 Click

.

Or,

Select **Export Custom Analyses** from the **File** menu.

Your custom analyses and their associated measurements, tracing lines, and landmarks are exported as a .ZIP file, and a message appears indicating the folder in which the file was created. You can share the .ZIP file with your colleagues (for example, by copying it to a USB flash drive or attaching it to an email message) who can then import it as described below.

2 Click **OK**.

To import a capture sequence and its associated layout:

1 Click

.

Or,

Select **Import Custom Analyses** from the **File** menu.

2 Select the folder and file for the .ZIP file containing the custom analyses that you want to import, and click **Open**.

Deleting a Custom Analysis

You can only delete custom analyses. You cannot delete the analyses that were installed with the Dolphin Imaging program.

To delete a custom analysis:

1 Click

.

Or,

Select **Open...** from the **File** menu.

The Open Analysis dialog box is displayed.

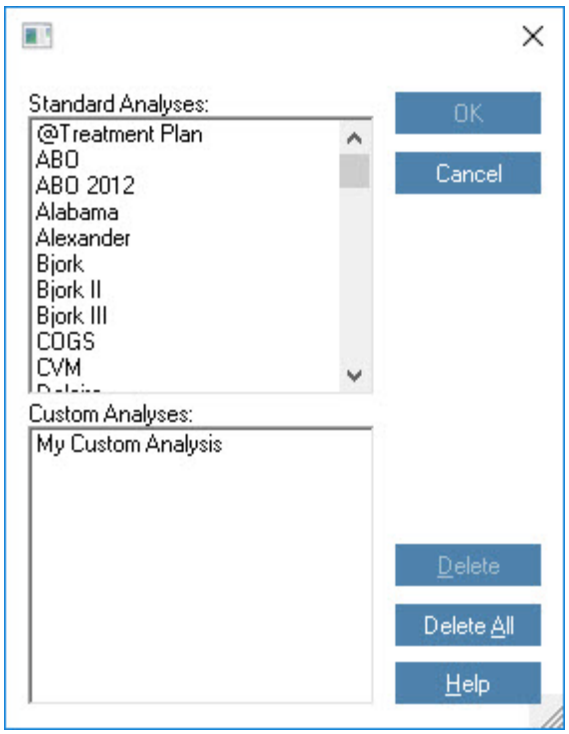
2 Select the analysis you want to delete, and click **Delete**.

Or,

Click **Delete All** to delete all custom analyses.

A dialog box opens asking you to confirm the deletion.

3 Click **Yes** to confirm the deletion.



Part IV: Dolphin 3D

This part of the *Dolphin Imaging User's Guide* describes how to use Dolphin 3D to capture, view, and manipulate 3D images created from most cone-beam computed tomography (CBCT), MRI, medical CT, and 3D facial camera systems. Dolphin 3D offers powerful yet intuitive tools for processing 3D image data. There are no complicated commands or scripting language to learn.

Note: *The features offered by Dolphin 3D are meant to assist dental clinicians and trained assisting staff in treatment planning. The results of this process should not be used as the primary source of patient evaluation and should be verified by other independent methods.*

- Chapter 19, Getting Started With Dolphin 3D describes importing new 3D volume and photos for a patient from a variety of sources, the menus and options available on the Dolphin 3D window, displaying different views of the patient's 3D volume, photos, and surfaces, and saving the patient's 3D volume, photos, and surfaces.
- Chapter 20, Volume Orientation describes how to change the horizontal/vertical orientation pf the patient's 3D volume so that it properly correlates to the requirements for your analysis.
- Chapter 21, Build X-rays describes building a variety of 2D x-ray views from a patient's 3D volume.
- Chapter 22, Digitize and Measurements (Medical Device) describes digitizing landmarks on the patient's 3D volume using standard and customized analyses; viewing measurements calculated from your digitized landmarks; taking your own measurements using lines, angles, or selected areas; and digitizing landmarks on the patient's 3D volume for use in Dolphin 2D.
- Chapter 23, Dolphin 3D Movies describes creating movies with different views of a patient's 3D volume and photograph (if available) for case presentation.
- Chapter 24, Airway Analysis (Medical Device) describes marking a patient's airway, viewing it in three dimensions, calculating its volume, locating the cross-section where its area is the smallest, and viewing a color map depicting the constricted areas.
- Chapter 25, Mirroring describes mirroring one side of a patient over to the other side, and either overlaying the original or replacing it. This is useful for analyzing asymmetries and for working with trauma patients who are missing some anatomy on one side.
- Chapter 26, Volumes Superimposition (Medical Device) describes superimposing two 3D volumes for comparison purposes.
- Chapter 27, 3D Implant Simulation (Medical Device) describes placing implants and temporary anchorage devices (TADs) and related procedures on a patient's 3D volume to assist in implant case evaluation, creating individualized treatment simulations, and patient presentation.
- Chapter 28, Volume Clipping and Sculpting describes using clipping slices, clipping boxes, and volume sculpting to view various sections within a patient's 3D volume.
- Chapter 29, Reports describes creating and printing reports that incorporate images from Dolphin 3D.

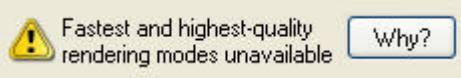
- Chapter 30, Orthognathic Surgical Planning (Medical Device) describes using the patient's 3D volume for planning surgery, presenting a surgery plan to the referring doctor and to the patient, and modeling splints.

If you purchased the stand-alone digital study module product, only the options for working with 3D photos and surfaces are available.

If you have not purchased the Dolphin 3D module, you can view and manipulate 3D volumetric images and photos, but you cannot save changes. For example, if another doctor sends you a Dolphin patient archive containing 3D data, you can view the data even if you have not purchased the Dolphin 3D module. However, you must purchase the Dolphin 3D module to import 3D volumetric images (such as DICOM volume sets) and 3D photos, edit them, digitize them, build x-rays from them, and so on.

If you have purchased a limited number of licenses for the Dolphin 3D module, that number of workstations in your office can simultaneously import 3D images, edit them, digitize them, build x-rays, and so on. The remaining workstations in your office can only view the 3D images. For more information, please consult your Dolphin representative.

The Dolphin web site (www.dolphinimaging.com) provides documentation on the hardware requirements for Dolphin 3D. Actual memory requirements depend on the data size of volumes you are viewing and editing. The advanced 3D rendering modes ("translucent" modes) are only enabled if your computer is equipped with a video graphics card that supports them. If you see the following message on the Dolphin 3D window, click Why? for a detailed description of why your computer is not fully compatible.



Note: *Dolphin 3D features that draw on the translucent image (such as sculpting) can display image corruption on screen. In some cases, this can be resolved by updating to the latest NVIDIA or ATI video card driver. In other cases, the solution is to disable the Windows "Aero" transparency effect. To disable the Windows "Aero" effect, right-click on an empty spot on the desktop, and select Personalize from the context menu. Then, choose another theme, such as "Windows 7 Basic."*

19 Getting Started With Dolphin 3D

Using Dolphin 3D, you can capture, view, and manipulate 3D volumes created from most cone-beam computed tomography (CBCT), MRI, Medical CT, and 3D facial camera systems. Dolphin 3D offers powerful yet intuitive tools for processing 3D image data.

To use the features of the full Dolphin 3D module, you need a DICOM data set (which may be one file or several files) containing the images that comprise the 3D scan of the patient's head. It is recommended that you also have a 2D or 3D frontal photograph of the patient's face and surfaces representing study models for the patient's upper and lower arches.

Note: *These features are meant to assist dental clinicians and trained assisting staff in treatment planning. The results of these processes should not be used as the primary source of patient evaluation and should be verified by other independent methods.*

This chapter describes basic procedures for getting started with Dolphin 3D, including:

- adding, editing, and deleting 3D volumes
- understanding the Dolphin 3D window
- using photos and surfaces
- working with arch model surfaces

Note: *If you purchased the full Dolphin 3D module, all these options are available to you. If you purchased the stand-alone digital study module product, only the options for working with 3D photos and surfaces are available.*

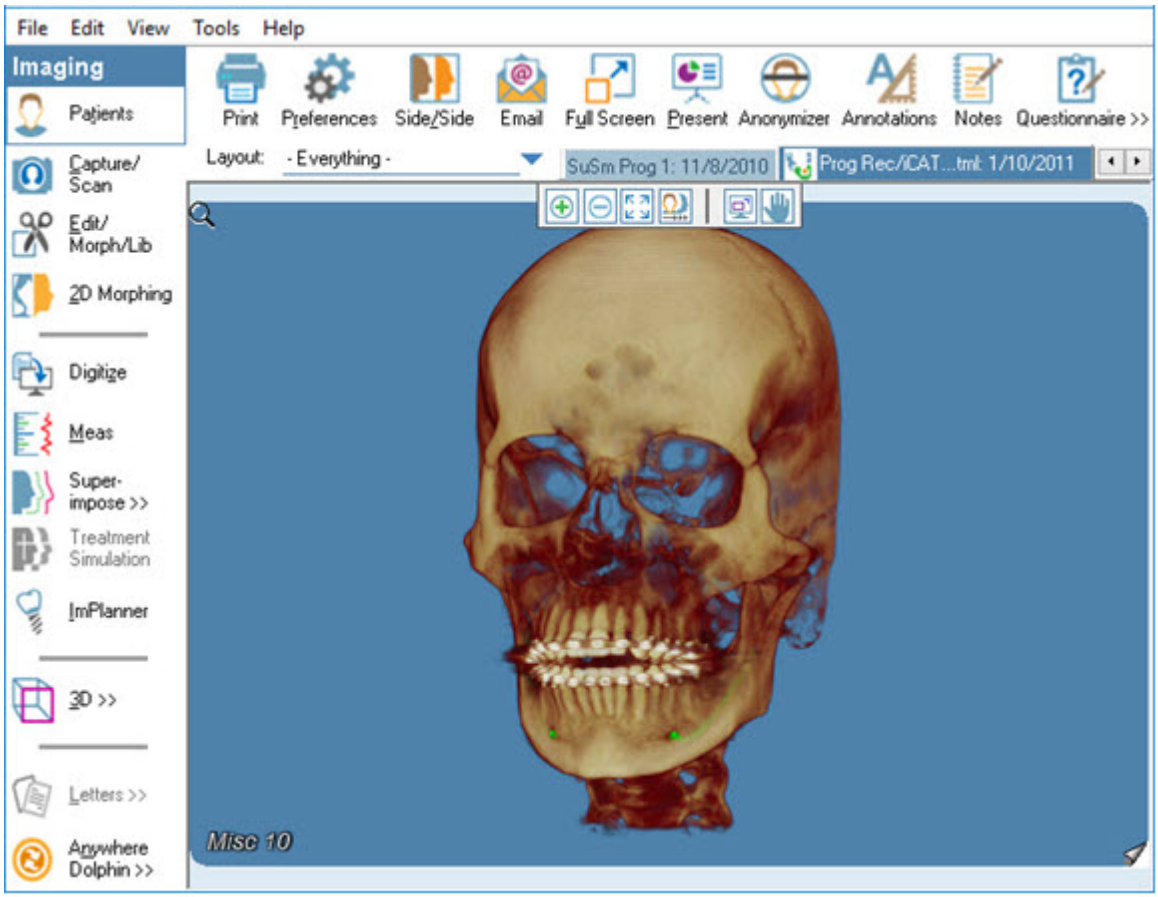
Adding, Editing, and Deleting 3D Volumes

The following procedures describe how to:

- view and edit an existing volume
- add a new volume
- import a volume from a PACS server
- delete an existing volume
- downsize a DICOM data set

Viewing or Editing an Existing Volume

If you have an existing 3D volume for a patient, you can view or edit it. The following figure shows an example of a patient's 3D volume on the Dolphin Imaging main screen.



To view or edit an existing 3D volume:

1 On the Dolphin Imaging main screen, select the timepoint that contains a 3D volume.

2 Click 3D >> on the Dolphin Imaging main screen.

A menu appears with options for accessing the 3D features. If this patient does not have any 3D volumes already, only **Import New...** is active, and the other options are disabled (grayed out).

3 Select **View Only...** to view the selected 3D volume only.

Or,

Select **Edit...** to edit the selected 3D volume.

If you have more than one 3D volume stored for this patient and timepoint, a list of images representing the 3D volumes appears.

4 If you have more than one 3D volume stored for this patient and timepoint, select the volume you want to view or edit.

The 3D volume appears in the Dolphin 3D window. The features available to you depend on whether you are viewing or editing the volume:

- If you selected **View Only...**, you can view and manipulate 3D volumes and photos, but you cannot save any changes.
- If you selected **Edit...**, you can edit 3D volumes and photos, re-orient them, digitize them, build x-rays from them, and so on. Then, you can save your changes.

Alternatively, you can right-click the patient's 3D volume in the image layout on the Dolphin Imaging main screen. Then, you can select **3D View...** or **3D Edit...** from the context menu to view or edit the patient's 3D volumes and photos.

Adding a New 3D Volume

If you have 3D volume data for a new patient, you can create the patient record and load the 3D volume at the same time using the Patient Lookup dialog box. For information, see “Adding or Changing Patients” on page 4-38.

If you have 3D volume data for an existing patient on your computer, you can add the 3D volume to one of the patient’s timepoints (see “Importing a New 3D Volume from your Computer” below). You can add as many 3D volumes to a single timepoint as you want.

If the DICOM image files for the patient’s 3D volume are on a PACS server, see “Importing a New 3D Volume from a PACS Server” on page 19-5.

Importing a New 3D Volume from your Computer

To add a 3D volume for a patient, you load a DICOM data set. The data set can be:

- A single DICOM file containing all images that comprise the 3D volume.
- A set of DICOM image files, each containing one image that is part of the 3D volume. In this case, all image files that comprise the data set must be in the same directory. In addition, the directory cannot contain any DICOM image files unrelated to the current data set.
- A set of DICOM image files, each containing one image that is part of the 3D volume, along with a DICOM directory file (usually named DICOMDIR) that identifies the DICOM image files for the data set. In this case, all the image files and the DICOM directory file must be in the same directory.

To add a 3D volume for an existing patient from a DICOM data set on your computer:

1 Select the patient and timepoint for this 3D volume.

2 Optionally, select the image layout to which you want to add the 3D volume.

You can only select a different layout if other images already exist for this patient.

3 Click

on the Dolphin Imaging main screen.

4 Select **Import New DICOM...**.

Or,

Select **Import New DICOM (with Downsizing Option)...**.

Use the **Import New DICOM (with Downsizing Option)...** to downsize the data set as you import it. This feature is useful if you encounter “out of memory” problems when importing a DICOM data set into Dolphin3D. Downsizing interpolates the original data set, so no slices are skipped. You can downsize both single- and multi-file data sets.

You can also downsize a DICOM data set separately from the import operation, which offers a wider range of downsizing options. For more information, see “Downsizing a DICOM Data Set” on page 19-9.

The Open dialog box appears so that you can select the directory containing a valid 3D DICOM volume data set.

5 Navigate to the folder containing the 3D DICOM volume data set.

6 If the data set is comprised of a single file, select that file.

Or,

If the data set is comprised of several files but has no DICOM directory file, select any file in the data set.

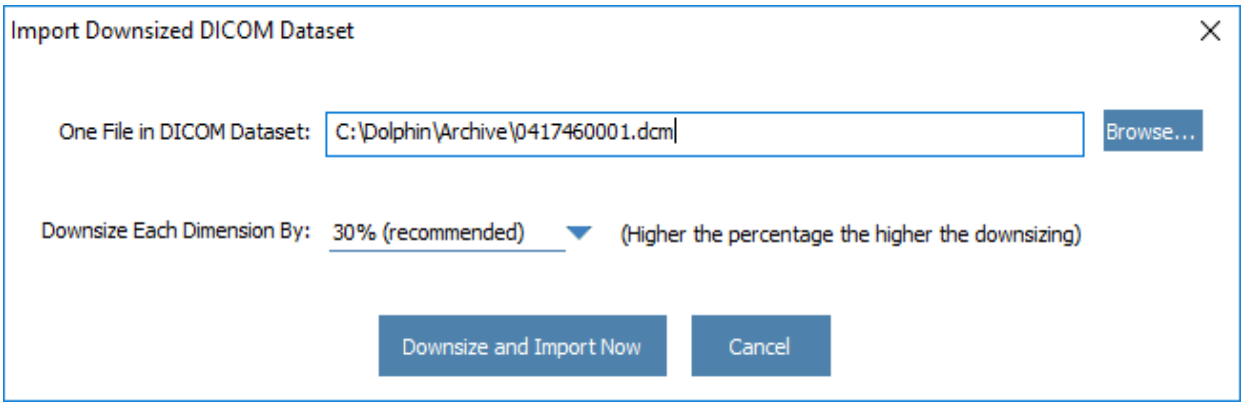
Or,

If the data set is comprised of several files and has a DICOM directory file, select the DICOM directory file.

7 Click **Open** to load the data set.

If you selected **Import New DICOM (with Downsizing Option)...**, the Import Downsized DICOM Dataset dialog box opens.

8 If you selected **Import New DICOM (with Downsizing Option)...**, select the downsizing percentage you want to use. Then, click **Downsize and Import Now**.



One File in DICOM Dataset	One of the files in the DICOM data set you want to downsize.
Browse...	Browse to one of the files in the DICOM data set you want to downsize.
Downsize Each Dimension By	Downsizing percentage to use when importing the volume.

Once the 3D volume is imported, it appears in the Dolphin 3D window (see “Understanding the Dolphin 3D Window” on page 19-11). Depending on the source of the volume, it may not appear recognizable initially. Before you begin to analyze the 3D volume, you may need to:

- Segment the volume: You may need to identify or fine-tune the segments of the 3D volume to use for the soft tissue and hard tissue views. For more information, see “Viewing the Soft Tissue” on page 19-26 and “Viewing the Hard Tissue” on page 19-27.
- Orient the volume: You may need to change the volume orientation so that it properly correlates to the requirements for your analysis. For more information, see Chapter 20, Volume Orientation.

These two activities are fundamental to your proper use of the 3D volume.

Importing a New 3D Volume from a PACS Server

Note: *Dolphin Imaging does not create new patient records based on the downloaded PACS files. The patient must exist in Dolphin Imaging before you download the volumes. When importing the volumes, Dolphin Imaging extracts the volumes from the PACS files and discards all other information.*

For information on capturing volumes from a PACS server into Dolphin 2D, see “Capturing from a PACS Server” on page 5-38.

To open the Dolphin DICOM Image Downloader:

1 Select the patient and timepoint for this 3D volume.

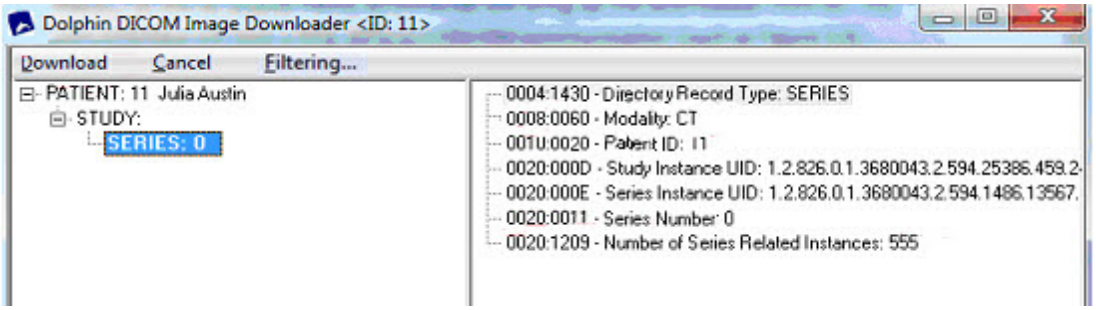
2 Optionally, select the image layout to which you want to add the 3D volume.

You can only select a different layout if other volumes already exist for this patient.

3 Click 3D >> on the Dolphin Imaging main screen.

4 Select **Import New DICOM from PACS...** to import volume files from a PACS server.

If DICOM data for the current patient exists on the PACS server, a window similar to the example below opens:



To filter the list in the navigation pane on the left:

1 Click **Filter...**.

The Filter Settings dialog box opens.

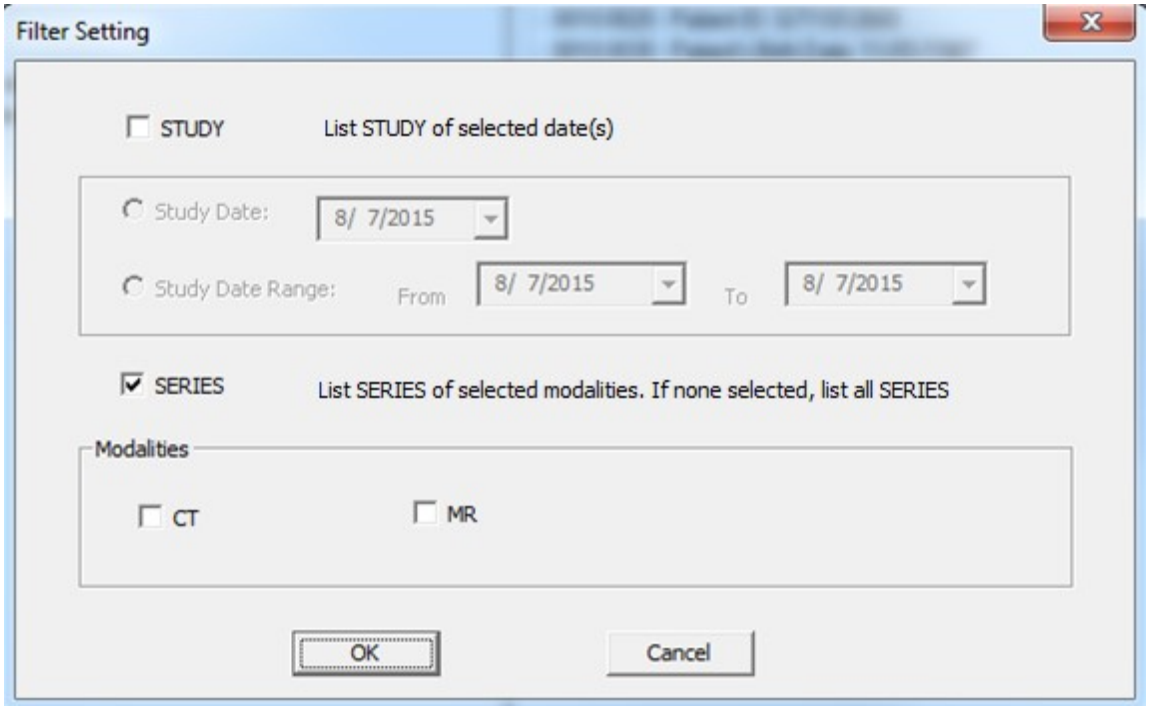
2 Check the box for each filtering criterion you want to use.

3 Enter any additional information needed to specify your filter criteria.

To limit the listed items by study date, check the **STUDY** box and enter a study date or date range.

To limit the listed items to series of single-slice images of a specific modality, check the **SERIES** box, then check the box for the modality you want.

4 Click **OK** to apply your filter criteria and close the dialog box.

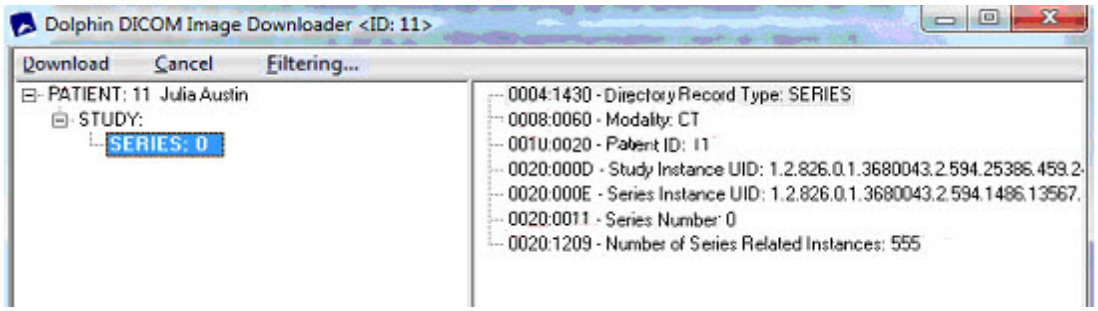


STUDY	Narrows your search by study date or date range. **Study Date:** Limit the search to the specified study date,. **Study Date Range:** Limit the search to a range of study dates.
SERIES	Narrows your search to the series of one or more modalities.

To download a series of single-slice images:

1 Using the navigation pane on the left, browse to find the series of images you want to import.

The **Download** option is disabled until you select a downloadable SERIES. The available modality candidates are CT and MR, and the minimum number of image instances is three by default. The following figure illustrates selecting a series of single-slice images.



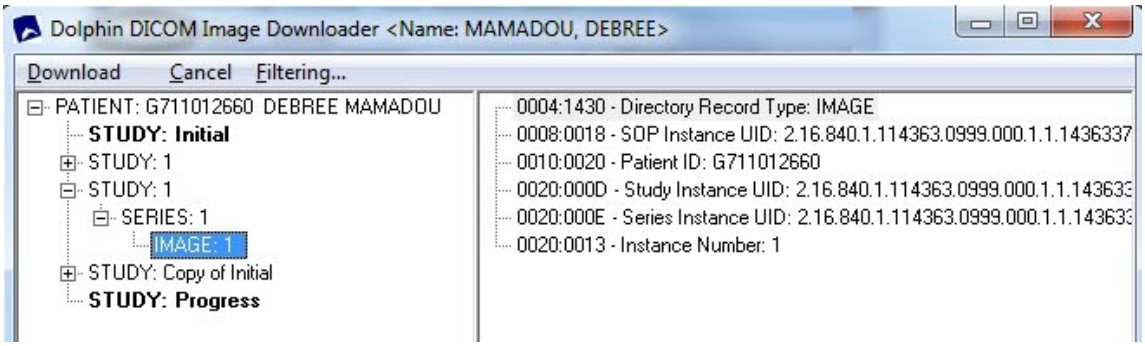
2 Click **Download**.

3 Click **Yes** on the confirmation dialog box that appears to download the series of images and import it into Dolphin 3D.

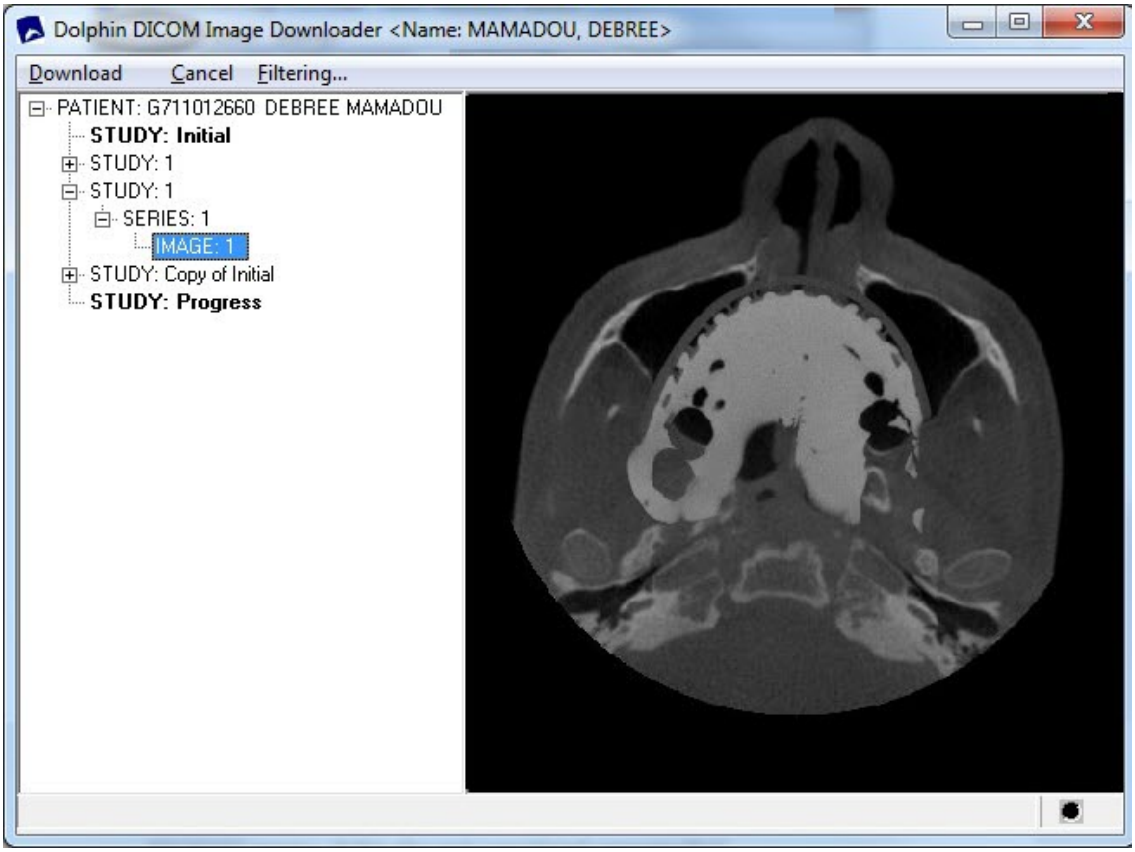
To download a multi-frame 3D image:

1 Using the navigation pane on the left, browse to find the multi-frame 3D image you want to import.

The following figure illustrates selecting a multi-frame 3D image.



2 Double-click the image entry in the navigation pane to display the middle slice in the right pane.



3 Click **Download**.

4 Click **Yes** on the confirmation dialog box that appears to download the multi-frame 3D image and import it into Dolphin 3D.

When the 3D volume appears in the Dolphin 3D window (see “Understanding the Dolphin 3D Window” on page 19-11), it may not appear recognizable initially. Before you begin to analyze the 3D volume, you may need to:

- Segment the volume: You may need to identify or fine-tune the segments of the 3D volume to use for the soft tissue and hard tissue views. For more information, see “Viewing the Soft Tissue” on page 19-26 and “Viewing the Hard Tissue” on page 19-27.
- Orient the volume: You may need to change the volume orientation so that it properly correlates to the requirements for your analysis. For more information, see Chapter 20, Volume Orientation.

These two activities are fundamental to your proper use of the 3D volume.

Deleting a 3D Volume

Deleting the 3D volume deletes the entire 3D volume data set stored in the Dolphin database for the patient. Deleting the 3D volume from within Dolphin Imaging does not delete any 3D volume data set files stored outside your Dolphin database.

To delete a 3D volume for a patient:

1 On the Dolphin Imaging main screen, select the timepoint.

2 Select **Delete Volume...** from the **Edit** menu.

Or,

Click . Then, select **Delete Volume...**.

If you have more than one 3D volume stored for this patient and timepoint, a list of images representing the 3D volumes appears.

3 If you have more than one 3D volume stored for this patient and timepoint, select the volume you want to delete.

The Deleting Volume dialog box appears and asks you to confirm the deletion.

4 Click **Yes** to delete the volume.

Downsizing a DICOM Data Set

If you encounter “out of memory” problems when importing a DICOM data set into Dolphin 3D, you can downsize the data set. Downsizing interpolates the original data set, so no slices are skipped. You can downsize both single- and multi-file data sets.

To downsize a data set:

1 Click on the Dolphin Imaging main screen.

2 Select **DICOM Volume Downsizing Tool...**.

The Downsize DICOM Dataset dialog box appears so that you can specify the data set you want to downsize, where you want to save the downsized data set, and options for downsizing.

3 Click **Browse...** in the Input group box.

4 Navigate to the folder containing the 3D DICOM volume data set.

5 Select a file in the data set. Then, click **Open**.

6 Click **Load Now** to load the DICOM data.

The Information group box shows information about the downsizing operation that will be performed with the currently selected options.

7 Click **Browse...** in the Output group box.

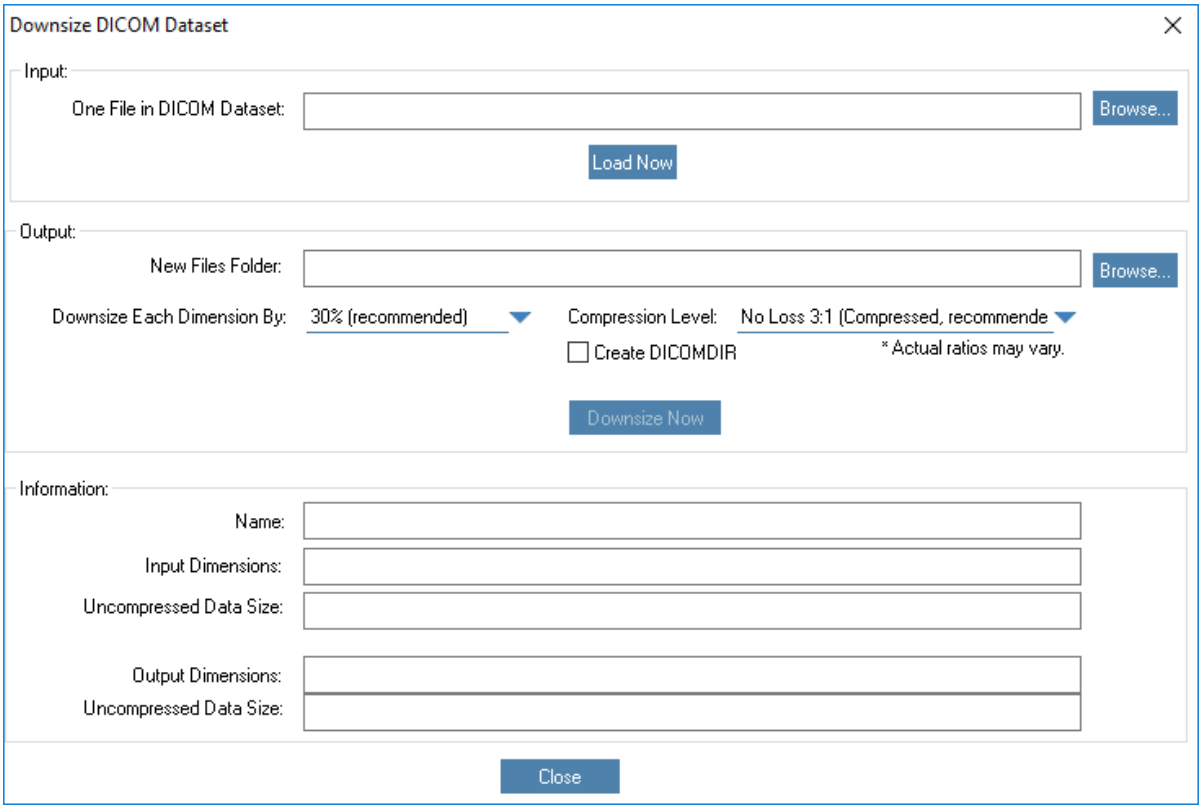
8 Navigate to the folder where you want to store the downsized DICOM volume data set. Then, click **OK**.

Or,

Click **Make New Folder**, and enter a name for the new folder. Then, click **OK**.

9 Set any other downsizing options.

10 Click **Downsize Now**.



Input	DICOM data set you want to downsize. **One File in DICOM Dataset:** One of the files in the DICOM data set you want to downsize. **Browse...:** Browse to one of the files in the DICOM data set you want to downsize. **Load Now:** Loads the DICOM data set you want to downsize.
Output	Storage options for the downsized DICOM data set. **New Files Folder:** Folder in which to store the downsized DICOM data set. **Browse...:** Browse to the folder in which to store the downsized DICOM data set. **Downsize Each Dimension By:** Percentage by which to downsize the DICOM data. Bear in mind that downsizing too much may result in a loss of detail in the 3D volumes. **Compression Level:** Level of compression to use when downsizing the DICOM data. **Create DICOMDIR:** Creates a DICOM directory file (DICOMDIR) that identifies the DICOM volume files for the data set. **Downsize Now:** Downsizes the data set.

Information	Information about the downsizing operation that will be performed with the currently selected options. **Name:** Name of the patient for this data set. **Input Dimensions:** Dimensions of the selected data set before downsizing. **Uncompressed Data Size:** Uncompressed size of the selected data set before downsizing. **Output Dimensions:** Dimensions of the selected data set after downsizing with the selected options. **Uncompressed Data Size:** Uncompressed size of the selected data set after downsizing with the selected options.

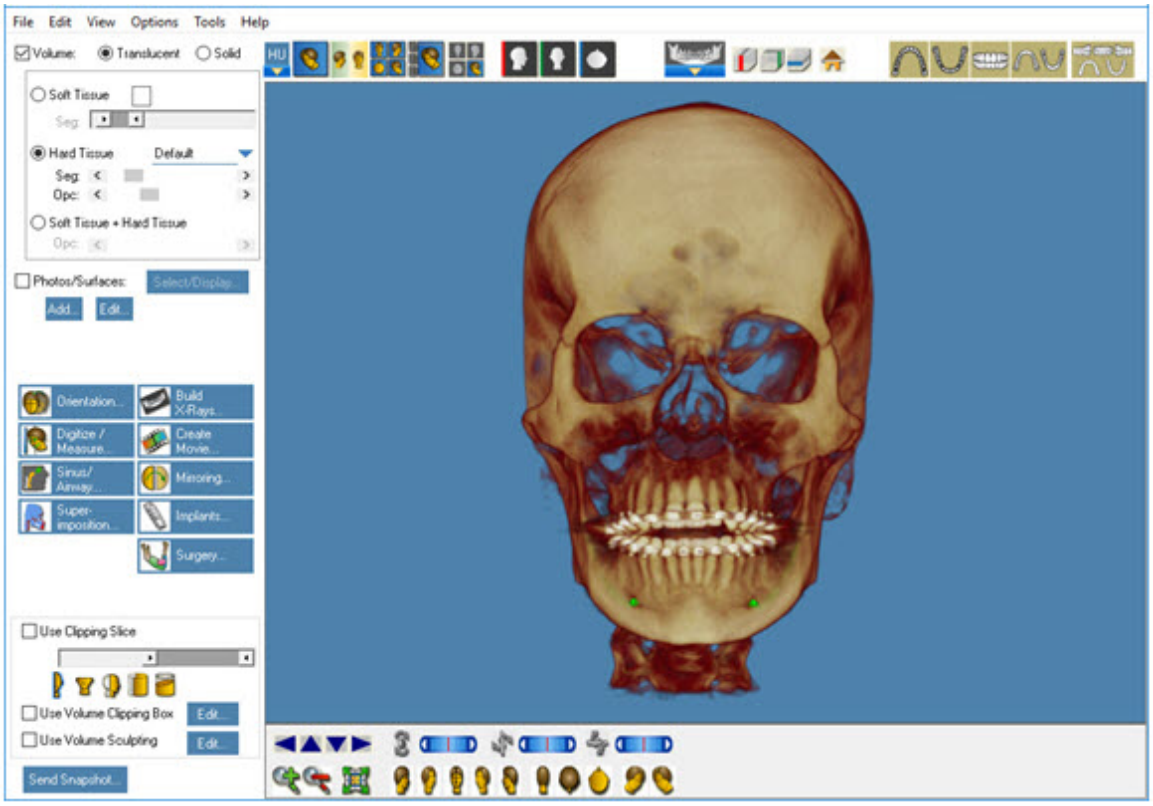
Understanding the Dolphin 3D Window

After you load a volume, it appears in the Dolphin 3D window as shown below. Using this window, you can:

- View the soft tissue, hard tissue, or both. Depending on your computer's graphics capabilities, you can use a translucent view that enables you to see features such as impacted teeth and implants. You can also set the color for the hard and soft tissue, which may enable you to distinguish various details of the volume more easily.
- View the patient's photo or a surface (of an arch model, for example) superimposed over the volume.
- Rotate the 3D volume. You can select one of the predefined views, or you can click and drag the volume to rotate it for any viewing angle.
- Change the magnification of the volume to zoom in on areas of interest.
- Display slices of the 3D volume representing the following standard planes on the 3D volume:
  - Sagittal plane: This vertical plane exactly divides the left and right sides.
  - Coronal plane: This vertical plane is orthogonal to the anterior-posterior axis. In the brain, it shows left and right, the top of the head and the neck.
  - Axial plane: This horizontal plane is orthogonal to the superior-inferior axis. In the brain, it shows left and right, face and back of the head.

  You can also customize the slice you are viewing by changing its angle, thickness, or location.
- Define your own viewing slices using either a clipping slice or clipping box.
  - A clipping slice cuts the 3D volume and displays a cross section (see “Using a Clipping Slice” on page 28-1).
  - A clipping box is a cube you define within the volume to display only the volume data within the box (see “Using a Clipping Box” on page 28-3).
- Use volume sculpting to remove parts of the volume. For more information, see “Sculpting the Volume” on page 28-6.

From this window, you can also access features that enable you to orient the 3D volume, add photos and surfaces, build x-rays from the volume data, digitize landmarks and create measurements, create a script or movie of the 3D volume, analyze the patient's airway, perform volume mirroring, superimpose two volumes, and simulate implants.



Volume	Displays the volume.
Translucent	Displays a translucent representation of the volume. Only available if your computer graphics card supports advanced 3D rendering.
Solid	Displays a solid representation of the volume.
Soft Tissue	Displays the patient's soft tissue image. In the translucent view, the following options configure the soft tissue image: **Color sample:** Sets the color for the soft tissue. **Seg...:** Sets the segment of the 3D volume for the soft tissue view. For more information on these options, see “Viewing the Soft Tissue” on page 19-26. In the solid view, the following options configure the soft tissue image: **drop-down list:** Sets the multi-color solid rendering template. For more information, see “Segmenting Solid Hard and Soft Tissues” on page 19-49. **Edit...:** Offers advanced segmentation options for the soft tissue view. For more information, see “Segmenting the Volume” on page 19-48. **Seg:** Sets the density segment of the 3D volume for the soft tissue view. These configuration options are saved for each 3D volume.

Hard Tissue	Displays the patient's hard tissue image. In the translucent view, the following options configure the hard tissue image: **drop-down list:** Sets the color scheme to use for the translucent view. **Seg:** Sets the density segment of the 3D volume for the hard tissue view. For more information on these options, see "Viewing the Hard Tissue" on page 19-27. **Opc:** Use this slider to set the level of opacity of the hard tissue image. In the solid view, the following options configure the hard tissue image: **drop-down list:** Sets the multi-color solid rendering template. For more information, see "Segmenting Solid Hard and Soft Tissues" on page 19-49. **Edit...:** Offers advanced segmentation options for the hard tissue view. For more information, see "Segmenting the Volume" on page 19-48. **Seg...:** Sets the segment of the 3D volume for the hard tissue view. These configuration options are saved for each 3D volume.
Soft Tissue + Hard Tissue	Displays both the soft and hard tissue images. The settings in the Soft Tissue and Hard Tissue group boxes configure the combined view. For more information, see "Viewing Both the Soft and Hard Tissue" on page 19-29. **Opc:** Sets the overall opacity of the combined image.
Photos/Surfaces	Displays a photo or surface (if available) superimposed on the volume. **Select/Display...:** Opens a dialog box where you can choose the photo or surface to display and set options for it. For more information, see"Viewing a Photo or Surface" on page 19-29. **Add...:** Opens a menu with the following options: • **2D Photo Wrap...:** Adds the patient's 2D photo and "wraps" it around the 3D volume. For more information, see "Working with 2D Photos" on page 19-67. • **3D Photo (.OBJ+bitmap)...:** Adds a 3D photo of the patient and superimposes it over the 3D volume. For more information, see "Working with 3D Photos" on page 19-56. • **Create Soft Tissue Surface (from volume)...:** Creates a surface representing the patient's soft tissue from the volume. For more information, see "Creating a Surface From the Volume" on page 19-74. • **Import Soft Tissue Surface (STL, OBJ, or PLY)...:** Imports a surface representing the patient's soft tissue and superimposes it over the 3D volume. For more information, see "Importing a Surface" on page 19-78. • **Import General Surface (STL, OBJ, or PLY)...:** Imports a surface representing something other than the patient's soft tissue or arch models. For more information, see "Importing a Surface" on page 19-78. • **Import Upper and Lower Arch Models (STL, OBJ, PLY, or DIXD)...:** Imports surfaces representing the patient's arch models. For more information, see "Importing Arch Model Surfaces" on page 19-83. **Edit...:** Opens a dialog box where you can adjust the superimposition of a photo or surface over the volume.

	Orients the volume so that it appears properly in the window. For more information, see Chapter 20, Volume Orientation.
	Creates x-rays from the 3D volume data. For more information, see Chapter 21, Build X-rays.
	Opens the **Digitize/Measurement** palette so that you can digitize landmarks and take measurements on the 3D volume. For more information, see Chapter 22, Digitize and Measurements (Medical Device).
	Opens the 3D Script Editor so you can create videos based on the 3D volume. For more information, see Chapter 23, Dolphin 3D Movies.
	Opens the Sinus/Airway Analysis dialog box so that you can mark and analyze the patient's airway. For more information, see Chapter 24, Airway Analysis (Medical Device). ***Note:*** *The Airway Analysis feature is available only on computers that support advanced 3D rendering modes ("translucent" modes).*
	Opens the Mirroring Tool dialog box so that you can perform volume mirroring operations. For more information, see Chapter 25, Mirroring. ***Note:*** *The Mirroring Tool is available only on computers that support advanced 3D rendering modes ("translucent" modes).*
	Opens the Superimposition dialog box so that you can superimpose two volumes. For more information, see Chapter 26, Volumes Superimposition (Medical Device).
	Opens the 3D Implant Simulation dialog box so that you can simulate the placement of implants using the 3D volume. For more information, see Chapter 27, 3D Implant Simulation (Medical Device).
	Opens the Dolphin 3D Orthognathic Surgical Planning module, which enables you to plan surgery using the patient's 3D volume. For more information, see Chapter 30, Orthognathic Surgical Planning (Medical Device).
Use Clipping Slice	Defines the cross-section of the volume to display. For more information, see "Using a Clipping Slice" on page 28-1.
Use Volume Clipping Box	Defines a clipping box for viewing part of the volume. For more information, see "Using a Clipping Box" on page 28-3.
Use Volume Sculpting	Enables you to sculpt the volume. For more information, see "Sculpting the Volume" on page 28-6.

Send Snapshot...	Opens a menu with the following options: **Close This Menu:** Closes the menu. **Save To Dolphin Layout/Database:** Saves the 3D volume to a slot in an image layout and stores it in your database. For more information, see “Saving, Exporting, Uploading, and Printing” on page 19-117. **Send To Report:** Uses this image in a Dolphin 3D report. For more information, see Chapter 29, Reports. **Copy To Clipboard:** Copies the 3D image to the clipboard. Then, you can paste it into another application. For more information, see “Copying an Image to the Clipboard” on page 19-119. **Print:** Prints the image. For more information, see “Printing an Image” on page 19-123. **Export To File:** Exports the 3D image to a file. For more information, see “Exporting an Image” on page 19-119.
	Renders the slice and volume with color based on Hounsfield Units. Color rendering using Hounsfield Units gives you better control in highlighting anatomies with known Hounsfield Unit ranges. ***Note:*** *Only available for scans imported using Dolphin Imaging version 11 or later.* For more information, see “Using the Hounsfield Unit View” on page 19-42.
layout buttons	Set the layout of the window. For more information, see “Layouts and Slices” on page 19-32. : Displays the volume layout. In this layout, only the 3D volume or photo appears in the window. Displays the side-by-side volume layout. In this layout, lateral and frontal views of the 3D volume or photo appear side by side in the window. : Displays the 4 volume layout. In this layout, four views of the same volume appear in the window. : Displays the 3+1 layout. In this layout, the window has four panes: three small panes on the left containing the sagittal, coronal, and axial slices, and one large pane on the right containing the 3D volume or photo. : Displays the 2x2 layout. In this layout, the window has four equal panes containing the sagittal slice, the coronal slice, the axial slice, and the 3D volume or photo.

slice buttons	Display standard slices rather than the 3D volume. For more information, see “Standard Slice Views” on page 19-38. : Displays the sagittal slice. : Displays the coronal slice. : Displays the axial slice.
	Toggles the display of the slice location lines (cross-hairs) on the sagittal, coronal, and axial slices. Only available when you are using one of the standard slice views, the 3+1 layout, or the 2x2 layout.
	Displays the specified x-ray to view. Available only after you have built at least one x-ray type. For more information, see Chapter 21, Build X-rays.
show/hide Slice buttons	Toggles the display of planes indicating the standard slice locations on the 3D volume or photo. For more information, see “Single Volume Layout” on page 19-33. : Toggles the display of a plane indicating the location of the sagittal slice. : Toggles the display of a plane indicating the location of the coronal slice. : Toggles the display of a plane indicating the location of the axial slice.
	Returns the sagittal, coronal, and axial slices to their standard locations after you have customized them. For more information, see “Changing the Slice Angle and Thickness” on page 19-40 and “Changing the Slice Locations” on page 19-41.
arch buttons	Displays arch model surfaces. Available only if you have imported arch model surfaces for this patient. For more information, see “Working With Arch Model Surfaces” on page 19-83. ***Note:*** *These views display the arches in the occlusion that they had when the scans were imported into Dolphin 3D.* : Displays the upper arch surface. : Displays the lower arch surface. : Displays both arch surfaces, one above the other. : Displays both arch surfaces side by side. : Displays several views of the arch surface.

	Move the 3D volume in the window in the indicated direction. For more information, see “Moving or Reorienting the Volume” on page 19-24.
	Zooms in on the 3D volume. For more information, see “Changing the Magnification” on page 19-25.
	Zooms out on the 3D volume. For more information, see “Changing the Magnification” on page 19-25.
	Fits the 3D volume in the window. For more information, see “Changing the Magnification” on page 19-25.
rotation sliders	Rotate the volume around the indicated axis. For more information, see “Moving or Reorienting the Volume” on page 19-24. : Rotates the 3D volume horizontally. : Rotates the 3D volume circularly. : Rotates the 3D volume vertically.
predefined views	Orient the 3D volume in one of the predefined views. For more information, see “Moving or Reorienting the Volume” on page 19-24. : Orients the 3D volume for a right view. : Orients the 3D volume for a right oblique view. : Orients the 3D volume for a front view. : Orients the 3D volume for a left oblique view. : Orients the 3D volume for a left view. : Orients the 3D volume for a back view. : Orients the 3D volume for a top view. : Orients the 3D volume for a bottom view. : Orients the 3D volume for an isometric view. : Orients the 3D volume for an isometric view.

The Menu Bar

At the top of the Dolphin 3D window, there are several menus that you can use to access program features. This section describes each of these menus.

Some of the program features on the menus are also accessible from the buttons on Dolphin 3D window.

The File Menu

The **File** menu contains the following choices:

Save...	Saves the 3D volume. For more information, see “Saving, Exporting, Uploading, and Printing” on page 19-117. The data is saved either to your Dolphin database or to your external DICOM storage location, depending on your DICOM volume storage options. For more information, see “Setting DICOM Volume Storage Options” on page 19-126.
Print...	Prints your current view of the 3D volume data. For more information, see “Printing an Image” on page 19-123.
Export DICOM...	Saves the 3D volume data to your computer as one or more DICOM files. For more information, see “Exporting DICOM Files” below.
Upload Volume to PACS...	Uploads the 3D volume from your computer to a PACS server. For more information, see “Uploading the Volume to a PACS Server” on page 19-122.
Create Surface from Volume...	Creates an surface from the volume for use with applications that can import and process an surface. For more information, see “Creating a Surface From the Volume” on page 19-74.
Exit	Exits from Dolphin 3D and returns to the Dolphin Imaging main screen.

The Edit Menu

The **Edit** menu contains the following choices:

Copy to Clipboard	Copies the image to the clipboard. You can then paste it into another program. For more information, see “Copying an Image to the Clipboard” on page 19-119.
Export to File...	Exports the image to a file on your computer's file system. For more information, see “Exporting an Image” on page 19-119.
Add to End of Movie Script	Adds the image as a key frame in a movie script. For more information, see “Adding a Frame” on page 23-5.

The View Menu

The **View** menu contains the following choices:

DICOM Header Information...	Displays scan information for this 3D volume, such as the patient name, scan source, and scan size. For more information, see “Viewing DICOM Header Information” on page 19-19.
Zoom volume to fit in window	Changes the image magnification so that it fits in the window. For more information, see “Changing the Magnification” on page 19-25.
Show/Hide Sagittal Plane	Toggles display of the sagittal plane. For more information, see “Single Volume Layout” on page 19-33.
Show/Hide Coronal Plane	Toggles display of the coronal plane. For more information, see “Single Volume Layout” on page 19-33.
Show/Hide Axial Plane	Toggles display of the axial plane. For more information, see “Single Volume Layout” on page 19-33.
Restore View Plane Positions	Returns all view planes (sagittal, coronal, and axial) to their default positions. For more information, see “Changing the Slice Locations” on page 19-41.
Show All View Planes	Displays all three view planes (sagittal, coronal, and axial) on the volume. For more information, see “Single Volume Layout” on page 19-33."
Hide All View Planes	Suppresses display of all three view planes (sagittal, coronal, and axial) on the volume. For more information, see “Single Volume Layout” on page 19-33.
Show/Hide Symmetry Caliper	Toggles display of the symmetry caliper. For more information, see “Using the Symmetry Caliper” on page 19-45.
Show/Hide Nerve Canals on Hard Tissue	Toggles display of nerve canals on the patient's hard tissue image. For more information on viewing nerve canals, see “Viewing Nerve Canals” on page 19-42. For information on marking the nerve canals, see “Building a Nerve Canals X-ray View” on page 21-29.
Show Anonymizing Bar	Toggles anonymizer bars to obscure the patient’s identity for case presentation purposes. Before you can show anonymizer bars, you must add them for the patient. For more information, see “Adding Anonymizer Bars” on page 19-46.
Select and Show Database Image	Displays an image stored in the database for this patient or an image stored on your computer.

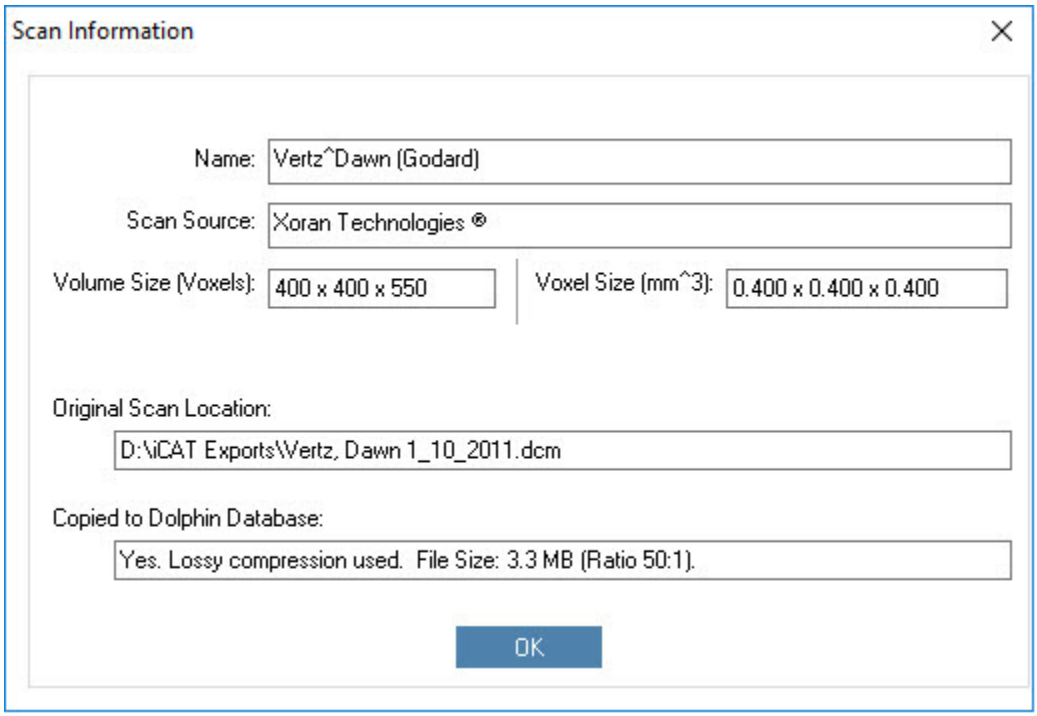
Viewing DICOM Header Information

To view DICOM header information for the volume:

1 Select **DICOM Header Information...** from the **View** menu.

The Scan Information dialog box opens.

2 Click **OK** to close the dialog box.



Name	Name of the patient for this 3D volume.
Scan Source	Source from which this 3D volume was captured.
Volume Size (Voxels)	Size of this 3D volume in voxels.
Voxel Size (mm^3)	Size of a voxel expressed in cubic millimeters.
Original Scan Location	Location where the originally scanned DICOM file or set of files is stored.
Copied to Dolphin Database	Information on whether the volume was copied to the Dolphin database, the options used to copy it, and the size of the file.

The Options Menu

The **Options** menu contains the following choices:

Background Color...	Sets the color used for the background in the window (see “Setting the Background Color” below)
General Options...	Sets general options for Dolphin 3D. For more information, see “Setting General Options” on page 19-123.

Runtime Memory Saving/ Optimizing...	Opens a sub-menu with the following options for optimizing your memory usage: **Current Optimization Status...:** Reports your current memory optimization status. **Optimize...:** Opens a dialog where you can optimize your memory usage. **Undo Optimization (Revert Back to Original DICOM Volume)...:** Reverts a previously performed optimization. For more information, see “Runtime Memory Saving/Optimizing” on page 19-129.
External DICOM Volume Storage	Sets the location where you want to save 3D volume data for your patients, either in your Dolphin database or in your external DICOM storage location. You can set the storage location for all future patients and for the current patient. For more information, see “Setting DICOM Volume Storage Options” on page 19-126.

The Tools Menu

The **Tools** menu contains the following choices:

Set Orientation...	Sets the orientation of the 3D volume. For more information, see Chapter 20, Volume Orientation.
Build X-Rays...	Builds x-rays based on the 3D volume. For more information, see Chapter 21, Build X-rays.
Digitize/ Measure...	Opens a window where you can digitize landmarks and take measurements on the 3D volume. For more information, see Chapter 22, Digitize and Measurements (Medical Device).
Create/Use Script	Opens a window where you can create and use a script to make Dolphin 3D movies For more information, see Chapter 23, Dolphin 3D Movies.
Sinus/Airway	Opens the Sinus/Airway dialog box so that you can mark and analyze the patient's airway. For more information, see Chapter 24, Airway Analysis (Medical Device).
Mirroring	Opens the Mirroring Tool dialog box so that you can perform volume mirroring operations. For more information, see Chapter 25, Mirroring.
Superimposition	Opens the Superimposition dialog box so that you can superimpose two volumes. For more information, see Chapter 26, Volumes Superimposition (Medical Device).
Implants	Opens the 3D Implant Simulation dialog box so that you can superimpose two volumes. For more information, see Chapter 27, 3D Implant Simulation (Medical Device).

Orthognathic Surgical Planning...	Opens a sub-menu of Orthognathic Surgical Planning options. **Restore Last Saved Workup...:** Opens the most recently saved surgical planning workup. **Restore From:** Selects the surgical planning workup to open. **Start New Workup...:** Starts a new surgical planning workup for this patient. **Start New Workup (With Externally Segmented Md Mx STLs)...:** Selects externally saved STL files to use as a starting point for a new surgical planning workup for this patient. For more information, see Chapter 30, Orthognathic Surgical Planning (Medical Device).
Edit Anonymizing Bar...	Opens a dialog box where you can add anonymizer bars to obscure the identity of a patient for case presentation purposes. Once you have added anonymizer bars, you can press ALT+A or select **Show Anonymizing Bar** from the **View** menu to toggle whether they display (see "Adding Anonymizer Bars" below).
DICOM Volume Storage	Opens a window where you can specify where to store the volume data for your patients. You can set this location for all future patients or for the current patient. For more information, see "Setting DICOM Volume Storage Options" on page 19-126.

The Help Menu

The **Help** menu contains the following choices:

Contents	Opens the Table of Contents for the online help.
Index	Opens the Index for the online help.
Using Help	Accesses help on using the online help.
Graphics Card Capabilities...	Opens a window that provides detailed information about the graphics card installed on your computer.

The Context Menu

The context menu provides shortcuts to commonly used Dolphin 3D features.

To access the context menu:

1 Right-click the image in the Dolphin 3D window.

The context menu contains the following choices:

Close this Menu	Closes the context menu.
Zoom volume to fit window	Changes the image magnification so that it fits in the Dolphin 3D window. For more information, see "Changing the Magnification" on page 19-25.

Show All View Planes	Displays all three view planes (sagittal, coronal, and axial) on the volume. For more information, see “Single Volume Layout” on page 19-33.
Hide All View Planes	Hides all three view planes (sagittal, coronal, and axial) on the volume. For more information, see “Single Volume Layout” on page 19-33.
Show/Hide Symmetry Caliper	Toggles the display of the symmetry caliper. For more information, see “Using the Symmetry Caliper” on page 19-45.
Show/Hide Nerve Canals on Hard Tissue	Toggles the display of nerve canals on the patient's hard tissue image. For more information on viewing nerve canals, see “Viewing Nerve Canals” on page 19-42. For information on marking the nerve canals, see “Building a Nerve Canals X-ray View” on page 21-29.
Add to End of Movie Script	Adds the image in the Dolphin 3D window as a key frame at the end of a movie script. For more information, see “Adding a Frame” on page 23-5.
Replace Highlighted Movie Script Frame	Replaces the selected frame in your script with a new frame. For more information, see “Adding a Frame” on page 23-5.
Save To Dolphin Layout/Database...	Saves the 3D volume data. For more information, see “Saving, Exporting, Uploading, and Printing” on page 19-117. The data is saved either to your Dolphin database or to your external DICOM storage location, depending on your DICOM volume storage options. For more information, see “Setting DICOM Volume Storage Options” on page 19-126.
Copy to Clipboard	Copies the image to the clipboard. You can then paste it into another program. For more information, see “Copying an Image to the Clipboard” on page 19-119.
Print...	Prints your current view of the 3D volume data. For more information, see “Printing an Image” on page 19-123.
Export to File...	Exports the image to a file on your computer's file system. For more information, see “Exporting an Image” on page 19-119.
Full Window	Maximizes the image so that it takes up your entire computer screen. Select this option again to return the image to its initial size. For more information, see “Changing the Magnification” on page 19-25
Set Volume Orientation to Current Slice Orientations	Sets the volume orientation to match the orientation of the slice you are currently viewing. For more information, see “Moving or Reorienting the Volume” on page 19-24.
Save Volume Orientation...	Saves the current volume orientation so that you can restore it later. For more information, see “Moving or Reorienting the Volume” on page 19-24.
Restore Volume Orientation...	Restores a previously saved volume orientation. For more information, see “Moving or Reorienting the Volume” on page 19-24.

Configuring the 3D Window View

Dolphin 3D offers several features that you can use to configure your view of the 3D volume and/or photo (if available). You can:

- move and reorient the volume in the window
- change the magnification
- view the soft tissue, hard tissue, or both
- View the patient's photo or a surface (of an arch model, for example) superimposed over the volume
- view various window layouts and volume slices

Moving or Reorienting the Volume

Most Dolphin 3D windows offer controls for moving the 3D volume in the window and changing it's orientation.

To move the volume in the window:

1 Click one of the arrow buttons ( ) to move the volume in the indicated direction.

Or,

SHIFT+click and drag the volume within the window.

To change the orientation of the volume:

1 Click the button for one of the predefined views to orient the volume for that view.

Or,

Click and drag one of the sliders to rotate the volume around the indicated axis.

Or,

Click an arrow button on one of the sliders to rotate the volume around the indicated axis.

Or,

SHIFT+click an arrow button on one of the sliders to rotate the volume in 15 degree increments around the indicated axis.

Or,

CTRL+click an arrow button on one of the sliders to rotate the volume in 30 degree increments around the indicated axis.

Or,

Click and drag the volume to rotate it.

The predefined views are:

Right	Left oblique	Top
Right oblique	Left	Bottom
Front	Back.	Right isometric
		Left isometric

The sliders rotate the volume as follows:

	Rotates the 3D volume horizontally.
	Rotates the 3D volume circularly.
	Rotates the 3D volume vertically.

If you have changed the orientation on one or more of the slice views, you can set the volume's orientation to match it. For information on the slice views, see “Standard Slice Views” on page 19-38.

To set the volume orientation to match the slice orientation:

1 Right-click the volume, and select **Set Volume Orientation to Current Slice Orientations** from the context menu.

Changing the Magnification

To change the magnification:

1 Click or press **F2** to zoom in.

Or,

Click or press **F3** to zoom out.

Or,

Click or press **F4** to fit the image to the window.

Or,

Select **Zoom Volume to Fit in Window** from the **View** menu to fit the image to the window.

Or,

Right-click the image, and select **Zoom volume to fit window** from the context menu.

Or,

CTRL+click and drag to change the magnification.

To maximize the image so that it takes up your entire computer screen:

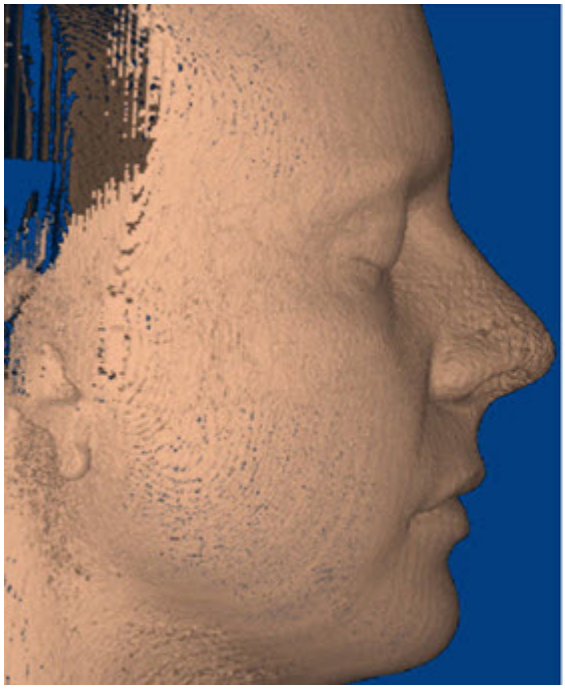
1 Right-click the image, and select **Full Window** from the context menu.

Select this option again to return the image to its initial size.

Viewing the Soft Tissue

Dolphin 3D offers two views of the patient's soft tissue: the solid view and the translucent view. The translucent view can enable you to see structures that might otherwise be difficult to see, but it is available only on computers that support advanced 3D rendering. The following figure illustrates the same patient volume in the solid soft-tissue view and in the translucent soft-tissue view.

Solid Soft Tissue View



Translucent Soft Tissue View

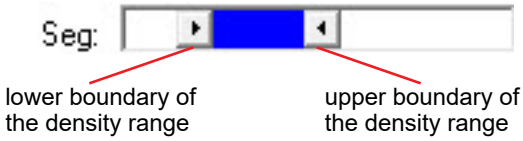
To use the translucent soft tissue view:

1 Check the **Volume** box. Then, select **Translucent** and **Soft Tissue**.

2 Optionally, click the color sample and select the color to use for this translucent soft tissue view.

3 Optionally, adjust the **Seg** slider to set the segmentation for this translucent soft tissue view.

Using the slider, you identify the range of tissue densities for the patient's soft tissue for this translucent soft tissue view. As you adjust the slider, the image in the main window changes to reflect the currently selected volume segment.



When segmenting soft tissue, you identify the lower and upper density values in the range you want to use. For example, the lower boundary may identify the transition between the air and the patient's soft tissue. The upper boundary may identify the transition between the patient's soft tissue and hard tissue.

To use the solid soft tissue view:

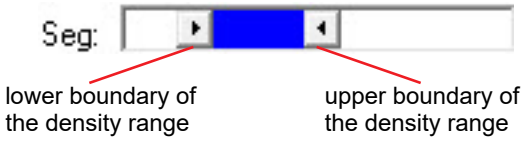
1 Check the **Volume** box. Then, select **Solid** and **Soft Tissue**.

2 Optionally, select the multi-color solid rendering template to use from the drop-down list.

For more information on multi-color solid rendering templates, see “Segmenting Solid Hard and Soft Tissues” on page 19-49.

3 Optionally, adjust the **Seg** slider to set the segmentation for the soft tissue view.

By segmenting the 3D volume, you identify the parts of the volume data to use for the soft tissue view. Using the slider, you identify the range of tissue densities for the patient's soft tissue. As you adjust the slider, the image in the main window changes to reflect the currently selected volume segment.



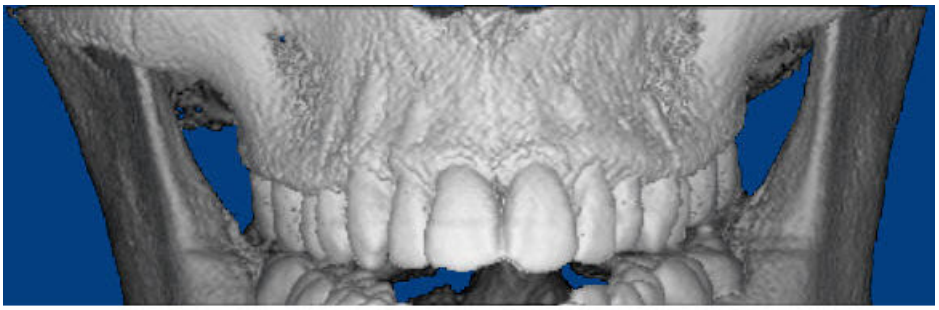
When segmenting soft tissue, you identify the lower and upper density values in the range you want to use. For example, the lower boundary may identify the transition between the air and the patient's soft tissue. The upper boundary may identify the transition between the patient's soft tissue and hard tissue.

The Soft Tissue Solid Volume Segmentation window offers more advanced options for segmenting the volume. For information on using these options, see “Segmenting the Volume” on page 19-48.

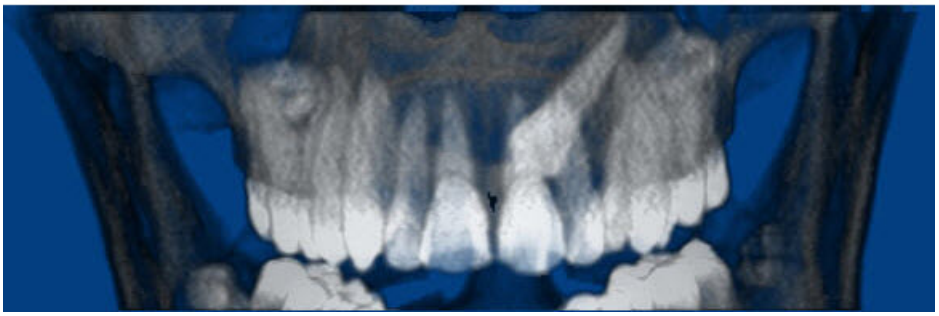
Viewing the Hard Tissue

Dolphin 3D offers two views of the patient’s soft tissue: the solid view and the translucent view. The translucent view can enable you to see structures that might otherwise be difficult to see, such as impacted teeth or implants, but it is available only on computers that support advanced 3D rendering. The following figure illustrates the same patient volume in the solid hard-tissue view and in the translucent hard-tissue view.

Solid Hard Tissue View



Translucent Hard Tissue View



To use the translucent-hard tissue view (available only on computers that support advanced 3D rendering):

1 Check the **Volume** box. Then, select **Translucent** and **Hard Tissue**.

2 Optionally, select the multi-color solid rendering template to use from the drop-down list.

For more information on multi-color solid rendering templates, see “Segmenting Solid Hard and Soft Tissues” on page 19-49.

3 Optionally, adjust the **Seg** slider to set the segmentation for this translucent hard tissue view.

4 Optionally, adjust the **Opc** slider to adjust the opacity of the translucent hard tissue view.

To use the solid hard tissue view:

1 Check the **Volume** box. Then, select **Solid** and **Hard Tissue**.

2 Optionally, select the multi-color solid rendering template to use from the drop-down list.

For more information on multi-color solid rendering templates, see “Segmenting Solid Hard and Soft Tissues” on page 19-49.

3 Optionally, adjust the **Seg** slider to set the segmentation for the hard tissue view.

By segmenting the 3D volume, you identify the parts of the 3D volume data to use for the hard tissue view. Using the slider, you identify the lower boundary for the range of tissue densities for the patient's hard tissue—that is, the transition between the patient's soft tissue and hard tissue. As you adjust the slider, the image in the main window changes to reflect the currently selected volume segment.

boundary between the soft and hard tissue

The Hard Tissue Solid Volume Segmentation window offers more advanced options for segmenting the volume. For information on using these options, see “Segmenting the Volume” on page 19-48.

Viewing Both the Soft and Hard Tissue

To view both the soft and hard tissue:

1 Check the **Volume** box. Then, select **Solid** and **Soft Tissue + Hard Tissue** to view the soft tissue solid view with the hard tissue solid view.

Or,

Check the **Volume** box. Then, select **Translucent** and **Soft Tissue + Hard Tissue** to view the soft tissue translucent view with the hard tissue translucent view.

2 Optionally, adjust the **Opc** slider to adjust the overall opacity of the image.

3 Optionally, set options for the hard tissue view.

For more information, see “Viewing the Hard Tissue” on page 19-27.

4 Optionally, set options for the soft tissue view.

For more information, see “Viewing the Soft Tissue” on page 19-26.

Viewing a Photo or Surface

If you have stored photos or surfaces for this patient, you can view them either alone or superimposed over a volume view. For information on adding photos and surfaces, see “Using Photos and Surfaces” on page 19-56.

To view a photo or surface only:

1 Uncheck the **Volume** box if it is currently checked.

2 Check the **Photos/Surfaces** box.

If you have not previously specified which of the available photos and/or surfaces you want to display, the Surfaces for Display dialog box opens (see below).

To view both the volume and a photo or surface:

1 Check the **Volume** box and select the soft tissue, hard tissue, or soft tissue + hard tissue view you want. Then, check the **Photos/Surfaces** box.

If you have not previously specified which of the available photos and/or surfaces you want to display, the Select Photos/Surfaces for Display dialog box opens (see below).

To specify which of this patient's available photos and/or surfaces you want to display:

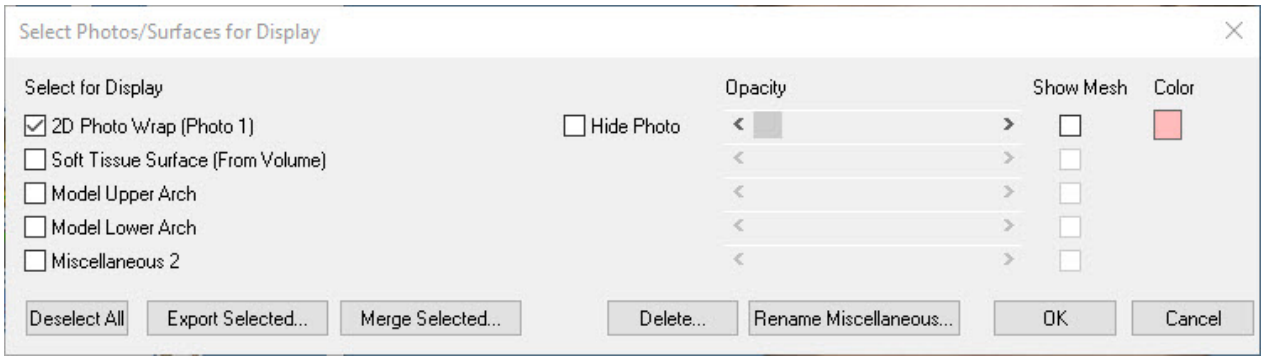
1 Check the **Photos/Surfaces** box if it isn't already checked. Then, click **Select/Display**.

If you choose to display a photo or surface (for example, by checking the **Photos/Surfaces** box) and you have not previously selected a photo or surface to display, the Select Photos/Surfaces for Display dialog box opens automatically.

2 Check the box for each photo or surface to display.

3 Optionally, set display options for each selected photo or surface.

4 Click **OK**.



Select for Display	Specifies the photos or surfaces to display.
Hide Photo	Specifies whether to display a photo or the color data used to represent the patient's skin for a surface. Since this data can be large, omitting it from the display can increase the speed of rendering and manipulating the image.
Opacity	Sets the level of opacity for a photo or surface.
Show Mesh	Uses a mesh representation based on the patient's photo or surface instead of the actual photo or surface.
Color	Sets the color for a surface or for the mesh representation of a photo. For photos, the color sample only appears if the **Mesh** box is checked.
Deselect All	Unchecks the boxes for all the available photos and surfaces.
Export Selected...	Exports one or more selected surfaces to a file. For more information, see "Exporting a Surface" on page 19-79.
Merge Selected...	Merges the selected surfaces into a composite surface. For more information, see "Merging Surfaces" on page 19-81.
Delete...	Deletes one or more selected surfaces. For more information, see "Deleting Photos and Surfaces" on page 19-117.
Rename Miscellaneous...	Changes the description of miscellaneous slots currently in use. Only appears if at least one miscellaneous surface slot (such as (*) Miscellaneous 1) is currently in use. For more information, see "Renaming Miscellaneous Slots" on page 19-117.

Viewing X-rays

After you have built at least one x-ray type, you can easily view the available x-rays (except the slice montage views) without opening the Build X-Rays Tool window. This image layout also enables you to include x-rays in movie scripts (see Chapter 23, Dolphin 3D Movies).

To view an x-ray:

1 Click .

2 Select the x-ray type you want to view.

The selected x-ray appears.

If an x-ray type is disabled on the menu, that x-ray has not been built yet. For more information, see Chapter 21, Build X-rays.

Viewing Arch Model Surfaces

If you have imported arch model surfaces for the patient, you can view them at any time. These views display the arch models in the occlusion established when the scans were imported into Dolphin 3D. Typically, this reflects the occlusion of the models from the scanning equipment, but the occlusion may have been adjusted when the scans were imported. For more information, see “Defining the Occlusion” on page 19-86.

To view one or both arch model surfaces only:

1 Click to view the upper arch.

Or,

Click to view the lower arch.

Or,

Click to view the both arches, one above the other.

Or,

Click to view the both arches side by side.

Or,

Click to see several views of the arch surface.

These buttons only appear if arch model surfaces are available for the current patient.

Note: *When viewing both arches side by side ( ), you can save a snapshot to the Undigitized Arch image slot in the* ***- Everything -*** *image layout. Then, you can digitize the snapshot in Dolphin 2D for a full arch length analysis. For more information, see "Digitizing Model Arches" on page 22-6.*

Layouts and Slices

The Dolphin 3D window offers the following image layouts:

Single Volume	Displays only the 3D volume or photo.
Side-by-Side Volume	Displays two views of the same volume.
4-Equal Volumes	Displays four equal panes containing four views of the same volume.
3+1 Slices-Volume	Displays four panes: three small panes on the left containing the sagittal, coronal, and axial slices, and one large pane on the right containing the 3D volume or photo.
4-Equal Slices-Volume	Displays four equal panes containing the sagittal slice, the coronal slice, the axial slice, and the 3D volume or photo.

The Dolphin 3D window also offers views of the three standard slices (sagittal, coronal, and axial).

To use a different layout:

1 Click to use the Single Volume View.

Or,

Click to use the Side-by-Side Volume View.

Or,

Click to use the 4-Equal Volumes Layout.

Or,

Click to use the 3+1 Slices-Volume Layout.

Or,

Click to use the 4-Equal Slices-Volume Layout.

Single Volume Layout

In this image layout, only the 3D volume or photo appears in the window. You also can view planes representing the three standard slices on the volume.

To toggle display of planes representing the slices:

1 Click to show or hide a plane representing the sagittal slice.

Or,

Click to show or hide a plane representing the coronal slice.

Or,

Click to show or hide a plane representing the axial slice.

Or,

Select **Show/Hide Sagittal Plane** from the **View** menu to show or hide a plane representing the sagittal slice.

Or,

Select **Show/Hide Coronal Plane** from the **View** menu to show or hide a plane representing the coronal slice.

Or

Select **Show/Hide Axial Plane** from the **View** menu to show or hide a plane representing the axial slice.

Or,

Right-click the volume and select **Show All View Planes** to show planes representing the sagittal, coronal, and axial slices.

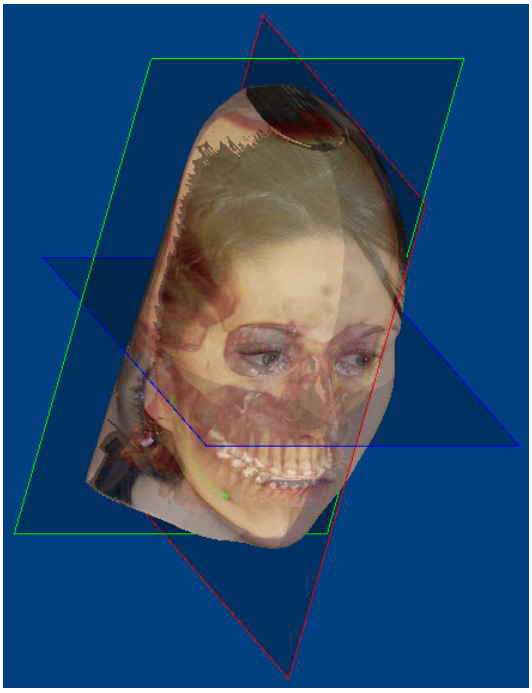
Or,

Right-click the volume and select **Hide All View Planes** to hide the planes representing the sagittal, coronal, and axial slices.

The following figure illustrates a volume with all three slices displayed. The planes are color coded as follows:

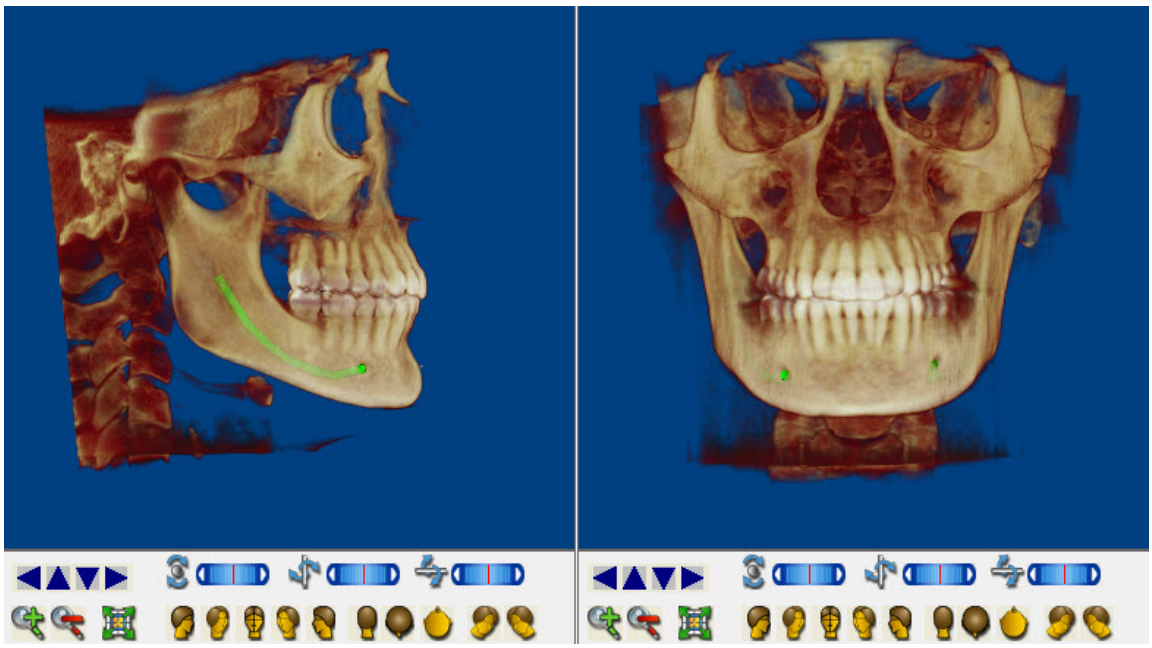
Red	Sagittal slice
Green	Coronal slice
Blue	Axial slice

Note: *Depending on the orientation of the volume, the slices may appear as lines rather than three-dimensional planes.*



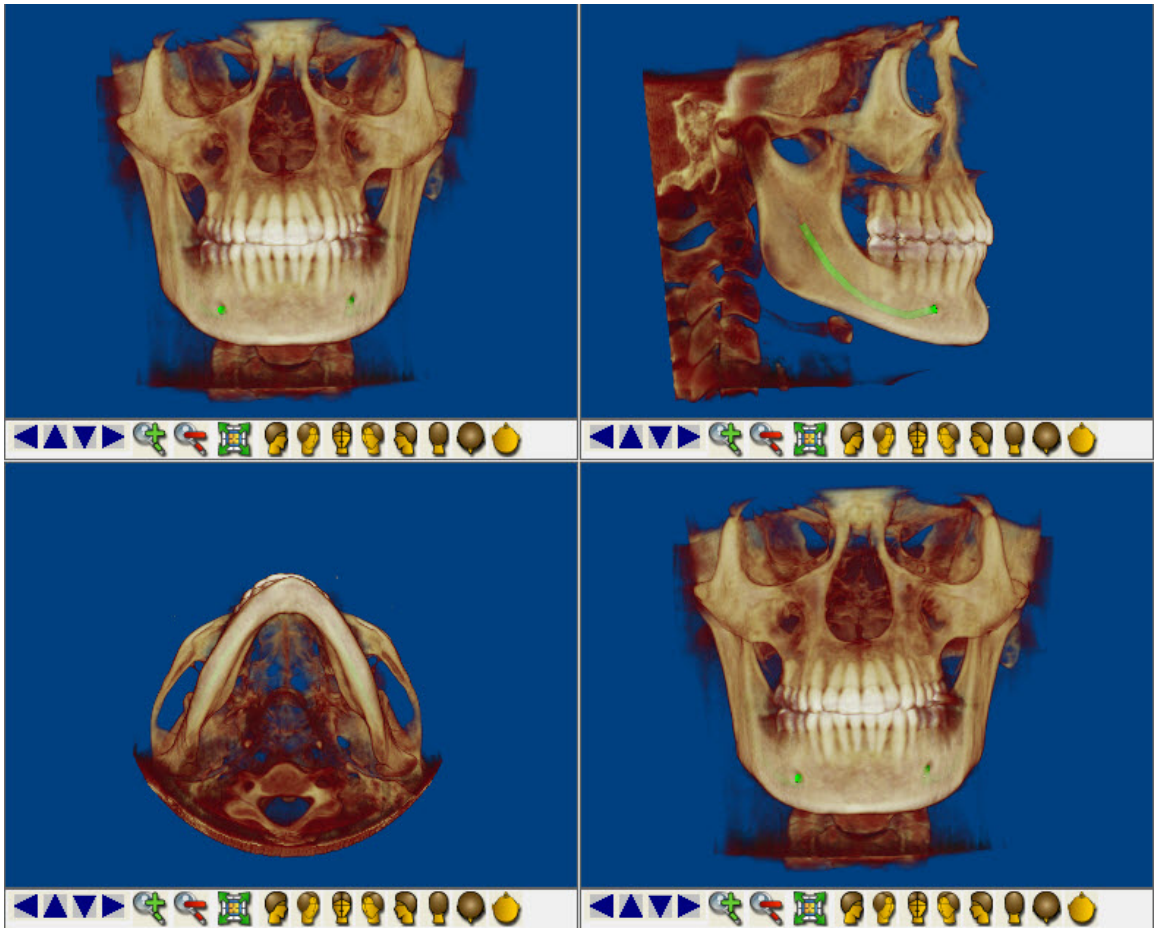
Side-by-Side Volume Layout

In this image layout, two views of the same 3D volume or photo appear side by side in the window. All the segmentation, clipping slice, sculpting, rendering scheme, and other settings are applied to both views. Initially, the two views are oriented as depicted on the button. However, you can change the orientation of each volume view independently.



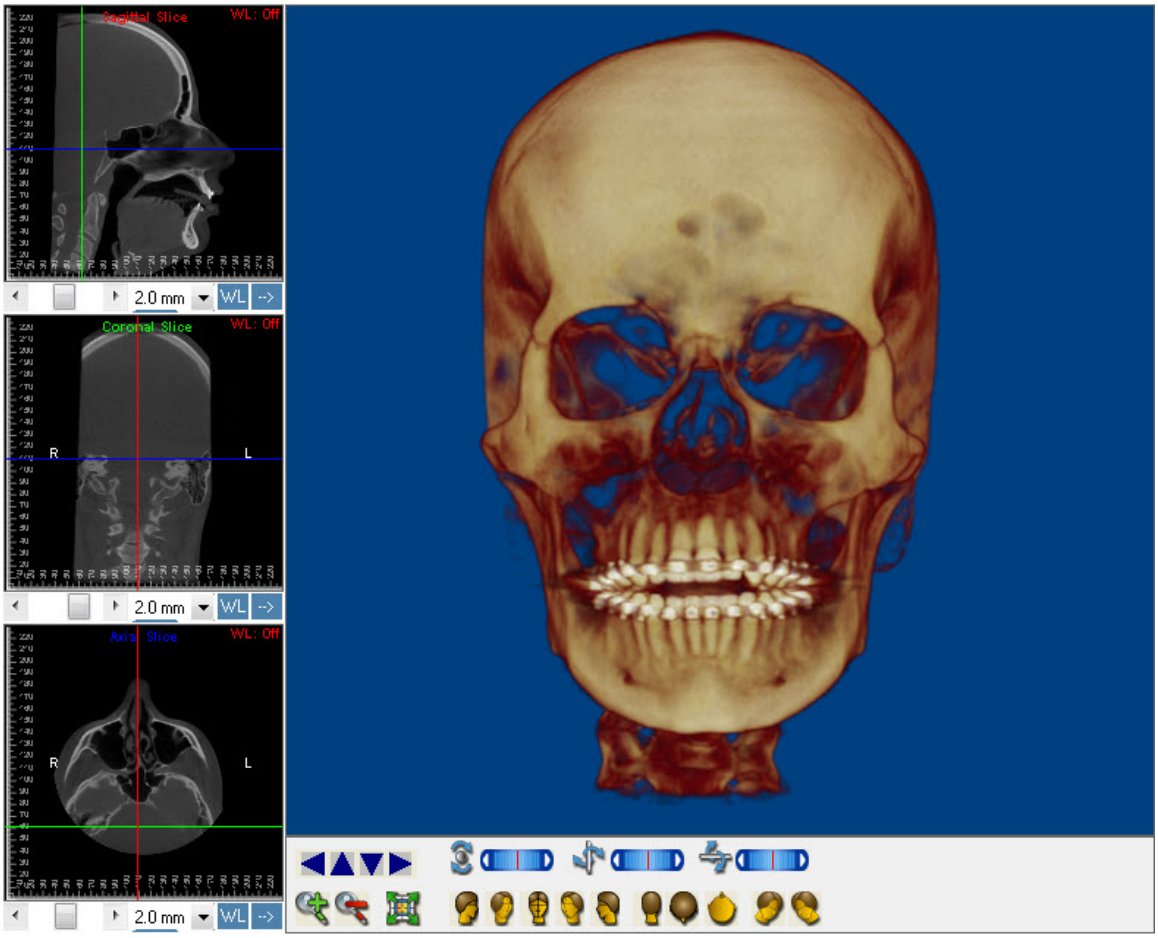
4-Equal Volumes Layout

In this image layout, the window has four panes containing different views of the same volume so all the segmentation, clipping slice, sculpting, rendering scheme, and other settings will be applied to all volume views. Initially, the four volume views are oriented as depicted on the button. However, you can change the orientation of each volume view independently.



3+1 Slices-Volume Layout

In this image layout, the window has four panes: three small panes on the left containing the sagittal, coronal, and axial slices, and one large pane on the right containing the 3D volume, photo, or two superimposed volumes.



slice location lines	Displays lines with the following color coding to identify the location of the three standard slices: **Red:** Sagittal slice **Green:** Coronal slice **Blue:** Axial slice For more information, see “Changing the Slice Locations” on page 19-41.
slider	Sets the location of the slice in the associated pane. For more information, see “Changing the Slice Locations” on page 19-41.
drop-down list	Sets the thickness of the slice. For more information, see “Changing the Slice Angle and Thickness” on page 19-40.

WL	Adjusts the window leveling, which affects the apparent brightness and contrast of the volume display. Changing the window leveling does not change any volume files. For more information on window leveling, see “Setting Window Leveling” on page 21-48.
-->	Moves the image in the associated pane to the large pane.

To move an image from a small pane to the large pane:

1 Click **-->** under the image to display in the large pane.

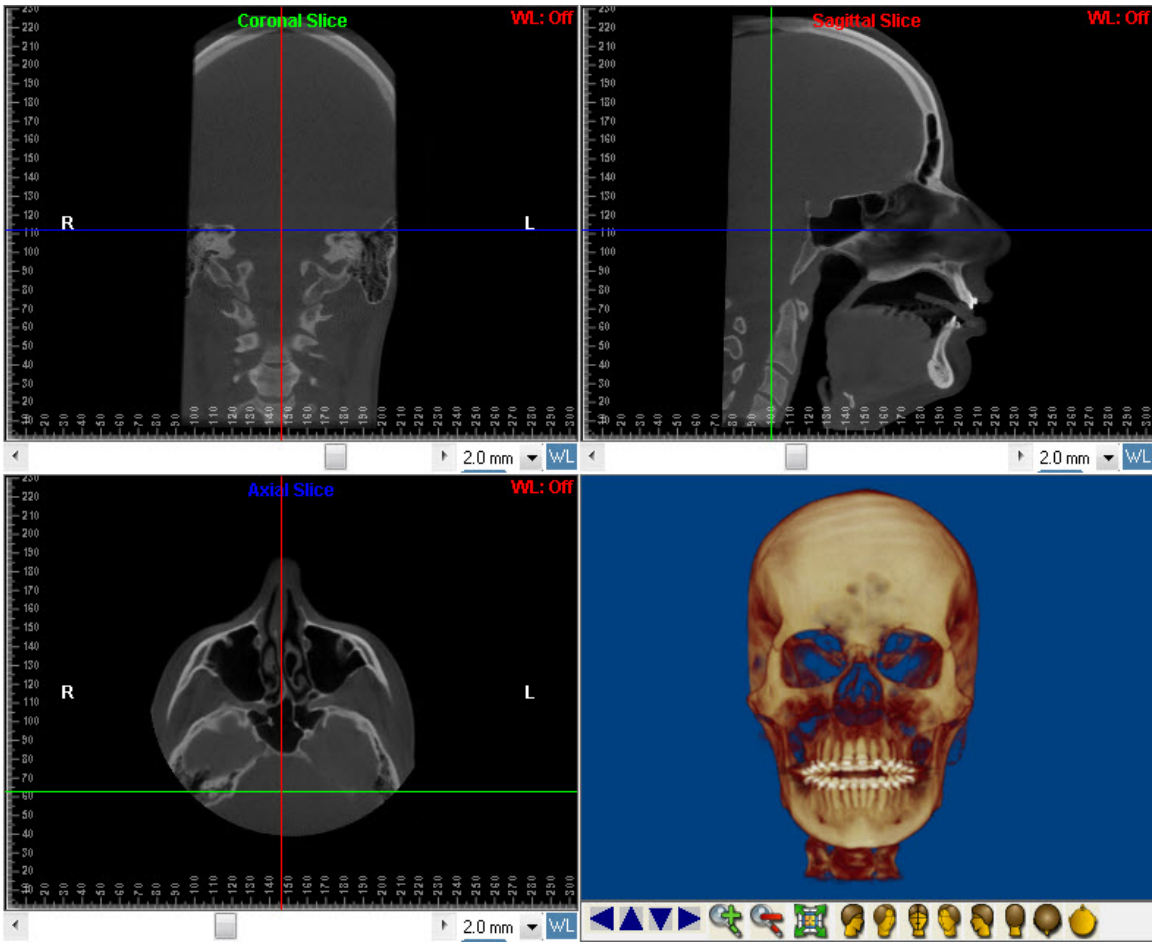
The image in the large pane is swapped with the image you moved.

To toggle the display of the slice location lines (cross-hairs) on the sagittal, coronal, and axial slices:

1 Click .

4-Equal Slices-Volume Layout

In this image layout, the window has four equal panes containing the sagittal slice, the corona slice, the axial slice, and the 3D volume, photo, or two superimposed volumes.



slice location lines	Lines with the following color coding to identify the location of the three standard slices: **Red:** Sagittal slice **Green:** Coronal slice **Blue:** Axial slice For more information, see “Changing the Slice Locations” on page 19-41.
slider	Sets the location of the slice shown in this pane. For more information, see “Changing the Slice Locations” on page 19-41.
drop-down list	Sets the thickness of the slice. For more information, see “Changing the Slice Angle and Thickness” on page 19-40.
WL	Sets the window leveling, which affects the apparent brightness and contrast of the image display. Changing the window leveling does not change any volume files. For more information on window leveling, see “Setting Window Leveling” on page 21-48.

To toggle the display of the slice location lines (cross-hairs) on the sagittal, coronal, and axial slices:

1 Click .

Standard Slice Views

In many Dolphin 3D windows, you can view x-ray representations of the sagittal, coronal, and axial slices. You can also customize these slices to change the cross-section of the volume that they display as described in “Changing the Slice Angle and Thickness” on page 19-40 and “Changing the Slice Locations” on page 19-41.

Note: *Some slice views may not appear on all Dolphin 3D windows.*

To view one of the standard slices:

1 Click to view the sagittal slice.

Or,

Click to view the coronal slice.

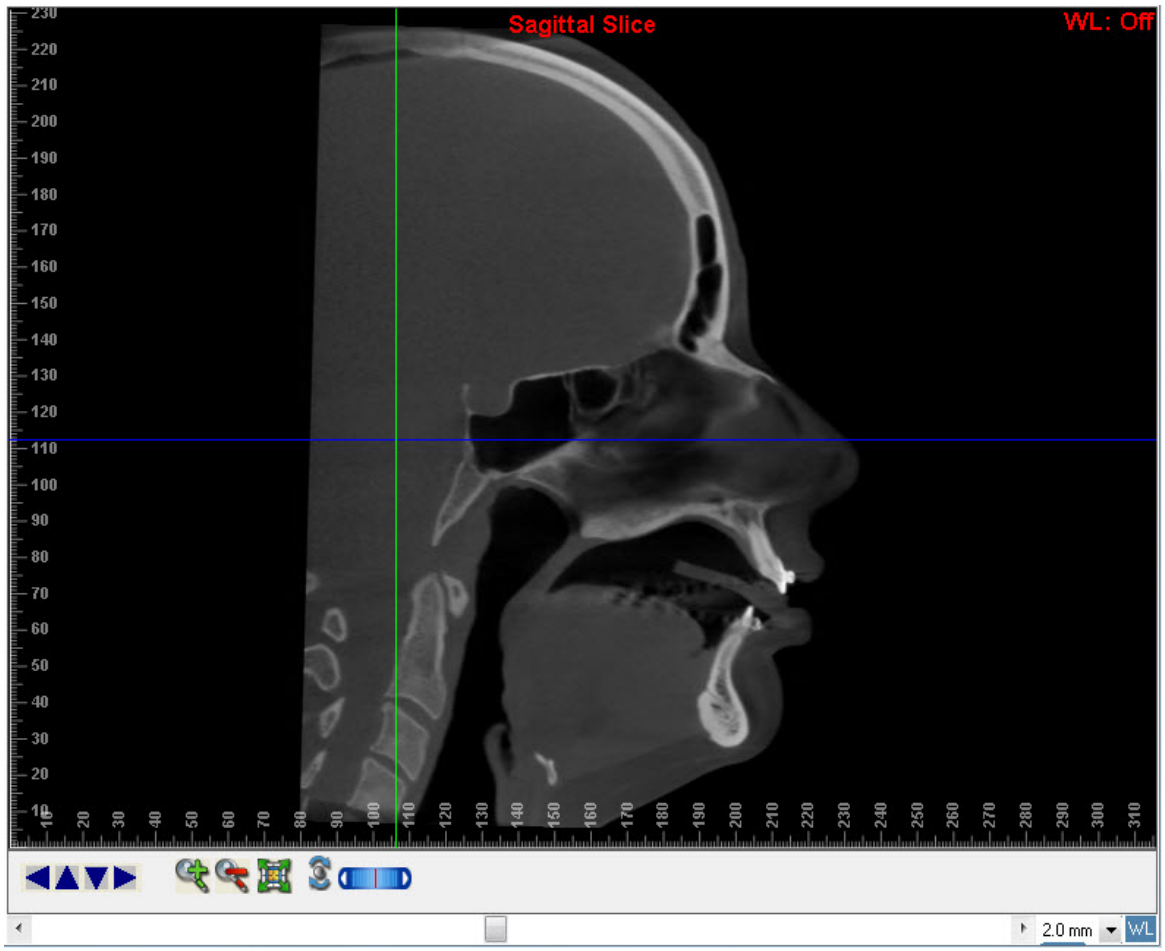
Or,

Click to view the axial slice.

Or,

Click to view a side-by-side image layout containing axial and sagittal slices.

The slice you selected appears in the window. The following figure illustrates the sagittal slice.



slice location lines	Lines with the following color coding to identify the location of the three standard slices: **Red:** Sagittal slice **Green:** Coronal slice **Blue:** Axial slice For more information, see “Changing the Slice Locations” on page 19-41.
slider	Sets the location of the slice shown in this pane. For more information, see “Changing the Slice Locations” on page 19-41.
WL	Sets the window leveling, which affects the apparent brightness and contrast of the image display. Changing the window leveling does not change any volume files. For more information on window leveling, see “Setting Window Leveling” on page 21-48.

To toggle the display of the slice location lines (cross-hairs) on the sagittal, coronal, and axial slices:

1 Click .

Changing the Slice Angle and Thickness

To change the slice angle and thickness:

1 Click one of the slice buttons or the button for a image layout that includes slice views.

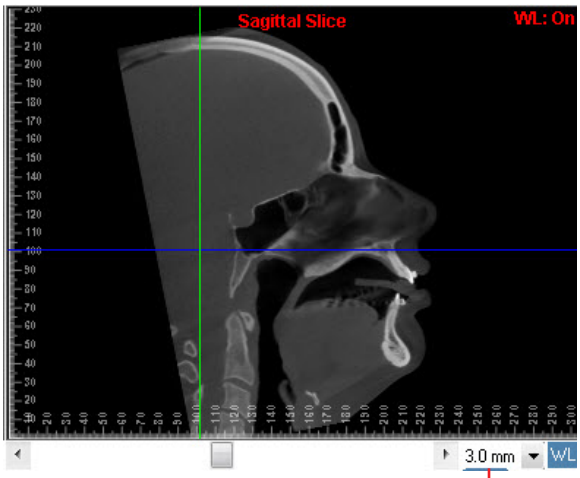
2 If the slice location lines (cross-hairs) are not visible on the slice view(s), click .

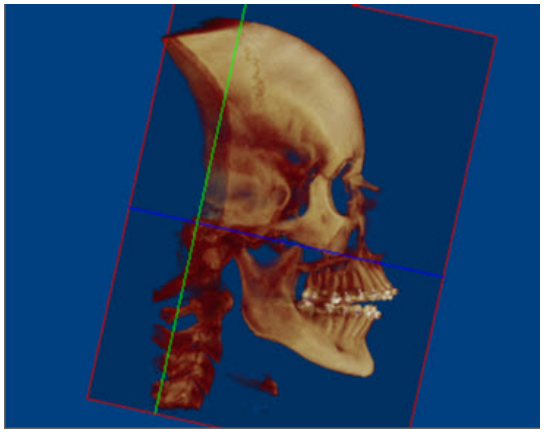
3 Optionally, if the layout you are viewing includes the 3D volume or photo, click the show/hide slice buttons ( ) to show planes representing the slices on the volume or photo.

4 On the slice view, move the mouse to the upper border until a small white circular arrow appears.

5 Click and move the mouse to tilt the slice view and select the angle of the slice.

The sagittal slice view is shown below, and all three planes are shown on the 3D volume on the right.





Select the slice thickness here

6 Use the drop-down list to the right of the slider to change the slice thickness.

To reset the slices to their default angles:

1 Click .

Or,

Select **Restore View Plane Positions** from the **View** menu.

Changing the Slice Locations

Changing the slice locations enables you to quickly and easily view an x-ray image for a different cross-section of the volume.

Change location for this slice here

To change the location of the slice you are viewing:

1 Move the slider under the slice image.

The image for that slice changes to reflect new location of the slice. In addition, the color-coded lines indicating the location of that slice on the other two slice images change to reflect its new location.

For example, if you move the slider under the sagittal slice image, that image changes to show a different cross-section of the volume. In the coronal and axial slice images, the red line also changes to indicate the new location of the sagittal slice.

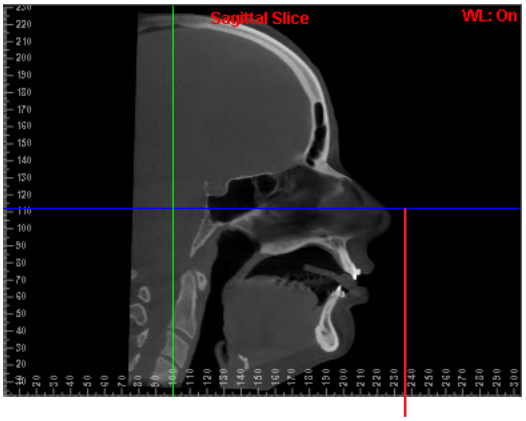
To change the location of a slice other than the one you are viewing:

1 If the slice location lines (cross-hairs) are not visible on the slice view(s), click .

2 Click and drag the line representing that slice on the image you're viewing.

Click and drag when your mouse pointer turns into a double-headed arrow.

For example, on the sagittal slice image, click and drag the green line to change the coronal slice location or the blue line to change the axial slice location.



Click and drag to change the axial slice location

To reset the slices to their default locations:

1 Click .

Or,

Select **Restore View Plane Positions** from the **View** menu.

Viewing Nerve Canals

To view nerve canals on the patient's hard tissue image:

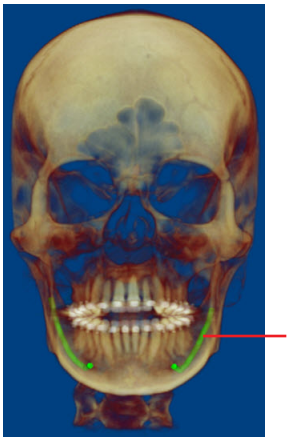
1 Select **Show/Hide Nerve Canals on Hard Tissue** from the **View** menu.

Or,

Right-click the image, and select **Show/Hide Nerve Canals on Hard Tissue**.

This menu item is only enabled if you have marked the patient's nerve canals. For more information, see “Building a Nerve Canals X-ray View” on page 21-29.

If you are using the translucent hard tissue view, you may need to adjust the opacity of the image (using the **Opc** slider) to see the nerve canals.



Using the Hounsfield Unit View

The Houndsfield Unit view renders the slice and volume with color based on Hounsfield Units. Color rendering using Hounsfield Units gives you better control in highlighting anatomies with known Hounsfield Unit ranges. You can define and save several Hounsfield Unit color mappings as described “Editing Hounsfield Unit Color Mappings” below.

Note: *The Houndsfield Unit view is only available for scans imported using Dolphin Imaging version 11.0 or later.*

To toggle the Hounsfield Unit rendering:

1 Click HU.

When you enable Hounsfield Unit rendering with this button, Dolphin 3D uses the color mapping you used last. If you have defined more than one mapping, you can select the mapping you want to use.

To select a Hounsfield Unit color mapping to use:

1 Click the arrow below the **Show/Hide Hounsfield Rendering** button, as illustrated below:

Click here to select a Hounsfield Unit color mapping

2 Select a previously saved Hounsfield Unit color mapping.

Editing Hounsfield Unit Color Mappings

To edit the Hounsfield Unit color mapping:

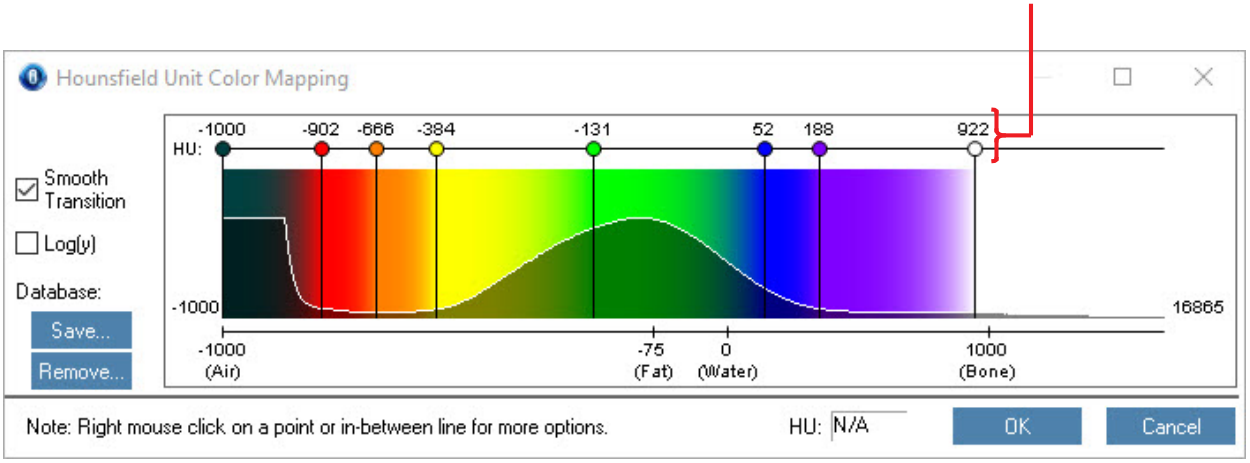
1 Click the arrow below the **Show/Hide Hounsfield Rendering** button, as illustrated below:

Click here to edit Hounsfield Unit color mappings

2 Select **Edit Current Hounsfield Unit Colors...**.

The Hounsfield Unit Color Mapping dialog box opens. As shown in the figure below, the Hounsfield Unit distribution includes color points that define the colors to use on the volume rendering for specific Hounsfield Unit values. You can add, remove, or change the color points until you achieve the desired results on your image.

Click and drag the points to define the colors to use for Houndsfield Unit values



Smooth Transition	Uses a smooth gradient transition between the colors used in the mapping.
Log(y)	Displays the Hounsfield Unit distribution using a logarithmic scale for the y-axis. Used for cases where the Hounsfield Unit distribution has some large spikes, which cause the rest of the distribution to appear very flat. For example, suppose the Hounsfield Unit distribution of your volume consisted mostly of values between 1 and 100, but it also had value spikes of 4050 and 4080. In a Hounsfield Unit distribution graph using the default linear scaling for the y-axis, the chart would appear very flat. Changing to a logarithmic scale for the y-axis would have the effect of placing more visual emphasis on the lower values (1-100) than on the higher values (3000-4000), lessening the impact of the value spikes on the shape of the graph. Affects the display of the Hounsfield Unit distribution only. It does not make any changes to the actual volume.
Save...	Saves this color mapping to your database.
Remove...	Removes this color mapping from your database.
HU	Displays the Hounsfield Unit value represented by the location on the distribution to which the mouse is currently pointing.

To set Hounsfield Unit values for a color point:

1 Right-click a point on the line at the top of the Hounsfield Unit distribution, and select **Change HU Value** from the context menu.

2 Enter a **Hounsfield Unit** value on the dialog box that appears, and click **OK**.

Alternatively, you can click and drag points on the line at the top of the Hounsfield Unit distribution to define the colors to use for specific Hounsfield Unit values.

To change the color of a point:

1 Right-click the point you want to change.

2 Select **Change Color** from the context menu.

3 On the Color dialog box, select the color to use. Then, click **OK**.

To add a color point:

1 Right-click the location on a line where you want to add a color point.

2 Select **Add New HU Color Point** from the context menu.

To remove a color point:

1 Right-click the color point you want to remove.

2 Select **Delete HU Color Point** from the context menu.

To save the current mapping in your database:

1 Click **Save...**.

The Hounsfield Unit Color Mapping Name dialog box opens.

2 Select one of the previously saved mappings from the list to replace it with your new mapping.

Or,

Enter a name in the field to save your mapping with a new name.

3 Click **OK**.

To remove a mapping from your database:

1 Click **Remove...**.

The Hounsfield Unit Color Mapping Name dialog box opens.

2 Select the mapping you want to remove from the list, and click **Remove**.

3 Click **Yes** on the confirmation dialog box that appears.

4 Click **OK**.

Using the Symmetry Caliper

A symmetry caliper can help you assess facial and skeletal asymmetry. There are two types of symmetry calipers:

- Left/Right: When displayed, this caliper appears centered on the line representing a vertical plane on the current view. For example, in the front, back, top, and bottom views, the Left/Right symmetry caliper is centered on the mid-sagittal plane. In the lateral views, the Left/Right symmetry caliper is centered on the coronal plane.
- Up/Down: When displayed, this caliper appears centered on the line representing a horizontal plane on the current view. For example, in the front, right, left, and back views, the Top/Bottom symmetry caliper is centered on the axial plane. In the top and bottom views, the Top/Bottom symmetry caliper is centered on the coronal plane. The Up/Down symmetry caliper is only available on the Orientation Calibration dialog box.

You can position the symmetry calipers at various locations on the patient's image so you can see whether the patient's image is symmetrical relative to the vertical and/or horizontal plane in the current view.

To toggle display of the symmetry caliper:

1 Select **Show/Hide Symmetry Caliper** from the **View** menu on the Dolphin 3D window to show or hide the Left/Right symmetry caliper.

Or,

Right-click the image on the Dolphin 3D window and select **Show/Hide Symmetry Caliper** from the context menu to show or hide the Left/Right symmetry caliper.

Or,

Check the **Left/Right Symmetry** box on the Orientation Calibration dialog box to show the Left/Right symmetry caliper.

Or,

Uncheck the **Left/Right Symmetry** box on the Orientation Calibration dialog box to hide the Left/Right symmetry caliper.

Or,

Check the **Up/Down Symmetry** box on the Orientation Calibration dialog box to show the Up/Down symmetry caliper.

Or,

Uncheck the **Up/Down Symmetry** box on the Orientation Calibration dialog box to hide the Up/Down symmetry caliper.

Or,

Check the **Show Symmetry Caliper** box on the **Method: Overlay Superimposition** or **Analysis/Verify Result** tab of the Superimposition dialog box to show the Left/Right symmetry caliper.

Or,

Uncheck the **Show Symmetry Caliper** box on the **Method: Overlay Superimposition** or **Analysis/ Verify Result** tab of the Superimposition dialog box to hide the Left/Right symmetry caliper.

For information on the **Orientation Calibration** dialog box, see Chapter 20, Volume Orientation. For information on the **Superimposition** dialog box, see Chapter 26, Volumes Superimposition (Medical Device).

To resize the symmetry caliper:

1 Click and drag one end of the symmetry caliper to resize it.

Or,

If you are using the symmetry caliper on the Orientation Calibration dialog box, select the length of the symmetry caliper from the drop-down list.

A label next to the symmetry caliper indicates its length.

To relocate the symmetry caliper:

1 Click and drag the symmetry caliper to change its location on the patient's image.

Click and drag when your mouse pointer turns into a double-headed arrow.

Adding Anonymizer Bars

Anonymizer bars are used to obscure the identity of a patient for case presentation purposes.

To add an anonymizer bar:

1 Select **Edit Anonymizing Bar...** from the **Tools** menu.

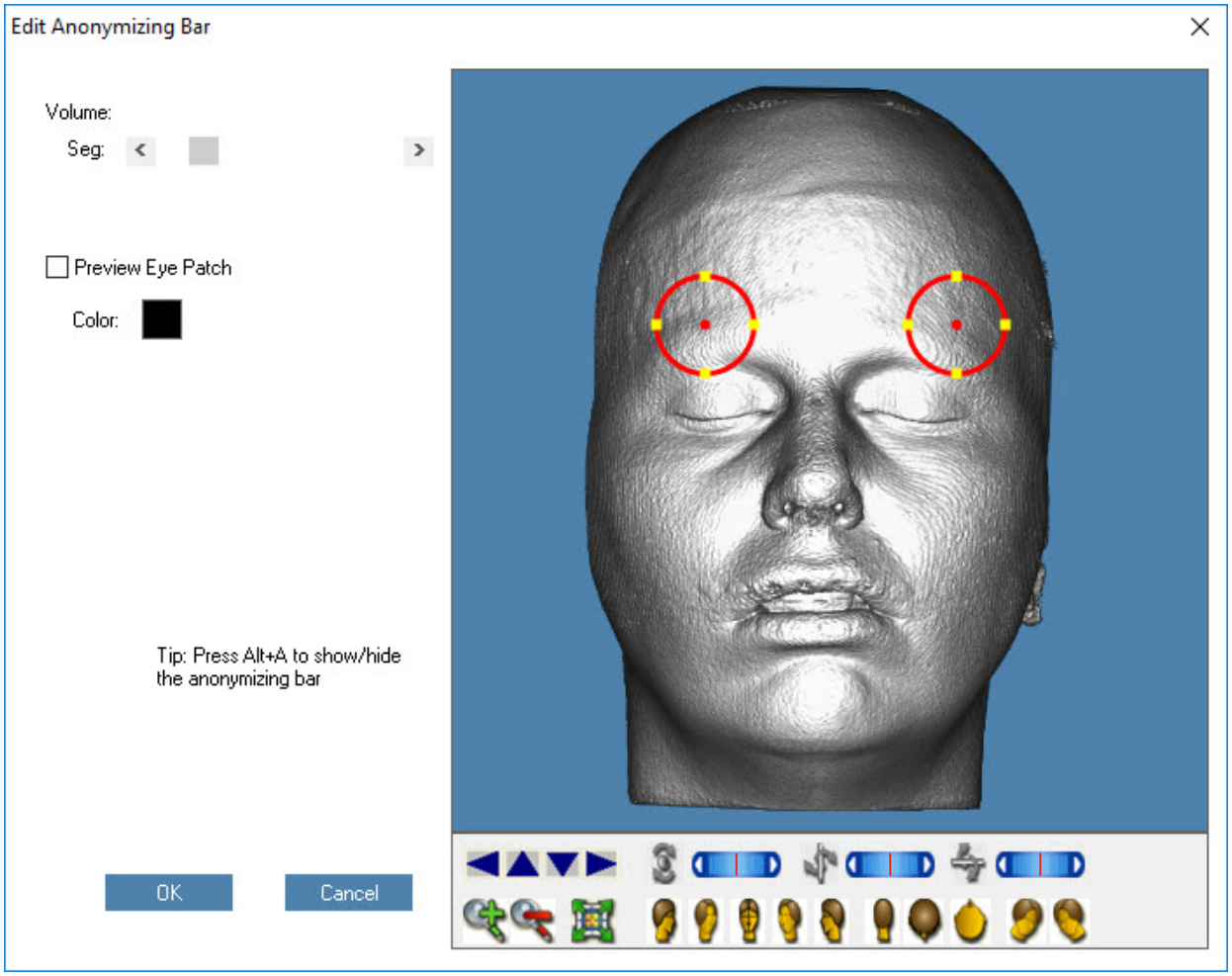
The Edit Anonymizing Bar dialog box opens and displays the soft tissue view of the volume.

2 Click and drag the red dots to move the red circles over the patient's eyes.

3 Optionally, click and drag the yellow boxes to resize the red circles.

4 Optionally, check the **Preview Eye Patch** box to preview the anonymizer bar.

5 Click **OK**.



Seg	Sets the segment of the 3D volume to use for the soft tissue view.
Preview Eye Patch	Previews the anonymizer bar.
Color	Sets the color for the anonymizer bar.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the volume, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

To toggle display of the anonymizer bars:

1 Press ALT+A.

Or,

Select **Show Anonymizing Bar** from the **View** menu.

Viewing Another Image

To view another image:

1 Choose **Select and Show Database Image** from the **View** menu.

Or,

Press ALT+I on your keyboard.

If you have previously selected an image to display for this patient, that image appears in the Select and Show Database Image dialog box and you can skip the next step. If you haven't previously chosen an image, the Image Chooser dialog box opens.

2 Select the image to display, and click **OK**.

Or,

Click **Browse...** to browse to and open an image stored on your computer.

To view a different image:

1 Click **Select Image...** on the Select and Show Database Image dialog box to open the Image Chooser dialog box.

2 Select the image to display, and click **OK**.

Or,

Click **Browse...** to browse to and open an image stored on your computer.

Setting the Background Color

To set the background color:

1 Select **Background Color...** from the **Options** menu.

The Color dialog box opens.

2 Select the color to use. Then, click **OK**.

Segmenting the Volume

By segmenting the 3D volume, you identify the parts of the 3D volume data to use for the soft tissue and hard tissue views. Circumstances in which you may want to segment the volume include:

- The first time you load a new 3D volume, you may want to segment the volume differently than Dolphin 3D does using automatic segmentation.
- When you are using a clipping box, you may want to segment the volume to suppress the display of some of the soft tissue or hard tissue image so that you can see interior structures. For more information on clipping boxes, see “Using a Clipping Box” on page 28-3.
- When you want to display the 3D volume with different colors representing different tissue densities (advanced).

Typically, you can segment the volume using the **Seg** slider associated with the Hard Tissue and Soft Tissue radio buttons as described in “Viewing the Soft Tissue” on page 19-26 and “Viewing the Hard Tissue” on page 19-27. This section describes more advanced segmentation options.

Segmenting Solid Hard and Soft Tissues

Using the advanced multi-color solid rendering feature, you can display the 3D volume with different colors representing different tissue densities. Dolphin 3D includes several tissue segmentation templates that you can modify as needed to create your own custom view.

To access the tissue segmentation templates:

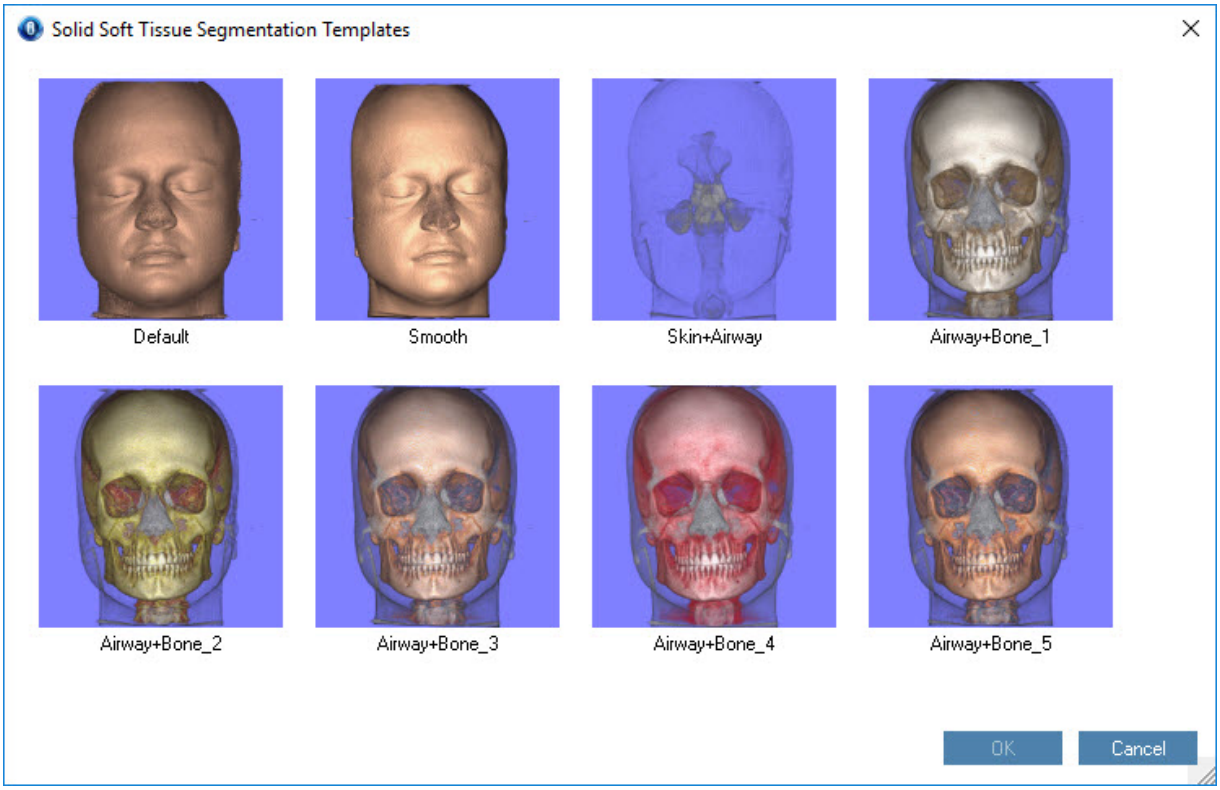
1 Check the **Volume** box. Then, select **Solid** and **Soft Tissue**.

Or,

Check the **Volume** box. Then, select **Solid** and **Hard Tissue**.

2 Select **<Templates...>** from the drop-down list.

The Solid Tissue Segmentation Templates dialog box opens:



3 Click the template you want to use, and click **OK**.

The volume is displayed in the Dolphin 3D window using the template you selected. You can now accept the current view or modify it, using the advanced multi-color solid rendering feature.

Advanced Segmentation of the Solid Hard and Soft Tissues

To perform advanced segmentation of the solid hard or soft tissue image using the default setting:

1 Check the **Volume** box. Then, select **Solid** and **Soft Tissue**.

Or,

Check the **Volume** box. Then, select **Solid** and **Hard Tissue**.

2 Click **Edit...**.

The Solid Volume Segmentation dialog box opens.

3 Move the arrow on the left of the slider to identify the lowest density level for tissue in this volume segment.

To move the arrow, you can:

- Click and drag the arrow.
- Click the up or down arrow at the end of the slider to move the arrow along the slider by a small, predefined increment.
- CTRL+click the up or down arrow at the end of the slider to move the arrow along the slider by a larger predefined increment.

When segmenting soft tissue, the arrow on the left of the slider identifies the boundary between the air and the patient's soft tissue. When segmenting hard tissue, this arrow identifies the boundary between the patient's soft tissue and hard tissue. As you move the arrow along the slider, the image in the main window changes to reflect the currently selected volume segment.

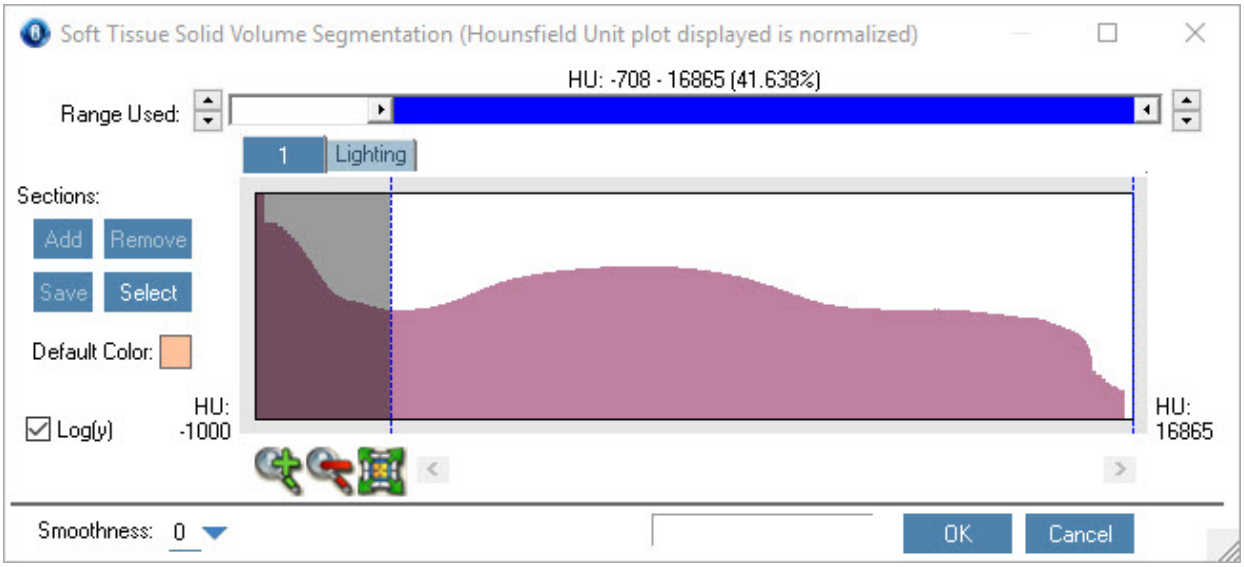
4 Move the arrow on the right of the slider to identify the highest density level for tissue in this volume segment.

When segmenting soft tissue, the arrow on the right of the slider identifies the boundary between the soft tissue and hard tissue. When segmenting hard tissue, you may want to include all densities greater than the patient's soft tissue (so that implants appear on the patient's hard tissue image, for example).

5 When the image in the main window accurately reflects the segment you are identifying (the soft tissue segment looks like the patient’s face or the hard tissue segment looks like the patient’s bone structure), click **OK** to save the segmentation data.

Or,

Click **Save** to save these segmentation settings as your defaults.



Range Used	(Default setting only) Sets the boundaries of the selected segment. Click the up and down arrows at the ends of the slider to fine-tune the selection. The label above the slider identifies the range and percentage of the 3D volume currently selected for the segment.
Numbered Tabs	The Default setting provides only one tab that shows the density histogram and the predefined area of interest. When using multi-color solid rendering (advanced), you can add more sections, which adds more tabs.
ALL 1-x	Displays all sections simultaneously. Not available if you are using the default setting.
Lighting	Sets the lighting options for this image. See “Setting Solid Volume Lighting Options” on page 19-55 for more information.
Add	Adds a new section.
Remove	Removes a section
Save	Saves these rendering settings so that you can use them on other patient volumes.
Select	Selects a previously saved rendering setting.
Default Color	Sets the color for the default soft tissue view.
Log(y)	Displays the density distribution using a logarithmic scale for the y-axis. Used for cases where the density distribution has some large spikes, which cause the rest of the distribution to appear very flat. For example, suppose the density distribution of your volume consisted mostly of values between 1 and 100, but it also had value spikes of 4050 and 4080. In a density distribution graph using the default linear scaling for the y-axis, the chart would appear very flat. Changing to a logarithmic scale for the y-axis would have the effect of placing more visual emphasis on the lower values (1-100) than on the higher values (3000-4000), lessening the impact of the value spikes on the shape of the graph. Affects the display of the density distribution only. It does not make any changes to the actual volume.

	Zooms in on the density histogram.
	Zooms out on the density histogram.
	Displays the full density histogram.
Smoothness	Sets the smoothness of a volume rendering. A high smoothness setting gives the volume rendering a smooth, metallic look. This setting can greatly improve the rendering appearance for noisy scans.

Segmenting Using Multi-color Solid Rendering

To segment the volume using multi-color solid rendering (advanced):

1 Check the **Volume** box. Then, select **Solid** and **Soft Tissue**.

Or,

Check the **Volume** box. Then, select **Solid** and **Hard Tissue**.

2 Select a template other than **Default** from the drop-down list.

Or,

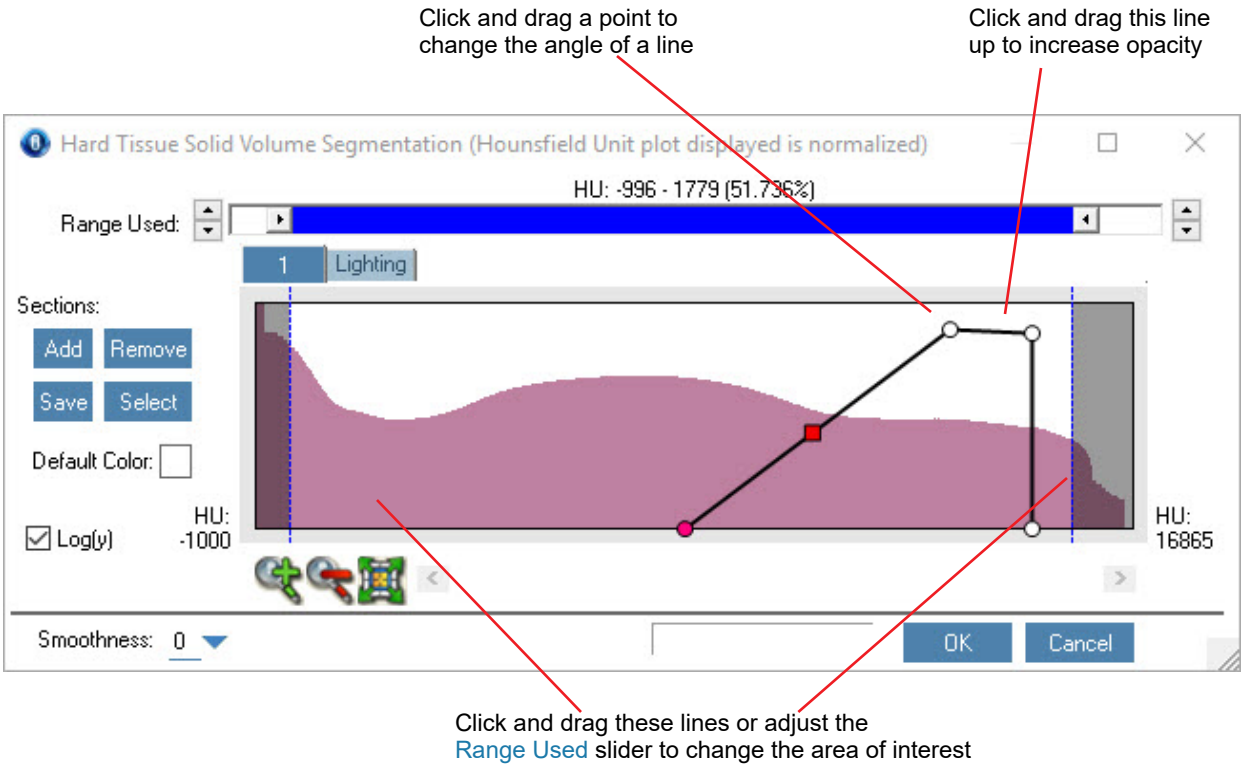
Select **<Templates...>** from the drop-down list to see thumbnails of the available templates. Then, select the template you want to use and click **OK**.

3 Click **Edit...** next to Soft Tissue to identify the soft tissue volume segment.

Or,

Click **Edit...** next to Hard Tissue to identify the hard tissue volume segment.

The Solid Volume Segmentation dialog box opens (the Hard Tissue Solid Volume Segmentation dialog box is shown in the figure below):



You can enlarge the window or zoom in or out until you get the desired view of the density histogram. The density histogram graphically represents the data density within the 3D volume.

The area of interest is unshaded, as shown in the figure above. You can adjust the Range Used slider or click and drag the boundary lines for the unshaded section to select an area of more or less density.

The area of interest includes points and color points. You can also add, remove, or change the color points until you achieve the desired results on your image.

To add a new image section:

1 Click **Add**.

A new tab opens on the dialog box, and the image changes to reflect the default color. You can now customize that section using the lines, points, and color points. Once you add additional tabs, the **ALL** tab appears.

To view all sections simultaneously:

1 Click the **ALL** tab.

To remove an image section:

1 Click the tab for the image section you want to remove. Then, click **Remove**.

Or,

Right-click a line for the image section you want to remove, either on the tab for that image section or on the **ALL** tab. Then, select **Remove the Whole Section** from the context menu.

2 On the confirmation dialog box that appears, click **Yes** to remove the image section.

To change the opacity of an image section:

1 Click and drag the horizontal line up to increase the opacity of the image section.

Or,

Click and drag the horizontal line down decrease the opacity of the image section.

To change the area defined by this section

1 Click and drag the left and/or right vertical line.

To change the color of an image section:

1 Right-click a line for the image section you want to change, either on the tab for that image section or on the **ALL** tab. Then, select **Change Color for the Whole Section** from the context menu.

2 On the Color dialog box that appears, select the color to use.

To change the area of interest:

1 Click and drag one of the points on the line.

The angle of the line changes, thus changing the area of interest.

To change the color of a point:

1 Right-click the point you want to change.

2 Select **Change Color for the Selected Point** from the context menu.

Or,

Select **Change Color for the Selected Color Point** from the context menu.

3 On the Color dialog box that appears, select the color to use.

To change the Hounsfield Units (HU) value for a point (applies only to volumes imported with Dolphin Imaging version 11 or later):

1 Right-click the point you want to change.

2 Select **Change HU Value for the Selected Curve Point** from the context menu.

Or,

Select **Change HU Value for the Selected Color Point** from the context menu.

3 Enter the HU value between -1000 and 18809, and click **OK**.

The selected point moves to the specified HU value on the x-axis of the histogram.

To add a color point:

1 Right-click the location on a line where you want to add a color point.

2 Select **Add a Color Point** from the context menu.

3 On the Color dialog box that appears, select the color to use.

To remove a color point:

1 Right-click the color point you want to remove.

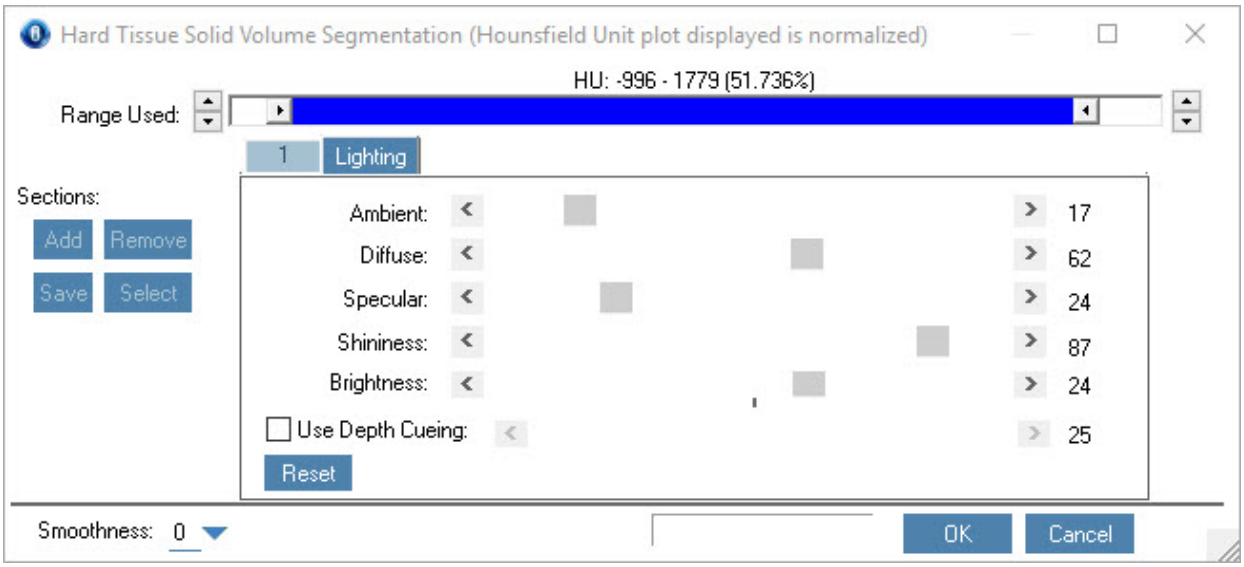
2 Select **Remove the Selected Color Point** from the context menu.

Setting Solid Volume Lighting Options

To set solid volume lighting options for a specific image:

1 Select the **Lighting...** tab from the Hard or Soft Tissue Solid Volume Segmentation dialog box.

2 Set any options, and click **OK** to use those options in your current session.



Ambient	Sets the level of ambient lighting used in the image.
Diffuse	Sets the level of diffuse lighting used in the image.
Specular	Sets the level of specular lighting used in the image. Specular lighting gives the image a reflective or mirror-like appearance.
Shininess	Sets the level of shininess of the image surface.
Brightness	Sets the level of brightness of the image.
Use Depth Cueing	Uses depth cueing, which affects the shading used to give the image a three-dimensional appearance. **slider:** Sets the depth cueing level.
Reset	Resets all options to the factory defaults.

Using Photos and Surfaces

You can store both photos and surfaces in Dolphin 3D and superimpose them over the 3D volume. This enables you to obtain a complete 3D view of the patient.

If you have stored photos or surfaces for this patient, you can view them either alone or superimposed over a volume view. You can store up to two photos for each volume, labeled Photo 1 and Photo 2. You can also store surfaces representing the patient's soft tissue or arch models.

Note: *The features for working with 3D photos and surfaces are available as part of Dolphin 3D and as a stand-alone digital study module product. If you purchased the stand-alone digital study module product, you can work with the 3D photos and surfaces only. If you purchased Dolphin 3D, you can work with 3D photos and surfaces in conjunction with the patient's 3D volume.*

Working with 3D Photos

If you have a 3D photo of a patient, you can import it into Dolphin Imaging and superimpose it over the volume. This gives the most realistic representation of the patient's appearance.

Importing a 3D Photo

To add a new 3D photo for a patient, you import it from an image file. You can add a 3D photo for a patient regardless of whether you have already imported the patient's 3D volume.

If you have both a 3D photo and a volume for the patient, you can superimpose the photo over the volume. For more information, see “Superimposing the Photo or Surface and the Volume” on page 19-57.

To import a 3D photo:

1 On the Dolphin Imaging main screen, select the timepoint and image layout to which you want to add the 3D photo.

2 Click on the Dolphin Imaging main screen.

3 Select **Import New Arch Models/3D Photo/Surface**.

4 Select **Import New 3D Photo (OBJ + Bitmap)...** from the sub-menu.

The Open dialog box appears.

5 Navigate to the folder containing the image file or dataset for the 3D photo.

6 Select the appropriate file or dataset. Then, click **Open** to load it.

The 3D photo and the volume (if available) appear in the Dolphin 3D window.

To import a 3D photo from the Dolphin 3D window:

1 On the Dolphin 3D window, click **Add...** under **Photos/Surfaces**.

2 Select **3D Photo (.OBJ + Bitmap)**.

The Open dialog box appears.

3 Navigate to the folder containing the image file or dataset for the photo.

4 Select the appropriate file or dataset. Then, click **Open** to load the photo.

The photo and the volume appear in the Dolphin 3D Window.

Superimposing the Photo or Surface and the Volume

Once you have imported a photo or soft tissue surface, you can superimpose it over the 3D volume using one or both of the following methods:

- Side-by-side superimposition: Use this method to view the photo or surface and the volume side by side and align them by identifying corresponding points.
- Overlay superimposition: Use this method to align the photo or surface and the volume by manipulating a preview of the superimposition.

Fine-tuning the superimposition may involve using both these methods. For example, you may use the side-by-side superimposition method initially, then fine-tune the superimposition with the overlay superimposition method. In addition, this dialog box offers the sculpting feature, which you can use to fine tune the 3D photo or surface. Finally, you can verify the superimposition on the **Verify Result** tab.

Using Side-by-Side Superimposition

With this method, you align a photo or surface and the volume by identifying corresponding points on them. After you superimpose a 3D photo or surface over the volume, you can preview the superimposition before saving it.

To superimpose a photo or surface over the volume:

1 Select the **Method: Side-by-Side Superimposition** tab.

The volume and photo or surface appear in the dialog box. Points appear on the images so that you can align them.

2 Zoom in on the volume and photo or surface, if necessary.

3 Orient both the photo or surface and volume to the frontal view so that they match.

4 Click and drag the points on the both the photo or surface and volume so that they identify corresponding locations.

5 Click **Superimpose Now!**

The result of your superimposition appears in the results box in the lower left corner of the window.

6 Rotate the image in the results box in the lower left corner of the window to verify the superimposition.

The figure below illustrates superimposing a 3D photo over a volume.

To use additional points to align a 3D photo or surface over the volume:

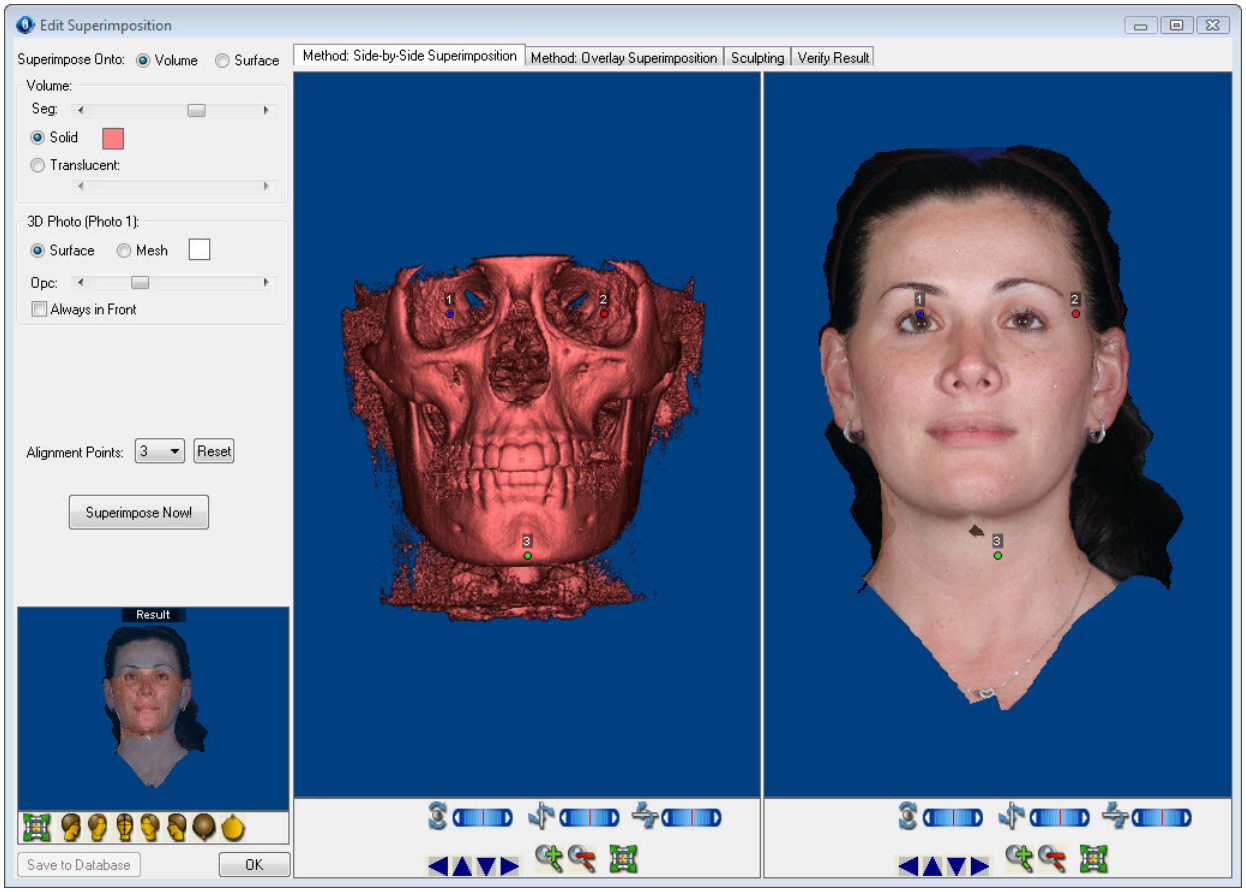
1 Select a number of points you want to use from the **Alignment Points** drop-down list.

Additional alignment points appear on both volume and the 3D photo or surface.

To reset the alignment points to their initial number and locations:

1 Click **Reset**.

The initial number of alignment points appears in the original positions on both the volume and the 3D photo or surface.



Superimpose Onto	Superimposition to perform: **Volume:** Superimposes the 3D photo or surface over the volume. **Surface:** Superimposes the 3D photo or surface over a surface.
Volume	Display options for the volume: **Seg**: Sets the segmentation to use for the volume. **Solid:** Displays a solid representation of the volume. **color sample:** Sets the color to use for the solid representation of the volume. **Translucent:** Displays a translucent representation of the volume. **slider:** Sets the transparency of the volume. For more information on these options, see “Single Volume Layout” on page 19-33.

3D Photo or Surface to Superimpose	Display options for the photo or surface: **Surface:** Displays the 3D photo or surface in the Result window. **Mesh:** Displays a mesh representation of the 3D photo or surface in the Result window. **Opc:** Sets the opacity of the 3D photo or surface. **Always in Front:** Displays the 3D photo or surface in front of the volume regardless of their actual positions in the superimposition.
Alignment Points	Number of points to use when superimposing the 3D photo or surface over the volume.
Reset	Resets all options in this dialog box to their default values.
Superimpose Now!	Superimposes the photo or surface over the volume and displays the result in the Result window.
Save to Database...	Saves this superimposition to your database.
Method: Side-by-Side Superimposition	Displays the photo or surface and the volume or surface side by side so that you can align them using corresponding points.
Method: Overlay Superimposition	Displays a preview of the superimposition that you use to align a 3D photo or surface and the volume. For more information, see “Using Overlay Superimposition” below.
Sculpting	Sculpts the photo or surface. For more information, see “Sculpting the 3D Photo or Surface” on page 19-65.
Verify Result	Displays a full-size preview that you use to verify that the 3D photo or surface is properly superimposed over the volume. For more information, see “Verifying and Saving the Result” on page 19-66.
Result	Displays a small preview of your superimposition and sculpting operations.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

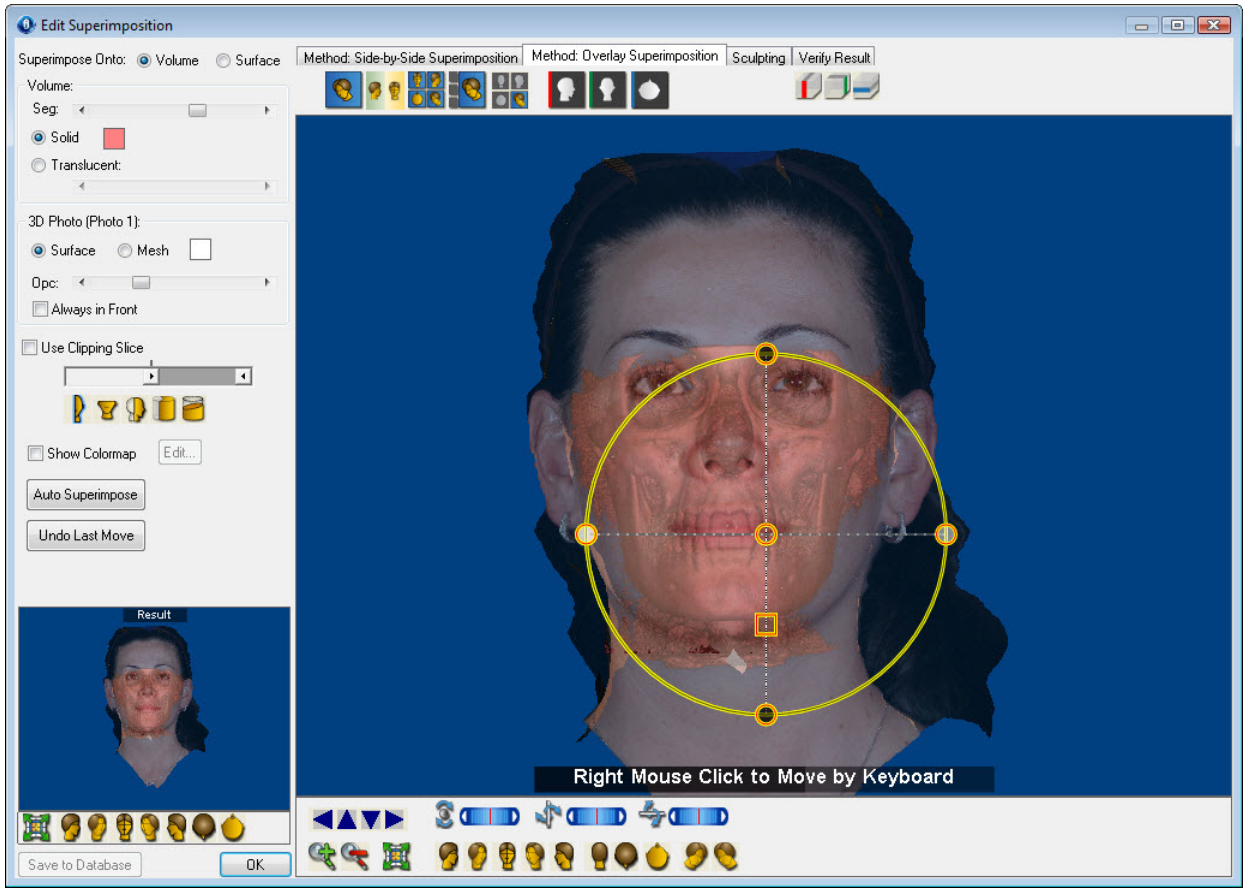
Using Overlay Superimposition

With this method, you align a 3D photo or surface and the volume by manipulating a preview of the superimposition.

To use overlay superimposition:

1 Select the **Method: Overlay Superimposition** tab.

The volume and 3D photo or surface are superimposed in the dialog box. You use the wheel-shaped alignment tool that appears over the superimposition to move the 3D photo or surface in relation to the volume.



Superimpose Onto	Superimposition to perform: **Volume:** Superimposes the 3D photo or surface over the volume. **Surface:** Superimposes the 3D photo or surface over a surface.
Volume	Display options for the volume: **Seg**: Sets the segmentation to use for the volume. **Solid:** Displays a solid representation of the volume. **color sample:** Sets the color to use for the solid representation of the volume. **Translucent:** Displays a translucent representation of the volume. **slider:** Sets the transparency of the volume. For more information on these options, see “Viewing the Soft Tissue” on page 19-26.

3D Photo or Surface to Superimpose	Display options for the photo or surface: **Surface:** Displays the 3D photo or surface in the Result window. **Mesh:** Displays a mesh representation of the 3D photo or surface in the Result window. **Opc:** Sets the opacity of the 3D photo or surface. **Always in Front:** Displays the 3D photo or surface in front of the volume regardless of their actual positions in the superimposition.
Use Clipping Slice	Defines the cross-section of the volume to display. For more information, see “Using a Clipping Slice” on page 28-1.
Show Colormap	Maps colors to distances in the superimposition. For more information, see “Using the Color Map” on page 19-64. **Edit...:** Sets options for the color map.
Auto Superimpose	Performs a voxel-based automated best-fit superimposition of the photo or surface over the volume after you have manually aligned them fairly closely.
Undo Last Move	Undoes the last operation.
Save to Database...	Saves this superimposition to your database. For more information, see “Verifying and Saving the Result” on page 19-66.
Method: Side-by-Side Superimposition	Displays the photo or surface and the volume or surface side by side so that you can align them using corresponding points. For more information, see “Using Side-by-Side Superimposition” on page 19-58.
Method: Overlay Superimposition	Displays a preview of the superimposition that you use to align a 3D photo or surface and the volume.
Sculpting	Sculpts the photo or surface. For more information, see “Sculpting the 3D Photo or Surface” on page 19-65.
Verify Result	Displays a full-size preview that you use to verify that the 3D photo or surface is properly superimposed over the volume. For more information, see “Verifying and Saving the Result” on page 19-66.
Result	Displays a small preview of your superimposition and sculpting operations.

For information on the layout buttons that appear above the image, see “Layouts and Slices” on page 19-32.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Aligning the Superimposition

To align the superimposition:

1 Manually align the photo or surface over the volume fairly closely.

You can manually align the superimposition using one or more of the ways:

- using a wheel-shaped alignment tool
- using the arrow buttons and rotation sliders
- typing in movement values

For more information, see “Manually Aligning the Superimposition” on page 26-9.

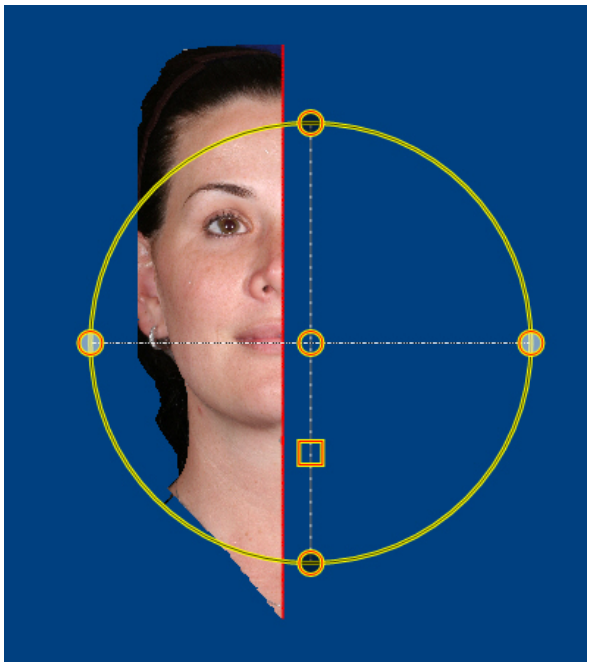
Once you have manually aligned superimposition fairly closely, you can use the automatic superimposition feature to perform a voxel-based automated best-fit superimposition.

2 Click **Auto Superimposition** to complete the alignment.

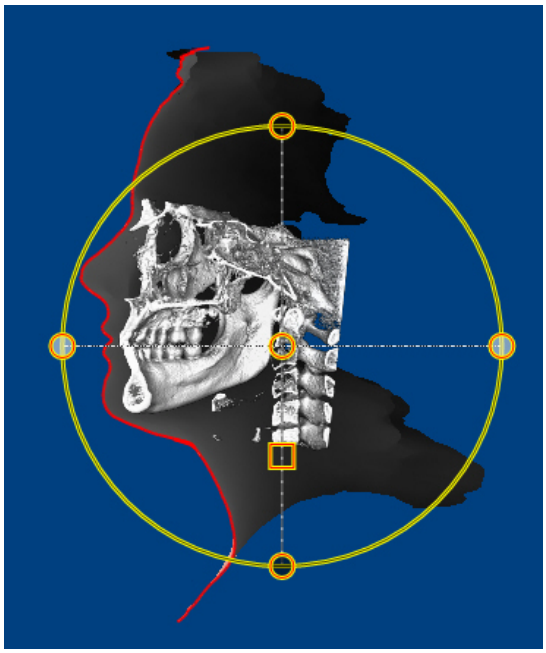
Changing the View

Changing the view while adjusting the superimposition enables you to use different viewing angles as well as both the external and internal anatomy, which can help ensure the greatest accuracy. For example, you begin performing the superimposition by registering on external anatomies, then switch to using a clipping slice to validate the accuracy of the internal structure alignments after superimposition is done on the outer surface of the skull.

For example, you can use a clipping slice to help you verify the superimposition. For example, suppose you are using the clipping slice shown below.



If you rotate the volume to the lateral view, the clipping slice remains fixed and the 3D Photo appears in red, as shown below:



For more information on clipping slices, see “Using a Clipping Slice” on page 28-1.

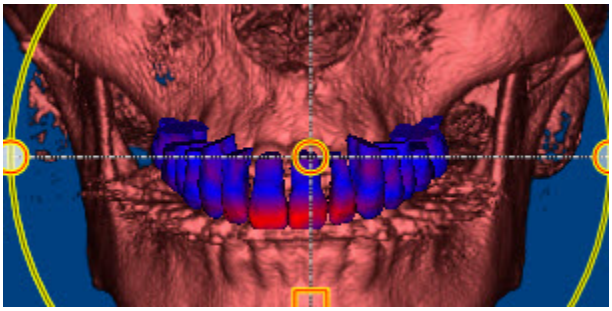
Using the Color Map

You can use a color map to assist you in creating an overlay superimposition or adjusting the occlusion between two arch models. The color map uses colors to indicate the distance between the two objects (volume and photo, volume and surface, or two surfaces).

To use the color map:

1 Check the **Show Colormap** box.

The photo or surface you are overlaying changes color to indicate distances according to the current color map definition. In the default definition, blue indicates no distance between the two objects, red indicates 4.5 mm or more, and shades of purple indicate distances between 0 and 4.5 mm.



2 Adjust the superimposition or occlusion so that the color-mapped object is all blue.

To define the color map:

1 Click **Edit...** next to the **Show Colormap** check box.

The Colormap Definition dialog box opens.

2 Enter the maximum distance you want to use for the color map.

Red will be used to indicate distances with this value or greater between the two objects.

Sculpting the 3D Photo or Surface

Sculpting a photo or surface enables you to crop or remove portions of it. For example, some 3D photos have jagged edges that you can smooth out using this feature.

To sculpt a 3D photo or surface:

1 Select the **Sculpt** tab.

Front and back views of the photo or surface appear in the dialog box.

2 Optionally, change the orientation of the photo or surface as described in “Moving or Reorienting the Volume” on page 19-24.

3 Select **Curves** in the Border group box to use curves to create the cropping polygon.

Or,

Select **Lines** in the Border group box to use lines to create the cropping polygon.

The figure below illustrates cropping polygons created using lines and curves.

4 Draw the cropping polygon.

For information on drawing a polygon, see “Selecting an Area of an Image” on page 6-4.

If you make a mistake and want to start over, click **Remove Cropping Border**.

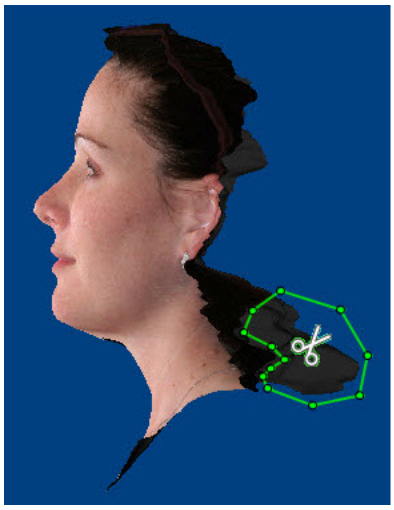
When you close the polygon, the mouse pointer changes to a pair of scissors.

5 Click inside the polygon to remove the part of the photo or surface that is inside the polygon.

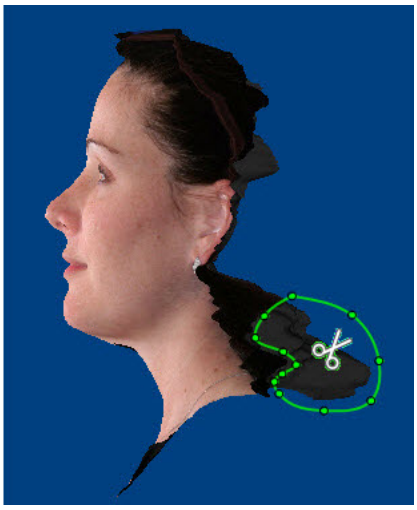
Or,

Click outside the polygon to remove the part of the photo or surface that is outside the polygon.

Cropping Border Created With Lines



Cropping Border Created With Curves



Verifying and Saving the Result

Before saving your superimposition, you can verify it by viewing it from different angles to see it is aligned correctly.

To verify your superimposition:

1 Click the **Verify Result** tab.

The dialog box displays the current superimposition.

2 Change the orientation of the superimposed image as described in “Moving or Reorienting the Volume” on page 19-24.

To save your work in your database:

1 Click **Save to Database...**.

If you imported a general surface and superimposed it with the volume, the Select Photo/Surface dialog box appears so that you can select a slot in which to save the surface.

2 Select the slot in which you want to save the general surface.

If you select a miscellaneous surface slot (such as (*) Miscellaneous 1), you can customize the description of that slot before saving the surface in it.

3 Optionally, if you selected a miscellaneous surface slot, enter a new description.

If you leave the description blank, Dolphin Imaging sets the slot to its default description.

4 Click **OK**.

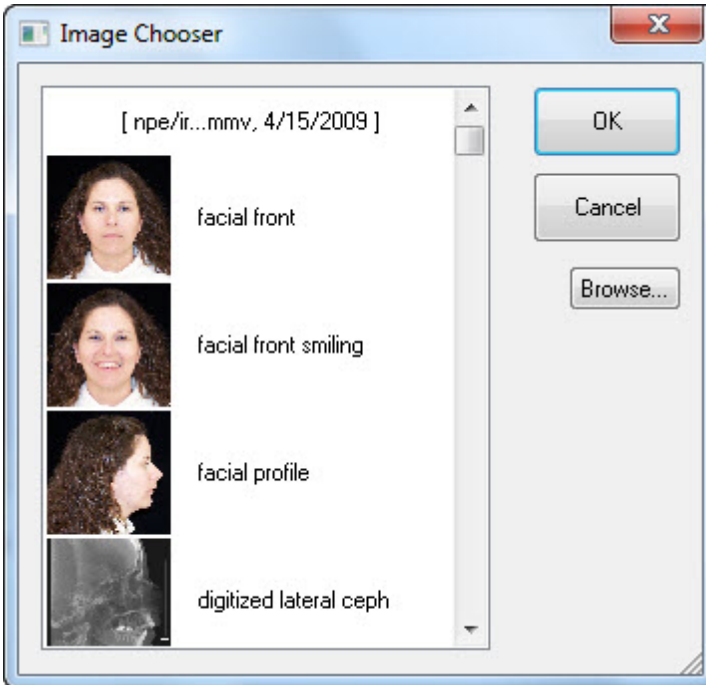
Working with 2D Photos

If you do not have a 3D photo of the patient, you can superimpose one of the 2D photos already stored in the Dolphin Imaging patient record over the volume or a soft tissue surface (including an existing 3D photo). The superimposition process “wraps” the 2D photo over the volume or surface, creating a very realistic representation of the patient's appearance.

Adding a 2D Photo

To add a 2D photo for a patient, you can select a photo available for this patient in Dolphin Imaging, or you can import an image from a file. Once you have added the photo, you can superimpose it over the volume or over a surface (such as a soft tissue surface or an existing 3D photo).

Note: *For best results, make sure the photo is taken with the nostril openings shown.*



To import a 2D photo:

1 On the Dolphin 3D window, click **Add...** under **Photos/Surfaces**.

2 Click **2D Photo Wrap...**.

The Image Chooser dialog box opens.

3 Select one of the images listed in the Image Chooser dialog box.

Or,

Click **Browse...** and browse to the image file to import into Dolphin 3D.

4 Click **OK**.

The 2D photo and the volume or surface appear in the New 2D Photo Wrap dialog box (see “Superimposing a 2D Photo” below).

list	2D photo from Dolphin imaging to add to the superimposition. In this list, the images for the current patient are grouped by timepoint.
Browse...	Import a 2D photo from an image file.

Superimposing a 2D Photo

To superimpose a 2D photo over the volume or surface, you identify corresponding points on both the 2D photo and the volume or surface.

To edit the superimposition of an existing 2D photo:

1 On the Dolphin 3D window, click **Edit...** under **Photos/Surfaces**.

2 Click **2D Photo Wrap**.

To superimpose the 2D photo over the volume or surface:

1 Select the **Method: Side-by-Side Superimposition** tab.

The volume or surface and 2D photo for this patient appear in the dialog box. Points appear on the images so that you can align them, as shown below.

2 Beside **Superimpose Onto**, select **Volume** to superimpose the photo over the volume.

Or,

Select **Surface** to superimpose the photo over the surface, such as an existing 3D photo or other soft tissue surface.

3 If you are superimpose the photo over the surface, select the surface you want to use, and click **OK**

4 Optionally, set view options for the volume in the appropriate group box.

5 Zoom in on the volume and photo, if necessary.

6 Orient both the photo and volume or surface to the frontal view so that they match.

7 Click and drag the red vertical line to the midline on both the photo and volume or surface.

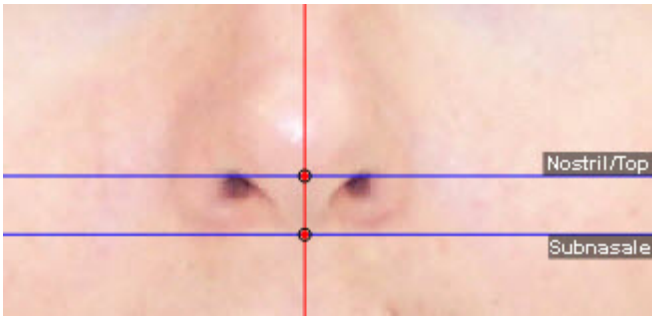
8 Click and drag the points on the both the photo and volume or surface so that they identify corresponding locations.

Or,

Click and drag the lines on the both the photo and volume or surface so that they identify corresponding locations.

Dolphin recommends landmarks on which to place the points on the volume or surface and the photo. However, you can place the points on different locations as long as the points on the photo correspond to the points on the volume or surface.

Note: *For best results, Dolphin recommends that you place the Nostril/Top line at the top of the patient's nostrils. This results in the best appearance for the nostrils when you tilt the superimposed image up toward an SMV view.*



9 Optionally, after placing the Nasion and Stomion lines or points on both images, click **Match Nasion-Stomion** to magnify both the volume or surface and the 2D photo to the same level.

Using the same magnification on both views may make it easier to place the points in corresponding locations.

Note: *Sometimes it is not possible to match up the points exactly.*

10 Optionally, check the **Show Guide Lines** box to see and move the guide lines that you can use as visual aids for placing the points.

11 Optionally, check the **Add Supporting Surface** box to create a surface backing for the wrapped photo from the volume as part of the superimposition process.

12 Since a 2D photo can only be wrapped onto the front portion of the volume, crucial neckline and jaw areas may be missing or need to be sculpted out. If you check this box, the missing (or the sculpted out) parts are replaced by a surface created from the volume.

13 If you are creating a supporting surface, click and drag the green square in the right (photo) pane to select part of the image to use to color the supporting surface.

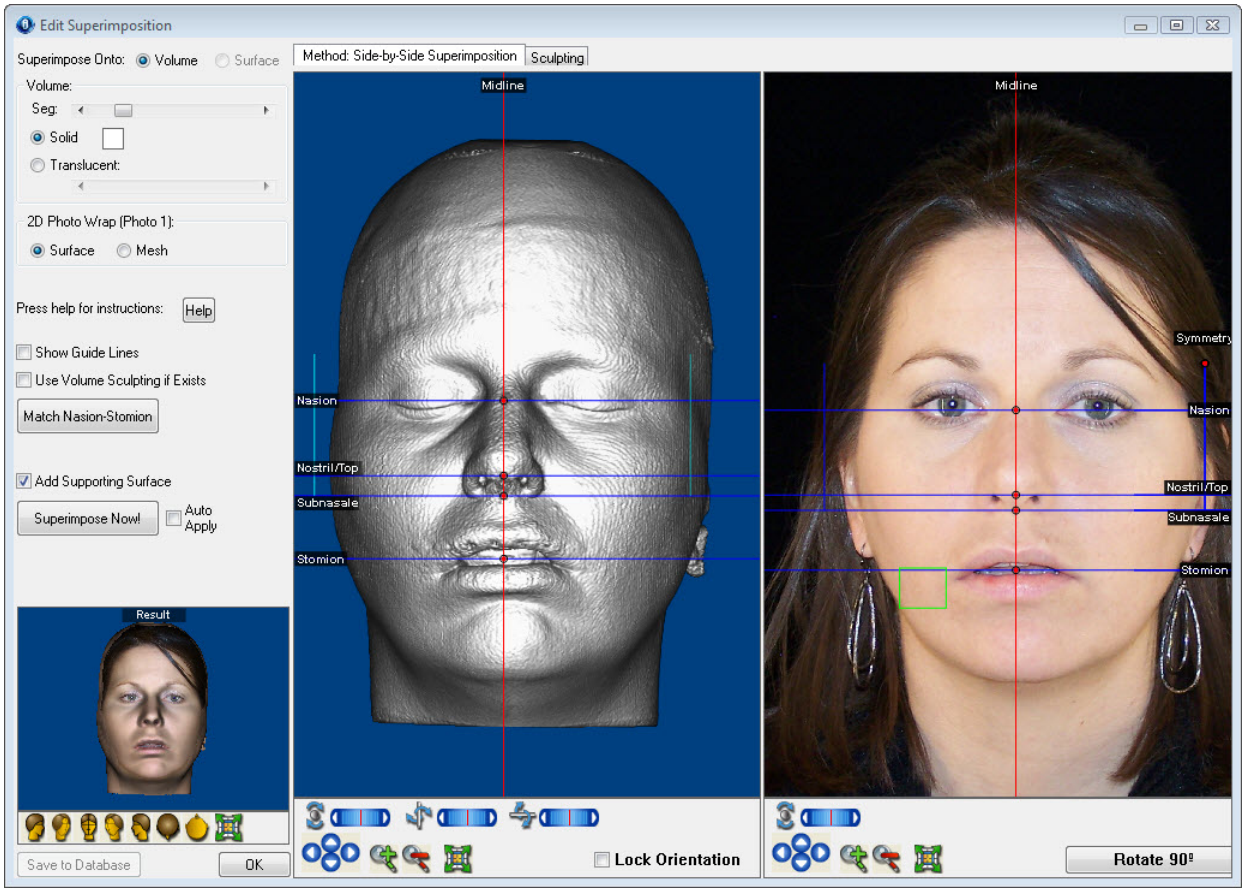
14 When areas of the 2D photo are sculpted out, the color of the supporting surface shows through. For example, if you place the green square over the patient's cheek and later sculpt part of the patient's neck from the wrapped 2D photo, the cheek coloration assigned to the supporting surface will show through in that area of the patient's neck.

15 Click **Superimpose Now!**

The result of your superimposition appears in the results box in the lower left corner of the window.

16 Rotate the image in the results box in the lower left corner of the window to verify the superimposition.

The following figure illustrates superimposing a 2D photo over a volume.



Superimpose Onto	Superimposition to perform: **Volume:** Superimposes the 2D photo over the volume. **Surface:** Superimposes the 2D photo over a surface. Only available on the **Method: Side-by-Side Superimposition** tab.
Volume	Display options for the volume onto which you're superimposing the 2D photo. Only available on the **Method: Side-by-Side Superimposition** tab. **Seg**: Sets the segmentation to use for the volume. **Solid:** Displays a solid representation of the volume. **color sample:** Sets the color to use for the solid representation of the volume. **Translucent:** Displays a translucent representation of the volume. **slider:** Sets the transparency of the volume. For more information on these options, see "Viewing the Soft Tissue" on page 19-26.
Show Guide Lines	Displays alignment guidelines to aid you in creating the superimposition. Only available on the **Method: Side-by-Side Superimposition** tab.
Use Volume Sculpting if Exists	Considers volume sculpting when creating the superimposition. Only available on the **Method: Side-by-Side Superimposition** tab. For more information on volume sculpting, see "Sculpting the Volume" on page 28-6.

Match Nasion-Stomion	Moves the volume/surface and photo so that the nasion and stomion are at the same level in the window. Only available on the **Method: Side-by-Side Superimposition** tab.
Add Supporting Surface	Creates a surface backing for the wrapped photo from the volume or surface as part of the superimposition process. Since a 2D photo can only be wrapped onto the front portion of the volume or surface, crucial neckline and jaw areas may be missing or need to be sculpted out. If you check this box, the missing (or the sculpted out) parts are replaced by a surface created from the volume or underlying surface.
Superimpose Now!	Creates the superimposition and display the result in the Test Superimposition window. Only available on the **Method: Side-by-Side Superimposition** tab.
Auto Apply	Previews the results of the superimposition in real time. Only available on the **Method: Side-by-Side Superimposition** tab.
Save to Database...	Saves this superimposition to your database. For more information, see “Verifying, Correcting, and Saving the Result” on page 19-72.
Method: Side-by-Side Superimposition	Displays the photo and the volume or surface side by side so that you can align them using corresponding points. For more information, see “Using Side-by-Side Superimposition” on page 19-58.
Sculpting	Sculpts the photo. For more information, see “Sculpting the 2D Photo” below.
Result	Displays a small preview of your superimposition and sculpting operations. Only available if the **Auto Apply** box is checked (see above).
Lock Orientation	Locks the orientation of the volume so that the rotation sliders no longer work. Only available when superimposing a 2D photo over the volume.
Rotate 90°	Rotates a 2D photo 90°. Only available when superimposing a 2D photo over the volume.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the images, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Sculpting the 2D Photo

Sculpting a photo enables you to crop or remove portions of it. For example, when you superimpose a 2D photo over a volume, the photo may have jagged edges that you can smooth out using this feature.

Note: *You must superimpose a 2D photo over the volume before you can use photo sculpting on it.*

To sculpt a 2D photo:

1 Select the **Sculpting** tab.

Front and back views of the superimposition appear in the dialog box.

2 Optionally, click the button for one of the predefined views to change to view that orientation and its mirror image.

Or,

Click and drag the image in either side of the window to rotate both images.

3 Select **Curves** in the Border group box to use curves to create the cropping border.

Or,

Select **Lines** in the Border group box to use lines to create the cropping border.

The figure below illustrates cropping borders created using lines and curves.

4 Click the point where you want to begin drawing the cropping border.

5 Release the mouse button and move the mouse to begin drawing the border.

6 Click whenever you want to place a point and change the direction of the line.

If you make a mistake and want to start over, click **Remove Border**.

7 Click the first point again to close the border.

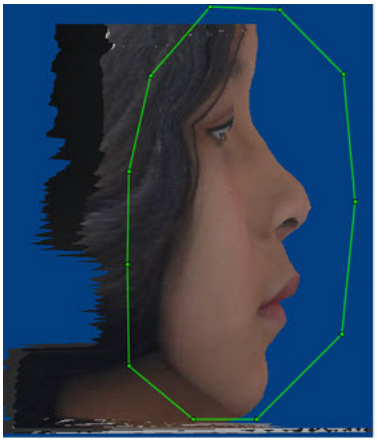
When you close the border, the mouse pointer changes to a pair of scissors.

8 Click inside the border to remove the part of the photo that is inside the border.

Or,

Click outside the border to remove the part of the photo that is outside the border.

Cropping Border Created With Lines



Cropping Border Created With Curves

Verifying, Correcting, and Saving the Result

When you superimpose a 2D photo over a volume, the result of your superimposition appears in the results box in the lower left corner of the window. Before saving your superimposition, you can verify it by viewing it from different angles to see it the superimposition is aligned correctly.

To verify your superimposition:

1 Select the **Method: Side-by-Side Superimposition** tab, if it isn't already selected.

2 Rotate the image in the results box in the lower left corner of the window to verify the superimposition.

The dialog box displays the current superimposition.

3 Change the orientation of the superimposed image as described in “Moving or Reorienting the Volume” on page 19-24.

Sometimes, you’ll see that the nostril area is not superimposed correctly.

To fine tune the superimposition in the nostril area:

1 Make sure the points and midline on the volume are located correctly.

2 Optionally, move the Nostril/Top point on the volume up or down until the nostrils are superimposed correctly.

Note: *You can check the **Auto Apply** box so you don’t need to click **Superimpose Now!** for every adjustment.*

To save your work in your database:

1 Click **Save to Database...**.

To close this dialog box:

1 Click **OK**.

Working with Surfaces

In Dolphin 3D, you can work with the several types of surfaces.

- If you have the full Dolphin 3D module, you can create a surface representing the patient's soft tissue from the volume. Then, you can export the surface for use with other applications.
- You can import a soft tissue or other type of surface from a file.
- You can import surfaces representing study models for the patient's upper and lower arch. If you have the full Dolphin 3D module, you can then superimpose these surfaces over the volume to create a high-resolution representation of the patient's teeth.

Note: *These features are meant to assist dental clinicians and trained assisting staff in treatment planning. The results of these processes should not be used as the primary source of patient evaluation and should be verified by other independent methods.*

Note: *The features for working with surfaces are available as part of Dolphin 3D and as a stand-alone digital study module product. If you purchased the stand-alone digital study module product, you can work with the surfaces only. If you purchased Dolphin 3D, you can work with surfaces in conjunction with the patient's 3D volume.*

Creating a Surface From the Volume

You can convert the sculpted and segmented volume to an surface at the selected resolution. Then, you can export the surface to a file for use with applications that can import and process a surface.

To create a surface from the volume:

1 On the Dolphin 3D window, click **Add...** under **Photos/Surfaces**. Then, select **Create Soft Tissue Surface (from volume)...**.

Or,

Select **Create Surface from Volume...** from the **File** menu.

Or,

On the **Analysis/Verify Result** tab of the Superimpositions window, click **Convert 2nd Volume to STL...**.

The Create Surface from Volume window opens. Initially, this window contains a single tab, as shown below.

2 Use the **Seg** slider to select the density segment of the volume to use to create the surface.

3 Optionally, check the **Use Volume Sculpting if Exists** box to use volume sculpting, if the volume has been sculpted, when creating the surface.

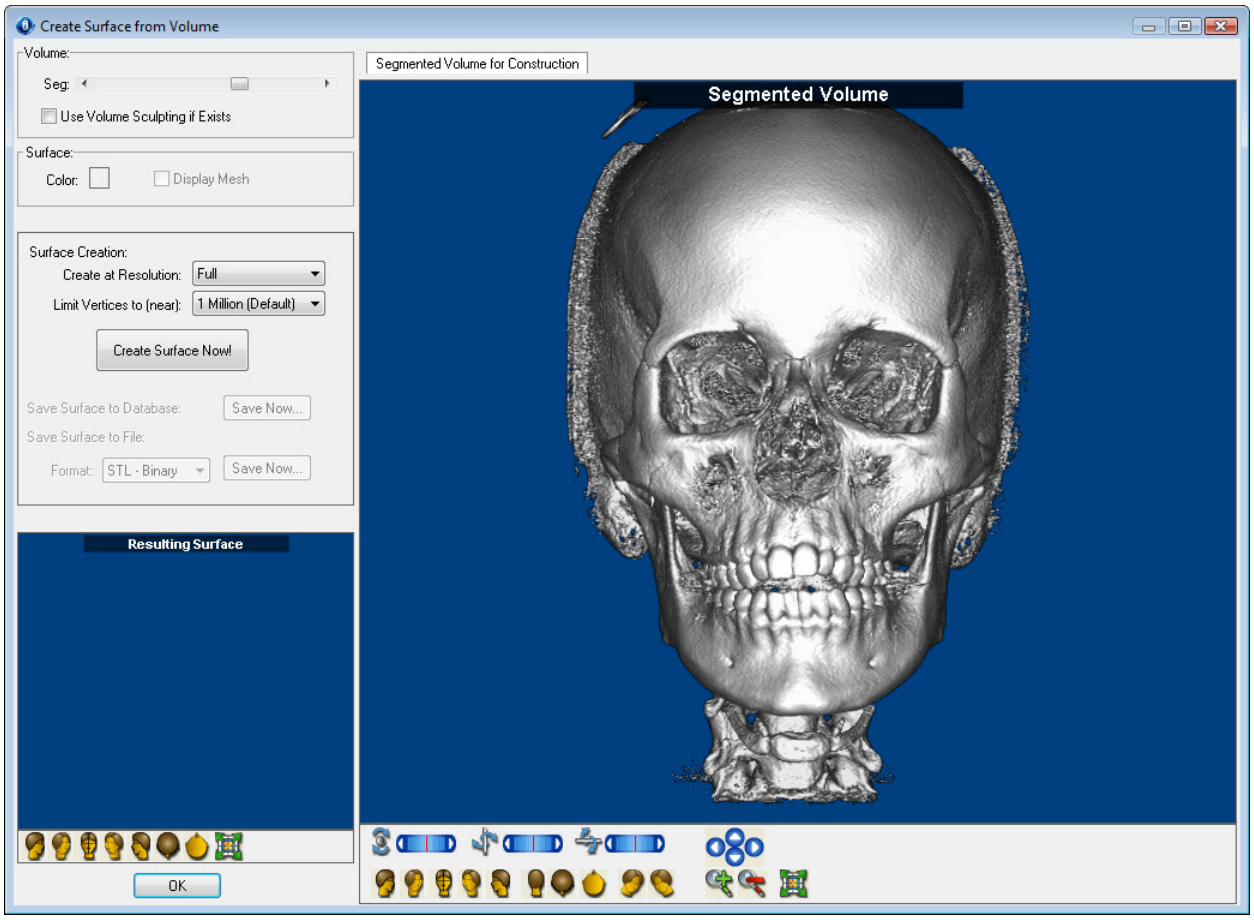
For more information, see “Sculpting the Volume” on page 28-6.

4 Select the resolution you want to use when creating the surface from the **Create Resolution at ->** drop-down list.

5 Set any other options for the surface.

6 Click **Create Surface Now!**

Two new tabs labeled **Surface Sculpting** and **Verify Resulting Surface** appear. In addition, the created surface is displayed in the lower left of the **Segmented Volume for Construction** tab and on the **Surface Sculpting** and **Verify Resulting Surface** tabs.



Volume	Options for the volume: **Seg:** Sets the density segment of the volume to use for the surface you want to create. **Use Volume Sculpting if Exists:** Uses volume sculpting, if the volume has been sculpted, when creating the surface. For more information, see “Sculpting the Volume” on page 28-6.
Surface	Options for the surface: **Color:** Sets the color of the surface. For more information, see “Setting the Surface Color” on page 19-77. **Display Mesh:** Displays a mesh representation of the surface.

Surface Creation	Options for creating the surface. **Create at Resolution:** Quality of the surface to create. **Limit Vertices to (near):** Number of surface vertices created when creating the surface at full resolution. Only available when **Full** is selected in the **Create at Resolution** drop-down list. This feature enables you to have greater control over the resolution of the created surface and any export files created from it. 1 million is the default number of surface vertices created. ***Note:*** *If you limit the number of vertices, there is the potential for error in the created surface shape. For this reason, you should visually examine the created surface to make sure if it matches the shape of the volume.* **Create Surface Now!:** Creates the surface. When you click this button, the **Surface Sculpting** and **Verify Resulting Surface** tabs appear. In addition, the created surface is displayed in the lower left of the **Segmented Volume for Construction** tab and on the **Surface Sculpting** and **Verify Resulting Surface** tabs. **Save Surface to Database:** Saves the created surface to your database. • **Save Now...:** Saves the surface. **Saving Surface to File:** Saves the created surface to a file. Only available after you have saved the surface to your database. • **Format:** File format to save (STL Text, STL Binary, OBJ Text, PLY Text, or PLY Binary). • **Save Now...:** Saves the surface.
Resulting Surface	Displays a preview the constructed surface.
Sculpting Options	Options for sculpting the created surface (see “Sculpting the Created Surface” on page 19-77). Only available on the **Surface Sculpting** tab. **Sculpting Border is:** Border to use when sculpting. • **Lines:** Uses straight lines. • **Curves:** Uses curved sculpting borders. **Remove Border:** Removes a sculpting border. **Surface Reverse:** “Reverses” the surface. For example, you can use this option to create a digital study model of the patient's teeth from a surface representing an impression of the patient's teeth. **Undo Last:** Undoes your last sculpting operation. **Undo All:** Undoes all of your sculpting operations.
Segmented Volume for Construction	Shows the volume you are using to create the surface.
Surface Sculpting	Enables you to sculpt the surface to crop or remove portions of it. Only available after you have created an surface.
Verify Resulting Surface	Enables you to verify the surface before saving it. Only available after you have created an surface.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Setting the Surface Color

To change the color of the surface:

1 Click the color sample.

The Color dialog box opens.

2 Select the color you want to use for the surface, and click **OK**.

Sculpting the Created Surface

To sculpt the newly created surface:

1 Select the **Surface Sculpting** tab.

2 Optionally, change the orientation of the volume as described in “Moving or Reorienting the Volume” on page 19-24.

3 Select **Curves** in the Sculpting Options group box to use curves to create the cropping polygon.

Or,

Select **Lines** in the Sculpting Options group box to use lines to create the cropping polygon.

The figure below illustrates cropping polygons created using lines and curves.

4 Draw the cropping polygon.

For information on drawing a polygon, see “Selecting an Area of an Image” on page 6-4.

If you make a mistake and want to start over, click **Remove Cropping Border**.

When you close the polygon, the mouse pointer changes to a pair of scissors.

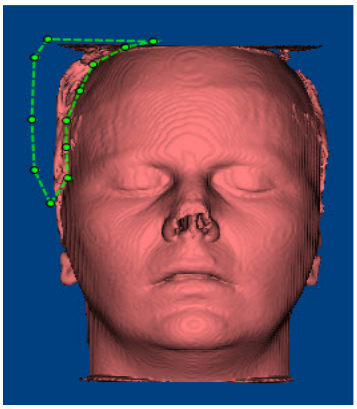
5 Click inside the polygon to remove the part of the photo that is inside the polygon.

Or,

Click outside the polygon to remove the part of the photo that is outside the polygon.

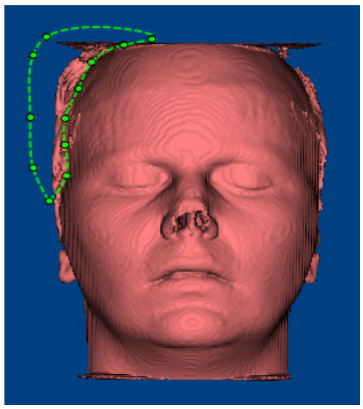
Cropping Border Created With Lines

Cropping border created with lines



Cropping Border Created With Curves

Cropping border created with curves



Saving the Surface

Before saving the surface, you should verify it on the **Verify Resulting Surface** tab.

To verify the surface:

1 Click the **Verify Resulting Surface** tab to check the surface before saving it.

2 Check the surface from all angles to make sure it is correct.

To save the surface to your database:

1 Click **Save Now...**.

Once you have saved the surface to your database, additional options appear so that you can also save it to a file.

To save the surface to a file:

1 Select the file format you want to use from the **Format** drop-down list.

2 Click **Save Now...**.

3 Specify the directory and file in which you want to save the surface

Importing a Surface

You can import a surface representing the patient's soft tissue from a file rather than creating it from the volume. Then, you can superimpose it over the volume.

In addition, you can import a general surface, which is simply a surface that represents something other than the patient's soft tissue or arch models. You can import a general surface for a patient regardless of whether you have already imported the patient's 3D volume.

Note: *The features for working with surfaces are available as part of Dolphin 3D and as a stand-alone digital study module product. If you purchased the stand-alone digital study module product, you can work with the surfaces only. If you purchased Dolphin 3D, you can work with surfaces in conjunction with the patient's 3D volume.*

To import a general surface from the Dolphin Imaging main screen:

1 On the Dolphin Imaging main screen, select the timepoint and image layout to which you want to add the surface.

2 Click

.

3 Select **Import New Arch Models/3D Photo/Surface**.

4 Select **Import New General Surface (STL, OBJ, or PLY)...** from the sub-menu.

The Open dialog box appears.

5 Navigate to the location of the file or dataset containing the surface. Then, click **Open**.

The surface appears in Photo/Surface Sculpting window so that you can sculpt it, if necessary. For information, see “Sculpting the 3D Photo or Surface” on page 19-65.

To import a general or soft tissue surface from the Dolphin 3D window:

1 On the Dolphin 3D window, click **Add...** under **Photos/Surfaces**.

2 Select **Import Soft Tissue Surface (STL, OBJ, or PLY)...** to import a surface representing the patient's soft tissue.

Or,

Select **Import General Surface (STL, OBJ, or PLY)...** to import another type of surface.

The Open dialog box appears.

3 Navigate to the location of the file or dataset containing the surface. Then, click **Open**.

The volume and surface appear in a superimposition window so that you can superimpose the surface over the volume. For information on how to superimpose the surface over the volume, see “Superimposing the Photo or Surface and the Volume” on page 19-57.

Exporting a Surface

You can export one or more of the surfaces stored in your database for a patient. Then, you can import them into any program that uses surfaces.

To export a single surface:

1 On the Dolphin 3D window, check the **Photos/Surfaces** box.

2 Click **Select/Display**.

3 Check the box for the surface you want to export.

4 Click **Export Selected...**.

5 Select the file format to use to export the surfaces.

6 Specify the file in which to save the exported surface. Then, click **Save**.

To export more than one surface:

1 On the Dolphin 3D window, check the **Photos/Surfaces** box.

2 Click **Select/Display**.

3 Check the box for each surface you want to export.

4 Click **Export Selected...**.

5 Select **Export segments to individual files, inside one ZIP file** to export the surfaces into separate files packaged into a .ZIP file.

Or,

Select **Export segments to a single composite STL file** to export all the surfaces into a single .STL file.

Exporting multiple surfaces into separate files can be useful if you intend to import one or more of the exported surfaces into another program, such as for 3D printing.

6 If you are exporting the surfaces into separate files, enter the folder in which to save the files in the **Export to ZIP File** field.

Or,

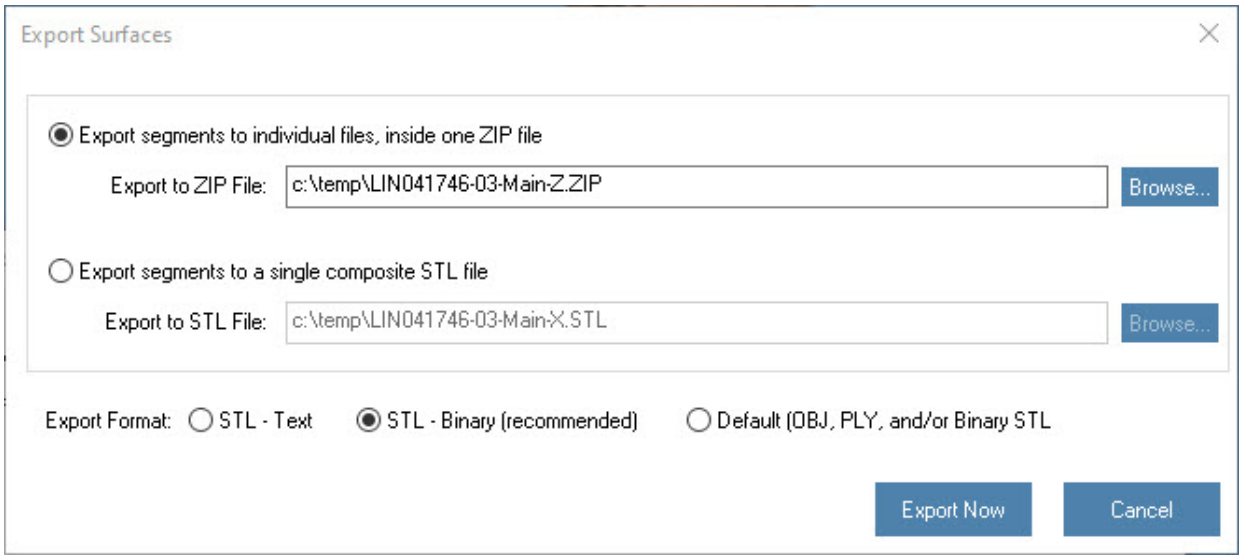
If you are exporting all the surfaces into the same file, enter the folder and file in which to store the surfaces in the **Export to STL File** field.

Or,

Click **Browse...** to select the folder and file in which to store the surfaces.

7 Select the file format to use to export the surfaces.

8 Click **Export Now**.



Export segments to individual files, inside one ZIP file	Exports the surfaces into separate files packaged in a .ZIP file. This can be useful if you intend to import one or more of the exported surfaces into another program, such as for 3D printing. **Export to ZIP File:** Folder and file in which to save the .ZIP file containing the exported files. **Browse...:** Browse to the appropriate folder and file.
Export segments to a single composite STL file	Exports all the surfaces into a single .STL file. **Export to File:** Folder and file in which to save all the exported surfaces. **Browse...:** Browse to the appropriate folder and file.
Exported STL Format	Exported file format. Possible values are **STL - Text**, **STL - Binary (recommended)**, and **Default (OBJ, PLY, and/or Binary STL)**. Select **Default (OBJ, PLY, and/or Binary STL)** to export the surfaces in their original file formats.
Export Now	Exports surfaces in the selected format to the specified folder and file.

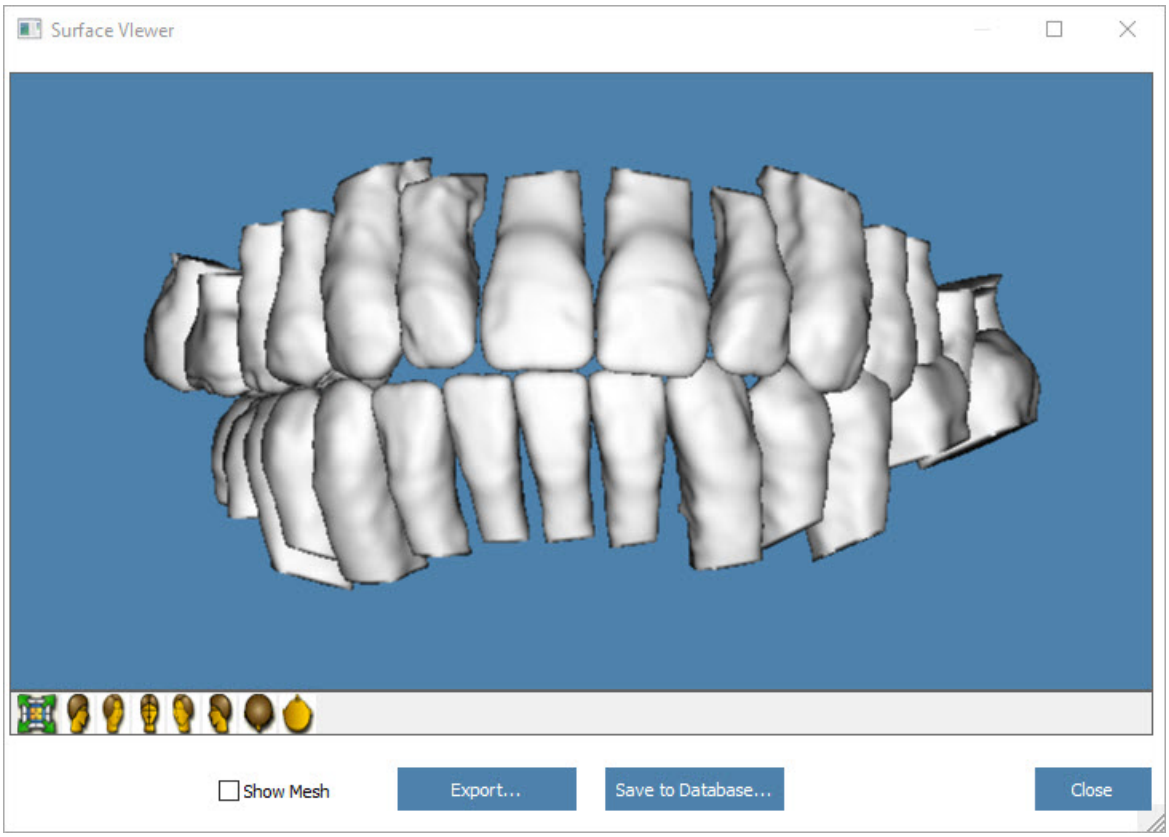
Merging Surfaces

To merge surfaces into a composite surface:

1 Check the box for each photo or surface that you want include in the composite.

2 Click **Merge Selected...**.

The photos and/or surfaces you selected appear in the Surface Viewer dialog box.



Show Mesh	Uses a mesh representation based on the surface instead of the actual surface.
Export...	Exports the composite surface to a file.
Save to Database...	Saves the composite surface in your database.

To save the composite to your database:

1 Click **Save to Database...**.

The Select Photo/Surface dialog box opens.

2 Select the slot in which you want to save the surface.

If you select a miscellaneous surface slot (such as (*) Miscellaneous 1), you can customize the description of that slot before saving the surface in it.

3 Optionally, if you selected a miscellaneous surface slot, enter a new description.

If you leave the description blank, Dolphin Imaging sets the slot to its default description.

4 Click **Save**.

To export the composite to a file:

1 Click **Export...**.

2 Select the file format to use, either **STL (Text)**; **STL (Binary), (recommended)**; or **PLY (Binary)**.

3 Specify the file in which to save the exported composite. Then, click **Save**.

Working With Arch Model Surfaces

Note: *The features for working with arch model surfaces are available as part of Dolphin 3D and as a stand-alone digital study module product. If you purchased the stand-alone digital study module product, you can work with the arch model surfaces only. If you purchased Dolphin 3D, you can work with arch model surfaces in conjunction with the patient's 3D volume.*

You can import surfaces representing study models for the patient's upper and lower arches from an intra-oral or laser scanner. After importing the arch model surfaces, you can define the occlusion positions for them:

- You can define the original occlusion when the scans are imported. This position typically comes from scanning the upper and lower intro-oral or stone models, using the specialized third-party program to merge the arches into optimal occlusion, then exporting the arches to files (one arch per file) in their relatively correct occlusal positions. When you import these files, you can change the original occlusion, if necessary, as described in "Editing Arch Models' Occlusion and Orientation" below. Then, you can view the models in this occlusion by clicking the arch buttons on the Dolphin 3D window (see "Viewing Arch Model Surfaces" on page 19-31).
- If you purchased the full Dolphin 3D module, you can also define the occlusion by superimposing the arch models over the volume. Superimposing the arch model surfaces over the volume or another surface (such as a soft tissue surface) creates a high-resolution representation of the patient's teeth used for operations like implant or orthognathic surgical planning.

  Note: *There is no guarantee that the occlusion of arch models superimposed over the volume is in its natural position when the patient was CBCT scanned.*

There is a slight difference between the two occlusions. In the occlusion of arch models superimposed over the volume, the frontal teeth gap is slightly bigger.

Note: *For best results, use a small separator between the upper and lower arches when taking the scan.*

Importing Arch Model Surfaces

Note: *If you purchased the stand-alone digital study module product, you can import the arch model surfaces from the Dolphin Imaging main screen. If you purchased Dolphin 3D, you can import arch model surfaces from the Dolphin Imaging main screen or from the Dolphin 3D window.*

To import arch models from the Dolphin Imaging main screen:

1 On the Dolphin Imaging main screen, select the timepoint and image layout to which you want to add the surface.

2 Click

on the Dolphin Imaging main screen.

3 Select **Import New Arch Models/3D Photo/Surface**.

4 Select **Import Lower and Upper Arch Models (STL, OBJ, PLY, or DIXD)...** from the sub-menu.

The Import Arch Models dialog box appears.

To import arch models from the Dolphin 3D window:

1 On the Dolphin 3D window, click **Add...** under **Photos/Surfaces**.

2 Select **Import Upper and Lower Arch Models (STL, OBJ, PLY, or DIXD)...**.

The Import Arch Models dialog box appears.

To load the files or dataset containing the arch model surfaces:

1 Select **STL/OBJ/PLY Format** to load files for the upper and lower arch models in STL, OBJ, or PLY format.

Or,

Select **CEREC Dixd Format** to upload a a CEREC DIXT format file containing the upper and lower arch models.

2 If you selected **STL/OBJ/PLY Format**, enter the location of the file or dataset containing the upper arch model in the **Upper Arch File** field and the lower arch model in the **Lower Arch File** field.

Or,

If you selected **CEREC Dixd Format**, enter the location of the file or dataset containing the upper and lower arch models in the **Dixd File** field.

Or,

Click **Browse...** and navigate to the location of the file or dataset that you want to load. Then, click **Open**.

3 (Optional) Check the **Do not Import OBJ Bitmap/Photo (if exists)** box to omit color data used to represent the patient's skin when loading the arch model files or datasets.

The color data used to represent the patient's skin can be very large, so omitting it decreases the time and the amount of your computer's memory (RM) needed to load and render the arch models. If you do decide to load the color data, you can choose at any time whether you want to display it. For more information, see "Viewing a Photo or Surface" on page 19-29.

4 Click **Load Now**.

An arch model appears in the lower part of the dialog box so that you can correct its orientation, if necessary.

1 If necessary, click and drag the arch model image until it is properly oriented for a frontal view.

2 Click **Continue**.

The New Arch Model - Set Dental Occlusion and Define Occlusal Plane window opens.

At this point, you set the arch model's occlusion and occlusal plane as described in "Editing Arch Models' Occlusion and Orientation" below.

Editing Arch Models' Occlusion and Orientation

Typically, the upper and lower arches are put into their proper occlusion positions by the external intraoral scanning process before imported into Dolphin. If this is not the case, you can modify the occlusion after the arch models have been imported. You can also add bases, modify, or sculpt away arch model bases.

When you import arch model surfaces, the New Arch Model - Set Dental Occlusion and Define Occlusal Plane window opens automatically so that you can set the occlusion and occlusal plane. However, you can open this window at any time.

To open the Edit Arch Models - Dental Occlusion and Occlusal Plane window:

1 On the Dolphin 3D window, click **Edit...** under **Photos/Surfaces**.

2 Select **Edit Arch Models Occlusion/Orientation**.

The Edit Arch Models - Dental Occlusion and Occlusal Plane window has the following tabs:

Define Occlusion	Used to specify the occlusion by moving the lower arch relative to the upper arch. For more information, see “Defining the Occlusion” below.
Define Occlusal/ Midline Planes	Used to specify the locations of the occlusal and midline planes. For more information, see “Defining the Occlusal and Midline Planes” on page 19-91.
Sculpting	Used to sculpt the arch surfaces. For more information, see “Sculpting the Imported Surfaces” on page 19-92.
Add/Modify Bases	Used to add or modify arch model bases. For more information, see “Adding or Modifying Bases” on page 19-94.

To set the occlusion and occlusal plane:

1 Set the occlusion as described in “Defining the Occlusion” below.

2 Specify the locations of the occlusal and midline planes as described in “Defining the Occlusal and Midline Planes” on page 19-91.

3 Optionally, sculpt the arch surfaces so that only the teeth remain as described in “Sculpting the Imported Surfaces” on page 19-92.

4 Click **OK** to save your work and close the Edit Arch Models - Dental Occlusion and Occlusal Plane window.

The arch models appear in the **Arches Composite View** in the Dolphin 3D window. At this point you can superimpose them with the volume as described in “Superimposing the Arch Model Surfaces Over the Volume” on page 19-101.

Defining the Occlusion

On this tab, you can move the lower arch model surface relative to the upper arch model surface to adjust the occlusion.

To adjust the occlusion using the wheel-shaped alignment tool:

1 On the Edit Arch Models - Dental Occlusion and Occlusal Plane window, click the Define Occlusion tab if it isn't already selected.

2 Click and drag inside the large circle to move the lower arch horizontally or vertically.

Or,

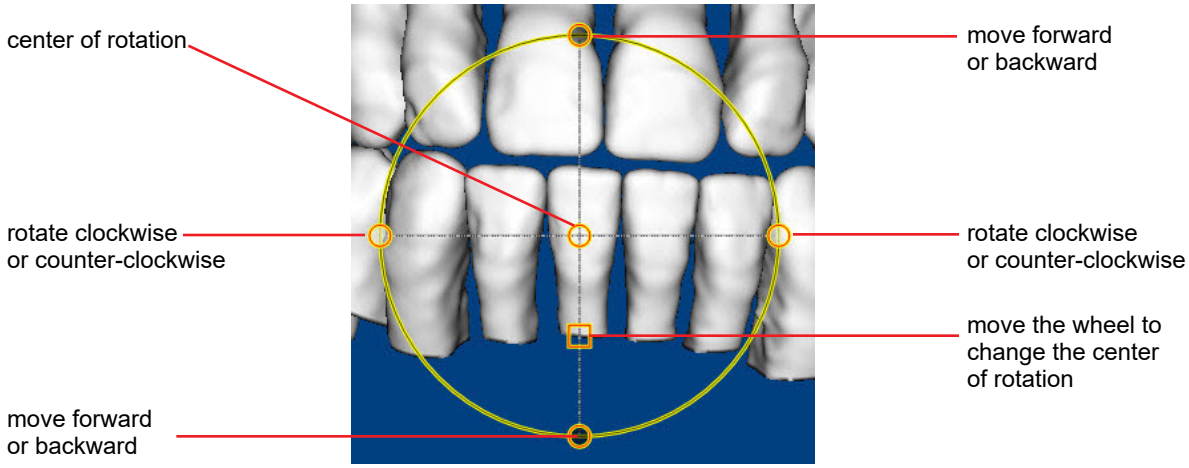
Click and drag the small circles at the 3 and 9 o'clock positions on the wheel to rotate the lower arch clockwise or counter-clockwise.

Or,

Click and drag the small circles at the 12 and 6 o'clock positions on the wheel to move the lower arch forward and backward (like a screw) in relation to the volume.

To change the center of rotation for the wheel-shaped alignment tool:

1 Click and drag the square to move the wheel so that its center is at the point that you want to use as the center of rotation.

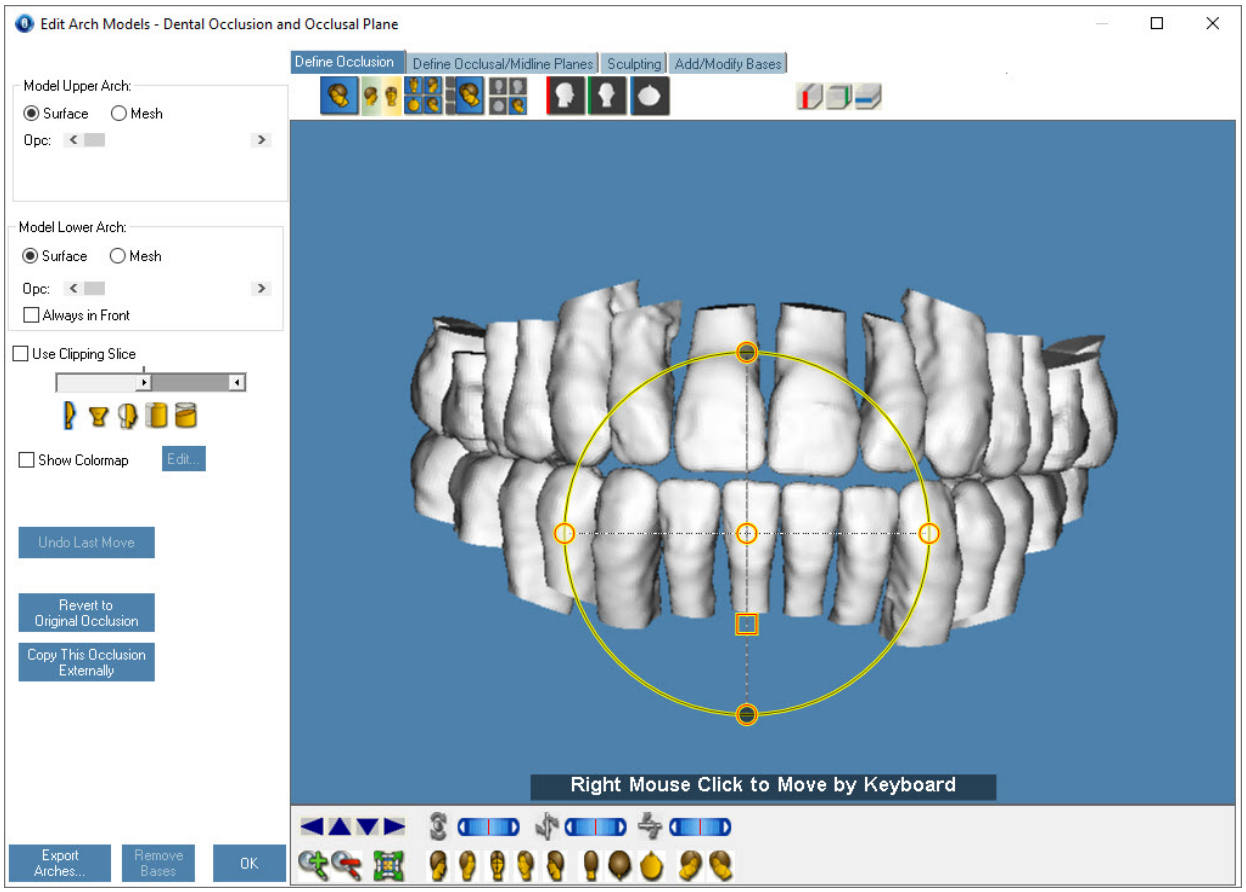


To adjust the occlusion using the other movement controls:

1 Click one of the arrow buttons to move the lower arch in the indicated direction.

Or,

Click and drag one of the sliders to rotate the lower arch around the indicated axis.



Model Upper Arch	Options for the upper arch model. **Surface:** Displays the upper arch model as a surface. **Mesh:** Displays a mesh representation of the upper arch model surface. **Opc:** Sets the level of opacity of the upper arch model image.
Model Lower Arch	Options for the lower arch model. **Surface:** Displays the lower arch model as a surface. **Mesh:** Displays a mesh representation of the lower arch model surface. **Opc:** Sets the level of opacity of the lower arch model image. **Always in Front:** Always displays the lower arch model in front of the upper arch model.
Use Clipping Slice	Defines the cross-section of the image to display. For more information, see “Using a Clipping Slice” on page 28-1.
Show Colormap	Maps colors to distances between the arch model surfaces. For more information, see “Using the Color Map” on page 19-64. **Edit...:** Sets options for the color map.
Undo Last Move	Undoes your last operation.

Original Occlusion	Returns to the original occlusion.
Export Arches...	Exports the arches at their current positions to one or more files. For more information, see “Exporting the Arches in Occlusion” on page 19-89.
Remove Bases	Removes bases that you added to these arch models on the **Add/Modify Bases** tab. You will probably need to use this option if you change the arch model positions after adding bases, so that you can redo the bases using the new positions. The previously defined trimming polygons are retained so that you don’t need to redraw them. For more information, see “Adding or Modifying Bases” on page 19-94.

For information on the layout buttons that appear above the image, see “Layouts and Slices” on page 19-32.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Typing In Movement Values

Rather than using the using the wheel-shaped alignment tool, you can adjust the occlusion by typing in movement values.

To type in movement values:

1 Right-click the image.

Or,

Click **Key Input.**

Or,

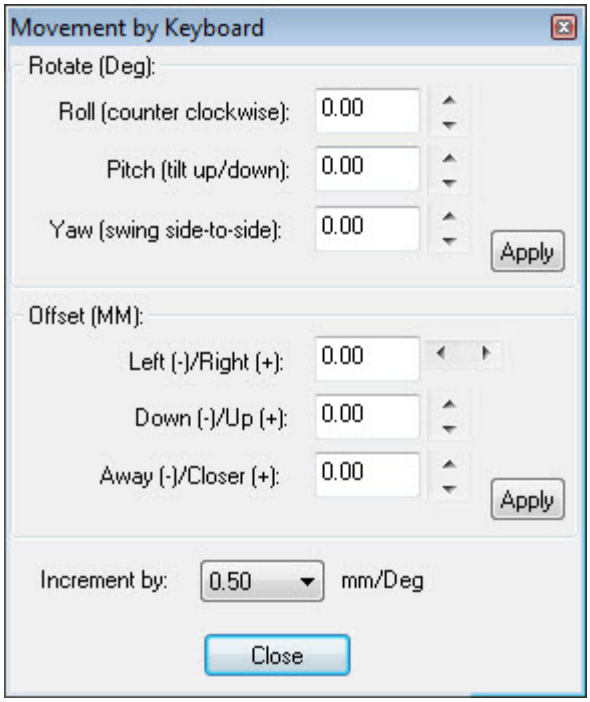
Right-click the image, and select **Input Movements Using Keyboard...** from the context menu.

The **Movement by Keyboard** dialog box opens.

2 Enter values to move the lower arch model surface relative to the upper arch model surface to adjust the occlusion.

3 Click **Apply** to see the result.

4 Click **Close** to close the dialog box.



Rotate (Deg)	Rotational values for the lower arch model surface: **Roll (counter clockwise):** Number of degrees to rotate counter-clockwise. **Pitch (tilt up.down):** Number of degrees to tilt up or down. **Yaw (swing side-to-side):** Number of degrees to swing side to side.
Offset (MM)	Linear movement values for the lower arch model surface: **Left (-)/Right(+):** Number of millimeters to move left or right. Enter a negative number to move left, or a positive number to move right. **Down(-)/Up(+):** Number of millimeters to move down or up. Enter a negative number to move down, or a positive number to move up. **Away(-)/Closer(+):** Number of millimeters to move closer or further away. Enter a negative number to move further away, or a positive number to move closer.
Increment by	Number of millimeters or degrees that the values should change when you click the arrow buttons.
Apply	Displays the result without closing the dialog box.

Exporting the Arches in Occlusion

To export the arches in their current positions:

1 Click **Export Arches...**.

2 Select **Export to Individual Files In the Following Folder** to export the arches into separate files.

Or,

Select **Export to Single Composite File** to export both arches into the same file.

Exporting the arches into separate files can be useful if you intend to import one or more of the exported files into another program.

3 If you are exporting the arches into separate files, enter the folder in which to save the files in the **Export to Folder** field.

Or,

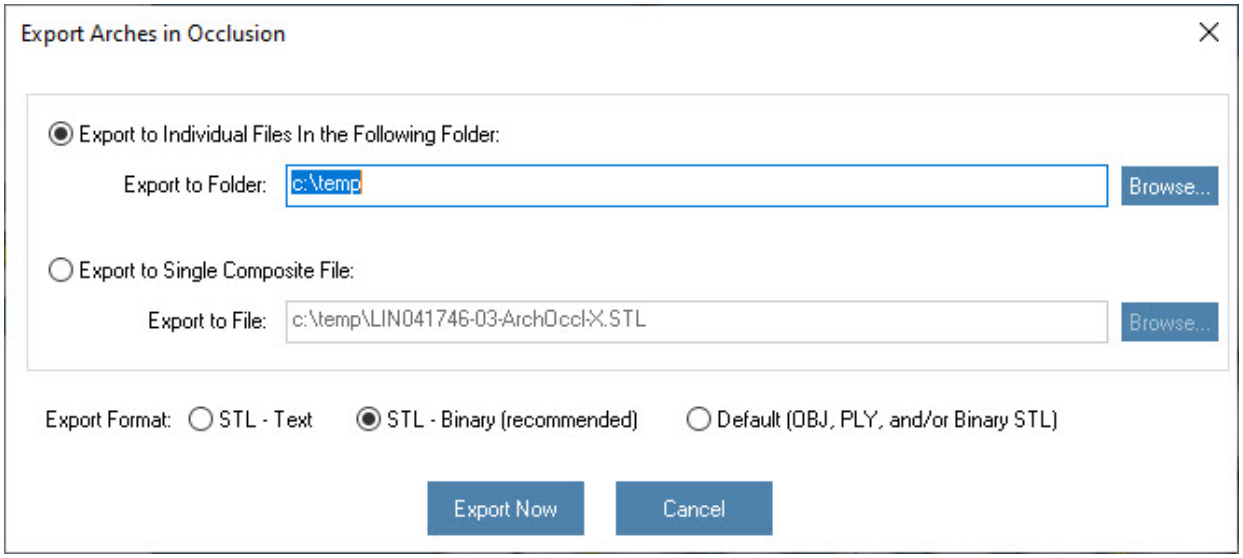
If you are exporting both arches into the same file, enter the folder and file in which to store them in the **Export to File** field.

Or,

Click **Browse...** to select the folder and/or file in which to store the arches.

4 Select the file format to use to export the arches.

5 Click **Export Now**.



Export to Individual Files In the Following Folder	Exports the arches into separate files, can be useful if you intend to import one or more of the exported files into another program. **Export to Folder:** Folder in which to save the exported files. **Browse...:** Browse to the appropriate folder.
Export to Single Composite File	Exports the arches into separate files. **Export to File:** File in which to save all the exported surfaces. **Browse...:** Browse to the appropriate folder.
Exported STL Format	Exported file format. Possible values are **STL - Text**, **STL - Binary (recommended)**, and **Default (OBJ, PLY, and/or Binary STL)**. Select **Default (OBJ, PLY, and/or Binary STL)** to export the surface in its original file format.
Export Now	Exports files in the selected format to the specified folder.

Defining the Occlusal and Midline Planes

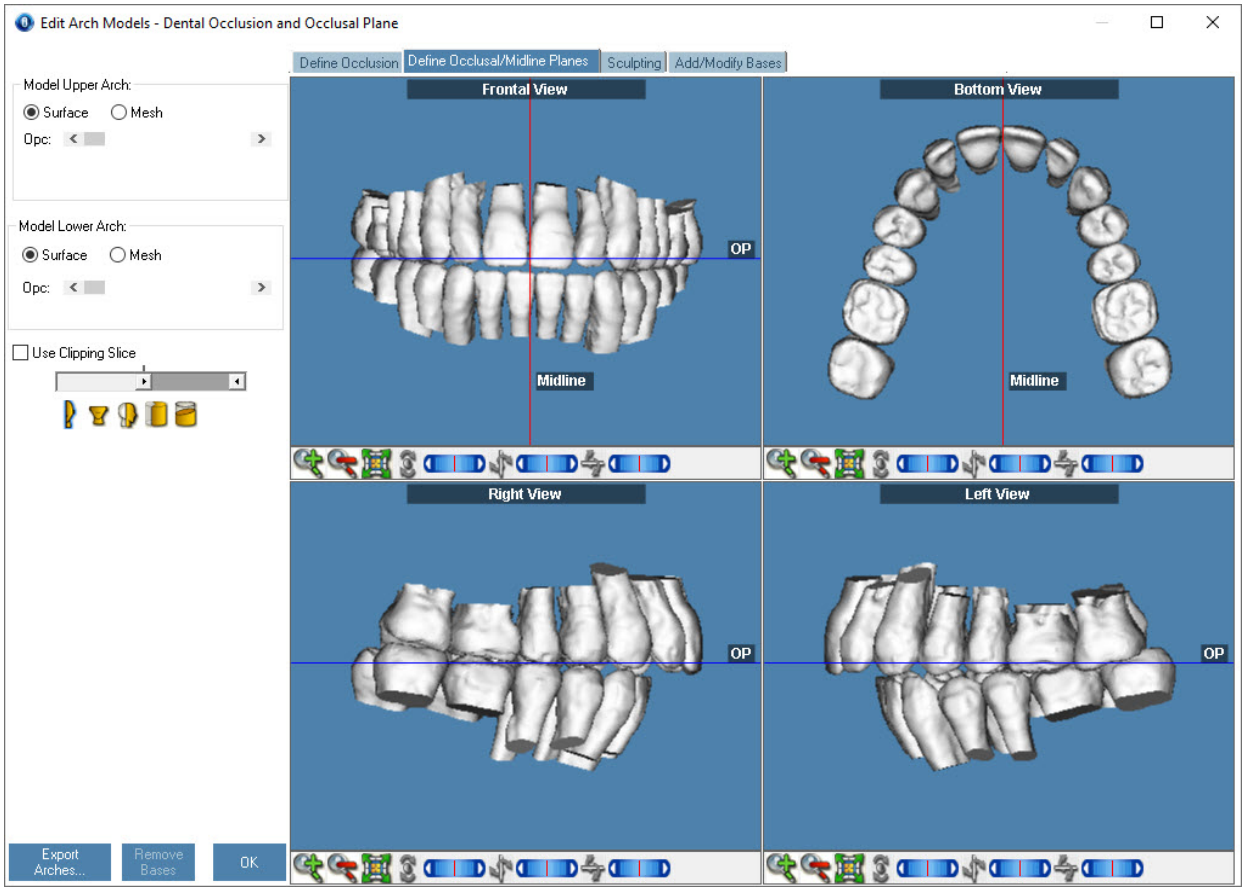
On this tab, specify the locations of the occlusal and midline planes.

To specify the locations of these planes:

1 Use the sliders, if necessary, to rotate the arch models.

2 Click and drag the blue line to the occlusal plane.

3 Click and drag the red line to the midline.



Model Upper Arch	Options for the upper arch model. **Surface:** Displays the upper arch model as a surface. **Mesh:** Displays a mesh representation of the upper arch model surface. **Opc:** Sets the level of opacity of the upper arch model image.
Model Lower Arch	Options for the lower arch model. **Surface:** Displays the lower arch model as a surface. **Mesh:** Displays a mesh representation of the lower arch model surface. **Opc:** Sets the level of opacity of the lower arch model image.

Use Clipping Slice	Defines the cross-section of the image to display. For more information, see “Using a Clipping Slice” on page 28-1.
Export Arches	Exports the arches at their current positions to one or more files. For more information, see “Exporting the Arches in Occlusion” on page 19-89.
Remove Bases	Removes bases that you added to these arch models on the **Add/Modify Bases** tab. You will probably need to use this option if you change the arch model positions after adding bases, so that you can redo the bases using the new positions. The previously defined trimming polygons are retained so that you don’t need to redraw them. For more information, see “Adding or Modifying Bases” on page 19-94.

For information on the rotation sliders and magnification controls that appear below the images, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Sculpting the Imported Surfaces

Sculpting a surface enables you to crop or remove portions of it. For example, if your surface is a model of the patient's teeth with a base, you may wish to sculpt it so that only the tooth crowns remain.

To sculpt the arch model surfaces:

1 Select the **Sculpting** tab.

The arch model surfaces appear in the window.

2 Select **Curves** in the Border group box to use curves to create the cropping polygon.

Or,

Select **Lines** in the Border group box to use lines to create the cropping polygon.

3 Select the arch you want to sculpt.

4 Optionally, click and drag the surface to rotate it.

5 Draw the cropping polygon.

For information on drawing a polygon, see “Selecting an Area of an Image” on page 6-4.

If you make a mistake and want to start over, click **Remove Cropping Border**.

When you close the polygon, the mouse pointer changes to a pair of scissors.

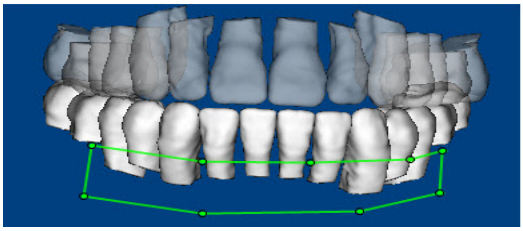
6 Click inside the polygon to remove the part of the surface that is inside the polygon.

Or,

Click outside the polygon to remove the part of the surface that is outside the polygon.

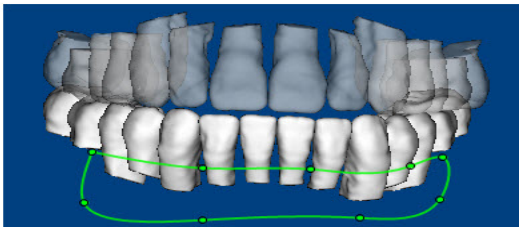
Cropping Border Created With Lines

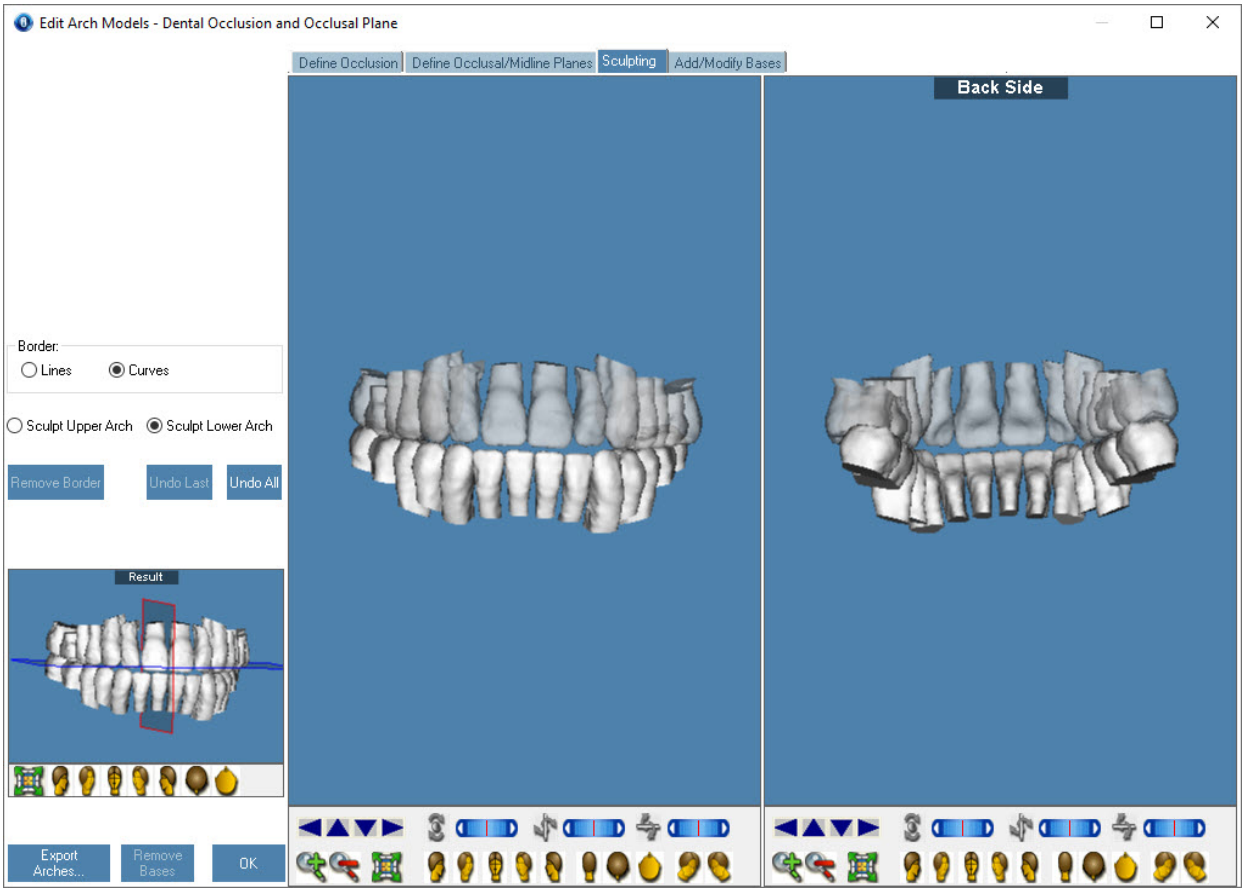
Cropping border created with lines



Cropping Border Created With Curves

Cropping border created with curves





Border	**Sculpting Border is:** Border to use when sculpting. • **Lines:** Uses straight lines. • **Curves:** Uses curved sculpting borders.
Sculpt Upper Arch	Sculpts the upper arch model.
Sculpt Lower Arch	Sculpts the lower arch model.
Remove Border	Removes the cropping polygon.
Undo Last	Undoes your last operation.

Undo All	Undoes the all sculpting operations.
Result	Shows a preview of the result of your sculpting operations.
Export Arches	Exports the arches at their current positions to one or more files. For more information, see “Exporting the Arches in Occlusion” on page 19-89.
Remove Bases	Removes bases that you added to these arch models on the **Add/Modify Bases** tab. You will probably need to use this option if you change the arch model positions after adding bases, so that you can redo the bases using the new positions. The previously defined trimming polygons are retained so that you don’t need to redraw them. For more information, see “Adding or Modifying Bases” below.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

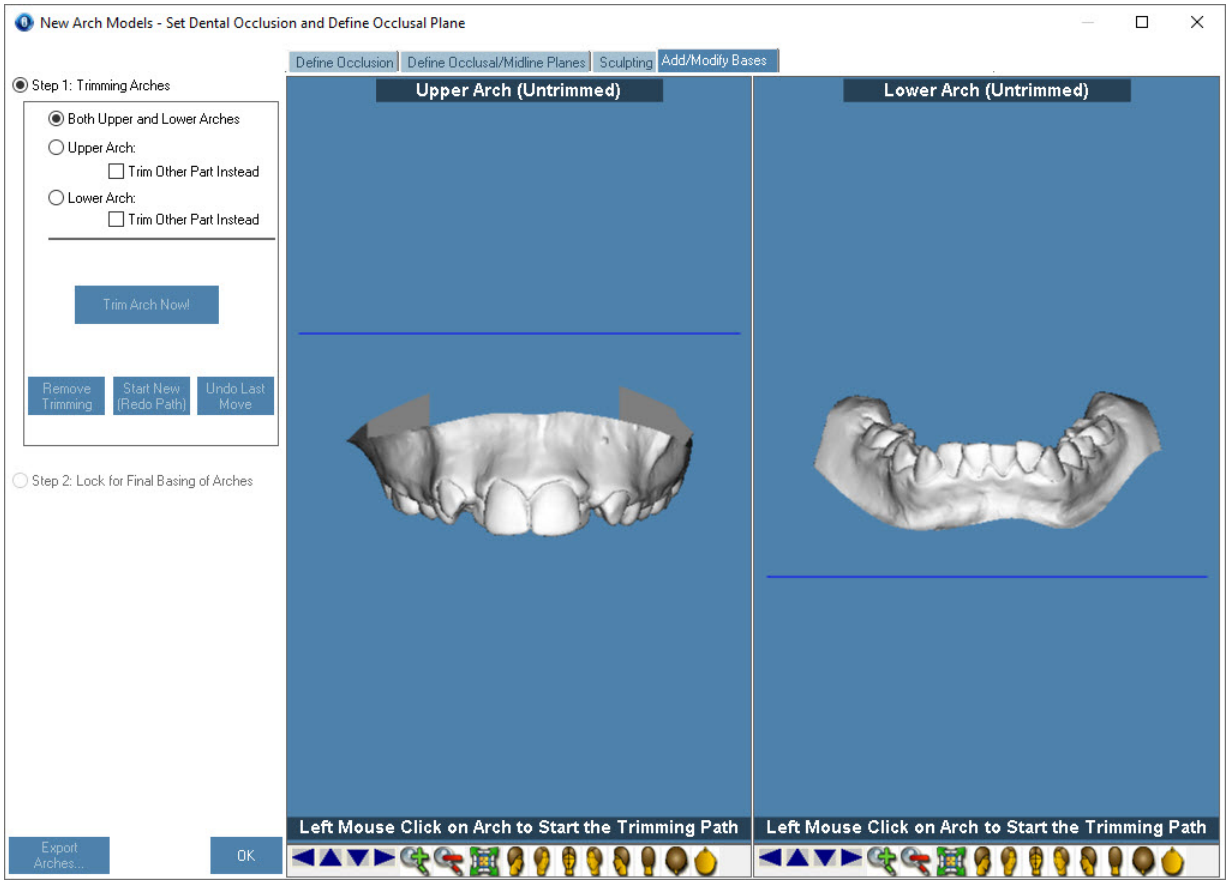
Adding or Modifying Bases

You can add full-profile or low-profile bases to arch models, including adding engraved text on the arch model bases. You can also print the resulting arch models with bases on a 3D printer.

To add bases to the arch model surfaces:

1 Select the **Add/Modify Bases** tab.

The arch model surfaces appear in the window along with options for the first step in the process.


New Arch Models - Set Dental Occlusion and Define Occlusal Plane
Define Occlusion
Define Occlusal/Midline Planes
Sculpting
Add/Modify Bases
Step 1: Trimming Arches
Both Upper and Lower Arches
Upper Arch:
Trim Other Part Instead
Lower Arch:
Trim Other Part Instead
Trim Arch Now!
Remove Trimming
Start New (Redo Path)
Undo Last Move
Step 2: Lock for Final Basing of Arches
Export Arches...
OK
Upper Arch (Untrimmed)
Lower Arch (Untrimmed)
Left Mouse Click on Arch to Start the Trimming Path
Left Mouse Click on Arch to Start the Trimming Path

Step 1: Trimming Arches	Options used to trim the arch model surface in preparation for adding a base to it. **Both Upper and Lower Arches:** Display both the upper and lower arches in the window. **Upper Arch:** Display only the upper arch in the window. • **Trim Other Part Instead:** Check this box if **Trim Arch Now!** selects the wrong area of the arch for trimming. **Lower Arch:** Display only the lower arch in the window. • **Trim Other Part Instead:** Check this box if **Trim Arch Now!** selects the wrong area of the arch for trimming. **Trim Arch Now!:** Trim the arch using the current selections. **Remove Trimming:** Undo the last trimming operation, but keep the trimming polygon drawn on the image so that you can return to fine-tuning the polygon. **Start New (Redo Path):** Remove the trimming polygon you've drawn so you can redraw it. **Undo Last Move:** Undo the last fine-tuning change to the polygon.
Step 2: Lock for Final Basing of Arches	Options used to add a base to the trimmed arch model surface. **Base Profile:** The base profile (**Full** or **Low**). **Bases Editing View:** Display the four panes in the right side of the window. Three panes are used to reshape base templates to fit the arch models, and the forth pane shows a preview of the result. **Preview/Result View:** Display a single pane in the right side of the window that shows a preview of the result. **Make Bases Now!:** Merge the trimmed arch models with the bases. Engraving:
View	Direction of the arch view (**Front**, **Back**, **Left**, **Right**, **Upper**, **Lower**). Only appears when **Step 2: Lock for Final Basing of Arches** is selected.
Hide Photo/Skin	Hide the OBJ or PLY photo/skin, enabling you to see yellow highlighting on the portion to be kept when trimming the arch.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see "Moving or Reorienting the Volume" on page 19-24 and "Changing the Magnification" on page 19-25.

Trimming the Arch Models

To trim the arch model surface in preparation for adding a base to it:

1 In the **Step 1: Trimming Arches** group box, specify the arch model view you want to display in the window (**Both Upper and Lower Arches**, **Upper Arch**, or **Lower Arch**).

Or,

Right-click the image, and select an arch model view option from the context menu.

2 Draw a trimming polygon on an arch model image.

To draw the polygon:

a Click the point where you want to begin drawing the polygon.

b Click and drag the image to rotate it, if necessary.

c Click whenever you want to place a point and change the direction of the line.

If you make a mistake, right-click to undo the line to the last point you placed. To start over, click **Start New (Redo Path)** in the **Step 1: Trimming Arches** group box or on the context menu.

d To complete the polygon, click the first point again.

e After completing the polygon, click and drag points as necessary to fine-tune the shape.

Or,

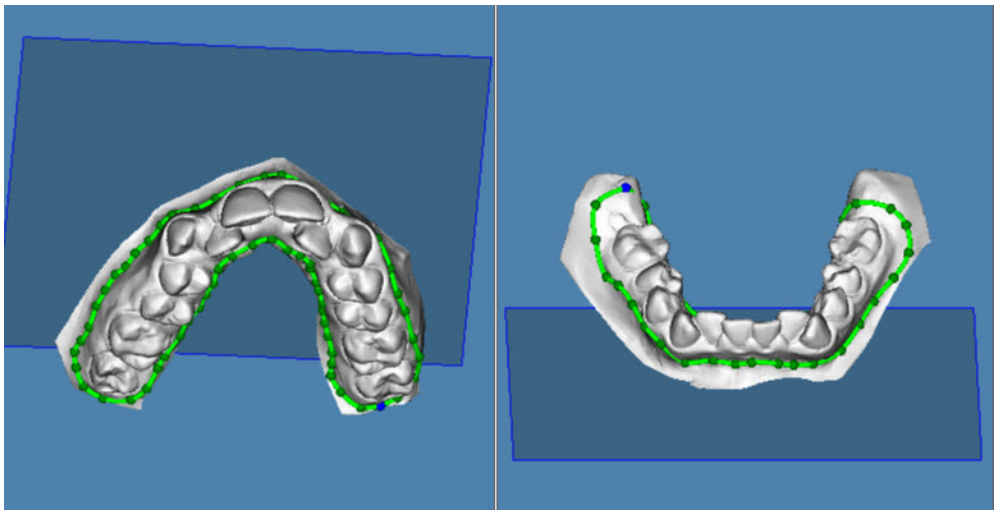
Click any location along the trimming polygon to add another point.

Or,

Right-click any existing point to remove it.

If you make a mistake while fine-tuning the polygon's shape, click **Undo Last Move** in the **Step 1: Trimming Arches** group box or on the context menu.

The following figure illustrates trimming polygons drawn on the upper and lower arches:



3 In the **Step 1: Trimming Arches** group box, click **Trim Arch Now!** to remove the part of the surface that is outside the polygon.

Or,

Right-click the image, and select **Trim Arch Now!** from the context menu.

If you are viewing and have drawn trimming polygons both arches, click **Trim Arch Now!** in the **Step 1: Trimming Arches** group box trims both arches. Right-clicking an image, and selecting **Trim Arch Now!** from the context menu trims only that arch.

4 Click **Yes** on the confirmation message that appears.

If the arch model surfaces are in STL format, the portion of the arch surface that you've selected to keep is highlighted in yellow, and the portion to be trimmed away is translucent white.

If the arch model surfaces are in OBJ or PLY format, the portion of the arch surface that you've selected to keep is unchanged, and the portion to be trimmed away is translucent white. To see the yellow highlighting, check the **Hide Photo/Skin** box.

To remove the trimming so that you can return to fine-tuning the trimming polygon:

1 If you are viewing both arches, click **Remove Trimming** in the **Step 1: Trimming Arches** group box remove the trimming from both arches.

Or,

Right-clicking an image, and selecting **Remove Trimming** from the context menu to remove the trimming from only that arch.

After removing the trimming, you can make any adjustments needed to the trimming polygon and trim the arch again.

To correct errors during the trimming operation:

1 If a magenta dot appears, adjust the trimming polygon near that area to correct the issue.

Or,

If no magenta dot appears, manually inspect the entire trimming polygon to identify and correct the problem.

To correct rare cases where **Trim Arch Now!** selects the wrong portion of the arch for trimming:

1 Check **Trim Other Part Instead** under the affected arch in the **Step 1: Trimming Arches** group box.

Adding the Bases

Once the arch models have been trimmed, you can add either full- or low-profile bases to them.

Adding Full-Profile Bases

To add full-profile bases:

1 Select **Full** from the **Base Profile** drop-down list to add full-profile bases.

The right side of the window changes to four panes: a front/back view, a left/right view, an upper/lower view, and a preview. Templates of the arch model bases appear above and below the arch models along with controls for adjusting the bases' shapes.

2 Optionally, select different view options using the radio buttons below the panes.

3 In the top two panes, click and drag the lines to move the base templates up or down and to resize them (make them thicker or thinner, wider or narrower).

4 In the lower-left pane, click and drag the dots to reshape the bases.

The back plane and the back four corner points of the upper and lower bases are always identical to mimic your ability to align the physical upper and lower models in their proper occlusion on a table.

5 Click **Make Bases Now!** to merge the trimmed arch models with the bases.

The Preview pane changes to show the final result.

To switch between the four-pane editing view and a single-pane preview view:

1 In the **Step 2: Lock for Final Basing of Arches** group box, select **Bases Editing View** to display the four-pane editing view in the right side of the window.

Or,

Select **Preview/Result View** to display a single-pane preview in the right side of the window.

Adding Low-Profile Bases

To add low-profile bases:

1 Select **Low** from the **Base Profile** drop-down list to add low-profile bases.

The right side of the window changes to three panes: a front/back view, a left/right view, and a preview. Templates of the arch model bases appear above and below the arch models along with controls for adjusting the thickness of the bases.

2 Optionally, select different view options using the radio buttons below the top two panes.

3 In the top two panes, click and drag the lines to resize the base templates (make them thicker or thinner).

4 Click **Make Bases Now!** to merge the trimmed arch models with the bases.

The Preview pane changes to show the final result.

To switch between the three-pane editing view and a single-pane preview view:

1 In the **Step 2: Lock for Final Basing of Arches** group box, select **Bases Editing View** to display the three-pane editing view in the right side of the window.

Or,

Select **Preview/Result View** to display a single-pane preview in the right side of the window.

Adding Engraving to the Bases

You can add two lines of engraving to the base of each arch model.

To add engraved text to the bases:

1 Click **Engraving**.

2 Select **Add/Modify Engraving**.

The Engraving Arches dialog box opens.

3 Enter the engraving text.

You can type in the exact text, or you can use tokens as described below to add values (such as the patient's birth date) from the patient's record.

4 Uncheck the box before the second field if you want to engrave only one line of text on the arch base.

5 Check the **Same As Upper Arch** box to add the engraved text you specified for the upper arch to the lower arch as well.

6 Select the font size for the engraved text from the **Font Size** drop-down list,

7 Select the depth of the engraving from the **Depth** drop-down list.

8 If you are adding engraving to a low profile base, specify the location for the engraving.

On low profile bases, the engraving is places on the flat top (upper arch) or bottom (lower arch). To specify the precise location:

a Click and drag the text box to move it.

b Click and drag the end dots to rotate it.

On full profile bases, engraving is always placed on the back of the bases, and you can't customize the location.

9 Click **Done**.

If you use tokens in the engraving text, they will replaced with the appropriate information. For example, the {PatientLastName} token will be replaced with the current patient's last name. For more information on the available tokens, see "Tokens" on page B-1.

To use a token:

1 Place your cursor in the engraving text field where you want to insert a token.

2 Click **Tokens**.

3 Select the token you want to use.

4 Click **Insert** to insert the token into the engraving text field at your cursor location.

To remove the engraving specified for arch model bases:

1 Click **Engraving**.

2 Select **Remove Engraving**.

Superimposing the Arch Model Surfaces Over the Volume

Note: *If you purchased the stand-alone digital study module product, you can work with the arch model surfaces only. The features described in this section are not available. To use these features, you must purchase the full Dolphin 3D module.*

Superimposing the arch model surfaces over the volume or another surface (such as a soft tissue surface) creates a high-resolution representation of the patient's teeth used for operations like implant or orthognathic surgical planning. Dolphin Imaging retains the occlusion established by superimposing the arch models over the volume separately from the occlusion established when the arch model surfaces were originally imported.

Note: *There is no guarantee that the occlusion of arch models superimposed over the volume is in its natural position when the patient was CBCT scanned.*

To superimpose the arch model surfaces over the volume or another surface:

1 On the Dolphin 3D window, click **Edit...**.

2 Select **Model Upper Arch** to superimpose the surface for the upper arch.

Or,

Select **Model Lower Arch** to superimpose the surface for the lower arch.

Or,

Select **Model Upper and Lower Arches (in original occlusion)...** to superimpose the upper and lower arches in their original occlusion.

The Edit Superimposition window open and displays the following tabs:

Method: Side-by-Side Superimposition	Displays the arch model and the volume or surface side by side so that you can align them using corresponding points. For more information, see “Using Side-by-Side Superimposition” on page 19-102.
Method: Overlay Superimposition	Displays a preview of the superimposition that you use to align the arch model and the volume or surface. For more information, see “Using Overlay Superimposition” on page 19-105.
Sculpting	Used to sculpt the arch surfaces. For best results when using arch models with bases, sculpt the arch model surface so that only the tooth crowns remain. For more information, see “Sculpting the Surface” on page 19-112.
Verify Result	Displays a full-size preview that you use to verify that the arch model is properly superimposed over the volume or surface. For more information, see “Verifying the Result” on page 19-113.

3 Use these tabs to superimpose the arch model surface over the volume or other surface.

4 Click **Save to Database...** to save your work.

5 Select the image slot to which you want to save the surface. Then, click **OK**.

Using Side-by-Side Superimposition

With this method, you align an arch model surface with the volume or another surface (such as a soft tissue surface created from the volume) by identifying corresponding points on them.

Note: *For best results when using arch models with bases, sculpt the arch model surface so that only the tooth crowns remain. For more information, see "Sculpting the Surface" on page 19-112.*

To use the side-by-side superimposition method:

1 Select the **Method: Side-by-Side Superimposition** tab.

The volume and arch model surface for this patient appear in the dialog box. Points appear on the images so that you can align them.

2 Next to **Superimpose Onto**, select **Volume** to superimpose the arch model surface onto the volume.

Or,

Select **Surface** to superimpose the arch model surface onto another surface (such as a soft tissue surface created from the volume).

3 If you are superimposing the arch model onto a surface, select the surface you want to use. Then, click **OK**.

4 Optionally, click the color sample in the Model Upper Arch or Model Lower Arch group box, and choose a color that stands out against the volume or other surface that you are using for the superimposition.

5 Zoom in on the images, if necessary.

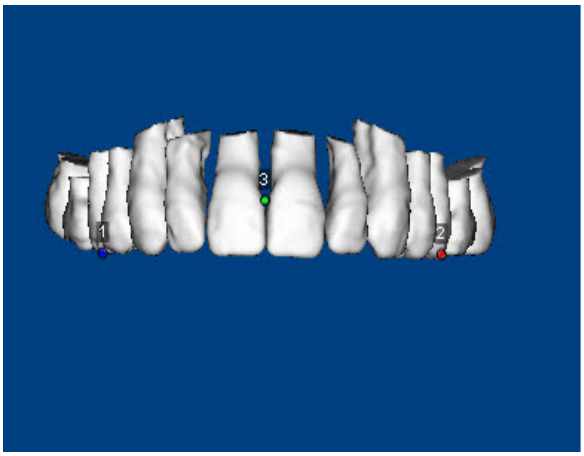
6 Orient both images so that they match.

7 Click and drag the points on the both the images so that they identify corresponding locations.

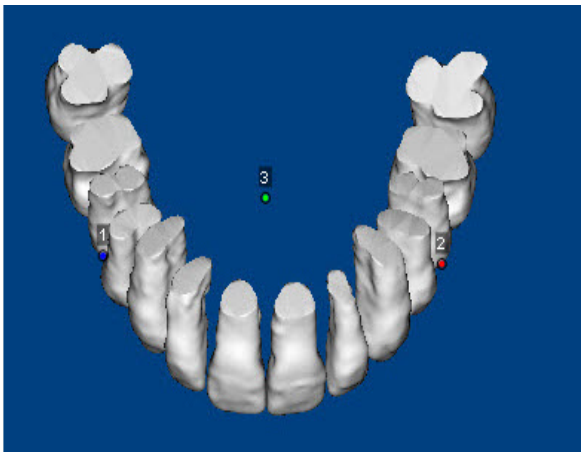
If you used fiducial markers when taking the scans, you can place the points on these markers rather than using corresponding locations on the patient's anatomy.

When placing the points, bear in mind that you are working in three dimensions. You may need to rotate the images to verify the placement of the points, as illustrated below.

From this angle, point 3 appears to be in the middle of the patient's incisors



From this angle, point 3 is clearly behind the patient's incisors



8 Click **Superimpose Now!**

The result of your superimposition appears in the results box in the lower left corner of the window.

9 Rotate the image in the results box in the lower left corner of the window to verify the superimposition.

To use additional alignment points:

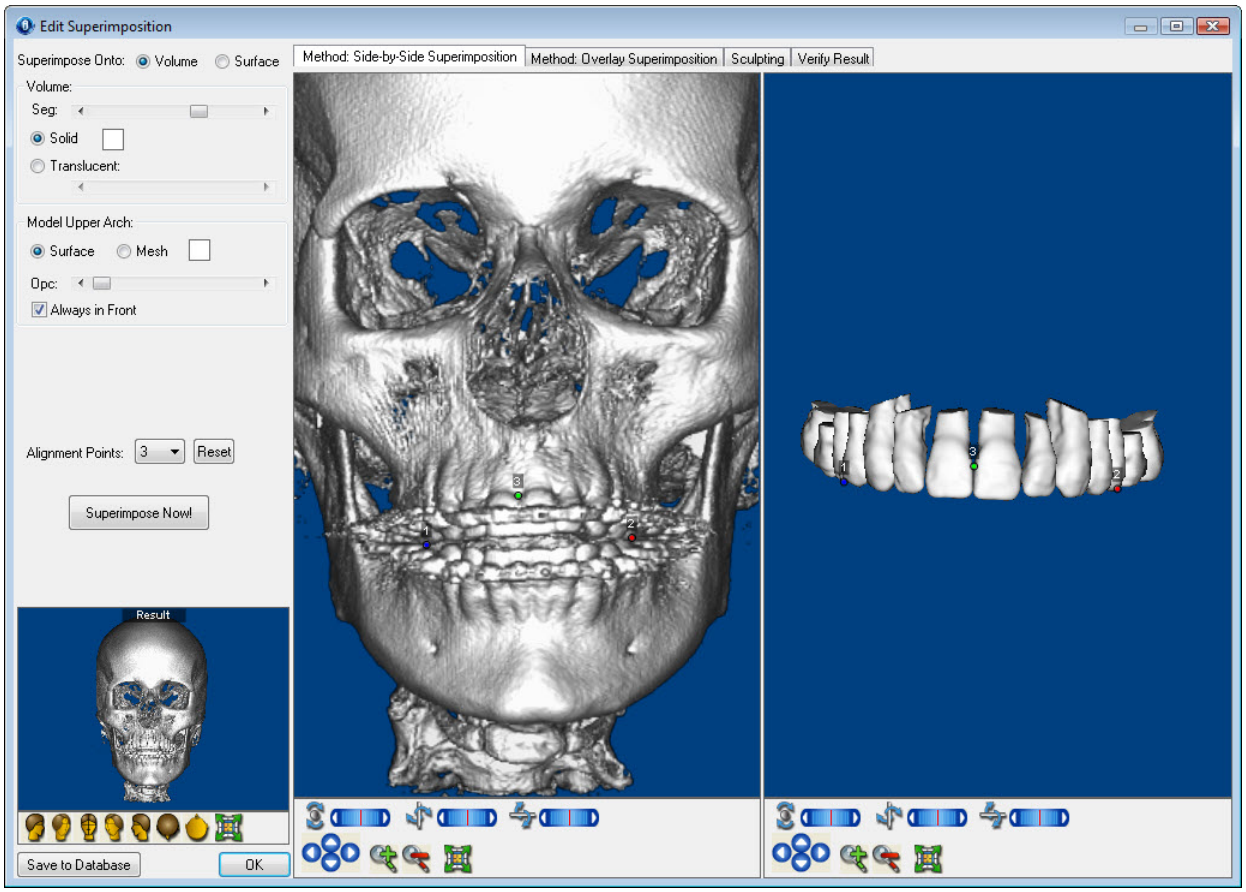
1 Select a number of points you want to use from the **Alignment Points** drop-down list.

Additional alignment points appear on both images.

To reset the alignment points to their initial number and locations:

1 Click **Reset**.

The initial number of alignment points appears in their original positions.



Superimpose Onto	Superimposition to perform: **Volume:** Superimposes the arch model over the volume. **Surface:** Superimposes the arch model over a surface.
Volume	Display options for the volume. **Seg:** Sets the segmentation to use for the volume. **Solid:** Displays a solid representation of the volume. **color sample:** Sets the color to use for the solid representation of the volume. **Translucent:** Displays a translucent representation of the volume. **slider:** Sets the transparency of the volume. For more information on these options, see “Viewing the Soft Tissue” on page 19-26.

Surface	Display options for a surface being used in this superimposition. You can use any surface available for this patient in the superimposition, and the name of this group box indicates the surface you are using. **Surface:** Displays the surface in the Result window. **Mesh:** Displays a mesh representation of the surface in the Result window. **Opc:** Sets the opacity of the surface. **Select...:** Select a different surface for use in this superimposition.
Model Upper Arch or Model Lower Arch	Display options for the arch model: **Surface:** Displays the arch model surface in the Result window. **Mesh:** Displays a mesh representation of the arch model in the Result window. **color sample:** Sets the color to use for the arch model. **Opc:** Sets the opacity of the arch model. **Always in Front:** Displays the arch model in front of the volume or surface regardless of their actual positions in the superimposition.
Alignment Points	Number of points to use when superimposing the arch model over the volume or surface.
Reset	Resets all options in this dialog box to their default values.
Superimpose Now!	Superimposes the arch model over the volume and displays the result in the Result window.
Save to Database...	Saves this superimposition to your database.
Result	Displays a small preview of your superimposition and sculpting operations.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Using Overlay Superimposition

With this method, you align an arch model surface with the volume or another surface (such as a soft tissue surface created from the volume) by manipulating a preview of the superimposition.

Note: *For best results when using arch models with bases, sculpt the arch model surface so that only the tooth crowns remain. For more information, see “Sculpting the Surface” on page 19-112.*

To use the overlay superimposition method:

1 Select the **Method: Overlay Superimposition** tab.

The volume and arch model surface for this patient are superimposed in the dialog box. You use the wheel-shaped alignment tool that appears over the superimposition to move the arch model in relation to the volume.

2 Next to **Superimpose Onto**, select **Volume** to superimpose the arch model surface onto the volume.

Or,

Select **Surface** to superimpose the arch model surface onto another surface (such as a soft tissue surface created from the volume).

3 If you are superimposing the arch model onto a surface, select the surface you want to use. Then, click **OK**.

To align the superimposition:

1 Manually align the arch model and the volume or surface fairly closely.

You can manually align the superimposition by moving the arch model surface using one or more of the ways:

- using a wheel-shaped alignment tool
- using the arrow buttons and rotation sliders
- typing in movement values

For more information, see “Manually Aligning the Superimposition” on page 26-9.

Once you have manually aligned superimposition fairly closely, you can use the automatic superimposition feature to perform a voxel-based automated best-fit superimposition. The automatic superimposition feature works best for scans that show the teeth cleanly, without scatter, and in which the patient had a small bite-block separating the upper and lower teeth from each other during the CBCT scan.

2 Click **Auto Superimposition**.

3 On the menu that appears, select **Simple (faster)** to perform the superimposition immediately.

Or,

Select **Advanced (4 results to chose from)** to choose from four superimposition results.

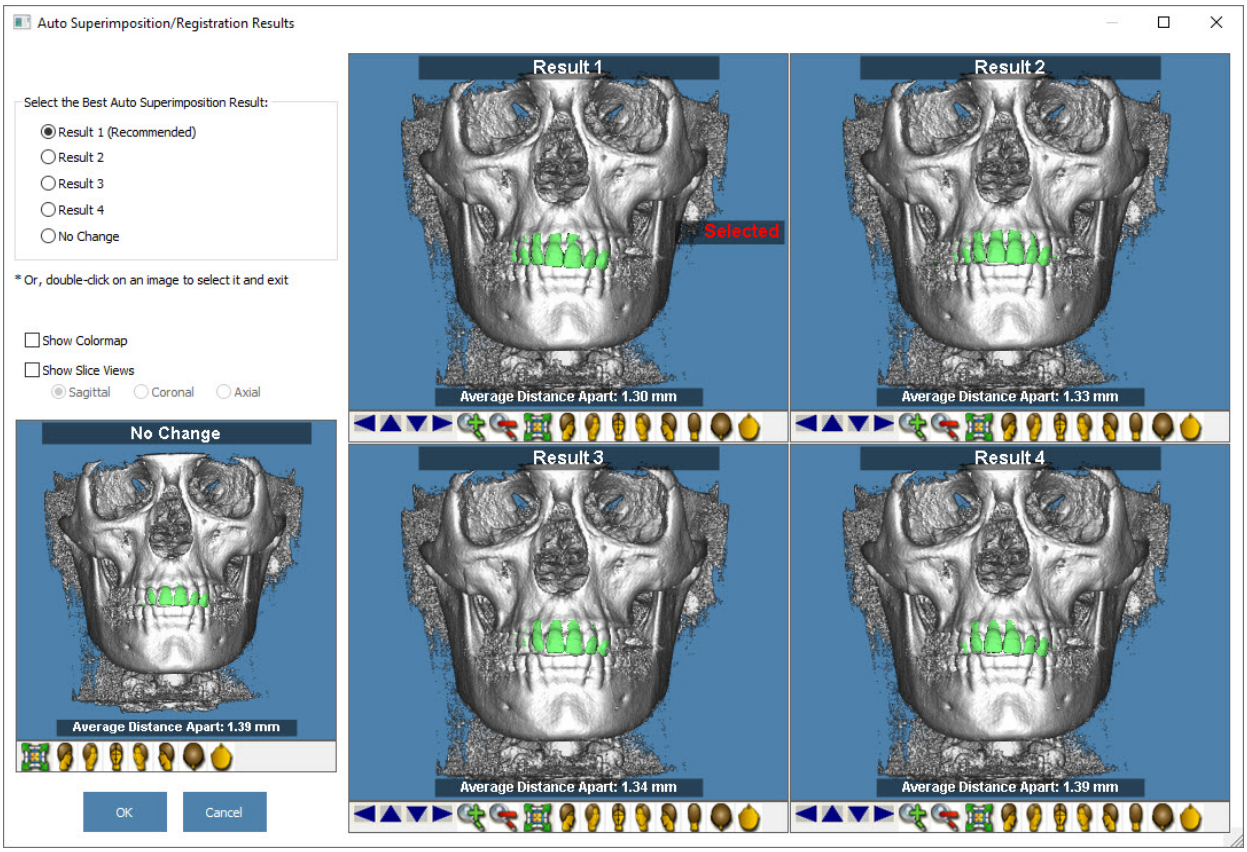
If you selected **Simple (faster)**, the superimposition appears immediately. If you selected **Advanced (4 results to chose from)**, the Auto Superimposition/Registration Results dialog box appears and displays four superimposition results so that you can choose the one that fits best.

4 Double-click the superimposition result that you want to use.

Or,

In the **Select the Best Auto Superimposition Result group box**, select the superimposition result that you want to use. Then, click **OK**.

Select **No Change** if you don’t want to use any of the four superimposition options displayed.



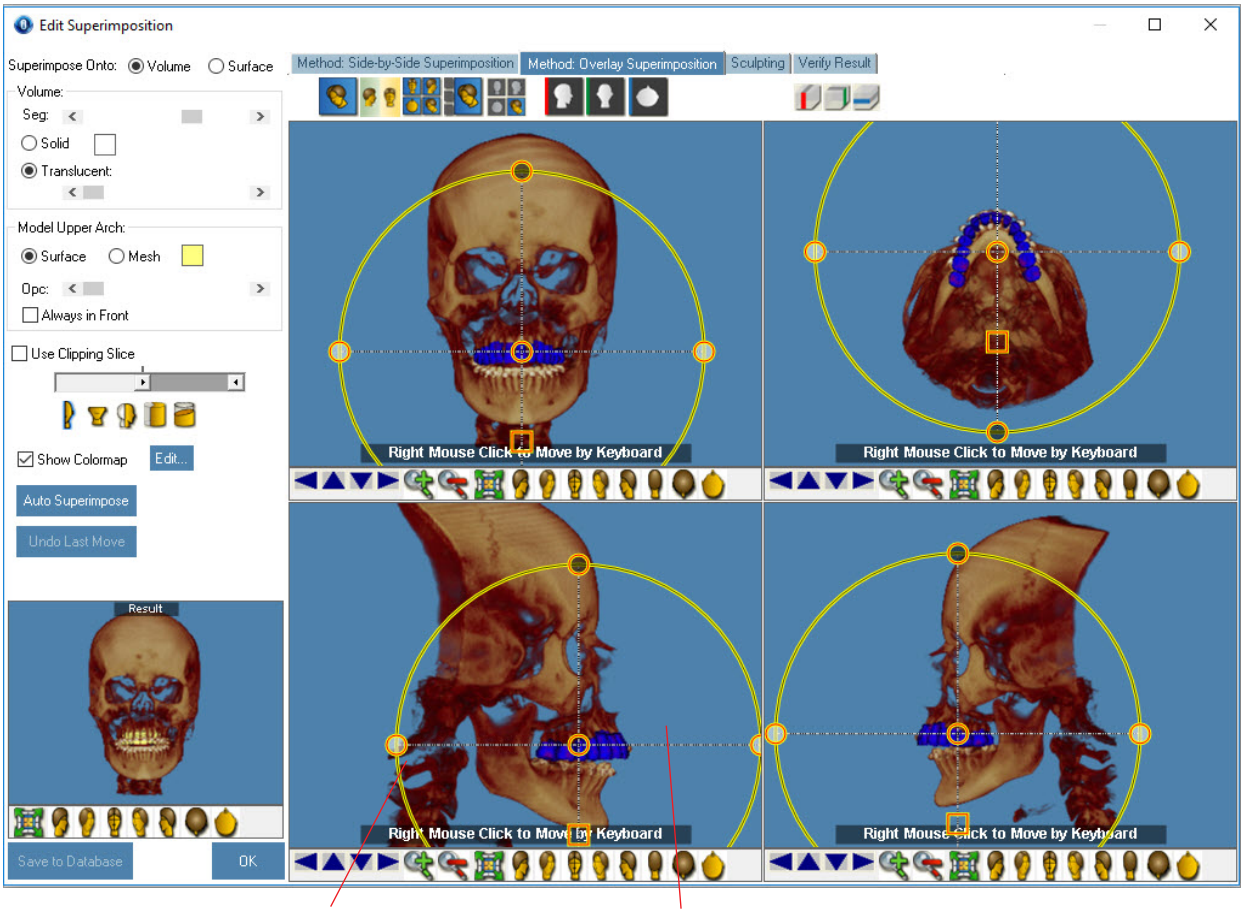
Select the Best Auto Superimposition Result	Select the superimposition result that you want to use. Select **No Change** if you don't want to use any of the four superimposition options displayed.
Show Colormap	Display a color map for each superimposition result. The color map uses colors to indicate the distances between the arch surface and the volume or other surface in the superimposition. For more information, see "Using the Color Map" on page 19-64.
Show Slice Views	Display the selected slice view (**Sagittal**, **Coronal**, or **Axial**) for each superimposition result. For more information, see "Layouts and Slices" on page 19-32.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see "Moving or Reorienting the Volume" on page 19-24 and "Changing the Magnification" on page 19-25.

The **Method: Overlay Superimposition** tab and the Auto Superimposition/Registration Results dialog box offer several features to help you review and fine tune the alignment.

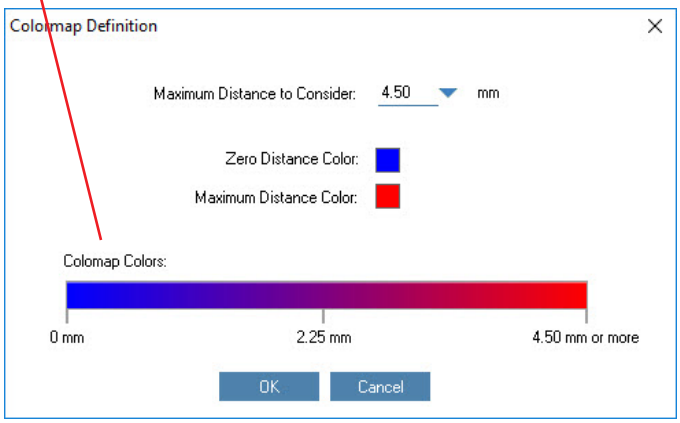
- You can move and rotate the superimposition as described in “Moving or Reorienting the Volume” on page 19-24.
- You can select different image layouts and slice views as described in “Layouts and Slices” on page 19-32.
- You can set a clipping slice as described in “Using a Clipping Slice” on page 28-1 to see a cross-section of the superimposition and view interior image details.
- You can view the color map, which uses colors to indicate the distances between the arch surface and the volume or other surface in the superimposition. For more information, see “Using the Color Map” on page 19-64.

The following figure illustrates using the 4-Equal Volumes Layout, a clipping slice, and the color map to fine tune a superimposition of the upper model arch with the volume.

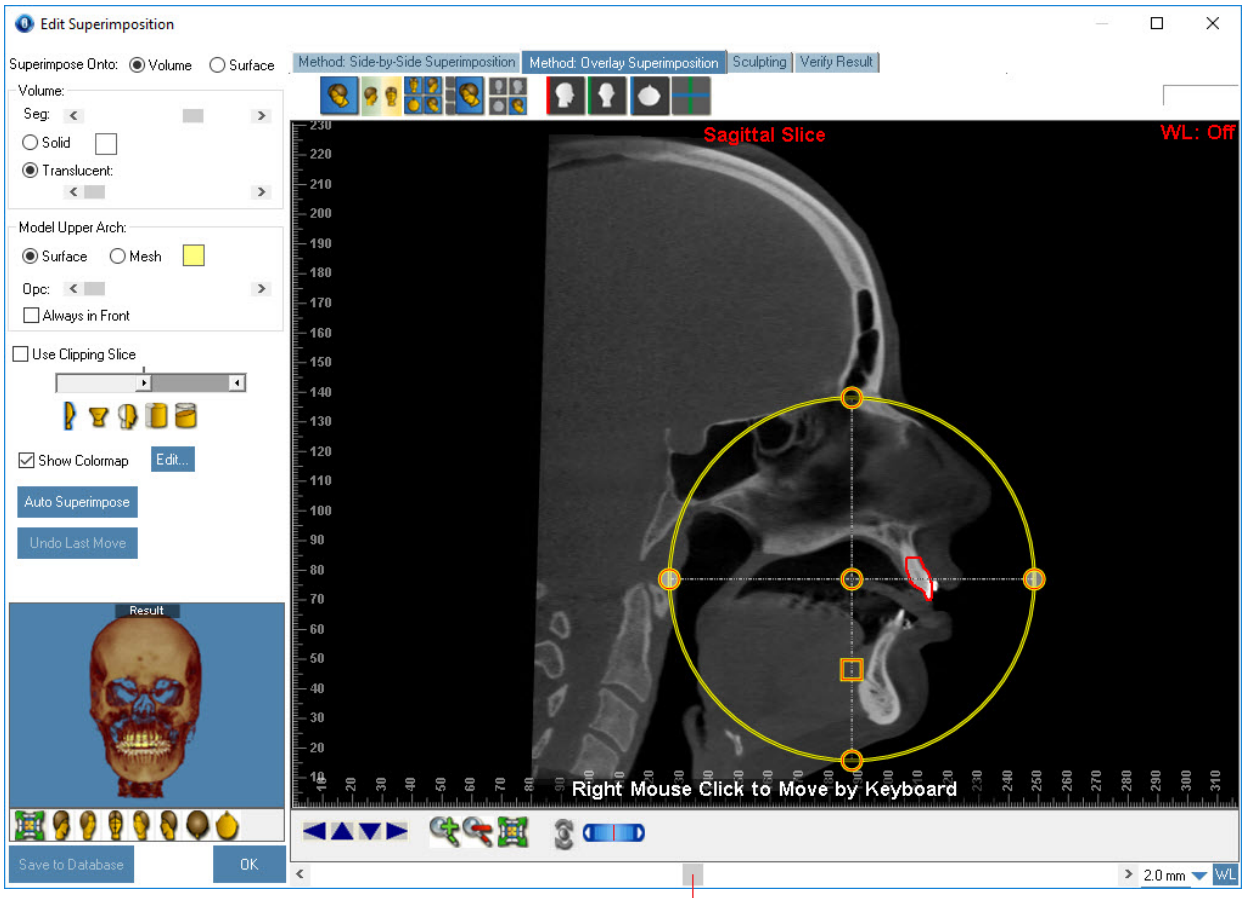


The color map shows distances between the arch model surface and the volume:
blue = 0 mm red = 2 mm or more

The clipping slice shows a cross section of the superimposition.



The following figure illustrates using a clipping slice and a slice view to fine tune a superimposition of the upper model arch with the volume. Using this view, you can align the red outline of the arch model surface with the volume. You can use all three slice views to fine tune the superimposition from different angles.



Move the slider to see different cross sections of the superimposition.

Superimpose Onto	Superimposition to perform: **Volume:** Superimposes the arch model over the volume. **Surface:** Superimposes the arch model over a surface.
Volume	Display options for the volume. **Seg**: Sets the segmentation to use for the volume. **Solid:** Displays a solid representation of the volume. **color sample:** Sets the color to use for the solid representation of the volume. **Translucent:** Displays a translucent representation of the volume. **slider:** Sets the transparency of the volume. For more information on these options, see “Viewing the Soft Tissue” on page 19-26.

Surface	Display options for a surface being used in this superimposition. You can use any surface available for this patient in the superimposition, and the name of this group box indicates the surface you are using. **Surface:** Displays the surface in the Result window. **Mesh:** Displays a mesh representation of the surface in the Result window. **Opc:** Sets the opacity of the surface. **Select...:** Select a different surface for use in this superimposition.
Model Upper Arch or Model Lower Arch	Display options for the arch model: **Surface:** Displays the arch model surface in the Result window. **Mesh:** Displays a mesh representation of the arch model in the Result window. **Opc:** Sets the opacity of the arch model. **Always in Front:** Displays the arch model in front of the volume or surface regardless of their actual positions in the superimposition.
Use Clipping Slice	Defines the cross-section of the volume to display. For more information, see “Using a Clipping Slice” on page 28-1.
Show Colormap	Maps colors to distances in the superimposition. For more information, see “Using the Color Map” on page 19-64. **Edit...:** Sets options for the color map.
Auto Superimpose	Performs a voxel-based automated best-fit superimposition of the arch model over the volume or surface after you have manually aligned them fairly closely.
Undo Last Move	Undoes the last operation.
Save to Database...	Saves this superimposition to your database.
Result	Displays a small preview of your superimposition and sculpting operations.

For information on the layout and slice buttons that appear above the image, see “Layouts and Slices” on page 19-32.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Sculpting the Surface

Sculpting a surface enables you to crop or remove portions of it. For example, if your surface is a model of the patient's teeth with a base, you may wish to sculpt it so that only the tooth crowns remain.

To sculpt a surface:

1 Select the **Sculpting** tab.

Front and back views of the surface appear in the dialog box.

2 Optionally, click the button for one of the predefined views to change to that orientation.

Or,

Click and drag the surface to rotate it.

3 Select **Curves** in the Border group box to use curves to create the cropping polygon.

Or,

Select **Lines** in the Border group box to use lines to create the cropping polygon.

The figure below illustrates cropping polygons created using lines and curves.

4 Draw the cropping polygon.

For information on drawing a polygon, see “Selecting an Area of an Image” on page 6-4.

If you make a mistake and want to start over, click **Remove Cropping Border**.

When you close the polygon, the mouse pointer changes to a pair of scissors.

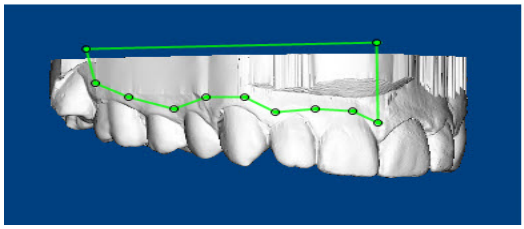
5 Click inside the polygon to remove the part of the surface that is inside the polygon.

Or,

Click outside the polygon to remove the part of the surface that is outside the polygon.

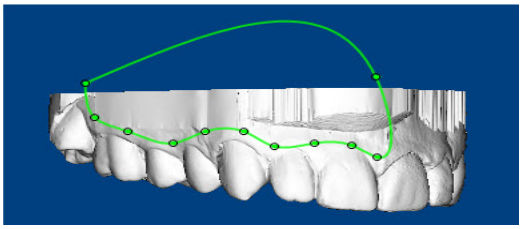
Cropping Border Created With Lines

Cropping border created with lines



Cropping Border Created With Curves

Cropping border created with curves



Verifying the Result

Before saving your superimposition, you can verify it by viewing it from different angles to see it is aligned correctly.

To verify your superimposition:

1 Click the **Verify Result** tab.

The dialog box displays the current superimposition.

2 Click the button for one of the predefined views to orient the superimposed image for that view.

Or,

Click and drag one of the sliders to rotate the superimposed image around the indicated axis.

Or,

Click and drag the superimposed image to rotate it.

Using Tooth Impressions to Create Arch Model Surfaces

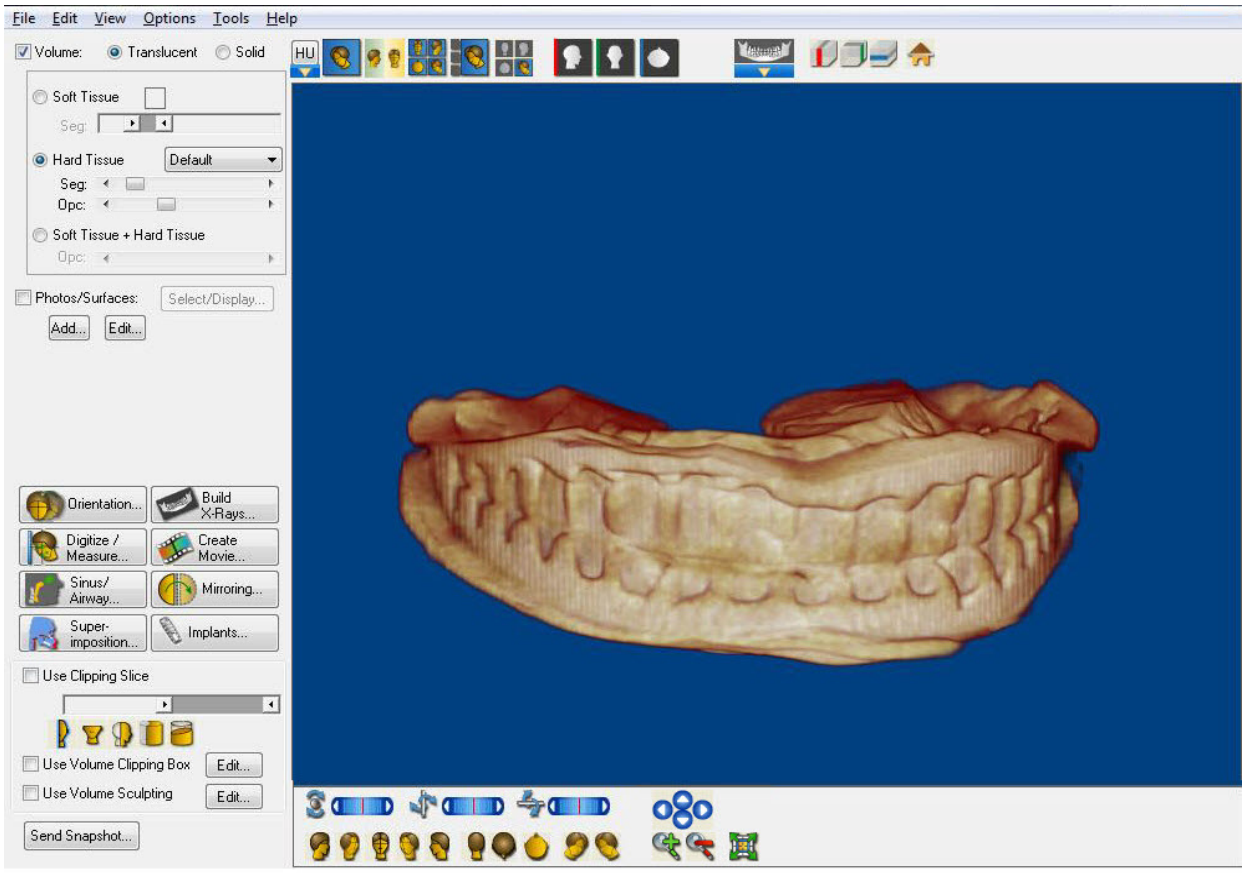
If you have a 3D CBCT scan of a negative impression of the patient's teeth, you can use it to create a positive surface representation.

To convert a negative impressions into positive arch model surfaces:

1 Import the 3D CBCT scan of the negative impression of the patient's upper and lower arches into Dolphin 3D.

For more information, see “Adding a New 3D Volume” on page 19-3 and “Importing a New 3D Volume from a PACS Server” on page 19-5.

Once the scan has been imported, it appears in the Dolphin 3D window. However, depending on the source of the image, it may not appear recognizable initially. Before you can use this image, you may need to segment and/or orient it.



2 If necessary, segment the image to identify or fine-tune the segments to use.

For more information, see “Segmenting the Volume” on page 19-48.

3 If necessary, orient the image so that it properly correlates to the requirements for your analysis.

For more information, see Chapter 20, Volume Orientation.

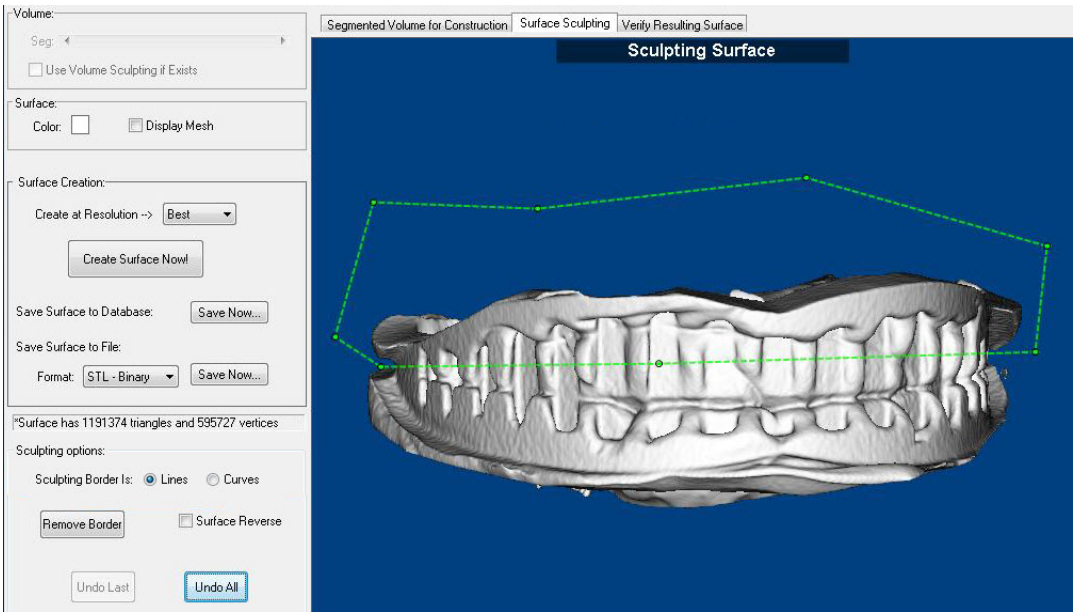
4 Create a surface from the volume.

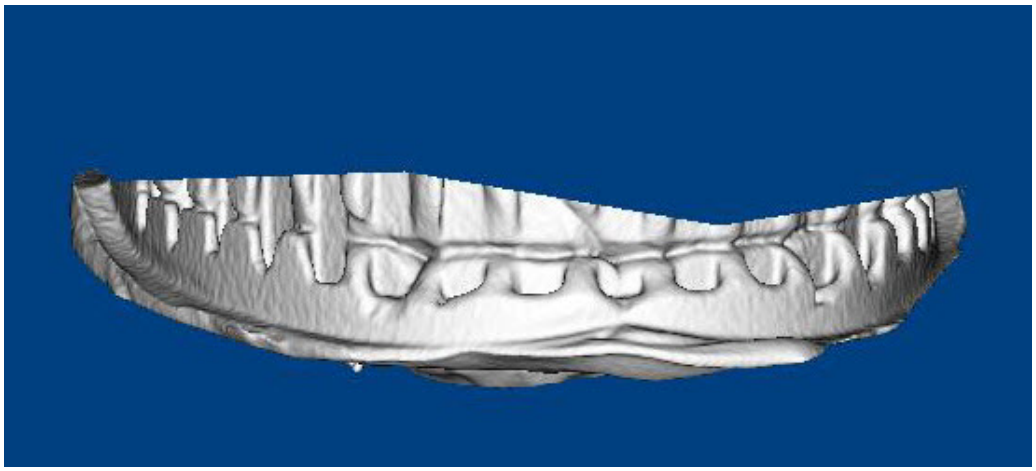
For more information, see “Creating a Surface From the Volume” on page 19-74.

When the surface has been created, two new tabs labeled **Surface Sculpting** and **Verify Resulting Surface** appear. In addition, the created surface is displayed in the lower left of the **Segmented Volume for Construction** tab and on the **Surface Sculpting** and **Verify Resulting Surface** tabs.

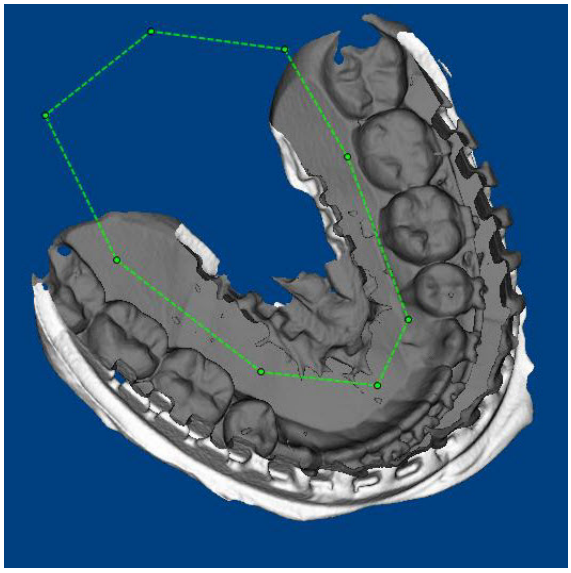
5 On the **Surface Sculpting** tab, sculpt the lower arch or upper arch surfaces from the full impression surface.

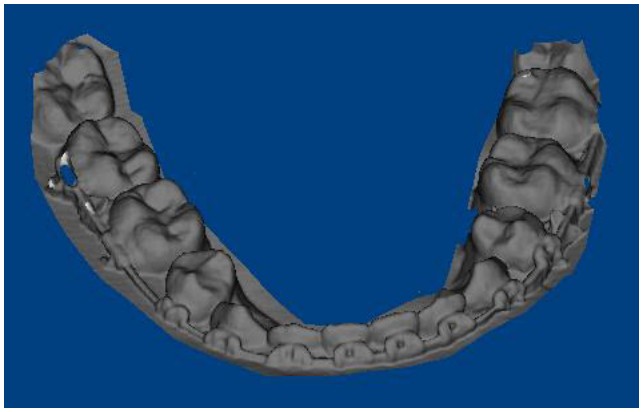
You need to sculpt each arch individually. The following figures illustrate sculpting the lower arch. For more information on how to sculpt a surface, see “Sculpting the Created Surface” on page 19-77.





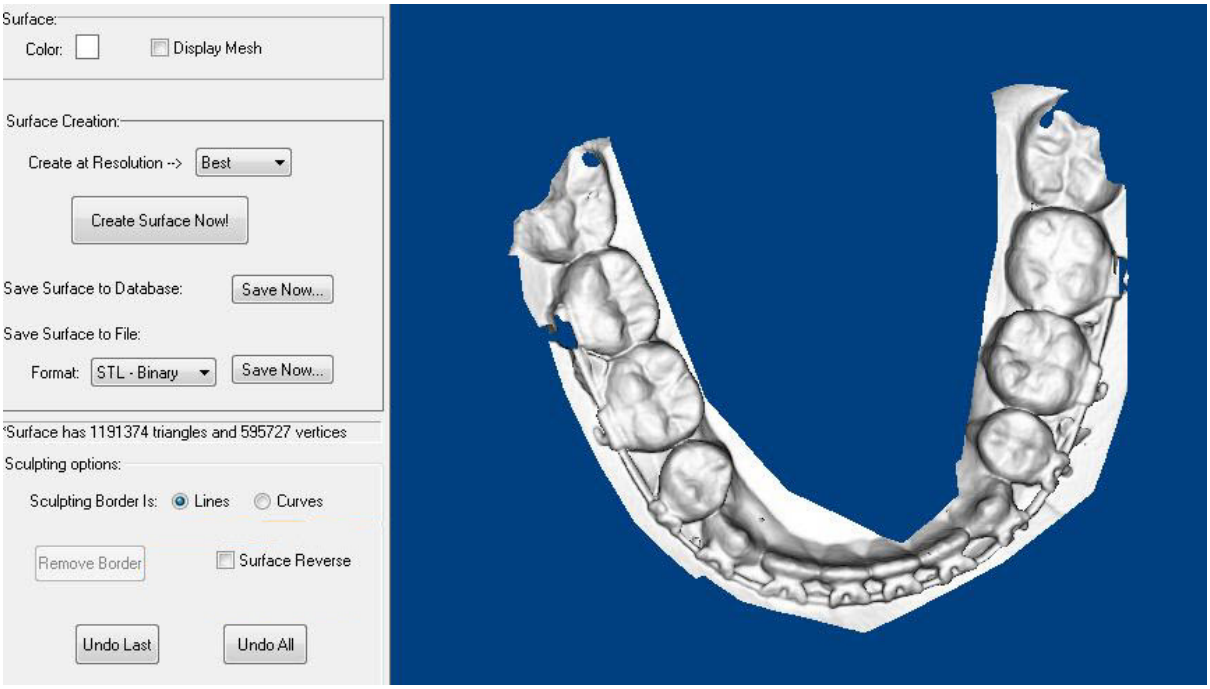
Rotate the image as necessary to sculpt out everything except the arch.





6 Check the **Surface Reverse** box to change from a negative impression to a positive arch surface.

The following figure illustrates the resulting positive surface for the lower arch.



7 Save the surface.

You can save the surface in your database, in a file, or both. For more information, see “Saving the Surface” on page 19-78.

Deleting Photos and Surfaces

To delete photos or surfaces:

1 On the Dolphin 3D window, check the **Photos/Surfaces** box.

2 Click **Select/Display**.

3 Click **Delete...**.

4 Check the box for each photo or surface you want to delete.

5 Click **Delete**.

Renaming Miscellaneous Slots

You can customize the description miscellaneous surface slots currently in use.

To customize a miscellaneous slot's description:

1 Click **Rename Miscellaneous...**.

2 Select a miscellaneous slot (such as (*) Miscellaneous 1), and click **Rename**.

3 Enter a new description.

If you leave the description blank, Dolphin Imaging sets the slot to its default description.

4 Click **OK**.

Saving, Exporting, Uploading, and Printing

This section describes how to save the volume, copy an image to the clipboard, export an image, export the volume as DICOM files, upload the volume to a PACS server, and print an image.

Saving a Volume

When you finish working with a volume you should save the 3D volume data. You may also want to save the 3D volume data periodically when working with it to make sure your changes are not lost in case of a system failure.

To save the volume:

1 Select **Save...** from the **File** menu.

The data is saved either to your Dolphin database or to your external DICOM storage location, depending on your DICOM volume storage options. For more information, see "Setting DICOM Volume Storage Options" on page 19-126.

To save the volume to an image layout in your Dolphin database:

1 Click **Send Snapshot...**. Then, select **Save To Dolphin Layout/Database**.

Or,

Right-click the volume and select **Save To Dolphin Layout/Database...** from the context menu.

2 Optionally, change to a different image layout as described below.

3 Click a slot in the image layout to save the volume in that slot.

4 Optionally, enter a new image slot title to use for the 3D volume in the **Image Title** field.

5 Click **Save...**.

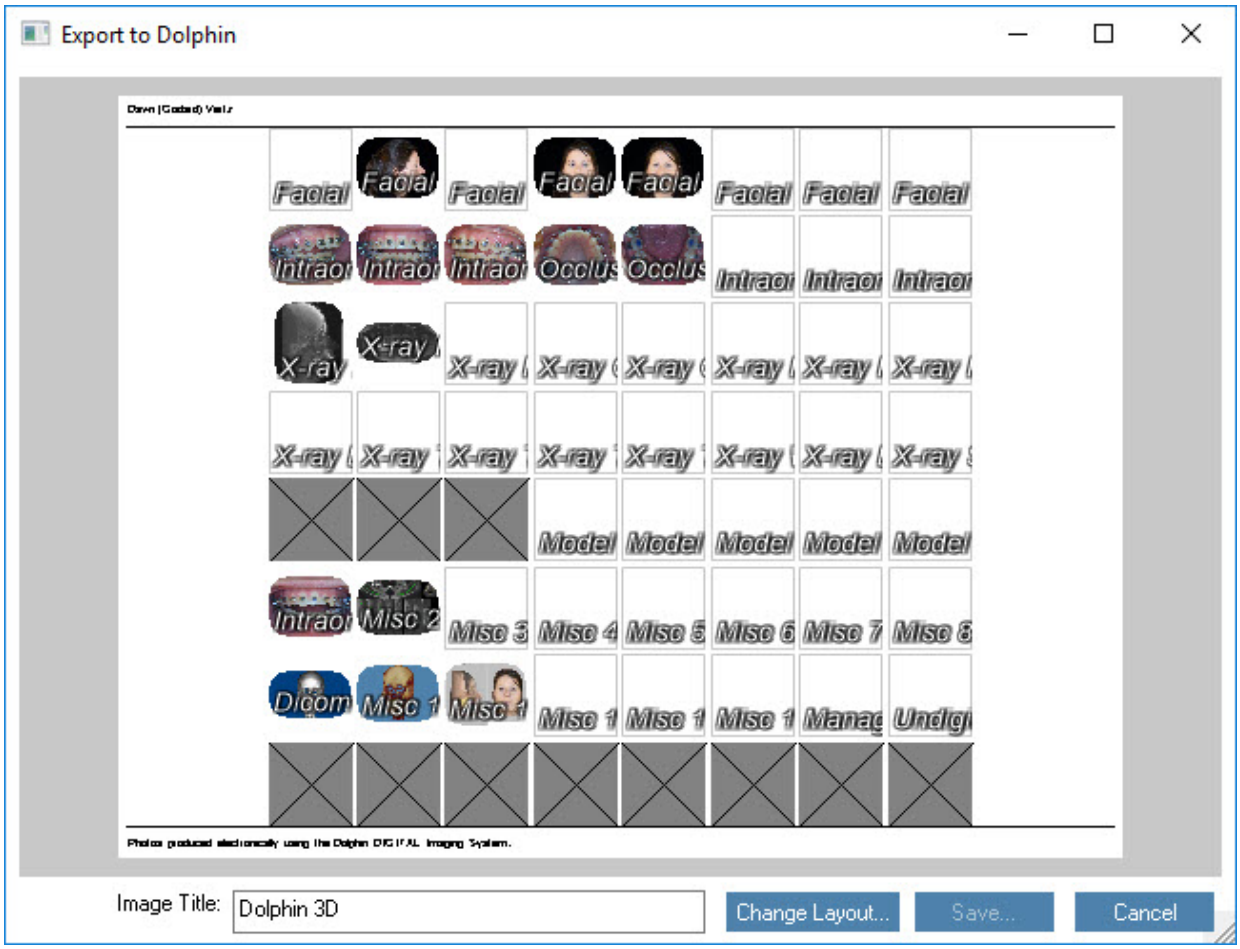


Image Layout	Currently selected image layout.
Image Title	Title to use for the 3D volume. Initially, this field contains the title defined in the image layout for the selected image slot.
Change Layout...	Selects a different image layout.
Save...	Saves the 3D volume in the selected image slot in the selected layout.

To choose a different image layout:

1 Click **Change Layout...**.

2 Select the image layout in which you want to save this 3D volume from the drop-down list. Then, click **OK**.

Copying an Image to the Clipboard

You can copy the image currently displayed in the window to the clipboard. Then, you can paste it into another application such as Microsoft Word.

To copy the image to the clipboard:

1 Click **Send Snapshot...**. Then, select **Copy To Clipboard**.

Or,

Select **Copy to Clipboard** from the **Edit** menu.

Or,

Right-click the image, and select **Copy to Clipboard**.

Exporting an Image

You can easily export an image to a file on your computer's file system.

To export the image to a file:

1 Click **Send Snapshot...**. Then, select **Export to File**.

Or,

Right-click the image, and select **Export to File...** from the context menu.

Or,

Select **Export to File...** from the **Edit** menu.

The Save As dialog box appears, as shown below.

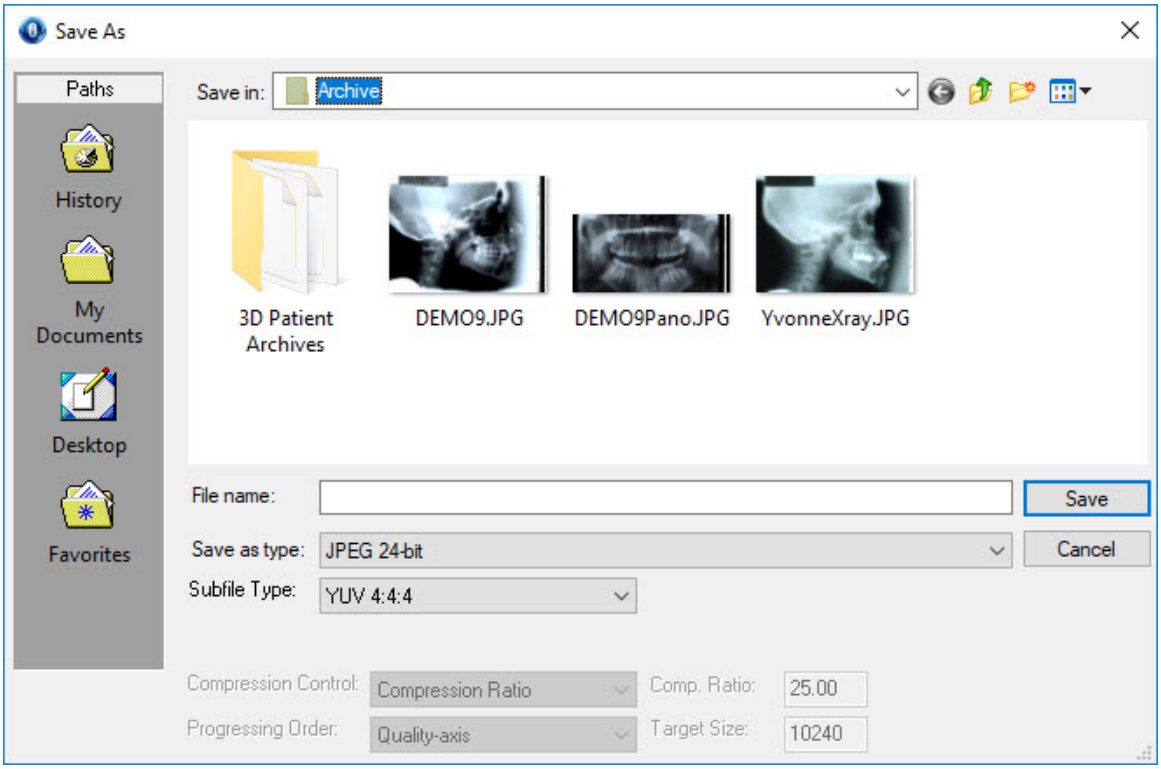
2 Specify the directory and file in which you want to save the image.

3 Optionally, select any other options from the drop-down lists.

Depending on the image type you select in the **Save As Type** drop-down list, additional options may be available in the other drop-down lists.

Note: *If you select one of the JPEG 2000 file types, an additional button appears on the Save As dialog box that enables you to set advanced options.*

4 Click **Save**.



Most options on this dialog box are described in the Microsoft Windows documentation.

You can use the **Save As Type** drop-down list to select the graphics file type to use when saving this image. JPEG 24-bit is recommended for producing high quality images with a small file size and maximum compatibility between imaging programs. Typically, you should use the default selections for all other options. Only modify these options if you are very familiar with graphics files types.

Exporting DICOM Files

To export the 3D volume to one or more DICOM files:

1 Select **Export DICOM...** from the **File** menu.

Or,

Click **Export to DICOM** on the **Analysis/Verify Result** tab of the Superimposition dialog box, then select **Export both volumes into a single DICOM dataset (for stitched volumes)...** to export two superimposed volumes to a single DICOM data set.

Or,

Click **Export to DICOM** on the **Analysis/Verify Result** tab of the Superimposition dialog box, then select **Export just the oriented 2nd volume (in the coordinates of the 1st volume)...** to export only the second volume, oriented as it is in the superimposition, to the DICOM data set.

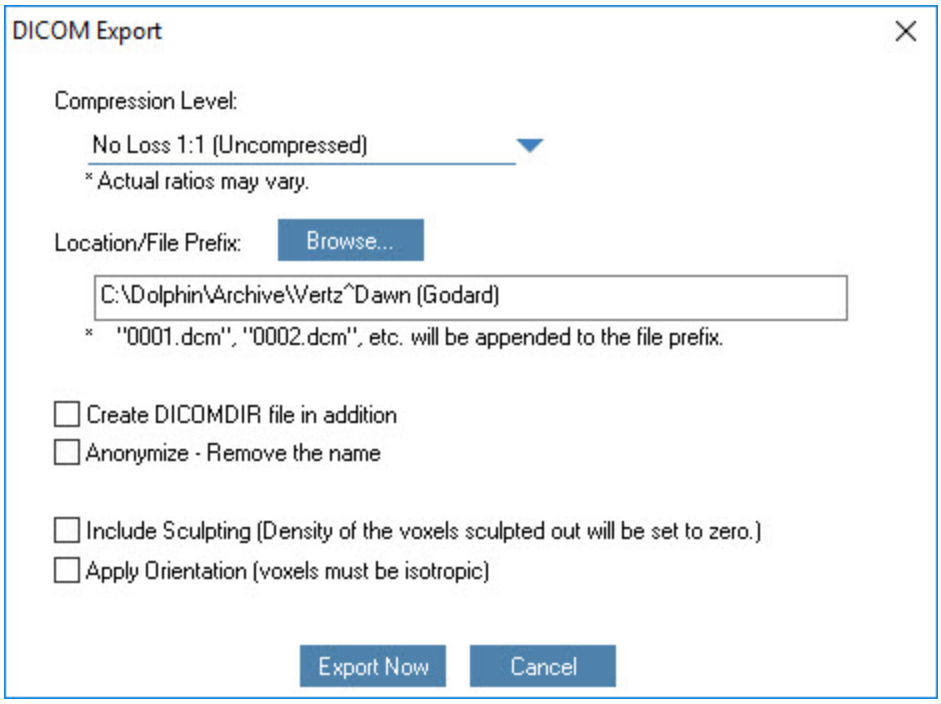
The DICOM Export dialog box opens.

2 Specify any export options on this dialog box.

3 Click **Export Now**.

The export may take a few moments, and a progress bar appears that indicates the progress of the export.

4 Click **OK** when the export completes.



Compression Level	Sets the level of compression to use when saving these files.
Location/File Prefix	Location in which to save the files and the filename prefix to use. When the files are created, sequential numbering and a .DCM extension will be appended to the filename prefix you specify. By default, the patient's name is used as the filename prefix.
Browse...	Browse to the location in which to save the files.
Create DICOMDIR final in addition	Creates a DICOM directory file (DICOMDIR) that identifies the DICOM volume files for the data set in addition to creating the DICOM volume files.
Anonymize-Remove the name	Removes the patient's name when saving the volume.
Include Sculpting	Saves the files with any sculpting that you have applied to the volume. Not available when exporting from the **Analysis/Verify Result** tab of the Superimposition dialog box. For more information on volume sculpting, see “Sculpting the Volume” on page 28-6.
Apply Orientation	Saves the files using your applied volume orientation. Not available when exporting from the **Analysis/Verify Result** tab of the Superimposition dialog box. For more information on volume orientation, see Chapter 20, Volume Orientation.

Uploading the Volume to a PACS Server

For information on uploading an image or image layout from Dolphin 2D to a PACS server, see “Uploading Images to a PACS Server” on page 3-37.

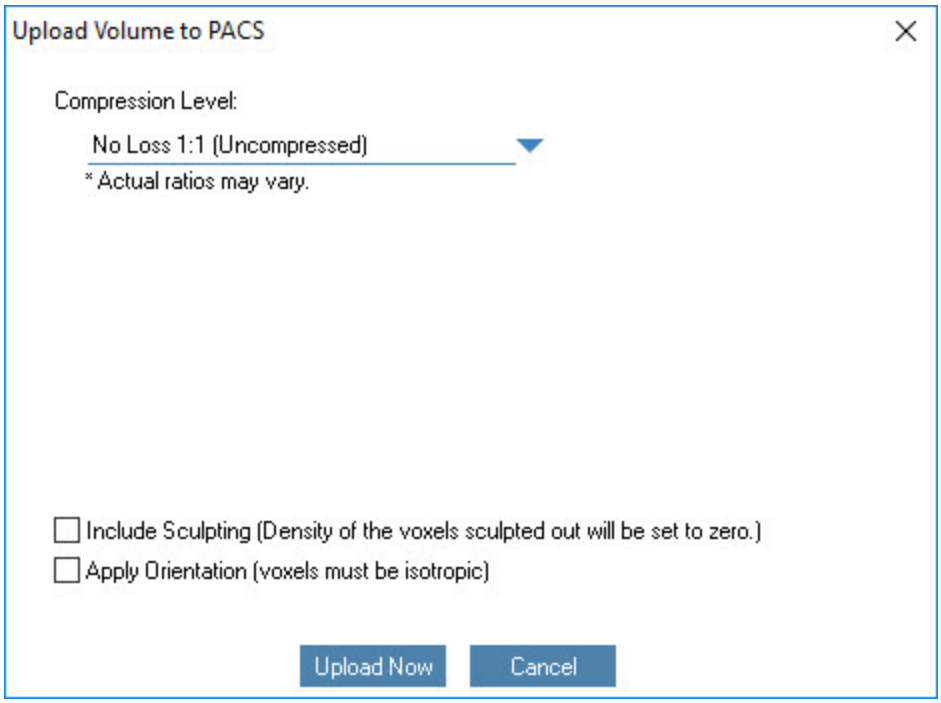
To upload the 3D volume to a PACS server:

1 Select **Upload Volume to PACS...** from the **File** menu.

2 Select any options you want to use for this upload operation.

3 Click **Upload Now**.

4 Click **Yes** on the confirmation dialog box that appears to upload the volume to the PACS server.



Compression Level	Sets the level of compression to use when saving the volume on the PACS server.
Include Sculpting	Saves the volume with any sculpting that you have applied to it. For more information on volume sculpting, see “Sculpting the Volume” on page 28-6.
Apply Orientation	Saves the volume using your applied volume orientation. For more information on volume orientation, see Chapter 20, Volume Orientation.
Upload Now	Uploads the volume to the PACS server.

Printing an Image

To print your current view of the 3D image:

1 Click **Send Snapshot...**. Then, select **Print**.

Or,

Select **Print...** from the **File** menu.

Or,

Right-click the image, and select **Print...** from the context menu.

The Print dialog box opens.

2 Select any printing options you want, and click **OK**.

Dolphin Imaging offers the following options in addition to the standard Microsoft Windows printing options (see “Printing” on page 16-4):

Print 1:1	Prints an image with cephalometric tracings using the **1:1** option. This setting has no effect if you are not printing an image with cephalometric tracings.
Preview	Previews your print job on the computer screen.

Setting Options

You can set the following types of Dolphin 3D options:

- General options: These options determine the appearance and behavior of 3D volumes in the Dolphin 3D window.
- DICOM volume storage options: These options specify where you want to store the volume data for your patients.
- Runtime Memory Saving/Optimizing options: These options enable you to optimize your memory usage when storing DICOM volumes.

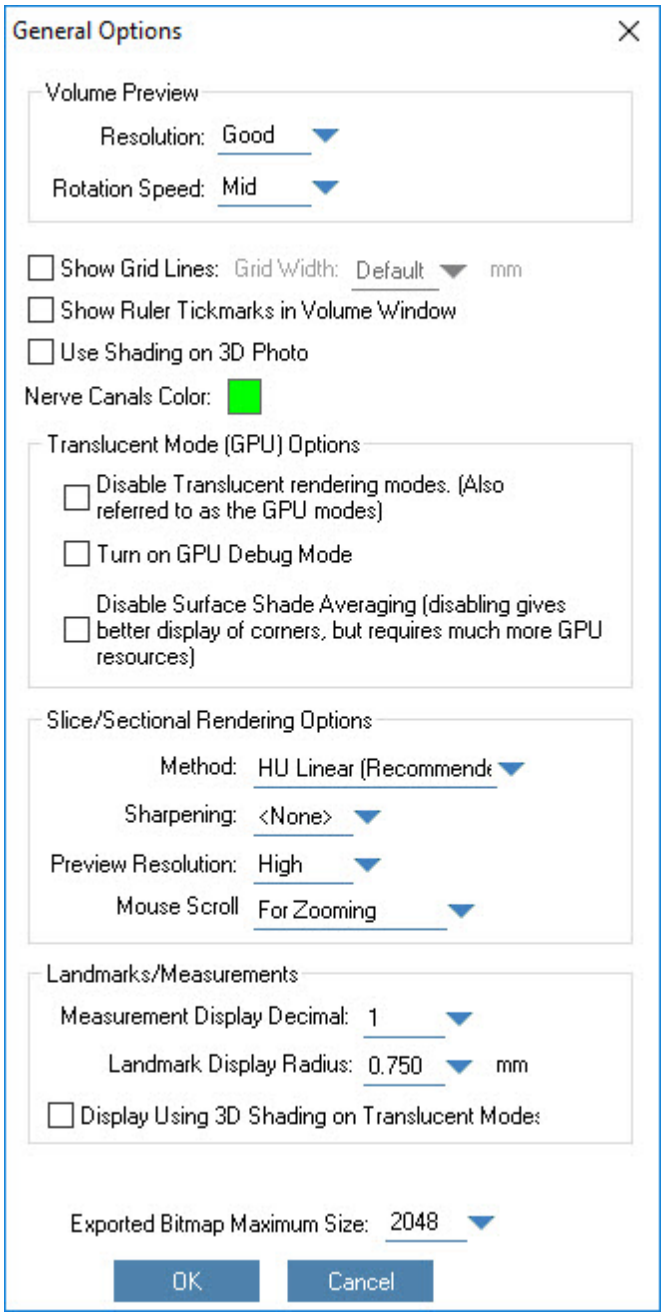
Setting General Options

These options determine the appearance and behavior of 3D volumes in the Dolphin 3D window.

To set general options:

1 Select **General Options...** from the **Options** menu.

2 Set any options, and click **OK**.



Volume Preview	Sets the following options: **Resolution:** Resolution to use when previewing changes. Bear in mind that higher resolutions result in slower response times. **Rotation Speed:** Speed to use when clicking and dragging the image.
Show Grid Lines	Shows grid lines when rotating the volume in the Dolphin 3D window. **Grid Width:** Sets the distance between grid lines.

Show Ruler Tickmarks in Volume Window	Shows rulers or tick marks on the Dolphin 3D window.
Use Shading on 3D Photo	Uses shading on the patient's 3D photo.
Nerve Canals Color	Sets the color of nerve canals on the patient's hard tissue image. For more information, see “Viewing Nerve Canals” on page 19-42.
Translucent Mode (GPU) Options	Sets the following options: **Disable Translucent rendering modes:** Disables the advanced 3D rendering modes. **Turn on GPU Debug Mode:** Enables troubleshooting information. Check this box if requested by a Dolphin support technician trying to determine why translucent display modes are not working on your computer. **Disable Surface Shade Averaging:** Displays surfaces without performing average shading, which displays surface corners better, but requires much more GPU memory resources. This option is typically used to improve the appearance of the synthetic portion of the surface data (such as the arch base and text imprinted on the arch models).
Slice/Sectional Rendering Options	Sets the following options related to displaying slices of the volume: **Method:** Rendering method to use when viewing volume slices. • **HU Linear (recommended)**: Displays the HU at the mouse pointer location when viewing a volume slice. The slice rendering is colored linearly based on the Hounsfield Units (HU) specified in the DICOM files. ***Note:*** *Only works for volumes imported into Dolphin Imaging Version 11 or later. For those volumes, this method is used by default.* • **High Contrast:** Analyses the volume to find the optimal coloration to produce a higher contrast slice image. Recommended for volumes with minimal “noise.” Used by default for volumes imported into Dolphin Imaging versions earlier than 11. • **Averaged:** Analyses the volume to find the optimal coloration to produce a smoother, more monotone slice image. Recommended for volumes with “noise” **Sharpening:** Percentage of sharpening to apply automatically when viewing volume slices. **Preview Resolution:** Resolution to use for slice rendering. High resolution is the default, but can result in slower response times. If slices are being rendered too slowly, set this option to Low. **Mouse Scroll:** Operation (zooming or depth scrolling) to perform using your mouse's scrolling wheel.

Landmarks/ Measurements	Sets the following options: **Measurement Display Decimal:** Number of decimal places to use in measurement displays. **Landmark Display Radius:** Size in the millimeters for landmarks. Affects the landmark dot size, line thickness, and font size used for digitized landmarks. **Display Using 3D Shading on Translucent Mode:** Draws measurement lines and texts in translucent modes in the same way as in solid modes.
Exported Bitmap Maximum Size	Maximum size (up to 2048) for images exported from Dolphin 3D.

Setting DICOM Volume Storage Options

Using these options, you specify whether you want to save 3D volume data for your patients in your Dolphin database or in your external DICOM storage location. Your external DICOM storage location can be any location other than your Dolphin database (such as a folder on a server or removable media) where you store 3D volume data for your patients. For example, it might be where your 3D scanning equipment stores scans. You can set the storage location for all future patients and for the current patient.

By default, when you import the DICOM data for a patient's CBCT scan, Dolphin Imaging copies the DICOM data to its working folder (for example, **`C:\dolphin\working`**). However, if you choose to save 3D volume data for your patients in your external DICOM storage location, Dolphin Imaging does not make a copy. Instead, it reads and stores 3D volume data for your patients in the location from which you originally imported it, which uses less disk space and creates smaller patient archives.

Using your external DICOM storage location works well if:

- that location is always available
- all patient 3D volume data is stored there permanently
- you don't need to save patient archives from Dolphin Imaging (for example, to share with other doctors)

Examples of when this option does not work well include:

- your external DICOM storage location is on removable media (such as DVD or CD-ROM) which might not always be available
- your external DICOM storage location is on a server that isn't always reachable
- patient data is sometimes deleted from your external DICOM storage location
- you save patient archives to give to someone else, because patient archives only contain the data stored in the Dolphin Imaging working folder (for example, **`C:\dolphin\working`**), which wouldn't include the CBCT scan.

Setting Default DICOM Volume Storage Options

To set default DICOM volume storage options:

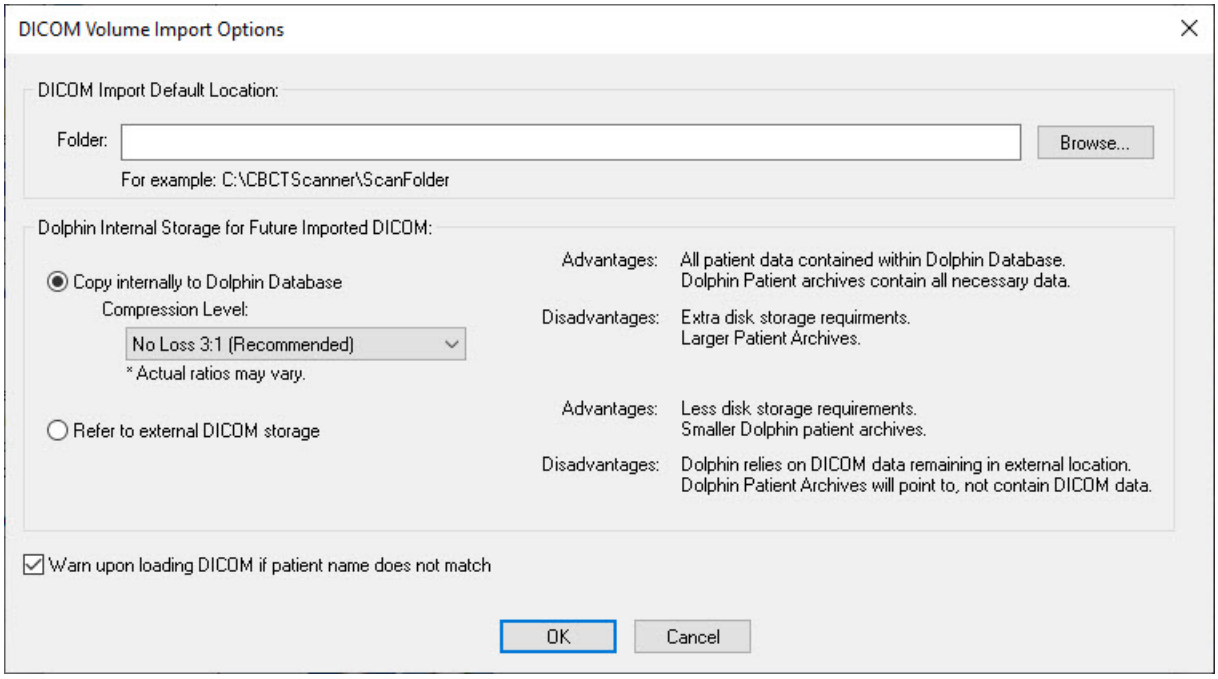
1 On the Dolphin Imaging main screen, click 3D >> .

2 Select **DICOM Storage Options...**.

The DICOM Volume Storage dialog box opens.

3 Select the storage options to use as your defaults.

4 Click **OK** to save your DICOM volume storage settings.



DICOM Import Default Location	Folder to use as your default location for importing volumes. **Browse...:** Browse to the folder.
Dolphin Internal Storage for Future Imported DICOM	Storage option to use for all future Dolphin 3D patients. **Copy internally to Dolphin Database:** Stores the volume data in your Dolphin database. This option consolidates all your patient data in your database, and it enables you to create patient archives that include the 3D volume data. However, depending upon the level of compression you select, it uses more disk space and results in larger patient archive files. • **Compression Level**: Compression level to use. The default compression, No Loss 3:1, allows the exact original data to be reconstructed from the compressed data. You can also choose from several lossy compression options. Lossy compression compresses and retrieves data that are different from the original, but these differences are not generally visible to the human eye. The recommended lossy compression is 50:1. ***Note:*** *Dolphin 3D only stores a single copy of the volume data, even if you save several images from the volume in different image layouts or different image slots within a single layout. Dolphin 3D also performs a lossless compression of the DICOM data, which may load into Dolphin 3D more quickly than uncompressed data from your external DICOM storage location.* **Refer to external DICOM storage:** Stores the volume data in your external DICOM storage. This option uses less disk space and results in smaller patient archive files. However, it also means that Dolphin 3D must be able to access your external DICOM storage for the patient volume data. In addition, your patient archive files will not be self-contained; they will also reference your external DICOM storage.
Warn upon loading DICOM if patient name does not match	Specify whether you want to see a warning message if Dolphin Imaging's patient name does not match the patient name stored in the DICOM file you are uploading.

Setting DICOM Volume Storage For a Patient

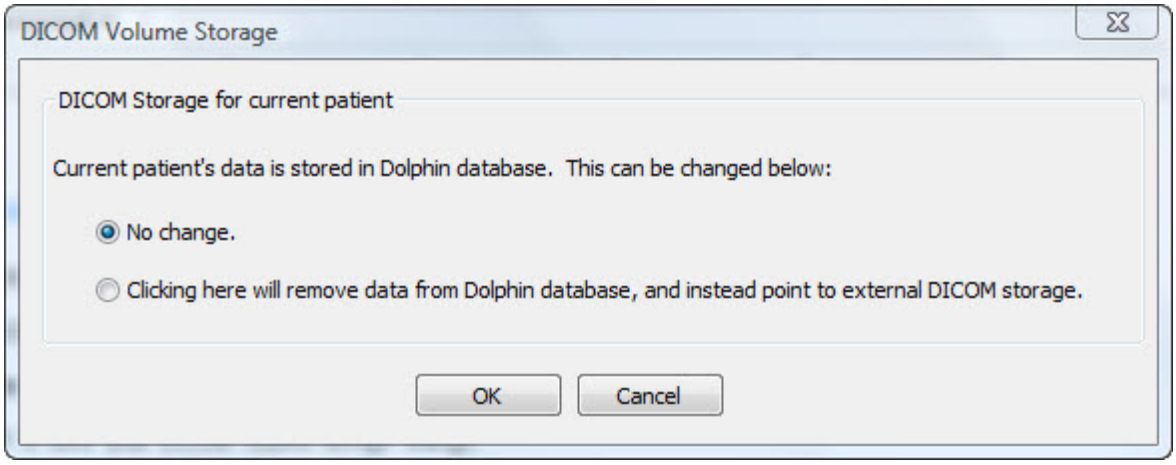
To set the DICOM volume storage options for a patient:

1 Select **External DICOM Volume Storage...** from the **Options** menu.

The DICOM Volume Storage dialog box opens.

2 Select the storage option to use for the current patient.

3 Click **OK** to save your DICOM volume storage settings.



DICOM Storage for current patient	Storage option to use for the current Dolphin 3D patient. **No change:** Does not change the storage for the current patient. **Clicking here will copy DICOM data into central Dolphin Database:** Copies the volume data from your external DICOM storage into your Dolphin database. **Clicking here will remove data from Dolphin database, and instead point to external DICOM storage:** Removes the volume data from your Dolphin database. The patient's database record will reference your external DICOM storage.

Runtime Memory Saving/Optimizing

Dolphin 3D offers a memory use optimization feature that enables you to identify and remove voxels that are considered “air” from the volume. Using this feature can address “running out of memory” conditions by making the volume data set smaller. The saving is typically at least 50% of the storage required for the DICOM volume.

Note: ***When using this feature, bear in mind that you are actually removing data from the volume.*** *Following the optimization procedure, visually check the volume to make sure that you didn't inadvertently remove too much data—that is, that only air was removed and that the patient's anatomy is all intact. If you accidentally removed too much data, you can undo the optimization, which reverts back to the full DICOM data set for the patient's volume.*

For information on optimizing memory usage, see “Optimizing Memory Usage” on page 19-130. If you have optimized memory usage and want to undo the operation, see “Undoing Optimization” on page 19-132. To check whether your memory use is optimized, see “Checking the Memory Optimization Status” below.

Checking the Memory Optimization Status

At any time, you can check whether memory optimization was performed and, if so, how much memory savings were achieved.

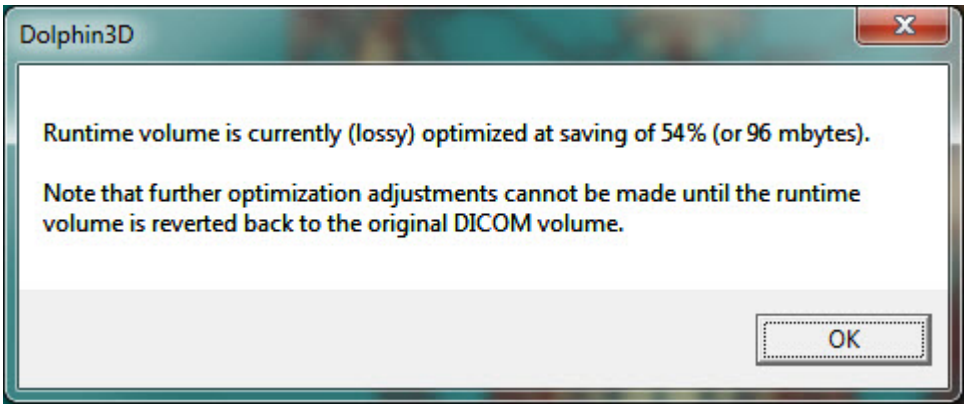
To check the memory optimization status:

1 Select **Runtime Memory Saving/Optimizing...** from the **Options** menu.

2 Select **Current Optimization Status...** from the sub-menu.

A message box reports the memory optimization status.

For information on optimizing memory usage, see “Optimizing Memory Usage” below. If you have optimized memory usage and want to undo the operation, see “Undoing Optimization” on page 19-132.



Optimizing Memory Usage

To optimize memory use for 3D volume data, you to identify and remove voxels that are considered “air” from the volume. Using this feature can address “running out of memory” conditions by making the volume data set smaller. The saving is typically at least 50% of the storage required for the DICOM volume.

Note: ***When using this feature, bear in mind that you are actually removing data from the volume.*** *Following the optimization procedure, visually check the volume to make sure that you didn't inadvertently remove too much data—that is, that only air was removed and that the patient's anatomy is all intact. If you accidentally removed too much data, you can undo the optimization, which reverts back to the full DICOM data set for the patient's volume (see “Undoing Optimization” below).*

To optimize memory usage:

1 Select **Runtime Memory Saving/Optimizing...** from the **Options** menu.

2 Select **Optimize...** from the sub-menu.

The Runtime DICOM Volume Storage Optimization dialog box opens.

3 Move the slider until you have identified the lowest density level for the patient's soft tissue.

The slider should identify the boundary between the air and the patient's soft tissue. As you move the slider, the approximate memory saving is displayed.

When you believe you have set the slider correctly, visually inspect the volume to make sure that none of the patient's anatomy has inadvertently been lost.

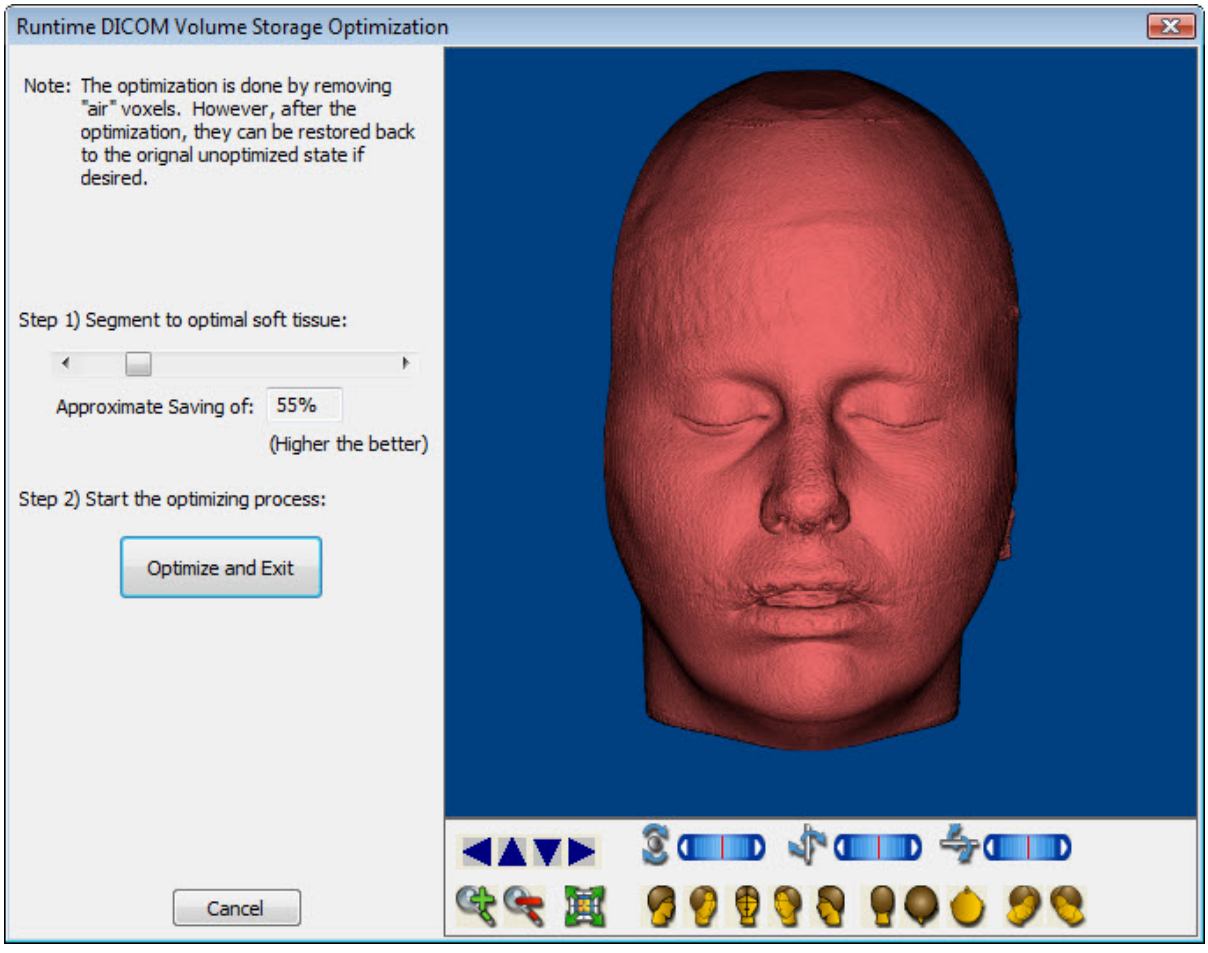
For information on reorienting the volume so that you can check that everything is correct, see “Moving or Reorienting the Volume” on page 19-24.

Bear in mind that even if you find out after optimization that you accidentally removed too much data, you can always undo the optimization, which reverts back to the full DICOM data set for the patient's volume. For more information, see “Undoing Optimization” below.

4 Click **Optimize and Exit** to initiate the optimization process.

When the optimization process completes, the actual memory saving is displayed.

5 Click **OK**.



slider	Sets the boundary between the air and the patient's soft tissue.
Optimize and Exit	Starts the optimization process.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Undoing Optimization

Using the optimization feature removes data from the volume. This data should only represent air. However, if you discover after optimization that you accidentally removed too much data (that some of the patient's anatomy is missing), you can always undo the optimization, which reverts back to the full DICOM data set for the patient's volume.

To undo an optimization:

1 Select **Runtime Memory Saving/Optimizing...** from the **Options** menu.

2 Select **Undo Optimization (Revert Back to Original DICOM Volume)...** from the sub-menu.

3 Click **Yes** on the confirmation dialog box that appears.

20 Volume Orientation

The first time you load a new volume into Dolphin 3D, you may need to change its horizontal/vertical orientation so that it properly correlates to the requirements for your analysis.

Although proper orientation of the 3D volume is subjective, it is also critical to your use of the Dolphin 3D features. For example, if the volume is not oriented correctly, the sagittal, coronal, or axial slice views will not display the cross-sections that you expect. It is highly recommended that you use consistent orientation for all your patients.

To begin orienting the volume:

1 Click

on the Dolphin 3D window.

Or,

Select **Set Orientation...** from the **Tools** menu.

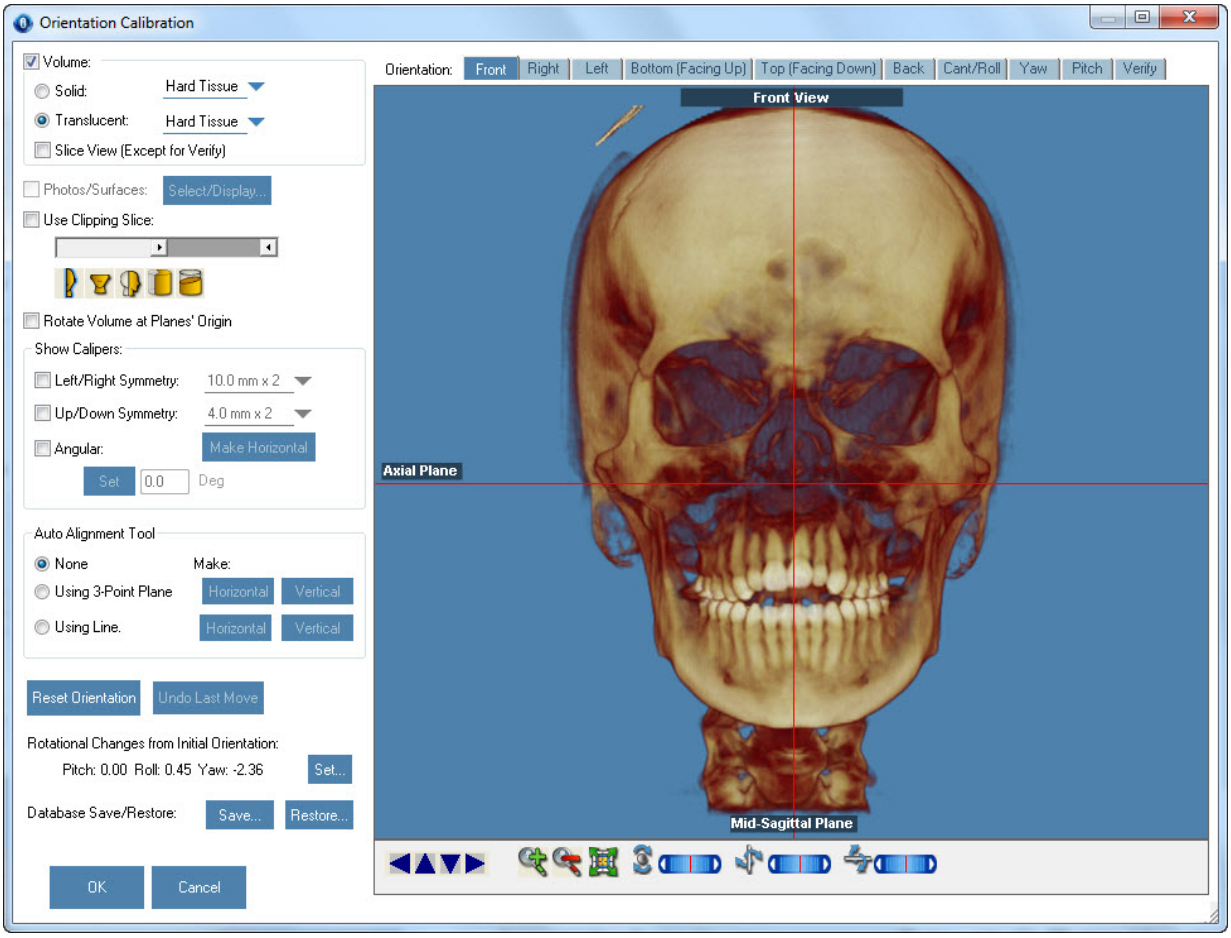
Or,

Click **Other Options...** on the 3D Implant Simulation window, then select **Define Local Orientation...** to set the volume orientation for a specific 3D implant simulation.

The Orientation Calibration window opens and displays the following tabs:

Front	Displays the frontal view with lines representing the mid-sagittal and axial planes. For information on using this tab, see “Using Planes, Calipers, and Auto-alignment Tools” on page 20-5.
Right	Displays the right lateral view with lines representing the axial and coronal planes. For information on using this tab, see “Using Planes, Calipers, and Auto-alignment Tools” on page 20-5.
Left	Displays the left lateral view with lines representing the axial and coronal planes. For information on using this tab, see “Using Planes, Calipers, and Auto-alignment Tools” on page 20-5.
Bottom (Facing Up)	Displays the volume from the bottom with the patient's face toward the top of the window with lines representing the mid-sagittal and coronal planes. For information on using this tab, see “Using Planes, Calipers, and Auto-alignment Tools” on page 20-5.
Top (Facing Down)	Displays the volume from the top with the patient's face toward the bottom of the window with lines representing the mid-sagittal and coronal planes. For information on using this tab, see “Using Planes, Calipers, and Auto-alignment Tools” on page 20-5.

Back	Displays the back view with lines representing the mid-sagittal and axial planes. For information on using this tab, see “Using Planes, Calipers, and Auto-alignment Tools” on page 20-5.
Cant/Yaw/ Pitch	Provides several options for displaying different views of the volume and adjusting its orientation based on the positions of landmarks, symmetries between them, or angles and distances relating to them. For information on using this tab, see “Adjusting Cant/Yaw/Pitch” on page 20-10.
Verify	Shows a view-only display of the volume and representations of the mid-sagittal, axial, and coronal planes. For information on this tab, see “Verifying the Orientation” on page 20-24.



The following options appear on all tabs of the Orientation Calibration window.

Volume	Uses a volume view to orient the volume. **Solid:** Displays the solid view of the volume (**Soft Tissue**, **Hard Tissue**, or **Both**) selected from the drop-down list. **Translucent:** Displays the translucent view of the volume (**Soft Tissue**, **Hard Tissue**, or **Both**) selected from the drop-down list. Available for computers that support advanced 3D rendering only. **Slice View (Except for Verify):** Displays a slice view instead of the full volume. This view is not available on the **Verify** tab. For more information, see “Selecting the Volume View” below.
Photos/Surfaces	Displays a photo or surface (if available) in the window. **Select/Display...:** Opens a dialog box where you can choose the photo or surface to display and set options for it.
Use Clipping Slice	Defines the cross-section of the volume to display. For more information, see “Using a Clipping Slice” on page 28-1.
Reset Orientation	Reverts to the last saved orientation for this volume.
Undo Last Move	Undoes the last operation on the volume.
Set...	Sets values for pitch, roll, and yaw to use for orienting the volume. For more information, see “Entering Orientation Values” on page 20-22. ***Note:*** *On the* **Verify** *tab, these values are displayed but cannot be changed.*
Save...	Saves the current orientation to your Dolphin database. For more information, see “Saving and Restoring the Orientation” on page 20-25.
Restore...	Restores a previously saved orientation from your Dolphin database. For more information, see “Saving and Restoring the Orientation” on page 20-25.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Selecting the Volume View

You do not set the orientation separately for the soft tissue, hard tissue, and photo. Instead, you set the orientation for the entire 3D volume. However, you may find it easier to correct the volume orientation when viewing the soft tissue, hard tissue, or photo.

To use the volume view when orienting the volume:

1 Check the **Volume** box.

2 Select **Solid** to use a solid volume view.

Or,

Select **Translucent** to use a translucent volume view.

3 Select **Hard Tissue** from the appropriate drop-down list to use the patient's hard tissue.

Or,

Select **Soft Tissue** from the appropriate drop-down list to use the patient's soft tissue.

Or,

Select **Both** from the appropriate drop-down list to use a combined hard and soft tissue image.

4 Check the **Slice View (Except for Verify)** box to use a slice view instead of the full volume.

This view is not available on the **Verify** tab.

To use a photo or surface:

1 Select the volume view you want to use as described above to use a volume view in conjunction with a photo or surface.

Or,

Uncheck the **Volume** box to use only a photo or surface.

2 Check the **Photos/Surfaces** box.

If you have not previously specified which of the available photos and/or surfaces you want to display, the Select Photos/Surfaces for Display dialog box opens automatically, and you can skip the next step.

3 Click **Select/Display**.

4 Check the box for each photo or surface to display.

5 Optionally, set display options for each selected photo or surface.

For information on the options you can set, see “Viewing a Photo or Surface” on page 19-29.

6 Click **OK**.

Using the Orientation Options

The tabs on the Orientation Calibration window offer different options for viewing the volume and correcting its orientation.

To use the orientation tabs:

1 Click one of the orientation tabs to use that view to orient the volume.

2 Optionally, click and drag the red lines representing the mid-sagittal, axial, and/or coronal planes to the correct locations on the volume.

You can use the red lines as guidelines when orienting the volume.

3 Using the orientation options, correct the volume’s orientation.

You should check all of the tabs to make sure the volume is oriented correctly.

4 Use the **Verify** tab to check your work.

The **Verify** tab provides a view-only representation of the patient's volume and the mid-sagittal, axial, and coronal planes.

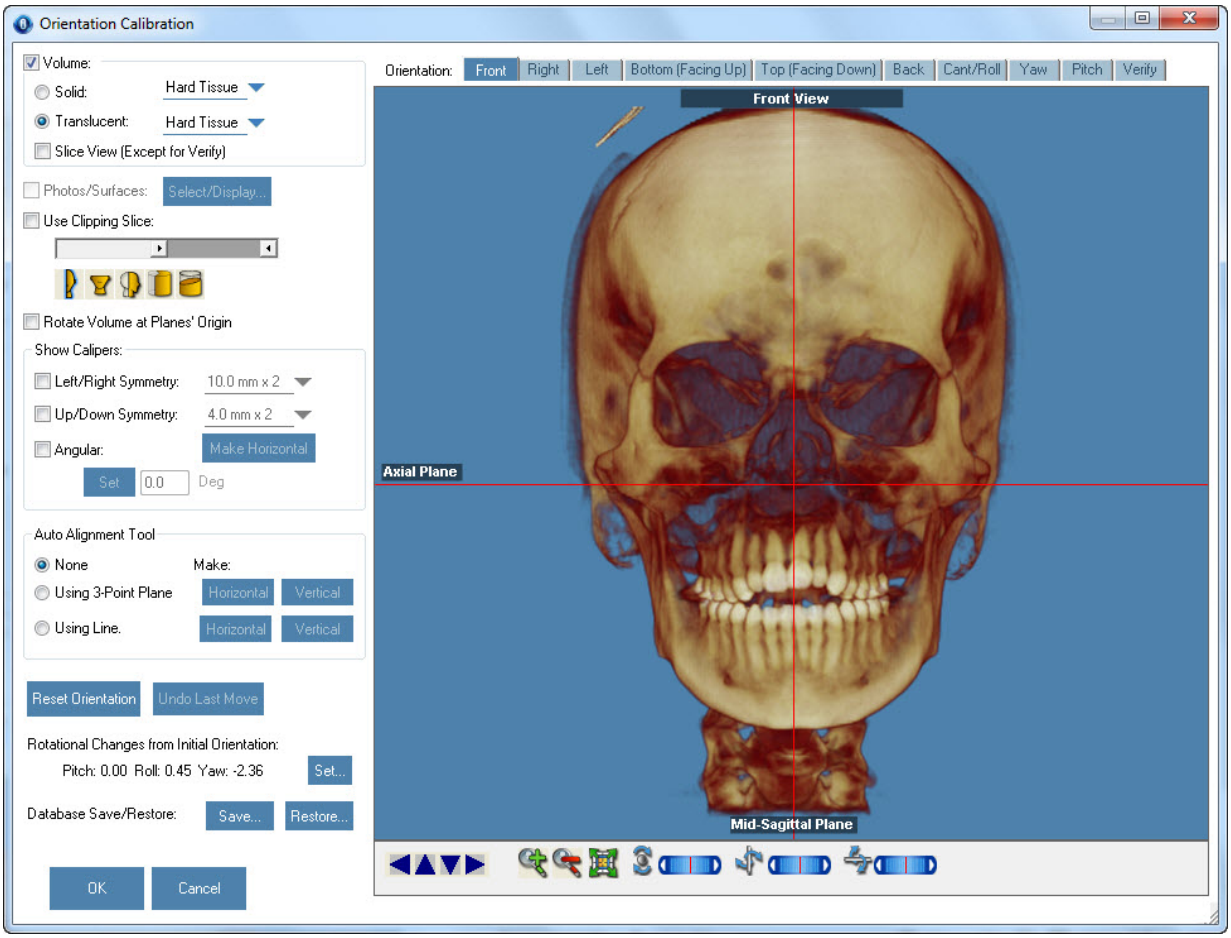
5 Click **OK** to save the volume orientation.

Using Planes, Calipers, and Auto-alignment Tools

The **Front**, **Right**, **Left**, **Bottom (Facing Up)**, **Top (Facing Down)**, and **Back** tabs display the volume from different angles. On these tabs, you can orient the volume by rotating it manually, using the 3-point plane or line auto-alignment tools.

To assist you in orienting the volume, these views display red lines representing the mid-sagittal, axial, and/or coronal planes You can also add calipers to these views.

The following figure illustrates the appearance of the orientation features offered on these tabs using the **Front** tab as an example:



You use the rotation sliders, arrow buttons, predefined view buttons to manually change the volume's orientation. For information on these features, see “Moving or Reorienting the Volume” on page 19-24. For

more information on the magnification controls that appear below the image, see “Changing the Magnification” on page 19-25.

In addition to these options, the **Front**, **Right**, **Left**, **Bottom (Facing Up)**, **Top (Facing Down)**, and **Back** tabs offer the following controls to help you orient the volume.

Rotate Volume at Planes' Origin	Uses the origins of the displayed planes (mid-sagittal, coronal, and/or axial) as the point around which to rotate the volume. For more information, see “Moving or Reorienting the Volume” on page 19-24.
Show Calipers	Displays one or more calipers on the patient's image. **Left/Right Symmetry:** Adds a left/right symmetry caliper. Set the length of the caliper using the drop-down list. For more information, see “Using the Symmetry Caliper” on page 19-45. **Up/Down Symmetry:** Adds a up/down symmetry caliper. Set the length of the caliper using the drop-down list. For more information, see “Using the Symmetry Caliper” on page 19-45. **Angular:** Adds an angular caliper used to orient the volume based on an angle, such as the Frankfort plane. For more information, see “Changing the Orientation Manually” below. • **Make Horizontal:** Rotates the volume so that the right side of the caliper is horizontal. • **Set:** Sets the caliper to the angle specified in the **Deg** field (see below). • **Deg:** Number of degrees for the angle.
Auto Alignment Tool	Species whether use an automatic alignment tool to orient the volume. **None:** Does not use an automatic alignment tool. **Using 3-Point Plane:** Uses a three-points plane. Recommended for use with the patient's photo in the frontal view. For more information, see “Using the 3-point Plane Auto-alignment Tool” on page 20-8. **Using Line:** Uses a line. Recommended for use with lateral views (either left or right). For more information, see “Using the Line Auto-alignment Tool” on page 20-9. **Horizontal:** Rotates the volume so that the line is horizontal. **Vertical:** Rotates the volume so that the 3-point plane or line is vertical.

Changing the Orientation Manually

The **Front**, **Right**, **Left**, **Bottom (Facing Up)**, **Top (Facing Down)**, and **Back** tabs display the volume from different angles along with red lines representing the mid-sagittal, axial, and coronal planes.

To correct the orientation:

1 Use the rotation sliders, arrow buttons, predefined view buttons to manually rotate the volume to orient it correctly in the window.

For information on these features, see “Moving or Reorienting the Volume” on page 19-24.

2 Optionally, click and drag the lines for the mid-sagittal, axial, and/or coronal planes to relocate them on the patient's volume so that you can use them as guides for correcting the orientation.

If necessary, you can rotate the volume about a point defined by the intersection of the two planes displayed on the volume. This enables you to rotate the volume about a point other than the center of the volume.

To rotate the volume about the intersection of the two planes:

1 Check the **Rotate Volume at Planes' Origin** box.

2 Click and drag the two planes to any locations on the volume.

3 Use the rotation sliders and arrow buttons to rotate the volume.

For information on these features, see “Moving or Reorienting the Volume” on page 19-24.

You can also add calipers to assist you in orienting the volume.

- You can use the symmetry caliper to check the symmetry of the patient's volume in the window. The symmetry caliper is most useful on the **Front**, **Bottom**, or **Top** orientation tabs. For more information, see “Using the Symmetry Caliper” on page 19-45.
- You can use the angular caliper (see below) to use an angular measurement to orient the volume.

To use an angular caliper:

1 Check the **Show Angular Caliper** box.

An angular caliper appears on the volume. Depending on the orientation tab currently selected, the caliper's apex is placed at the intersection of the mid-sagittal and axial planes or the coronal and axial planes.

2 Enter the number of degrees for the angle. Then, click **Set**.

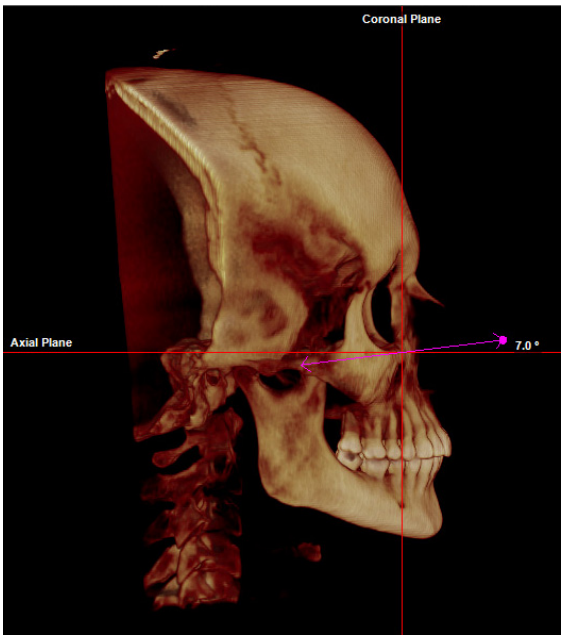
Or,

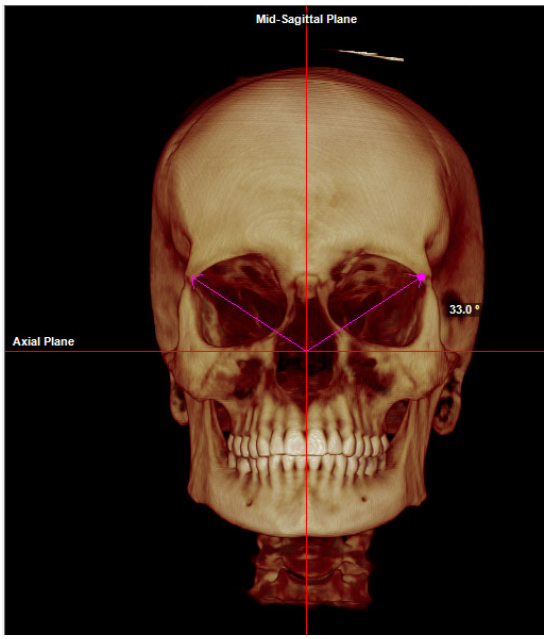
Click and drag the rotation handle (pink square) that appears on one end of the caliper to set the angle.

To use the rotation handle to set the angle, click and drag when a rotation icon appears around the handle.

3 Optionally, click and drag the planes to reposition the caliper.

The following figure illustrates two uses of the angular caliper.





Using the 3-point Plane Auto-alignment Tool

To use the 3-point plane automatic alignment tool to orient the volume:

1 Select the **Front** orientation tab.

The 3-point plane automatic alignment tool is recommended for use with a photo in the frontal view.

2 Select **Using 3-Point Plane**.

A triangle appears on the patient's volume.

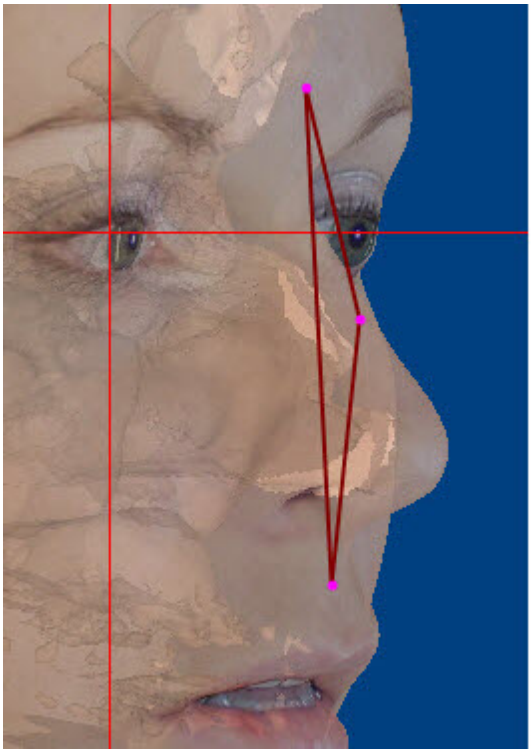
3 Click and drag each of the three points to locations on the patient's volume.

When the mouse is over one of the points, triangles appear around that point.

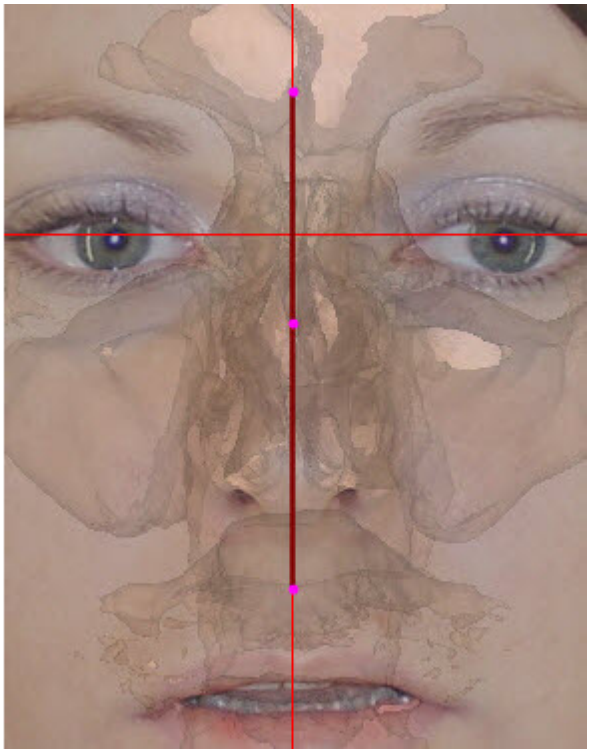
4 Click **Make Vertical** to rotate the volume so that the plane defined by the three points is aligned with the vertical plane on the current view.

The following figure illustrates one possible use of the 3-point plane automatic alignment tool.

1 Place the points at the soft tissue glabella, bridge of nose, and soft tissue A-point.



2 Click **Make Vertical**.



Using the Line Auto-alignment Tool

To use the line automatic alignment tool to orient the volume:

1 Select the **Right** or **Left** orientation tab.

The line automatic alignment tool is recommended for the lateral views.

2 Select **Using Line**.

A line appears on the patient's volume.

3 Click and drag the end points of the line to locations on the patient's volume.

When the mouse is over one of the end points, triangles appear around that end point.

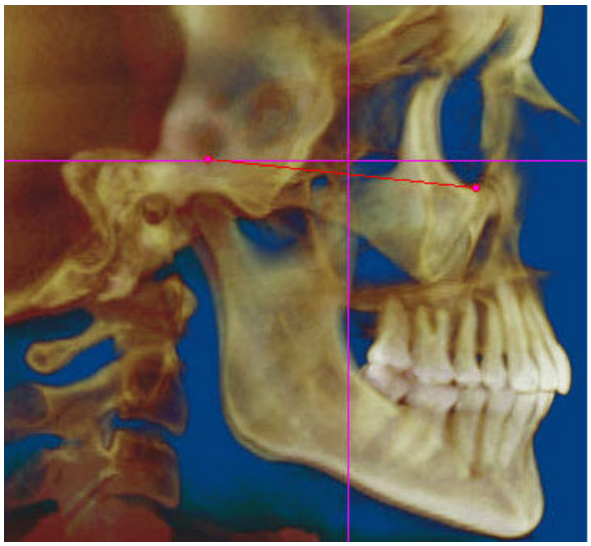
4 Click **Make Vertical** to rotate the volume so that the line is aligned with the vertical plane on the current view.

Or,

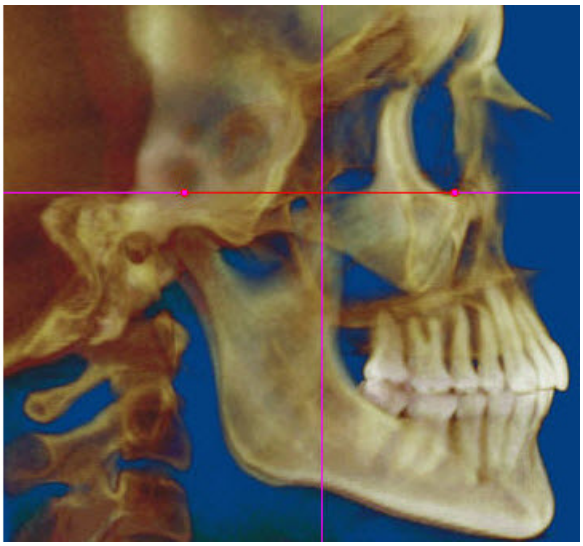
Click **Make Horizontal** to rotate the volume so that the line is aligned with the horizontal plane on the current view.

The following figure illustrates one possible use of the line automatic alignment tool.

1 Place one end of the line at the porion and the other at the orbitale.



2 Click **Make Horizontal**.



Adjusting Cant/Yaw/Pitch

The **Cant/Yaw/Pitch** tab provides the following options for adjusting the orientation of the volume:

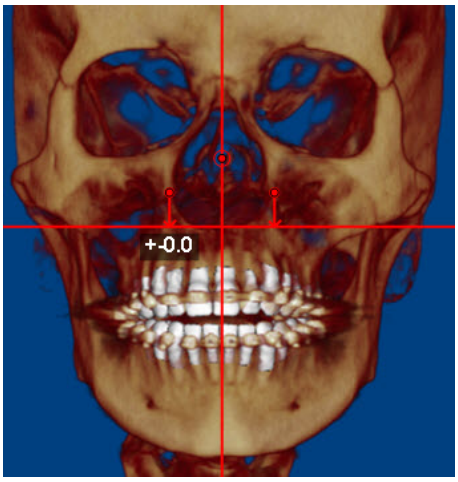
- **Cant:** Displays the frontal view of the volume and provides options for adjusting its orientation based on the relative positions of the canines, molars, and other landmarks. For more information, see “Adjusting Cant” below.
- **Yaw:** Displays the volume from the bottom with the patient's face toward the top of the window and provides options for adjusting its orientation based on the symmetries of the upper canines, upper molars, gonions, soft tissue points, and other landmarks. For more information, see “Adjusting Yaw” on page 20-15.
- **Pitch:** Displays the left and right lateral views of the volume and provides options for adjusting its orientation based on angles and distances relating to various landmarks and reference lines. For more information, see “Adjusting Pitch” on page 20-17.
- **4-View:** Displays four views of the volume: Cant, Yaw, Pitch, and Verify. You can use this view to adjust the cant, yaw, and pitch, then verify your result all on the same tab. For more information, see “Using the 4-View Option” on page 20-20.
- **Side/Side:** Displays two views of your choosing (Cant, Yaw, Pitch, or Verify) next to each other. For more information, see “Using the Side/Side View Option” on page 20-21.

In addition to using these options, you can type in values for cant, yaw, and pitch as described in “Entering Orientation Values” on page 20-22.

Adjusting Cant

When adjusting cant, you use the frontal view of the volume and adjust its orientation based on the relative positions of the canines, molars, and other landmarks. You can use this feature to transfer clinical orientation measurements taken on the patient using lasers and markers to the virtual patient.

To adjust the volume's cant:



1 On the **Cant/Yaw/Pitch** tab, select the **Cant** option.

2 Check the box for each pair of landmarks that you want to use to orient the volume.

The following appears for each selected pair of landmarks (see the figure to the right):

- points on the left and right sides of the volume used for identifying the landmarks
- a horizontal reference line
- arrows connecting the points to the line
- a value indicating the measured difference between the points on the left and right sides of the volume

The figure illustrates these items when the **Show Lower Canines** box is checked. In this example, the **Allow Moving Landmark Points** box is also checked, which allows you to move the landmark points in two dimensions. If the **Allow Moving Landmark Points** box is not checked, the landmark points and the arrows connecting them to the horizontal reference lines are yellow rather than red.

3 Identify each pair of selected landmarks on the volume.

You can identify the landmarks in two or three dimensions. For more information, see "Identifying the Landmarks in Two Dimensions" below or "Identifying the Landmarks in Three Dimensions" on page 20-13.

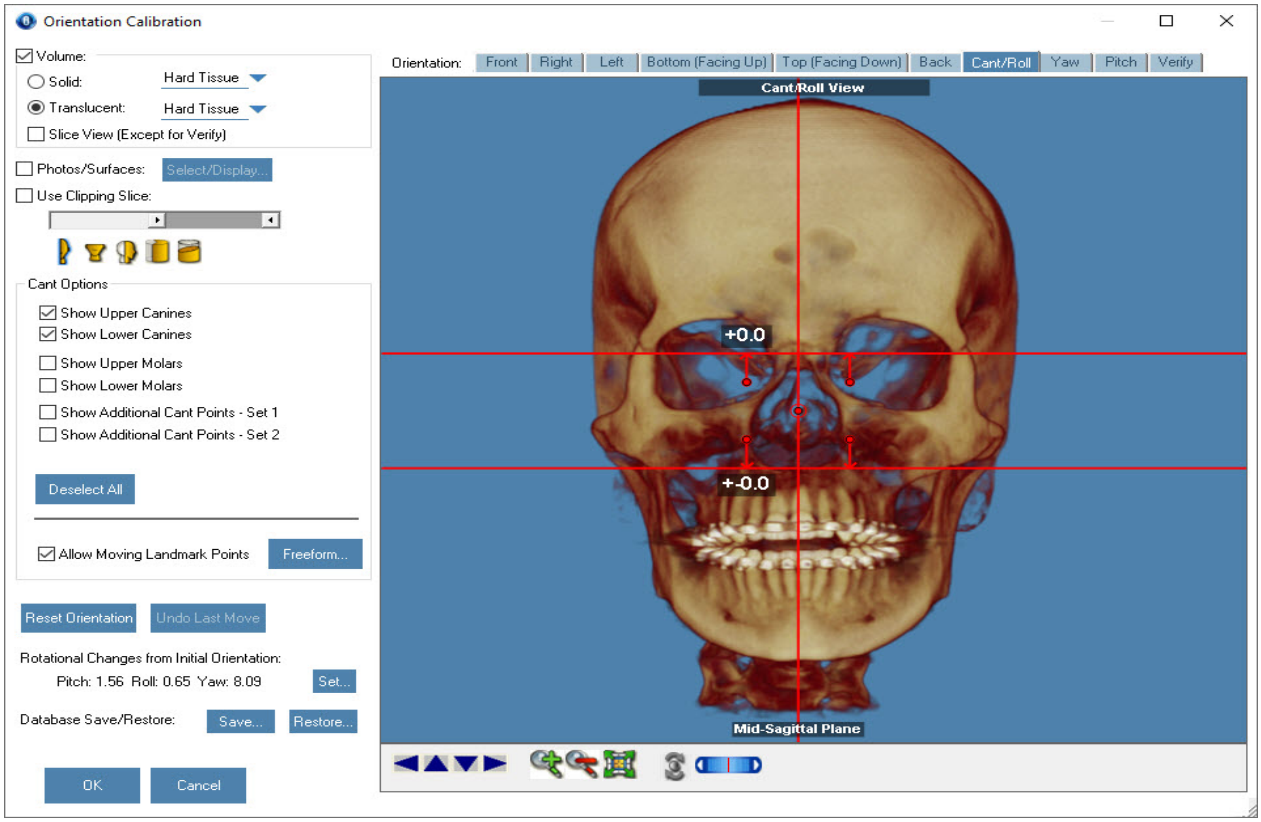
4 If necessary, click and drag the red line representing the mid-sagittal plane to the correct location on the volume.

5 Optionally, click and drag the center-of-rotation point to change the point around which to rotate the volume.

The center-of-rotation is a red dot inside a circle ( ) on the line representing the mid-sagittal plane.

6 Rotate the volume until the measurements displayed in the window accurately reflect the clinical measurements for this patient.

For example, if the clinical measurements indicate that the patient's right lower canine is 2.0 mm lower than the left lower canine, you would rotate the volume until the difference between the lower canines reads -2.0. For more information, see "Moving or Reorienting the Volume" on page 19-24.



Show Upper Canines	Measures the relative positions of the upper canines.
Show Lower Canines	Measures the relative positions of the lower canines.
Show Upper Molars	Measures the relative positions of the upper molars.
Show Lower Molars	Measures the relative positions of the lower molars.
Show Additional Cant Points - Set 1	Measures the relative positions of a pair of anatomical features that you select.
Show Additional Cant Points - Set 2	Measures the relative positions of a pair of anatomical features that you select.
Show Pagonion to Mid-Sagittal	Measures the distance from the pogonion to the mid-sagittal plane.
Deselect All	Unchecks all the boxes in the Cant Options group box.
Allow Moving Landmark Points	Allows you to move the points used to identify landmarks. With this option, you identify landmarks in two dimensions (see “Identifying the Landmarks in Two Dimensions” below).
Freeform...	Opens a dialog box that enables you to identify landmarks in three dimensions (see “Identifying the Landmarks in Three Dimensions” on page 20-13).

Identifying the Landmarks in Two Dimensions

To identify the landmarks you want to use to correct the volume's orientation:

1 Check the **Allow Moving Landmark Points** box if it isn't already.

The landmark points and the arrows connecting them to reference line(s) or plane(s) change from yellow to red, indicating that you can move the points in two dimensions. To identify landmarks in three dimensions, see "Identifying the Landmarks in Three Dimensions" below.

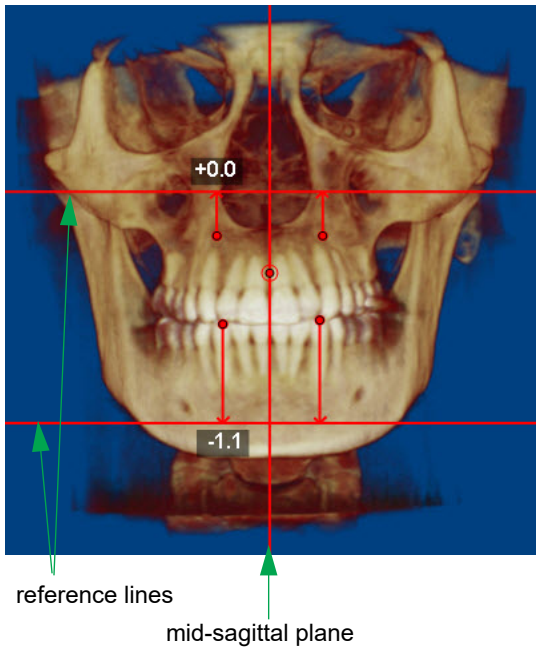
2 Optionally, change the volume viewing options to make it easier to identify the landmarks.

For example, some landmarks may be more visible if you change your view of the volume or use a clipping slice. For more information, see "Selecting the Volume View" on page 20-3 and "Using a Clipping Slice" on page 28-1.

3 Click and drag the red point for each landmark to the correct location on the volume.

When you place the points, the difference between the corresponding landmarks on the left and right sides appears. For example, in the figure to the right, the lower canine on the patient's right side is 1.1 mm lower than the lower canine on the patient's left side.

If a reference line is obscuring a landmark location, you can click and drag the line out of the way. Moving a reference line has no effect on the measurement values.



4 When you finish placing the red points on the appropriate landmarks, uncheck the **Allow Moving Landmark Points** box so that the locations of the points cannot be changed accidentally.

Identifying the Landmarks in Three Dimensions

To identify the landmarks you want to use to correct the volume's orientation:

1 Click **Freeform...**.

The Locate Landmarks dialog box opens.

2 Select the landmark that you want to identify from the **Landmarks to Locate** list.

A yellow circle appears around the point corresponding to the selected landmark.

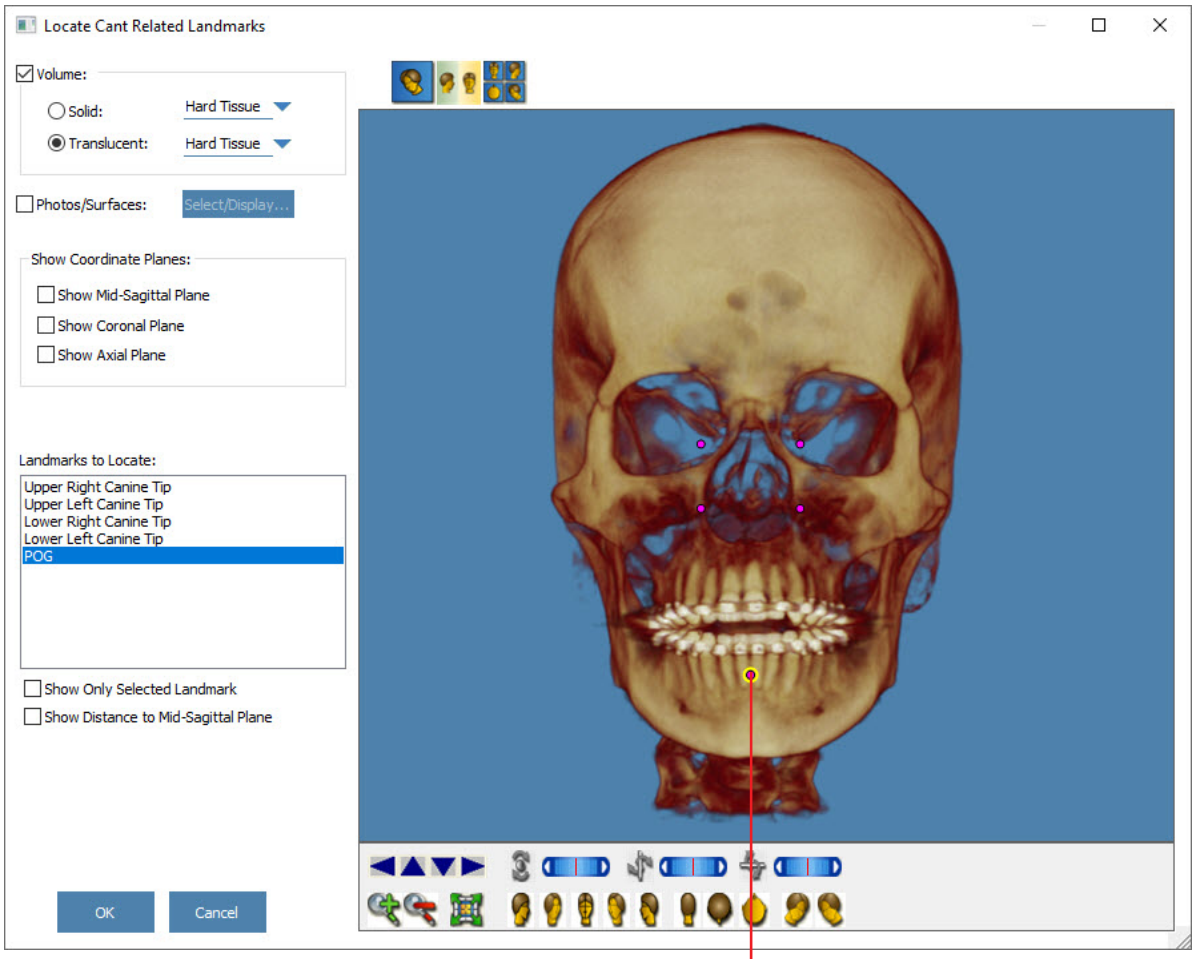
3 Optionally, change the volume viewing options to make it easier to identify the landmarks.

For example, some landmarks may be more visible if you change your view of the volume. For more information, see "Selecting the Volume View" on page 20-3.

4 Click and drag the point to the correct landmark location on the volume.

Rotate the volume as necessary to accurately place the point on the landmark. For more information, see “Moving or Reorienting the Volume” on page 19-24.

5 When you finish placing the points on the appropriate landmarks, click **OK**.



point corresponding to the landmark selected in the **Landmark to Locate** list

Volume	Uses a volume view to locate the landmarks. **Solid:** Displays the solid view of the volume (**Soft Tissue**, **Hard Tissue**, or **Both**) selected from the drop-down list. **Translucent:** Displays the translucent view of the volume (**Soft Tissue**, **Hard Tissue**, or **Both**) selected from the drop-down list. Available for computers that support advanced 3D rendering only.
Photos/Surfaces	Displays a photo or surface (if available) in the window. **Select/Display...:** Opens a dialog box where you can choose the photo or surface to display and set options for it.

Show Coordinate Planes	Displays the selected reference planes on the image. **Show Mid-Sagittal Plane:** Displays the mid-sagittal plane. **Show Coronal Plane:** Displays the coronal plane. **Show Axial Plane:** Displays the axial plane.
Landmarks to Locate	Lists the landmarks that you can locate on the volume.
Show Only Selected Landmark	Displays only the landmark selected in the **Landmarks to Locate** list on the image.
Show Distance to Mid-Sagittal Plane	Displays the distance between each landmark point and the mid-sagittal plane.

For information on the layout buttons that appear above the image, see “Layouts and Slices” on page 19-32. For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Adjusting Yaw

Selecting the **Yaw** option displays the volume from the bottom with the patient's face toward the top of the window and provides options for adjusting its orientation based on the symmetries of the upper canines, upper molars, gonions, soft tissue points, and other landmarks. You can use this feature to transfer clinical orientation measurements taken on the patient using lasers and markers to the virtual patient.

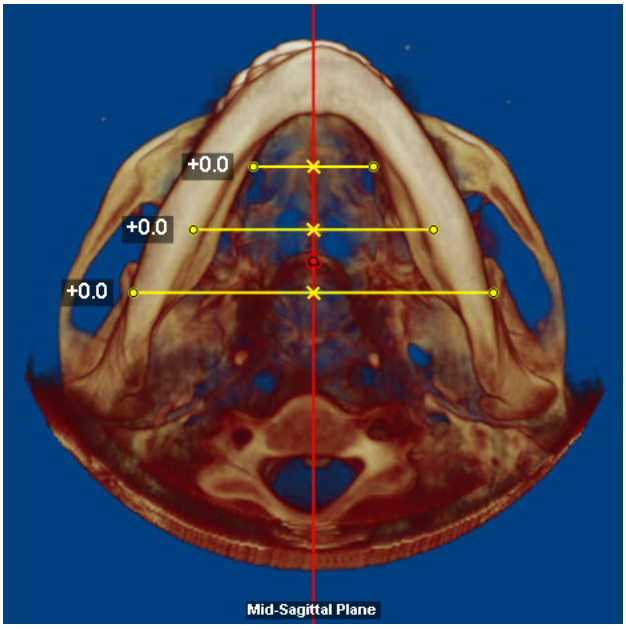
To adjust the volume’s yaw:

1 Select the **Yaw** option.

2 Check the box for each pair of landmarks that you want to use to orient the volume.

The following appears for each selected pair of landmarks (see the figure to the right):

- points on the left and right sides of the volume used for identifying the landmarks
- arrows connecting the points to a line representing the mid-sagittal plane
- a value indicating the measured difference between the points on the left and right sides of the volume



The figure illustrates these items when the **Show Lower Canines, Show Lower Canines**, and **Show Gonions** boxes are checked. In this example, the **Allow Moving Landmark Points** box is not checked, which prevents movement of the landmark points in two dimensions. If the **Allow Moving Landmark Points** box is checked, the landmark points and the arrows connecting them to the mid-sagittal plane are red rather than yellow.

3 Identify each pair of selected landmarks on the volume.

You can identify the landmarks in two or three dimensions. For more information, see “Identifying the Landmarks in Two Dimensions” on page 20-13 or “Identifying the Landmarks in Three Dimensions” on page 20-13.

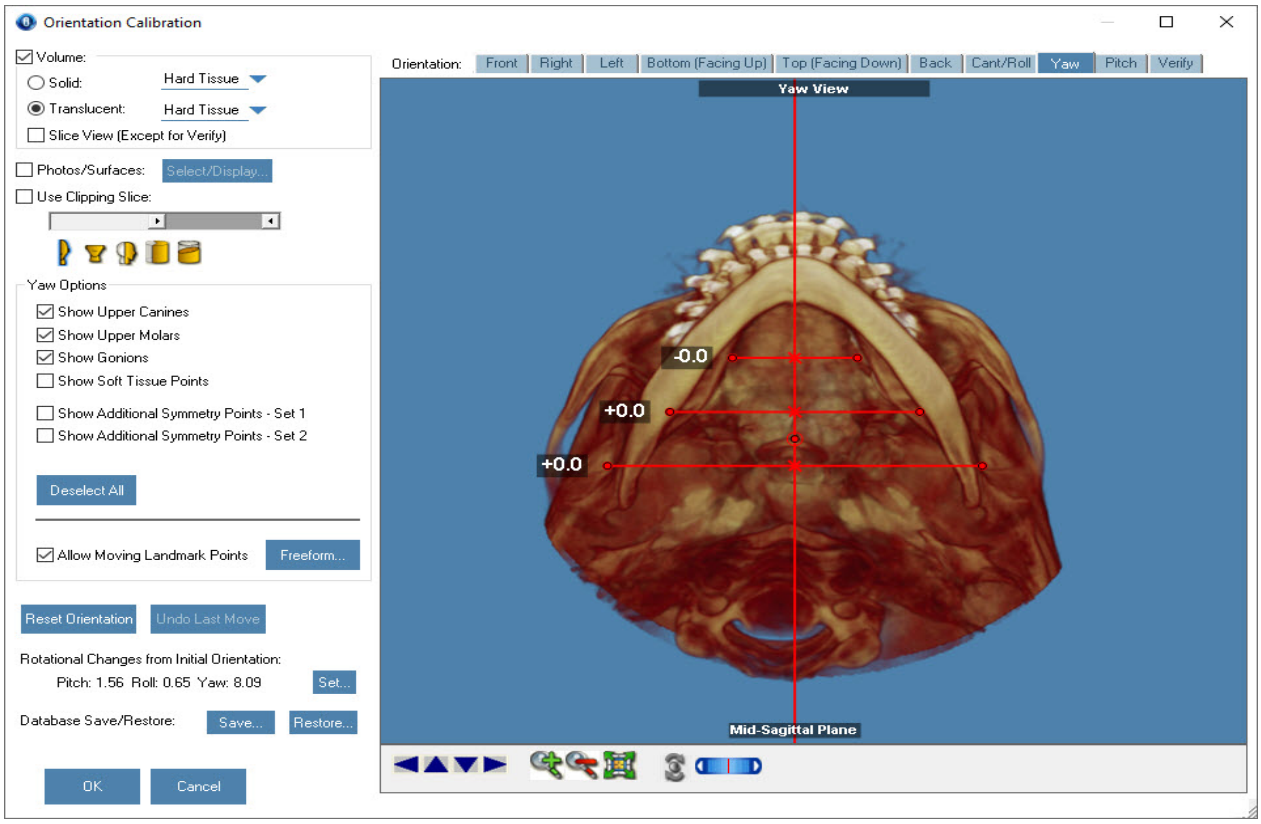
4 If necessary, click and drag the red line representing the mid-sagittal plane to the correct location on the volume.

5 Optionally, click and drag the center-of-rotation point to change the point around which to rotate the volume.

The center-of-rotation is a red dot inside a circle ( ) on the line representing the mid-sagittal plane.

6 Rotate the volume until the measurements displayed in the window accurately reflect the clinical measurements for this patient.

For example, if the clinical measurements indicate that the patient’s right upper canine is 1 mm closer to the mid-sagittal plane than the left upper canine, you would rotate the volume until the difference between the upper canines reads -1.0.



Show Upper Canines	Measures the relative positions of the upper canines.
Show Upper Molars	Measures the relative positions of the upper molars.
Show Gonions	Measures the relative positions of the gonions.
Show Soft Tissue Points	Measures the relative positions of soft tissue landmarks.

Show Additional Symmetry Points - Set 1	Measures the relative positions of a pair of anatomical features that you select.
Show Additional Symmetry Points - Set 2	Measures the relative positions of a pair of anatomical features that you select.
Deselect All	Unchecks all the boxes in the Yaw Options group box.
Allow Moving Landmark Points	Allows you to move the points used to identify landmarks. With this option, you identify landmarks in two dimensions (see “Identifying the Landmarks in Two Dimensions” on page 20-13).
Freeform...	Opens a dialog box that enables you to identify landmarks in three dimensions (see “Identifying the Landmarks in Three Dimensions” on page 20-13).

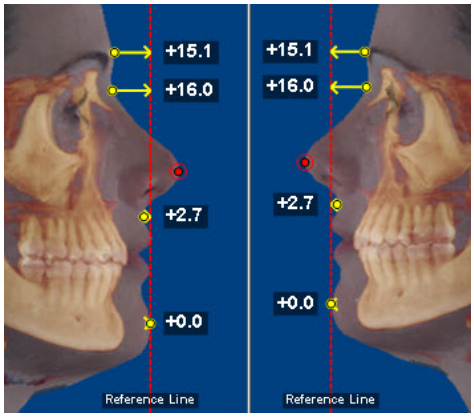
Adjusting Pitch

The **Pitch** tab displays the left and right lateral views of the volume and provides options for adjusting its orientation based on angles and distances relating to various landmarks and reference lines. You can use this feature to transfer clinical orientation measurements taken on the patient using lasers and markers to the virtual patient.

To adjust the volume’s pitch:

1 Check the box for the landmarks and/or lines that you want to use to orient the volume.

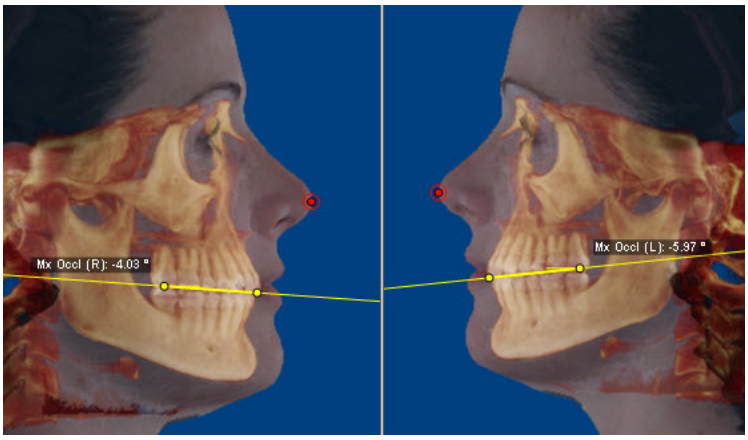
The following appears if you select **Show Profile Points** (see the figure to the right):



- points used for identifying the soft tissue profile landmarks.
- arrows connecting the points to a red dotted reference line.
- values indicating the distance between the soft tissue profile landmarks and the reference line. Since the soft tissue profile landmarks are all on the mid-sagittal plane, these values are the same on the left and right views.

The following appears if you select **Show Upper Occlusal Lines (Left/Right)** in the Pitch Options group box and **Horizontal** under Show Angles Relative to (see the figure below):

- points used for identifying the upper incisor tip and U6 mesial cusp tip landmarks
- upper occlusal line
- values indicating the angle between the upper occlusal line and the horizontal



In these examples, the **Allow Moving Landmark Points** box is not checked, which prevents movement of the landmark points in two dimensions. If the **Allow Moving Landmark Points** box is checked, the landmark points, the arrows connecting them to the reference line, and/or the occlusal plane are red rather than yellow.

2 If you selected **Show Profile Points**, optionally click and drag the red dotted reference line to the location from which you want measure distances.

3 If you selected one of the lines in the Pitch Options group box, specify whether you want to measure angles from the horizontal or vertical.

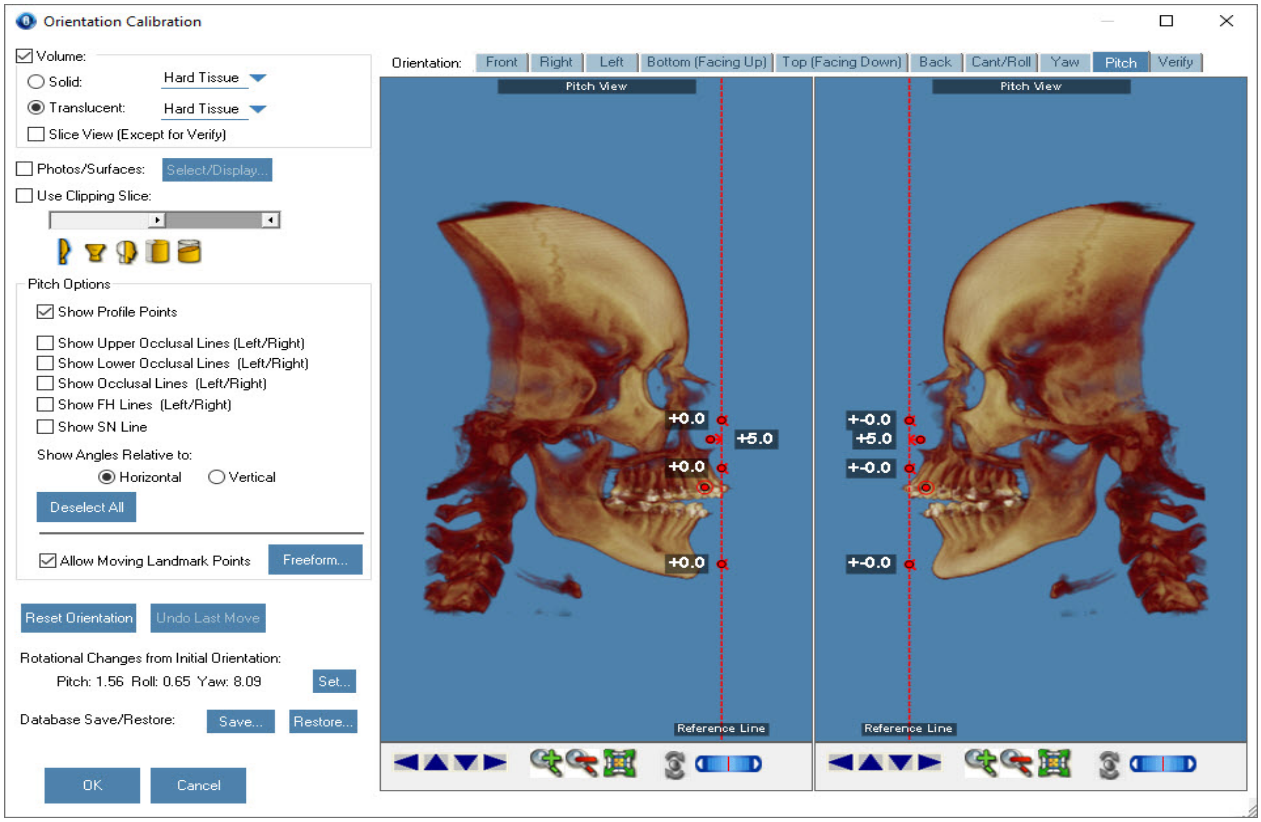
4 Identify the appropriate landmarks on the volume.

You can identify the landmarks in two or three dimensions. For more information, see “Identifying the Landmarks in Two Dimensions” on page 20-13 or “Identifying the Landmarks in Three Dimensions” on page 20-13.

5 Optionally, click and drag the center-of-rotation point to change the point around which to rotate the volume.

The center-of-rotation is a red dot inside a circle ( ).

6 Rotate the volume until the measurements displayed in the window accurately reflect the clinical measurements for this patient.



Show Profile Points	Displays four soft tissue profile points and their distances from a movable vertical line. The same landmarks are shown in both left and right lateral views. By default, the soft tissue profile points are associated with the soft tissue glabella, soft tissue nasion, subnasale, and soft tissue pogonion landmarks. However, you can place them at other profile-based landmarks.
Show Upper Occlusal Lines (Left/Right)	Displays lines between the upper incisor tip and U6 mesial cusp tip landmarks on the left and right side and the angles between those lines and the horizontal or vertical, as selected under **Show Angles Relative to:** (see below). ***Note:*** *The left upper occlusal line is independent of the right upper occlusal line.*
Show Lower Occlusal Lines (Left/Right)	Displays lines between the lower incisor tip and L6 mesial cusp tip landmarks on the left and right side and the angles between those lines and the horizontal or vertical, as selected under **Show Angles Relative to:** (see below). ***Note:*** *The left lower occlusal line is independent of the right lower occlusal line.*
Show Occlusal Lines (Left/Right)	Displays the left and right occlusal lines, which are calculated based on the respective upper occlusal and lower occlusal lines. These lines are always displayed in yellow and do not have landmark points or angular information.
Show FH Lines (Left/Right)	Displays Frankfort Horizontal lines (drawn between the orbitale and porion) on the left and right side and the angles between those lines and the horizontal or vertical, as selected under **Show Angles Relative to:** (see below). ***Note:*** *The left Frankfort Horizontal line is independent of the right Frankfort Horizontal line.*

Show SN Line	Displays Sella Nasion lines (drawn between the nasion and sella) on the left and right side and the angles between those lines and the horizontal or vertical, as selected under **Show Angles Relative to:** (see below). ***Note:*** *The left and right Sella Nasion lines are identical, because the nasion and sella are mid-sagittal landmarks.* ***Note:*** *The Sella Nasion line on the left profile image is independent of the Sella Nasion line on the right profile image.*
Show Angles Relative to:	Specifies whether to base angular measurements on the horizontal or vertical.
Deselect All	Unchecks all the boxes in the Pitch Options group box so that no lines or points are displayed.
Allow Moving Landmark Points	Allows you to move the points used to identify landmarks. With this option, you identify landmarks in two dimensions (see “Identifying the Landmarks in Two Dimensions” on page 20-13).
Freeform...	Opens a dialog box that enables you to identify landmarks in three dimensions (see “Identifying the Landmarks in Three Dimensions” on page 20-13).

Using the 4-View Option

The **4-View** option displays four views of the volume: Cant, Yaw, Pitch, and Verify. You can use this view to adjust the cant, yaw, and pitch, then verify your result all on the same tab.

To use the **4-View** option:

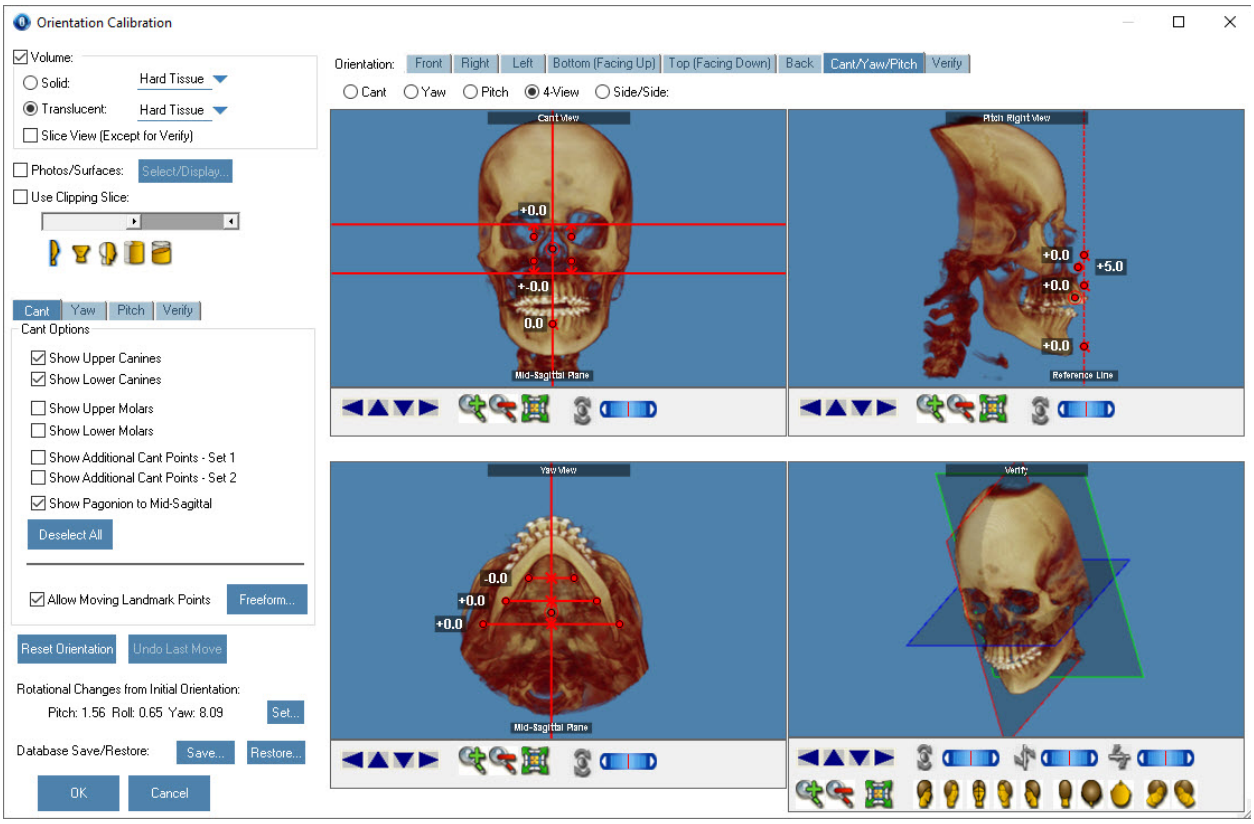
1 On the **Cant/Yaw/Pitch** tab, select **4-View**.

2 On the left, select the sub-tab for the adjustment you would like to make (**Cant**, **Yaw**, or **Pitch**).

Or,

Select the **Verify** sub-tab to configure the image in the Verify pane.

For information on adjusting **Cant**, **Yaw**, and **Pitch**, see “Adjusting Cant” on page 20-11, “Adjusting Yaw” on page 20-15, and “Adjusting Pitch” on page 20-17. For information on configuring the image in the Verify pane, see “Verifying the Orientation” on page 20-24.



Using the Side/Side View Option

With the **Side/Side View** option, you can select two views of the volume and display them side by side. You can display:

- Cant, Yaw, or Pitch (right or left view) in the left pane
- Cant, Yaw, Pitch (right or left view), or Verify in the right pane

Using sub-tabs on the left, you can choose options for the two views you selected.

To use the **Side/Side View** option:

1 On the **Cant/Yaw/Pitch** tab, select **Side/Side**.

2 Select two views of the volume using the drop-down lists that appear.

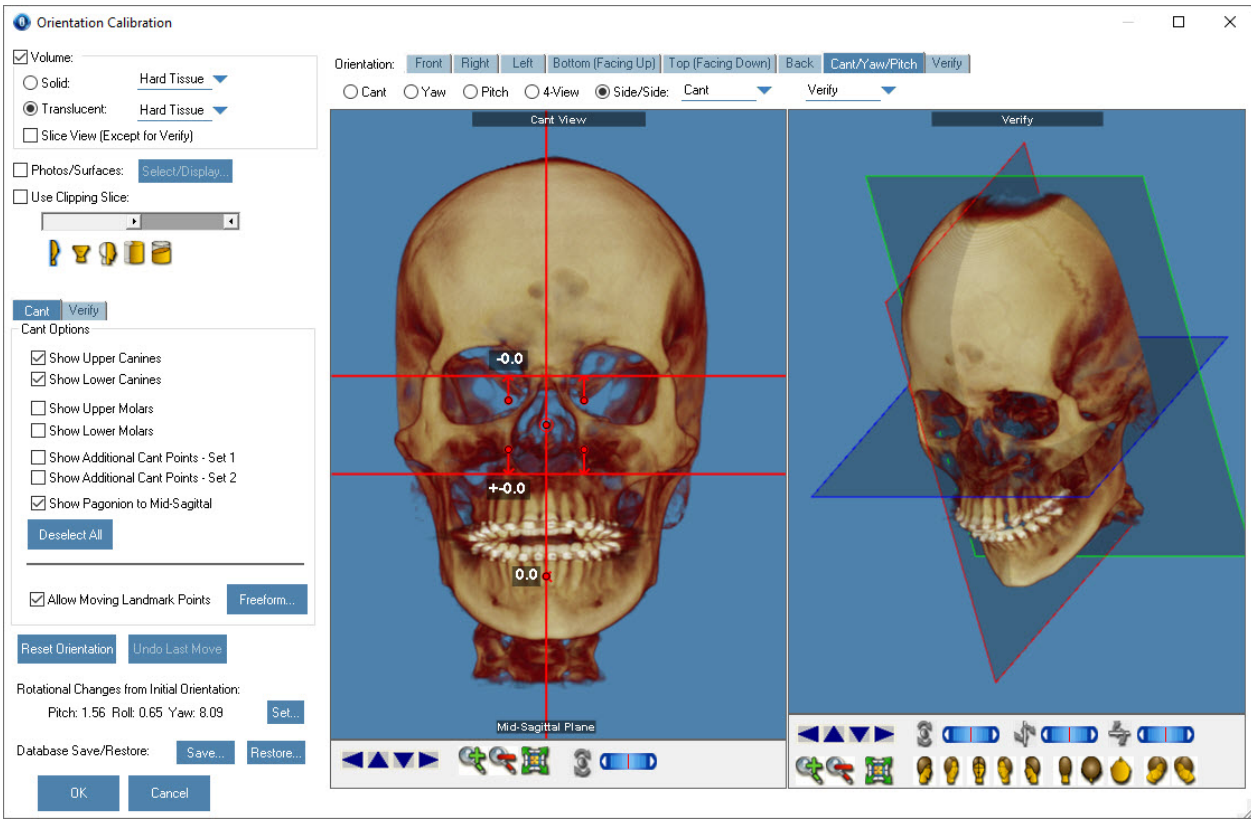
3 On the left, select the sub-tab for one of the two views you chose.

4 If you selected the **Cant**, **Yaw**, or **Pitch** sub-tab, select options to adjust the volume's orientation.

Or,

If you selected the **Verify** sub-tab, select options to configure the image in the Verify pane.

For information on adjusting **Cant**, **Yaw**, and **Pitch**, see "Adjusting Cant" on page 20-11, "Adjusting Yaw" on page 20-15, and "Adjusting Pitch" on page 20-17. For information on configuring the image in the Verify pane, see "Verifying the Orientation" on page 20-24.



Entering Orientation Values

On any tab of the Orientation Calibration dialog box except **Verify**, you can set the orientation by entering values for the three directions in which you can rotate the volume.

To enter orientation values:

1 Click **Set...**.

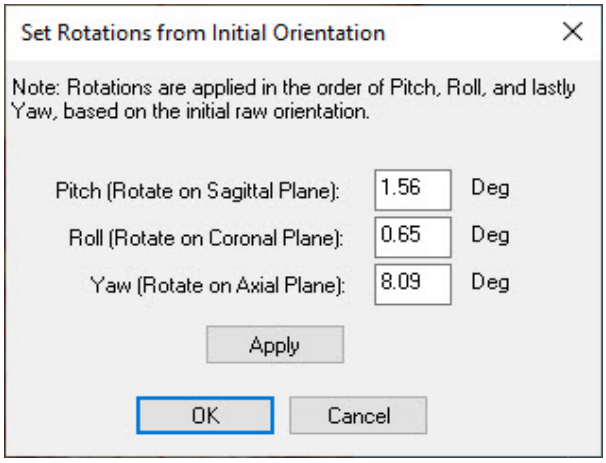
A dialog box opens where you can set values for pitch, roll, and yaw.

2 Enter the appropriate values to correct the volume's orientation.

3 Click **Apply** to see the result without closing the dialog box.

Or,

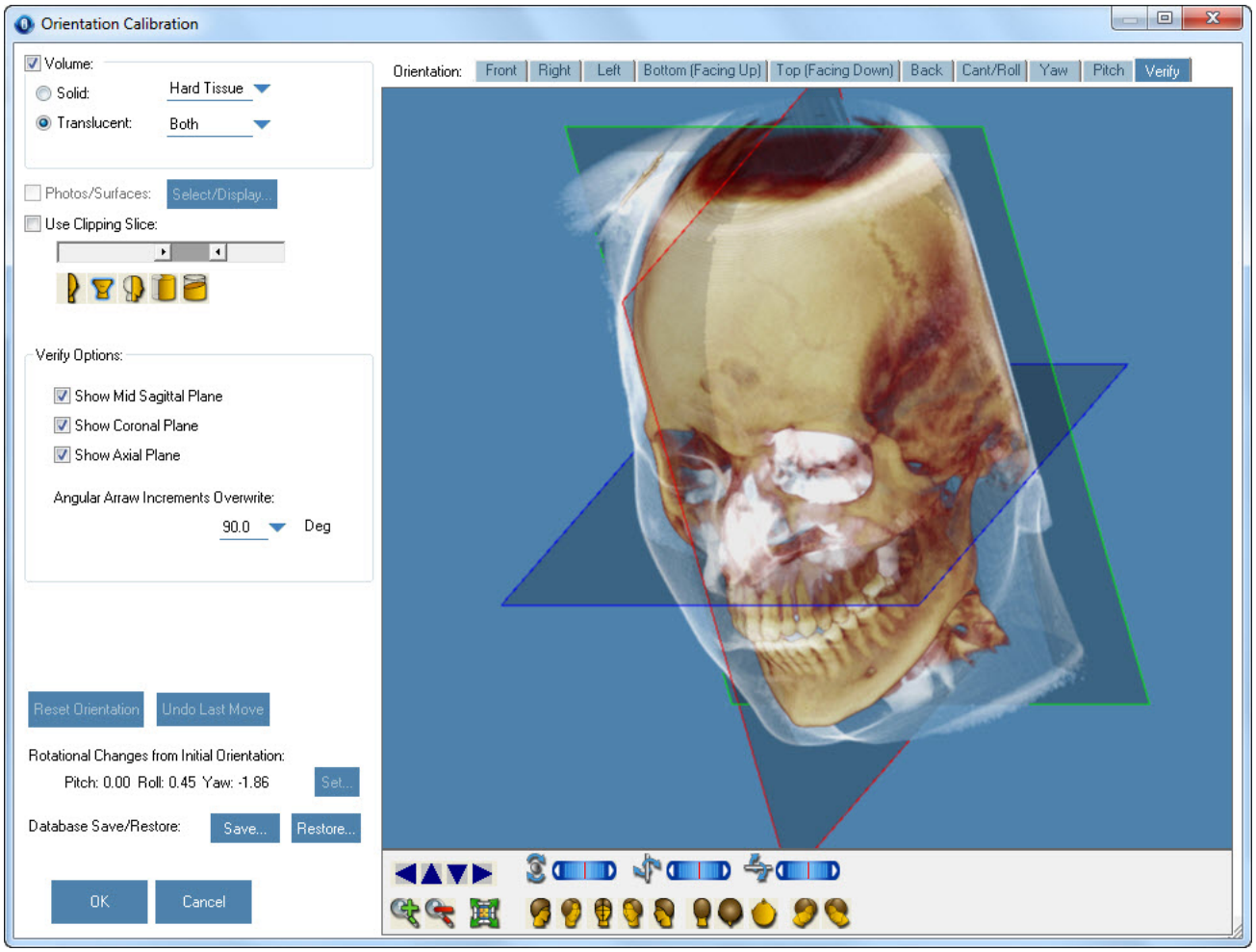
Click **OK** to apply your changes and close the dialog box.



Pitch (Rotate on Sagittal Plane)	Number of degrees to rotate the volume around the sagittal plane. For more information, see “Adjusting Pitch” on page 20-17.
Roll (Rotate on Coronal Plane)	Number of degrees to rotate the volume around the coronal plane. or more information, see “Adjusting Cant/Yaw/Pitch” on page 20-10.
Yaw (Rotate on Axial Plane)	Number of degrees to rotate the volume around the axial plane. or more information, see “Adjusting Yaw” on page 20-15.
Apply	Displays the result without closing the dialog box.

Verifying the Orientation

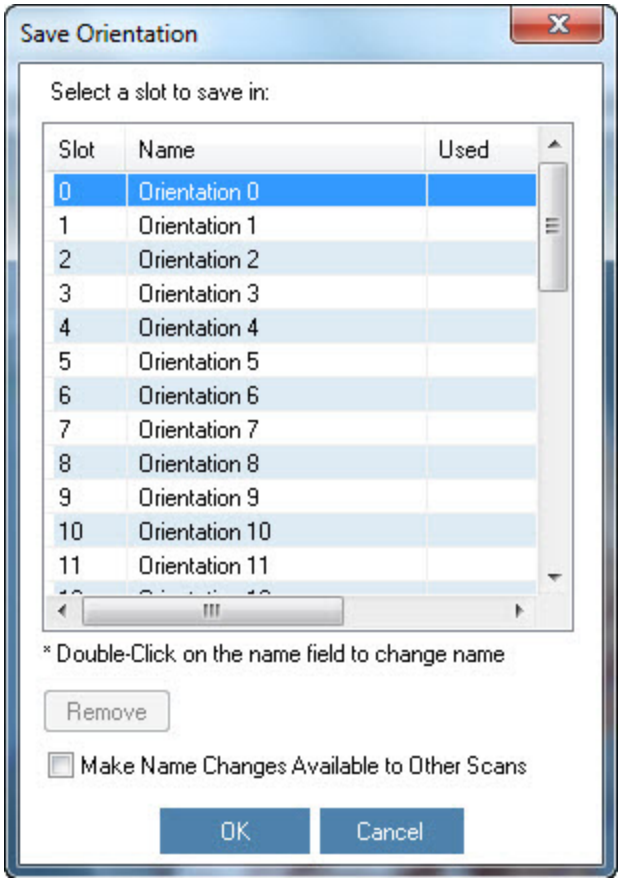
The **Verify** tab shows a view-only display of the volume and representations of the mid-sagittal, axial, and coronal planes so that you can verify that the volume is oriented correctly.



Show Mid Sagittal Plane	Displays a representation of the mid-sagittal plane.
Show Coronal Plane	Displays a representation of the coronal plane.
Show Axial Plane	Displays a representation of the axial plane.
Angular Arraw Increments Overwrite	Number of degrees that the volume rotates when you click an arrow button on one of the rotation sliders at the bottom of the window. Select **None** from the drop-down list to rotate the volume by 1 degree (the default rotation amount).

Saving and Restoring the Orientation

Once you have oriented a volume, you can save the orientation in your Dolphin database and restore it later.



To save your current volume orientation:

1 Click **Save...** on the Orientation Calibration window.

Or,

Right-click the volume on the Dolphin 3D window, and select **Save Volume Orientation...** from the context menu.

The Save Orientation dialog box opens.

2 Select the slot in which you want to save this orientation. Then, click **OK**.

Slot 0 contains the native DICOM orientation (the orientation of the volume as it was originally scanned).

To restore a previously saved volume orientation:

1 Click **Restore...** on the Orientation Calibration window.

Or,

Right-click the volume on the Dolphin 3D window, and select **Restore Volume Orientation...** from the context menu.

The Restore Orientation dialog box opens.

2 Select the slot containing the orientation you want to restore. Then, click **OK**.

To delete a previously saved volume orientation:

1 Click **Save...** on the Orientation Calibration window.

Or,

Right-click the volume on the Dolphin 3D window, and select **Save Volume Orientation...** from the context menu.

The Save Orientation dialog box opens (see above).

2 Select the slot containing the orientation you want to delete. Then, click **Remove**.

3 Click **OK**.

To rename an orientation slot:

1 Double-click the slot you want to rename.

2 Enter a new name for the slot.

3 Optionally, check the **Make Name Changes Available to Other Scans** box to make the name change visible when you save the orientations for other volumes.

4 Click **OK**.

21 Build X-rays

Using Dolphin 3D, you can build the following types of 2D x-rays from the 3D volume: lateral, panoramic, TMJ, cross sections (upper arch, lower arch, or both), nerve canals on a panoramic view, frontal, and sub-mentovertex (SMV).

Note: *Before building x-rays, you may want to digitize landmarks on the volume. Then, saving an x-ray to Dolphin 2D creates two versions of it, one with the digitized landmarks and one without. For more information, see "3D Digitizing For Use in Dolphin 2D" on page 22-20 and "Saving an X-ray" on page 21-49.*

Using the Build X-rays Tool

To build and view an x-ray:

1 Click

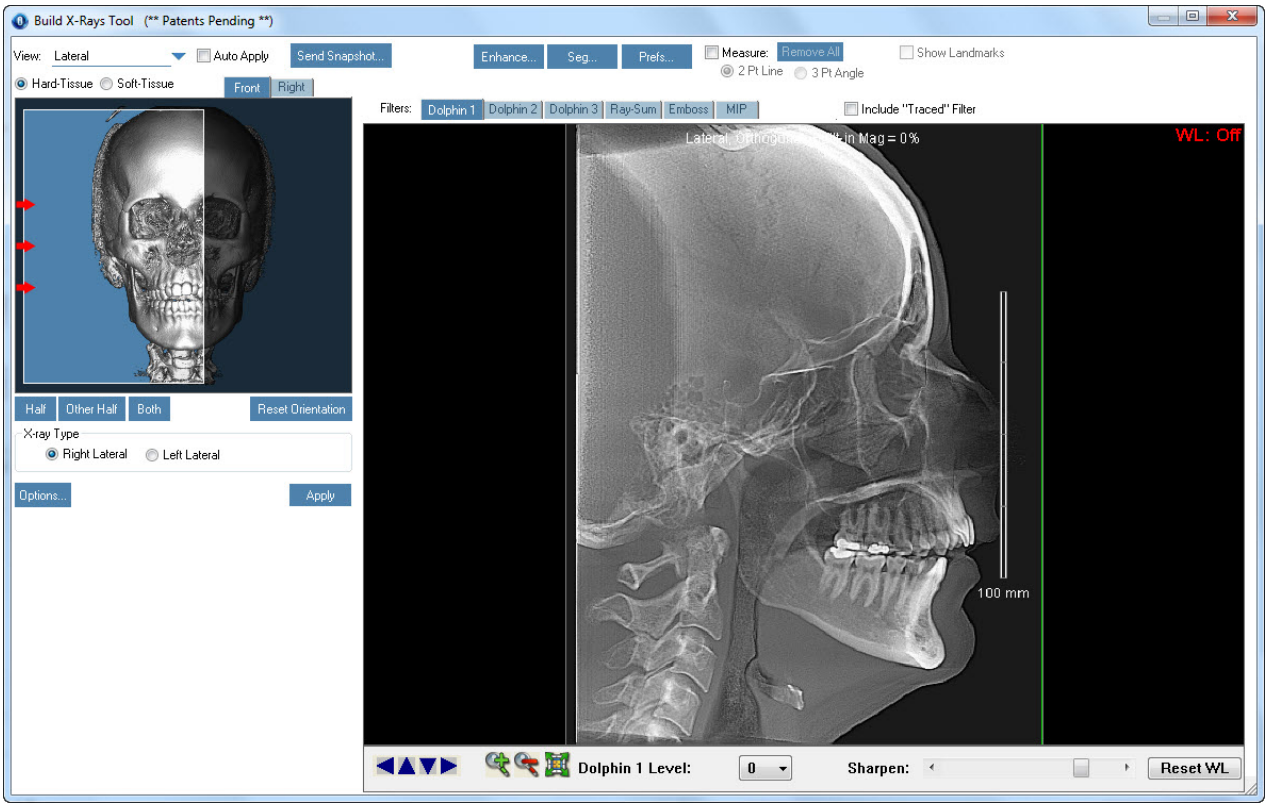
on the Dolphin 3D window.

Or,

Select **Build X-Rays...** from the **Tools** menu.

The Build X-Rays Tool window opens with a setup palette on the left and the x-ray view that you built last (if any) on the right.

Note: *If you have not yet set the soft and hard tissue segmentation to use when building x-rays, the Quick Solids Segmentation dialog box opens automatically so that you can segment the image before building x-rays. For more information, see "Setting the Segmentation" on page 21-7.*



View	Type of x-ray to view or create. **Lateral:** Displays or creates a lateral x-ray. See “Building a Lateral X-ray” on page 21-9. **Panoramic:** Displays or creates a panoramic x-ray. See “Building a Panoramic X-ray” on page 21-13. **TMJ:** Displays or creates a TMJ view. See “Building an X-ray View of the TMJ Area” on page 21-18 **Cross Sections, Cross Sections Upper, and Cross Sections Lower:** Displays or creates cross section views. See “Building a Cross-Sections X-ray View” on page 21-24. **Nerve Canals:** Displays or creates a nerve canals view on a panoramic view. See “Building a Nerve Canals X-ray View” on page 21-29. **Frontal:** Displays or creates a frontal x-ray. See “Building a Frontal X-ray” on page 21-39. **SMV:** Displays or creates a submentovertex (SMV) x-ray. See “Building an SMV X-ray” on page 21-42.
Auto Apply	Applies the x-ray setup options immediately rather than waiting for you to click **Apply**.

Send Snapshot...	Opens a menu with the following options: **Close This Menu:** Closes the menu. **Save To Dolphin Layout/Database:** Saves the x-ray to a slot in a Dolphin image layout and store it in your database. For more information, see “Saving an X-ray” on page 21-49. **Send To Report:** Uses this x-ray in a Dolphin 3D report. For more information, see Chapter 29, Reports. **Copy To Clipboard:** Copies the x-ray to the clipboard. Then, you can paste the image into another application. For more information, see “Copying an X-ray to the Clipboard” on page 21-51. **Print:** Prints the x-ray. For more information, see “Printing an X-ray” on page 21-53. **Export To File:** Exports the x-ray to a file. For more information, see “Exporting an X-ray” on page 21-52.
Enhance...	Opens the Enhancement dialog box so you can enhance the image after you create it. For more information see “Enhancing an X-ray” on page 21-47.
Seg...	Opens the Quick Solids Segmentation dialog box so you can set the segmentation to use for x-ray building. For more information, see “Setting the Segmentation” on page 21-7.
Prefs...	Sets projection preferences for lateral, frontal, and SMV x-rays. For more information, see “Setting Projection Preferences” on page 21-43.
Measure	Measure distances and angles on x-rays. When this box is checked, the following features become active: **2 Pt Line:** Measures the distance between two points. **3 Pt Angle:** Measures the angle between two lines. **Remove All:** Remove measurements from generated x-rays. For more information, see “Viewing Landmarks and Measurements” on page 21-46.
Show Landmarks	Projects and shows any digitized 3D landmarks onto generated lateral, frontal, and SMV x-rays. For more information, see “Viewing Landmarks and Measurements” on page 21-46.
Filters	Display the same x-ray view created using filters that emphasize different anatomical structures. For more information, see “Using Filters” on page 21-4.
Include “Traced” Filter	Enables the Traced filter for creating x-rays. Since creating an x-ray using this filter requires intensive use of computing resources, this filter is disabled by default. For more information, see “Using Filters” on page 21-4.
Dolphin 1 Level	Sets the transparency of the x-ray on the Dolphin 1 filter tab. The default is zero for maximum transparency in the image. Increase this number if the patient’s hard tissue is less dense to increase the opacity of the hard tissue for optimal x-ray visualization.
Sharpen	Adjusts the image sharpness.
Reset WL	Resets the window leveling to the default setting. For more information, see “Setting Window Leveling” on page 21-48.

For information on the arrow buttons and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Creating an X-ray View

To create an x-ray view:

1 Select the view from the **View** drop-down list.

The x-ray setup palette changes to reflect the view you select.

2 Set options for the x-ray view to create on the x-ray setup palette.

3 Click **Apply**.

The selected x-ray appears in the right side of the Build X-Rays Tool window. Dolphin 3D generates the x-ray using several filters (displayed as tabs). For more information, see “Using Filters” below.

Using Filters

To help emphasize different structures of interest, Dolphin 3D creates x-rays using several rendering filters, which appear as tabs on the Build X-Rays Tool window:

Dolphin 1, 2, and 3	Mimic traditional film x-ray images, balancing the clarity of anatomical structures for orthodontic and orthognathic surgery applications.
Ray-Sum	Creates x-rays with the Ray-sum (the academic standard) technique.
Emboss	Creates x-rays with an embossing effect, which throws the hard-tissue structures into relief.
Maximum Intensity Projection (MIP)	Creates x-rays with a volume rendering technique specially designed to emphasize high-intensity structures within the volumetric data.
Traced	Creates x-rays that focus on the outlines of anatomical structures. Since creating x-rays with this filter is computing-intensive, this filter is not enabled by default.

To display an x-ray view created with a different filter:

1 To display an x-ray created using the Traced filter, check the **Enable “Traced” method** box.

2 Click the tab for the filter to display.

Orienting the Volume on the Setup Palette

Before building x-rays for a patient, you may need to change the image orientation of the 3D volume so that the x-rays are created correctly. To orient the 3D volume, you rotate and spin the volume image on the setup palette. Then, you check the orientation from different angles to make sure that it’s correct.

Displaying the Hard and Soft Tissue

When creating a lateral, frontal, or SMV x-ray view, you can display either the patient's hard tissue or soft tissue image on the setup palette. Switching between the hard tissue or soft tissue may help you properly orient the volume for x-ray creation.

To change the view to hard or soft tissue:

1 Select **Hard Tissue** to view the hard tissue image.

Or,

Select **Soft Tissue** to view the soft tissue image.

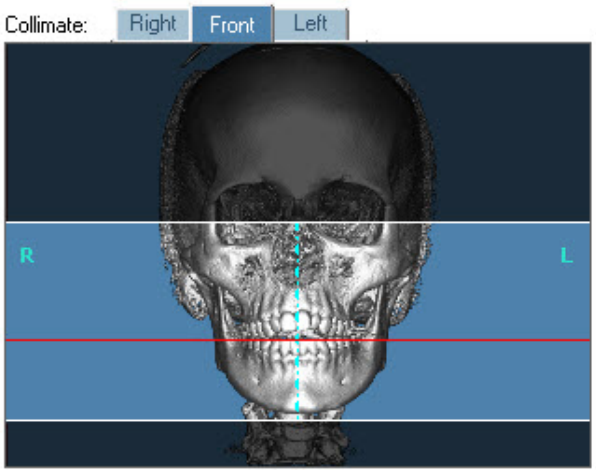
Moving the Midline

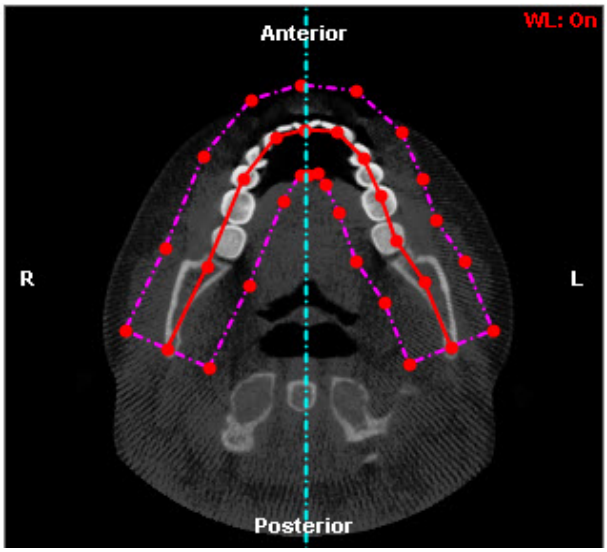
When creating a panoramic, cross-sections, or nerve canals view, you can use a blue midline as a guide when orienting the image. In the panoramic view, the midline appears both on the volume image at the top of the palette and on the Arch Path image below. In the cross-sections and nerve canals views, the midline only appears on the Arch Path image.

To move the blue midline:

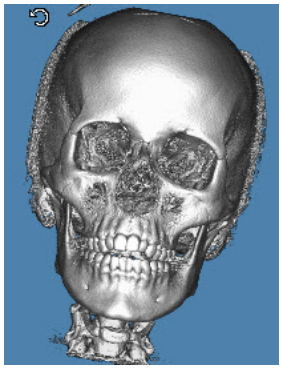
1 Click and drag the midline to a new location.

For example, on the panoramic view, you can place the midline at the mid-sagittal plane and check the volume's orientation using both images on the palette, as shown below:





Rotating and Spinning the Volume



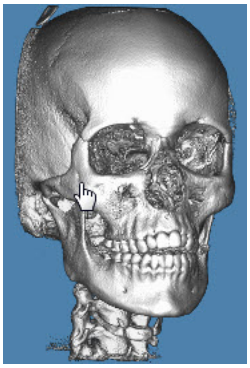
You can rotate the volume clockwise and counter-clockwise, and you can spin it around a horizontal or vertical axis.

To rotate the volume clockwise or counter-clockwise:

1 Place your mouse cursor over the edge of the image on the palette.

2 When your cursor turns into a rotation icon, click and drag to rotate the image clockwise or counter-clockwise (see right).

To spin the volume around a horizontal or vertical axis:



1 Click the hard or soft tissue image.

2 When your cursor turns into a hand pointer, drag the mouse left or right to spin the image around a vertical axis.

Or,

When your cursor turns into a hand pointer, drag the mouse up or down to spin the image around a horizontal axis.

To return to the original orientation:

1 Click **Reset Orientation**.

Checking the Orientation

The setup palette provides tabs that display the volume from different angles so that you can check its orientation. The tabs that are available depend in the x-ray view you selected from the **View** drop-down list.

To check the orientation:

1 Click the **Front** tab to check the orientation using the frontal view.

Or,

Click the **Right** tab to check the orientation using the right lateral view.

Or,

Click the **Left** tab to check the orientation using the left lateral view.

Or,

Click the **Bottom** tab to check the orientation using the bottom-up view.

The Context Menu

Once you have created an x-ray from the volume, you can right-click it to open the context menu that contains the following choices:

Close this Menu	Closes the context menu.
Save this Image to Dolphin Layout...	Saves the x-ray to a Dolphin image layout. For more information, see “Saving an X-ray” on page 21-49.
Send this Image to Report...	Sends this x-ray to a Dolphin 3D report. For more information, see Chapter 29, Reports.
Copy this Image to Clipboard	Copies the x-ray to the clipboard. For more information, see “Copying an X-ray to the Clipboard” on page 21-51.
Export this Image to File...	Exports the x-ray to a file on your computer. For more information, see “Exporting an X-ray” on page 21-52.
Print this Image...	Prints the x-ray on the designated printer. For more information, see “Printing an X-ray” on page 21-53.
Show/Hide Digitized Landmarks	Toggles the display of digitized landmarks on this x-ray. For more information, see “Viewing Landmarks and Measurements” on page 21-46.

If the x-ray view includes slices (for example, the TMJ, Cross Sections, or Nerve Canal views), you can right-click one of the slice images in the montage to open a context menu with the following additional options:

Save Highlighted Slice to Dolphin Layout...	Saves the selected slice to a Dolphin image layout. For more information, see “Saving an X-ray” on page 21-49.
Send Highlighted Slice to Report...	Sends this selected slice to a Dolphin 3D report. For more information, see Chapter 29, Reports.
Copy Highlighted Slice to Clipboard	Copies the selected slice to the clipboard. For more information, see “Copying an X-ray to the Clipboard” on page 21-51.
Export Highlighted Slice to File...	Exports the selected slice to a file on your computer. For more information, see “Exporting an X-ray” on page 21-52.
Print Highlighted Slice,,,	Prints the selected slice on the designated printer. For more information, see “Printing an X-ray” on page 21-53.
Show This Slice in a Large Window	Opens a window that displays a close-up of the selected slice. For more information, see “Viewing a Slice Close-up” on page 21-21

Setting the Segmentation

Before building x-rays, you should set the image segmentation to use for all x-ray types. Using the **Seg...** button on the Build X-Rays Tool window, you can set soft and hard tissue segmentation specifically for generating x-rays. For example, for the purposes of generating x-rays, the condyles should be included in the hard-tissue segment, whereas this is not as important for other purposes.

If you have not segmented the 3D image when you first open the Build X-Rays Tool window, the Quick Solids Segmentation dialog box opens automatically so that you can segment the image before building x-rays. Then, when you close the Build X-Rays Tool window, your quick segmentation is used automatically as the default for the 3D image. However, at any time, you can open the Solid Volume Segmentation dialog box to set the default segmentation for the 3D image.

If you have previously set the segmentation of the 3D image on the Solid Volume Segmentation dialog box and change it on the Quick Solids Segmentation dialog box, Dolphin Imaging gives you the opportunity to replace your original image segmentation with your quick segmentation when you close the Build X-Rays Tool window.

To set the segmentation:

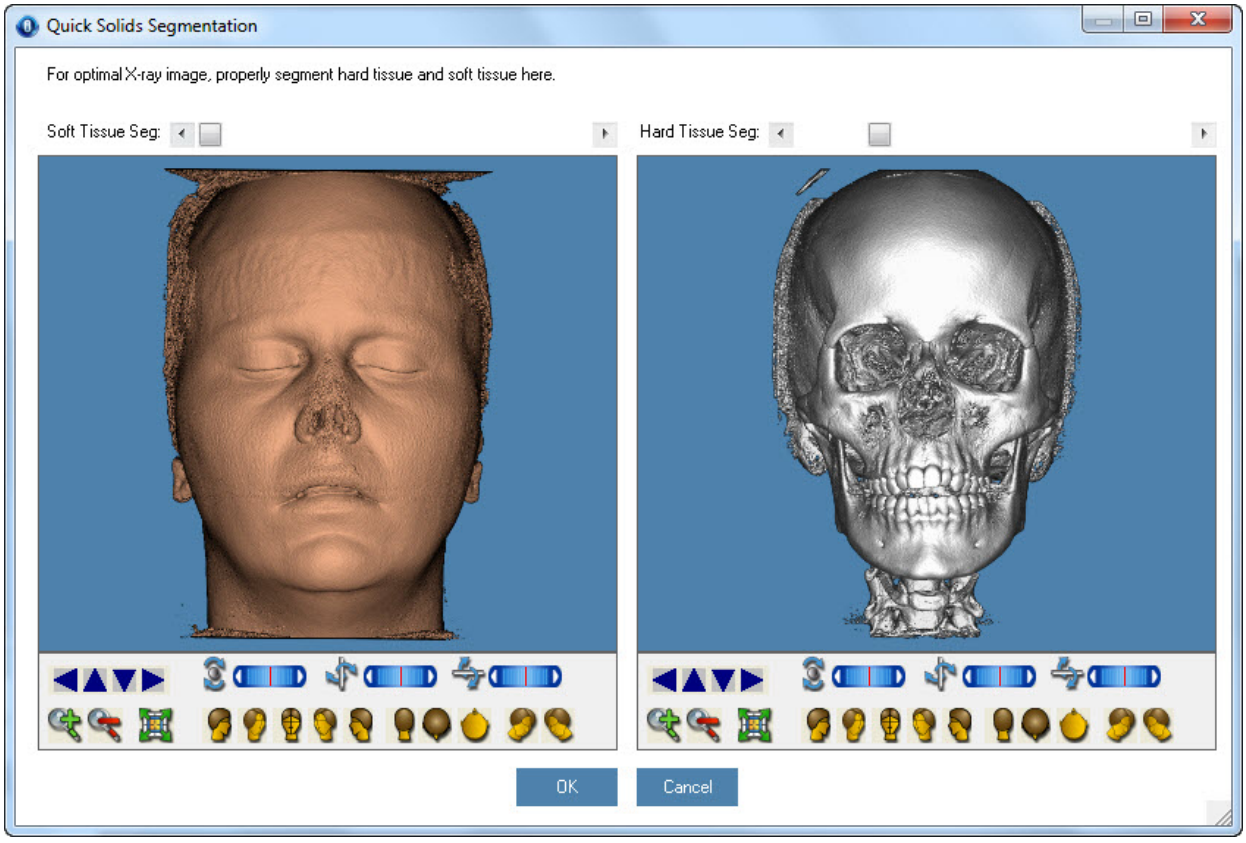
1 Click **Seg...** on the Build X-Rays Tool window.

The Quick Solids Segmentation dialog box opens.

2 Set the **Soft Tissue Seg** slider to identify the lower end of the density range to use for the patient's soft tissue.

3 Set the **Hard Tissue Seg** slider to identify the lower end of the density range to use for the patient's hard tissue.

4 Click **OK**.



Soft Tissue Seg	Identifies the lower end of the density range to use for soft tissue. For example, this slider would identify the boundary between the air and the patient's soft tissue.
Hard Tissue Seg	Identifies the lower end of the density range to use for hard tissue. For example, this slider would identify the boundary between the patient's soft tissue and hard tissue.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the images, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

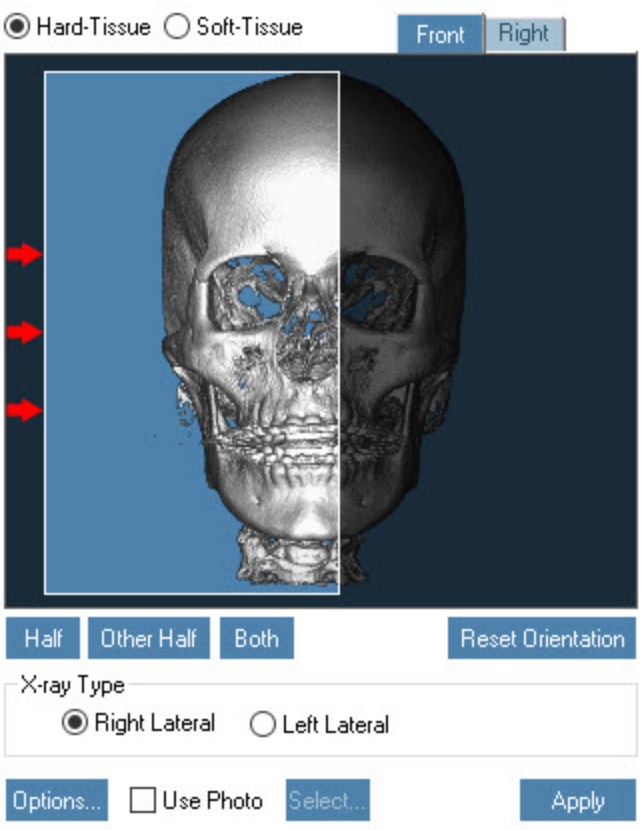
Building a Lateral X-ray

To build a lateral x-ray, you first enter setup options on the lateral x-ray setup palette. These options determine how the x-ray is created from the 3D volume.

To build a lateral x-ray:

1 Select **Lateral** from the **View** drop-down list on the Build X-Rays Tool window.

The lateral x-ray setup palette (see below) appears on the left side of the dialog box.



2 Set the x-ray orientation.

For more information, see “Orienting the Volume on the Setup Palette” on page 21-4.

3 Identify the part of the 3D volume to use to create the x-ray.

For more information, see “Selecting Part of the Volume for Lateral X-ray Building” on page 21-10.

4 Specify the type of x-ray to use as your default (either right lateral or left lateral).

For more information, see “Selecting the Lateral X-ray Type” on page 21-11.

5 Configure the projection and ruler options to use when creating the x-ray.

For more information, see “Selecting the Projection Type and Ruler Options” on page 21-44.

6 Click **Apply** to create the x-ray using the specified options.

The x-ray appears in the Build X-Rays Tool window.

Hard Tissue	Displays the patient's hard tissue image.
Soft Tissue	Displays the patient's soft tissue image.
Front	Frontal view.
Left/Right	Right or left lateral view.
Image	Previews the current orientation. The red arrows indicate the direction from which the x-ray will be taken.
Half	Selects the half of the volume typically used to create the selected x-ray type. For example, if you select **Right Lateral** as the x-ray type, this button selects the half of the volume on the patient's right.
Other Half	Selects the other half of the volume to create the selected x-ray type. For example, if you select **Right Lateral** as the x-ray type, this button selects the half of the volume on the patient's left.
Both	Selects both halves of the volume.
Reset Orientation	Sets the orientation to the default.
X-ray Type	Type of x-ray (either **Right Lateral** or **Left Lateral**) to create.
Options...	Opens the Lateral Options dialog box so you can select projection type and ruler options.
Use Photo	Overlays a patient photo or soft tissue surface (if available) on the x-ray. This is useful if the patient's soft tissue contours are difficult to see on the generated x-ray. **Select:** Selects the photo or surface to use. Only available if the patient has more than one photo or surface.
Apply	Applies the settings on the palette to build the x-ray image.

For more information on these controls, see "Orienting the Volume on the Setup Palette" on page 21-4, "Selecting Part of the Volume for Lateral X-ray Building" on page 21-10, "Selecting the Lateral X-ray Type" on page 21-11, "Selecting the Projection Type and Ruler Options" on page 21-44, and "Using a Photo or Surface" on page 21-12.

Selecting Part of the Volume for Lateral X-ray Building

When you build x-rays, you can use the entire 3D volume or you can select only part of the volume. Selecting part of the volume enables you to focus on particular areas of interest.

To select a part of the volume for x-ray building:

1 Click the **Front** tab if it isn't already selected.

2 Click **Half** to select the half of volume typically used to create the selected x-ray type.

Or,

Click **Other Half** to select the other half of volume.

Or,

Click **Both** to select both sides of the volume.

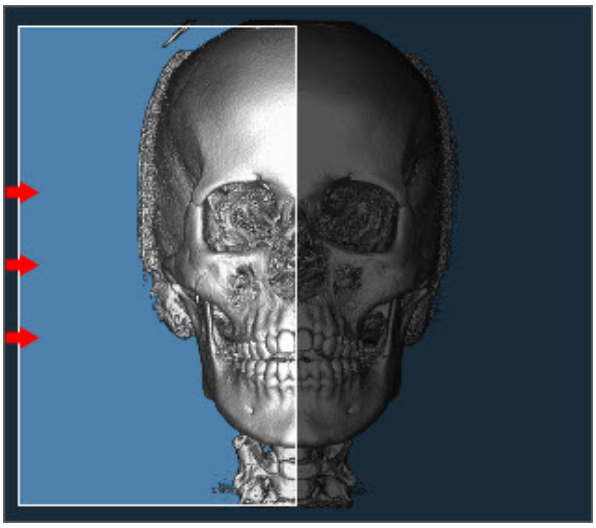
For example, if you select **Right Lateral** as the x-ray type, clicking **Half** selects the half of the volume on the patient's right, and clicking **Other Half** selects the half of the volume on the patient's left.

3 If you selected **Half** or **Other Half**, optionally click and drag the midline to identify one boundary of the part of the volume you want to select.

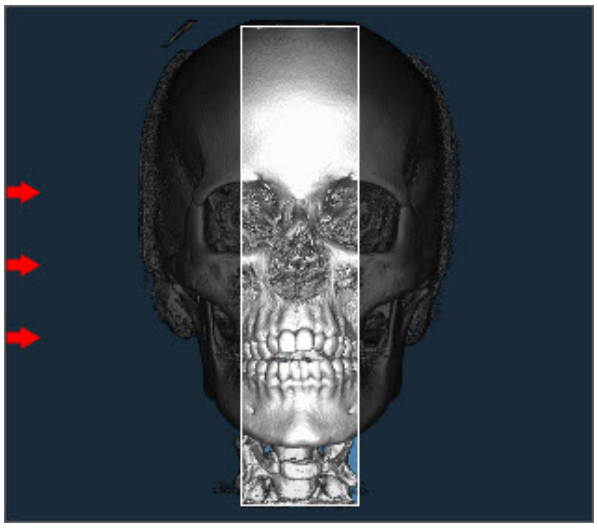
4 Optionally, click and drag the edges of the image to identify boundaries of the part of the volume you want to select.

The following figure illustrates picking different parts of the volume for x-ray building. The highlighted part of the image indicates the selected area.

Use the patient's right side to create the x-ray



Use the center of the volume to create the x-ray



Selecting the Lateral X-ray Type

You can create either a right lateral or left lateral x-ray.

To set the type of lateral x-rays to create:

1 Click **Right Lateral** to create lateral x-rays in which the patient's image faces right.

Or,

Click **Left Lateral** to create lateral x-rays in which the patient's image faces left.

Using a Photo or Surface

If a photo or soft tissue surface is available for the current patient and timepoint, you can overlay the photo or surface on lateral and frontal x-rays. This is useful if the patient's soft tissue contours are difficult to see on the generated x-ray.

To overlay the patient's photo or soft tissue surface:

1 Check the **Use Photo** box.

2 If the patient has more than a single photo or surface, select the one to use. Then, click **OK**.

3 Click **Apply** to create the x-ray with the selected photo or surface.

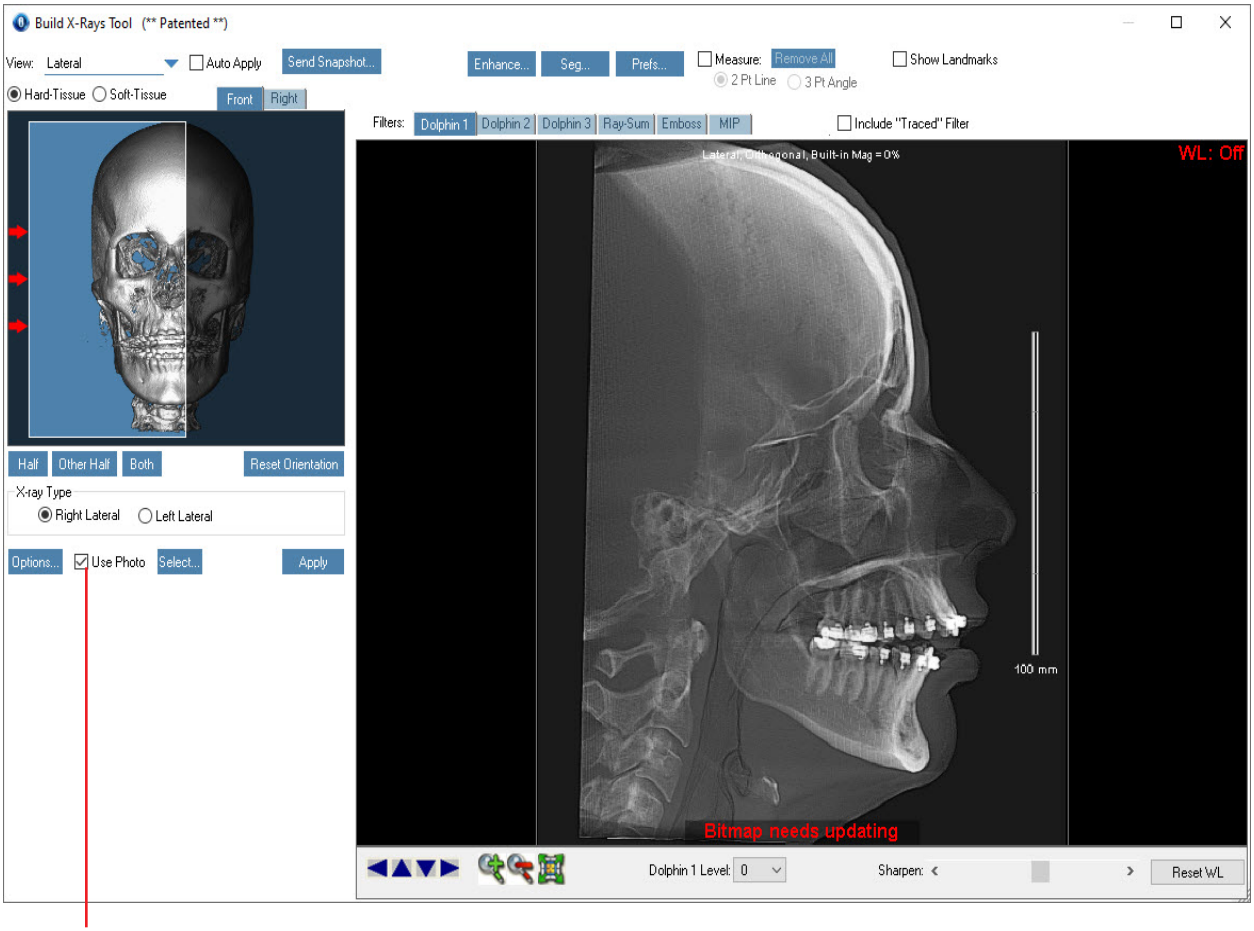
To choose a different photo or surface:

1 Click **Select**.

The **Select** button only appears if the patient has more than one photo or surface.

2 Select the photo or surface to use, and click **OK**.

3 Click **Apply** to create the x-ray with the selected photo or surface.



Check this box to overlay a photo or surface

Building a Panoramic X-ray

To build a panoramic x-ray, you first enter setup options on the panoramic x-ray setup palette. These options determine how the x-ray is created from the 3D volume.

To build a panoramic x-ray:

1 Select **Panoramic** from the **View** drop-down list on the Build X-Rays Tool window.

The panoramic x-ray setup palette opens (see right).

2 Set the x-ray orientation.

For more information, see “Orienting the Volume on the Setup Palette” on page 21-4.

3 Identify the occlusal plane.

For more information, see “Identifying the Occlusal Plane” on page 21-14.

4 Identify the part of the 3D volume to use to create the x-ray.

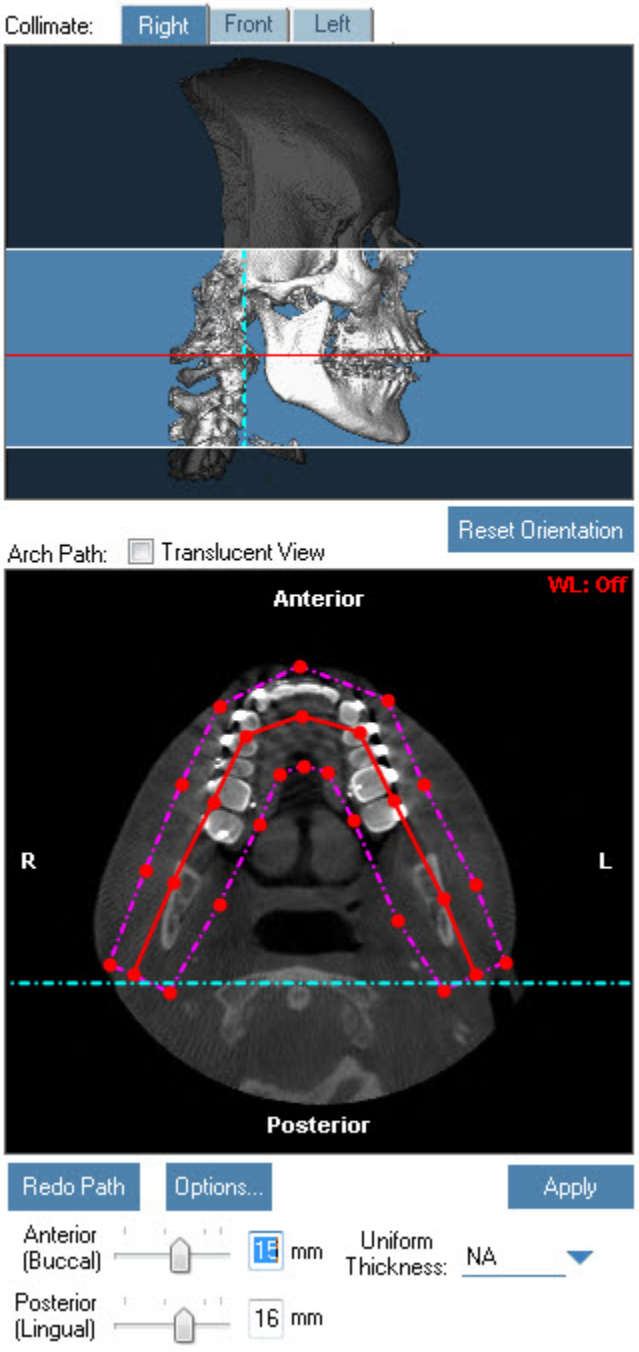
For more information, see “Selecting Part of the Volume for Panoramic X-ray Building” on page 21-15.

5 Configure the projection and ruler options to use when creating the x-ray.

For more information, see “Setting Panoramic Advanced Options” on page 21-17.

6 Click **Apply** to create the x-ray using the specified options.

The x-ray appears in the Build X-Rays Tool window.



Right	Right lateral view.
Front	Frontal view.
Left	Left lateral view.
Collimate Image	Previews the current orientation and the height of the panoramic x-ray. You can use the blue lines as guides in orienting the image. The red line identifies the volume slice shown in the Arch Path image. ***Note:*** *The red line does not appear if you are using the translucent view for the arch path image. In the translucent view, the arch path image is constructed from the entire volume.*
Reset Orientation	Sets the orientation to the default.
Arch Path: Translucent View	Displays a translucent view in the arch path image.
Arch Path Image	Volume slice identified by the red line on the Collimate image. You use this image to specify a projection path and set the depth of the volume used to create the panoramic x-ray.
Redo Path	Erases your current projection path.
Options...	Sets options for the ruler and projection path.
Apply	Applies the settings on the palette to build the x-ray image.
Anterior (Buccal)	Sets the width of the area on the anterior side of the projection path to use when creating the x-ray image.
Posterior (Lingual)	Sets the width of the area on the posterior side of the projection path to use when creating the x-ray image.
Uniform Thickness	Total width (in millimeters) of the area surrounding the projection path to use when creating the x-ray image. Both the **Anterior (Buccal)** and **Posterior (Lingual)** sliders are set automatically to one-half the selected width.

For more information on these controls, see “Orienting the Volume on the Setup Palette” on page 21-4, “Selecting Part of the Volume for Panoramic X-ray Building” on page 21-15, and “Setting Panoramic Advanced Options” on page 21-17.

Identifying the Occlusal Plane

During this step, you position the red horizontal guideline at the occlusal plane unless you are using the Translucent View of the Arch Path image.

To move the red horizontal guideline (not applicable when using the Translucent View of the Arch Path image):

1 Click and drag the guideline to a new location.

Or,

Place your mouse over the Collimate image, and use the wheel on your mouse to move the red guideline.

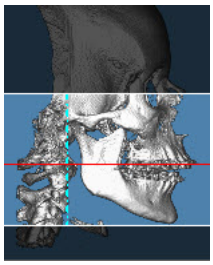
To zoom the Arch Path image on the palette:

1 Place your mouse over the Arch Path image, and use the wheel on your mouse to change the magnification.

Selecting Part of the Volume for Panoramic X-ray Building

On the panoramic x-ray image palette, you identify the height of the panoramic x-ray and the projection path used to create it.

Setting the X-ray Height



To set the height of the x-ray:

1 On the Collimate image, click and drag the edges of the highlighted portion of the image to identify the part of the volume to include in the panoramic x-ray.

The x-ray will include the highlighted portions of the image.

Drawing the Projection Path

To set the projection path:

1 Optionally, check the **Arch Path: Translucent View** box to use a translucent view when drawing the projection path.

2 On the Collimate image, click and drag the red cross-section line so that the patient's teeth are clearly visible in the Arch Path image.

In most cases, you use the patient's upper arch as a guide to specify the projection path.

Note: *The red line does not appear if you are using the translucent view for the Arch Path image. In the translucent view, the Arch Path image is constructed from the entire volume.*

3 On the Arch Path image, click the location where you want the projection path to begin.

A red point appears on the image.

4 Release the mouse button and move the mouse to begin drawing the path.

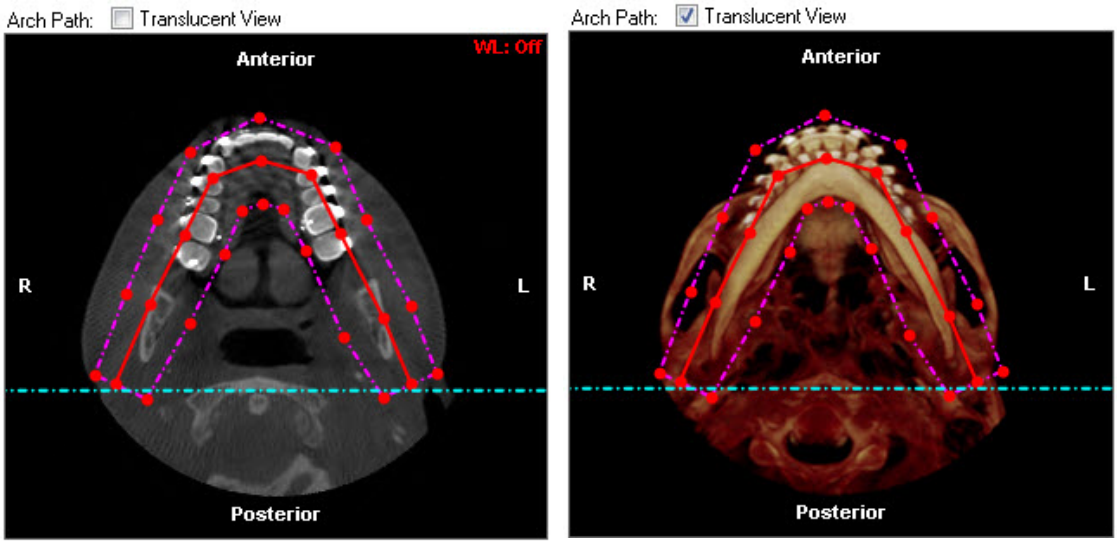
As you move the mouse, you'll see a line extending from the point to the current mouse position.

5 Click whenever you want to place a point and change the direction of the line.

6 To complete the projection path, double-click the end of the path.

A pink polygon appears indicating a cross-section of the part of the volume that will be included.

In the following figure, the image on the left illustrates the arch path with the **Translucent View** box unchecked. The image on the right illustrates the arch path with the **Translucent View** box checked.



Once you have drawn the protection path, you can move points along it to fine tune it.

To fine tune the protection path:

1 Click and drag one or more of the red points along the projection path.

To erase your projection path and begin again:

1 Click **Redo Path** to erase both the red projection path and the pink polygon.

Setting the Thickness

To adjust the thickness of the volume used for the x-ray:

1 Move the **Anterior (Buccal)** and **Posterior (Lingual)** sliders to set the width of the selected area on either side of the projection path.

Or,

Select a total width in millimeters from the **Uniform Thickness** drop-down list to select an area of the same thickness on either side of the projection path.

For example, if you select **14 mm** from the **Uniform Thickness** drop-down list, both the **Anterior (Buccal)** and **Posterior (Lingual)** sliders are set automatically to 7 mm.

Setting Panoramic Advanced Options

To set panoramic advanced options:

1 Click **Options...**.

The Panoramic Advanced Options dialog box opens.

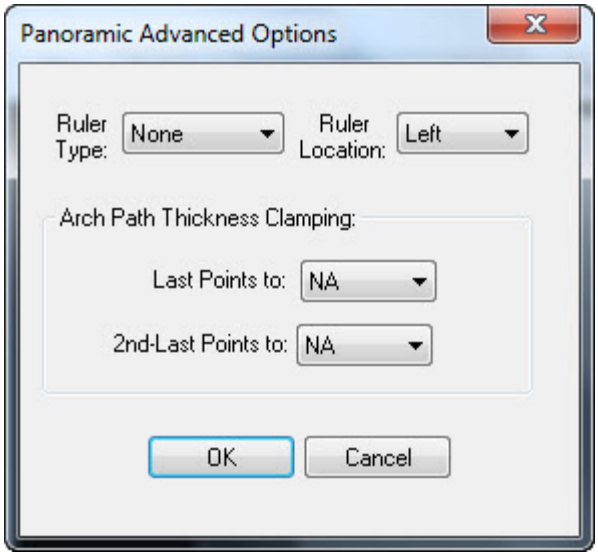
2 Use the **Ruler Type** drop-down list to specify the type of ruler to display on the x-ray.

3 Use the **Ruler Location** drop-down list to set the location for the ruler on the x-ray.

4 In the Arch Path Thickness Clamping group box, set the thickness of the volume used at the last and next to last points at either end of the projection path to create the volume.

For example, you can use a narrower area to create the x-ray at the ends of the projection path.

5 Click **OK**.



Ruler Type	Type of ruler to display on the x-ray: • **Tickmarks:** Displays the ruler. • **100 mm bar:** Displays a solid bar 100 millimeters in length. • **None:** Suppresses display of the ruler.
Ruler Location	Location for the ruler on the x-ray (Left, Right, Top, or Bottom).
Last Points to	Width in millimeters to use on either side of the projection path at the points at either end of the path.
2nd Last Points to	Width in millimeters to use on either side of the projection path at the next to last point at either end of the path.

Building an X-ray View of the TMJ Area

The TMJ view is a series of x-ray images, each representing a slice of the volume in the temporomandibular joint area. To build an x-ray view of the TMJ area, you first enter setup options on the TMJ setup palette. These options determine how the x-ray images are created from the 3D volume.

To build an x-ray view of the TMJ area:

1 Select **TMJ** from the **View** drop-down list on the Build X-Rays Tool window.

The TMJ x-ray setup palette opens (see right).

2 Set the x-ray orientation.

For more information, see “Orienting the Volume on the Setup Palette” on page 21-4.

3 Identify the occlusal plane.

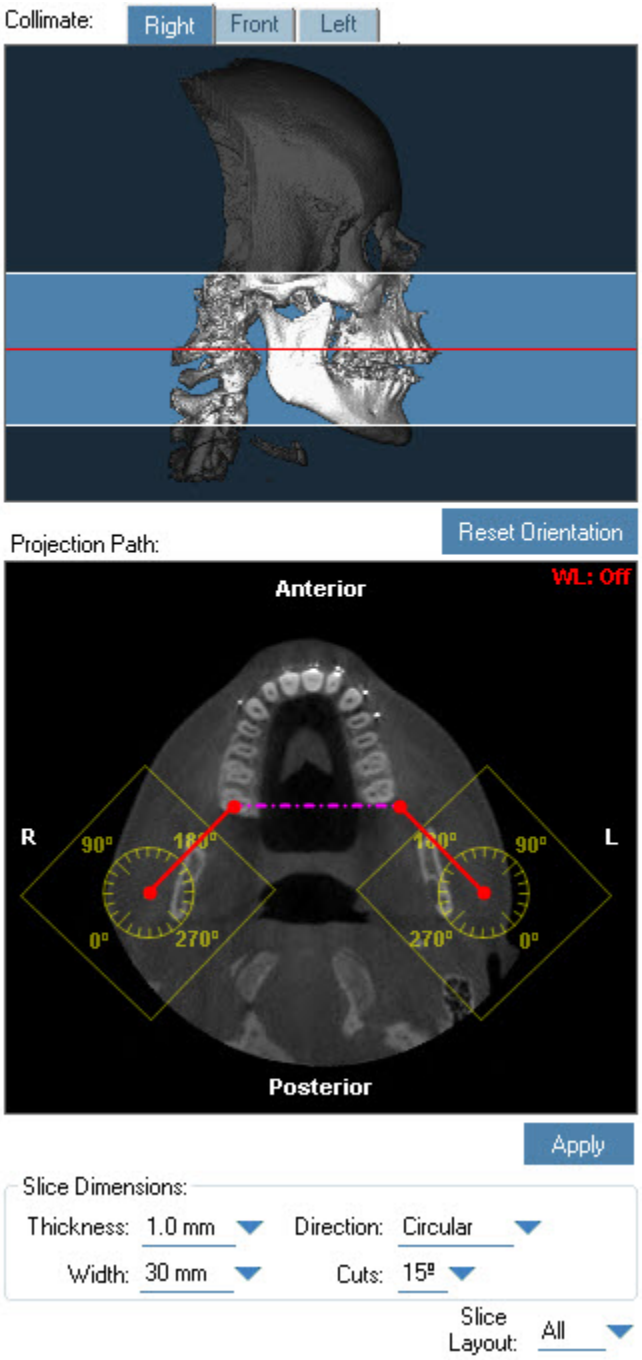
For more information, see “Identifying the Occlusal Plane” on page 21-19.

4 Identify the part of the 3D volume to use to create the x-ray view.

For more information, see “Selecting Part of the Volume for TMJ X-ray Building” on page 21-20.

5 Click **Apply** to create the TMJ view x-rays using the specified options.

The TMJ view appears in the Build X-Rays Tool window.



Right	Right lateral view.
Front	Frontal view.
Left	Left lateral view.
Collimate Image	Previews the current orientation and the height of the x-ray. You can use the blue lines as guides in orienting the image. The red line identifies the volume slice shown in the Arch Path image.
Reset Orientation	Sets the orientation to the default.
Arch Path Image	Volume slice identified by the red line on the Collimate image. You use this image to specify a projection path and set the depth of the volume used to create the x-ray.
Apply	Applies the settings on the palette to build the x-ray image.
Thickness	Thickness for each slice to create in the TMJ view.
Direction	Direction of the slices (**Coronal**, **Sagittal**, or **Circular**).
Width	Width for each slice image to create in the TMJ view.
Cuts	Number of slices to create. Each cut results in one image for each temporomandibular joint. For example, selecting **8** creates 16 images, 8 for the left side and 8 for the right side.
Slice Layout	Layout for the slice images. For information on viewing the close-ups of the slices, see “Viewing a Slice Close-up” on page 21-21.

For more information on these controls, see “Orienting the Volume on the Setup Palette” on page 21-4, “Identifying the Occlusal Plane” below, “Selecting Part of the Volume for TMJ X-ray Building” on page 21-20, and “Viewing a Slice Close-up” on page 21-21.

Identifying the Occlusal Plane

During this step, you position the red horizontal guideline at the occlusal plane.

To zoom the bottom image on the palette:

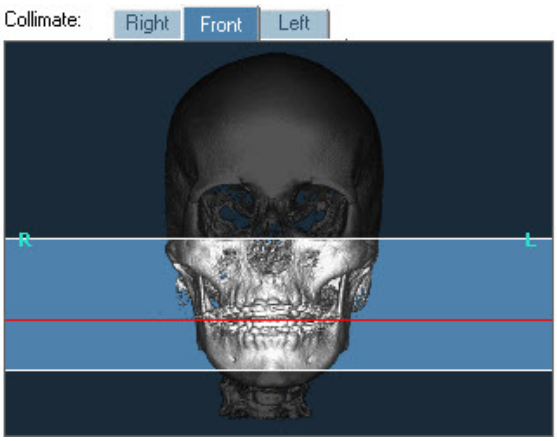
1 Place your mouse over the bottom image, and use the wheel on your mouse to change the magnification.

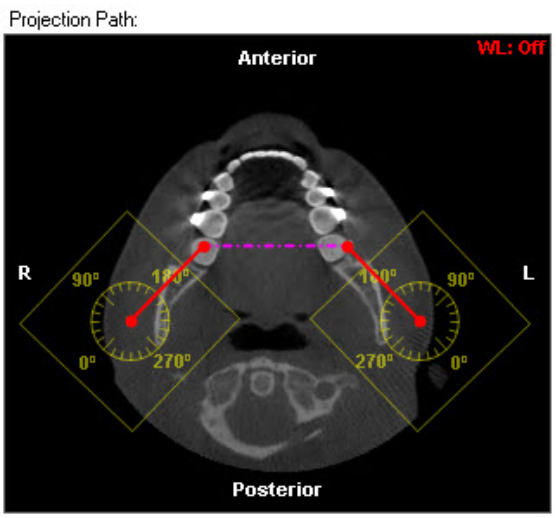
To move the red horizontal guideline:

1 Click and drag the guideline to a new location.

Or,

Place your mouse over the top image, and use the wheel on your mouse to move the red guideline.

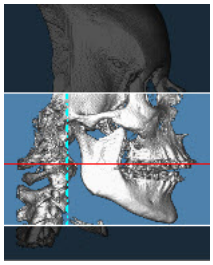




Selecting Part of the Volume for TMJ X-ray Building

On the TMJ x-ray image palette, you identify the height of the x-rays, and the projection path and slices used to create them. You also specify the layout to use to view them.

To set the height of the x-ray:



1 On the Collimate image, click and drag the edges of the highlighted portion of the image to identify the part of the volume to include in the x-rays.

   The x-rays will include the highlighted portions of the image.

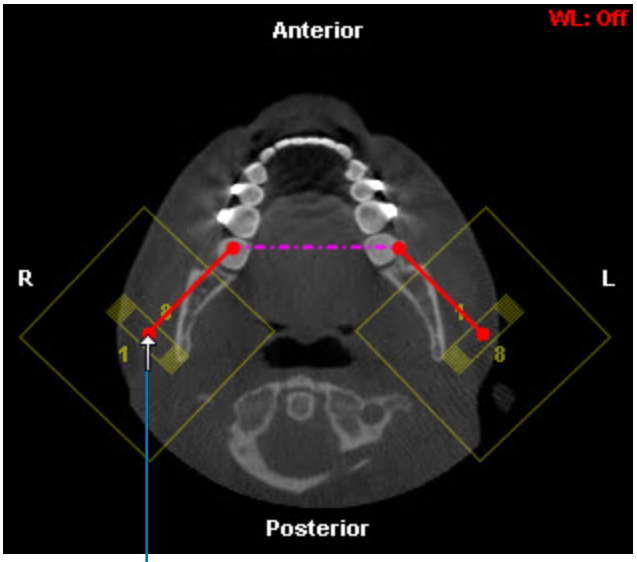
To set the projection path:

1 On the Collimate image, click and drag the red cross-section line so that the patient's teeth are clearly visible in the Arch Path image.

   In most cases, you use the patient's upper arch as a guide to specify the projection path.

2 On the Projection Path image, click and drag the red points to identify the projection path.

   Click and drag when the mouse pointer turns into an arrow, as shown below.



Click and drag when the mouse pointer turns into an arrow

3 In the Slice Dimensions group box, set the thickness, width, direction, and number of cuts for the slices to create.

4 Optionally, select the layout to use for viewing the slices from the **Slice Layout** drop-down list.

5 Click **Apply** to create the TMJ view.

The right side of the Build X-Rays Tool window splits into two views. You can now examine the series of slices and analyze the temporomandibular joint.

Viewing a Slice Close-up

Once you have created a slice montage, you can view a close-up of a single slice.

To view a slice close-up:

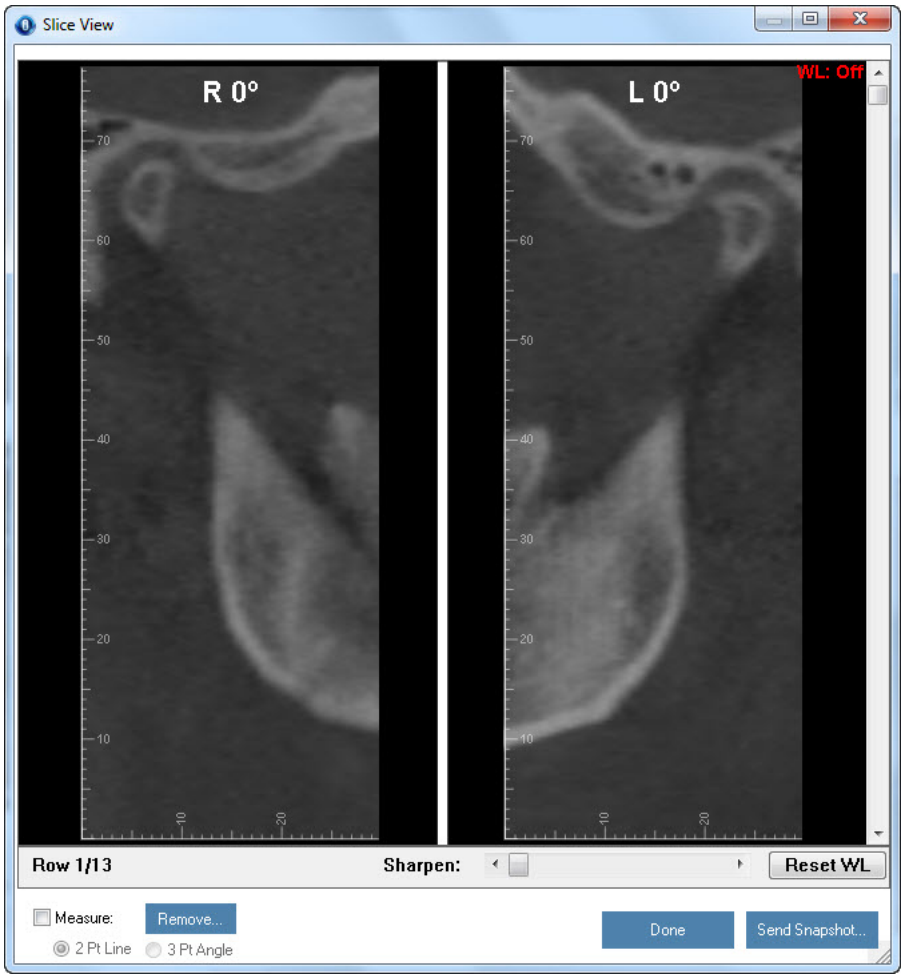
1 Right-click a slice in the montage.

2 Select **Show This Slice in a Large Window**.

The Slice View window opens.

To view another slice in the Slice View window:

1 Use the scrollbar or the middle mouse scroll wheel.



Sharpen	Sharpens the image.
Reset WL	Resets the window leveling to the default setting. For more information, see “Setting Window Leveling” on page 21-48.
Measure	Takes measurements on the image. **2 Pt Line:** Take measurements using lines. **3 Pt Angle:** Take measurements using angles. **Remove...:** Removes measurement lines and/or angles. Choose one of the following: • **Measurements from the current slice only:** Remove measurement lines and/or angles only from the slice displayed in the Slice View window. • **Measurements from all slices:** Remove measurement lines and/or angles from all slices.

Send Snapshot...	Opens a menu with the following options: **Close This Menu:** Closes the menu. **Save To Dolphin Layout/Database:** Saves the x-ray to a slot in a Dolphin image layout and store it in your database. For more information, see "Saving an X-ray" on page 21-49. **Send To Report:** Uses this x-ray in a Dolphin 3D report. For more information, see Chapter 29, Reports. **Copy To Clipboard:** Copies the x-ray to the clipboard. Then, you can paste the image into another application. For more information, see "Copying an X-ray to the Clipboard" on page 21-51. **Print:** Prints the x-ray. For more information, see "Printing an X-ray" on page 21-53. **Export To File:** Exports the x-ray to a file. For more information, see "Exporting an X-ray" on page 21-52.

To take a measurement using a line:

1 Check the **Measure** box.

2 Select **2 Pt Line** to take measurements using lines.

.Or,

Select **3 Pt Angle** to take measurements using angles.

3 Click two points on the image to identify the beginning and end of the line.

Or,

4 Click three points on the image to identify the two lines and vertex of the angle.

Dolphin 3D draws a line or angle using the points you identified and displays the measurement.

To remove lines, angles, and measurements:

1 Click **Remove...**.

2 Select **Measurements from the current slice only** to remove measurement lines and/or angles only from the slice displayed in the Slice View window.

Or,

Select **Measurements from all slices** to remove measurement lines and/or angles from all slices.

3 If you selected **Measurements from all slices**, click **Yes** in the confirmation dialog box that appears.

Building a Cross-Sections X-ray View

A cross-sections view is a series of x-ray images, each representing a slice of the volume in a specific area. Dolphin 3D offers three cross-sections views, enabling you to generate three sets of cross-section images:

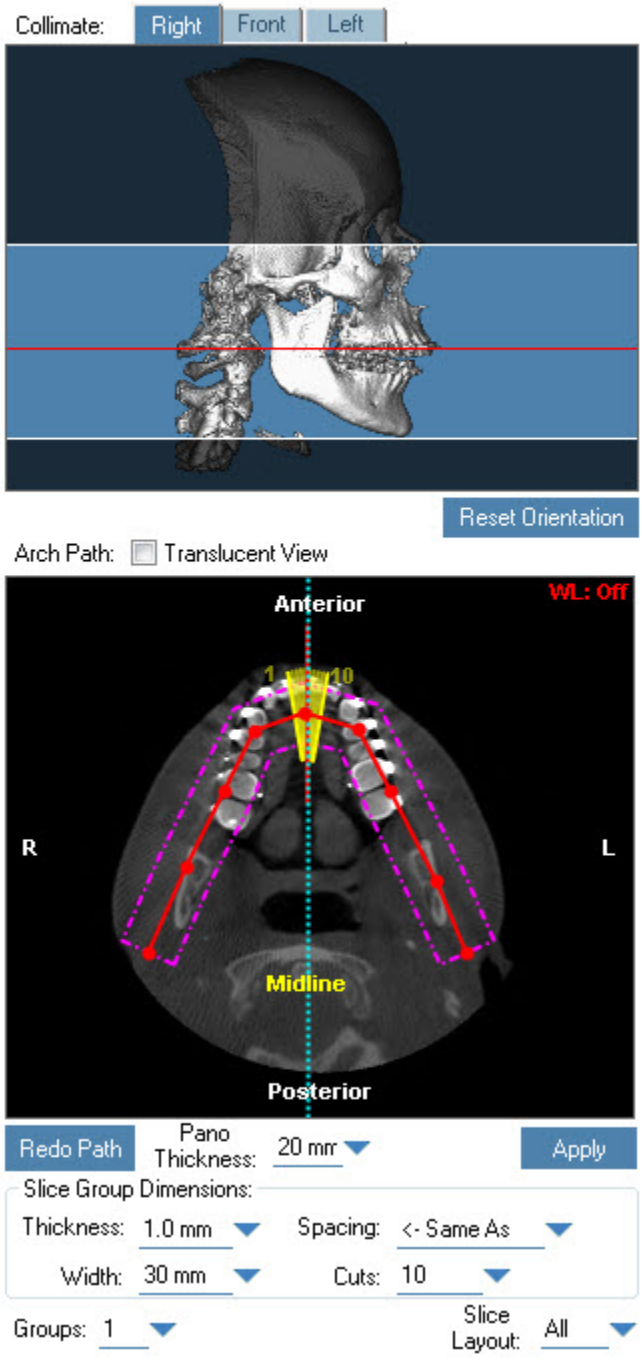
Cross Sections	Cross-section images of both the upper and lower arches.
Cross Sections Upper	Cross-section images of the upper arch.
Cross Sections Lower	Cross-section images of the lower arch.

You build these three views in the same way. The only difference is the part of the volume you select for x-ray building.

To build a cross-sections x-ray view:

1 Select **Cross Sections**, **Cross Sections Upper**, or **Cross Sections Lower** from the **View** drop-down list on the Build X-Rays Tool window.

The cross-sections x-ray setup palette opens (see right).



2 Set the x-ray orientation.

For more information, see “Orienting the Volume on the Setup Palette” on page 21-4.

3 Identify the occlusal plane.

For more information, see “Identifying the Occlusal Plane” on page 21-25.

4 Identify the part of the 3D volume to use to create the x-ray view.

For more information, see “Selecting Part of the Volume for Cross-Section X-ray Building” on page 21-26.

5 Click **Apply** to create the cross-section view x-rays using the specified options.

The cross-section view appears in the Build X-Rays Tool window.

Right	Right lateral view.
Front	Frontal view.
Left	Left lateral view.
Collimate Image	Previews the current orientation and the height of the x-ray. You can use the blue lines as guides in orienting the image. The red line identifies the volume slice shown in the Arch Path image. ***Note:*** *The red line does not appear if you are using the translucent view for the Arch Path image. In the translucent view, the Arch Path image is constructed from the entire volume.*
Reset Orientation	Sets the orientation to the default.
Arch Path: Translucent View	Displays a translucent view in the Arch Path image.
Arch Path Image	Volume slice identified by the red line on the Collimate image. You use this image to specify a projection path and set the depth of the volume used to create the x-ray images.
Redo Path	Erases your current projection path.
Pano Thickness	Total width (in millimeters) of the area surrounding the projection path.
Apply	Applies the settings on the palette to build the x-ray images.
Thickness	Thickness for each slice to create in the cross-section view.
Spacing	Spacing for the slice group. **<-Same As:** Sets **Spacing** and **Thickness** to the same value.
Width	Width for each slice image to create in the cross-sections view.
Cuts	Number of slices to create if you specified uniform spacing. Select the number of degrees for each slice if you selected circular spacing. Each cut results in one image.
Groups	Number of slice groups to use.
Slice Layout	Layout for the slice images.

For more information on these controls, see “Orienting the Volume on the Setup Palette” on page 21-4, “Identifying the Occlusal Plane” below, “Selecting Part of the Volume for Cross-Section X-ray Building” on page 21-26, and “Viewing a Slice Close-up” on page 21-21.

Identifying the Occlusal Plane

During this step, you position the red horizontal guideline at the occlusal plane unless you are using the Translucent View of the Arch Path image.

To zoom the bottom image on the palette:

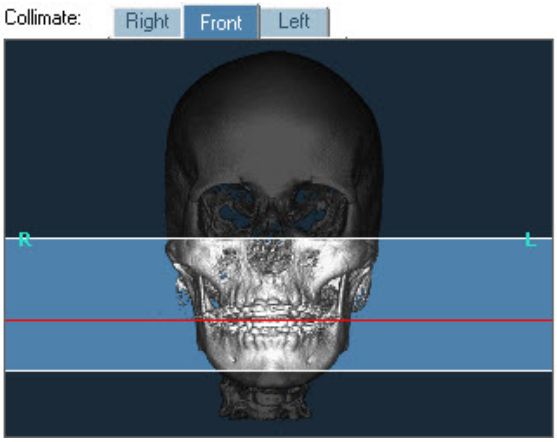
1 Place your mouse over the bottom image, and use the wheel on your mouse to change the magnification.

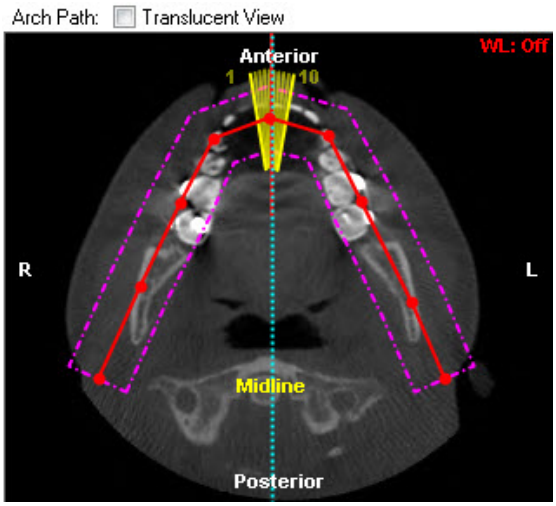
To move the red horizontal guideline (not applicable when using the Translucent View of the Arch Path image):

1 Click and drag the guideline to a new location.

Or,

Place your mouse over the top image, and use the wheel on your mouse to move the red guideline.





Selecting Part of the Volume for Cross-Section X-ray Building

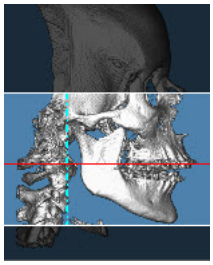
On the Cross-Section x-ray image palette, you identify the height of the x-rays, and the projection path and slices used to create them. You also specify the layout to use to view them.

Setting the X-ray Height

To set the height of the x-ray:

1 On the Collimate image, click and drag the edges of the highlighted portion of the image to identify the part of the volume to include in the x-rays.

The x-rays will include the highlighted portions of the image.



Setting Cross-section Options

To set options for your custom cross-section:

1 On the Collimate image, click and drag the red horizontal guideline so that the patient's arch appears in the Arch Path image.

Note: *The red line does not appear if you are using the translucent view for the Arch Path image. In the translucent view, the Arch Path image is constructed from the entire volume.*

2 From the **Pan Thickness** drop-down list, select the total width (in millimeters) for the area surrounding the projection path.

3 In the Slice Group Dimensions group box, specify the following options for creating slices for your custom cross-sections of the volume.

Thickness	Thickness for each slice to create in the cross-section view.
Spacing	Type of spacing (**Uniform** or **Circular**) for the slice group.
Width	Width for each slice image to create in the cross-section view.
Cuts	Number of slices to create if you specified uniform spacing. Select the number of degrees for each slice if you selected circular spacing. Each cut results in one image.

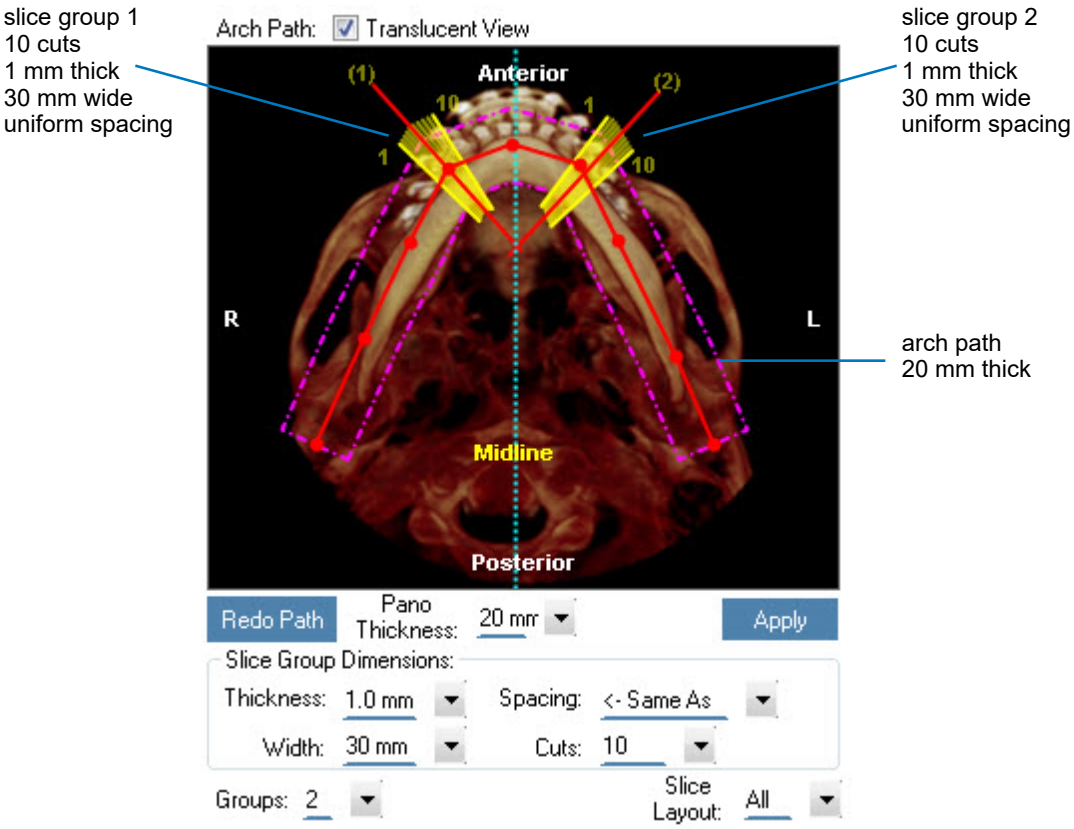
4 From the **Groups** drop-down list, specify how many slice groups to use.

Each slice group is created using the options specified in the Slice Group Dimensions group box.

Drawing the Projection Path

For information on how to draw a projection path, see “Drawing the Projection Path” on page 21-15.

Once you have drawn the projection path, a pink polygon appears indicating a cross-section of the part of the volume that will be included in the x-rays. A yellow representation of the slices created using the options specified in the Slice Group Dimensions group box and the **Groups** drop-down list also appears, as illustrated below. The following figure illustrates the arch path with the **Translucent View** box checked:



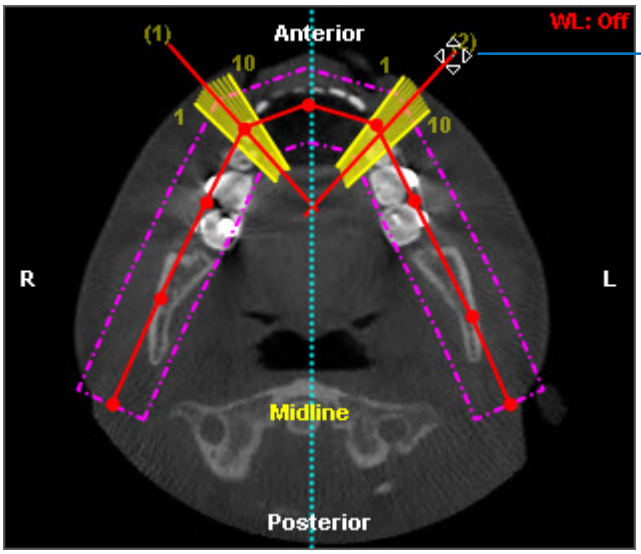
Moving Slice Groups

Initially, the slice groups are in default positions. However, you can easily change the location of the slice groups to create a custom cross-section view.

To move a slice group:

1 Click and drag the red line for a slice group to a different location along the arch path.

Click and drag when your mouse pointer turns into four triangles, as illustrated below. The following figure illustrates the arch path without the **Translucent View** box checked.



click and drag to move slice group 2

Creating the Cross-section View

To create your custom cross-section view:

1 Optionally, select the layout to use for viewing the slices from the **Slice Layout** drop-down list.

2 Click **Apply**.

The image is displayed in the upper right portion of the Build X-Rays dialog box, and each numbered slice is displayed in the lower right portion of the dialog box. For information on viewing the close-ups of the slices, see “Viewing a Slice Close-up” on page 21-21.

Building a Nerve Canals X-ray View

A nerve canals view is a series of x-ray images, each representing a slice of the volume in a specific area, with the nerve canals marked.

Note: *Once you have marked the nerve canals, you can view them on the patient's hard tissue image in the main Dolphin 3D window. For more information, see "Viewing Nerve Canals" on page 19-42*

To build a nerve canals view, you first enter setup options on the nerve canals setup palette. These options determine how the x-ray images are created from the 3D volume.

To build a nerve canals x-ray view:

1 Select **Nerve Canals** from the **View** drop-down list on the Build X-Rays Tool window.

The nerve canals x-ray setup palette opens (see right).

2 Set the x-ray orientation.

For more information, see "Orienting the Volume on the Setup Palette" on page 21-4.

3 Identify the occlusal plane.

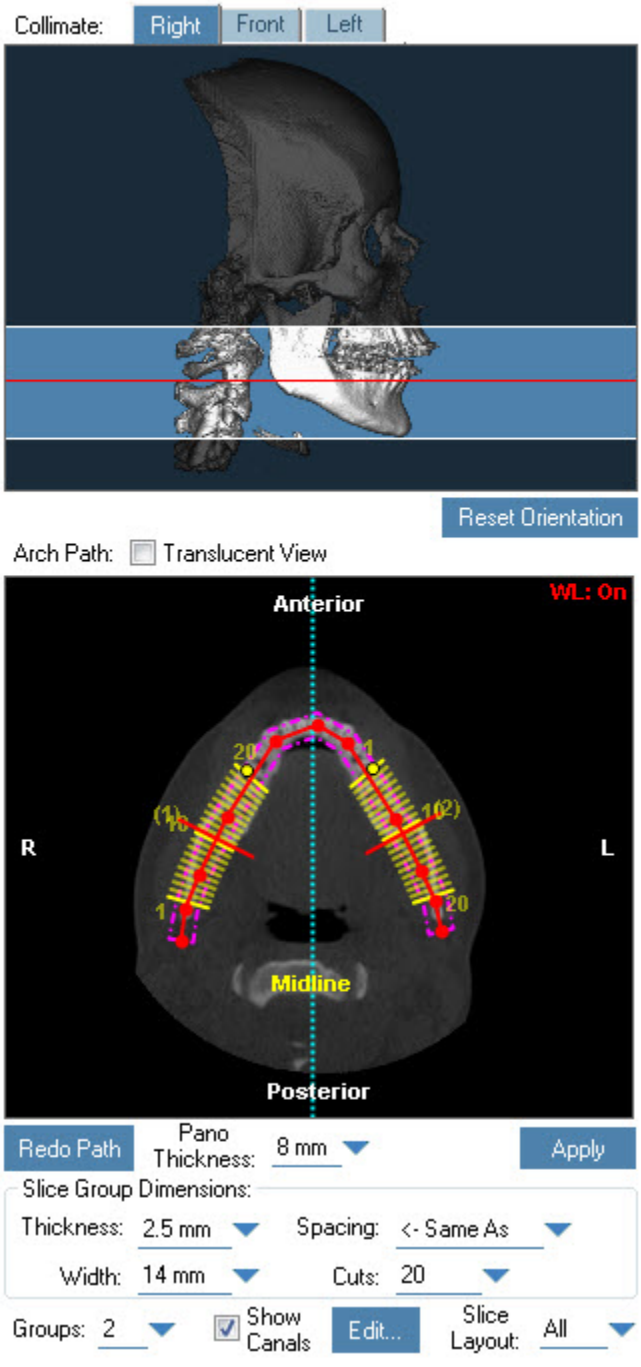
For more information, see "Identifying the Occlusal Plane" on page 21-31.

4 Identify the part of the 3D volume to use to create the x-ray view.

For more information, see "Selecting Part of the Volume for Nerve Canals X-ray Building" on page 21-35.

5 Click **Apply** to create the nerve canals view x-rays using the specified options.

The nerve canals view appears in the Build X-Rays Tool window.



Right	Right lateral view.
Front	Frontal view.
Left	Left lateral view.
Collimate Image	Previews the current orientation and the height of the x-ray. You can use the blue lines as guides in orienting the image. The red line identifies the volume slice shown in the Arch Path image. ***Note:*** *The red line does not appear if you are using the translucent view for the Arch Path image. In the translucent view, the Arch Path image is constructed from the entire volume.*
Arch Path: Translucent View	Displays a translucent view in the Arch Path image.
Reset Orientation	Sets the orientation to the default.
Arch Path Image	Volume slice identified by the red line on the Collimate image. You use this image to specify a projection path and set the depth of the volume used to create the x-ray images.
Redo Path	Erases your current projection path.
Pano Thickness	Total width (in millimeters) of the area surrounding the projection path.
Apply	Applies the settings on the palette to build the x-ray images.
Thickness	Thickness for each slice to create in the nerve canals view.
Spacing	Spacing for the slice group. **<-Same As:** Sets **Spacing** and **Thickness** to the same value.
Width	Width for each slice image to create in the nerve canals view.
Cuts	Number of slices to create. Each cut results in one image.
Groups	Number of slice groups to use.
Show Canals	Displays the nerve canals on the Arch Path image.
Edit...	Opens the Nerve Canal Editing dialog box so that you can specify the width, color, and transparency of the nerve canal marker. You can also specify whether or not to mark the mental foramina.
Slice Layout	Layout for the slice images.

For more information on these controls, see “Orienting the Volume on the Setup Palette” on page 21-4, “Identifying the Occlusal Plane” below, “Marking the Mental Foramina” on page 21-32, “Marking the Nerve Canals” on page 21-33, and “Selecting Part of the Volume for Nerve Canals X-ray Building” on page 21-35.

Identifying the Occlusal Plane

During this step, you can position the red horizontal guideline (unless you are using the Translucent View of the Arch Path image) and optionally display and position the midline.

To zoom the bottom image on the palette:

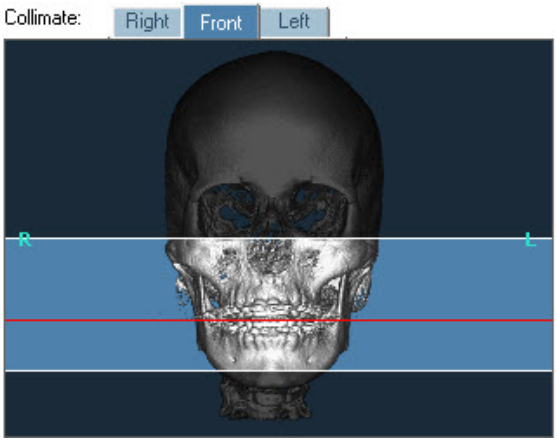
1 Place your mouse over the bottom image, and use the wheel on your mouse to change the magnification.

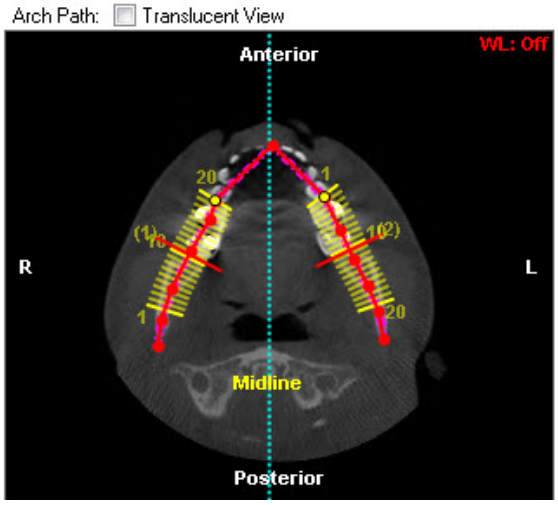
To move the red horizontal guideline (not applicable when using the Translucent View of the Arch Path image):

1 Click and drag the guideline to a new location.

Or,

Place your mouse over the top image, and use the wheel on your mouse to move the red guideline.

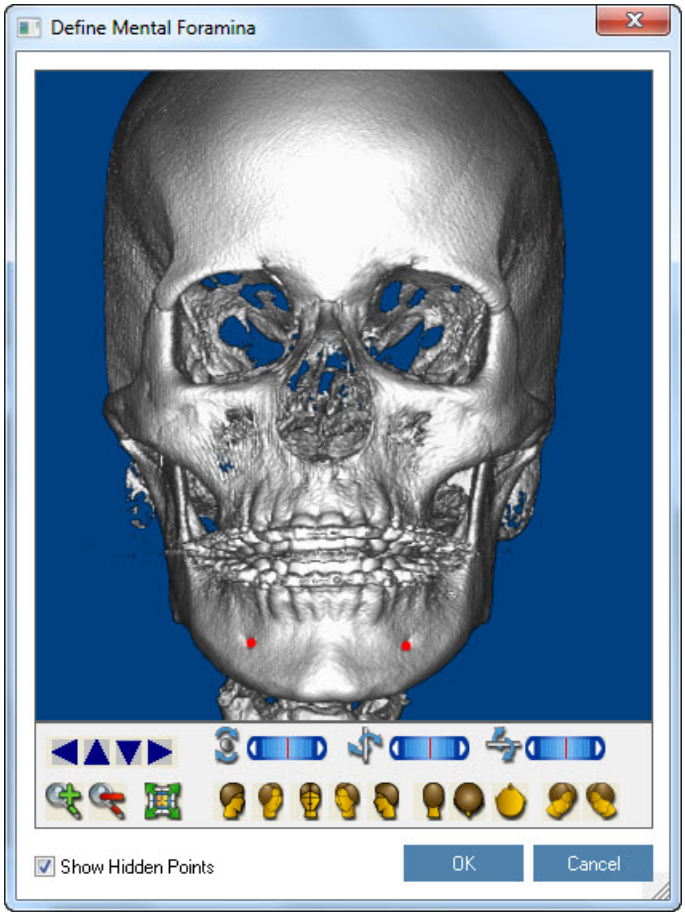




Marking the Mental Foramina

Before you mark the nerve canals on the patient's x-ray, you may want to mark the mental foramina. Once marked, the mental foramina appear as yellow dots on the panoramic image in the upper right portion of the Build X-Rays Tool window.

You can delete these markers at any time using the Nerve Canal Editing dialog box. For more information, see “Editing a Nerve Canal Image” on page 21-38.



To mark the mental foramina:

1 On the Nerve Canals palette, click **Edit**.

The Nerve Canal Editing dialog box is displayed.

2 In the Mental Foramina group box, click **Define**.

The Define Mental Foramina dialog box is displayed.

3 Click and drag the red dots on the image to each mental foramen.

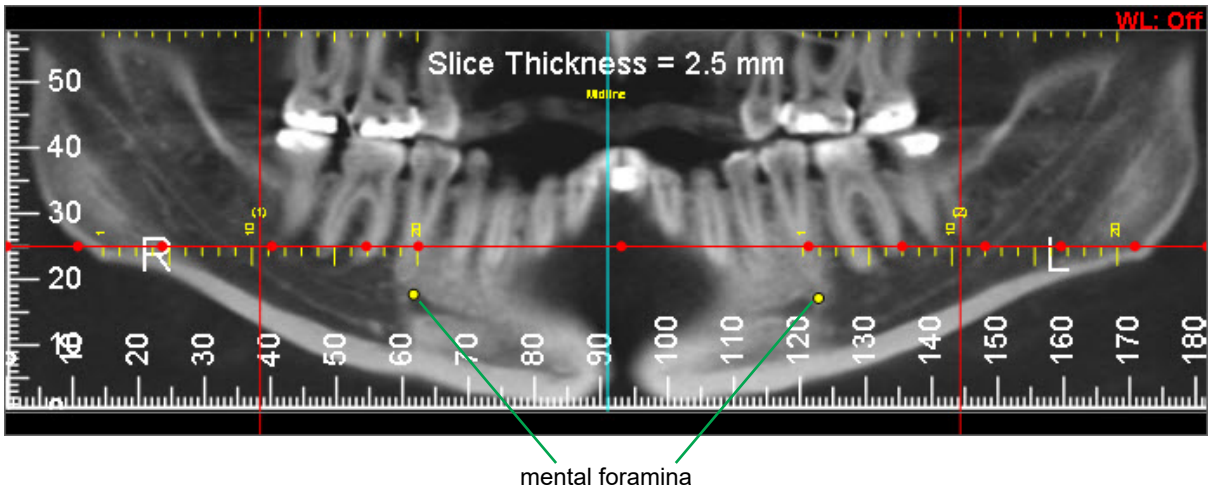
4 Click **OK**.

Image	Click and drag the red dots to each foramen.
Show Hidden Points	Displays the foramina points even if they are rotated behind the volume.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the images, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Marking the Nerve Canals

Once you have marked the mental foramina (see “Marking the Mental Foramina” on page 21-32), they appear as yellow dots on a panoramic image in the upper right portion of the Build X-Rays Tool window, as shown below. You can use these markers as a guide when marking the nerve canals.



To mark the nerve canals:

1 On the panoramic image in the upper right portion of the Build X-Rays Tool window, click and drag the red dots as needed to reveal the nerve canals.

   Click and drag when the mouse pointer turns into four triangles surrounding the red dot. Clicking and dragging the red dots changes the arch path that appears in the Arch Path image. You can add or remove red dots, if necessary, as described below.

   Once you have a clear view of a nerve canal, you can mark it.

2 On the panoramic image, click the location where you want to begin drawing the nerve canal.

   A red point appears on the panoramic image.

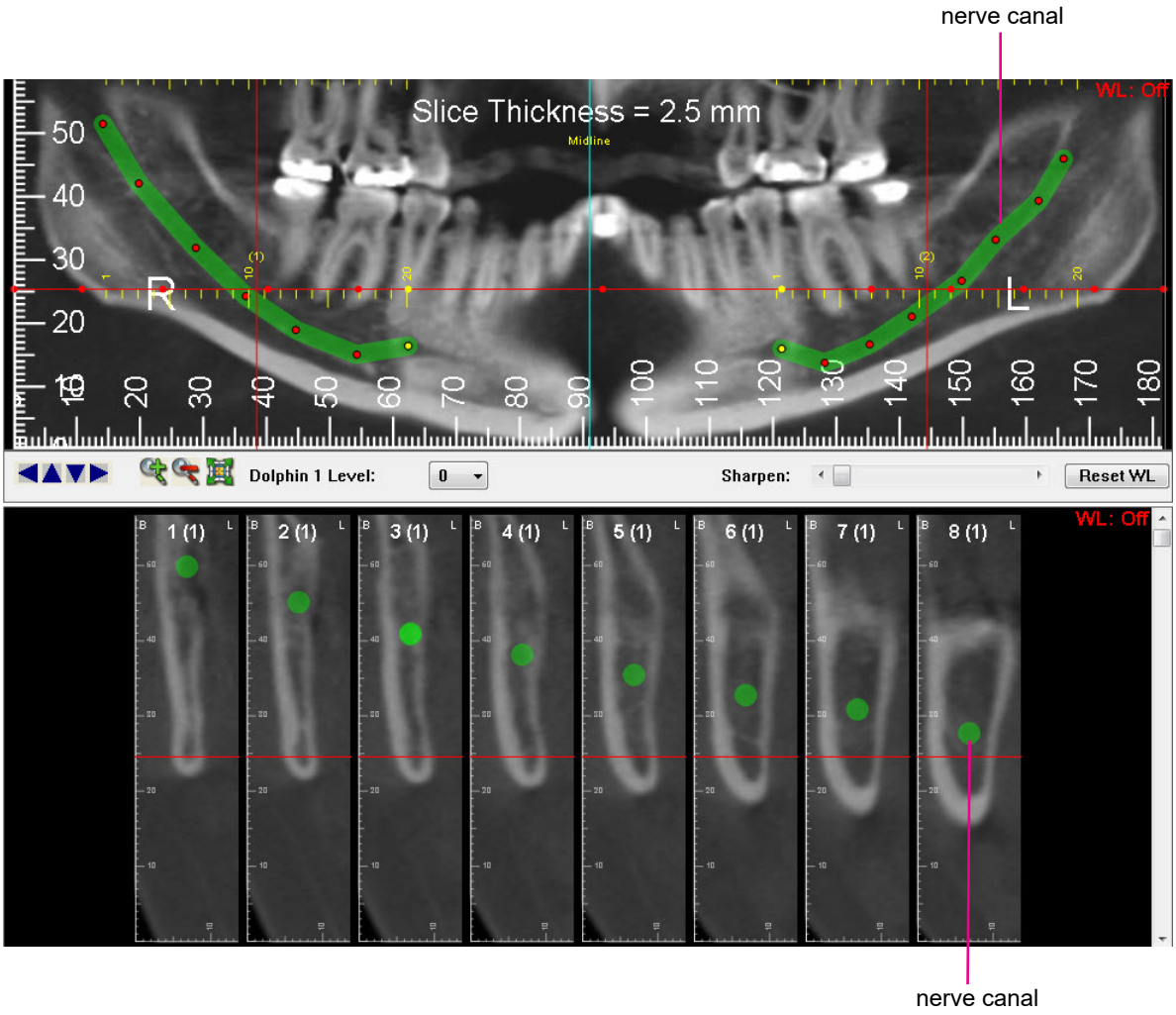
3 Release the mouse button and move the mouse to begin drawing the nerve canal.

   As you move the mouse, you’ll see a line extending from the point to the current mouse position. By default, the line is green, but you can change its color on the Nerve Canal Editing dialog box. For more information, see “Editing a Nerve Canal Image” on page 21-38.

4 Click whenever you want to place a point and change the direction of the line.

5 To complete the nerve canal, double-click the end of the line.

   As you draw the nerve canal, a dot appears on each slice to show the location of the nerve in that slice. By default, the dot is green, but you can change its color on the Nerve Canal Editing dialog box.



To add another red dot to the panoramic image:

1 Right-click the location on the horizontal red line where you want to add a new dot.

2 On the confirmation dialog box that appears, click **Yes**.

To remove a red dot from the panoramic image:

1 Right-click the red dot to remove.

2 On the confirmation dialog box that appears, click **Yes**.

To change the position of a point on the nerve canal drawing:

1 Click and drag a point to change its position.

To modify the position of the nerve canal drawing using the slice images:

1 Click and drag the dot that represents the nerve canal on a slice image.

Click and drag when your mouse pointer turns into four triangles surrounding the dot.

To remove a point on the nerve canal drawing:

1 Right-click the point to remove.

2 On the dialog box that appears, select **Delete the Selected Point**. Then, click **OK**.

To remove a segment of the nerve canal drawing:

1 Right-click a point on the segment to remove.

2 On the dialog box that appears, select **Delete the Whole Segment**. Then, click **OK**.

You can delete all segments of the nerve canal drawing from the Nerve Canal Editing dialog box. For more information, see “Editing a Nerve Canal Image” on page 21-38.

Selecting Part of the Volume for Nerve Canals X-ray Building

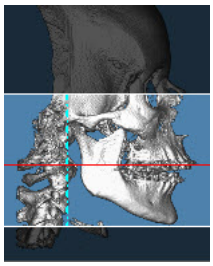
On the Nerve Canals x-ray image palette, you identify the height of the x-rays, and the projection path and slices used to create them. You also specify the layout to use to view them.

Setting the X-ray Height

To set the height of the x-ray:

1 On the Collimate image, click and drag the edges of the highlighted portion of the image to identify the part of the volume to include in the x-rays.

The x-rays will include the highlighted portions of the image.



Setting Options for the Nerve Canals View

To set options for your nerve canals view:

1 On the Collimate image, click and drag the red horizontal guideline so that the nerve canals are in the Arch Path image.

Note: *The red line does not appear if you are using the translucent view for the Arch Path image. In the translucent view, the Arch Path image is constructed from the entire volume.*

2 From the **Pan Thickness** drop-down list, select the total width (in millimeters) for the area surrounding the projection path.

3 In the Slice Group Dimensions group box, specify the following options for creating slices for your nerve canals view of the volume.

Thickness	Thickness for each slice to create.
Spacing	Type of spacing (**Uniform** or **Circular**) for the slice group.
Width	Width for each slice image to create.
Cuts	Number of slices to create. Each cut results in one image.

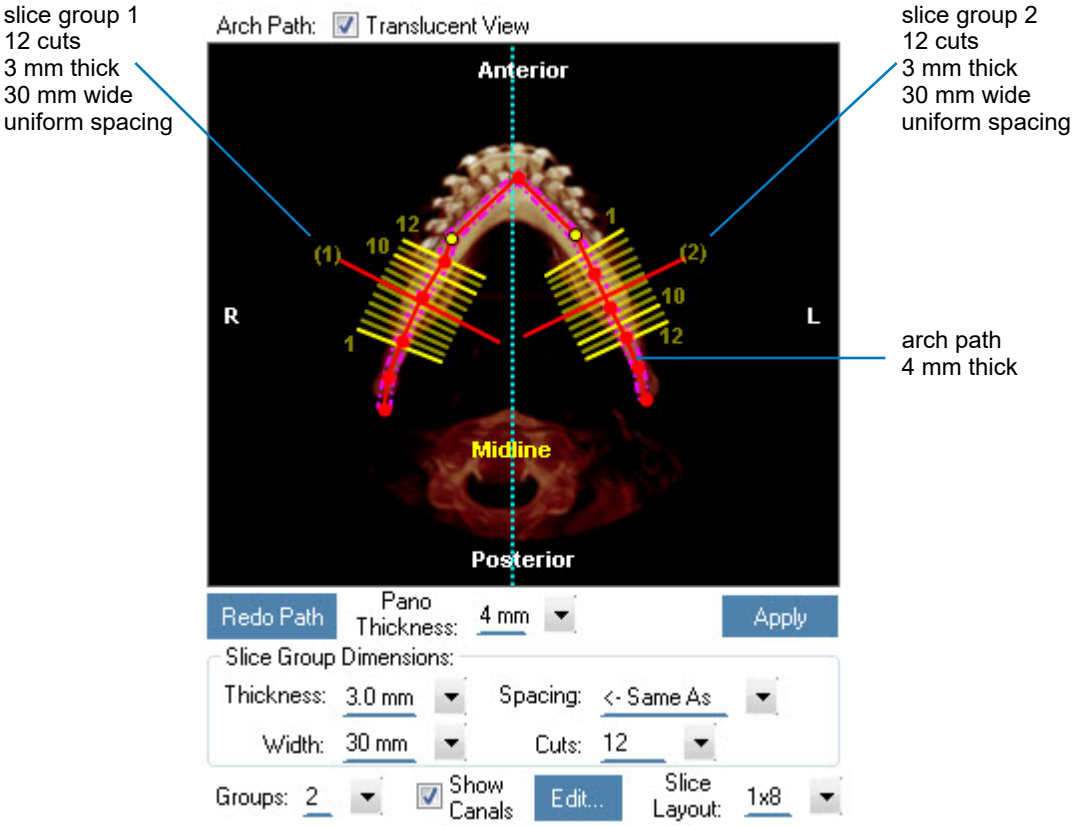
4 From the **Groups** drop-down list, specify how many slice groups to use.

Each slice group is created using the options specified in the Slice Group Dimensions group box.

Drawing the Projection Path

For information on how to draw a projection path, see “Drawing the Projection Path” on page 21-15.

A pink polygon appears on the image indicating a cross-section of the part of the volume that will be included in the x-rays. A yellow representation of the slices created using the options specified in the Slice Group Dimensions group box and the Groups drop-down list also appears, as illustrated below. The following figure illustrates the arch path with the **Translucent View** box checked.



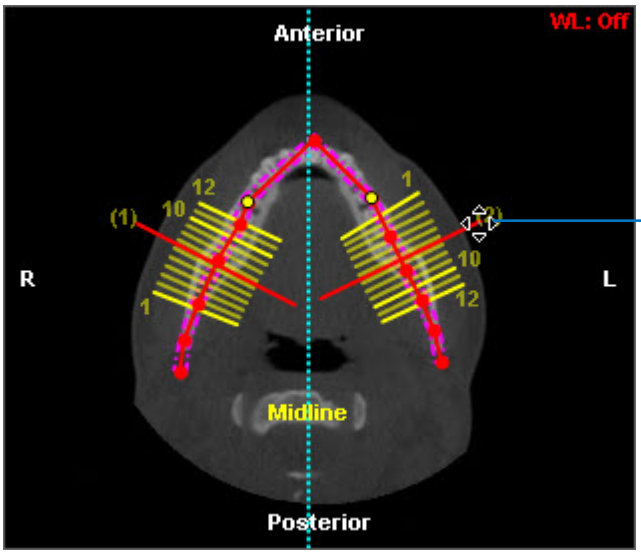
Moving Slice Groups

Initially, the slice groups are in default positions. However, you can easily change the location of the slice groups to create a custom nerve canals view.

To move a slice group:

1 Click and drag the red line for a slice group to a different location along the projection path.

Click and drag when your mouse pointer turns into four triangles, as illustrated below. The following figure illustrates the arch path with the **Translucent View** box unchecked.



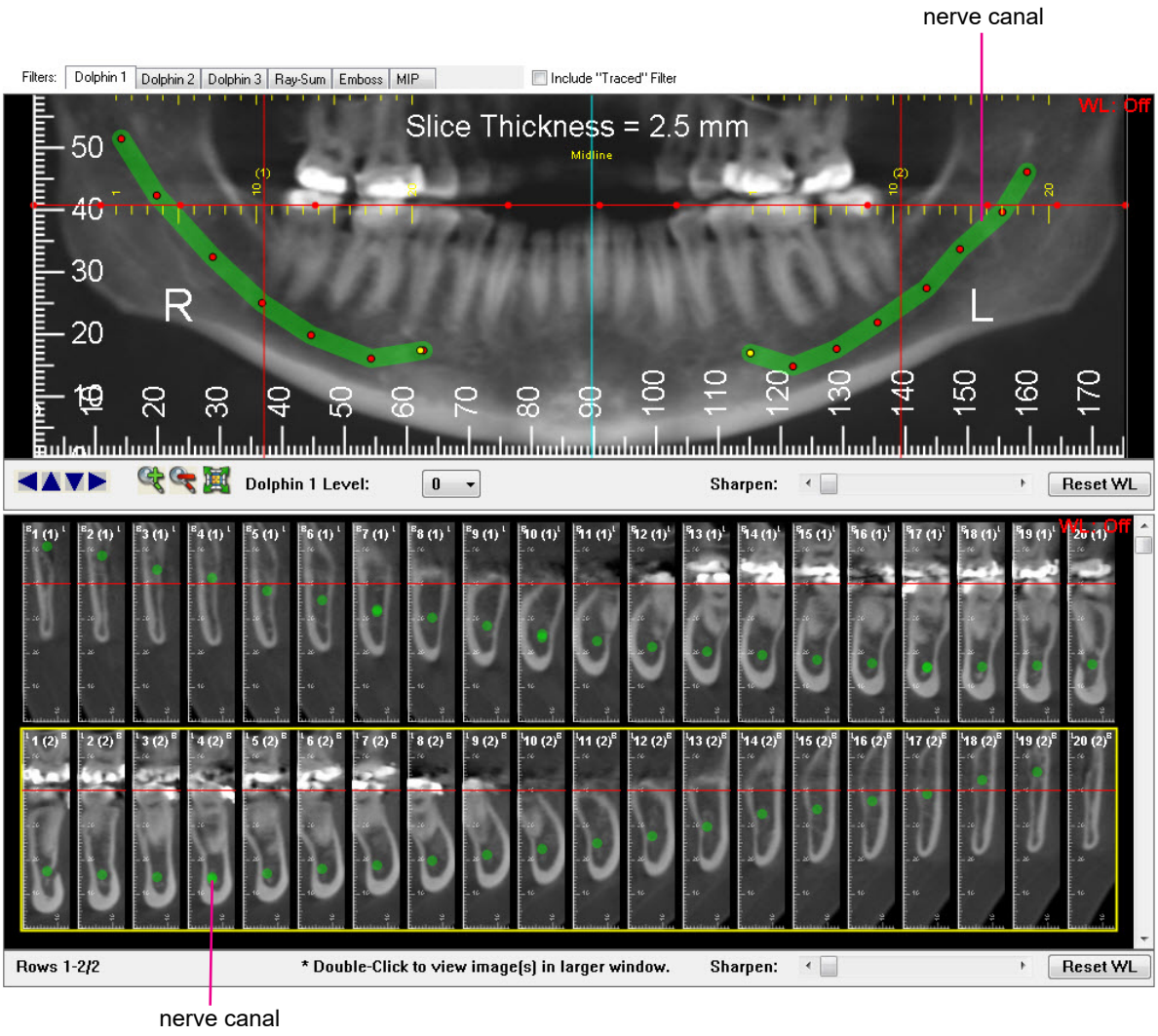
Creating the Nerve Canals View

To create your nerve canals view:

1 Optionally, select the layout to use for viewing the slices from the **Slice Layout** drop-down list.

2 Click **Apply**.

A panoramic image is displayed in the upper right portion of the Build X-Rays Tool window, and each numbered slice is displayed in the lower right portion of the dialog box. For information on viewing the close-ups of the slices, see “Viewing a Slice Close-up” on page 21-21.



Editing a Nerve Canal Image

You can specify the width, color, and transparency of the nerve canal marker either before or after you create it. You can also specify whether or not you want to mark the mental foramina, and you can delete the marker and start over.

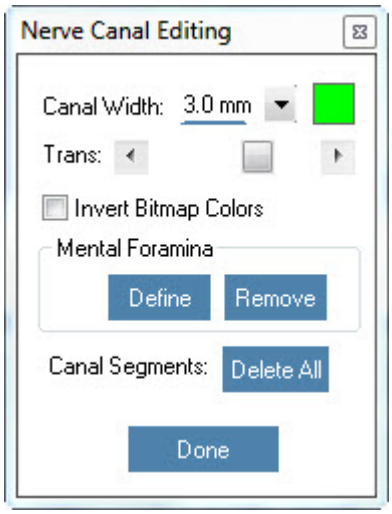
To edit the nerve canal marker:

1 On the Nerve Canals palette, click **Edit**.

The Nerve Canal Editing dialog box is displayed.

2 Make any changes to the options specified on this dialog box.

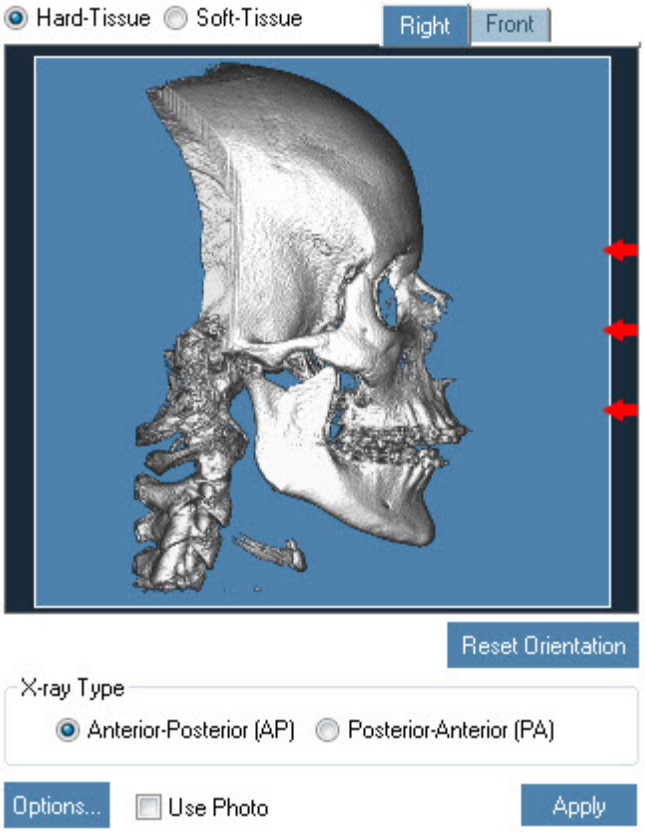
3 Click **Done** when you are finished editing.



Canal Width	Canal marker width in millimeters.
Color Sample	Color to use for the canal marker.
Trans	Sets the transparency of the canal marker.
Invert Bitmap Colors	Reverses the foreground and background colors of the x-ray
Define	Define and mark the mental foramina. For more information, see “Marking the Mental Foramina” on page 21-32.
Remove	Removes the mental foramina marker.
Delete All	Deletes all canal segments.
Done	Closes the Nerve Canal Editing dialog box.

Building a Frontal X-ray

To build a frontal x-ray, you first enter setup options on the frontal x-ray setup palette. These options determine how the x-ray is created from the 3D volume.



To build a frontal x-ray:

1 Select **Frontal** from the **View** drop-down list on the Build X-Rays Tool window.

The frontal x-ray setup palette opens.

2 Set the x-ray orientation.

For more information, see “Orienting the Volume on the Setup Palette” on page 21-4.

3 Identify the part of the 3D volume to use to create the x-ray.

For more information, see “Selecting Part of the Volume for Frontal X-ray Building” on page 21-40.

4 Specify the type of x-ray to use as your default (either anterior-posterior or posterior-anterior).

For more information, see “Selecting the Frontal X-ray Type” on page 21-41.

5 Configure the projection and ruler options to use when creating the x-ray.

For more information, see “Selecting the Projection Type and Ruler Options” on page 21-44.

Hard Tissue	Displays the patient's hard tissue image.
Soft Tissue	Displays the patient's soft tissue image.
Right	Right lateral view.
Front	Frontal view.
Image	Previews the current orientation. The red arrows indicate the direction from which the x-ray will be taken.
Options...	Opens the Frontal Options dialog box so you can select projection type and ruler options.
Reset Orientation	Sets the orientation to the default.
X-ray Type	Type of x-ray (either **Anterior-Posterior** or **Posterior-Anterior**) to create.
Use Photo	Overlays a patient photo or soft tissue surface (if available) on the x-ray (see "Using a Photo or Surface" on page 21-12). This is useful if the patient's soft tissue contours are difficult to see on the generated x-ray. **Select:** Photo or surface to use. Only available if the patient has more than one photo or surface.
Apply	Applies the settings on the palette to build the x-ray image.

For more information on these controls, see "Orienting the Volume on the Setup Palette" on page 21-4, "Selecting Part of the Volume for Frontal X-ray Building" on page 21-40, "Selecting the Frontal X-ray Type" on page 21-41, "Selecting the Projection Type and Ruler Options" on page 21-44, and "Using a Photo or Surface" on page 21-12.

Selecting Part of the Volume for Frontal X-ray Building

When you build x-rays, you can use the entire 3D volume or you can select only part of the volume. Selecting part of the volume enables you to focus on particular areas of interest.

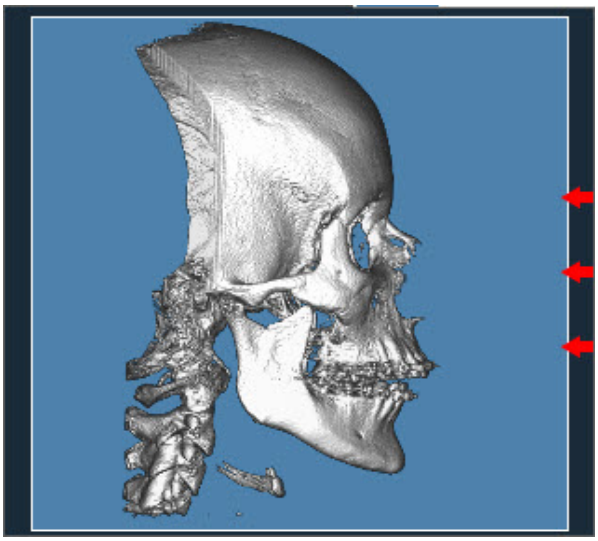
To select a part of the volume for x-ray building:

1 Click the **Right** tab if it isn't already selected.

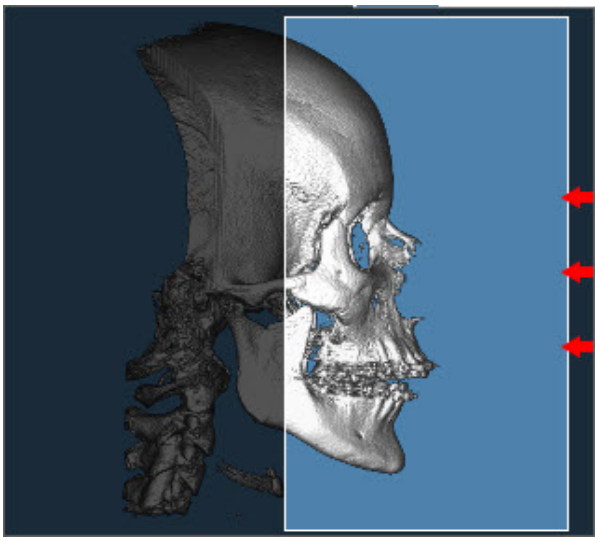
2 Click and drag the edges of the highlighted portion of the image to identify the part of the volume to include in the frontal x-ray.

The following figure illustrates picking different parts of the volume for x-ray building. The highlighted part of the image indicates the selected area.

Use the entire volume to create the x-ray



Use only the front part of the volume to create the x-ray



Selecting the Frontal X-ray Type

You can create either an anterior-posterior or posterior-anterior x-ray.

To set the type of x-ray to create:

1 Click **Anterior-Posterior** to create frontal x-rays in which the direction of exposure is front to back.

Or,

Click **Posterior-Anterior** to create frontal x-rays in which the direction of exposure is back to front.

Building an SMV X-ray

To build an SMV x-ray, you first enter options on the SMV x-ray setup palette. These options determine how the x-ray is created from the 3D volume.

To build an SMV x-ray:

1 Select **SMV** from the **View** drop-down list on the Build X-Rays Tool window.

The SMV x-ray setup palette opens.

2 Set the x-ray orientation.

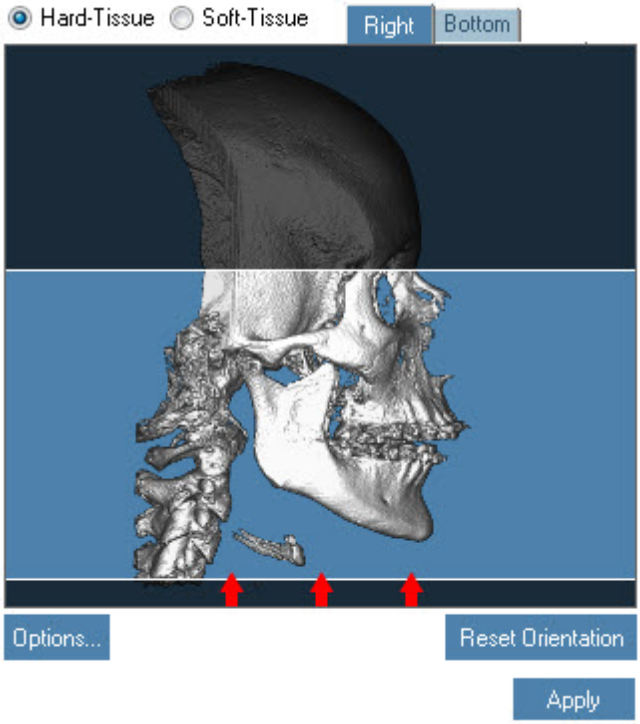
For more information, see “Orienting the Volume on the Setup Palette” on page 21-4.

3 Identify the part of the 3D volume to use to create the x-ray.

For more information, see “Selecting Part of the Volume for SMV X-ray Building” on page 21-43.

4 Configure the projection options to use when creating the x-ray.

For more information, see “Selecting the Projection Type and Ruler Options” on page 21-44.



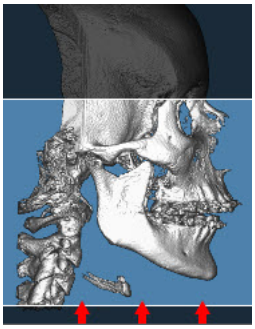
5 Click **Apply** to create the x-ray using the specified options.

The x-ray appears in the Build X-Rays Tool window.

Hard Tissue	Displays the patient’s hard tissue image.
Soft Tissue	Displays the patient’s soft tissue image.
Right	Right lateral view.
Bottom	Bottom view.
Image	Previews the current orientation. The red arrows indicate the direction from which the x-ray will be taken.
Options	Opens the SMV Options dialog box so you can select projection type and ruler options.
Reset Orientation	Sets the orientation to the default.
Apply	Applies the settings on the palette to build the x-ray image.

For more information on these controls, see “Orienting the Volume on the Setup Palette” on page 21-4, “Selecting Part of the Volume for SMV X-ray Building” on page 21-43, and “Selecting the Projection Type and Ruler Options” on page 21-44.

Selecting Part of the Volume for SMV X-ray Building



On the SMV X-ray setup palette, you identify the part of the volume to use for SMV x-ray building.

To select a part of the volume for x-ray building:

1 Click the **Right** tab if it isn't already selected.

2 Click and drag the edges of the highlighted portion of the image to identify the part of the volume to include in the SMV x-ray.

The figure to the right illustrates picking part of the volume for SMV x-ray building. The highlighted part of the image indicates the selected area.

Selecting X-ray Building Preferences

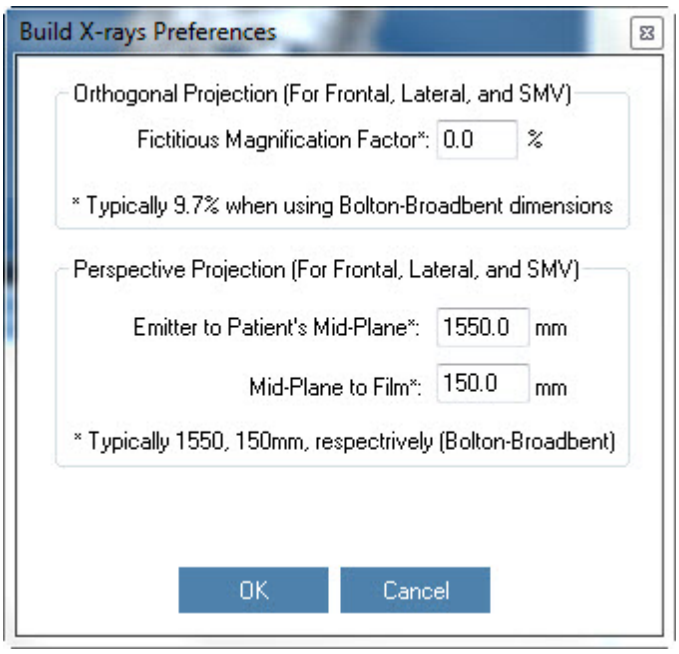
You can construct lateral, frontal, and SMV x-rays from the 3D volume data in either of the following ways:

- Orthogonal: Creates a non-distorted x-ray.
- Perspective: Creates an x-ray with the measured distortion and warping effects of a traditional x-ray. You can set preferences so that your resulting x-rays are consistent with those produced by your existing film-based x-ray machine.

You can customize the projection preferences that Dolphin Imaging uses to create x-rays for all the x-ray views. Then, for each x-ray view, you can specify the x-ray projection type to use (orthogonal or perspective), set the ruler options to use, and add margins.

Setting Projection Preferences

Projection preferences specify options for creating x-rays using orthogonal and perspective projection. These options apply to all x-rays created using the Build X-rays Tool. For example, the preferences that you set for perspective projection apply to all x-ray views that you choose to generate using perspective projection.For information on setting the projection type for an x-ray view, see “Selecting the Projection Type and Ruler Options” on page 21-44.



To set projection preferences:

1 Click **Prefs...** on the Build X-Rays Tool window.

The Build X-rays Preferences dialog box opens.

2 Set any preferences, and click **OK**.

Fictitious Magnification Factor	Magnification factor to use when generating x-rays using orthogonal projection. By default, this option is set to 0.0% (no magnification). If you are using Bolton-Broadbent dimensions, set this option to 9.7%.
Emitter to Patient's Mid Plane	Distance in millimeters from the emitter to the patient's mid-plane to use when generating x-rays using perspective projection. If you are using Bolton-Broadbent dimensions, set this option to 1550 mm.
Mid-Plane to Film	Distance in millimeters from patient's mid-plane to the film to use when generating x-rays using perspective projection. If you are using Bolton-Broadbent dimensions, set this option to 150 mm.

Selecting the Projection Type and Ruler Options

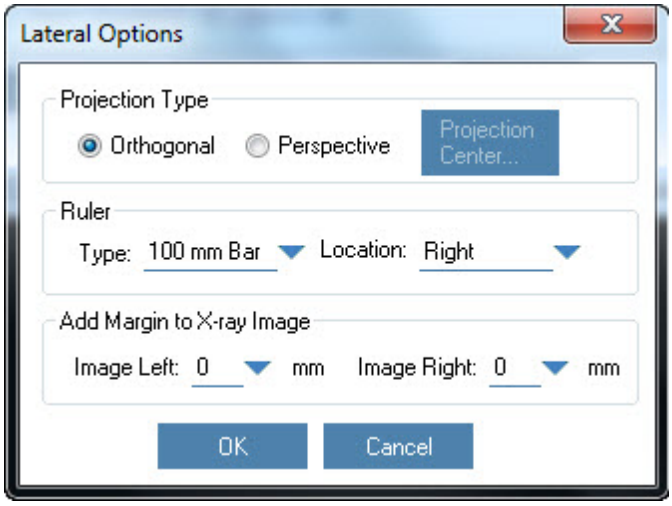
You can set the following options for generating lateral, frontal, and SMV x-rays:

- The projection type to use (orthogonal or perspective) when constructing x-rays from the 3D volume data. For more information, see "Setting Projection Preferences" on page 21-43.
- The projection center point to use when creating x-rays with either projection type.
- The type of ruler to display on the x-ray
- The width of the margins on the generated x-ray. You may want to add margins to accommodate the display of measurement values when the x-ray is used with 2D analyses that display measurements in the margins.

To specify the projection type to use:

1 Click **Options...** on the setup palette for the lateral, frontal, or SMV x-ray view.

The Options dialog box for the current x-ray view appears.



2 In the Projection Type group box, select **Orthogonal** to create non-distorted x-rays.

Or,

Select **Perspective** to mimic x-rays created traditional, film-based x-ray equipment.

If you selected **Perspective**, set the projection center point as described below.

To set ruler options:

1 In the Ruler group box, use the **Type** drop-down list to specify the type of ruler to display on the x-ray:

- **Tickmarks**: Displays the ruler.
- **100 mm bar**: Displays a solid bar 100 millimeters in length.
- **None**: Suppresses display of the ruler.

2 Use the **Location** drop-down list to set the location for the ruler on the x-ray (**Left**, **Right**, **Top**, or **Bottom**).

To add margins:

1 Select the width of the margins in the Add Margins to X-ray Image group box.

Use the drop-down list on the left to set the left margin and the one on the right to set the right margin.

To set the projection center point:

1 Click **Projection Center...**.

The Center of Perspective Projection dialog box opens.

2 Select **Hard Tissue** to use the patient's hard tissue image when selecting the projection center point.

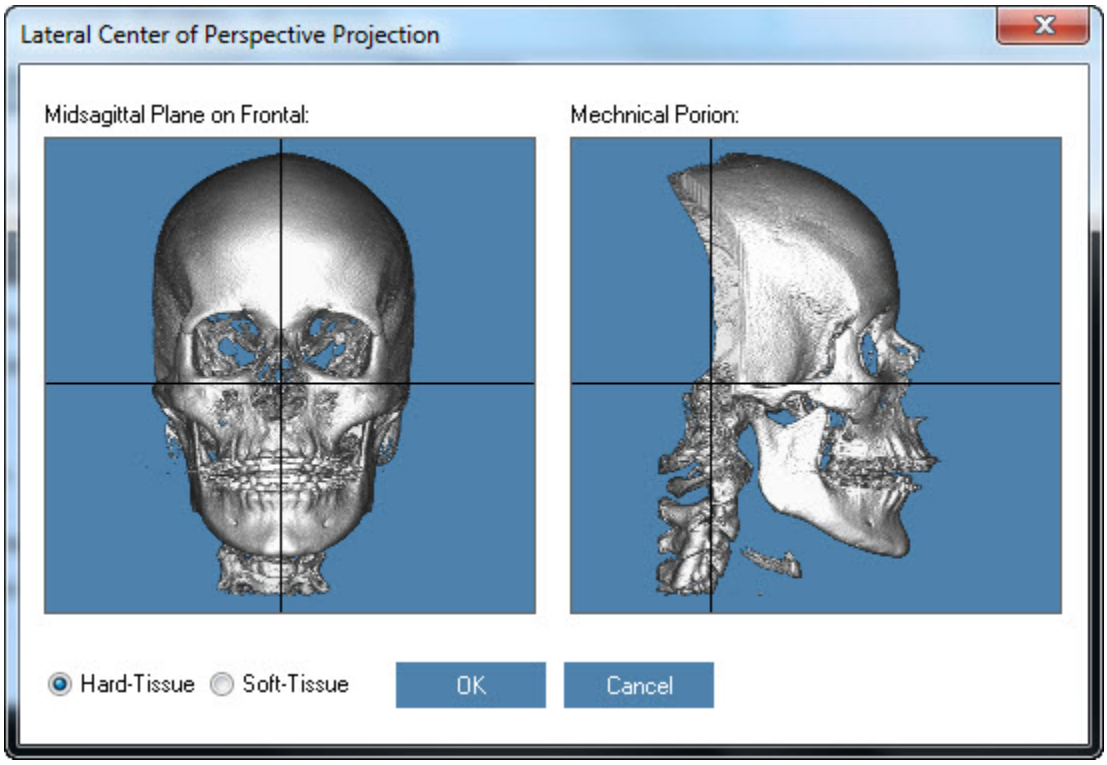
Or,

Select **Soft Tissue** to use the patient's soft tissue image.

3 Using the frontal image, click and drag the vertical line to the mid-sagittal plane.

4 Using the lateral image, click and drag the two lines until they cross at the mechanical porion.

5 Click **OK**.



Midsagittal Plane on Frontal	The vertical line on this image identifies the mid-sagittal plane.
Mechanical Porion	The two lines on this image intersect at the mechanical porion.
Hard Tissue	Displays the patient's hard tissue.
Soft Tissue	Displays the patient's soft tissue.

Viewing Landmarks and Measurements

After you generate the x-ray view you desire, you can:

- view any landmarks you have digitized for the volume on the x-ray view
- measure distances and angles directly on that view

If you have digitized landmarks for the volume, you can view them on any x-ray views you generate. For more information on digitizing landmarks, see Chapter 22, Digitize and Measurements (Medical Device).

To toggle the display of landmarks on the image:

1 Right-click the image. Then, select **Show/Hide Digitized Landmarks** from the context menu.

To add measurements and angles to an x-ray view:

1 Check **Measure** in the Build X-Rays Tool window.

2 Generate the desired view (Lateral, Panoramic, TMJ, Cross Sections, Nerve Canals, Frontal, or SMV).

3 Click **2 Pt Line** to measure the distance between two points.

Or,

Click **3 Pt Angle** to measure the angle between two lines.

4 Draw the line or angle to measure on the x-ray image.

If you selected **2 Pt Line**, click the two endpoints of the line. As you move your mouse from one endpoint to the other, a line appears with the distance in millimeters.

If you selected **3 Pt. Angle**, click three points to define the angle. Two lines appear joined by the apex. The number of degrees for the angle appears near the apex.

Right-click to undo the point that you just placed.

To change a measurement line or angle:

1 Click and drag the end points.

To move the label for a measurement line or angle:

1 Click and drag the label.

To remove all measurements from the x-ray:

1 Click **Remove All**.

Enhancing an X-ray

The Build X-Rays Tool offers the image enhancement options to help you produce readable x-ray images:

To enhance the image:

1 Click **Enhance**.

The Enhancements dialog box appears.

2 Set any options on this dialog box to enhance the image.

If you are enhancing the TMJ, Cross Sections, Cross Sections Upper, and Cross Sections Lower, or Nerve Canals view, this dialog box contains two tabs, Pano and Cross Sections, so that you can set enhancement options for the panoramic image separately from the cross section images. For the Lateral, Panoramic, Frontal, and SMV views, this dialog box does not have any tabs.

Local Enhancement Options	Settings that apply to the current x-ray only. **Window Leveling (WL):** Affects the apparent brightness and contrast of the x-ray image on the screen. • **Reset WL:** Resets the window leveling to the default setting. For more information, see "Setting Window Leveling" below. **Contrast:** Sets the light/dark contrast of the image. **Gamma:** Sets the light/dark contrast of the image. **Brightness:** Sets the brightness of the image. **Sharpen:** Sets the sharpness of the image. **Soft Tissue:** Sets the transparency of the soft tissue on the image. Not available on the Cross Sections tab. **"Dolphin 1" Filter Level:** Transparency of the x-ray on the Dolphin 1 filter tab. The default is zero for maximum transparency. Increase this number if the patient's hard tissue is less dense to increase the opacity of the hard tissue for optimal x-ray visualization. Not available on the Cross Sections tab. **Reset:** Sets all of the above options to the defaults for this x-ray view.
Global Enhancement Options	**Reset All:** Sets the above options to the defaults for all x-ray views (Lateral, Panoramic, TMJ, Cross Sections, Nerve Canal, Frontal, and SMV).

Setting Window Leveling

The Build X-Rays Tool creates x-rays as 12-bit gray scale images, but the computer screen displays an 8-bit gray scale image. By adjusting the window leveling, you chose the subset of gray scale intensities to display on the screen. Window leveling does not change the image data, however.

To change the apparent brightness or contrast (window leveling):

1 To change the image brightness on the screen, click and drag the mouse from left to right.

2 To change the image contrast on the screen, click and drag the mouse up or down.

A red legend (for example, **W/L: Off**) indicates whether you have set the window leveling.

Note: *These changes affect the way the x-ray image displays on the screen only; they do not change the image data. For more information, see "Enhancing an X-ray" on page 21-47.*

To reset the window leveling to the default setting:

1 Click **Reset WL**.

Or,

Click **WL**.

The label on the button that resets the window leveling may be **Reset WL** or **WL**, depending on the dialog box you are currently viewing.

Saving, Copying, and Exporting X-rays

Once you have created an x-ray for this patient, you can:

- Save it: Stores the x-ray images created with all the enabled filters for the current view so that you can view them from within Dolphin Imaging. The x-ray image data is saved either to your Dolphin database or to your external DICOM storage location, depending on your DICOM volume storage options. For more information, see “Setting DICOM Volume Storage Options” on page 19-126.
- Copy it to the clipboard: Copies the x-ray image you're currently viewing to the clipboard so that you can paste it into another application.
- Export it: Saves the x-ray image you're currently viewing in a file on your computer.

Saving an X-ray

To save the x-ray:

1 Click **Send Snapshot...** on the Build X-Rays Tool window. Then, select **Send to Dolphin Layout/ Database**.

Or,

Right-click the image. Then, select **Save this Image to Dolphin Layout...** from the context menu.

Or,

Right-click an image in the slice montage for the cross-sections, nerve canals, or TMJ x-ray view. Then, select **Save Highlighted Slice to Dolphin Layout...** from the context menu.

For more information, see “Building an X-ray View of the TMJ Area” on page 21-18, “Building a Cross-Sections X-ray View” on page 21-24, and “Building a Nerve Canals X-ray View” on page 21-29.

2 Optionally, change to a different image layout as described below.

3 Click a slot in the image layout to save the image in that slot.

4 Optionally, enter a new image slot title to use for the 3D image in the **Image Title** field.

5 Click **Save...**.

Images created with all the x-ray filters (shown on the tabs in the Build X-Rays Tool window) are stored as part of this patient's record. The x-ray image data is saved either to your Dolphin database

or to your external DICOM storage location, depending on your DICOM volume storage options. For more information, see “Setting DICOM Volume Storage Options” on page 19-126.

Note: *The traced filter image is not stored unless the **Enable “Traced” Filter** box is checked on the Build X-Rays Tool window. For more information, see “Using Filters” on page 21-4.*

If you have digitized landmarks on the volume, saving an x-ray creates two versions of it, one with the digitized landmarks and one without. For more information, see “3D Digitizing For Use in Dolphin 2D” on page 22-20.

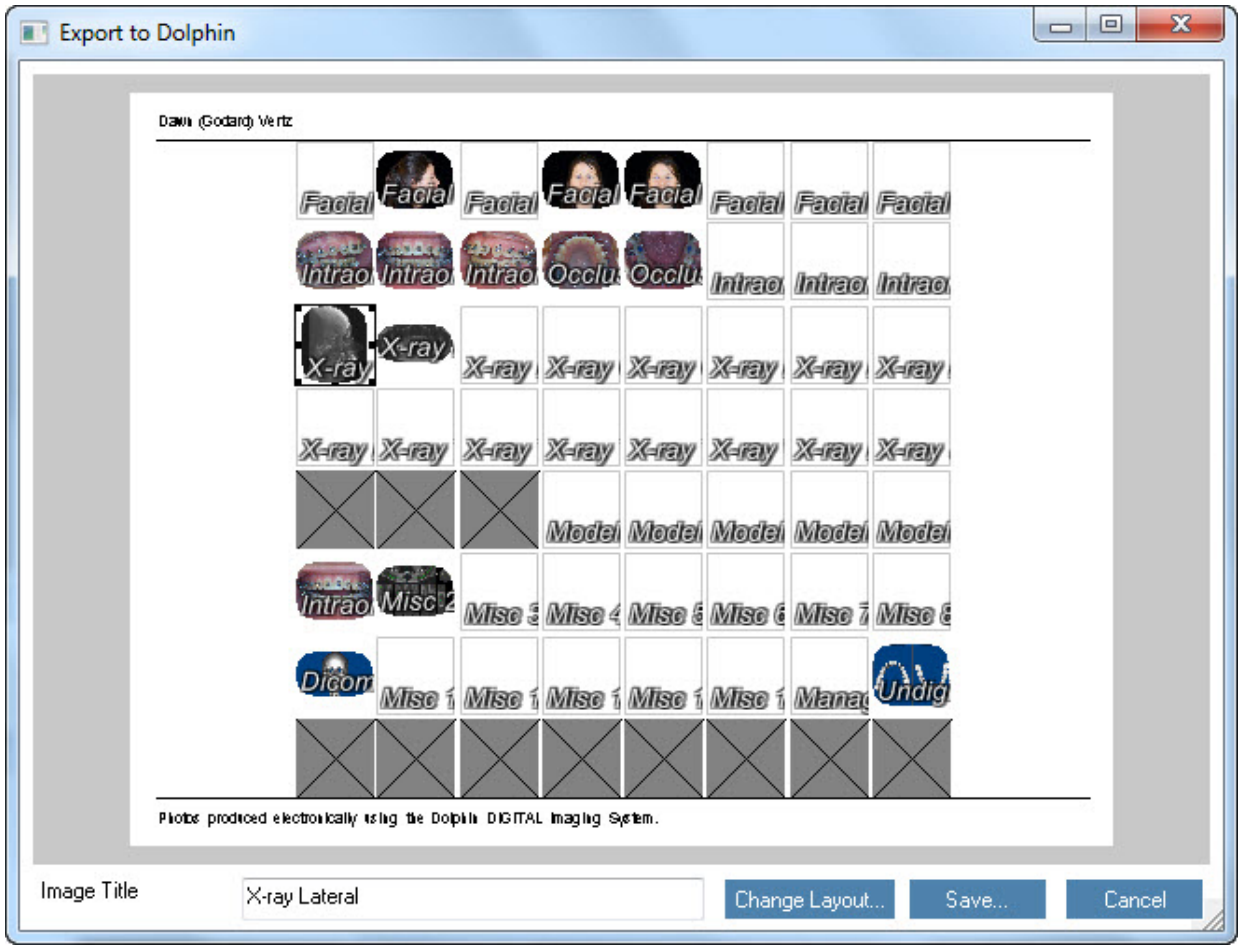


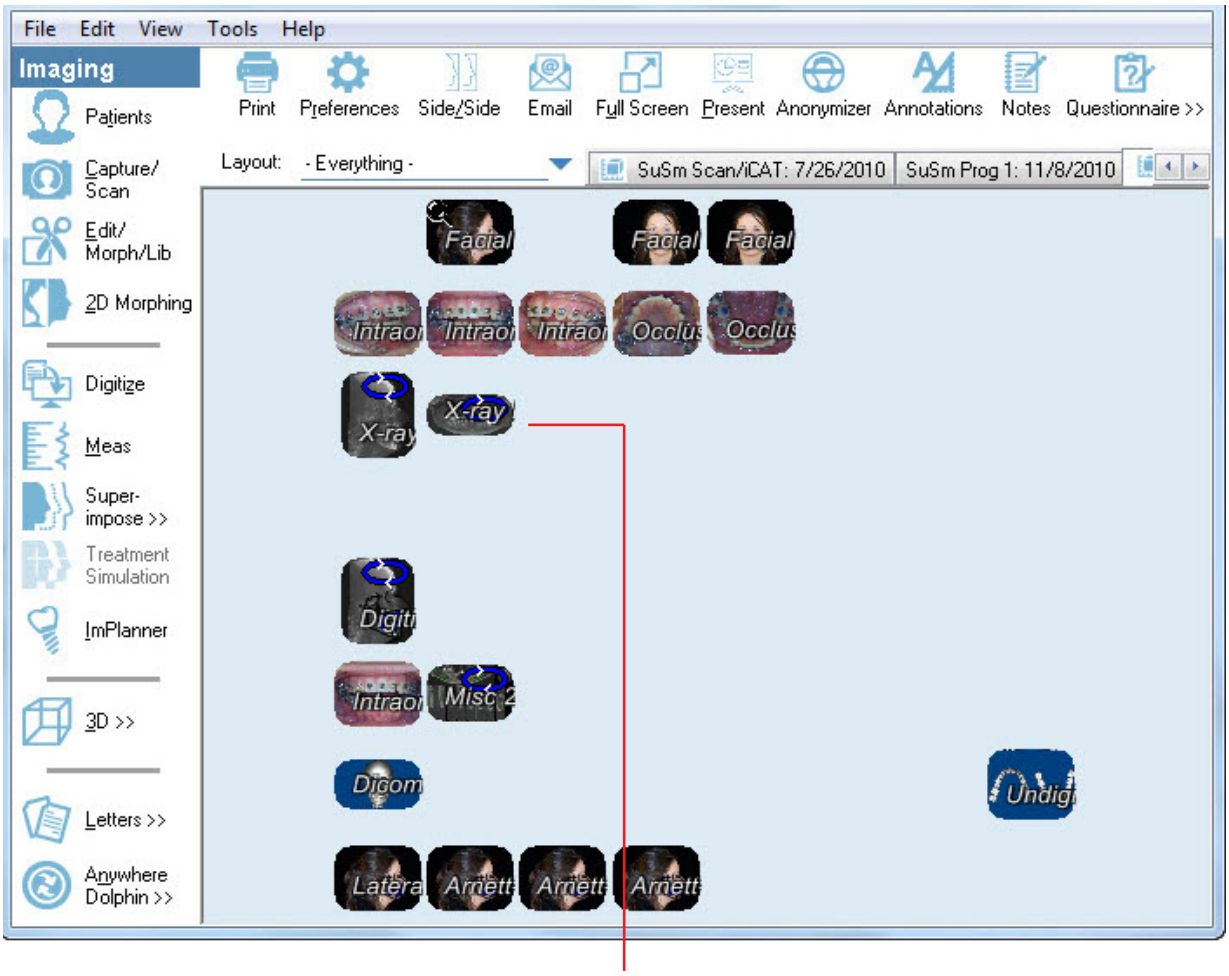
Image Layout	Currently selected image layout.
Image Title	Image title to use for the image. Initially, this field contains the title defined in the image layout for the selected image slot.
Change Layout...	Changes to a different image layout.
Save...	Saves the image in the selected image slot in the selected layout.

To choose a different image layout:

1 Click **Change Layout...**.

2 Select the image layout in which to save this image from the drop-down list. Then, click **OK**.

Once saved, the x-rays are available on the Dolphin Imaging main screen in the layout slot you selected, as shown below.



x-rays generated from the volume

Copying an X-ray to the Clipboard

To copy the x-ray to the clipboard:

1 Click **Send Snapshot...** on the Build X-Rays Tool window. Then, select **Copy to Clipboard**.

Or,

Right-click the image. Then, select **Copy this Image to Clipboard** from the context menu.

Or,

Right-click an image in the slice montage for the cross-sections, nerve canals, or TMJ x-ray view. Then, select **Copy Highlighted Slice to Clipboard** from the context menu.

The x-ray image or highlighted slice is copied to the clipboard. You can then paste it into another application such as Microsoft Word.

Exporting an X-ray

To export the x-ray to a file:

1 Click **Send Snapshot...** on the Build X-Rays Tool window. Then, select **Export to File**.

Or,

Right-click the image. Then, select **Export this Image to File...** from the context menu.

Or,

Right-click an image in the slice montage for the cross-sections, nerve canals, or TMJ x-ray view. Then, select **Export Highlighted Slice to File...** from the context menu.

The Save As dialog box appears, as shown below.

2 Specify the directory and file in which to save the image.

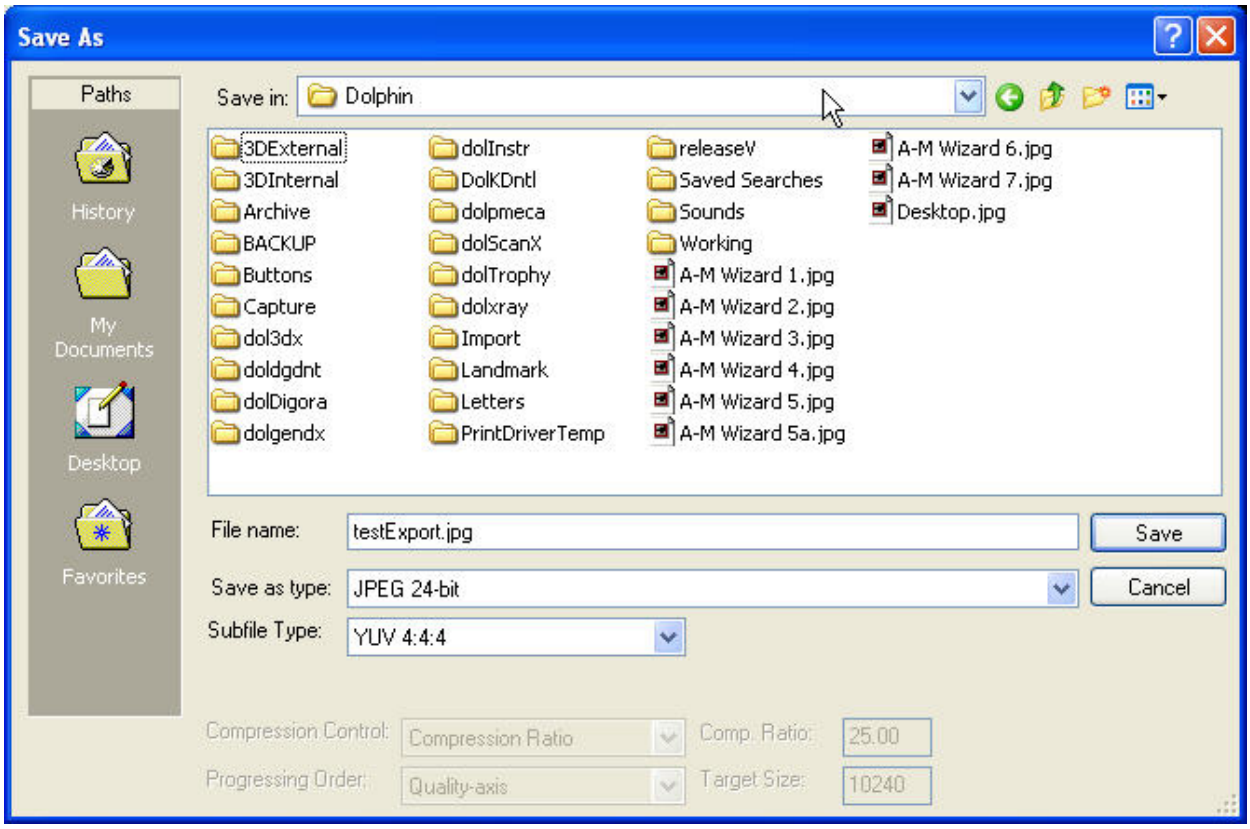
3 Optionally, select any other options from the drop-down lists.

Depending on the image type you select in the **Save As Type** drop-down list, additional options may be available in the other drop-down lists.

Note: *If you select one of the JPEG 2000 file types, an additional button appears on the Save As dialog box that enables you to set advanced options.*

4 Click **Save**.

The x-ray image currently displayed in the Build X-Rays Tool window is exported and saved in the file you specified.



Most options on this dialog box are described in the Microsoft Windows documentation.

You can use the **Save As Type** drop-down list to select the graphics file type to use when saving this image. JPEG 24-bit is recommended for producing high quality images with a small file size and maximum compatibility between imaging programs. Typically, you should use the default selections for all other options. Only modify these options if you are very familiar with graphics file types.

Printing an X-ray

To print the current x-ray view:

1 Click **Send Snapshot...** on the Build X-Rays Tool window. Then, select **Print**.

Or,

Right-click the image. Then, select **Print this Image...** from the context menu.

Or,

Right-click an image in the slice montage for the cross-sections, nerve canals, or TMJ x-ray view. Then, select **Print Highlighted Slice...** from the context menu.

The Print dialog box is displayed.

2 Select any printing options and click **OK**.

Dolphin Imaging offers the following options in addition to the standard Microsoft Windows printing options (see “Printing” on page 16-4):

Print 1:1	Prints an image with cephalometric tracings using the **1:1** option. This setting has no effect if you are not printing an image with cephalometric tracings.
Preview	Previews your print job on the computer screen.

22 Digitize and Measurements (Medical Device)

To digitize images, you specify landmarks on the image that are used for cephalometric analyses. Dolphin 3D enables you to digitize landmarks on the 3D volume, thus achieving a greater degree of accuracy. Using Dolphin 3D, you can:

- digitize landmarks for new 3D analyses.
- digitize landmarks for conventional 2D analyses in three dimensions.

Depending on the analysis you choose, you have one of the following options after you have digitized landmarks:

- for all analyses except **<Dolphin>**, you can view measurements calculated from your digitized landmarks.
- for the **<Dolphin>** analysis, you can take measurements using lines, angles, or selected areas.

You also can export the digitized landmarks or measurements to the clipboard so that you can paste them into another application, such as Microsoft Excel, for further analysis.

Note: *If you purchased the full Dolphin 3D module, you can use all its capabilities when digitizing landmarks and taking measurements. For example, you can digitize landmarks on the hard and soft tissue, and on any available photos and surfaces. You can rotate the 3D volume to obtain the best view for locating the landmarks. You also can use clipping slices or clipping boxes to locate landmarks within the 3D volume. For more information, see "Moving or Reorienting the Volume" on page 19-24, "Using a Clipping Slice" on page 28-1, and "Using a Clipping Box" on page 28-3.*

If you purchased the stand-alone digital study module product, you can use most digitizing and measurement features, but with 3D photos and surfaces only. Some features, such as the **Landmarks** tab, clipping slices, or clipping boxes, are not available when working with 3D photos and surfaces.

To open the Digitize/Measurement palette:

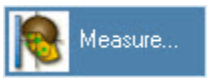
1 Click

on the Dolphin 3D window.

Or,

Select **Digitize/Measure...** from the **Tools** menu on the Dolphin 3D window.

Or,

Click 

on the **Step 7: Present** tab in the Orthognathic Surgical Planning module.

The Digitize/Measurement palette opens.

2 Select the view you want from the **View** drop-down list.

Select **3D** to digitize landmarks and view measurements for new 3D analyses. Select **2D Lateral** or **2D Frontal** to digitize landmarks for conventional 2D analyses in three dimensions.

Note: *To digitize arch models, you can save them in an image layout slot and then digitize them using Dolphin Imaging's 2D digitize feature. For more information, see "Digitizing Model Arches" on page 22-6.*

3 Select an analysis from the **Analysis** drop-down list.

Depending on the analysis you pick, this palette contains one or more of the following tabs:

Landmark	Digitize landmarks on the 3D image. Available for all analyses. For more information, see "Adding, Changing, or Removing Landmarks" on page 22-3. ***Note:*** *You cannot digitize landmarks on 3D photos or surfaces.*
Measurements	View measurements calculated from your digitized landmarks. Available for all analyses except **<Dolphin>**. For more information, see "Viewing and Taking Measurements" on page 22-8
2D Slice Area	Measure two-dimensional slice areas. Available only for the **<Dolphin>** analysis. For more information, see "Measuring Slice Areas" on page 22-15.
2D Line	Take measurements using lines. Available only for the **<Dolphin>** analysis. For more information, see "Taking Measurements Using Lines" on page 22-12.
3D Line	Take measurements using lines. Available only for the **<Dolphin>** analysis. For more information, see "Taking Measurements Using Lines" on page 22-12.
2D Angle	Take measurements using angles. Available only for the **<Dolphin>** analysis. For more information, see "Taking Measurements Using Angles" on page 22-13.
3D Angle	Take measurements using angles. Available only for the **<Dolphin>** analysis. For more information, see "Taking Measurements Using Angles" on page 22-13.
2D Path	Take measurements using paths. Available only for the **<Dolphin>** analysis. For more information, see "Taking Measurements Using Paths" on page 22-16.
3D Path	Take measurements using paths. Available only for the **<Dolphin>** analysis. For more information, see "Taking Measurements Using Paths" on page 22-16.
2D Cut Gap Distance	Measure distances between osteotomy segments. Available only when you open the **Digitize/Measurement** palette from the **Step 7: Present** tab in the Orthognathic Surgical Planning module. For more information, see "Measuring Cut Gap Distances" on page 30-123.
Dist to Midline	Measure distances between points and the mid-sagittal plane. Available only for the **<Dolphin>** analysis using volume/surface and arch views (not for slice or panoramic views). For more information, see "Measuring Distance to the Midline" on page 22-18.

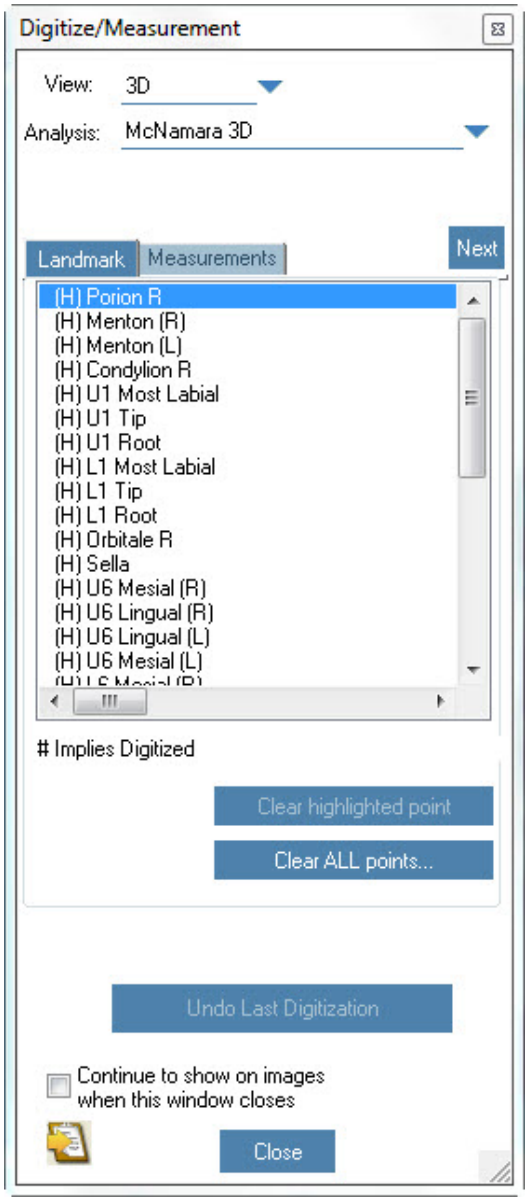
Adding, Changing, or Removing Landmarks

You use the **Landmark** tab of the Digitize/Measurement palette to add, change, or remove landmarks. You can digitize landmarks for new 3D analyses, or you can digitize landmarks for conventional 2D analyses in three dimensions.

Once you have finished digitizing, you can build digitized x-rays from the digitized 3D volume. When building x-rays, Dolphin 3D represents the 3D digitized landmarks in two dimensions. You can then compare these digitized x-rays with conventional digitized x-rays created with Dolphin Imaging's Digitize feature. For more information on building x-rays from the 3D volume, see Chapter 21, Build X-rays. For more information on Dolphin Imaging's Digitize feature, see Chapter 7, Digitize (Medical Device).

To open the Landmark tab:

1 Click the **Landmark** tab if it isn't already selected.



View	View for the type of analysis to digitize. **3D:** Digitize landmarks for 3D analyses. **2D Lateral:** Digitize landmarks for 2D lateral analyses. **2D Frontal:** Digitize landmarks for 2D frontal analyses. ***Note:*** *For 2D analyses, measurements are calculated using orthogonal (rather than perspective) projection. However, if you build x-rays with perspective projection after digitizing landmarks, the measurements on that x-ray are calculated with the specified magnification. This feature is useful for comparison with older records. For more information, see "Selecting the Projection Type and Ruler Options" on page 21-44.* The analyses available in the **Analysis** drop-down list depend on the view you choose.
Analysis	Analysis for which to digitize landmarks. The available choices depend on your selection in the **View** drop-down list.
Next	Move to the next landmark or measurement line in the list.
Clear highlighted point	Removes the point currently highlighted in the list from the image.
Clear ALL points...	Removes all the digitized points from the image.
Undo Last Digitization	Undoes your last digitize operation.
Continue to show on images when this window closes	Displays digitized landmarks on the patient's image after you close the Digitize/Measurement palette.
	Copies the landmark coordinate data to the clipboard. The exported data can be imported into another application such as Microsoft Excel. For more information, see "Copying Landmark and Measurement Data to the Clipboard" on page 22-21.
Close	Closes the palette.

Adding Landmarks

To digitize landmarks:

1 On the Digitize/Measurement palette, select the view for the type of analysis that you want to digitize from the **View** drop-down list.

2 Click the analysis that you want to digitize from the **Analysis** drop-down list.

3 Click the **Landmark** tab if it isn't already selected.

The **Landmark** tab lists the landmarks for the currently selected analysis.

4 On the 3D volume, locate and right-click each landmark listed on the **Landmark** tab.

To properly locate landmarks, you may need to switch your view to the hard tissue, the soft tissue, or the patient's 3D photo (if available). If you are digitizing landmarks for a 3D analysis, Dolphin 3D automatically switches between the hard tissue and soft tissue views as appropriate for the landmark

you are digitizing. You may also need to rotate the 3D volume, use clipping slices, or clipping boxes to locate landmarks within the 3D volume as described in “Moving or Reorienting the Volume” on page 19-24, “Using a Clipping Slice” on page 28-1, and “Using a Clipping Box” on page 28-3.

As you go through the list of landmarks, the selection bar in the list indicates the current landmark.

To skip a landmark when digitizing:

1 Click **Next**.

Changing Landmarks

To change the location of a digitized landmark:

1 Click the landmark in the **Landmark** list.

Or,

Press the UP ARROW key until the selection bar in the list is over the landmark name.

A circle with intersecting lines appears on the digitized image to identify the landmark selected in the **Landmark** list.

2 Right-click the correct location for the landmark.

Alternatively, you can simply click and drag the landmark:

3 Move the mouse over the landmark you want to move.

When the mouse is over one of the landmarks, the mouse pointer changes to small triangles surrounding the landmark.

4 Click and drag the landmark to a new location.

Removing Landmarks

To remove landmarks:

1 Select the landmark you want to remove in the list. Then, click **Clear highlighted point**.

Or,

Click **Clear ALL digitized points...** to remove all digitized landmarks.

2 If you clicked **Clear ALL digitized points...**, click **Yes** in the confirmation dialog box that appears to remove all digitized landmarks.

Digitizing Model Arches

If you have imported upper and lower arch models for a patient, you can save them in an image layout slot and then digitize them using Dolphin Imaging's 2D digitize feature.

For information on importing arch models, see "Working With Arch Model Surfaces" on page 19-83. For information on the 2D digitize feature, see Chapter 7, Digitize (Medical Device).

To save the arch models in an image layout slot:

1 Click to view the upper and lower arch models side by side.

2 Click **Send Snapshot...**. Then, select **Save To Dolphin Layout/Database**.

Or,

Select **Save...** from the **File** menu.

Or,

Right-click the image and select **Save To Dolphin Layout/Database...** from the context menu.

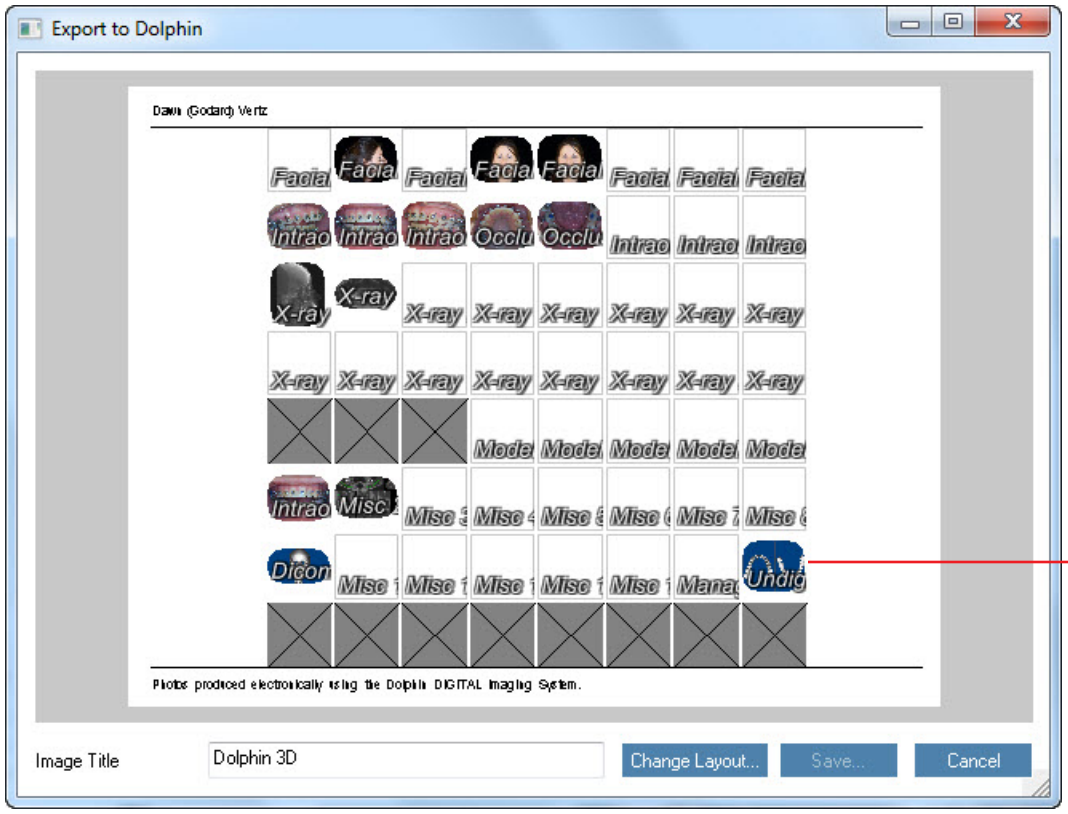
3 Click **Change Layout...**.

4 Select the **- Everything -** image layout from the drop-down list. Then, click **OK**.

5 Click the **Undigitized Arch** image slot in the image layout to save the arch models in that slot (see below).

6 Click **Save...**.

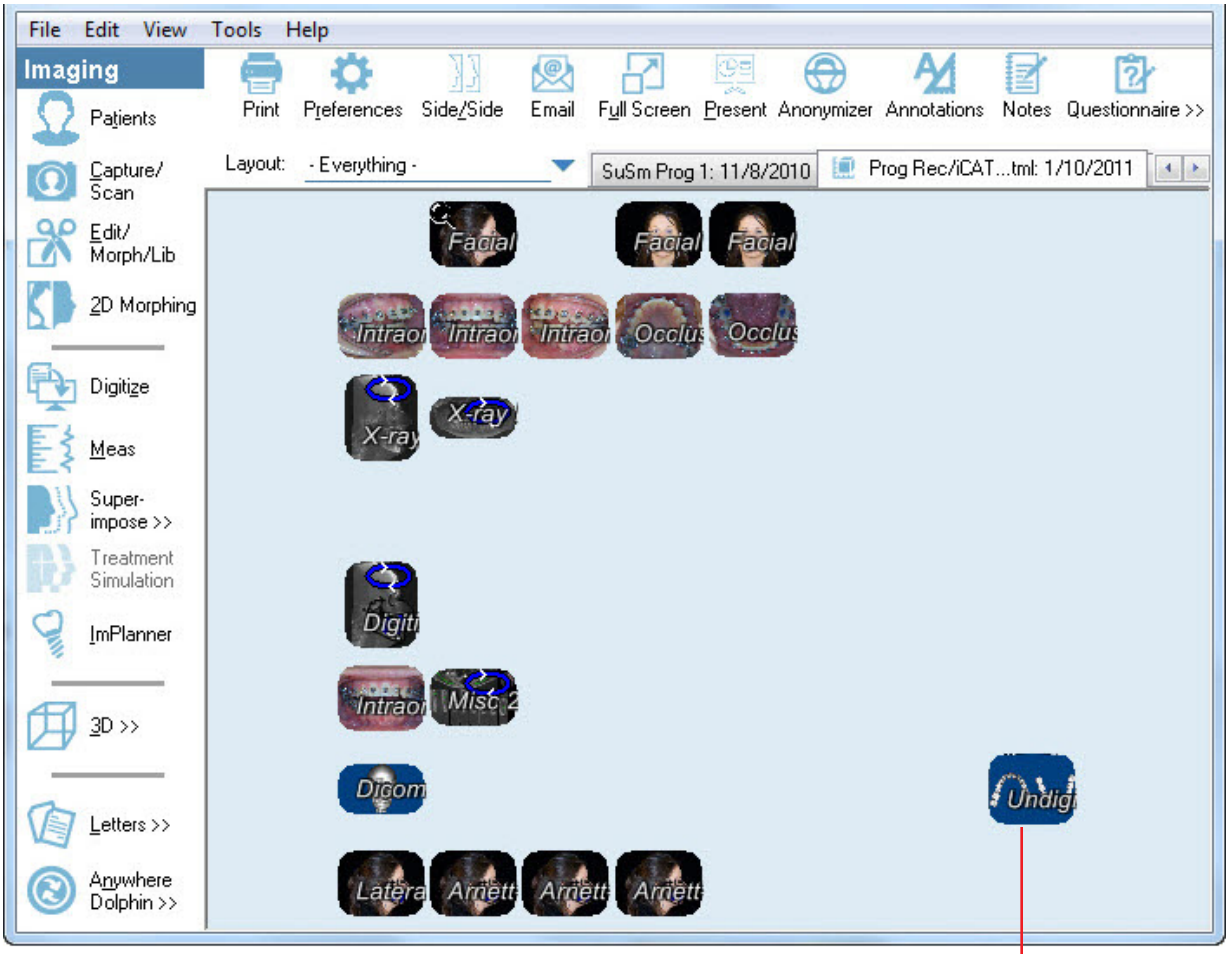
7 Exit from Dolphin 3D.



To digitize the arch models:

1 On the Dolphin Imaging main screen, select **- Everything -** from the **Layout** drop-down list.

2 Click the arch models in the **Undigitized Arch** image slot in the image layout.



arch models saved from Dolphin 3D

3 Click Digitize .

4 In the Ceph Analyses group box on the Digitize Setup dialog box, click .

5 Digitize the arch models as described in “Digitizing Study Models” on page 7-12.

Viewing and Taking Measurements

You use the following tabs on the **Digitize/Measurement** palette to view and take measurements:

Measurements	View measurements calculated from your digitized landmarks. Available for all analyses except **<Dolphin>**. For more information, see “Viewing and Taking Measurements” on page 22-8
2D Slice Area	Measure two-dimensional slice areas. Available only for the **<Dolphin>** analysis. For more information, see “Measuring Slice Areas” on page 22-15.

2D Line	Take measurements using lines. Available only for the **<Dolphin>** analysis. For more information, see “Taking Measurements Using Lines” on page 22-12.
3D Line	Take measurements using lines. Available only for the **<Dolphin>** analysis. For more information, see “Taking Measurements Using Lines” on page 22-12.
2D Angle	Take measurements using angles. Available only for the **<Dolphin>** analysis. For more information, see “Taking Measurements Using Angles” on page 22-13.
3D Angle	Take measurements using angles. Available only for the **<Dolphin>** analysis. For more information, see “Taking Measurements Using Angles” on page 22-13.
2D Path	Take measurements using paths. Available only for the **<Dolphin>** analysis. For more information, see “Taking Measurements Using Paths” on page 22-16.
3D Path	Take measurements using paths. Available only for the **<Dolphin>** analysis. For more information, see “Taking Measurements Using Paths” on page 22-16.
2D Cut Gap Distance	Measure distances between osteotomy segments. Available only when you open the Digitize/Measurement palette from the **Step 7: Present** tab in the Orthognathic Surgical Planning module. For more information, see “Measuring Cut Gap Distances” on page 30-123.
Dist to Midline	Measure distances between points and the mid-sagittal plane. Available only for the **<Dolphin>** analysis using volume/surface and arch views (not for slice or panoramic views). For more information, see “Measuring Distance to the Midline” on page 22-18.

Viewing Measurements

You use the **Measurements** tab of the Digitize/Measurement palette to view measurements. This tab is available for all analyses except **<Dolphin>** (which is available in the 3D view).

To view the measurements:

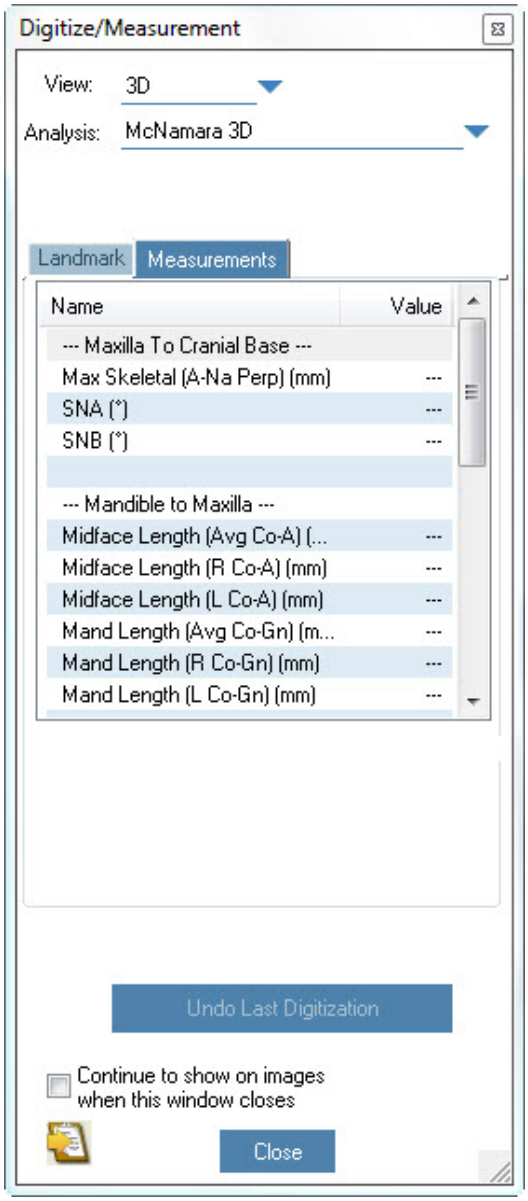
1 Click the **Measurements** tab on the Digitize/Measurement palette.

The **Measurements** tab lists all the measurements for the currently selected analysis. If you have digitized the landmarks necessary to calculate a particular measurement, the measurement value appears in the **Value** column.

Note: *For 2D analyses, measurements are calculated using orthogonal (rather than perspective) projection. However, if you build x-rays with perspective projection after digitizing landmarks, the measurements on that radiograph are calculated with the specified magnification. This feature is useful for comparison with older records. For more information, see “Selecting the Projection Type and Ruler Options” on page 21-44.*

To resize the columns in the measurement list:

1 Click and drag the dividing line between two column headings.


Digitize/Measurement
View: 3D
Analysis: McNamara 3D
Landmark
Measurements
Name
Value
--- Maxilla To Cranial Base ---
Max Skeletal (A-Na Perp) (mm) ---
SNA (°) ---
SNB (°) ---
--- Mandible to Maxilla ---
Midface Length (Avg Co-A) (... ---
Midface Length (R Co-A) (mm) ---
Midface Length (L Co-A) (mm) ---
Mand Length (Avg Co-Gn) (m... ---
Mand Length (R Co-Gn) (mm) ---
Mand Length (L Co-Gn) (mm) ---
Undo Last Digitization
Continue to show on images when this window closes
Close

View	View for the type of analysis for which to display measurements. **3D:** Measurements for 3D analyses, including the **<Dolphin>** analysis. **2D Lateral:** Measurements for 2D lateral analyses. **2D Frontal:** Measurements for 2D frontal analyses. **2D Arch:** Measurements for 2D arch analyses. The analyses available in the **Analysis** drop-down list depend on the view.
Analysis	Analysis for which you want to view measurements. The available choices depend on your selection in the **View** drop-down list.
check boxes	Selects measurements to display on the image. Available only on the **2D Line**, **3D Line**, **2D Angle**, **3D Angle**, **2D Path**, **3D Path**, **2D Slice Area**, **2D Cut Gap Distance,** and **Dist to Midline** tabs.
Name	Name of the measurement.
Value	Value for the measurement.
Show ALL	Displays all defined measurements on the image. Available only on the **2D Line**, **3D Line**, **2D Angle**, **3D Angle**, **2D Path**, **3D Path**, **2D Slice Area**, **2D Cut Gap Distance,** and **Dist to Midline** tabs.
Hide ALL	Hides all defined measurements on the image. Available only on the **2D Line**, **3D Line**, **2D Angle**, **3D Angle**, **2D Path**, **3D Path**, **2D Slice Area**, **2D Cut Gap Distance,** and **Dist to Midline** tabs.
Remove Highlighted Line, Angle, Path, Area, Cut Gap, or Dist	Removes the measurement currently highlighted in the list from the image. This button's label depends on the tab currently selected. Available only on the **2D Line**, **3D Line**, **2D Angle**, **3D Angle**, **2D Path**, **3D Path**, **2D Slice Area**, **2D Cut Gap Distance,** and **Dist to Midline** tabs.
Remove ALL Lines, Angles, Paths, Areas, Cut Gaps, or Distances	Removes all the measurements listed on the currently selected tab. This button's label depends on the tab currently selected. Available only on the **2D Line**, **3D Line**, **2D Angle**, **3D Angle**, **2D Path**, **3D Path**, **2D Slice Area**, **2D Cut Gap Distance,** and **Dist to Midline** tabs.
Clear ALL Measurements...	Removes all the measurements from the image.Available only on the **2D Line**, **3D Line**, **2D Angle**, **3D Angle**, **2D Path**, **3D Path**, **2D Slice Area**, **2D Cut Gap Distance,** and **Dist to Midline** tabs.
Undo Last Digitization	Undoes your last digitize operation. Available only on the **Landmark** tab.
Continue to show on images when this window closes	Displays measurements on the patient's image after you close the Digitize/ Measurement palette.
	Copies the measurement data to the clipboard. The exported data can be imported into another application such as Microsoft Excel. For more information, see “Copying Landmark and Measurement Data to the Clipboard” on page 22-21.
Close	Closes the palette.

Taking Measurements Using Lines

You use the **2D Line** and **3D Line** tabs of the Digitize/Measurement palette to take two-dimensional or three-dimensional measurements using lines. These tabs are available only when the 3D view and **<Dolphin>** analysis are selected.

To take a measurement using a line:

1 Select **3D** from the **View** drop-down list.

2 Select **<Dolphin>** from the **Analysis** drop-down list.

3 Click the **2D Line** tab on the Digitize/Measurement palette to take two-dimensional measurements.

Or,

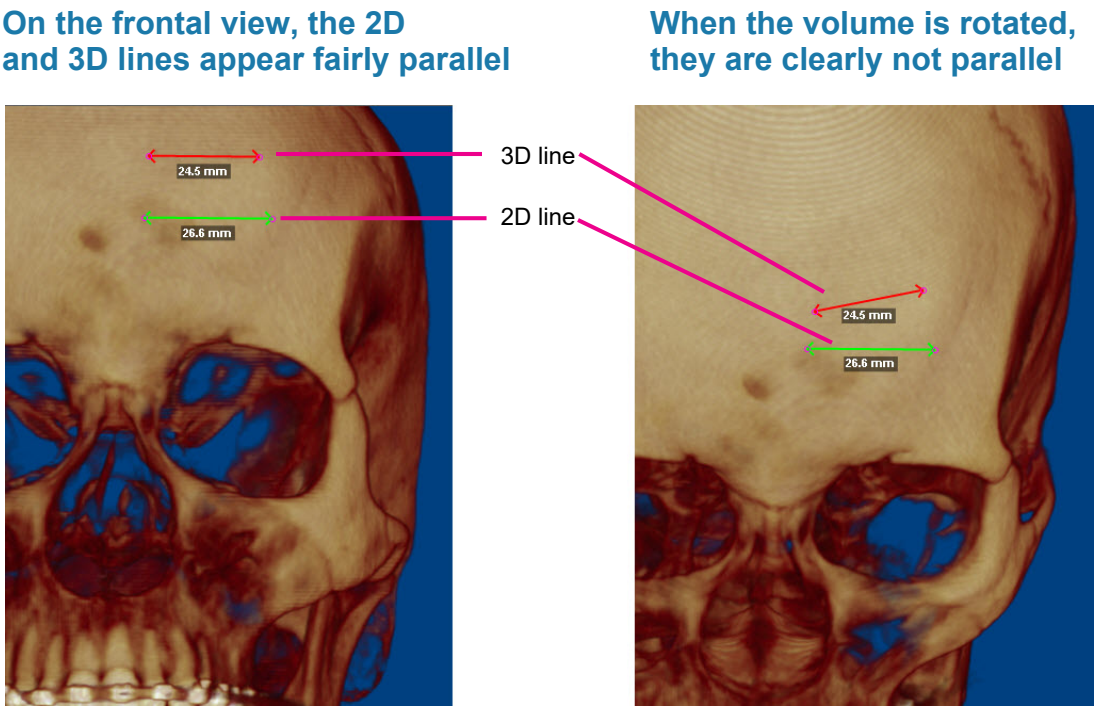
Click the **3D Line** tab to take three-dimensional measurements.

The tab you selected opens. The **2D Line** and **3D Line** tabs offer the same options. The only difference is whether the measurement will be taken in two dimensions or three.

4 Click two points on the image to identify the beginning and end of the line.

Dolphin 3D draws a line between the two points you identified. On the palette, a name for the line is listed in the **Name** column and its length appears in the **Value** column.

The following figure illustrates the difference between a 2D line and a 3D line.



A 2D measurement is defined completely on the same viewing plane—that is, at the same depth. After the last point of the measurement is defined, the object is projected onto the viewing plane.

To change the location of a line:

1 Select the line you want to move in the list.

2 Click and drag an end point to reposition it.

To remove lines and measurements:

1 Select the line you want to remove in the list. Then, click **Remove Highlighted Line**.

Or,

Click **Remove ALL Lines...** to remove all lines.

Or,

Click **Clear ALL Measurements...** to remove all measurements.

2 If you **Remove ALL Lines...** or **Clear ALL Measurements...**, click **Yes** on the confirmation dialog box that appears.

Taking Measurements Using Angles

You use the **2D Angle** and **3D Angle** tabs of the Digitize/Measurement palette to take two-dimensional or three-dimensional measurements using angles. These tabs are available only when the 3D view and **<Dolphin>** analysis are selected.

To take a measurement using an angle:

1 Select **3D** from the **View** drop-down list.

2 Select **<Dolphin>** from the **Analysis** drop-down list.

3 Click the **2D Angle** tab on the Digitize/Measurement palette to take two-dimensional measurements.

Or,

Click the **3D Angle** tab to take three-dimensional measurements.

The tab you selected opens. The **2D Angle** and **3D Angle** tabs offer the same options. The only difference is whether the measurement will be taken in two dimensions or three.

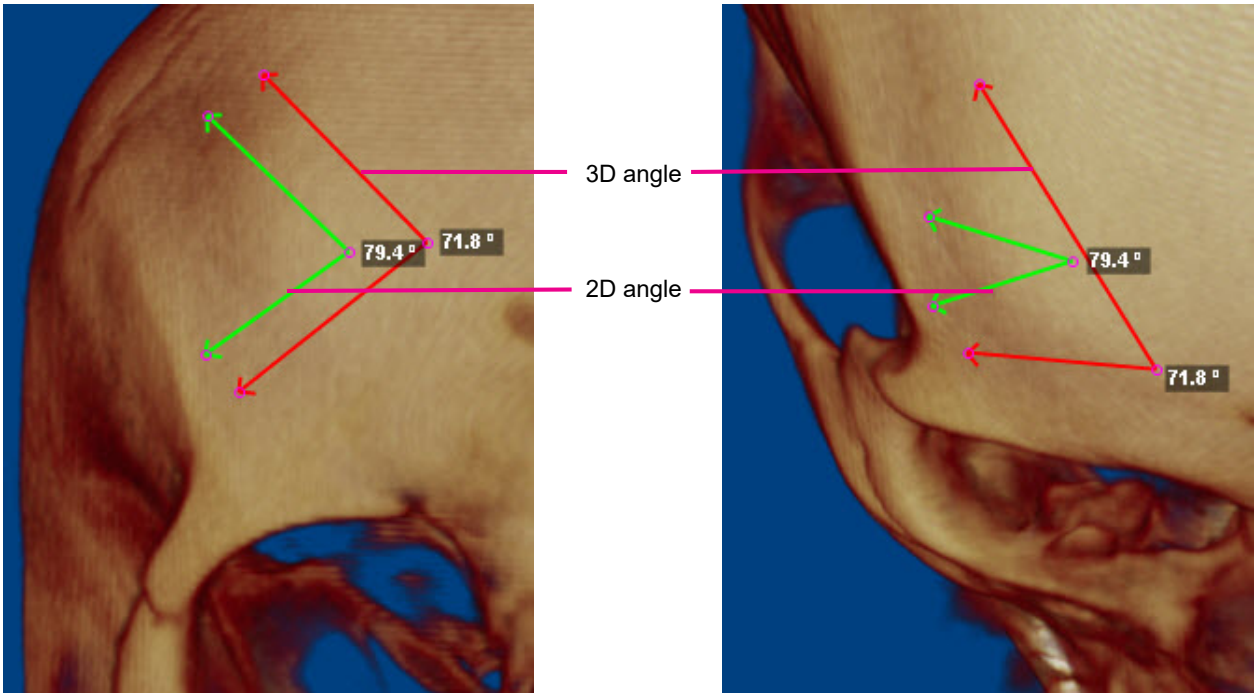
4 Click three points on the image to identify the two lines and vertex of the angle.

Dolphin 3D draws an angle using the three points you identified, with the second point as the vertex. On the palette, a name for the angle is listed in the **Name** column and its measurement in degrees appears in the **Value** column.

The following figure illustrates the difference between a 2D angle and a 3D angle.

On the frontal view, the 2D and 3D angles appear similar

When the volume is rotated, the difference is apparent



To change an angle:

1 Select the angle you want to change in the list.

2 Click and drag one or more points to change the angle.

To remove angles and measurements:

1 Select the angle you want to remove in the list. Then, click **Remove Highlighted Angle**.

Or,

Click **Remove ALL Angles...** to remove all angles.

Or,

Click **Clear ALL measurements...** to remove all measurements.

2 If you clicked **Remove ALL Angles...** or **Clear ALL measurements...**, click **Yes** in the confirmation dialog box that appears.

Measuring Slice Areas

You use the **2D Slice Area** tab of the Digitize/Measurement palette to measure areas on slices. This tab is available only for the **<Dolphin>** analysis (only available in the 3D view).

To measure an area on a slice:

1 Select **3D** from the **View** drop-down list.

2 Select **<Dolphin>** from the **Analysis** drop-down list.

3 Click the **2D Slice Area** tab on the Digitize/Measurement palette.

The **Slice Area** tab opens.

4 Select one of the slice or x-ray views.

You can only define a slice area on a slice or x-ray view. For more information, see “Layouts and Slices” on page 19-32.

5 Click the point where you want to begin drawing the slice area.

6 Click whenever you want to place a point and change the direction of the line.

If you make a mistake, you can click and drag a point to reposition it or click **Clear Highlighted Area** to start over.

7 Click the first point again to close the slice area.

When you close the slice area, Dolphin 3D fills it with crosshatching. On the palette, a name for the area is listed in the **Name** column and its area in square millimeters (mm^2) appears in the **Value** column.

To change a slice area:

1 Select the slice area you want to change in the list.

2 Click and drag one or more points to change the slice area.

To remove slice areas and measurements:

1 Select the slice area you want to remove in the list. Then, click **Remove Highlighted Area**.

Or,

Click **Remove ALL Areas...** to remove all slice areas.

Or,

Click **Clear ALL measurements...** to remove all measurements.

2 If you clicked **Remove ALL Areas...** or **Clear ALL measurements...**, click **Yes** in the confirmation dialog box that appears.

Taking Measurements Using Paths

You use the **Path** tab of the Digitize/Measurement palette to take measurements using paths. This tab is available only for the **<Dolphin>** analysis.

To take a measurement using a path:

1 Select **3D** from the **View** drop-down list.

2 Select **<Dolphin>** from the **Analysis** drop-down list.

3 Click the **2D Path** tab on the Digitize/Measurement palette to take two-dimensional measurements.

Or,

Click the **3D Path** tab to take three-dimensional measurements.

The tab you selected opens. The **2D Path** and **3D Path** tabs offer the same options. The only difference is whether the measurement will be taken in two dimensions or three.

4 Click points on the image to identify the path.

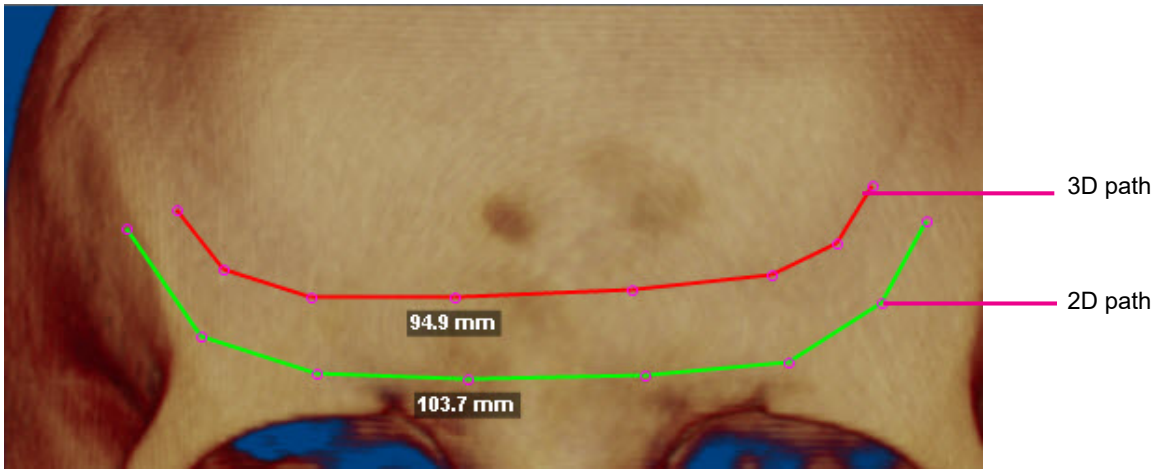
Dolphin 3D draws a path using points you identified.

5 Click the last point on the path twice to end the path.

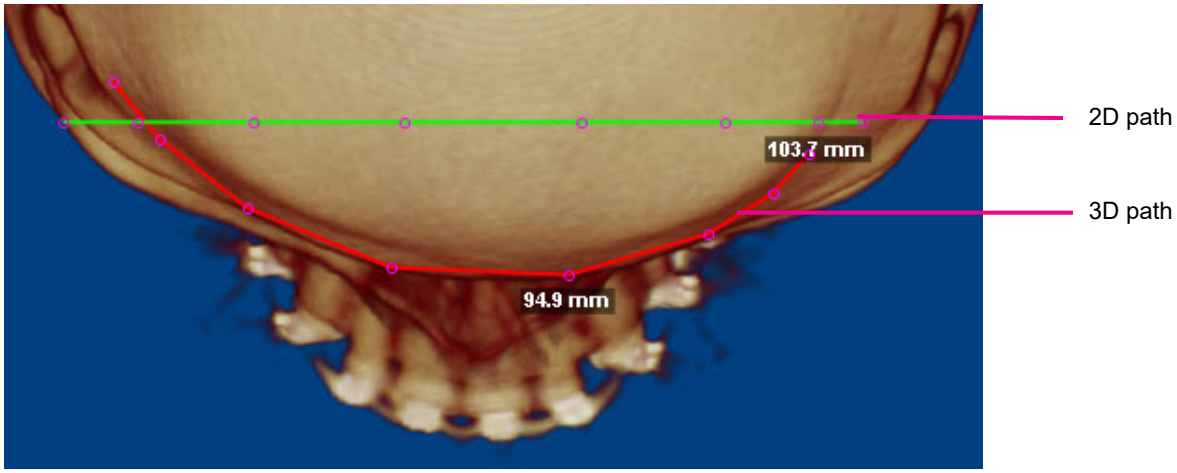
On the palette, a name for the path is listed in the **Name** column and the distance appears in the **Value** column.

The following figure illustrates the difference between a 2D path and a 3D path.

On the frontal view, the 2D and 3D paths appear similar



When the volume is rotated, the difference is apparent



To change a path:

1 Select the path you want to change in the list.

2 Click and drag one or more points to change the path.

To remove paths and measurements:

1 Select the path you want to remove in the list. Then, click **Remove Highlighted Path**.

Or,

Click **Remove ALL Paths...** to remove all paths.

Or,

Click **Clear ALL measurements...** to remove all measurements.

2 If you clicked **Remove ALL Paths...** or **Clear ALL measurements...**, click **Yes** in the confirmation dialog box that appears.

Measuring Distance to the Midline

You use the **Dist to Midline** tab of the Digitize/Measurement palette to measure the distance between digitized points and the mid-sagittal plane. You can digitize any number of points on the patient's 3D image to measure different distances.

This tab is available only for the **<Dolphin>** analysis. In addition, this feature is available only for volume/surface and arch views (not for slice or panoramic views).

To measure the distance between a point to the midline:

1 Select **3D** from the **View** drop-down list.

2 Select **<Dolphin>** from the **Analysis** drop-down list.

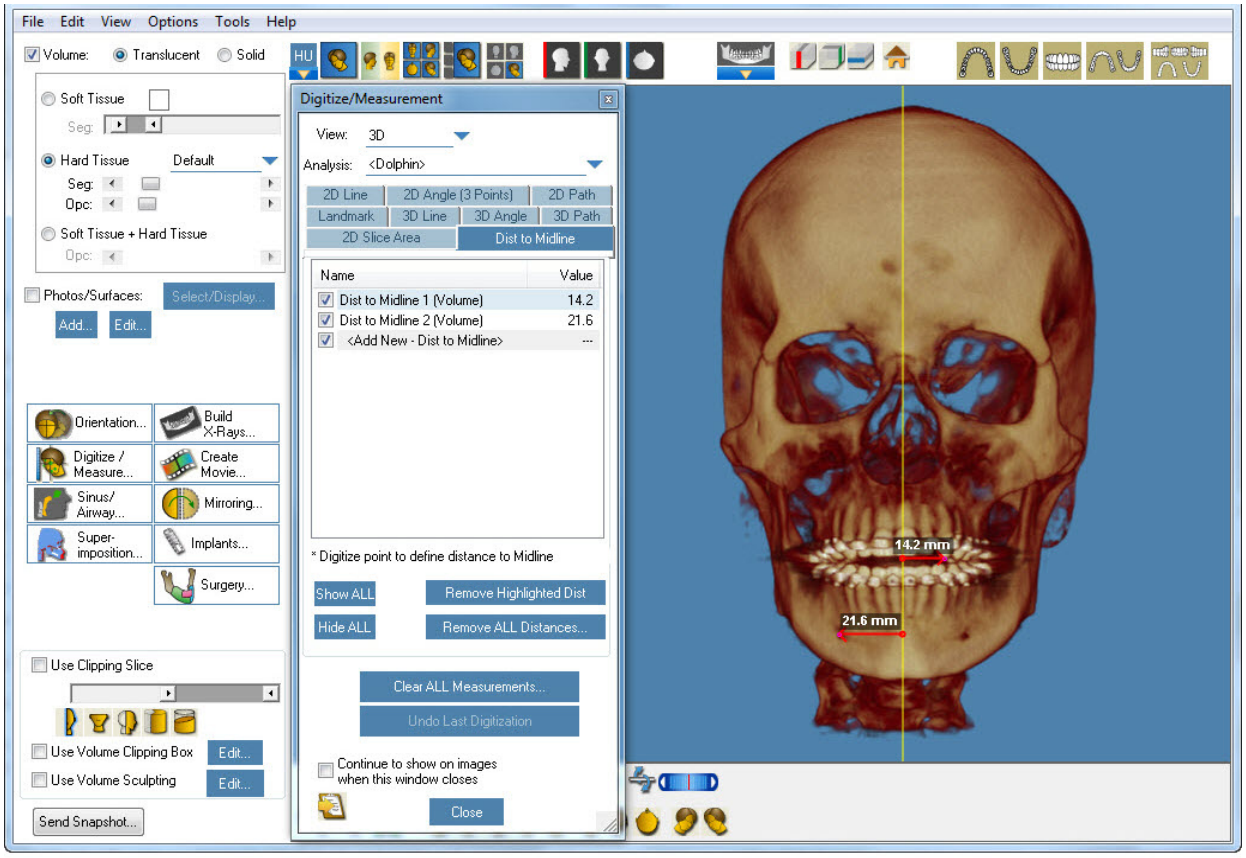
3 Click the **Dist to Midline** tab on the Digitize/Measurement palette.

The **Dist to Midline** tab opens, and the mid-sagittal plane appears on the patient's 3D image.

4 Click a point on the image to measure the distance between that point and the mid-sagittal plane.

Dolphin 3D draws an arrow on the patient's image that measures the distance in millimeters. On the palette, a name for the measured distance is listed in the **Name** column and the distance appears in the **Value** column.

Note: *If you later change the location of the mid-sagittal plane (see Chapter 20, Volume Orientation), the distances on the* **Dist to Midline** *tab will be automatically updated.*



Locating a Measurement

To locate a measurement listed on the patient's 3D image:

1 Select a measurement listed on the palette.

The digitized point for that measurement is highlighted in yellow on the patient's 3D image.

Showing and Hiding Measurements

To show or hide measured distances on the patient's 3D image:

1 On the palette, check the box for a measurement to display it on the patient's 3D image.

Or,

Uncheck the box for a measurement if you don't want to display it on the patient's 3D image.

Or,

Click **Show ALL** to display all measured distances on the patient's 3D image.

Or,

Click **Hide ALL** to display all measured distances on the patient's 3D image.

Removing Measurements

To remove a measured distance:

1 Select a measurement listed on the palette.

2 Click **Remove Highlighted Dist**.

To remove all measured distances:

1 Click **Remove ALL Distances...**.

2 Click **Yes** on the confirmation dialog box that appears.

3D Digitizing For Use in Dolphin 2D

You can digitize landmarks for conventional 2D analyses in three dimensions, then use the result in Dolphin 2D.

To digitize landmarks for conventional 2D analyses in three dimensions:

1 Select the type of 2D analysis you want to digitize (**2D-Lateral**, **2D-Frontal**, or **2D-Arch**) from the **View** drop-down list on the Digitize/Measurement palette.

2 Select the 2D analysis you want to digitize from the **Analysis** drop-down list.

3 Digitize the landmarks.

4 Close the Digitize/Measurement palette.

5 Click

.

6 Build the appropriate x-ray type (see Chapter 21, Build X-rays).

7 Send a snapshot to your Dolphin database (see "Saving an X-ray" on page 21-49).

When you save the x-ray to your database, a digitized cephalometric image is saved in addition to the x-ray image.

The 2D analyses include only the landmarks necessary to construct the measurements table for the analyses. Landmarks used in Dolphin 2D to auto-draw structures are not included. You have two options if want to see the auto-drawn structures in Dolphin 2D:

- Open the digitized cephalometric image you saved from Dolphin 3D in the Dolphin 2D digitizing interface. On the Digitize Setup dialog box, select the auto-drawn structures you want and select **Existing session (Add/modify points)**. Then, digitize the additional points necessary to auto-draw the desired structures. For more information, see “Digitize Setup” on page 7-3.
- Create a custom analysis that includes the points necessary to auto-draw the desired structures. To create your custom analysis, you can start with an existing analysis, add the necessary points, and save it under a new name. Then, select that analysis when digitizing in Dolphin 3D. For more information on creating a custom analysis, see Chapter 18, Custom Analysis Editor (Medical Device).

Copying Landmark and Measurement Data to the Clipboard

To copy the landmark and measurement data to the clipboard:

1 Click on the Digitize/Measurement palette.

A message appears indicating that landmark coordinates and measurements have been copied to the clipboard.

2 Click **OK**.

You can paste the data from the clipboard into another application, such as Microsoft Excel, for further analysis.

23 Dolphin 3D Movies

With the 3D Script Editor, you can create a smooth, animated movie with different views of the 3D volume and photograph (if available). To create a movie, you perform the following basic steps:

1 You create a script that contains key frames (or snapshots) of the 3D volume and photograph (if available).

   Your key frames can include different viewing angles, zoom factors, translucency, clipping slices or boxes, and so on. The movie that you create from this script will display each of these key frames in order, smoothly transitioning from one frame to the next whenever possible. For more information, see “Creating a Script” on page 23-5.

   At any time, you can save the script so that you can load it and work on it more later.

2 You generate and view a preview of the movie from your script to make sure that the movie will work as expected.

   Generating the preview takes much less time than generating the final movie file. By viewing the preview, you can get a good idea of how the final movie will look and decide whether you want to add more frames to the movie or delete some of the existing frames. For more information, see “Previewing a Movie” on page 23-10.

3 You generate the final movie file in AVI format, which you can play using popular movie viewing programs such as Windows Media Player and QuickTime.

   Before generating the movie, you can specify options that control its speed, resolution, quality, and file size. Depending on the number of frames in your movie, generating it may take several minutes. For more information, see “Generating a Movie” on page 23-10.

4 After you have generated the movie, you can save it as part of the patient's record in Dolphin Imaging. You can also export it to your computer's file system so that you can open it outside of Dolphin Imaging, email it to the patient or other professionals, and so on.

   Saving the movie in your Dolphin Imaging database stores it as part of the current timepoint. When saving the movie, you select the image layout and image slot in which you want to store it. For more information, see “Saving a Movie” on page 23-12.

In addition to saving the entire movie as part of the patient's Dolphin Imaging record, you can save the script's sequence of frames as individual Dolphin images. In this way, you can create a composite set of images for your 3D volume for later viewing or for transfer to referrals.

Once you have created and saved a script, you can apply it to other patients to create movies containing the same views of their 3D volume data. In this way, you can create standardized movie presentations of your patients. For more information, see “Reusing Scripts” on page 23-16.

To open the 3D Script Editor:

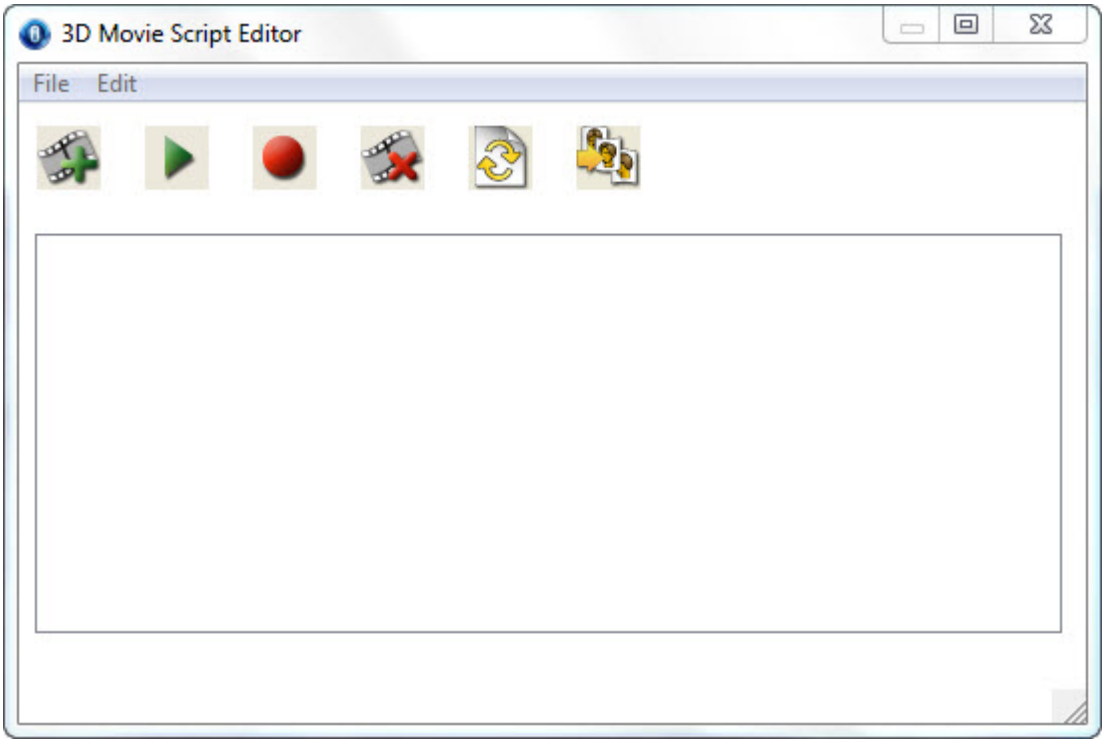
1 Click

.

Or,

Select **Create/Use Script...** from the **Tools** menu.

The 3D Script Editor dialog box opens.



File menu	Offers the following options: **New Script:** Clears the current script from the 3D Script Editor dialog box so you can begin creating a new script. If you have previously saved the script, clearing it does not delete the saved script file. For more information, see “Loading, Saving, and Clearing a Script” on page 23-9. **Load Script...:** Loads a previously saved script so that you can edit it, preview it, or generate a movie from it. For more information, see “Loading, Saving, and Clearing a Script” on page 23-9. **Save Script:** Saves your current script in a file on your computer's file system. For more information, see “Loading, Saving, and Clearing a Script” on page 23-9. **Save Script As...:** Saves your current script in a file on your computer's file system with a new name. For more information, see “Loading, Saving, and Clearing a Script” on page 23-9. **Make Movie...:** Generates a movie from your script and plays it in your default movie player (such as Windows Media Player or QuickTime). For more information, see “Generating a Movie” on page 23-10. **Save frames as individual images...:** Saves the script's sequence of frames as individual images in an image layout. For more information, see “Saving the Frames as Dolphin Images” on page 23-14. **Save Movie...:** Saves the movie you have generated as part of the patient's record in Dolphin Imaging. Only available after you have generated a movie from the script. For more information, see “Saving a Movie” on page 23-12. **Export Movie...:** Exports the movie you have generated to a file on your computer's file system. Only available after you have generated a movie from the script. For more information, see “Exporting a Movie to a File” on page 23-14. **Hide Dialog:** Hides the 3D Script Editor dialog box.

Edit menu	Offers the following options: **Insert New Frame at End:** Adds a new frame to the end of your script. For more information, see “Adding a Frame” on page 23-5. **Insert New Frame After Highlighted Frame:** Adds a new frame to your script after the selected frame. For more information, see “Adding a Frame” on page 23-5. **Insert New Frame Before Highlighted Frame:** Adds a new frame to your script before the selected frame. For more information, see “Adding a Frame” on page 23-5. **Replace Highlighted Frame:** Replaces the selected frame in your script with a new frame. For more information, see “Adding a Frame” on page 23-5. **Delete Highlighted Frame:** Deletes the selected frame from your script. For more information, see “Deleting a Frame” on page 23-7. **Refresh Script Preview:** Refreshes the frames in the current script using the current patient. For more information, see “Reusing Scripts” on page 23-16. **Preview Movie:** Previews the movie that you can make from your script in your default movie player (such as Windows Media Player or QuickTime). For more information, see “Previewing a Movie” on page 23-10. **Movie Generation Properties...:** Opens the AVI Generation Properties dialog box so that you can set options for generating movies. For more information, see “Setting Movie Generation Properties” on page 23-10.
	Adds a new frame to the end of your script. For more information, see “Adding a Frame” on page 23-5.
	Previews the movie that you can make from your script in your default movie player (such as Windows Media Player or QuickTime). For more information, see “Previewing a Movie” on page 23-10.
	Generates a movie from your script and plays it in your default movie player (such as Windows Media Player or QuickTime). For more information, see “Generating a Movie” on page 23-10.
	Deletes the selected frame from your script. For more information, see “Deleting a Frame” on page 23-7.
	Refreshes the frames in the current script using the current patient. For more information, see “Reusing Scripts” on page 23-16.
	Exports the script's sequence of frames as individual images in an image layout. For more information, see “Saving the Frames as Dolphin Images” on page 23-14.
	Saves a movie you have generated as part of the patient's record in Dolphin Imaging. Available only after you have generated a movie from the script. For more information, see “Saving a Movie” on page 23-12.

Creating a Script

Creating a script involves adding and arranging a sequence of frames that will be used to create the movie. You can also set properties for the frames to control how long each frame remains on the screen in the final movie. By default, transitioning from one movie frame to the next takes one second, and the last frame in the movie displays statically on the screen for one second.

When you generate a preview or the final movie file, your default movie viewer opens and shows a preview or final movie that transitions through the frames in your script in the order they appear in the 3D Script Editor dialog box.

Note: *When creating your script, it is important to insert enough frames so that there is no ambiguity in the way that the movie should transition from one frame to the next. To make sure that your movie will be generated as you expect, you can preview it. After the preview, you can make any corrections to your script, such as inserting additional frames, reordering the frames, or deleting frames.*

Adding a Frame

To add the first key frame to your script:

1 In the Dolphin 3D window, manipulate the 3D volume as necessary to create the view that you want to use for this frame.

2 On the Dolphin 3D window, select **Add to End of Movie Script** from the **Edit** menu.

Or,

On the Dolphin 3D window, right-click the image and select **Add to End of Movie Script** from the context menu.

Or,

On the 3D Script Editor dialog box, click .

Or,

On the 3D Script Editor dialog box, select **Insert New Frame at End** from the **Edit** menu.

Or,

Press INS on your keyboard.

The frame you added appears in the 3D Script Editor dialog box.

To add an additional key frame to the end of your script:

1 In the Dolphin 3D window, manipulate the 3D volume as necessary to create the view that you want to use for this frame.

2 On the Dolphin 3D window, select **Add to End of Movie Script** from the **Edit** menu.

Or,

On the Dolphin 3D window, right-click the image and select **Add to End of Movie Script** from the context menu.

Or,

On the 3D Script Editor dialog box, click .

Or,

On the 3D Script Editor dialog box, right-click one of the frames. Then, select **Insert at End** from the context menu.

Or,

On the 3D Script Editor dialog box, select **Insert New Frame at End** from the **Edit** menu.

Or,

Press INS on your keyboard to add the new frame at the end of the script.

To add an additional key frame in the middle of your script:

1 In the Dolphin 3D window, manipulate the 3D volume as necessary to create the view that you want to use for this frame.

2 On the 3D Script Editor dialog box, select a frame in the script.

3 On the 3D Script Editor dialog box, select **Insert New Frame After Highlighted Frame** from the **Edit** menu to add the new frame after the selected frame.

Or,

On the 3D Script Editor dialog box, right-click one of the frames. Then, select **Insert After Highlighted Frame** from the context menu to add the new frame after the selected frame.

Or,

On the 3D Script Editor dialog box, select **Insert New Frame Before Highlighted Frame** from the **Edit** menu to add the new frame before the selected frame.

Or,

On the 3D Script Editor dialog box, right-click one of the frames. Then, select **Insert Before Highlighted Frame** from the context to add the new frame before the selected frame.

To replace a key frame in your script:

1 In the Dolphin 3D window, manipulate the 3D volume as necessary to create the view that you want to use for this frame.

2 On the 3D Script Editor dialog box, select a frame in the script.

3 On the Dolphin 3D window, right-click the image and select **Replace Highlighted Movie Script Frame** from the context menu.

Or,

On the 3D Script Editor dialog box, select **Replace Highlighted Frame** from the **Edit** menu.

Or,

On the 3D Script Editor dialog box, click right-click one of the frames. Then, select **Replace Highlighted Frame** from the context menu.

Deleting a Frame

To delete a key frame from your script:

1 In the 3D Script Editor dialog box, click the frame you want to delete from your script, and click .

Or,

Click the frame you want to delete from your script, and select **Delete Highlighted Frame** from the **Edit** menu.

Or,

Right-click the frame you want to delete from your script, and select **Delete Highlighted Frame**.

A dialog box appears asking you to confirm the deletion.

2 Click **Yes** to delete the frame.

Reordering Frames

To reorder the key frames in your script:

1 Drag and drop a frame to a different location in the script.

As you drag the frame, a vertical bar indicates the position to which the frame will be moved if you drop it.

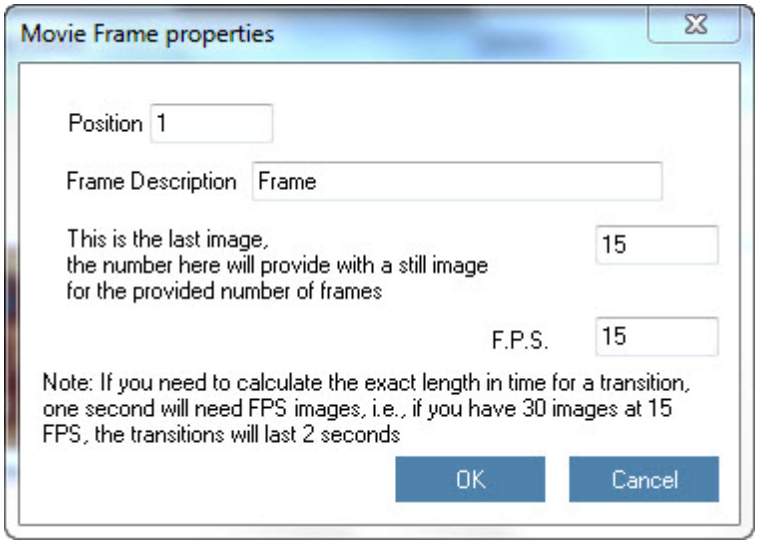
Setting Frame Properties

To set properties for a key frame:

1 Right-click the frame, and select **Highlighted Frame Properties...** from the context menu.

The Movie Frame Properties dialog box opens.

2 Set any properties for this frame, and click **OK**.



Position	Position of this frame within your script. To change the position of a frame, see “Reordering Frames” on page 23-7.
Frame Description	Description for this frame.
Number of images to generate **Or** **This is the last image...**	For all frames except the last, the number of frames to use to transition between this key frame and the next key frame. Typically is set to the same number as the frames per second (F.P.S), but you can change it if you want to dedicate more or fewer movie frames for this key frame relative to other key frames in the movie. For the last frame, the number of still frames to generate for this key frame. Since the last movie frame doesn't transition to another key frame, it remains as a static image on the screen for the number of frames you specify.
F.P.S	Number of frames per second for this script. To change the frames per second, see “Setting Movie Generation Properties” on page 23-10.

Loading, Saving, and Clearing a Script

To load a previously saved script:

1 Select **Load Script...** from the **File** menu.

The Open dialog box appears.

2 Navigate to the folder containing the script you want to open.

3 Select the script.

4 Optionally, check the **Open as Read Only** box.

If you open the script as read-only, you will not be able to save the script using the same name. In this way, you can avoid accidentally writing over a script to which you don't want to make any changes.

5 Click **Open**.

To save a script:

1 Select **Save Script** from the **File** menu.

Or,

Select **Save Script As...** from the **File** menu to save this script with a new name.

If this is the first time you have saved the script or if you selected **Save Script As...**, the Save As dialog box appears.

2 Navigate to the folder in which you want to save the script.

3 Enter the file name that you want to use for the script. Then, click **Save**.

To clear a script from the 3D Script Editor dialog box:

1 Select **New Script** from the **File** menu.

A dialog box appears asking you to confirm that you want to clear the script currently open in the 3D Script Editor dialog box.

Note: *Clearing a script removes it from the 3D Script Editor dialog box. Any work you have done on the script since you last saved it will be lost. If you have saved the script, the saved script file will not be deleted.*

2 Click **Yes** to clear the script.

Previewing a Movie

Once you have created your script, you can preview the movie it will generate to make sure that the script works as expected. The generated preview is a low-resolution version of your movie that generates much faster than the final movie. Once the preview is generated, it opens in your default movie viewer (such as Microsoft Media Player or QuickTime) and begins playing so that you can see how it looks.

Once you are happy with the movie's appearance, you can generate the final movie.

To preview a movie generated from your script:

1 Click .

Or,

Select **Preview Movie** from the **Edit** menu.

A progress bar appears at the bottom of the 3D Script Editor dialog box as the preview generates.

Generating a Movie

Depending on the number of key frames in your movie, generating it may take several minutes. Once the movie is generated, it opens in your default movie viewer (such as Microsoft Media Player or QuickTime) and begins playing so that you can see how it looks.

To generate a movie from your script:

1 Click .

Or,

Select **Make Movie...** from the **File** menu.

A progress bar appears at the bottom of the Dolphin 3D Movie Maker window as the movie generates.

Setting Movie Generation Properties

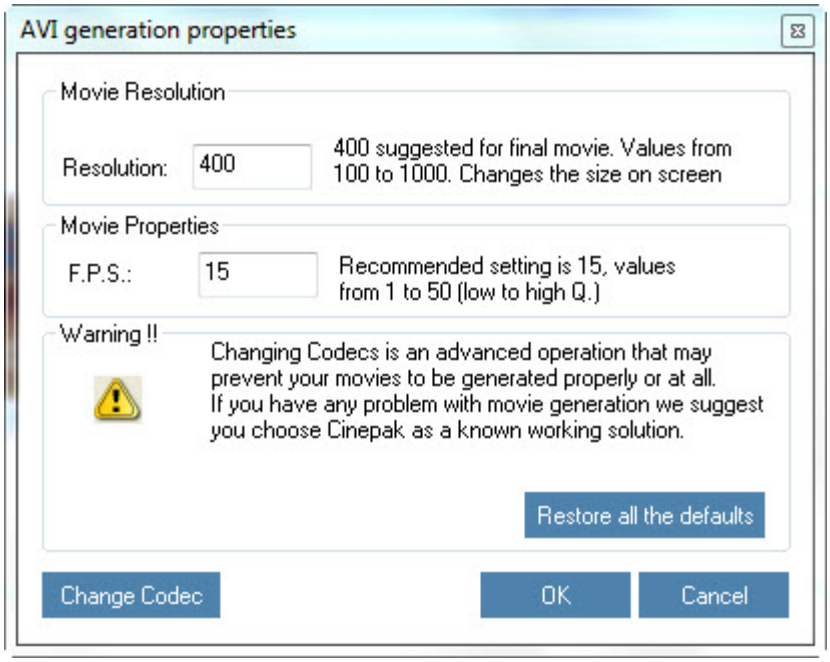
To set movie generation properties:

1 Select **Movie Generation Properties...** from the **Edit** menu.

The AVI Generation Properties dialog box opens so that you can specify options for the movie.

2 Enter options for the movie.

3 Click **OK**.



Resolution	Resolution (from 100 to 10000) for your movie, which determines the size of the movie window on the screen. For example, a value of 400 creates a movie that is 400 pixels wide by 400 pixels high, which typically is sufficient resolution for a computer screen. If the movie includes frames that use the 3+1 or 2x2 layout, you may want to increase this value to 700.
F.P.S.	Number of frames per second for the movie.
Restore all the defaults	Restores the default values for all movie generation options.
Change Codec	Changes the codec to use to create the movie. The codec is the program that compresses and decompresses the movie data. Changing the codec is an advanced operation. In most cases, you can simply use the default codec selection. For more information, see “Setting Advanced Movie Generation Properties” on page 23-11.

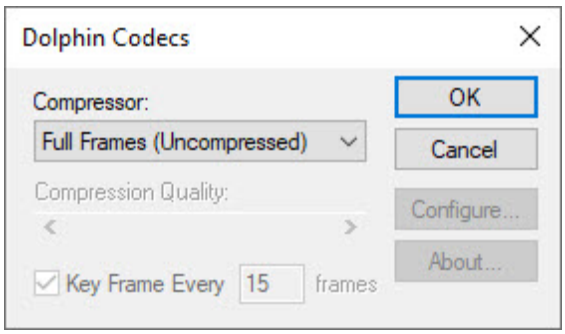
Setting Advanced Movie Generation Properties

To use a different codec to generate the movie:

1 Click **Change Codec**.

The Dolphin Codecs dialog box opens so that you can select the codec you want to use to generate the movie and enter options for it.

2 Select a codec from the **Compressor** drop-down list.



The computer or device used to play the resulting movie must support the codec that you select.

3 Set any other options for the codec, and click **OK**.

Compressor	Codec to use when generating the movie. Some codecs may not be supported by your computer, depending on its hardware and software configuration.
Compression Quality	Quality value to use when compressing the movie. A lower value results in a lower quality movie and a smaller file size (due to higher compression). If you change this option, the corresponding field on the AVI Generation Properties dialog box is set automatically to match. Not available for all codecs.
Key Frame Every *n* frames	Sets the number of frames that the movie takes to transition between frames. If you change this option, the corresponding field on the AVI Generation Properties dialog box is set automatically to match. Not available for all codecs.
Configure	Accesses additional configuration options for the selected codec. These options depend on the codec, and are not available for all codecs.

Saving a Movie

After you generate a movie, you can save it in the following ways:

- Save it to Dolphin Imaging: Saving a movie makes it part of the patient's record in Dolphin Imaging. For example, if you archive this patient and send the archive file to a referral, the movie will be included in the archive file and the referral will be able to view it.
- Export it to your computer's file system: Exporting the movie creates a file on your computer's file system. You can then view the movie without starting Dolphin Imaging. You can also share it with the patient or other professionals by emailing them the movie file or writing it on a CD or DVD.

Saving a Movie to Dolphin Imaging

To save a movie to Dolphin Imaging:

1 Click .

Or,

Select **Save Movie...** from the **File** menu.

The Export to Dolphin window opens so that you can select the image layout and slot in which you want to store the movie. The movie will be saved in the current timepoint for this patient.

2 Optionally, change to a different image layout as described below.

3 Click a slot in the image layout to save the movie in that slot.

4 Optionally, enter a new image slot title to use for the movie in the **Image Title** field.

5 Click **Save...**.

Image Layout	Currently selected image layout. Click a slot in the layout to save the movie in that slot.
Image Title	Image title to use for the movie. Initially, this field contains the title defined in the image layout for the selected image slot.
Change Layout...	Change to a different image layout.
Save...	Saves the movie in the selected image slot in the selected layout.

To choose a different image layout:

1 Click **Change Layout...**.

2 Select the image layout in which you want to save this movie from the drop-down list. Then, click **OK**.

Exporting a Movie to a File

To export a movie to your computer's file system:

1 Select **Export Movie...** from the **File** menu.

The Save As dialog box appears.

2 Specify the directory and file in which you want to save the movie.

3 Click **Save** to save the movie.

Saving the Frames as Dolphin Images

Once you have created a script, you can export the sequence of frames in your script as individual images to the patient's current timepoint in Dolphin Imaging. You can store the images in any image layout. The first frame in your script will be saved in the first slot in the selected image layout and subsequent frames will be saved in the subsequent slots until all key frames in your script have been saved.

Note: *When you save the frames to an image layout, images currently stored in the selected image layout can be overwritten. For this reason, you may want to export the images into an empty image layout.*

For example, suppose the Misc. Photos layout for the current timepoint already has images stored in the first, second, and third image slots. If you save the frames from a script containing two frames to the Misc. Photos layout, the existing images in the first two slots of the layout will be overwritten.

If you routinely save the frames from a particular script as Dolphin Images, you may wish to create an image layout for this purpose. For more information, see Chapter 17, Layout Editor.

To save the script's frames to a Dolphin Imaging layout:

1 Click .

Or,

Select **Save Frames as Individual Images...** from the **File** menu.

The Export to Dolphin dialog box opens.

2 Optionally, select the image layout to which you want to export the frames.

The images will be exported to patient's current timepoint and the selected image layout.

3 Click **Save...**.

A dialog box appears warning you that saving to an image layout that already contains images may overwrite the existing images.

4 Click **Yes** to save the key frames to the image layout.

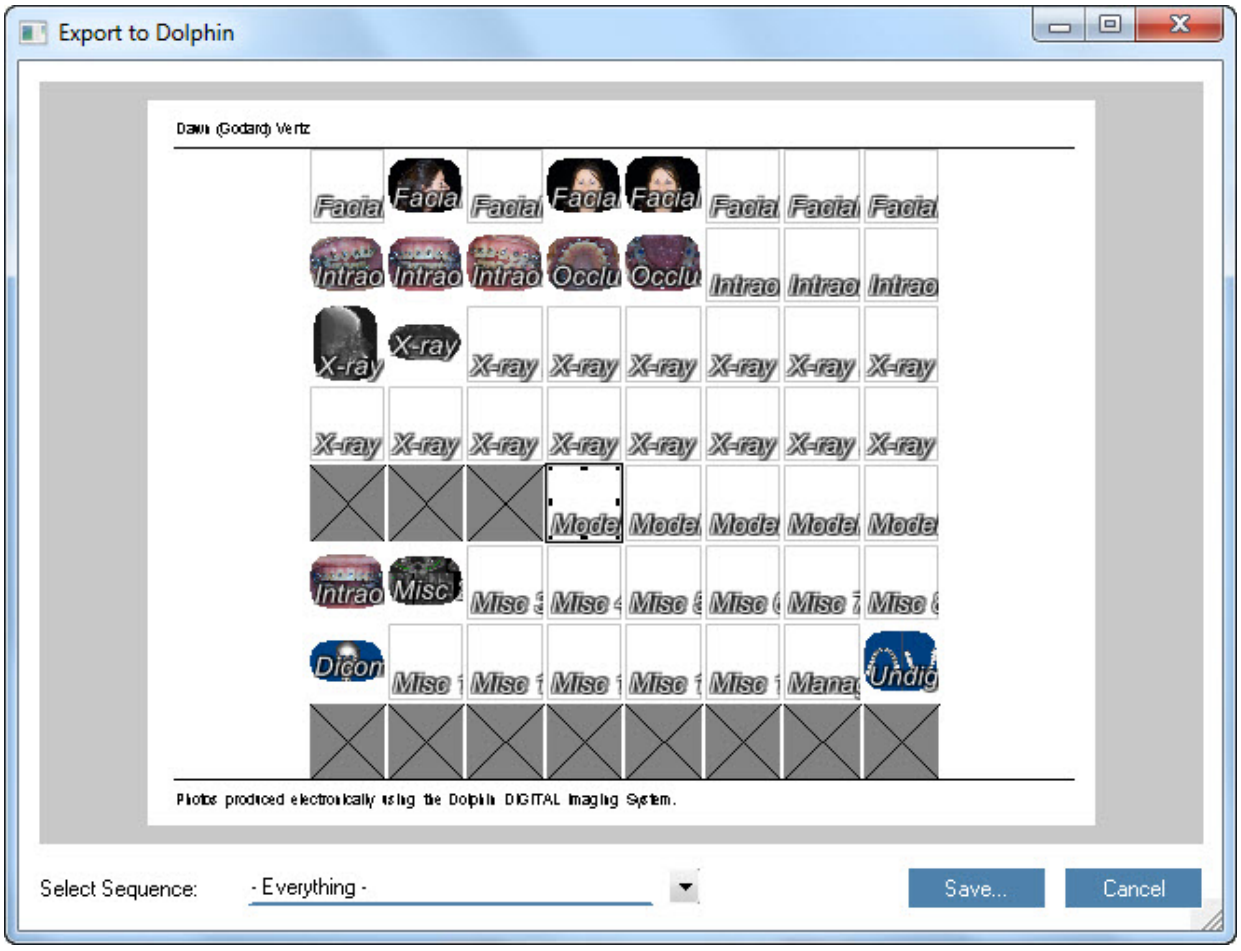


Image Layout	Currently selected image layout.
Select Sequence	Select a different image layout.
Save...	Saves the key frames in the script to the selected layout.

Once you have saved the images to Dolphin Imaging, you can save them as individual image files on your computer for sharing with others.

To save the script's frames as individual image files on your computer:

1 On the Dolphin Imaging main screen, right-click one of the images in the image layout to which you saved the script's frames.

2 Select **Save Layout As...** from the context menu.

3 Specify the directory and file in which you want to save the images.

4 Check the **Save Individually** box to create separate image files for each image in the layout.

5 Click **Save**.

An image file is created in the directory you specified for each image in the layout.

Reusing Scripts

Once you have created and saved a script, you can use it over and over again to create movies using the 3D image data from a variety of patients. To do this, you load the saved script and refresh its frames with data from the current patient. For information on loading a script, see “Loading, Saving, and Clearing a Script” on page 23-9.

To refresh the script's frames with the current patient's data:

1 Click .

Or,

Select **Refresh Script Preview** from the **Edit** menu.

The frames in the 3D Script Editor dialog box update to reflect the new data.

24 Airway Analysis (Medical Device)

Using the Airway Analysis feature, you can mark a patient's airway, view it in three dimensions, calculate its volume, and locate the cross-section where its area is the smallest. You can also save up to five work-ups for each patient.

Dolphin 3D offers the following airway analysis methods:

- **Sinus/Airway:** With this method, you identify the patient's airway by viewing slices of the volume and placing seed points in the voids on the image. Starting at these seed points, Dolphin 3D selects adjacent empty areas and finds the airway volume. For more information, see “Performing a Sinus/ Airway Analysis” on page 24-14.
- **Upper Constricted Airway (With Colormap):** With this method, you identify the patient’s upper airway by drawing a seed curve in a void on the image. Starting at the seed curve, Dolphin 3D selects adjacent empty areas and displays colors depicting the constricted areas. For more information, see “Performing an Upper Constricted Airway Analysis” on page 24-21.

Note: *This feature is meant to assist dental clinicians and trained assisting staff in treatment planning. The results of this process should not be used as the primary source of patient evaluation and should be verified by other independent methods.*

Note: *The Airway Analysis feature is available only on computers that support advanced 3D rendering modes (“translucent” modes).*

The Airway Analysis Dialog Box

To open the Airway Analysis dialog box:

1 Click

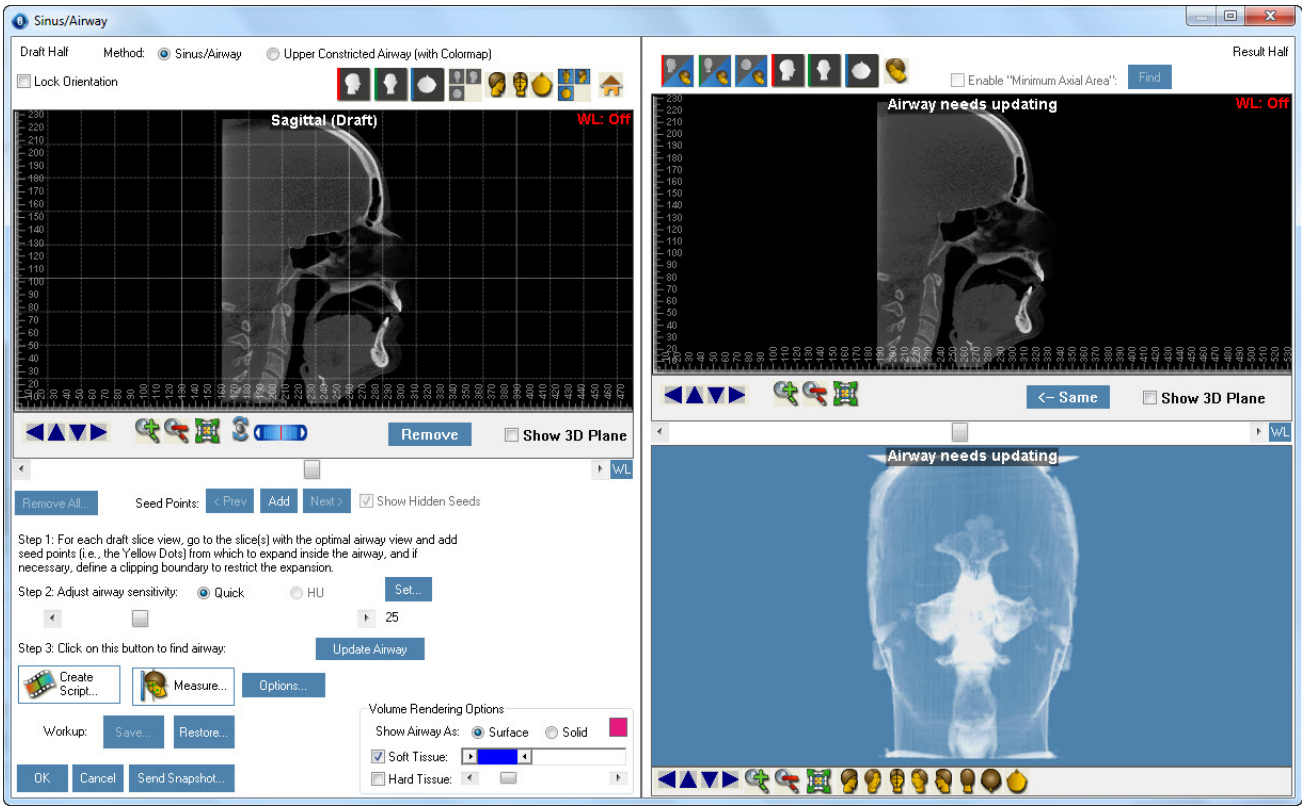
on the Dolphin 3D window.

Or,

Select **Airway Analysis** from the **Tools** menu.

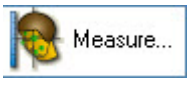
The Airway Analysis dialog box opens. This dialog box is divided into two halves:

Draft Half	On the left side, you set the options for the airway analysis you want to perform.
Result Half	On the right side, you view the results of your airway analysis using both a slice view and a translucent volume view.



Some of the options on this dialog box depend on the airway analysis you are performing. The following options are always available.

Method	Type of airway analysis to perform. **Sinus/Airway:** Identify the patient's airway by viewing slices of the volume and placing seed points in the voids on the image. Starting at these seed points, Dolphin 3D selects adjacent empty areas and finds the airway volume. For more information, see “Performing a Sinus/Airway Analysis” on page 24-14. **Upper Constricted Airway (With Colormap):** Identify the upper airway by drawing a seed curve in a void on the image. Starting at the seed curve, Dolphin 3D selects adjacent empty areas and displays colors depicting the constricted areas. For more information, see “Performing an Upper Constricted Airway Analysis” on page 24-21.
Lock Orientation	Locks the orientation of the image.
	Resets the slices to their default locations.

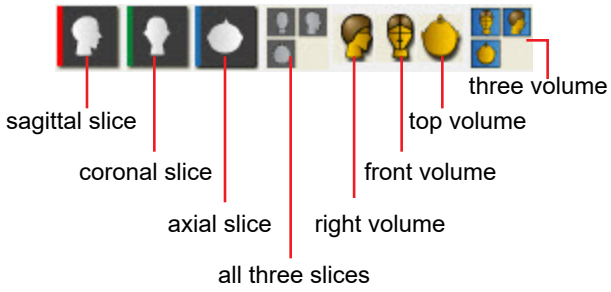
Result Half Views	Offers the standard slice views and one predefined volume view in addition to the following views. : The sagittal slice and the volume. : The coronal slice and the volume. : The axial slice and the volume. For more information, see “Selecting the View for the Result Half” on page 24-7.
Show 3D Plane	Displays planes indicating the locations of the sagittal, coronal, and axial slices on the volume view in the lower right corner.
Remove	If the **Sinus/Airway** analysis method is selected, removes the boundary from the current slice in the Draft Half (see “Restricting the Airway Analysis Area” on page 24-11). If the **Upper Constricted Airway (With Colormap)** analysis method is selected, opens a menu with the following options: • **Remove Airway Seed Curve:** Removes the airway seed curve from the Draft Half image (see “Performing an Upper Constricted Airway Analysis” on page 24-21). • **Remove Airway Boundary Curve:** Removes the airway boundary from the Draft Half image (see “Restricting the Airway Analysis Area” on page 24-11)
slider	Sets the location of the slice. For more information, see “Selecting the View for the Draft Half” on page 24-5.
WL	Resets the window leveling to the default values. For more information, see “Setting Window Leveling” on page 21-48.
Adjust airway sensitivity	Sets the sensitivity that Dolphin 3D uses when selecting the airway. For more information, see “Setting the Airway Sensitivity” on page 24-13. **Quick:** Set the sensitivity using a scale from 1 to 100. **HU:** Set the sensitivity using a scale based on the minimum to maximum Hounsfield Unit (HU) values of the specific DICOM dataset. **Set...:** Opens a dialog box where you can type in values to set the sensitivity. for selecting the airway **slider:** Sets the sensitivity for selecting the airway.
Update Airway	Updates the images on the Result Half with the changes you have made to the patient's airway. For more information, see “Verifying Your Results” on page 24-18 or “Viewing Your Results” on page 24-24.
	Open the 3D Script Editor, which enables you to create videos based on the image or images in the Result Half of the dialog box. For more information, see Chapter 23, Dolphin 3D Movies.
	Opens the Digitize/Measurement palette so that you can take measurements on the volume view in the Result Half of the dialog box. For more information, see Chapter 22, Digitize and Measurements (Medical Device).

Options...	Opens a menu containing the following options: **Reset Orientation:** Resets the image orientation to the default orientation and removes any seed points and boundaries. **Use 2-sided Sensitivity Adjustments:** Enables you to set a sensitivity range for Dolphin 3D to use when selecting the airway. For more information, see “Setting the Airway Sensitivity” on page 24-13. **Edit Upper Constricted Airway Area Colormap...:** Opens a dialog box where you can customize the color mapping used by the **Upper Constricted Airway (With Colormap)** airway analysis method. For more information, see “Editing the Upper Constricted Airway Area Colormap” on page 24-25. **Close This Menu:** Closes the context menu.
Save...	Opens a menu with options to: • save the present state of the airway analysis to one of five work-up slots (see “Saving and Restoring the Airway Analysis” on page 24-28) • save the airway surface to one of the database surface slots. (see “Saving an Airway Surface” on page 24-28)
Restore...	Restores one of the previously saved work-ups. For more information, see “Saving and Restoring the Airway Analysis” on page 24-28.
Volume Rendering Options	Specify how to render the volume view in the lower right corner. **Soft Tissue:** Displays the patient's soft tissue in the lower right corner. • **slider:** Sets the density segment for the soft tissue view. For more information, see “Viewing the Soft Tissue” on page 19-26. **Hard Tissue:** Displays the patient's hard tissue in the lower right corner. • **slider:** Sets the density segment for the hard tissue view. For more information, see “Viewing the Hard Tissue” on page 19-27 Uncheck both the **Soft Tissue** and **Hard Tissue** boxes to show the airway only, hiding the patient's image. For more information, see “Locating the Minimum Axial Area” on page 24-19.
Send Snapshot...	Opens a menu with the following options: **Close This Menu:** Closes the menu. **Save To Dolphin Layout/Database:** Saves the 3D image to a slot in a Dolphin image layout and store it in your database. For more information, see “Saving, Exporting, Uploading, and Printing” on page 19-117. **Send To Report:** Uses this image in a Dolphin 3D report. For more information, see Chapter 29, Reports. **Copy To Clipboard:** Copies the 3D image to the clipboard so that you can paste it into another application. For more information, see “Saving, Exporting, Uploading, and Printing” on page 19-117. **Print:** Prints the image. For more information, see “Printing an Image” on page 19-123. **Export To File:** Exports the 3D image to a file. For more information, see “Exporting an Image” on page 19-119.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Selecting the View for the Draft Half

The following figure summarizes the views offered on the Draft Half of the Airway Analysis dialog box. All these views are offered for the a **Sinus/Airway** airway analysis. The **Upper Constricted Airway (With Colormap)** airway analysis offers the sagittal slice and right volume views only.



For information on the slice and volume views offered on the Result Half, see “Selecting the View for the Result Half” on page 24-7.

To select a slice to view on the Draft Half:

1 Click to view the sagittal slice.

Or,

Click to view the coronal slice.

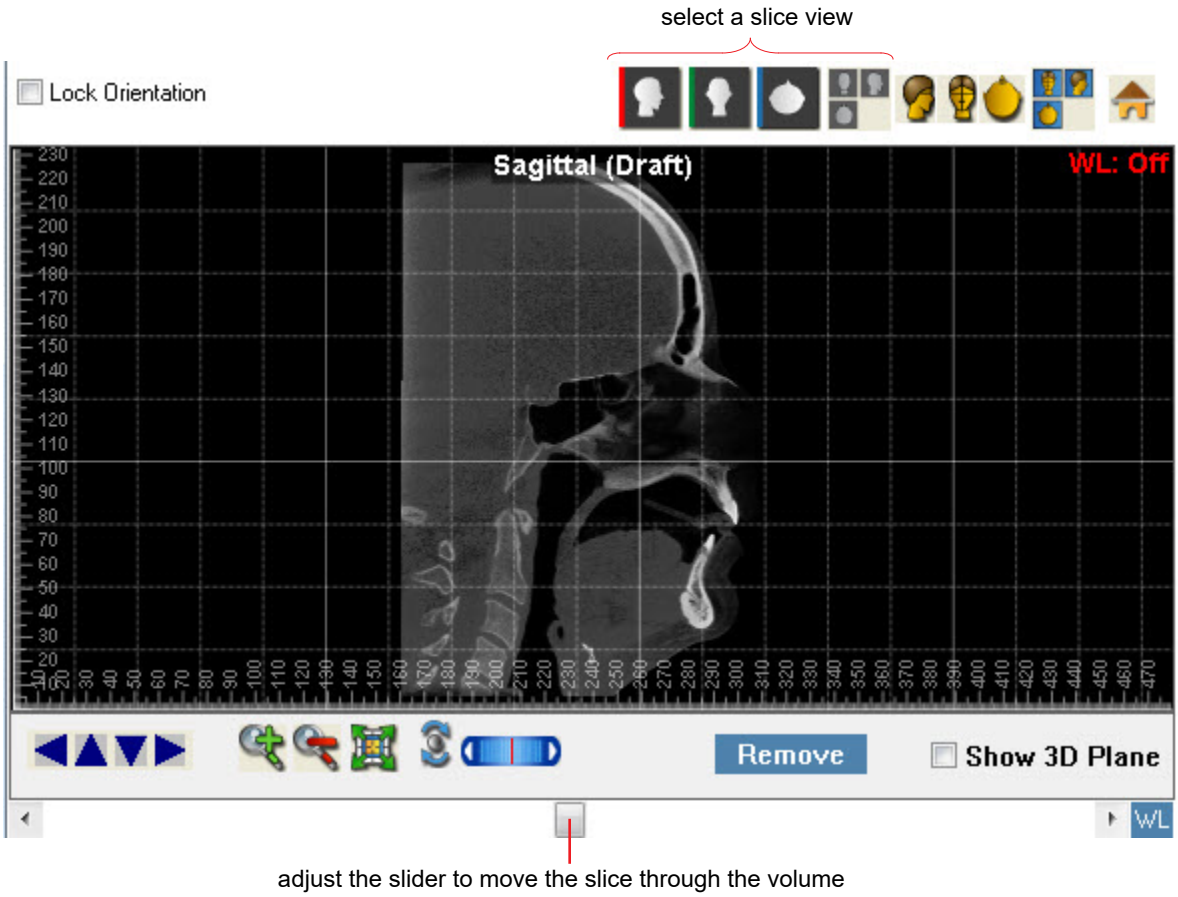
Or,

Click to view the axial slice.

Or,

Click to view all three slices.

2 Adjust the slider below the slice view to move the slice through the volume.



To reset the slices to their default locations:

1 Click .

To select a volume view on the Draft Half:

1 Click for a right view.

Or,

Click for a front view.

Or,

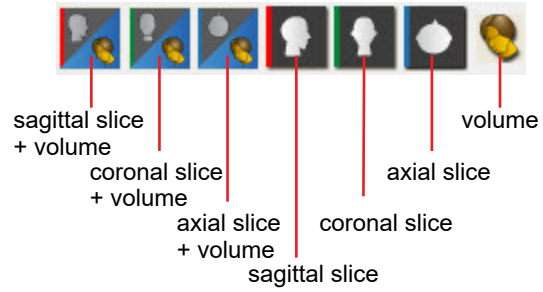
Click for a bottom view.

Or,

Click for all three views.

Selecting the View for the Result Half

The following figure summarizes the views offered on the Result Half of the Airway Analysis dialog box.



To select a slice to view on the Result Half:

1 Click to view the sagittal slice above the volume.

Or,

Click to view the coronal slice above the volume.

Or,

Click to view the axial slice above the volume.

Or,

Click to view only the sagittal slice.

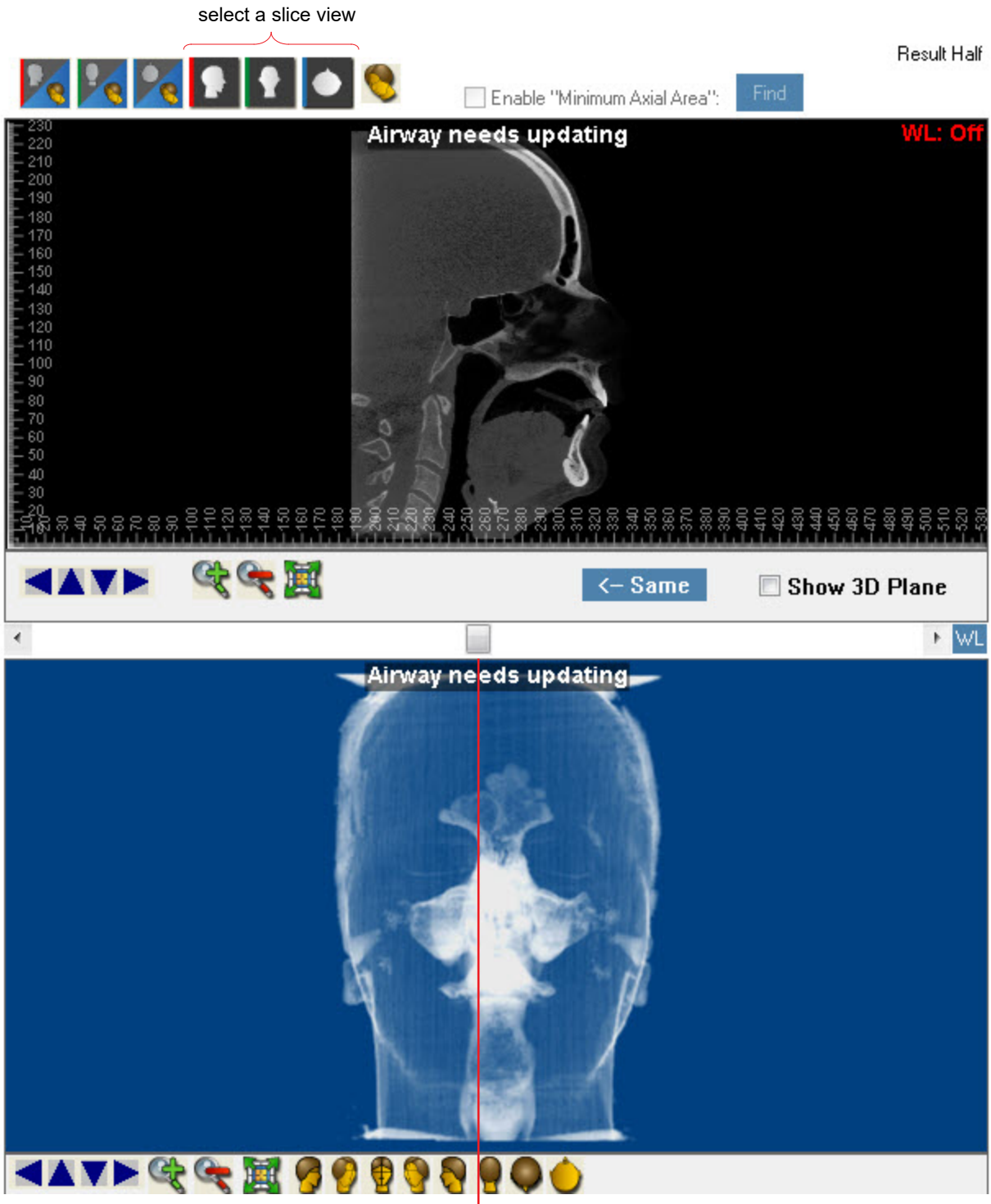
Or,

Click to view only the coronal slice.

Or,

Click to view only the axial slice.

2 Adjust the slider below the slice view to move the slice through the volume.


select a slice view
Result Half
Enable "Minimum Axial Area":
Find
Airway needs updating
WL: Off
<- Same
Show 3D Plane
WL
Airway needs updating
adjust the slider to move the slice through the volume

To select a volume view on the Result Half:

1 Click to view the sagittal slice above the volume.

Or,

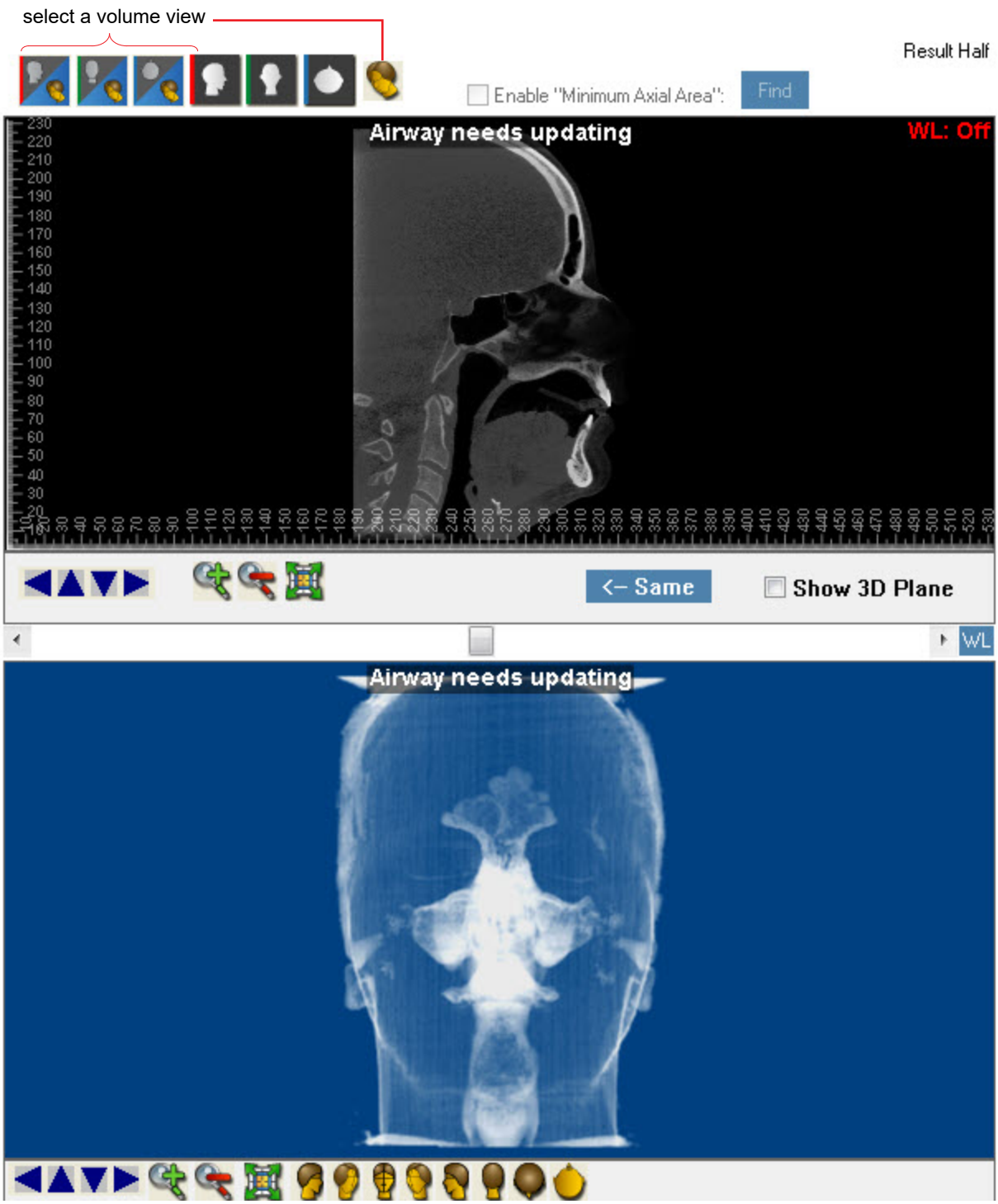
Click to view the coronal slice above the volume.

Or,

Click to view the axial slice above the volume.

Or,

Click to view only the volume.


select a volume view
Result Half
Enable "Minimum Axial Area":
Find
Airway needs updating
WL: Off
<-- Same
Show 3D Plane
WL
Airway needs updating

Restricting the Airway Analysis Area

Before you begin either a **Sinus/Airway** or **Upper Constricted Airway (With Colormap)** airway analysis, you can restrict the area for that analysis by creating a polygon on it. Then, when you place a seed point or draw a seed curve, Dolphin 3D selects adjacent empty areas as part of the airway only up to the boundary defined by the polygon.

To restrict the airway analysis area for a particular slice or volume view:

1 Select **Sinus/Airway** or **Upper Constricted Airway (With Colormap)** as the airway analysis method.

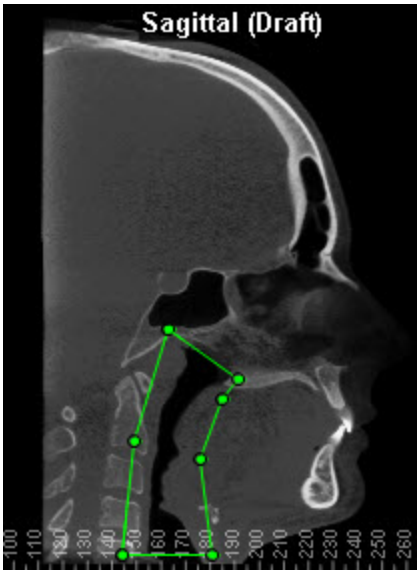
2 On the Draft Half of the Airway Analysis dialog box, click the button for the slice or volume view on which you want to create a boundary.

3 If you are using the **Upper Constricted Airway (With Colormap)** analysis method, select **Airway Boundary (Optional)**.

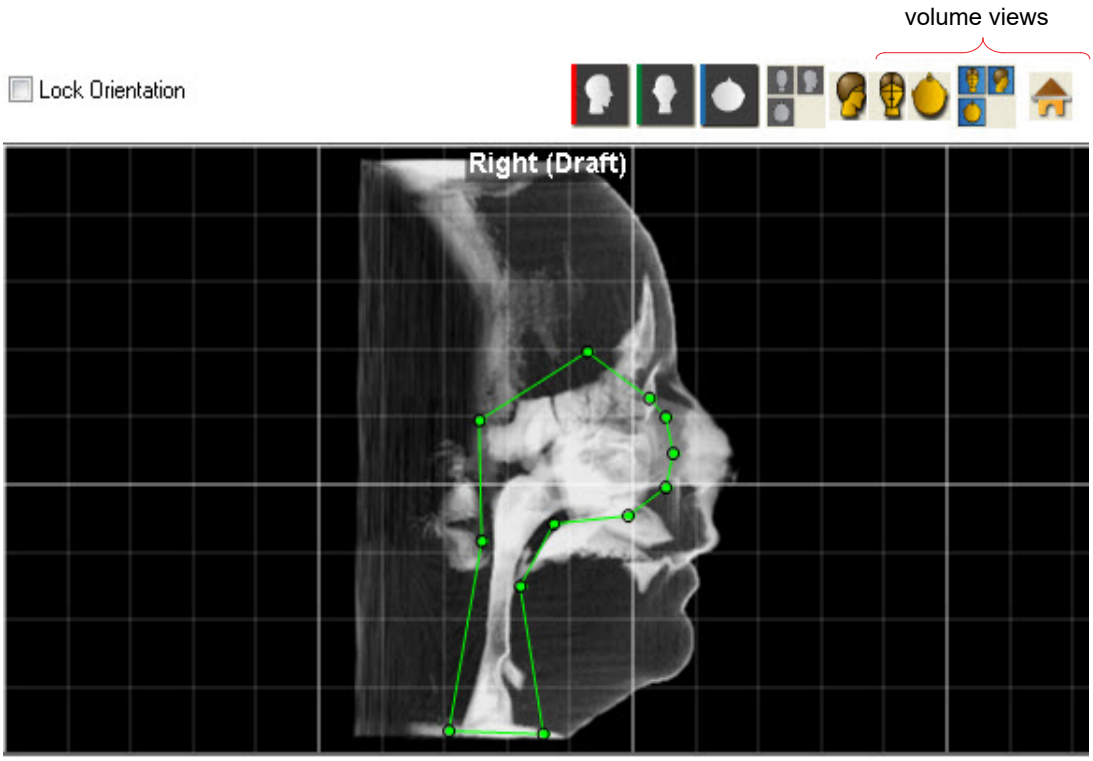
4 Draw the boundary polygon.

For information on drawing a polygon, see “Selecting an Area of an Image” on page 6-4.

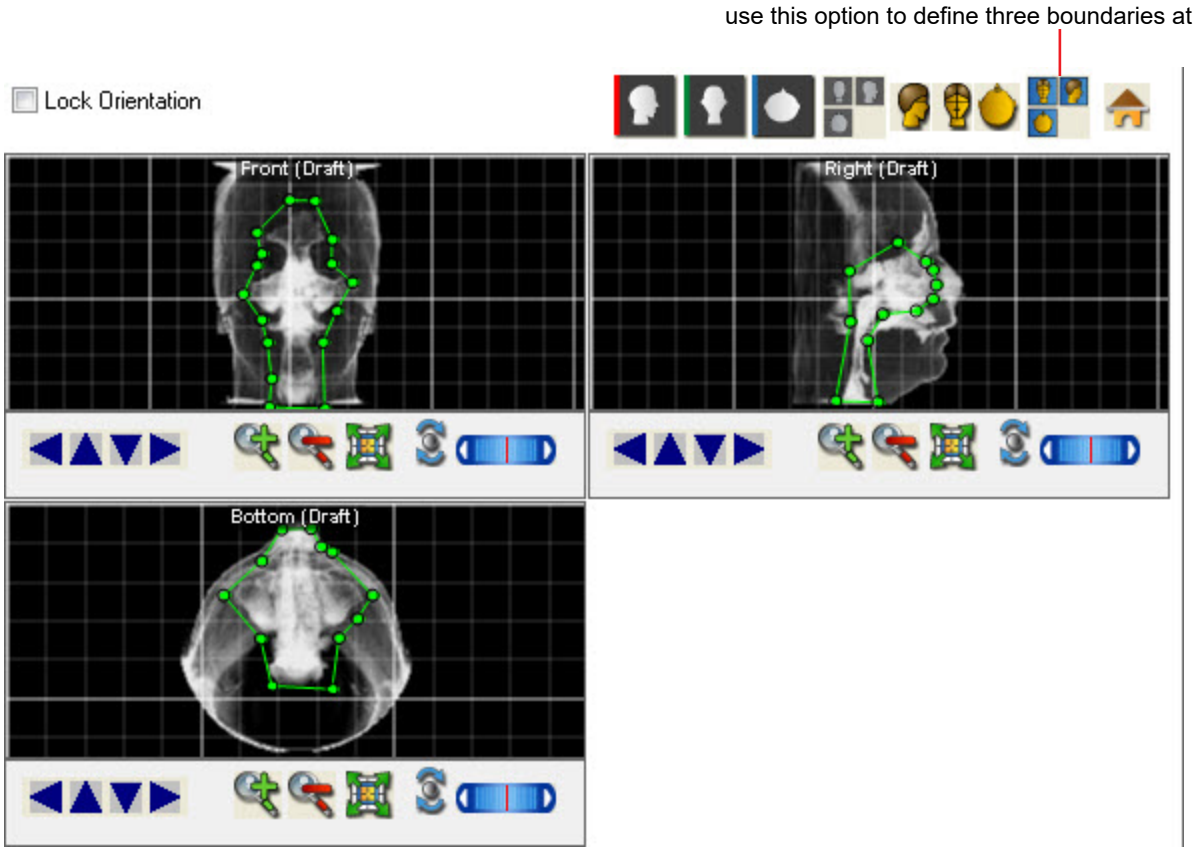
If you are using the **Sinus/Airway** airway analysis method, it's usually better to draw the boundary very approximately around the patient's airway (as illustrated below) to avoid placing parts of the patient's airway that are not visible in the current slice view “out of bounds.” In addition, you need to place very few seed points (sometimes only one), and Dolphin 3D automatically identifies the patient's airway by selecting adjacent empty areas.



You can also use the volume views to help you define a boundary that encompasses all of the patient's airway, as shown below:



You can use the three-volume view to define three boundaries at the same time:



To remove a boundary from a single slice view (**Sinus/Airway** airway analysis method):

1 On the Draft Half of the dialog box, click the button for the slice view from which you want to remove the boundary.

2 Click **Remove**.

To remove the boundaries from all slice and volume views (**Sinus/Airway** airway analysis method):

1 Click **Remove All...**.

2 Select **Remove ALL Boundaries**.

3 Click **Yes** on the confirmation dialog box to remove all the boundaries.

To remove the boundaries and seed points from all slice and volume views (**Sinus/Airway** airway analysis method):

1 Click **Remove All...**.

2 Select **Remove ALL Boundaries and Seed Points**.

3 Click **Yes** on the confirmation dialog box to remove all the boundaries and seed points.

To remove a boundary (**Upper Constricted Airway (With Colormap)** airway analysis method):

1 Click **Remove**.

2 Select **Remove Airway Boundary**.

Setting the Airway Sensitivity

For either the **Sinus/Airway** or **Upper Constricted Airway (With Colormap)** airway analysis method, you can adjust the sensitivity that Dolphin 3D uses when selecting empty areas adjacent to the seed points or curve to identify the patient's airway.

To set the sensitivity:

1 Next to Step 2: Adjust airway sensitivity, select **Quick** to set the sensitivity using a scale from 1 to 100.

Or,

Select **HU** to set the sensitivity using a scale based on the minimum to maximum HU values of the specific DICOM dataset.

If you set the sensitivity using HU values, Dolphin 3D selects the airway based on the HU values of the volume voxels.

2 Adjust the slider to set the sensitivity value.

If you have already placed seed points or drawn an airway curve, adjusting the slider causes the magenta shading that represents the airway to expand or contract slightly. Set the slider so that the magenta shading properly fills the part of the patient's airway that you've identified.

By default, you set the sensitivity using a single value. However, you can set the sensitivity using a range of values. This enables you to find anatomies other than airway (teeth, for example).

To set a sensitivity range:

1 Click **Options...**.

2 Select **Use 2-sided Sensitivity Adjustments** from the menu.

The slider changes to offer two adjustments so that you can set the upper and lower limits of the sensitivity range.

To type in sensitivity values instead of using the slider:

1 Click **Set...**.

The Airway Sensitivity dialog box opens.

2 Enter one or more sensitivity values for selecting the airway.

By default, you set the sensitivity by entering a single value in the **Upper Bound** field. However, if you have enabled the **Use 2-sided Sensitivity Adjustments** option as described above, you can enter the upper and lower limits of the sensitivity range.

Performing a Sinus/Airway Analysis

This analysis identifies and finds the volume of the patient's airway by viewing slices of the volume and placing one or more seed points in the empty areas on the image that are part of the patient's airway. Starting at these seed points, Dolphin 3D selects adjacent empty areas as part of the patient’s airway.

To use this analysis method:

1 Select **Sinus/Airway** as the method at the top of the Draft Half of the window.

2 Select the views that you want for the draft and result halves of the window.

For more information, see “Selecting the View for the Draft Half” on page 24-5 and “Selecting the View for the Result Half” on page 24-7.

3 Draw a boundary on the patient’s image in the Draft Half of the window if you want to restrict the area for the airway analysis.

When you place seed points, Dolphin 3D selects adjacent empty areas as part of the airway only up to the boundary. For more information, see “Restricting the Airway Analysis Area” on page 24-11.

4 Place one or more seed point in the empty space that is part of the patient's airway.

Typically, you only need to place a single seed point. When you place the seed point, magenta shading fills all the adjacent empty areas on all the volume slices, identifying them as part of the patient's airway. For more information, see “Placing Seed Points” on page 24-16.

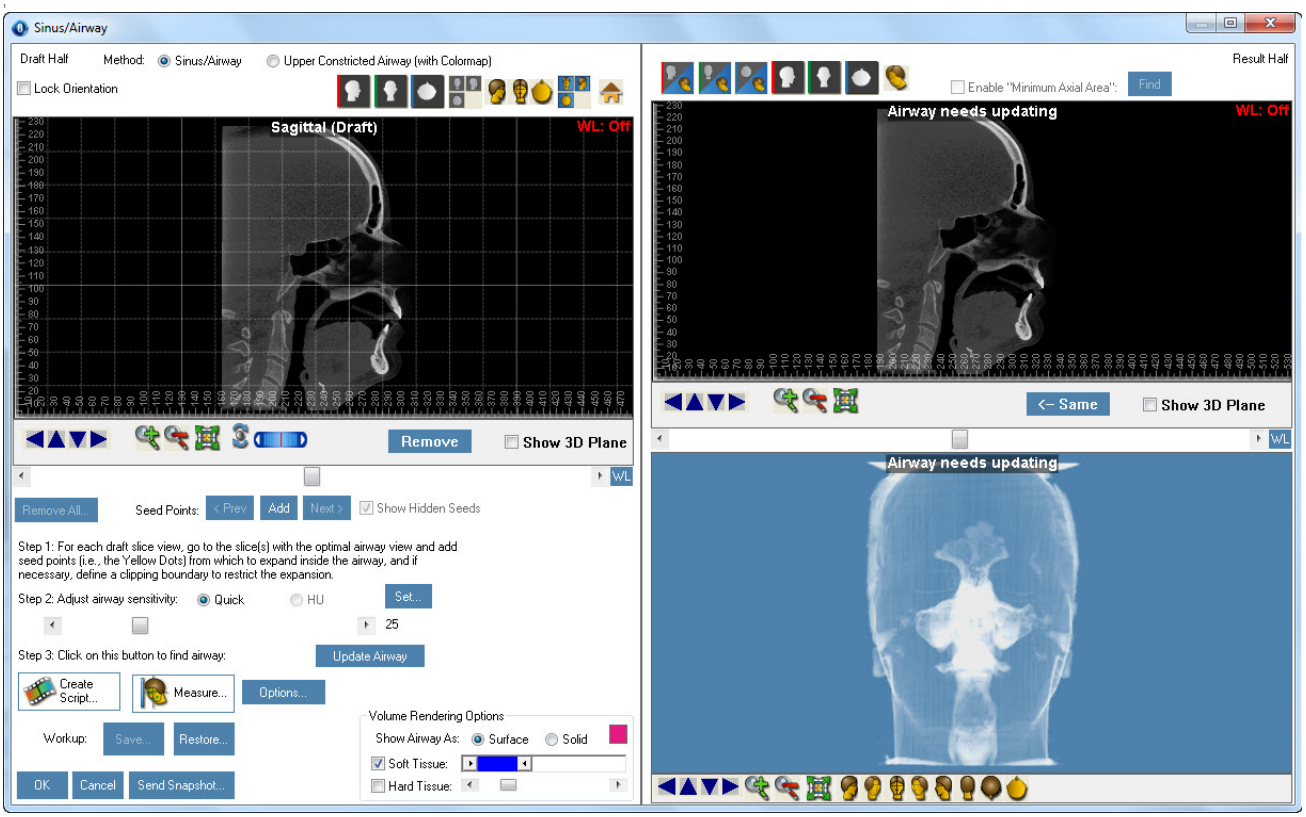
5 If the magenta shading doesn’t properly fill the airway, adjust the sensitivity that Dolphin 3D uses when identifying the airway.

For more information, see “Setting the Airway Sensitivity” on page 24-13.

6 Click **Update Airway**.

Dolphin 3D calculates the airway volume based on the seed points you have placed and updates both images in the Result Half of the window. For more information on the results of the analysis, see “Verifying Your Results” on page 24-18 and “Locating the Minimum Axial Area” on page 24-19.

The following figure shows the options available when **Sinus/Airway** is selected as the analysis method:



The following table describes the options available only when **Sinus/Airway** is the analysis method. For information on the options that are always available, see “The Airway Analysis Dialog Box” on page 24-1.

Draft Half Views	Offers the standard slice views and three predefined volume views in addition to the following views. Displays all three standard slices. Displays the volume in the three views pictured. : For more information, see “Selecting the View for the Draft Half” on page 24-5.
Enable “Minimum Axial Area”	Enables the “Minimal Axial Area” feature, which finds the axial cross-section of the volume where the airway area is the smallest.

Find	Finds the minimal axial area (see above). For more information, see “Locating the Minimum Axial Area” on page 24-19.
<-Same	Sets the location of the slice in the Draft Half to the location set in slice view in the Result Half.
Remove All...	Opens a menu with the following choices. **Remove ALL Boundaries:** Removes all the boundaries for all the slices. **Remove ALL Seed Points:** Removes all the seed points. **Remove ALL Boundaries and Seed Points:** Removes all the boundaries and all the seed points for all the slices. **Close This Menu:** Closes this menu. For more information, see “Restricting the Airway Analysis Area” on page 24-11 and “Placing Seed Points” on page 24-16.
<Prev	Changes the slice view to show the previous seed point. Click this button repeatedly to view all the seed points you placed in reverse order of placement.
Add	Adds a seed point. For more information, see “Placing Seed Points” on page 24-16.
Next>	Changes the slice view to show the next seed point. Click this button repeatedly to view the seed points in the order you placed them.
Show Hidden Seeds	Displays seed points that would ordinarily be obscured within the volume. For more information, see “Placing Seed Points” on page 24-16.
Volume Rendering Options	Specify how to render the volume view in the lower right corner. **Show Airway As:** Set options for rendering the airway. • **Surface:** Renders the airway as an surface, which is sharper than the solid rendering. • **Solid:** Renders the airway as a solid. • **Color Sample:** Sets the color for the airway.

Placing Seed Points

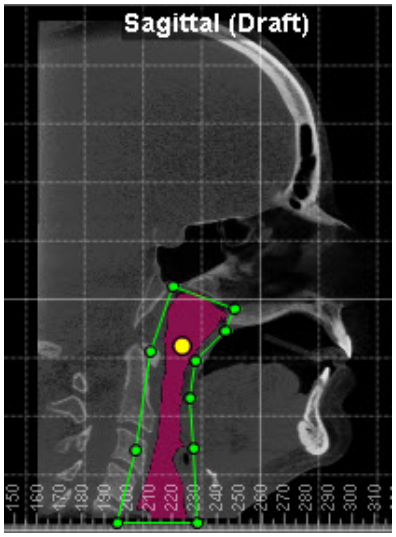
When you place a seed point, Dolphin 3D identifies all adjacent empty areas on all the volume slices as part of the patient's airway. For this reason, you typically only need to place a single seed point for Dolphin 3D to identify all of the patient’s airway. The only time you need to add more than one seed point is if there are areas of patient’s airway that don’t connect to each other on *any* slice.

To place a seed point:

1 Click **Add**.

A yellow point appears on the image in the Draft Half of the window.

2 Click and drag the yellow point to an empty space in the image that is part of the patient's airway.



Click and drag when four triangles appear surrounding the yellow point. When you place the seed point, magenta shading fills the adjacent empty areas, identifying them as part of the patient's airway.

Note: *If you have drawn boundaries to restrict the airway analysis area, make sure you place the seed points inside all of the boundaries. For more information on drawing boundaries, see "Restricting the Airway Analysis Area" on page 24-11.*

If the magenta shading doesn't properly fill the identified part of the airway, you can adjust the sensitivity for selecting the area around a seed point. For more information, see "Setting the Airway Sensitivity" on page 24-13.

To remove all seed points and start your airway analysis again:

1 Click **Remove All...**.

2 Select **Remove ALL Seed Points**.

3 Click **Yes** on the confirmation dialog box to remove all the seed points.

To remove the boundaries and seed points from all viewing slices:

1 Click **Remove ALL...**.

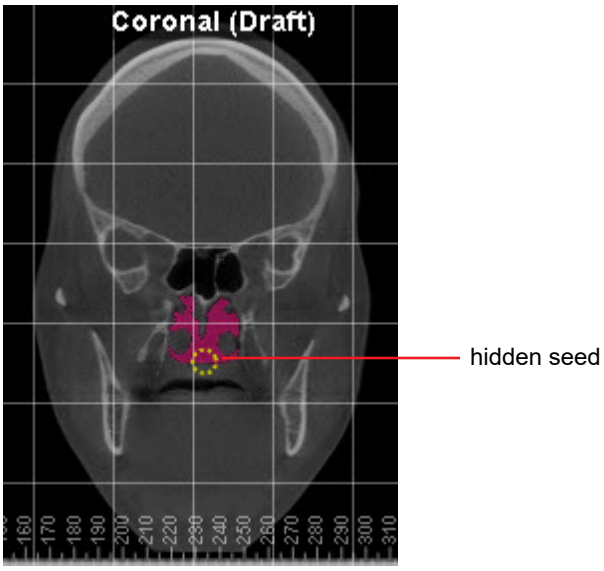
2 Select **Remove ALL Boundaries and Seed Points**.

3 Click **Yes** on the confirmation dialog box to remove all the boundaries and seed points.

To view hidden seed points:

1 Check the **Show Hidden Seeds** box.

Any seed points that you have placed that would not ordinarily be visible on the current slice view appear.



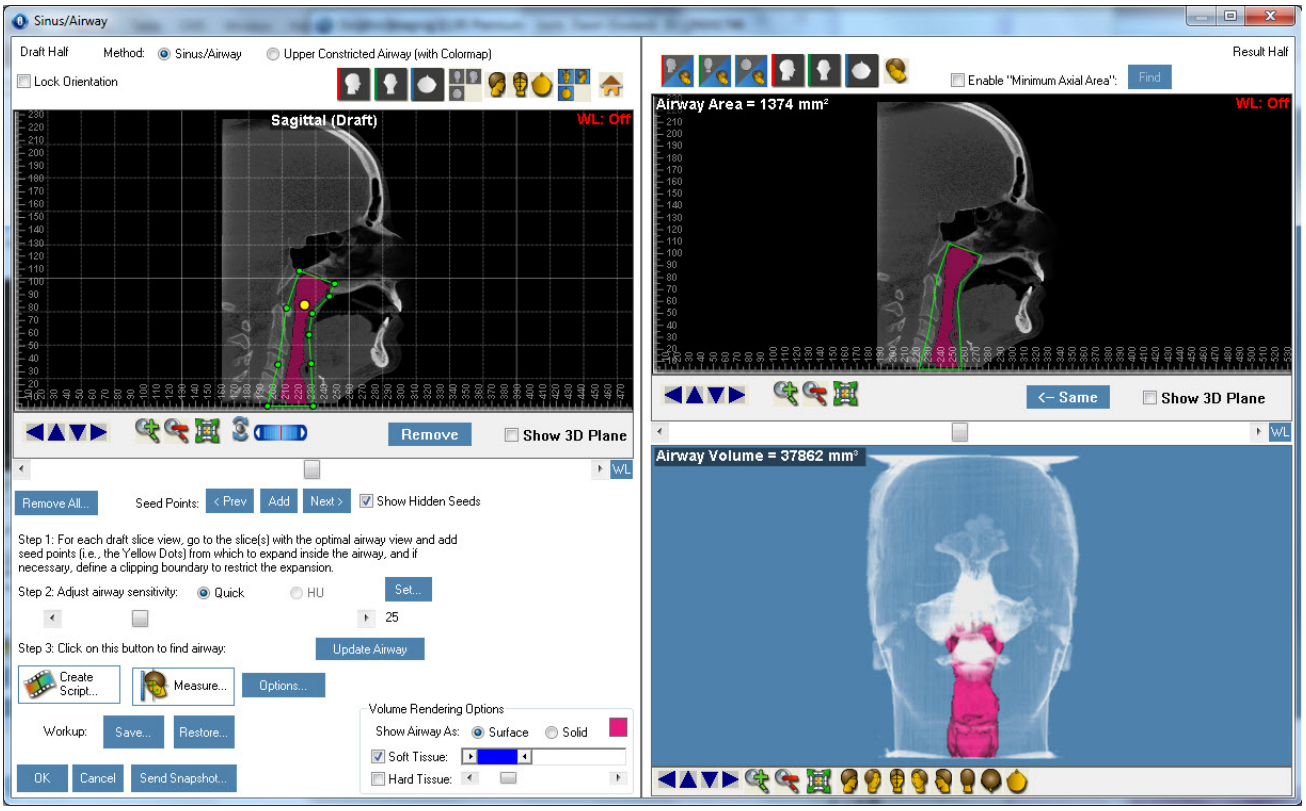
Verifying Your Results

To verify the airway analysis results:

1 When you finish placing seed points, click **Update Airway**.

Dolphin 3D calculates the airway volume based on the seed points you have placed and updates both images in the Result Half of the dialog box.

2 Adjust the slider below the upper (slice view) pane in the Result Half to “scroll through” the slices.



Locating the Minimum Axial Area

Although the main purpose of the **Sinus/Airway** method is to find the volume of the airway, you can also locate the axial cross-section of the volume where the airway area is the smallest.

To find the axial cross-section of the volume where the airway area is the smallest:

1 On the Result Half of the dialog box, click or .

2 Check the **Enable "Minimum Axial Area"** box.

3 Click and drag the dotted red lines to identify the area of the volume to search.

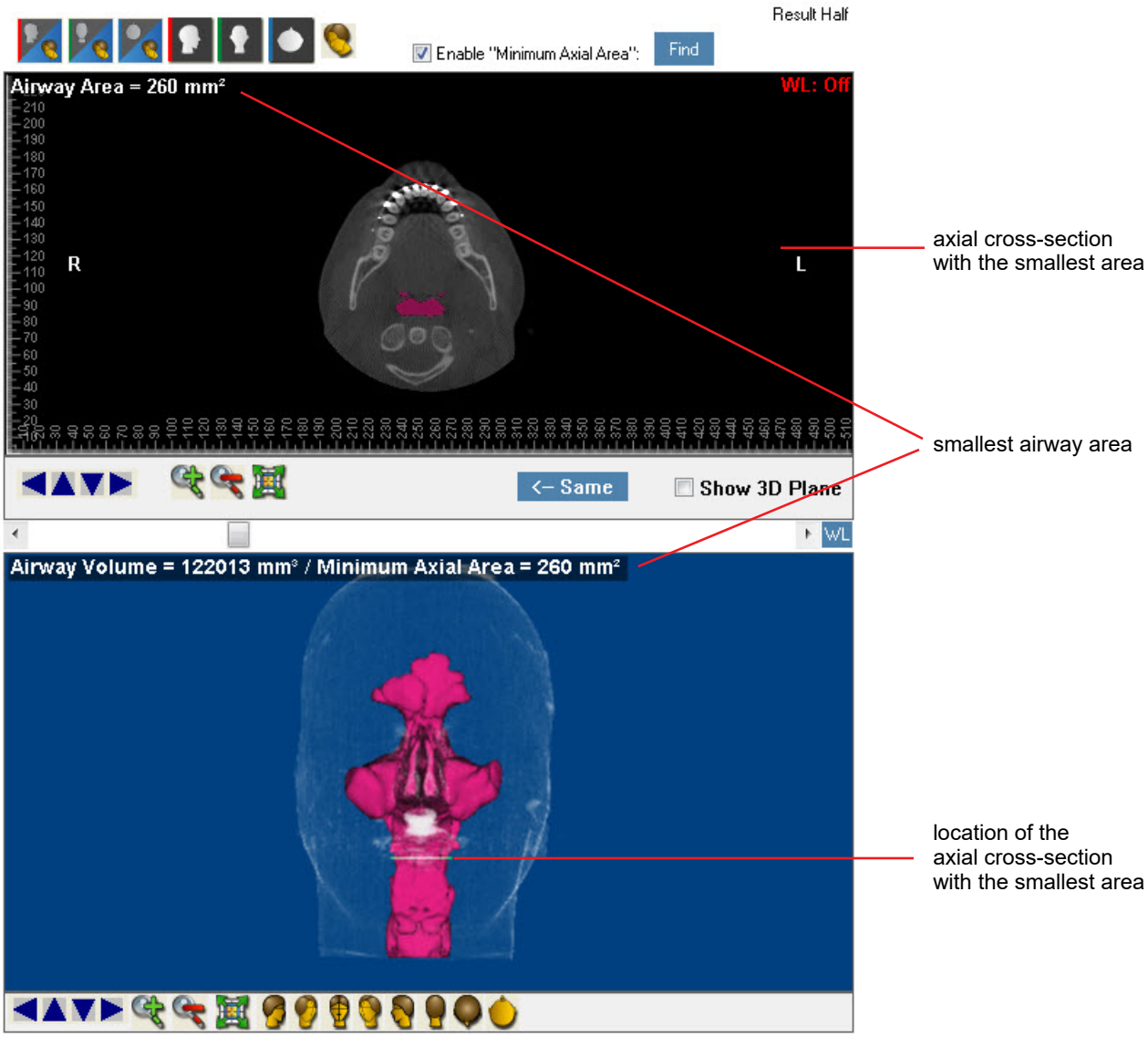
4 Click **Find**.

Dolphin 3D searches the identified area of the volume to find the axial cross-section where the area of the airway is the smallest. It displays location of this cross-section and the minimum area on the volume view in the lower right of the Result Half of the dialog box.

5 Click to view the axial cross-section with the smallest airway area.

Or,

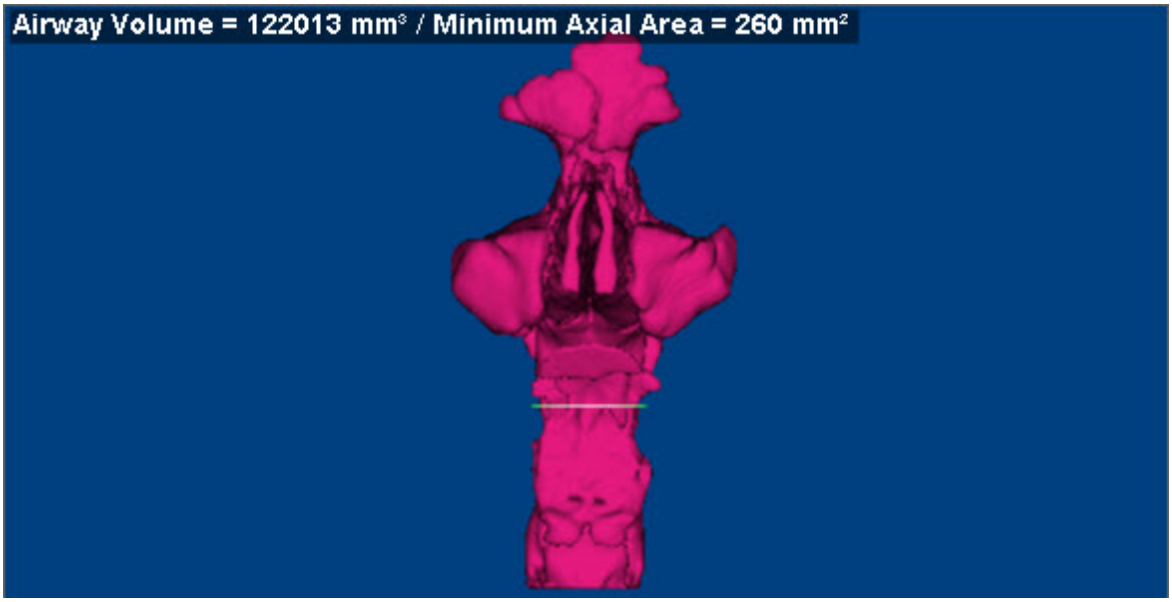
Click to view the axial cross-section with the smallest airway area and see that cross-section's location on the volume (see below).



To view only the airway in the volume view:

1 Under Volume Rendering Options, uncheck both the **Soft Tissue** and the **Hard Tissue** boxes.

The volume view in the lower right of the Result Half shows the patient's airway only.



Performing an Upper Constricted Airway Analysis

This analysis identifies the upper airway and displays colors depicting the constricted areas.

To select this analysis method:

1 Select **Upper Constricted Airway (with Colormap)** as the method at the top of the Draft Half of the window.

2 Select the view that you want for the Result Half of the window.

For more information, see “Selecting the View for the Result Half” on page 24-7.

3 Draw a boundary on the patient’s image in the Draft Half of the window if you want to restrict the area for the airway analysis.

When you draw the seed curve, Dolphin 3D selects adjacent empty areas as part of the airway only up to the boundary. For more information, see “Restricting the Airway Analysis Area” on page 24-11.

4 Draw a seed curve on the patient’s image in the Draft Half of the window to identify the airway.

When you complete the airway seed curve, magenta shading fills the adjacent empty area, identifying it as part of the patient's airway. For more information, see “Identifying the Airway” on page 24-23.

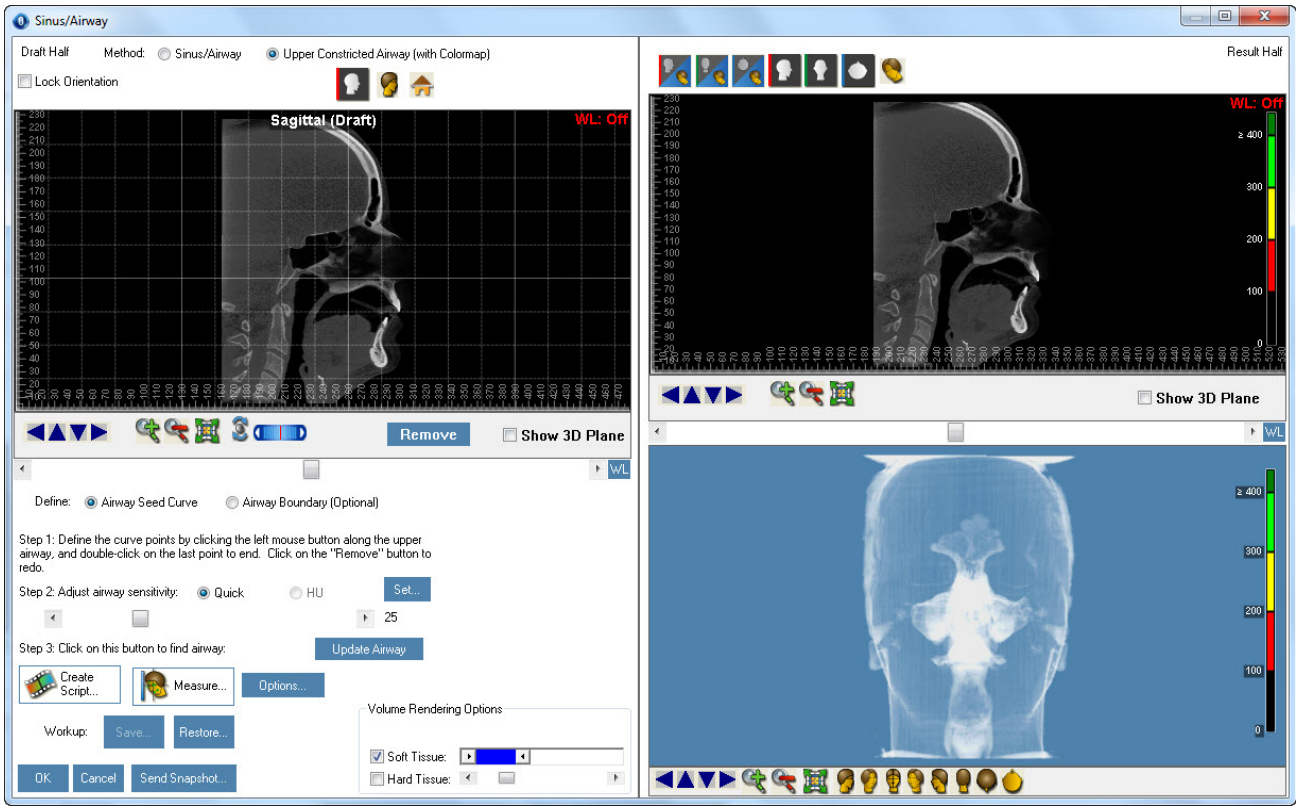
5 If the magenta shading doesn’t properly fill the airway, adjust the sensitivity that Dolphin 3D uses when identifying the airway.

For more information, see “Setting the Airway Sensitivity” on page 24-13.

6 Click **Update Airway**.

Dolphin 3D calculates the airway volume based on the airway curve and updates both images in the Result Half of the window. For more information on the results of the analysis, see “Viewing Your Results” on page 24-24.

The following figure shows the options available when **Upper Constricted Airway (with Colormap)** is selected as the analysis method:



The following table describes the options available only when **Upper Constricted Airway (with Colormap)** is the analysis method. For information on the options that are always available, see “The Airway Analysis Dialog Box” on page 24-1.

Draft Half Views	Offers the standard sagittal slice and right volume views. For more information, see “Selecting the View for the Draft Half” on page 24-5.
Define	Specifies the type of curve (Airway Seed Curve or Airway Boundary) that you are currently drawing on the Draft Half image. For information on drawing an airway seed curve, see “Identifying the Airway” on page 24-23. For information on drawing an airway boundary, see “Restricting the Airway Analysis Area” on page 24-11.

Identifying the Airway

To identify the patient's airway, you draw a curve within the airway on the sagittal slice view in the Draft Half of the dialog box.

To draw the airway curve:

1 Click and release the left mouse button on a point where you want to begin the curve.

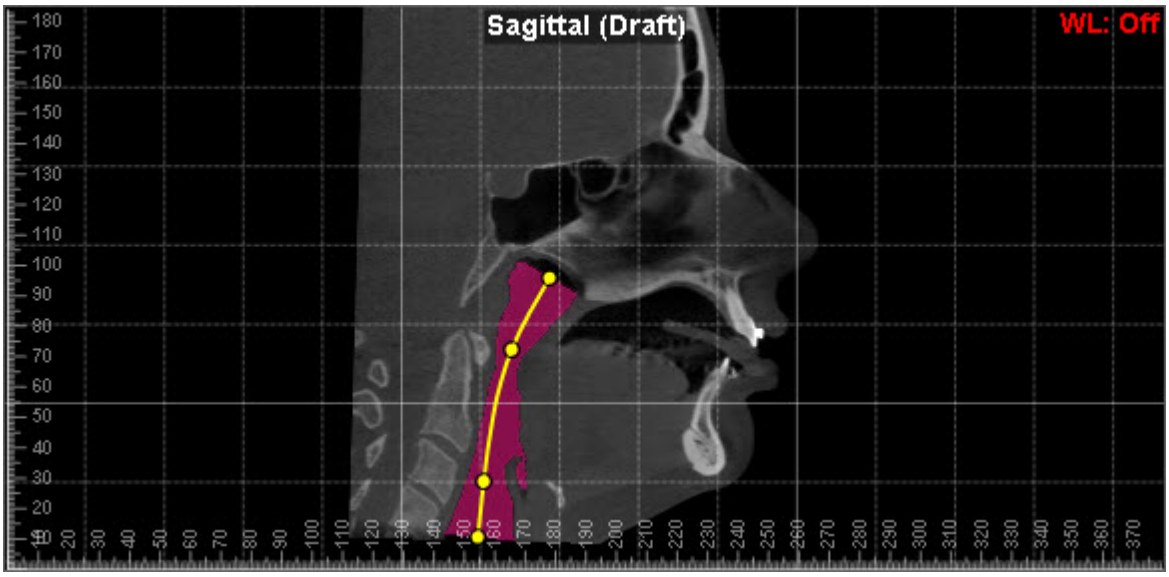
2 Move the mouse to draw a curve that follows the contour of the patient's airway.

As you move the mouse, you'll see a line extending from the point to the current mouse position.

3 Click the mouse button whenever you want to place a point and change the direction of the curve.

4 To complete the curve, double-click, or click the last point you placed again.

When you complete the airway curve, magenta shading fills the adjacent empty area, identifying it as part of the patient's airway. If the magenta shading doesn't properly fill the patient's airway, you can adjust the sensitivity for selecting the area around the airway curve. For more information, see "Setting the Airway Sensitivity" on page 24-13.



To modify the airway curve:

1 Click and drag the points on the curve.

To remove the airway curve and start your airway analysis again:

1 Click **Remove**.

2 Select **Remove Airway Seed Curve**.

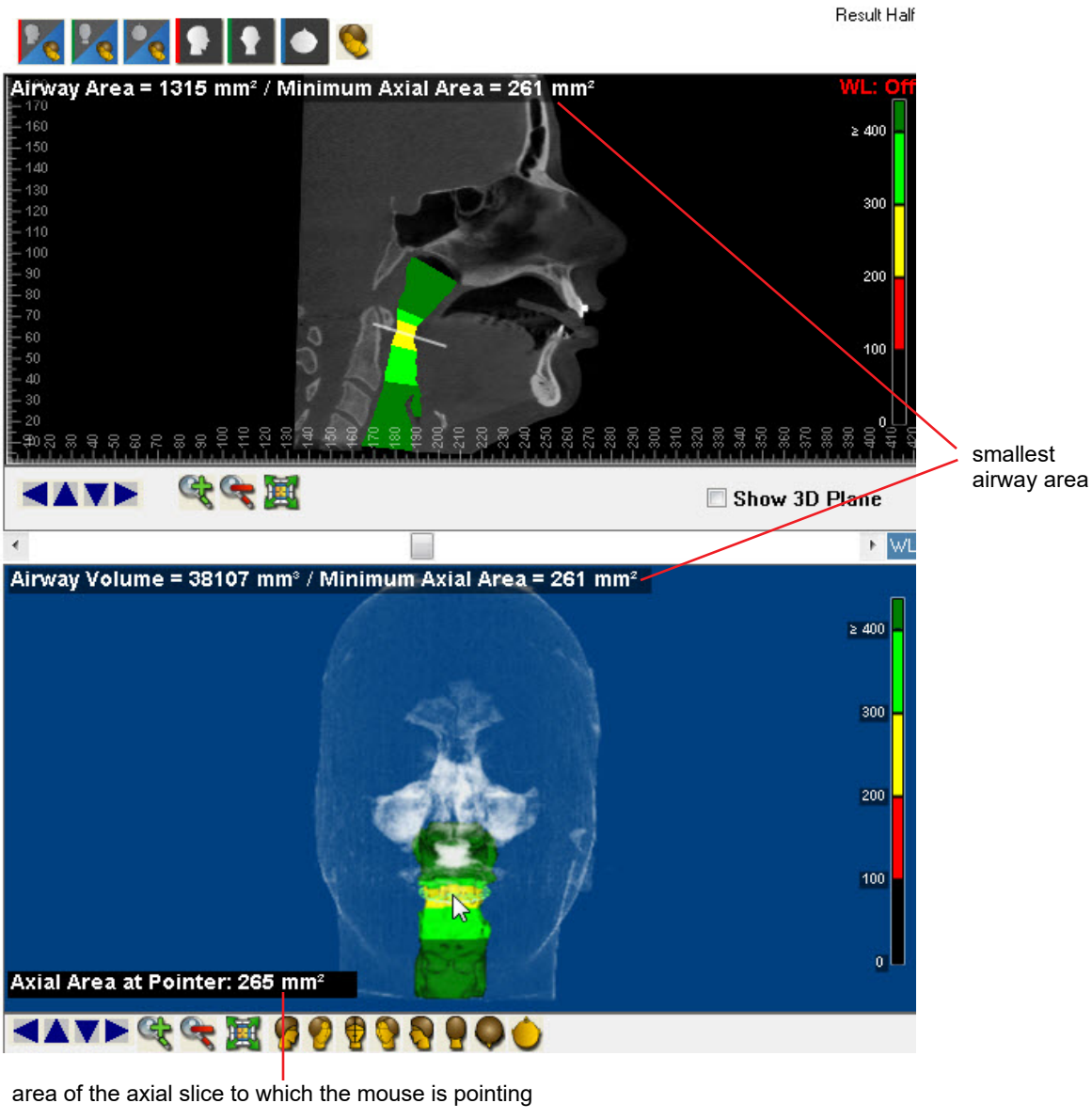
Viewing Your Results

To view the airway analysis results:

1 Click **Update Airway**.

Dolphin 3D calculates the airway area and minimum axial area in square millimeters, and the airway volume in cubic millimeters. Then, it updates both images in the Result Half of the dialog box. Color mapping indicates the area of the slices along the airway curve.

2 Optionally, place your mouse pointer over any location on the airway to see the area of that axial slice.



Editing the Upper Constricted Airway Area Colormap

You can customize the color mapping used by the **Upper Constricted Airway (With Colormap)** airway analysis method to assign colors to area values.

To open the color mapping:

1 Click **Options...**.

2 Select **Edit Upper Constricted Airway Area Colormap...** from the menu.

The Upper Constricted Airway Area Colormap dialog box opens and displays the current mapping between colors and area values. For example, in the figure below, if the area of an axial airway slice is between 200 and 300 mm^2, the axial slice will be yellow in the analysis result images.

color mapping	Sets the mapping between colors and area values.
Smooth Transition	Uses color gradients to transition between colors on the mapping.
Set Upper Bound	Opens the Airway Area Upper Bound dialog box so that you can set the largest airway area to use in the color map.
Restore to Installed	Restores the Dolphin factory settings for the color mapping.
Restore to Default	Restores the color mapping settings that you have previously saved as your default settings (see below).
Save As Default	Saves the current color mapping settings as the defaults to use when performing an **Upper Constricted Airway (With Colormap)** airway analysis.

Customizing the Color Mapping

On the color mapping, color map points identify boundaries between colors on the color map. Each color map point represents an area value in mm^2.

To change the area value range for a color:

1 On the Area (mm^2) line, click and drag a color map point.

To type in a new value for a color map point:

1 Right-click a color map point, and select **Change Area Value** from the context menu.

2 Type a new value for it (in mm^2) in the Airway Area dialog box, and click **OK**.

To add a new color map point (split one area value range into two ranges):

1 Click the Area (mm^2) line between two points.

2 Click **Yes** to add the new point.

To delete a color map point:

1 Right-click the color map point, and select **Delete Colormap Point** from the context menu.

2 Click **Yes** to delete the point.

To change the color for an area value range:

1 Right-click the color map point for that color's lower boundary, and select **Change Color** from the context menu.

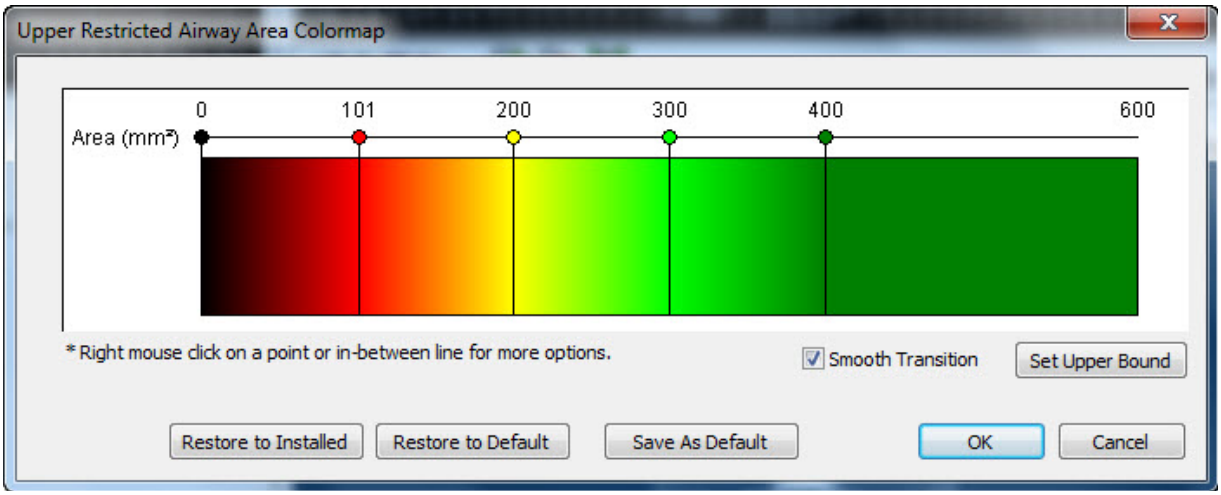
2 Select a new color, and click **OK**.

Using Gradient Color Transitions

To use gradients to transition between colors on the color map:

1 Check the **Smooth Transition** box.

The color map changes to show gradients between colors.



Setting the Color Map's Upper Bound

In some cases, the area range covered by the analysis can be so large that the area ranges that are of interest may be difficult to see. If this is the case, you can set the upper bound of the range to a lower value.

To change the upper bound on the color map:

1 Click **Set Upper Bound**.

2 Enter a new value in the Airway Area Upper Bound dialog box, and click **OK**.

Saving and Restoring Color Map Settings

To save your current color map as the default:

1 Click **Save As Default**.

The saved color map will be used by default for all future **Upper Constricted Airway (With Colormap)** airway analysis sessions.

To discard your color map settings and return to a saved color map:

1 Click **Restore to Default** to return to the color map currently being used as the default color map.

Or,

Click **Restore to Installed** to return to Dolphin factory settings for the color map.

Saving and Restoring the Airway Analysis

When you close the Airway Analysis dialog box, all your seed points and boundaries are automatically saved. The next time you open this dialog box, this information is restored automatically. In addition, you can save up to five versions of the airway analysis work-up. Later, you can restore any saved work-up.

To save an airway analysis work-up:

1 Click **Save...**.

A menu appears offering five slots for saving your work-up.

2 Click a work-up slot to save your work in that slot.

To restore a previously saved work-up:

1 Click **Restore...**.

A menu appears listing the work-up slots. Empty slots are grayed out.

2 Click the slot containing the work-up that you want to restore.

Saving an Airway Surface

You can save a surface representation of the airway to your database. Then, you use it just like any other surface. For example, you can view it along with the volume in the Dolphin 3D window or use it in the creation of 3D movies. For information on viewing the airway surface, see “Viewing a Photo or Surface” on page 19-29.

To save the airway surface to your database:

1 Click **Save...**.

A menu appears offering options for saving your work-up.

2 Click **Save Airway Surface to Database...**.

A dialog box appears listing slots in which you can save the surface.

3 Select a slot to save the surface in that slot, and click **OK**.

25 Mirroring

Volume mirroring enables you to mirror one side of a patient over to the other side, and either overlay the original or replace it. This is useful for analyzing asymmetries and for working with trauma patients who are missing some anatomy on one side.

To create a mirror image, you first select the volume view you want to use. For example, you can select:

- the soft or hard tissue in a frontal or bottom view
- a coronal or axial slice x-ray view

Then, you create the mirror image.

Note: *The Mirroring Tool is available only on computers that support advanced 3D rendering modes ("translucent" modes).*

To open in the Mirroring Tool dialog box:

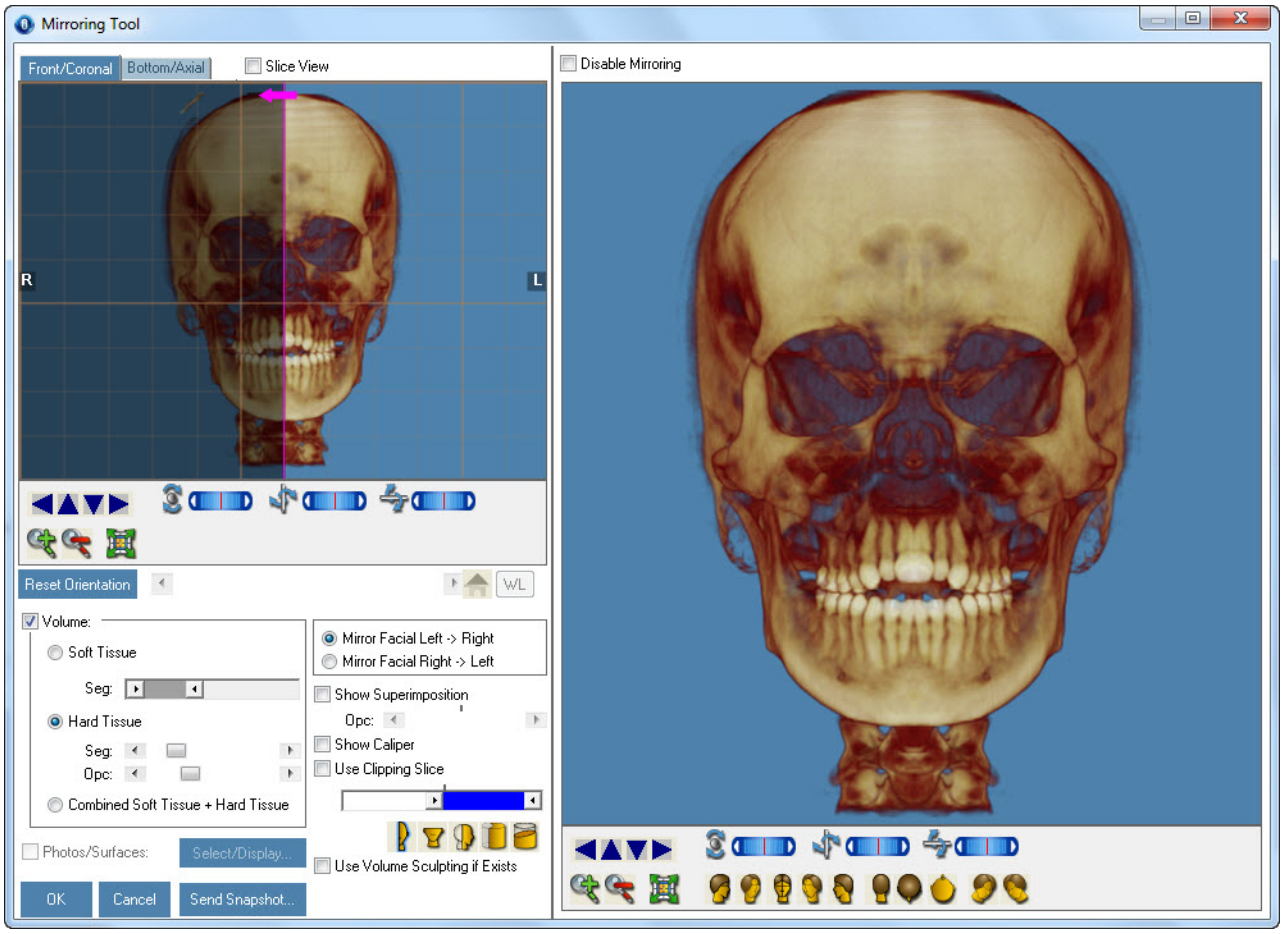
1 Click

on the Dolphin 3D window.

Or,

Select **Mirroring** from the **Tools** menu.

The Mirroring Tool dialog box opens.



Front/Coronal	Offers the following views: • a frontal view of the volume if the **Slice View** box is not checked (see below) • the coronal slice if the **Slice View** box is checked
Bottom/Axial	Offers the following views: • a bottom view of the volume if the **Slice View** box is not checked (see below) • the axial slice if the **Slice View** box is checked
Slice View	Displays the coronal and axial slices on the **Front/Coronal** and **Bottom/Axial** tabs, respectively, rather than the front and bottom volume views.
Reset Orientation	Returns the images on the **Front/Coronal** and **Bottom/Axial** tabs to the default orientation.
slider	Sets the location of the slice currently being displayed. Available only when the **Slice View** box is checked. For more information, see “Using a Slice View for the Mirror Image” on page 25-6.
	Returns the coronal and axial slices to their standard locations after you have customized them. Available only when the **Slice View** box is checked. For more information, see “Using a Slice View for the Mirror Image” on page 25-6.

WL	Resets the window leveling to the default values. Available only when the **Slice View** box is checked. For more information, see “Setting Window Leveling” on page 21-48.
Soft Tissue	Displays the patient's soft tissue. **Seg:** Sets the density segment of the 3D volume to use for the soft tissue view. For more information, see “Using the Soft Tissue for the Mirror Image” on page 25-4.
Hard Tissue	Displays a translucent representation of the patient's hard tissue. **Seg:** Sets the density segment of the 3D image to use for the hard tissue view. **Opc:** Sets the level of opacity in the hard tissue image. For more information, see “Using the Hard Tissue for the Mirror Image” on page 25-5.
Combined Soft Tissue + Hard Tissue	Displays both the patient’s soft and hard tissue images in the window. The settings in the Soft Tissue and Hard Tissue group boxes are used to construct the combined view. For more information, see “Using the Soft and Hard Tissue for the Mirror Image” on page 25-5.
Photos/Surfaces	Displays a photo or surface (if available) superimposed on the volume. **Select/Display...:** Opens a dialog box where you can choose the photo or surface to display and set options for it. For more information, see “Using a Photo or Surface for the Mirror Image” on page 25-6.
Mirror Facial Left -> Right	Creates the left side of the image by mirroring the right side of the volume.
Mirror Facial Right -> Left	Creates the right side of the image by mirroring the left side of the volume.
Show Superimposition	Displays the mirror image superimposed over the volume. **Opc:** Sets the level of opacity in the superimposition.
Show Caliper	Displays a symmetry You can on the image. For more information, see “Using the Symmetry Caliper” on page 19-45.
Use Clipping Slice	Defines the cross-section of the image to display. For more information, see “Using a Clipping Slice” on page 28-1.
Use Volume Sculpting if Exists	Uses the sculpted volume for the mirror image view, if you have performed sculpting operations on this volume. For more information, see “Sculpting the Volume” on page 28-6.

Send Snapshot...	Opens a menu with the following options: **Close This Menu:** Closes the menu. **Save To Dolphin Layout/Database:** Saves the image to a slot in a Dolphin image layout and stores it in your database. For more information, see “Saving, Exporting, Uploading, and Printing” on page 19-117. **Send To Report:** Uses this image in a Dolphin 3D report. For more information, see Chapter 29, Reports. **Copy To Clipboard:** Copies the image to the clipboard. Then, you can paste it into another application. For more information, see “Copying an Image to the Clipboard” on page 19-119. **Print:** Prints the image. For more information, see “Printing an Image” on page 19-123. **Export To File:** Exports the image to a file. For more information, see “Exporting an Image” on page 19-119.
Disable Mirroring	Displays the whole volume rather than the volume constructed with the mirroring feature.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Identifying the View for the Mirror Image

You can create your mirror image view using:

- the patient's soft tissue or photo
- the patient's hard tissue
- a combined soft tissue/hard tissue view
- a slice view

Using the Soft Tissue for the Mirror Image

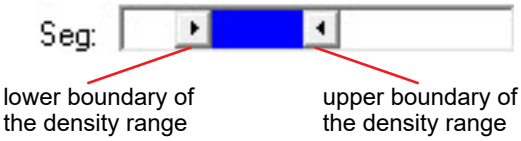
To identify a soft tissue view for the mirror image:

1 Check the **Volume** box.

2 Select **Soft Tissue**.

3 Optionally, adjust the **Seg** slider to set the segmentation for the soft tissue view.

To segment the soft tissue view, use the slider to identify the range of tissue densities for the patient's soft tissue. As you adjust the slider, the soft tissue image changes to reflect the currently selected image segment.



When segmenting soft tissue, you identify the lower and upper density values in the range you want to use. For example, the lower boundary may identify the transition between the air and the patient's soft tissue. The upper boundary may identify the transition between the patient's soft tissue and hard tissue.

4 Select the **Front/Coronal** tab to create a mirror image using a frontal view.

Or,

Select the **Bottom/Axial** tab to create a mirror image using a bottom view.

Using the Hard Tissue for the Mirror Image

To identify a hard tissue view for the mirror image:

1 Check the **Volume** box.

2 Select **Hard Tissue**.

3 Adjust the **Seg** slider to set the segmentation for the hard tissue view.

To segment the hard tissue view, you use the slider to identify the lower tissue density boundary for the patient's hard tissue—that is, the transition between the patient's soft and hard tissue. As you adjust the slider, the hard tissue image changes to reflect the currently selected image segment.

4 Adjust the **Opc** slider to set the opacity of the hard tissue view.

5 Select the **Front/Coronal** tab to create a mirror image using a frontal view.

Or,

Select the **Bottom/Axial** tab to create a mirror image using a bottom view.

Using the Soft and Hard Tissue for the Mirror Image

To use the combined soft tissue and hard tissue view for the mirror image:

1 Check the **Volume** box.

2 Select **Combined Soft Tissue + Hard Tissue**.

3 Set options for the soft tissue and hard tissue views as described in “Using the Soft Tissue for the Mirror Image” on page 25-4 and “Using the Hard Tissue for the Mirror Image” on page 25-5.

Using a Photo or Surface for the Mirror Image

If you have stored photos or surfaces for this patient, you can use them to create the mirror image. For information on displaying photos and surfaces, see “Using Photos and Surfaces” on page 19-56.

Using a Slice View for the Mirror Image

To identify a slice view for the mirror image:

1 Check the **Slice View** box.

The images on the two tabs changed to the coronal and axial slices.

2 Select the **Front/Coronal** tab to create a mirror image using a coronal slice.

Or,

Select the **Bottom/Axial** tab to create a mirror image using an axial slice.

3 Optionally, adjust the slider to set the location of the coronal or axial slice.

Or,

Click to return the coronal and axial slices to the default positions.

Creating the Mirror Image

To create the mirror image:

1 Optionally, check the **Mirror Facial Left -> Right** box to create the left side of the image by mirroring the right side of the volume.

Or,

Check the **Mirror Facial Right -> Left** box to create the right side of the image by mirroring the last side of the volume.

2 Optionally, check the **Show Superimposition** box to view the mirror image superimposed over the volume.

3 If you checked the **Show Superimposition** box, optionally adjust the **Opc** slider to set the transparency of the superimposed mirror image.

4 Optionally, check the **Show Caliper** box to show a symmetry You can on the image.

For more information, see “Using the Symmetry Caliper” on page 19-45.

5 On the **Front/Coronal** or **Bottom/Axial** tab, click and drag the pink line to set the location of the center line for the mirror image.

Click and drag when your mouse pointer turns into a double-headed arrow.

You can rotate the mirror image or use clipping slices to view interior structures. See “Moving or Reorienting the Volume” on page 19-24 and “Using a Clipping Slice” on page 28-1.

26 Volumes Superimposition (Medical Device)

If you have two volumes that you want to compare, you can superimpose them. There are two methods for performing the superimposition:

- Side-by-side superimposition: Use this method to view both volumes side by side and align them by identifying corresponding points.
- Overlay superimposition: Use this method to align the volumes by manipulating a preview of the superimposition.

Fine-tuning the superimposition may involve using both these methods. For example, you may use the side-by-side superimposition method initially, then fine-tune the superimposition with the overlay superimposition method. Then, you can verify the superimposition on the **Analysis/Verify Result** tab.

Note: *This feature is meant to assist dental clinicians and trained assisting staff in treatment planning. The results of this process should not be used as the primary source of patient evaluation and should be verified by other independent methods.*

Opening the Superimposition Dialog Box

To open in the Superimposition dialog box:

1 Click

on the Dolphin 3D window.

Or,

Select **Superimposition** from the **Tools** menu.

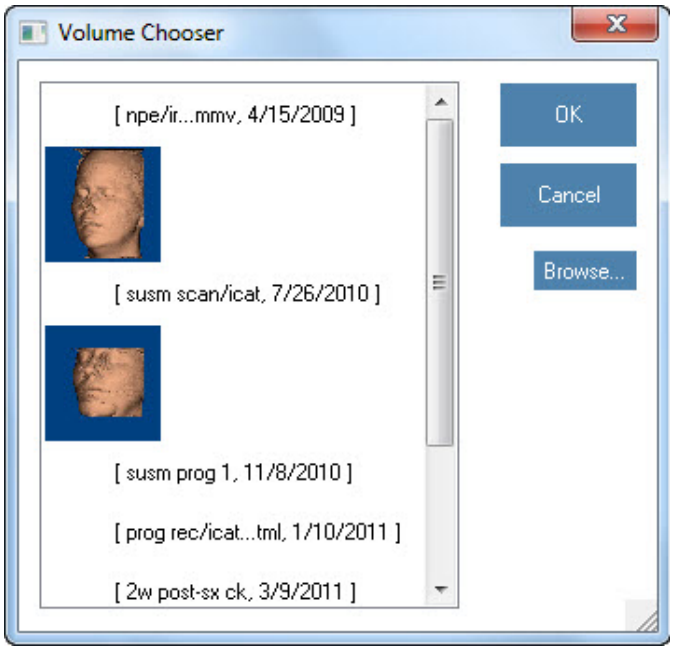
The Volume Chooser dialog box opens.

2 Select the second volume to use in this superimposition.

Or,

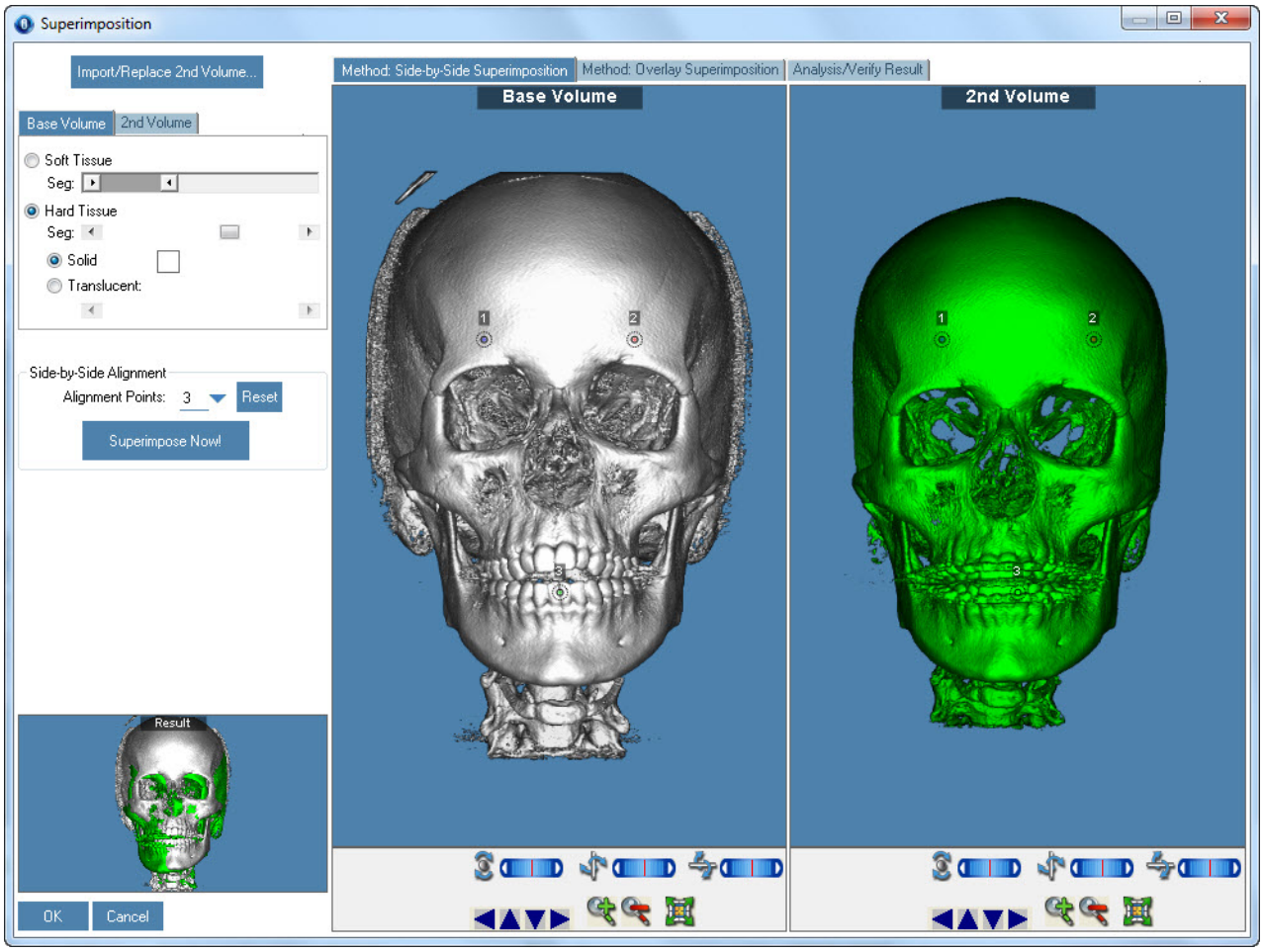
Click **Browse...** and browse to the file containing the second of volume.

3 Click **OK**.



The two volumes appear in the Superimposition dialog box.

list	Volumes available for the current patient, grouped by timepoint.
Browse...	Import a volume from a file.



The following options are common to all tabs on this dialog box. For information on options specific to a particular tab, see “Using Side-by-Side Superimposition” on page 26-4, “Using Overlay Superimposition” on page 26-6, and “Analyzing and Verifying the Result” on page 26-14.

Import/Replace 2nd Volume...	Import a new volume to replace the second volume.
Base Volume	Display options for the base volume in this superimposition. **Soft Tissue:** Displays the patient's soft tissue image. • **Seg...**: Sets the segment of the 3D image to use for the soft tissue view. **Hard Tissue:** Displays the patient's hard tissue image. • **Seg...:** Sets the segment of the 3D image to use for the hard tissue view. • **Solid:** Displays a solid representation of the patient's hard tissue. • **Color Sample:** Color for the solid hard tissue view. • **Translucent:** Display a translucent representation of the patient's hard tissue. Available only if your computer graphics card supports advanced 3D rendering. ○ **Slider:** Sets the level of transparency in the translucent hard tissue image. Available only if your computer graphics card supports advanced 3D rendering. For more information, see "Viewing the Soft Tissue" on page 19-26and "Viewing the Hard Tissue" on page 19-27.
2nd Volume	Display options for the second volume in this superimposition. **Soft Tissue:** Displays the patient's soft tissue image. • **Seg...**: Sets the segment of the 3D image to use for the soft tissue view. **Hard Tissue:** Displays the patient's hard tissue image. • **Seg...:** Sets the segment of the 3D image to use for the hard tissue view. • **Solid:** Displays a solid representation of the patient's hard tissue. • **Color Sample:** Color for the solid hard tissue view. • **Translucent:** Display a translucent representation of the patient's hard tissue. Available only if your computer graphics card supports advanced 3D rendering. ○ **Slider:** Sets the level of transparency in the translucent hard tissue image. Available only if your computer graphics card supports advanced 3D rendering. **Always Displayed in Front of Base Volume:** Always displays the second volume in front of the base volume. For more information, see "Viewing the Soft Tissue" on page 19-26and "Viewing the Hard Tissue" on page 19-27.
Method: Side-by-Side Superimposition	Displays the two volumes side by side so you can align them by identifying corresponding points. For more information, see "Using Side-by-Side Superimposition" on page 26-4.
Method: Overlay Superimposition	Align the two volumes by manipulating a preview of the superimposition. For more information, see "Using Overlay Superimposition" on page 26-6.

Analysis/Verify Result	Displays the results of your superimposition. For more information, see “Analyzing and Verifying the Result” on page 26-14.
Result	Previews the results of your superimposition. Does not appear on the **Analysis/Verify Result** tab.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the images, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

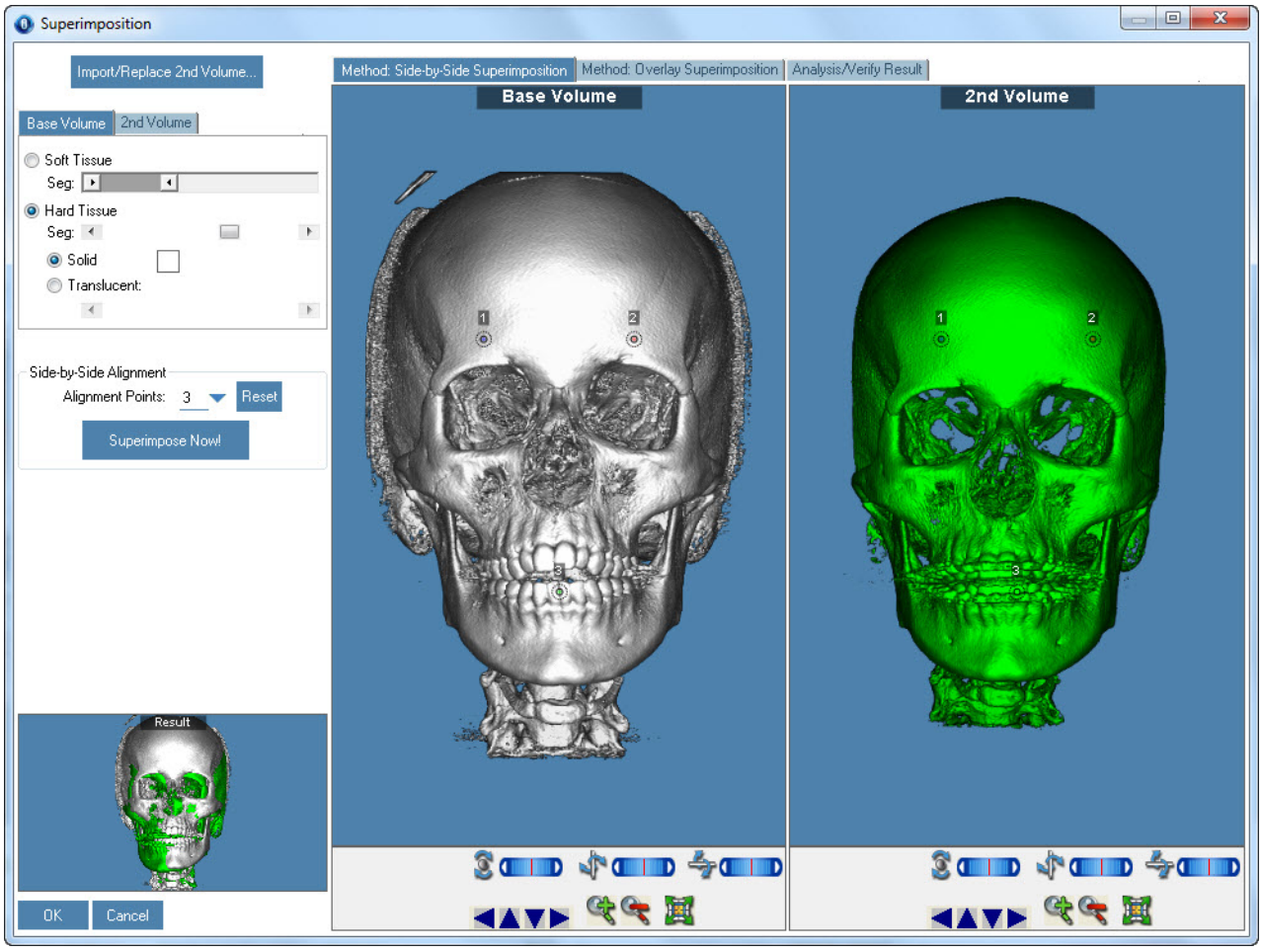
Using Side-by-Side Superimposition

With the side-by-side superimposition method, you align two volumes by identifying corresponding points on them. Then, you can preview the superimposition before saving it.

To use side-by-side superimposition:

1 Select the **Method: Side-by-Side Superimposition** tab on the Superimpositions dialog box.

The two volumes appear in the dialog box. Points appear on the volumes so that you can align them.



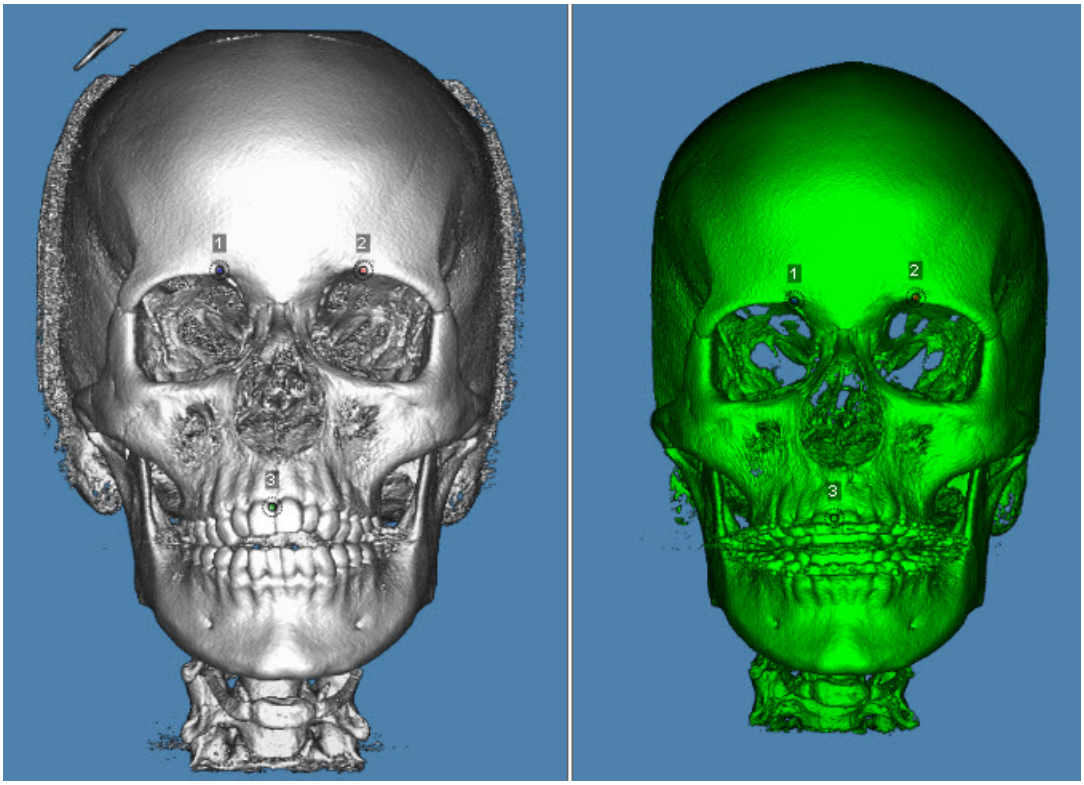
The following options are specific to the **Method: Side-by Side Superimposition** tab. For information on options common to all tabs on this dialog box, see “Opening the Superimposition Dialog Box” on page 26-1. For information on the rotation sliders, arrow buttons, and magnification controls that appear below the images, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Alignment Points	Number of alignment points to use to superimpose the volumes. For more information, see “Adding and Resetting Points” on page 26-6.
Reset	Returns the alignment points to their initial number and positions. For more information, see “Adding and Resetting Points” on page 26-6.
Superimpose Now!	Superimposes the two volumes and display the result in the Result window.

Superimposing the Two Volumes

To superimpose the two volumes:

1 Click and drag the points on the volumes so that they identify corresponding locations.



To superimpose the volumes:

1 Click **Superimpose Now!**

The result of your superimposition appears in the results box in the lower left corner of the window.

Adding and Resetting Points

To use additional points to align the volumes:

1 Select a number of points to use from the **Alignment Points** drop-down list.

Additional alignment points appear on both volumes.

To reset the alignment points to their initial number and locations:

1 Click **Reset**.

The initial number of alignment points appears in the original positions on both volumes.

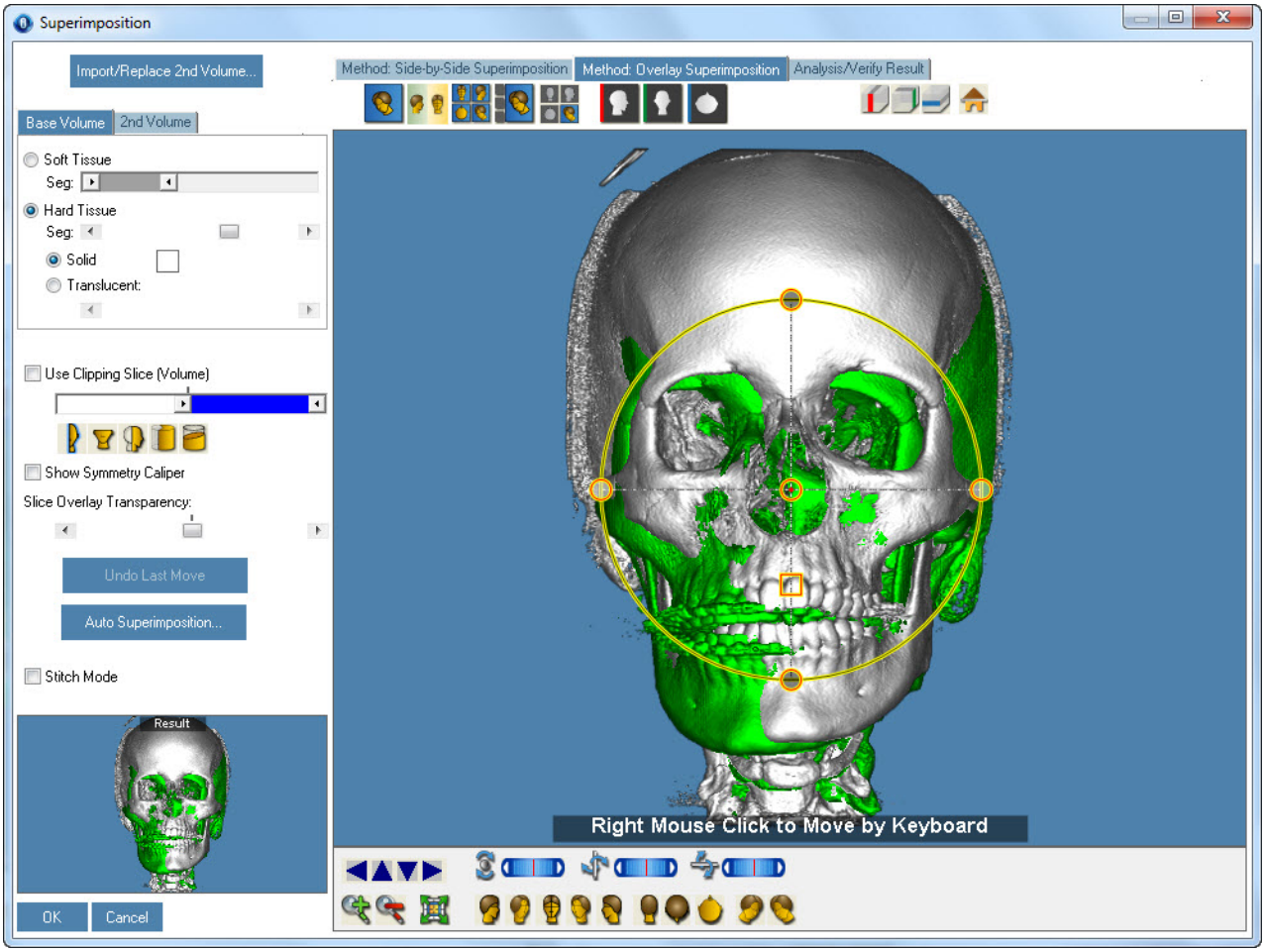
Using Overlay Superimposition

With the overlay superimposition method, you align the two volumes by manipulating a preview of the superimposition.

To use overlay superimposition:

1 Select the **Method: Overlay Superimposition** tab.

The volumes are superimposed in the dialog box. You use the wheel-shaped alignment tool that appears over the superimposition to move the second volume in relation to the first volume.



The following options are specific to the **Method: Overlay Superimposition** tab. For information on options common to all tabs on this dialog box, see “Opening the Superimposition Dialog Box” on page 26-1. For information on the layout and slice buttons that appear above the image, see “Layouts and Slices” on page 19-32. For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the images, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Use Clipping Slice	Defines the cross-section of the image to display. For more information, see “Using a Clipping Slice” on page 28-1.
Show Symmetry Caliper	Displays a symmetry You can on the superimposition. For more information, see “Using the Symmetry Caliper” on page 19-45.
Slice Overlay Transparency	Sets the transparency of the superimposition in the slice views. For more information, see “Standard Slice Views” on page 19-38.
Undo Last Move	Undoes the last operation.
Auto Superimposition	Performs a voxel-based automated best-fit superimposition of the two volumes after you have manually aligned them fairly closely. You can use this feature to superimpose the two volumes in their entirety, or you can select a region of the two volumes for the superimposition.

Stitch Mode	Performs the superimposition using stitching. For more information, see “Using Stitching” on page 26-13.

Changing the View

Changing the view while adjusting the superimposition enables you to use different viewing angles as well as both the external and internal anatomy, which can help ensure the greatest accuracy. For example, you begin performing the superimposition by registering on external anatomies, then switch to internal anatomies such as maxilla (ANS-PNS) cross-section or sella-nasion cross-section. Superimposition on the slice views can also be used to validate the accuracy of the internal structure alignments after superimposition is done on the outer surface of the skull.

For information on the layout and slice buttons that appear above the image, see “Layouts and Slices” on page 19-32. For information on the predefined view buttons that appear below the image, see “Moving or Reorienting the Volume” on page 19-24.

To use both external and internal anatomy to align the superimposition (an example):

1 Click to orient the image for a frontal view.

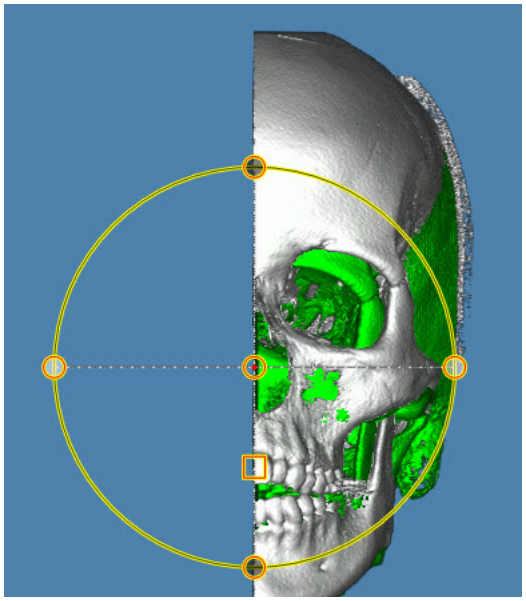
2 Check Use Clipping Slice.

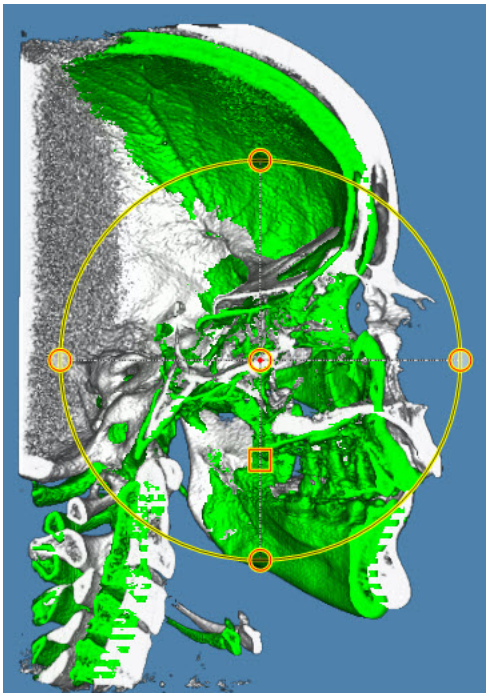
3 Click to set the clipping slice at the mid-sagittal plane.

The image appears similar to the example shown below.

4 Click to rotate the image to the lateral view

The clipping slice remains fixed, and you can see how the internal anatomy aligns as shown below:





Manually Aligning the Superimposition

Several Dolphin 3D features offer the overlay superimposition method to superimpose two volumes, a photo and a volume, a model arch or other surface and a volume, and so on. To use this method, you begin by manually align the superimposition using one or more of the ways:

- using a wheel-shaped alignment tool as described in “Using the Wheel-shaped Alignment Tool” below.
- using the arrow buttons and rotation sliders as described in “Using the Arrow Buttons and Rotation Sliders” below
- typing in movement values as described in “Typing In Movement Values” below.

Once you have manually aligned superimposition fairly closely, you can use the automatic superimposition feature to perform a voxel-based automated best-fit superimposition.

Using the Wheel-shaped Alignment Tool

To adjust the superimposition using the wheel-shaped alignment tool:

1 Click and drag inside the large circle to move the second volume, 3D photo, or surface horizontally or vertically.

Or,

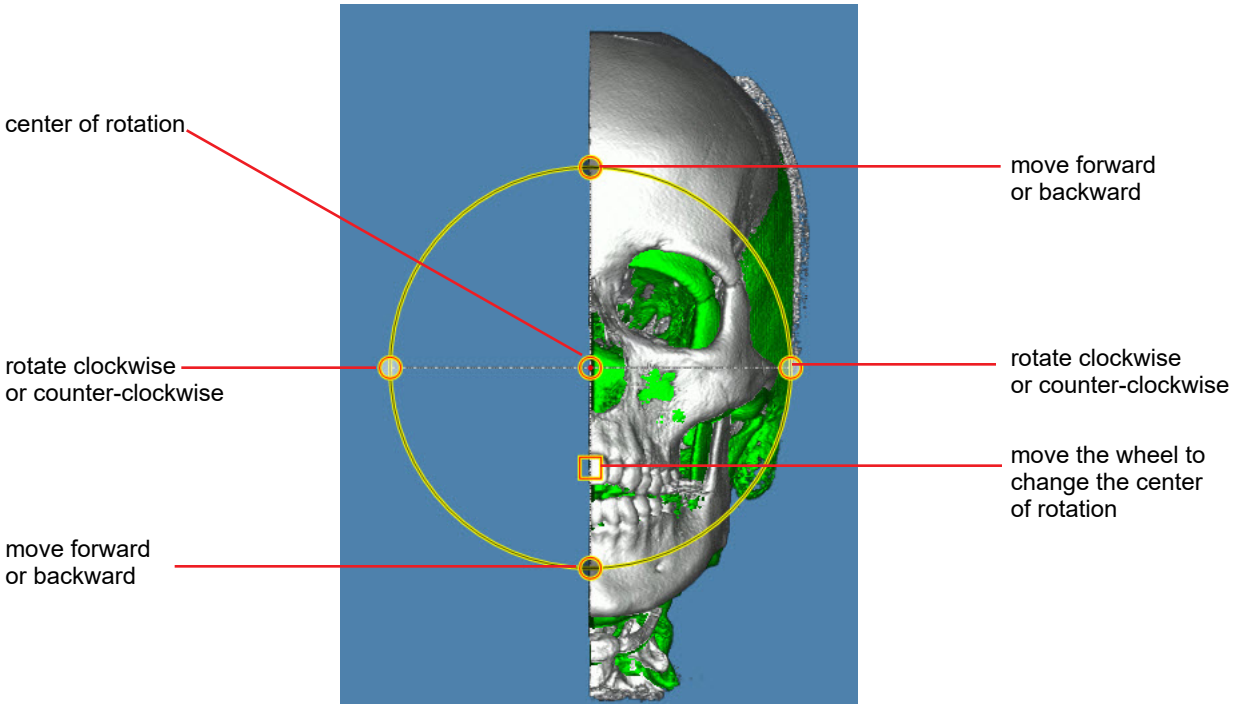
Click and drag the small circles at the 3 and 9 o'clock positions on the wheel to rotate the second volume, 3D photo, or surface clockwise or counter-clockwise.

Or,

Click and drag the small circles at the 12 and 6 o'clock positions on the wheel to move the second volume, 3D photo, or surface forward and backward (like a screw).

To change the center of rotation:

1 Click and drag the square to move the wheel so that its center is at the point that you want to use as the center of rotation.



Using the Arrow Buttons and Rotation Sliders

To adjust the superimposition using the other movement controls:

1 Click one of the arrow buttons to move the second volume, 3D photo, or surface in the indicated direction.

Or,

Click and drag one of the sliders to rotate the second volume, 3D photo, or surface around the indicated axis.

For more information on the arrow buttons and rotation sliders, see “Moving or Reorienting the Volume” on page 19-24.

Typing In Movement Values

To type in movement values:

1 Right-click the superimposed image.

Or,

Click **Key Input.**

Or,

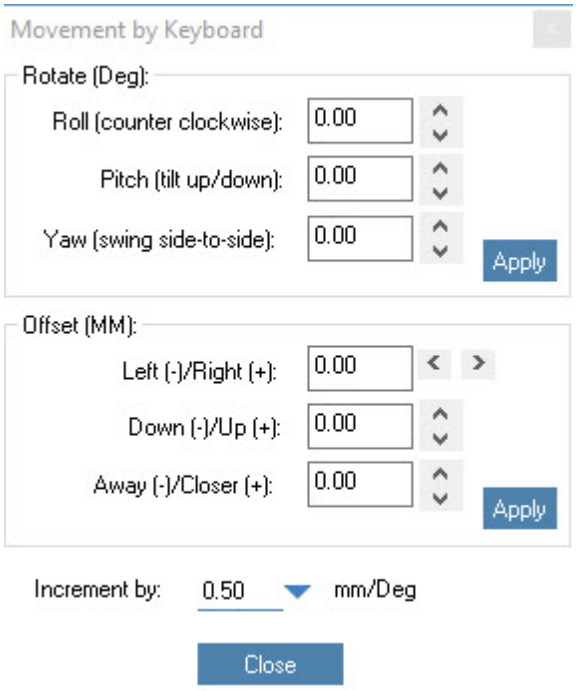
Right-click the image, and select **Input Movements Using Keyboard...** from the context menu.

The **Movement by Keyboard** dialog box opens.

2 Enter the appropriate values to adjust the superimposition.

3 Click **Apply** to see the result.

4 Click **Close** to close the dialog box.



Rotate (Deg)	Rotational values for the overlaid image: **Roll (counter clockwise):** Number of degrees to rotate counter-clockwise. **Pitch (tilt up.down):** Number of degrees to tilt up or down. **Yaw (swing side-to-side):** Number of degrees to swing side to side.

Offset (MM)	Linear movement values for the overlaid image: **Left (-)/Right(+):** Number of millimeters to move left or right. Enter a negative number to move left, or a positive number to move right. **Down(-)/Up(+):** Number of millimeters to move down or up. Enter a negative number to move down, or a positive number to move up. **Away(-)/Closer(+):** Number of millimeters to move closer or further away. Enter a negative number to move further away, or a positive number to move closer.
Increment by	Number of millimeters or degrees that the values should change when you click the arrow buttons.
Apply	Displays the result without closing the dialog box.

Using Automatic Superimposition

Once you have manually aligned two volumes fairly closely, you can use the automatic superimposition feature to perform a voxel-based automated best-fit superimposition. You can superimpose the two volumes in their entirety, or you can select a region of the two volumes for the superimposition.

To perform an automatic superimposition:

1 Manually align the two volumes fairly closely as described in “Using Overlay Superimposition” on page 26-6.

2 Click **Auto Superimposition**.

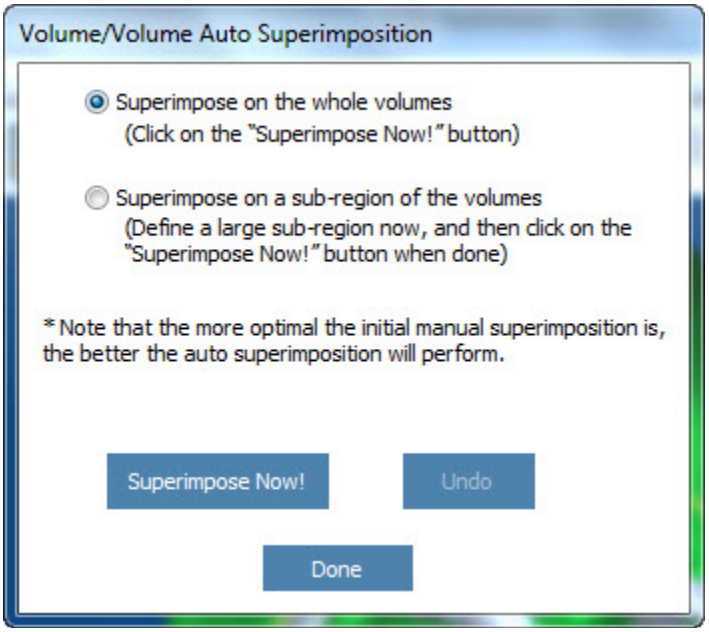
A dialog box opens so that you can specify whether to superimpose the entire volumes or a region of the two volumes.

3 Select **Superimpose on the whole volume** to superimpose the entire volumes.

Or,

Select **Superimpose on a sub-region of the volumes** to superimpose a region of the two volumes.

If you selected **Superimpose on a sub-region of the volumes**, the **4-Equal Slices-Volume** layout appears the **Method: Overlay Superimposition** tab. Each view in the layout includes a red selection rectangle that you use to select the region of the two volumes to superimpose.



4 If you selected **Superimpose on a sub-region of the volumes**, use the red selection rectangles to select the region of the two volumes.

In any of the four views, you can click and drag inside the red rectangle to reposition it. Click and drag an edge or corner of the red rectangle to resize it. Any changes you make in one of the views is reflected in the other three views.

5 Click **Superimpose Now!** to perform the superimposition.

Superimpose on the whole volumes	Superimposes the two volumes in their entirety.
Superimpose on a sub-region of the volumes	Enables you to select a region of the two volumes to use for the superimposition.
Superimpose Now!	Superimposes the two volumes and displays the result in the Result window.
Undo	Undoes the last superimposition operation.

Using Stitching

The stitching feature enables you to “stitch” two volumes together. Typically, you would use two scans of different isolated areas of the patient (for example, left condyle scan and right condyle scan). This feature is very useful for CBCT systems that can capture only very small field-of-view.

To perform 3D superimposition using stitching:

1 Open in the Superimposition dialog box, selecting the two volumes to “stitch” together.

2 Check the **Stitch Mode** box.

A cutting plane appears, and each volume is “cut” by the plane on its respective side.

3 Adjust the cutting plane by clicking and dragging the yellow dot.

You can export the resulting stitched volume as one data set. For more information, see “Exporting DICOM Files” on page 19-120.

Analyzing and Verifying the Result

Before saving your superimposition, you can verify it by viewing it from different angles, using different clipping slices, or using a symmetry You can to see that the volumes are aligned correctly.

To verify your superimposition:

1 Click the **Analysis/Verify Result** tab.

The dialog box displays the current superimposition.

2 Click the button for one of the predefined views to orient the superimposed volumes for that view.

Or,

Click and drag one of the sliders to rotate the superimposed volumes around the indicated axis.

Or,

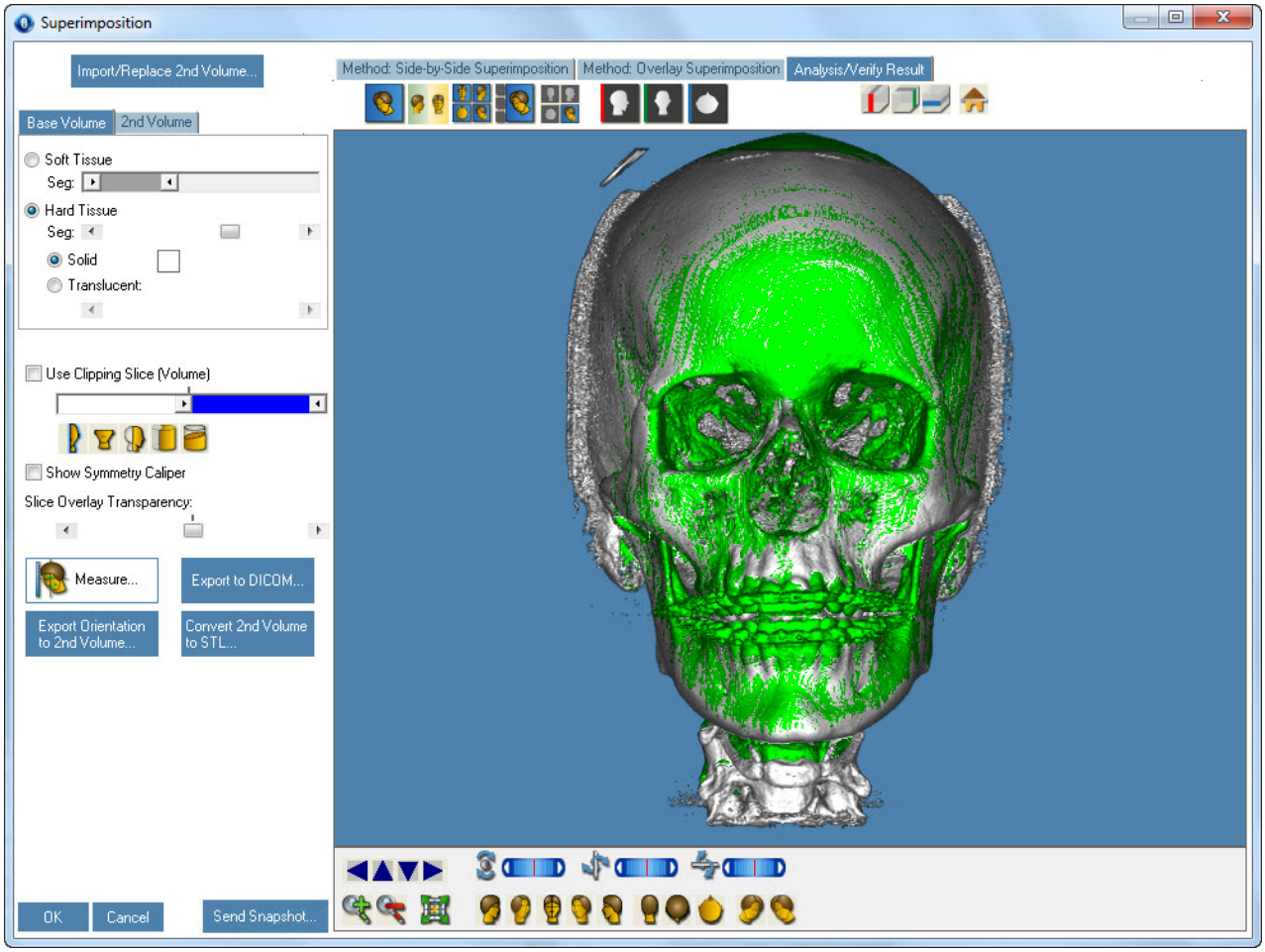
Click and drag the superimposed volumes to rotate them.

To match up the orientation of the two volumes:

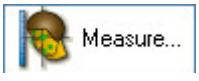
1 On the **Analysis/Verify Result** tab, click **Export Orientation to 2nd Volume...**.

2 On the confirmation dialog box that appears, click **Yes**.

When you click **Yes**, the second volume's new orientation is saved to your Dolphin database.



The following options are specific to the **Analysis/Verify Result** tab. For information on options common to all tabs on this dialog box, see “Opening the Superimposition Dialog Box” on page 26-1. For information on the layout and slice buttons that appear above the image, see “Layouts and Slices” on page 19-32. For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the images, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Use Clipping Slice	Defines the cross-section of the image to display. For more information, see “Using a Clipping Slice” on page 28-1.
Show Symmetry Caliper	Displays a symmetry You can on the superimposition. For more information, see “Using the Symmetry Caliper” on page 19-45.
Slice Overlay Transparency	Sets the transparency of the overlay slice (slice of the second volume) when viewing the superimposition in the 3+1 layout, the 2x2 layout., or one of the standard slice views. For information on layouts and slices, see “Standard Slice Views” on page 19-38.
	Opens a window where you can take measurements on the superimposed volume. For more information, see “Viewing and Taking Measurements” on page 22-8.

Export to DICOM	Opens a menu with the following options: **Export both volumes into a single DICOM dataset (for stitched volumes)...:** Exports the two superimposed volumes to a single DICOM data set. **Export just the oriented 2nd volume (in the coordinates of the 1st volume)...:** Exports only the second volume, oriented as it is in the superimposition, to the DICOM data set. For more information see “Exporting DICOM Files” on page 19-120.
Export Orientation to 2nd Volume...	Sets the second volume's orientation to match the base volume's orientation.
Convert 2nd Volume to STL...	Opens the Create Surface From Volume dialog box so that you can create a surface from the second volume. For more information, see “Creating a Surface From the Volume” on page 19-74.
Send Snapshot...	Opens a menu with the following options: **Close This Menu:** Closes the menu. **Save To Dolphin Layout/Database:** Saves the superimposition to a slot in a Dolphin image layout and stores it in your database. For more information, see “Saving, Exporting, Uploading, and Printing” on page 19-117. **Send To Report:** Uses this superimposition in a Dolphin 3D report. For more information, see Chapter 29, Reports. **Copy To Clipboard:** Copies the superimposition to the clipboard. Then, you can paste it into another application. For more information, see “Copying an Image to the Clipboard” on page 19-119. **Print:** Prints the superimposition. For more information, see “Printing an Image” on page 19-123. **Export To File:** Exports the superimposition to a file. For more information, see “Exporting an Image” on page 19-119.

Saving the Superimposition

To save your superimposition and close this dialog box:

1 Click **OK**.

27 3D Implant Simulation (Medical Device)

You can use the 3D Implant Simulation feature to assist you in implant case evaluation, creating individualized treatment simulations, and patient presentation. This feature performs placement of implants and temporary anchorage devices (TADs) and related procedures on a patient's 3D volume. Within minutes, your patients and referring doctors can fully understand your treatment process.

3D Implant Simulation enables you to:

- place, move, and rotate implants and TADs on the volume, slice, or panoramic views, or using a surface representing a study model
- select implant types from a generic implant template library and specify each implant’s size
- zoom in and out on an implant
- define a “safety zone” about each implant to avoid proximity collisions
- segment and sculpt the volume, use clipping slices and automatic clipping around the implant, and set the image transparency for better implant placement
- measure distances and angles
- convert the segmented volume, as a solid, to an surface and export it to an industry standard file format in addition to the geometric placement information of the implants on the surface
- define and show the nerve canals on the volume views so that you can avoid placing implants close to the nerves
- adjust and show coloring of the sectional views according to Hounsfield Units

Note: *This feature is meant to assist dental clinicians and trained assisting staff in treatment planning. The results of this process should not be used as the primary source of patient evaluation and should be verified by other independent methods.*

It is recommended that you have at least one panoramic, cross sections panoramic, or nerve canals panoramic x-ray view for the current patient before using the 3D Implant Simulation module to plan implant placement. For more information, see Chapter 21, Build X-rays.

Accessing 3D Implant Simulation

To access the 3D Implant Simulation module:

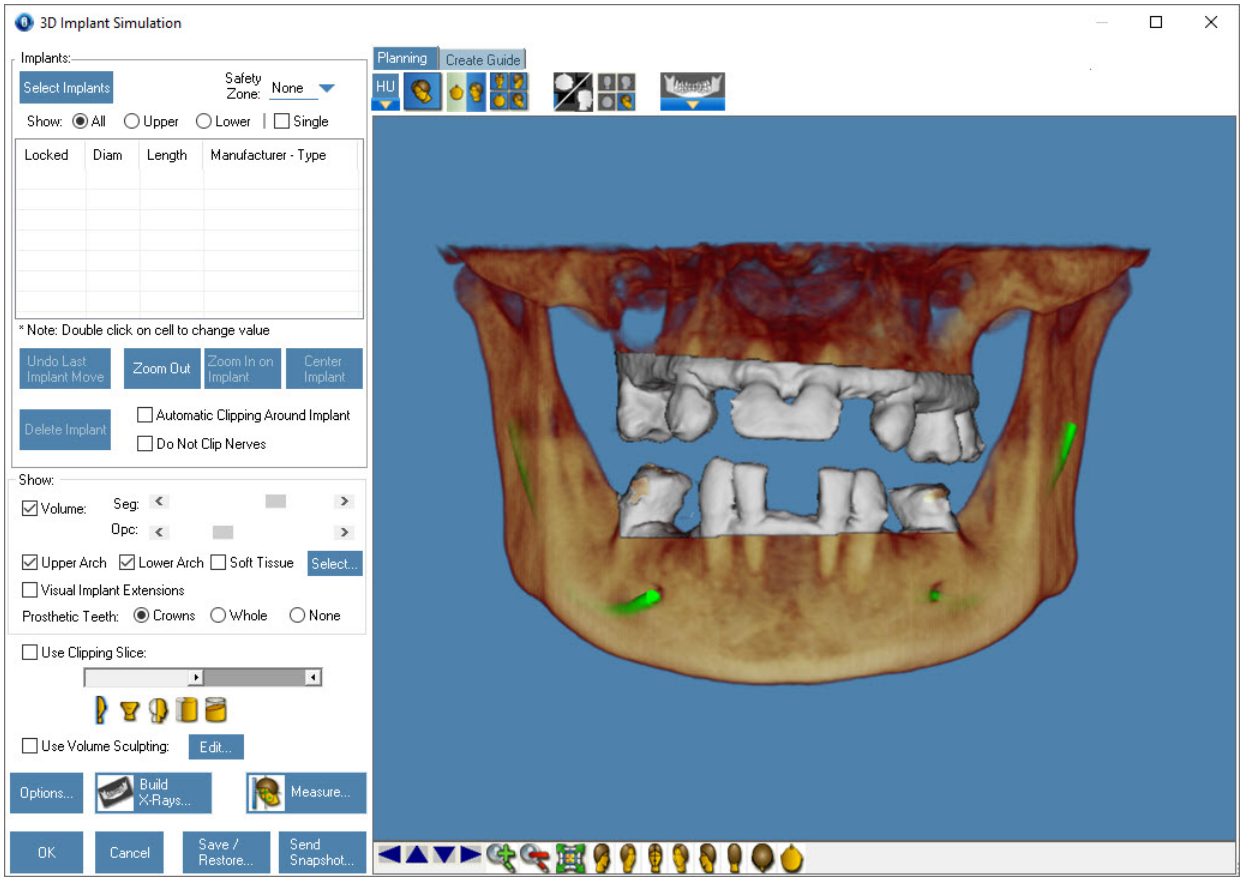
1 Click

on the Dolphin 3D window.

Or,

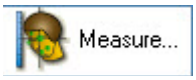
Select **Implants...** from the **Tools** menu.

The 3D Implant Simulation window opens.



Implants	Options to add and remove implants. **Select Implants:** Adds a new implant from the library. For more information, see “Adding Implants and TADs” on page 27-16. **Safety Zone:** Size (in millimeters) of a safety zone about each implant. Used to avoid proximity collisions. Choose **None** if you don't want a safety zone. For more information, see “Adding a Safety Zone” on page 27-19. **Show:** Implants to display on the image. • **All:** Show all implants • **Upper:** Show implants in the upper arch only. • **Lower:** Show implants in the lower arch only. • **Single:** Show only the implant selected in the implant list. **implant list:** Diameter, length, manufacturer, and type of each implant added for this patient. In this list, a red line separates the upper and lower arches. Check the box in the Locked column to lock an implant in position to avoid moving it inadvertently. For more information, see “Moving and Rotating Implants” on page 27-18. **Undo Last Implant Move:** Undoes implant operations in the reverse of the order in which they were performed. For more information, see “Moving and Rotating Implants” on page 27-18. **Zoom Out:** Zooms out after zooming in on an implant. For more information, see “Configuring the View” on page 27-7. **Zoom In on Implant:** Zooms in on the selected implant and centers it in the window. For more information, see “Configuring the View” on page 27-7. **Center Implant:** Centers the selected implant in the window without zooming in. For more information, see “Configuring the View” on page 27-7. **Delete Implant:** Deletes the selected implant. For more information, see “Deleting an Implant” on page 27-29. **Automatic Clipping Around Implant:** Clips around the implant to see cut-away views of it within the volume. For more information, see “Clipping Around the Implant” on page 27-20. **Do Not Clip Nerves:** Prevents clipping of nerves when using clipping around the implant. For more information, see “Clipping Nerves” on page 27-22.

Show	Options to configure the 3D view. Not available when you are using an x-ray view for implant placement. **Volume:** Uses the volume to plan implant placement. • **Seg:** Sets the density segment of the 3D image to use for the hard tissue view. • **Opc:** Sets the opacity in the hard tissue image. **Upper Arch:** Displays the upper model arch (if available). **Lower Arch:** Displays the lower model arch (if available). **Soft Tissue:** Displays the patient's soft tissue surface. This option only appears if a soft tissue surface is available for the patient. For more information, see "Working with Surfaces" on page 19-73. • **Select...:** Opens the Select Photos/Surfaces for Display dialog box so that you can select the soft tissue surface you want to view. This option only appears if a soft tissue surface is available for the patient. **Visual Implant Extensions:** Displays visual implant extensions. **Prosthetic Teeth:** Options for displaying prosthetic teeth. • **Crown:** Displays only the crowns. • **Whole:** Displays the prosthetic teeth in their entirety (including roots). • **None:** Hides the prosthetic teeth.
Cross Sections	Options for cross-section images. Available only when an x-ray view with cross sections is displayed. **Direction:** Direction of the slices (either Sagittal or Axial). **Height:** Height of the slices. **Thickness:** Thickness of the slices. **Spacing:** Spacing of the slices. **Cuts Per Implant:** Number of cuts for each implant. **Slice Layout:** Layout of the slices montage.
Use Clipping Slice	Defines the cross-section of the image to display. For more information, see "Using a Clipping Slice" on page 28-1.
Use Volume Sculpting	Uses the sculpted volume for implant placement, if you have performed sculpting operations on this volume. Not available when you are using an x-ray view. **Edit...:** Opens the Sculpting Tool window so that you can perform sculpting operations on this volume.For more information, see "Sculpting the Volume" on page 28-6.

Options...	Opens a menu with the following options: **General Preferences:** Set colors for implants, safety zones, and nerves or edit the diameter, length, manufacturer, and type for implants in the library. For more information, see “Setting Preferences” on page 27-32. **Define Local Coordinates...:** Opens the Orientation Calibration window so you can set the volume orientation for this implant simulation. For more information, see Chapter 20, Volume Orientation. **Save Prosthetic Teeth to Database...:** Saves the prosthetic teeth in the current workup into a surface slot in your Dolphin database so that you can display them in the main Dolphin 3D window. For more information, see “Using Prosthetic Teeth” on page 27-25. **Export Implants to STL Files:** Export the implants to a file. For more information, see “Exporting Implants” on page 27-29. **Copy Dimensions of Implants to Clipboard:** Copies the dimensions of the implants to the clipboard so that you can paste them into another application such as Microsoft Word. **Set Implants Orientation Grouping:** Groups a set of upper or lower arch implants so their orientation stay fixed in relation to each other. • **Upper Arch Implants Grouping...:** Select implants from the upper arch to group. • **Lower Arch Implants Grouping...:** Select implants from the lower arch to group. **Restart with a clean workup...:** Restarts your implant planning process with a clean workup. You can save up to five workups for each patient at a time. For more information, see “Restarting With a Clean Workup” on page 27-32.
	Opens the Build X-rays Tool window so you create x-rays from the 3D image data. For more information, see Chapter 21, Build X-rays.
	Opens the Digitize/Measurement palette so that you can take measurements on the 3D image. For more information, see Chapter 22, Digitize and Measurements (Medical Device).
Save/Restore	Opens a menu with the following options: **Save Implant Workup:** Save your current workup. **Restore Implant Workup:** Load the previously saved workup. **Edit Implant Workup Description:** Edit the description of a workup slot. **Remove Implant Workup:** Remove a workup from your database. For more information, see “Managing Implant Planning Workups” on page 27-31.

Send Snapshot...	Opens a menu with the following options: **Close This Menu:** Closes the menu. **Save To Dolphin Layout/Database:** Saves the image to a slot in an image layout and stores it in your database. For more information, see “Saving, Exporting, Uploading, and Printing” on page 19-117. **Send To Report:** Uses this image in a Dolphin 3D report. For more information, see Chapter 29, Reports. **Copy To Clipboard:** Copies the image to the clipboard. Then, you can paste it into another application. For more information, see “Copying an Image to the Clipboard” on page 19-119. **Print:** Prints the image. For more information, see “Printing an Image” on page 19-123. **Export To File:** Exports the image to a file. For more information, see “Exporting an Image” on page 19-119. **Add Implants information when exporting:** Choose this option to toggle whether information about the implants is included in export files.
	Renders the slice and volume with color based on Hounsfield Units. Color rendering using Hounsfield Units gives you better control in highlighting anatomies with known Hounsfield Unit ranges. ***Note:*** *Only available for scans imported using Dolphin Imaging version 11 or later.* For more information, see “Using the Hounsfield Unit View” on page 19-42.
Layout buttons	Offers the standard layouts in addition to the following views. : Displays a side-by-side layout containing axial and sagittal slice views. For more information on the standard layouts, see “Layouts and Slices” on page 19-32.
	Displays the specified x-ray to view. Available only after you have built at least one x-ray type. For more information, see “Using X-ray Views” on page 27-9 and Chapter 27, 3D Implant Simulation (Medical Device).
Slice thickness drop-down list	Sets the slice thickness. Appears below the slice image only. For more information, see “Changing the Slice Angle and Thickness” on page 19-40.
Sharpen	Sets the sharpness of an x-ray image. Available only if an x-ray is displayed.
WL or Reset WL	Resets the window leveling. Available only if a slice or x-ray view is displayed. For more information see “Setting Window Leveling” on page 21-48.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Configuring the View

The 3D Implant Simulation window offers several options to configure the image that appears in the window's right pane. For example, you can

- identify the implants to display on the patient's image as described below.
- show or hide the 3D volume, soft tissue surface, model arch surfaces (if available), visual implant extensions, and prosthetic teeth as described below.
- zoom in or out as described below.
- center a specific implant in the right pane without zooming as described below.
- specify the volume, slice, or x-ray view to display as described in “Using X-ray Views” on page 27-9, “Using Slice Views” on page 27-10, and “Using Volume Views” on page 27-12.
- change the image's position, or orientation as described in “Positioning the Implant” on page 27-18.
- use clipping slice or sculpting as described in Chapter 28, Volume Clipping and Sculpting.

To specify which implants to display:

1 Optionally, select an implant in the list of implants.

You only need to select an implant if you want to limit the display to a single implant.

2 Next to **Show:**, select **All** to show all implants

Or,

Select Upper to show implants in the upper arch only.

Or,

Select **Lower** to show implants in the lower arch only.

Or,

Check the **Single** box to show only the implant selected in the list of implants.

To view the volume:

1 Check the **Volume** box.

2 Optionally, adjust the **Seg** slider to set the segmentation for the volume view.

3 Using the slider, you identify the range of tissue densities for the volume view.

As you adjust the slider, the image in the right pane changes to reflect the currently selected image segment.

4 Optionally, adjust the **Opc** slider to set the level of opacity for the volume view.

To view study model surfaces (if available):

1 Check the **Upper Arch** box to view the study model surface for the patient's upper arch.

Or,

Check the **Lower Arch** box to view the study model surface for the patient's lower arch.

For information on adding study model surfaces for a patient, see “Working With Arch Model Surfaces” on page 19-83.

To view a soft tissue surface:

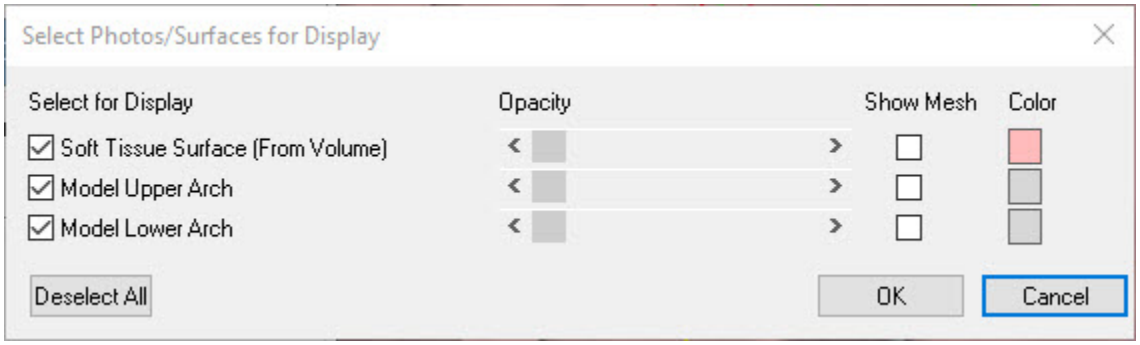
1 Check the **Soft Tissue** box. Then, click **Select...**.

These options only appear if a soft tissue surface is available for the patient. For more information, see “Working with Surfaces” on page 19-73.

2 Check the box for the surface to display.

3 Optionally, set display options for the surface.

4 Click **OK**.



Select for Display	Specifies the photos or surfaces to display.
Opacity	Sets the level of opacity for a photo or surface.
Show Mesh	Uses a mesh representation based on the patient's photo or surface instead of the actual photo or surface.
Color	Sets the color for a surface or for the mesh representation of a photo. For photos, the color sample only appears if the **Mesh** box is checked.
Deselect All	Unchecks the boxes for all the available photos and surfaces.

To view visual implant extensions:

1 Check the **Visual Implant Extensions** box.

To view prosthetic teeth:

1 Select **Crowns** to display only the crowns.

Or,

Select **Whole** to display the prosthetic teeth in their entirety (including roots).

Or,

Check **None** to hide the prosthetic teeth.

For information on adding prosthetic teeth, see “Using Prosthetic Teeth” on page 27-25.

To get a better view of an implant

1 Click **Zoom In on Implant**.

To return to the previous magnification:

1 Click **Zoom Out**.

To center the selected implant in the right pane without zooming in:

1 Click **Center Implant**.

Using X-ray Views

When you add an implant, it initially appears on the patient's x-ray image so that you can position it.

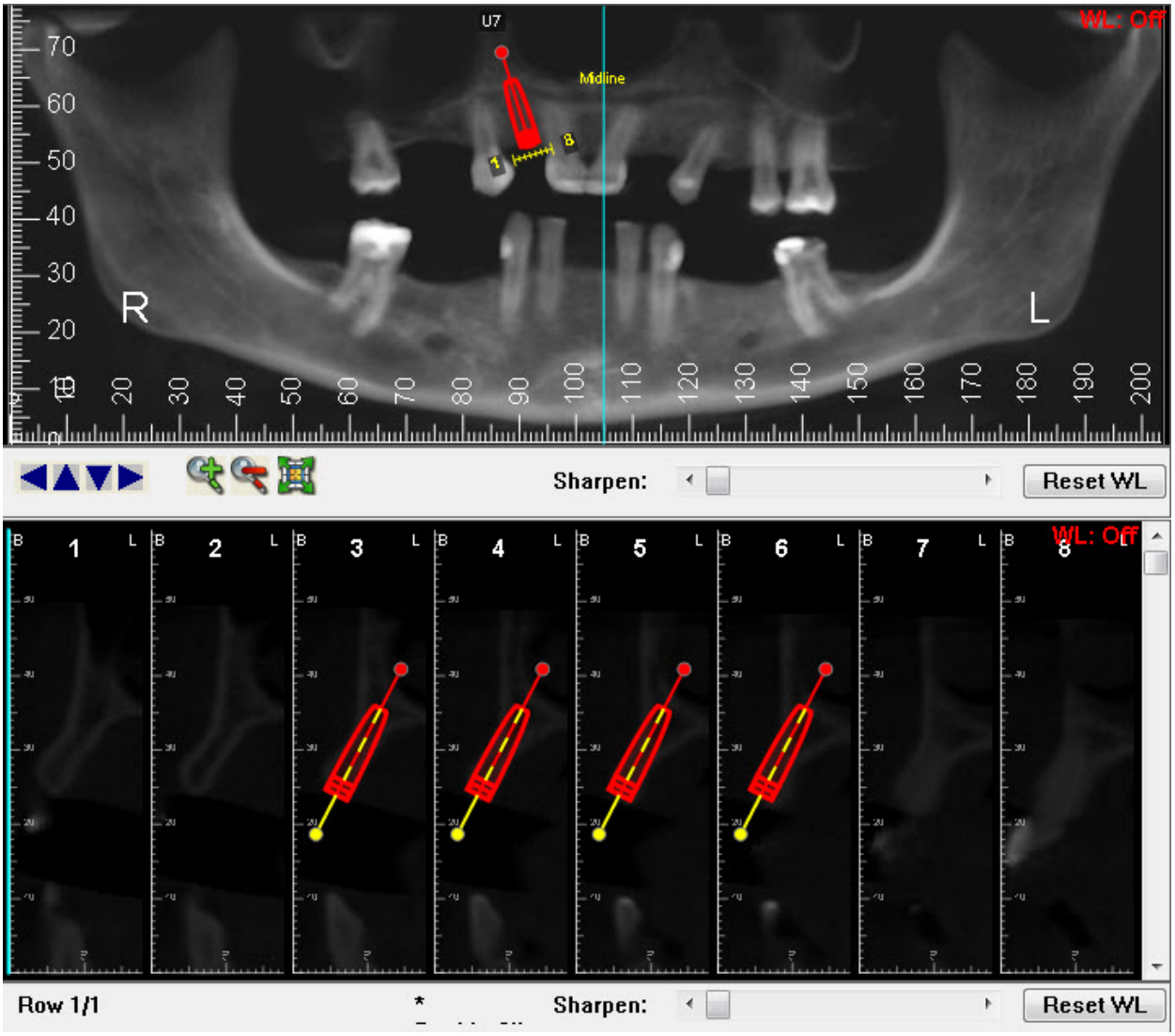
To select the x-ray view to use:

1 Click .

2 Select the view to use.

3 If you selected a view with cross sections, specify options for cross-section images in the Cross Sections group box.

The following figure shows an implant after it was added but before it was properly positioned.



Using Slice Views

Once you have placed the implant initially (see “Adding Implants and TADs” on page 27-16), you can use different slices of the volume to verify and correct its placement.

To change to one of the slice views:

1 Click to use a side-by-side layout containing axial and sagittal slices.

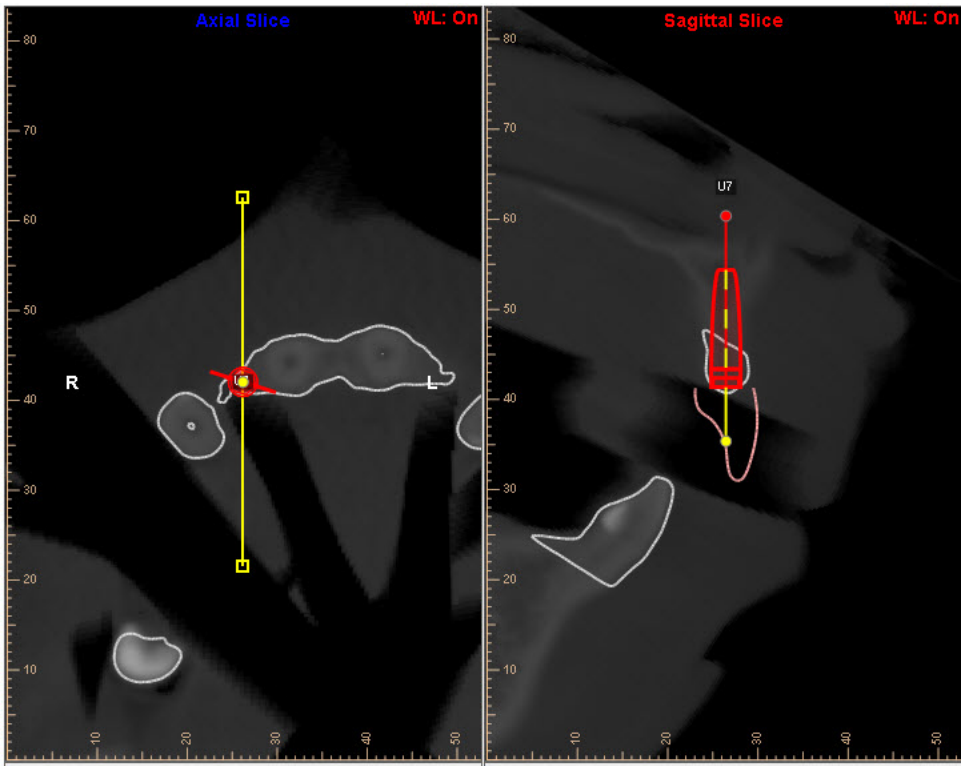
Or,

Click to use the 2x2 layout, which shows the sagittal slice, the coronal slice, the axial slice, and the 3D volume or photograph.

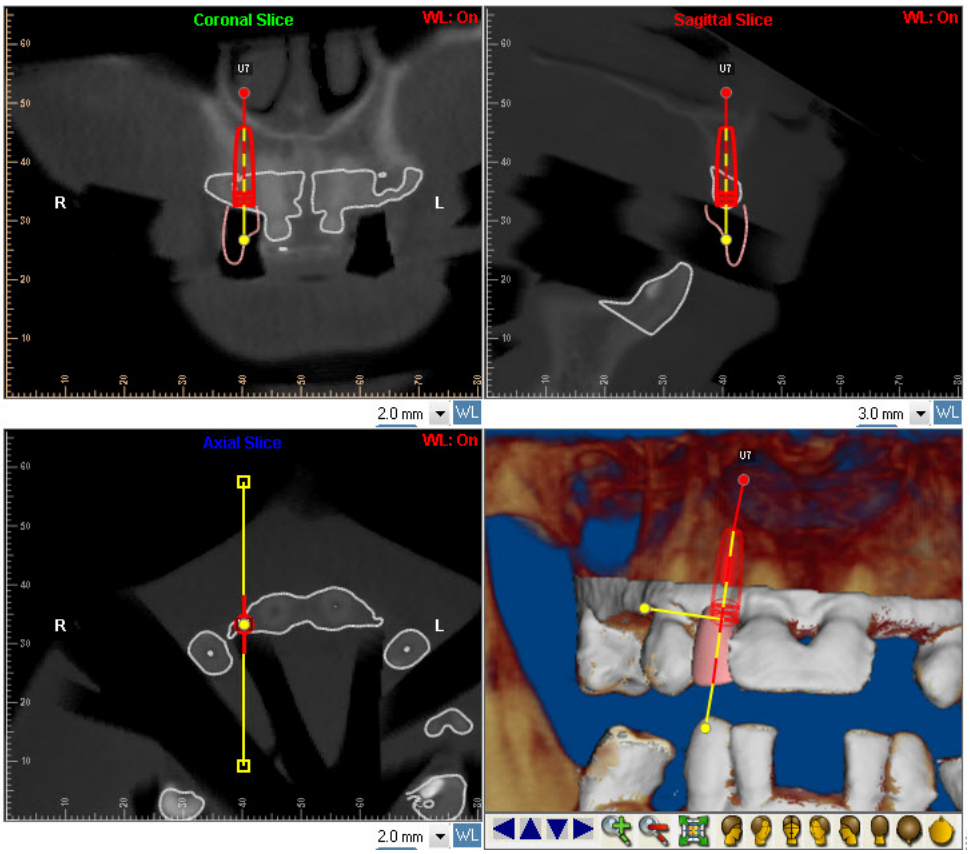
2 Set any options for the slice view.

The slice you selected appears in the window. For more information, see “Changing the Slice Angle and Thickness” on page 19-40 and “Changing the Slice Locations” on page 19-41.

In the side-by-side layout, the axial view is fixed to the axial axis of the current implant, and the sagittal view is fixed to the center of the implant's long axis, as illustrated below. On the axial slice view, a yellow line specifies the sagittal cut viewed in the right pane.



In the 2x2 layout, the axial view is fixed to the axial axis of the current implant, and the coronal and the sagittal views are fixed to the center of the implant's long axis, as illustrated below. On the axial slice view, a yellow line specifies the cut viewed in the sagittal slice pane. The cut viewed in the coronal slice pane is perpendicular to the yellow line.



To change the location of the sagittal cut in either the side-by-side or 2x2 layout:

1 In the axial view, click and drag one of the handles on the ends of yellow line.

Using Volume Views

Once you have placed the implant initially (see “Adding Implants and TADs” on page 27-16), you can use different views of the volume to verify and correct its placement.

To change to one of the volume views:

1 Click to use the volume layout.

Or,

Click to use a side-by-side layout containing axial and sagittal volume views.

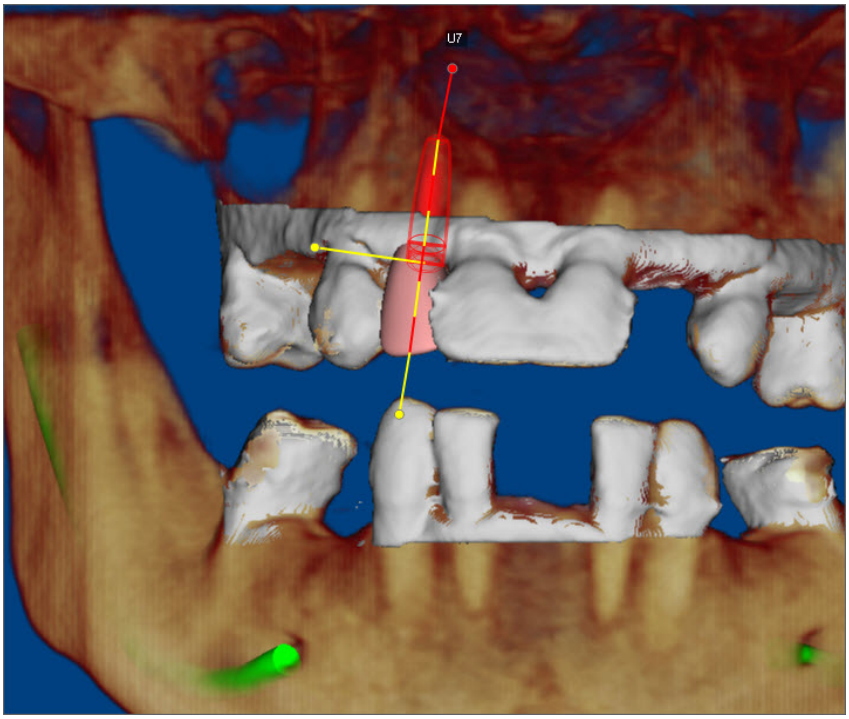
Or,

Click to use the 4 volume layout.

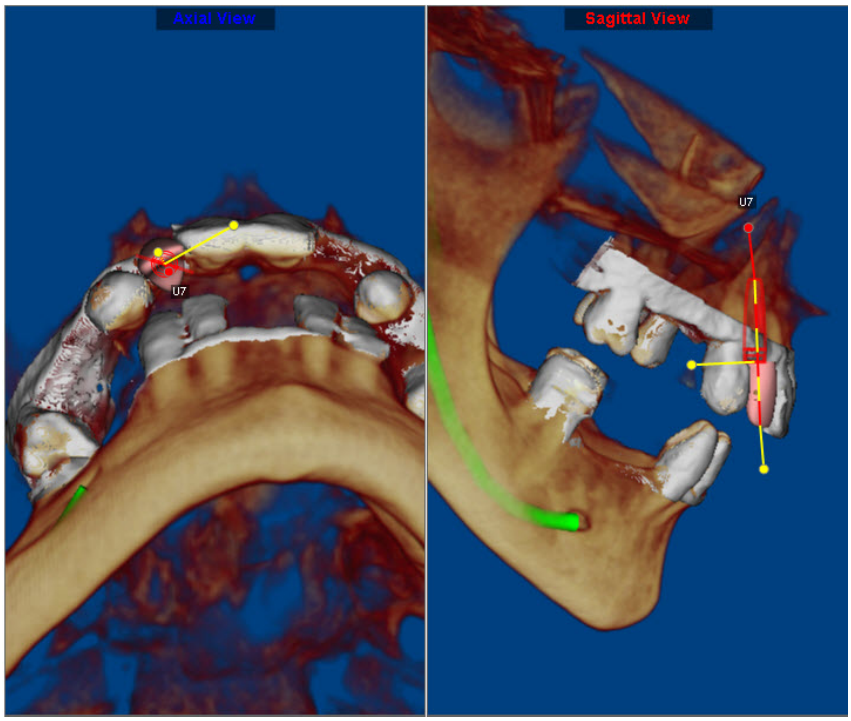
2 Set any options for the volume view.

For more information, see “Configuring the View” on page 27-7.

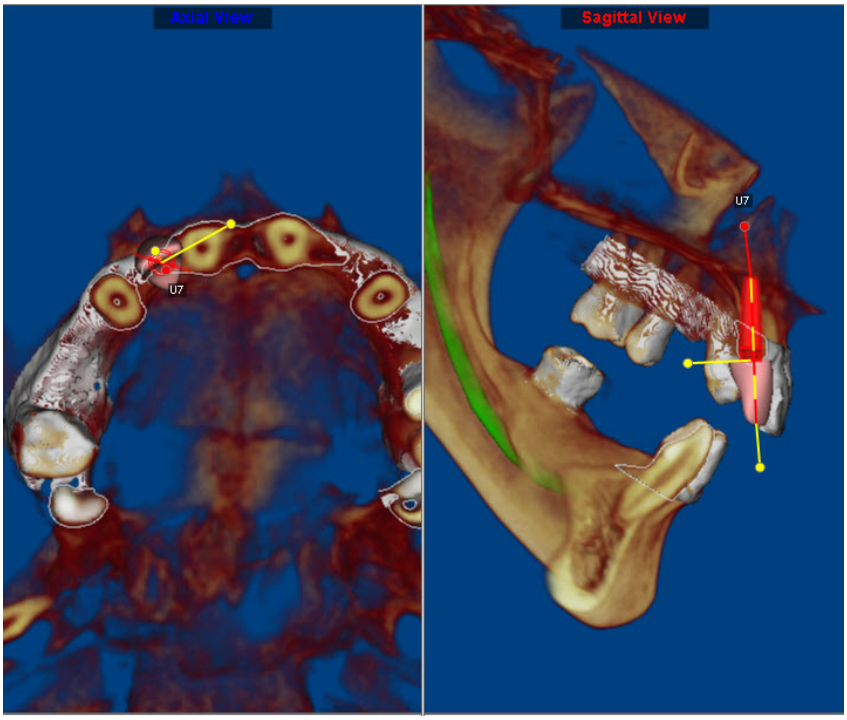
The figure below illustrates the volume layout.



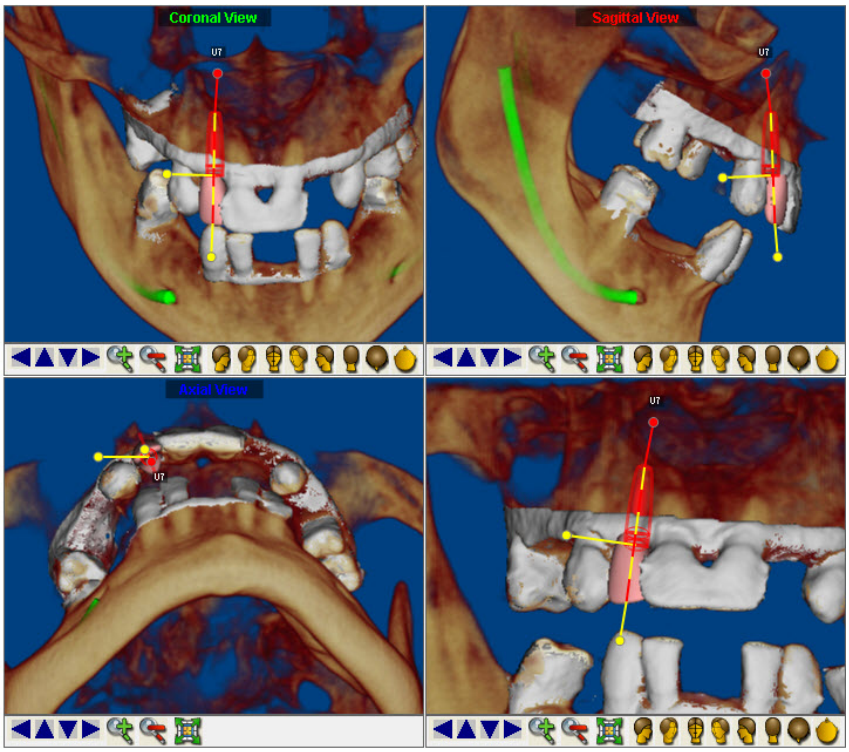
In the side-by-side layout, the view on the left is fixed to the axial axis of the current implant, as shown below.



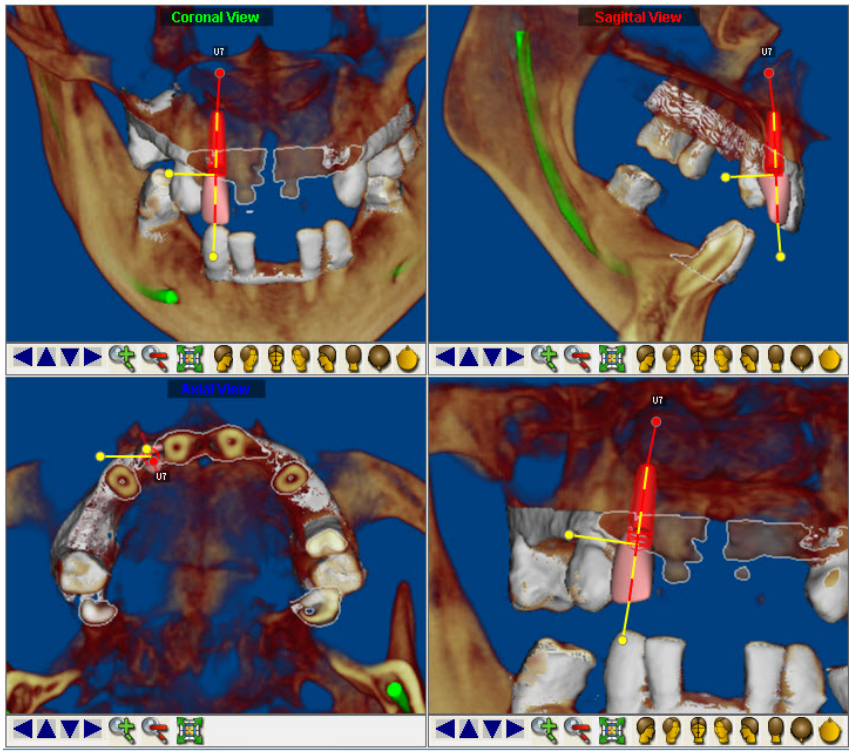
If you check the **Automatic Clipping Around Implant** box in the side-by-side layout, the clipping plane is located at the abutment end of the implant in the axial view and at the center of the implant's long axis on the sagittal view (the volume from the implant toward you is clipped out), as shown below. For more information, see “Clipping Around the Implant” on page 27-20.



In the 4 volume layout, the axial view in the lower left is fixed to the axial axis of the current implant, as shown below. In this view, you can rotate the volume freely in all three of the non-axial views. However, when you click **Zoom In on Implant**, in addition to zooming in on the implant, the upper left view reverts to the Coronal View and the upper right view reverts to the Sagittal View.



If you check the **Automatic Clipping Around Implant** box in the 4 volume layout, the clipping plane is located at the abutment end of the implant in the axial view and at the center of the implant's long axis on the other views (the volume from the implant toward you is clipped out), as shown below. For more information, see “Clipping Around the Implant” on page 27-20.



Adding Implants and TADs

3D Implant Simulation helps you plan implant placement by representing implants and TADs on a patient's 3D volume.

Note: *This feature is meant to assist you in treatment planning. Do not use results of this process as the primary source of patient evaluation. The results should be verified by other independent methods.*

To add an implant:

1 Optionally, click on the 3D Implant Simulation window, and select the x-ray view to use initially when positioning implants and/or TADs.

If you don't select an x-ray view, the implants and/or TADs will initially appear on a default view. The default view that appears depends on the x-rays that you have generated for this patient. For more information on selecting an x-ray view, see “Using X-ray Views” on page 27-9.

2 Click **Select Implants**.

The Add Implants dialog box opens where you can add implants and TADs.

3 Optionally, check the box for each position in which to add an implant.

You can reorient and zoom in on the patient's image, if necessary, to confirm the implant location.

4 Optionally, select the number of TADs to add for the patient's upper arch from the top drop-down list

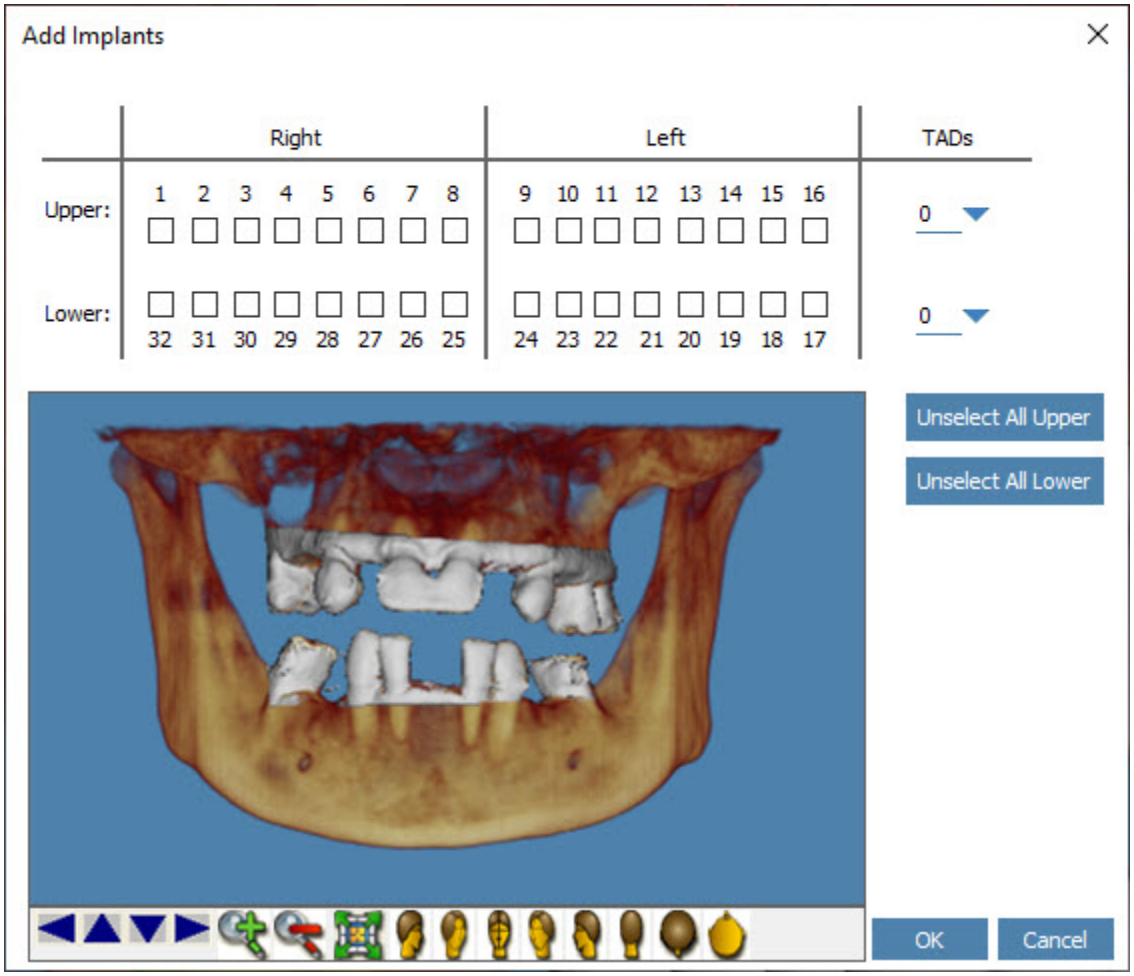
Or,

Optionally, select the number of TADs to add for the patient's lower arch from the bottom drop-down list.

5 Click **OK**.

The selected implants and TADs appears on the patient's image. The implants used are from the default set selected in the preferences for the 3D Implant Simulation feature. Information about the implants or TADs appears in the list of implants. If you have specified that prosthetic teeth be added when you add implants, prosthetic teeth are added at the same time. Prosthetic teeth are used only as a guide when positioning the implant. For more information, see “Setting Preferences” on page 27-32.

At this point, you can position the implant as described in “Positioning the Implant” on page 27-18. You can also choose a different view to display as described in “Using X-ray Views” on page 27-9, “Using Slice Views” on page 27-10, and “Using Volume Views” on page 27-12.



Upper	Positions in the patient's upper arch in which to add implants.
Lower	Positions in the patient's lower arch in which to add implants.
TADs	Number of TADs to add for the patient's upper and lower arches.
Unselect All Upper	Unchecks all the boxes for the patient's upper arch.
Unselect All Lower	Unchecks all the boxes for the patient's lower arch.

For information on the arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Positioning the Implant

The 3D Implant Simulation module offers several features to help you position the implant correctly. To verify correct implant placement in three dimensions, you can:

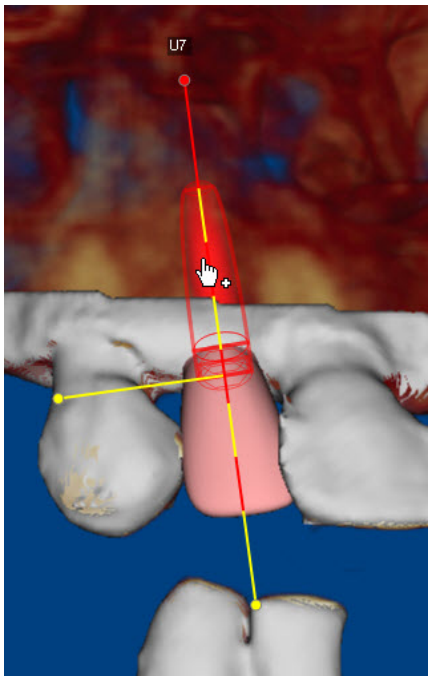
- move and rotate the implant
- add a safety zone around implants
- use automatic clipping around the implant
- enable and disable clipping of nerves

Moving and Rotating Implants

To move the implant:

1 Click and drag the implant.

If the implant has a prosthetic tooth linked to it, a plus sign appears when you place your cursor over the implant indicating that the implant and prosthetic tooth will move together. The plus sign appears even if the prosthetic tooth is not visible (for example, on panoramic images). For more information, see “Using Prosthetic Teeth” on page 27-25.



To rotate the implant:

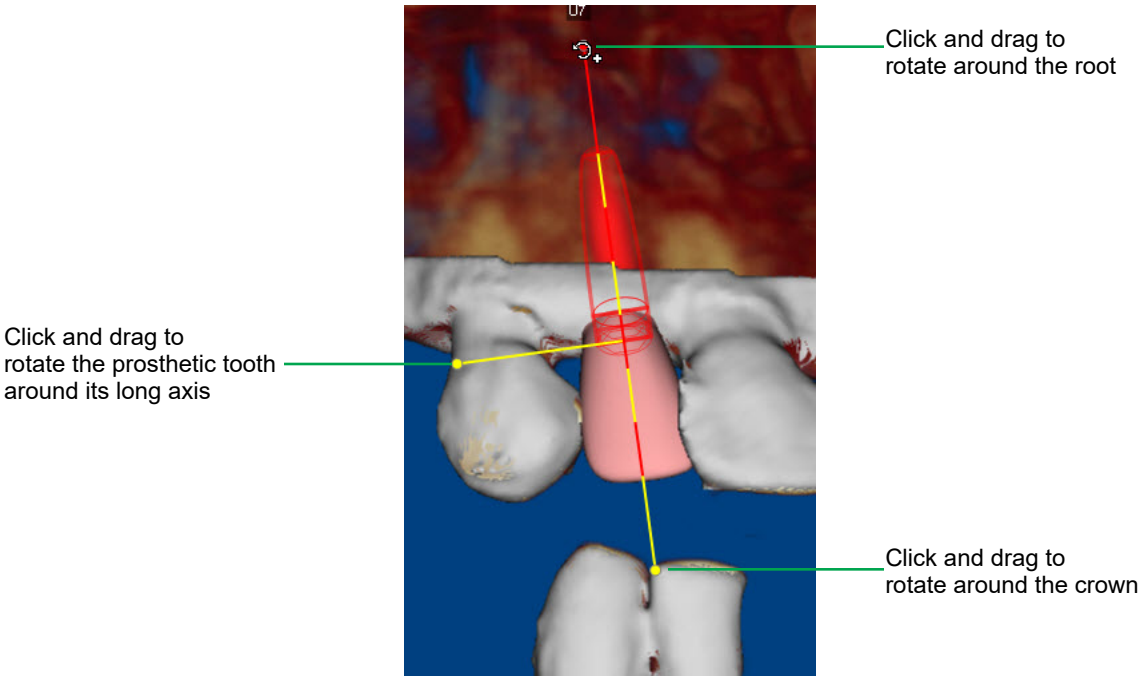
1 Click and drag the implant's red rotation handle to rotate the implant around the root.

Or,

Click and drag the blue rotation handle near the crown to rotate the implant around the crown.

Or,

Click and drag the blue rotation handle to the left of the implant to rotate the prosthetic tooth around its long axis.



To rotate the implant to be parallel or perpendicular to the viewing plane:

1 Right-click the implant.

2 Select **Make Implant Parallel to Viewing Plane** from the context menu

Or,

Select **Make Implant Perpendicular to Viewing Plane** from the context menu.

Note: *The context menu is not available if the implant is currently perpendicular to the viewing plane.*

To undo the last move:

1 Click **Undo Last Implant Move**.

To lock an implant to avoid moving it inadvertently:

1 Check the box in the Locked column for that implant in the list of implants.

Adding a Safety Zone

You can add a visual safety zone around implants to help you avoid placing them too close to each other.

To add a safety zone:

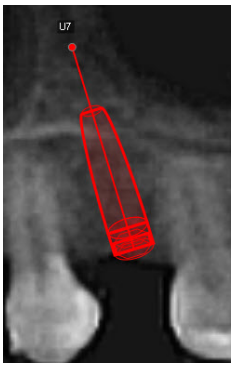
1 Select the size (in millimeters) from the **Safety Zone** drop-down list.

Or,

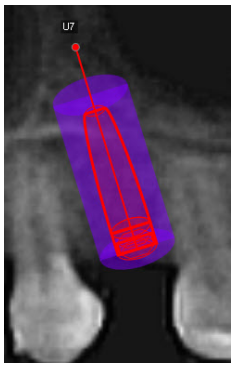
Select **None** if you don't want a safety zone.

The following example illustrates an implant without and with a safety zone on the x-ray and volume views.

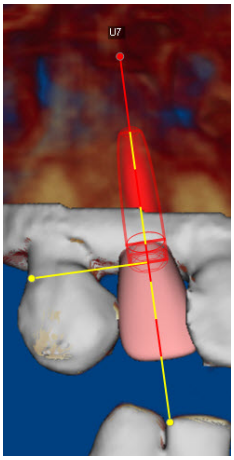
Implant on x-ray without safety zone



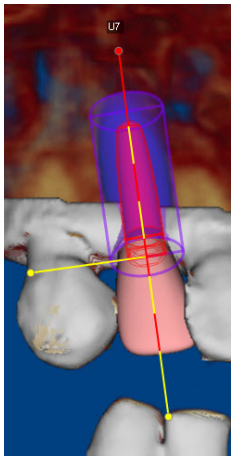
Implant on x-ray with safety zone



Implant on volume without safety zone



Implant on volume with safety zone



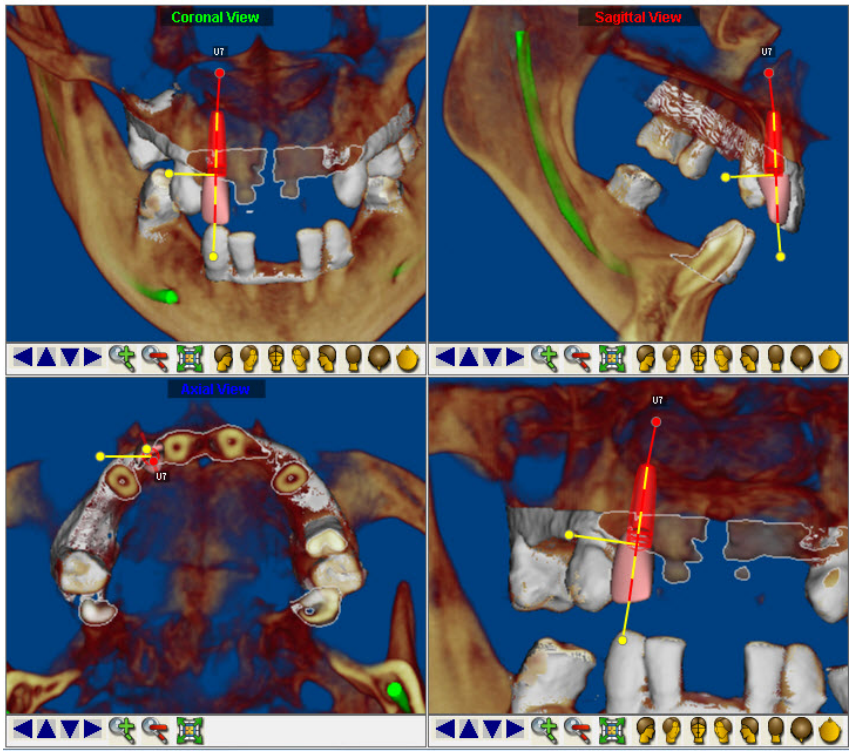
Clipping Around the Implant

To use clipping around the implant:

1 Check the **Automatic Clipping Around Implant** box.

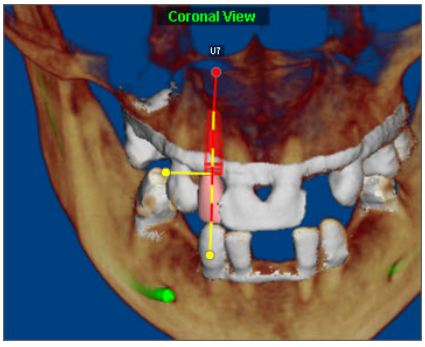
The volume is clipped around the implant so that you can see cut-away views of the implant within the volume. For more information on volume clipping, see “Using Clipping Slices and Boxes” on page 28-1.

The following figure illustrates clipping around the implant in the 4 volume layout. Note that in three of the four views, the volume is clipped lengthwise along the implant. In the lower left view, however, the volume is clipped across the implant at one end of it.

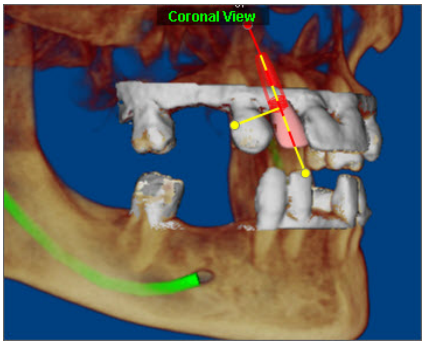


If you rotate the view, the volume is automatically clipped to show a cut-away of the implant in the new orientation. The following example illustrates clipped around the implant before and after rotating the volume in the upper left of the 4 volume layout.

Before rotating the volume



After rotating the volume



At this point, you can move or rotate the implant as necessary to fine-tune its placement.

Clipping Nerves

If you have built a nerve canals x-ray view for this patient and the implant is near the nerves, you may want to enable and disable clipping of the nerves while positioning the implant. By default, nerve clipping is enabled when you enable clipping around the implant.

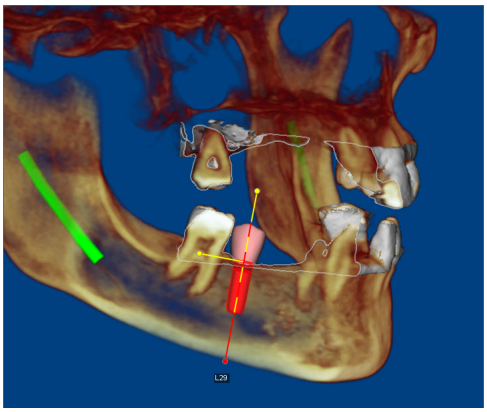
To disable clipping of the nerves:

1 Check the **Automatic Clipping Around Implant** box to enable clipping around the implant.

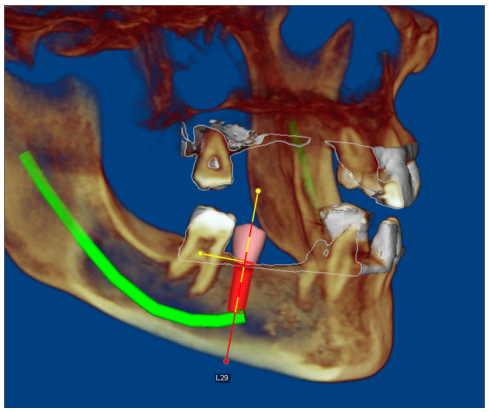
2 Check the **Do Not Clip Nerves** box to disable nerve clipping.

The following example illustrates nerve clipping enabled and disabled.

Nerve Clipping Enabled



Nerve Clipping Disabled



Grouping Implants

Once you have added and placed several implants, you can group them to make them parallel to each other. Once you have grouped implants, you can still move them independently from each other, but you cannot rotate them.

You can create a group for each of the patient's arches. However, you don't have to include all the implants in the patient's arch in the group for that arch. You pick individual implants to include in a group. For example, if a patient has three implants in the upper arch, you can choose to group only two of them. Then, you could still rotate remaining implant.

To group implants:

1 Click **Options...**.

2 Select **Set Implants Orientation Grouping**.

3 Select **Upper Arch Implants Grouping...** to select implants from the upper arch to group.

Or,

Select **Lower Arch Implants Grouping...** to select implants from the lower arch to group.

The Implants Orientation Grouping dialog box opens.

4 Check the box for each implant to include in the group.

Or,

Click **Select All to include** all listed implants in the group.

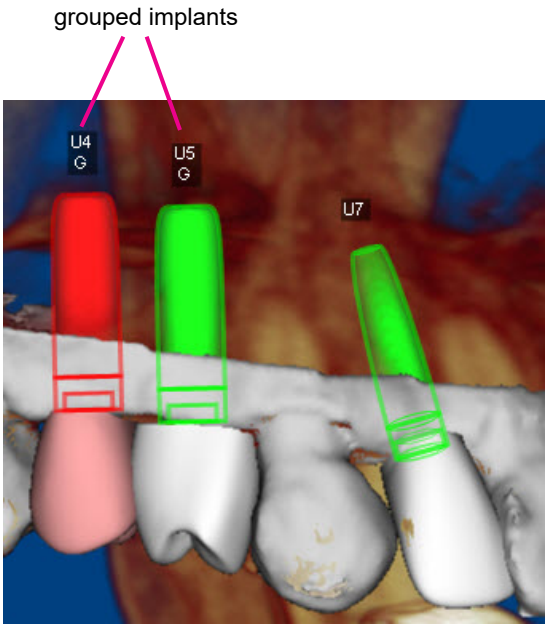
The selected implants appear in the lower part of the dialog box. You can check the **Show Volume** and **Show Prosthetic Teeth** boxes to show these items along with the implants. In addition, you can click and drag the image to rotate it.

5 Select the implant to designate as the “group master” from the **Set Group Master Implant** drop-down list.

All other implants in the group rotate, if necessary, to make them parallel to the group master implant.

6 Click **OK**.

On the 3D Implant Simulation window, a G identifies grouped implants.



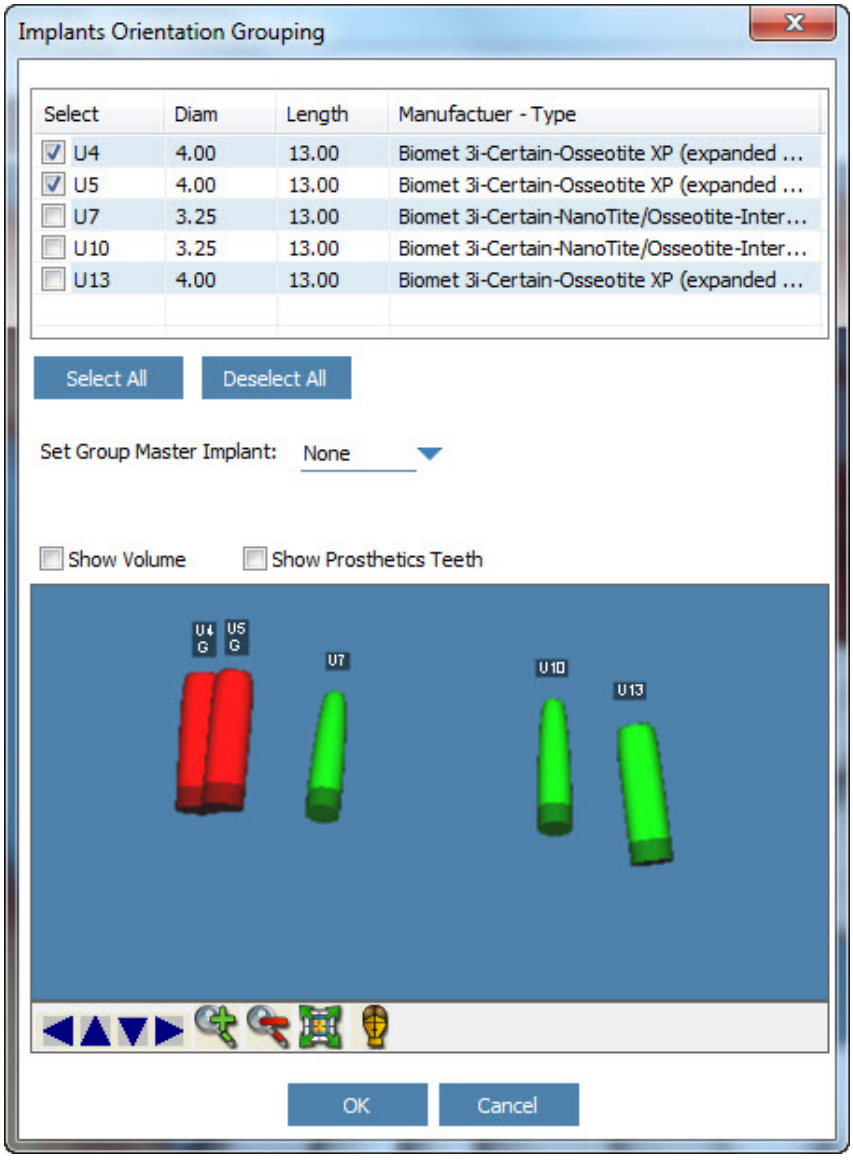
To ungroup implants:

1 On the Implants Orientation Grouping dialog box, uncheck the box for each implant that you want to remove from the group.

Or,

Click **Deselect All** to completely disband the group.

2 Click **OK**.



Implant List	Diameter, length, manufacturer, and type of each implant added for this patient. In this list, a red line separates the upper and lower arches. Check the box in the Select column to include the implant in the group.
Select All	Checks the boxes for all listed implants.
Deselect All	Unchecks the boxes for all listed implants.
Show Volume	Shows the volume in the lower part of the dialog box.
Show Prosthetic Teeth	Shows the prosthetic teeth in the lower part of the dialog box.

For information on the arrow buttons, magnification controls, and frontal view button that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Using Prosthetic Teeth

If you have specified that prosthetic teeth be added when you add implants, a prosthetic tooth is added at the same time (see “Setting Preferences” on page 27-32). Otherwise, you can add the prosthetic teeth at any time.

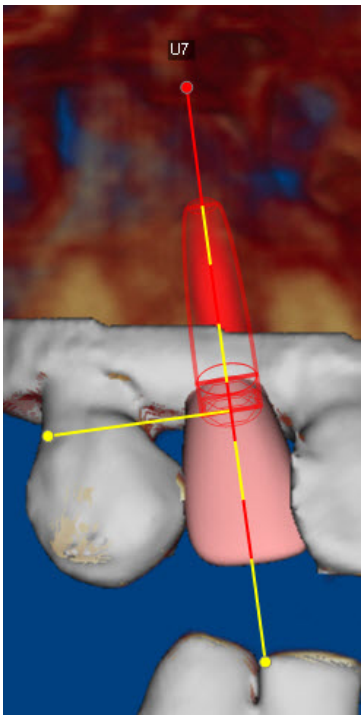
Due to the non-uniform warping nature of panoramic images, prosthetic teeth do not appear on panoramic images. In addition, prosthetic teeth cannot be added to TADs.

Note: *Prosthetic teeth are used only as a guide when positioning the implant.*

To add a prosthetic tooth to an implant:

1 Right-click the implant, and select **Prosthetic Teeth Options** from the context menu.

2 Select **Add Prosthetic Tooth**.



The prosthetic tooth is added to the implant. The prosthetic tooth's shape depends on the implant's tooth number. For example, if the implant's tooth number is U8, the prosthetic tooth is in the shape of a right incisor. The default color for prosthetic teeth is set on the 3D Implant Preferences dialog box. However, if a color is set for the implant, the tooth color matches the implant.

When you add a prosthetic tooth, it is linked to its implant so that the two move as a unit. You can unlink the tooth and implant (see below) to move the implant independently. Re-linking moves the implant back to the prosthetic tooth. For more information on positioning implants and prosthetic teeth, see “Positioning the Implant” on page 27-18.

To set display options for prosthetic teeth:

1 Next to **Prosthetic Teeth:**, select **Crowns** to display the prosthetic teeth crowns only.

Or,

Select **Whole** to display the prosthetic teeth as complete teeth (roots and crowns).

Or,

Select **None** to hide the prosthetic teeth.

To delete a prosthetic tooth:

1 Right-click the prosthetic tooth, and select **Prosthetic Teeth Options** from the context menu.

2 Select **Delete Prosthetic Tooth** from the context menu.

3 Click **Yes** to confirm the deletion.

By default, when a prosthetic tooth is added to the implant, it is physically linked to the implant so that the implant and the tooth move together. However, you can unlink the prosthetic tooth from the implant so that the prosthetic tooth becomes stationary and you can move the implant independently from it.

To unlinked prosthetic teeth and implants:

1 Right-click the implant, and select **Prosthetic Teeth Options** from the context menu.

2 Select **Unlink Prosthetic Tooth from its Associated Implant** to unlink the selected prosthetic tooth and implant.

Or,

Select **Unlink ALL Prosthetic Teeth from their Associated Implants** to unlink all the prosthetic teeth and implants.

To re-link a prosthetic tooth to the implant:

1 Right-click the implant, and select **Prosthetic Teeth Options** from the context menu.

2 Select **Link Prosthetic Tooth to its Associated Implant**.

To change the size of a prosthetic tooth or all prosthetic teeth:

1 Right-click the implant, and select **Prosthetic Teeth Options** from the context menu.

2 Select **Change the Prosthetic Tooth Diameter/Length** from the context menu.

The Prosthetic Teeth Sizing dialog box opens.

3 Select an option from the **Increase/Decrease Diameter** drop-down list in the Sizing Selected Prosthetic Tooth group box to change the diameter of the selected tooth.

Or,

Select an option from the **Increase/Decrease Diameter** drop-down list in the Sizing ALL Prosthetic Teeth group box to change the diameter of all prosthetic teeth.

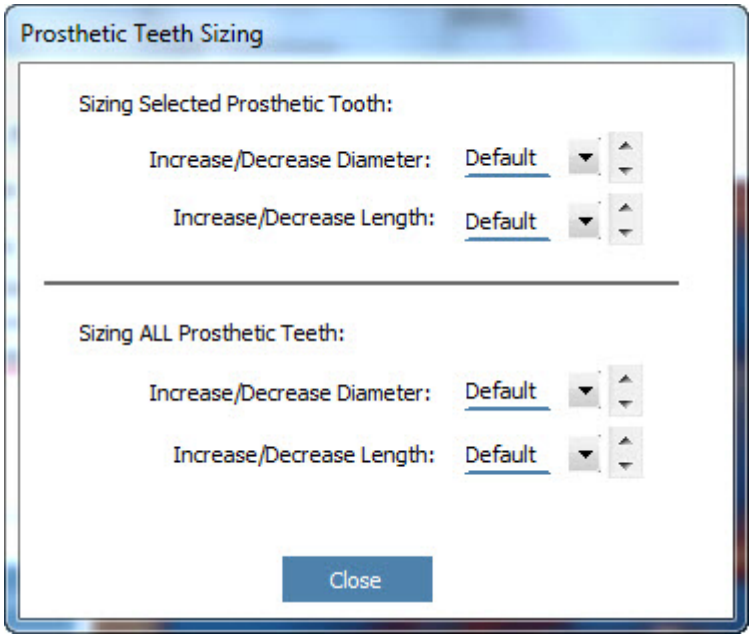
Note: *Changing the size of all prosthetic teeth not only resizes the ones currently in use, It also changes the size of all prosthetic teeth you add in the future.*

4 Select an option from the **Increase/Decrease Length** drop-down list in the Sizing Selected Prosthetic Tooth group box to change the length of the selected tooth.

Or,

Select an option from the **Increase/Decrease Length** drop-down list in the Sizing ALL Prosthetic Teeth group box to change the length of all prosthetic teeth.

5 Click **Close**.



Sizing Selected Prosthetic Tooth	Resize the selected tooth. **Increase/Decrease Diameter:** Diameter of the selected tooth. **Increase/Decrease Length**: Length of the selected tooth.
Sizing ALL Prosthetic Tooth	Resize all of the prosthetic teeth currently added for this patient and all future prosthetic teeth. **Increase/Decrease Diameter:** Diameter of all prosthetic teeth. **Increase/Decrease Length:** Length of all prosthetic teeth.

To save the prosthetic teeth as a surface in your Dolphin database:

1 Click **Options...**.

2 Select **Save Prosthetic Teeth to Database...**.

3 On the Save Prosthetic Teeth dialog box, select the surface slot in which to dave the prosthetic teeth. Then, click **Save**.

Once you have saved the prosthetic teeth in a surface slot, you can display them in the main Dolphin 3D window. For more information, see “Viewing a Photo or Surface” on page 19-29.

Modifying an Implant

You can modify the type, length, or diameter of a single implant or of all implants you have added to the patient's volume.

To modify an implant:

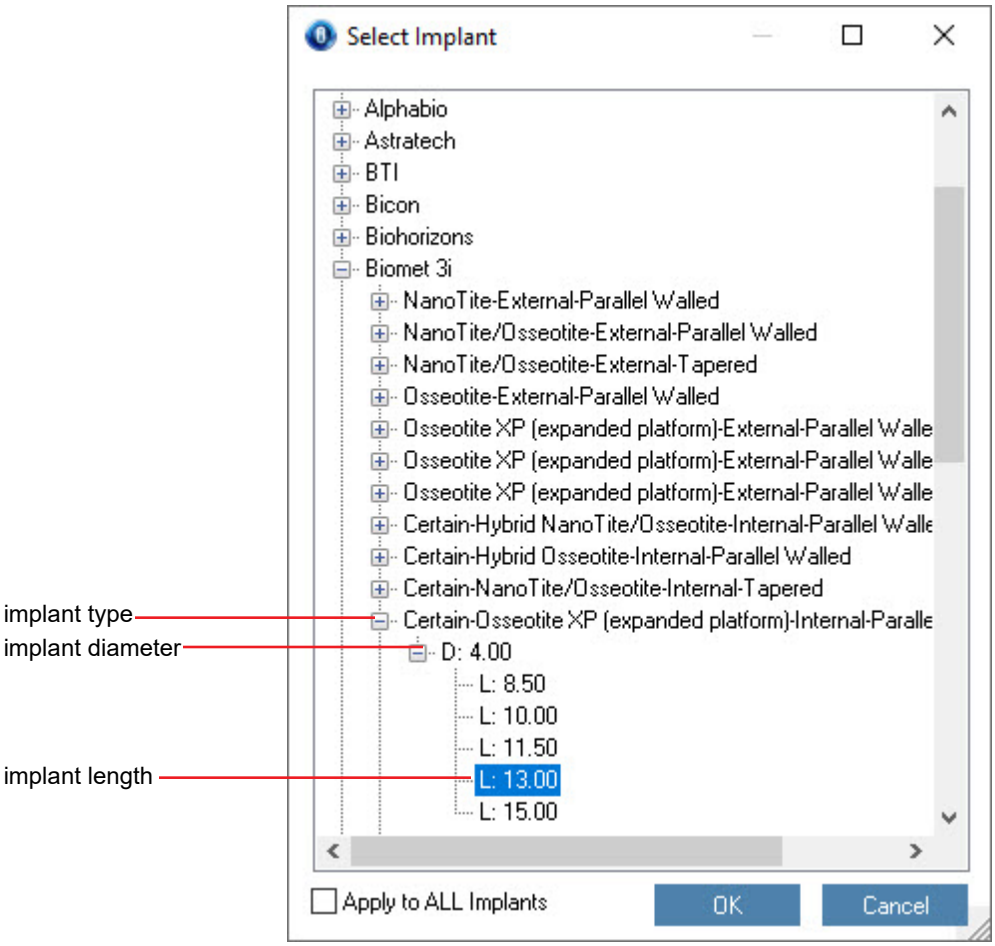
1 In the **Implants** list, double-click one of the cells for the implant to change.

The Select Implant dialog box opens.

2 Select the type, diameter, and length for the implant.

3 Optionally, check the **Apply to ALL Implants** box to set all implants you have added to the volume to the selected type, diameter, and length.

4 Click **OK**.



Alternatively, a context menu provides shortcuts for changing an implant's length and diameter.

To change an implant's length:

1 Right-click the implant, and select **Change Implant Length** from the context menu.

1 Select the new length from the sub-menu.

To change an implant's diameter:

1 Right-click the implant, and select **Change Implant Diameter** from the context menu.

2 Select the new diameter from the sub-menu.

Deleting an Implant

To delete an implant:

1 In the Implants table, click the implant to delete.

2 Click **Delete Implant**.

3 Click **Yes** on the confirmation dialog box that appears to delete the implant.

Alternatively, a context menu provides an option for deleting an implant.

To use the context menu to delete an implant:

1 Right-click the implant, and select **Delete Implant** from the context menu.

2 Click **Yes** on the confirmation dialog box that appears to delete the implant.

Exporting Implants

You can export the implants as STL files. You can also export the end-points of the implants to text files.

To export the implants:

1 On the 3D Implant Simulation window, click **Options…**.

2 Select **Export Implants to STL Files**.

3 Check the appropriate boxes to indicate what to export.

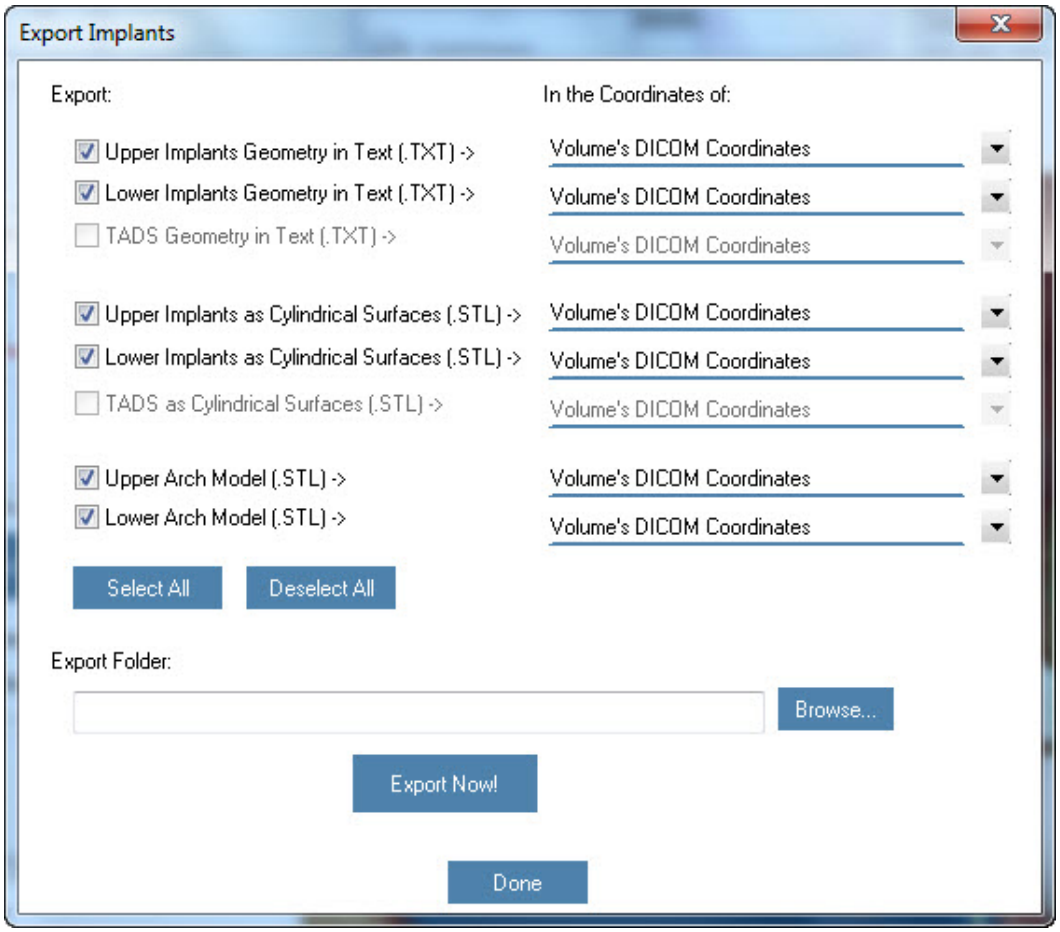
4 For each selected export option, select the type of coordinates to use from the associated drop-down list.

5 Enter the folder in which to save the exported files.

Or,

Click **Browse...** and browse to the folder.

6 Click **Export Now!**



Export	Items to export. You can export implant geometry (end location coordinates) as text files, implants as cylindrical surfaces in STL files, and the upper and lower arch models in STL files. **Select All:** Checks all the boxes. **Deselect All:** Unchecks all the boxes.
In the Coordinates of	Coordinates to use. The options for exported coordinates are: **Export to the volume's DICOM coordinates:** The DICOM coordinates are specified in the imported DICOM data set. **Export to the user defined local coordinates:** The local coordinates are the current orientation that you have set. **Upper arch model native coordinates:** If the upper arch model was exported with this option, then the geometry of the surface will be exactly as it was imported, and other objects exported with this option will be placed with geometry relative to the exported upper arch surface. **Lower arch model native coordinates:** If the lower arch model was exported with this option, then the geometry of the surface will be exactly as it was imported, and other objects exported with this option will be placed with geometry relative to the exported lower arch surface.

Export Folder	Folder in which to save the exported files in this field. **Browse:** Browse to the folder.
Export Now!	Exports the files.

Managing Implant Planning Workups

For each patient and timepoint, Dolphin 3D offers five slots for implant planning workups.

Note: *Save workups only include information about the implants and TADs selected and placed for the patient. They do not, for example, include the study model arch surfaces. So if you created and saved a workup using a set of arch model surfaces and then imported new arch model surfaces for the patient, the next time you loaded the saved implant planning workup, the patient's new arch model surfaces would appear.*

When exiting the Dolphin 3D Implants module, your current implant simulation is automatically saved. When you re-enter the Dolphin 3D Implants module for the same patient, the last implant simulation is automatically restored. To keep using the same implant simulation for a patient, you don't need to save it to a slot each time you exit or restore it each time you return.

Saving a Workup

To save the current workup:

1 Click **Save/Restore**.

2 Select **Save Implant Workup**.

3 Select the slot in which to save the workup.

If you are saving the workup into an unused slot, a dialog box opens so that you can enter a description of this workup. If the selected slot already contains a saved workup, a dialog box opens asking whether to overwrite it.

4 If you are saving the workup into an unused slot, make any changes to the default description. Then, click **OK**.

Or,

If you are saving the workup into a slot that already contains a saved workup, click **Yes** to overwrite the workup previously saved in the slot with the current workup.

Restoring a Saved Workup

To open a previously saved implant planning workup for this patient:

1 Click **Save/Restore**.

2 Select **Restore Implant Workup**.

3 Select the slot containing the workup to open.

Editing a Workup Description

To edit the description of a workup:

1 Click **Save/Restore**.

2 Select **Edit Implant Workup Description**.

3 Select the slot for which to edit the workup description.

4 Enter a new description for the workup. Then, click **OK**.

Removing a Workup

To remove a previously saved workup:

1 Click **Save/Restore**.

2 Select **Remove Implant Workup**.

3 Select the slot from which to remove the previously saved workup.

4 Click **Yes** to delete the workup.

Restarting With a Clean Workup

To discard your work and restart your implant planning process with a clean workup:

1 Click **Options...**.

2 Select **Restart with a clean workup...**.

3 Click **Yes** on the confirmation dialog box that appears.

Setting Preferences

On the 3D Implant Preferences dialog box, you can set the following:

- the colors used on the 3D Implant Simulation window to represent implants, safety zones, nerves, prosthetic teeth, and so on
- the tooth numbering system to use
- whether to display prosthetic teeth
- the specifications of the default implant types in your implant library

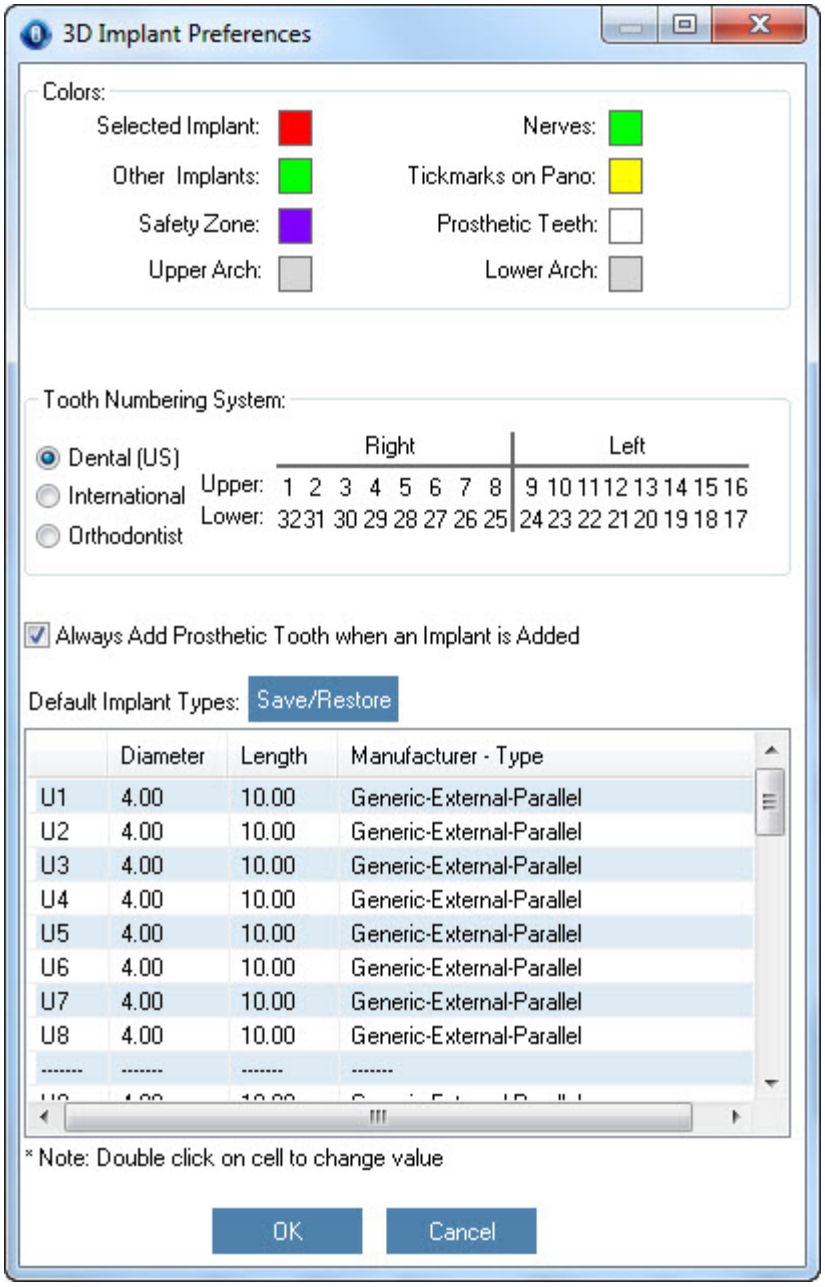
To set preferences for 3D implants:

1 On the 3D Implant Simulation window, click **Options…**. Then, select **General Preferences…**.

The 3D Implant Preferences window opens.

2 Optionally, change any settings on this dialog box.

3 Click **OK**.



Colors	Colors for the selected implant, other implants, safety zones, nerves, tick marks on panoramic views, prosthetic teeth, and the upper and lower arches.
Tooth Numbering System	Tooth numbering system to use.
Always add Prosthetic Teeth when an Implant is Added	Automatically adds a prosthetic tooth whenever you add an implant. Prosthetic teeth are used only as a guide when positioning the implant.
Default Implant Types	Displays the diameter, length, manufacturer, and type of each default implant type in your implant library and enables you to change these settings.

Save/Restore:	Opens a menu with the following options. **Save Default Set:** Save the listed implants as a set. You can save up to five implant sets. **Restore Default Set:** Restore a previously saved set of implants. **Edit Default Set Description:** Change the description of a previously saved set of implants. **Remove Default Set:** Delete a previously saved set of implants.

Modifying Default Implant Types

To modify a default implant type:

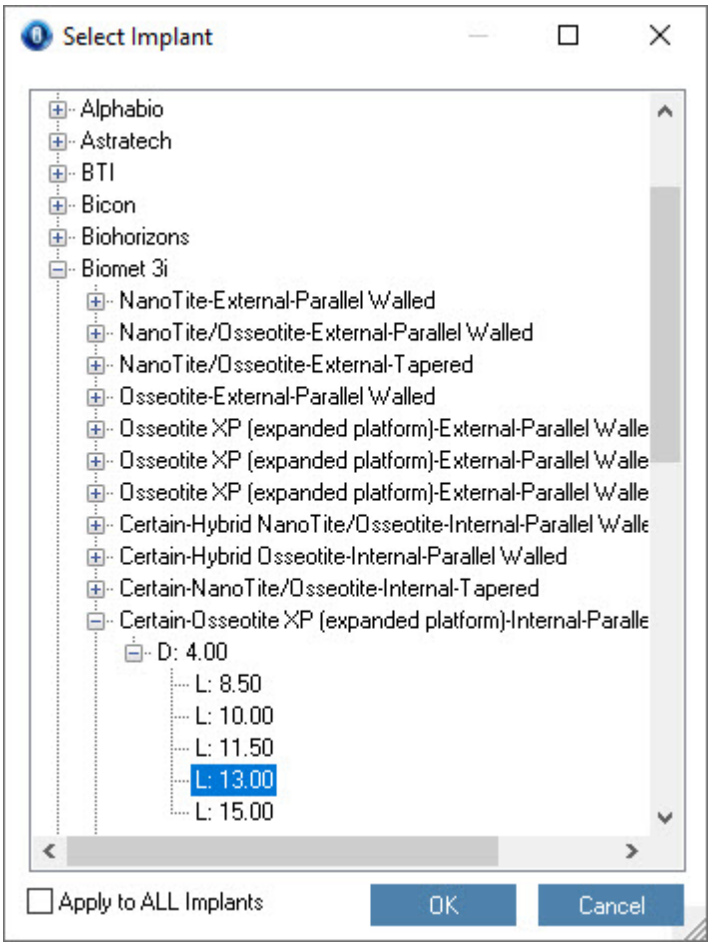
1 In the implants list, double-click one of the cells for the implant type to change.

The Select Implant dialog box opens.

2 Select the type, diameter, and length for the implant type.

3 Optionally, check the **Apply to ALL Implants** box to apply the new settings to all implant types.

4 Click **OK**.



Saving and Loading Implant Sets

If you have modified any implants in the implants list, you can save these modifications as an implant set for use later.

To save an implant set:

1 On the 3D Implants Preferences dialog box, click **Save/Restore**.

2 Click **Save Default Set**.

3 Select the slot into which to save this set of implants.

4 Enter a description for the implant set. Then, click **OK**.

The implants listed in the **Default Implant Types** list are saved as a set. You can save up to five implant sets.

To load a previously saved implant set:

1 On the 3D Implants Preferences dialog box, click **Save/Restore**.

2 Select **Restore Default Set**.

3 Select the slot containing the set of implants to load.

To change the description of a previously saved set of implants:

1 On the 3D Implants Preferences dialog box, click **Save/Restore**.

2 Select **Edit Default Set Description**.

3 Select the slot containing the implant set to rename.

4 Enter a new description for the implant set. Then, click **OK**.

To delete a previously saved implant set:

1 On the 3D Implants Preferences dialog box, click **Save/Restore**.

2 Select **Remove Default Set**.

3 Select the slot containing the set of implants to delete.

4 Click **Yes** in the confirmation dialog box that appears.

28 Volume Clipping and Sculpting

Dolphin 3D offers clipping slices so that you can create your own custom cross-section views of the 3D volume. A clipping box is like a 3-dimensional clipping slice. With a clipping box, you define a cube within the volume, and only the image data within the clipping box is displayed. You can use these features simultaneously to view a cross-section of the volume contained within the clipping box.

With the volume sculpting feature, you can sculpt out any arbitrarily shaped section of the scan, such as isolating the mandible. Once you have sculpted out a portion of interest, you can export it as a DICOM file that can be read by other 3D programs.

Using Clipping Slices and Boxes

Clipping slices and boxes enable you to view slices or cut-away views of the 3D volume. You can view slices along the three standard planes (the sagittal, coronal, and axial slices), or you can define your own views. The clipping slice cuts the 3D volume and displays a cross section. A clipping box is like a 3-dimensional clipping slice. With a clipping box, you define a cube within the volume, and only the image data within the clipping box is displayed. You can use these features simultaneously to view a cross-section of the volume contained within the clipping box.

Using a Clipping Slice

Using a clipping slice enables you to see a cross-section of the 3D volume and view interior image details (such as the patient's airway). Dolphin 3D provides several predefined settings to view various cross-sections of the image, or you can define a custom location for the clipping slice.

Dolphin 3D remembers the last location you set for a clipping slice. For instance, if you set the clipping slice to half-way through the 3D volume, the clipping slice is initially set at half-way through the volume relative to the current view the next time you use a clipping slice.

To use a clipping slice:

1 Check **Use Clipping Slice**.

2 Click to set the clipping slice at the mid-sagittal plane.

Or,

Click to set the clipping slice at the axial plane.

Or,

Click to set the clipping slice at the coronal plane.

Or,

Click to use a pie-shaped clipping slice that includes the patient's arch.

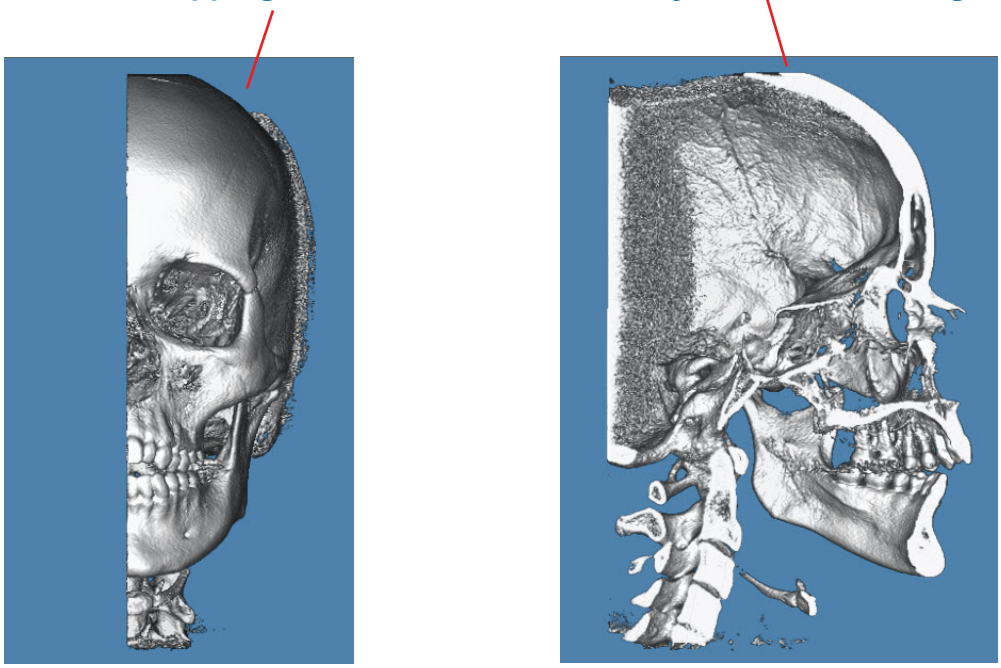
Or,

Click to orient the clipping slice in the direction of the viewer.

3 Move the slider to identify the location of the clipping slice.

When you rotate an image while using a clipping slice, the clipping slice remains fixed. For example, shown below.

The clipping slice remains fixed when you rotate the image



Using a Clipping Box

A clipping box is like a 3-dimensional clipping slice. With a clipping box, you define a cube within the volume, and only the image data within the clipping box is displayed. Using a clipping box, you can view interior structures from several angles. You can define a clipping box using the patient's soft tissue, hard tissue, or translucent view (if your computer supports the advanced 3D rendering modes). Once you have a clipping box defined using one of these views, it applies to the other views.

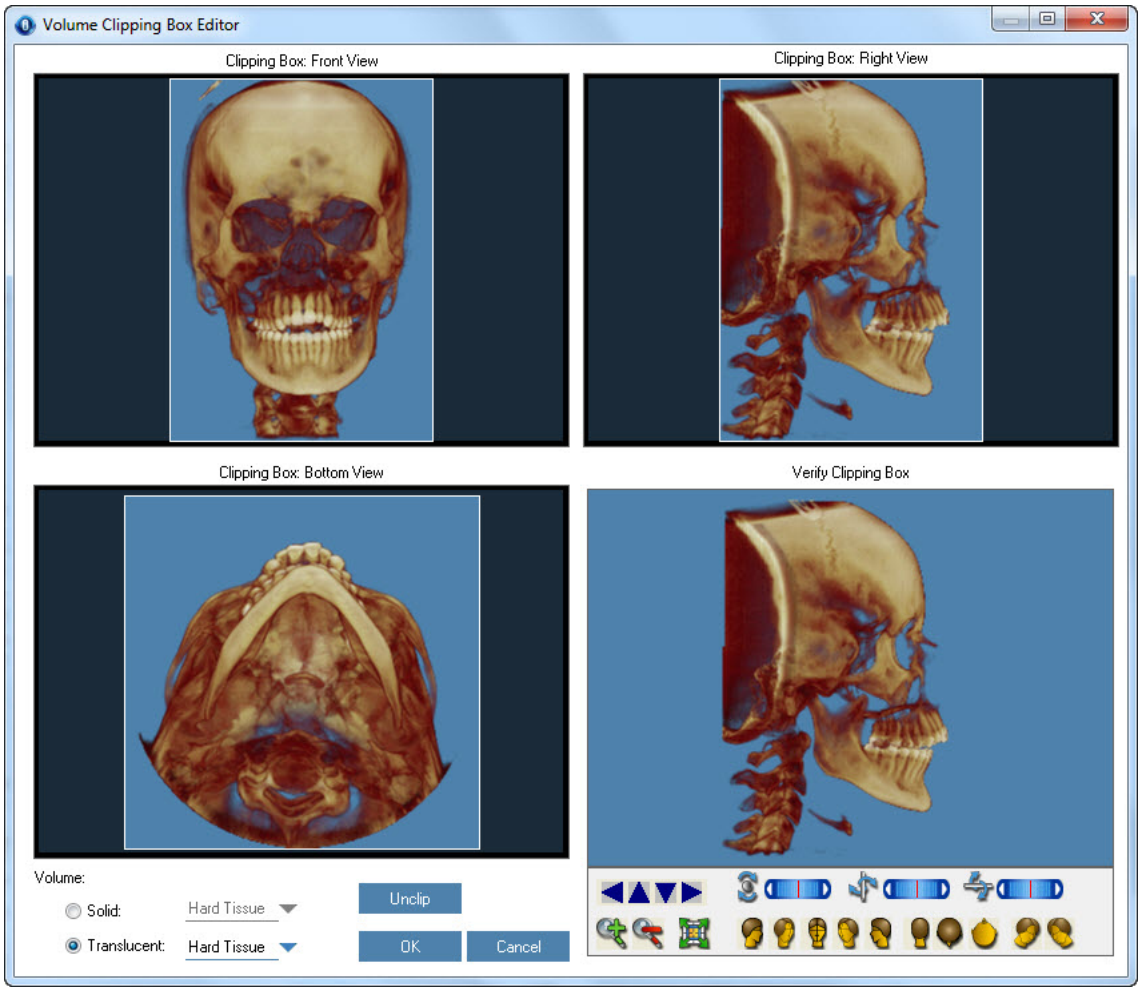
To open the Volume Clipping Box Editor window:

1 Check the **Use Volume Clipping Box** box on the Dolphin 3D window.

2 Click **Edit...**.

The Volume Clipping Box Editor window opens.

Note: *The clipping box uses the 3D volume's original orientation (as taken by the 3D scanner). It does not take into account any changes in the orientation that you made on the Orientation Calibration window. For information on orienting the 3D image, see Chapter 20, Volume Orientation.*



Clipping Box: Front View	Frontal view of the volume and defined clipping box.
Clipping Box: Right View	Right lateral view of the volume and defined clipping box.
Clipping Box: Bottom View	Bottom-up view of the volume and defined clipping box.
Verify Clipping Box	Previews the clipping box.
Solid	Define the clipping box for a solid view. **drop-down list:** Type of solid view (**Soft Tissue**, **Hard Tissue**, or **Both**) to use.
Translucent	Define the clipping box for a translucent view. Only available if your computer supports the advanced 3D rendering modes. **drop-down list:** Type of translucent view (**Soft Tissue**, **Hard Tissue**, or **Both**) to use.
Unclip	Returns the boxes on the **Front**, **Right**, and **Bottom** images to their initial position, so that the entire image is selected within the clipping box.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Defining a Clipping Box

To define a clipping box:

1 On the Volume Clipping Box Editor window, select the view you want (**Solid** or **Translucent**)

The Translucent view is only available if your computer supports the advanced 3D rendering modes.

2 Select an option from the drop-down list to further define the view.

You can view the soft tissue, hard tissue, or both.

3 In the **Front**, **Right**, and **Bottom** images, click and drag the edges of the boxes to define the clipping box.

When you change the size of the box on one of these images, the boxes on the other images change to reflect your new clipping box selection. In addition, the **Verify Clipping Box** image provides a preview of your clipping box.

4 Optionally, use the controls below the **Verify Clipping Box** image to rotate it and view a preview of your clipping box from several angles.

5 When you finish selecting the area of the volume to use for the clipping box, click **OK**.

The image appears in the Dolphin 3D window using the clipping box you defined.

Dolphin 3D remembers your clipping box definition. The next time that you check the **Use Volume Clipping Box** box, your last clipping box definition is applied.

Clipping Example

The following example illustrates one possible use of a clipping box and clipping slice. It defines a clipping box so that you can view the structure of the patient's airway in three dimensions. Then, it defines a clipping slice so that you can view a cross-section of the patient's airway.

To define this example clipping box:

1 On the Dolphin 3D window, check the **Use Volume Clipping Box** box.

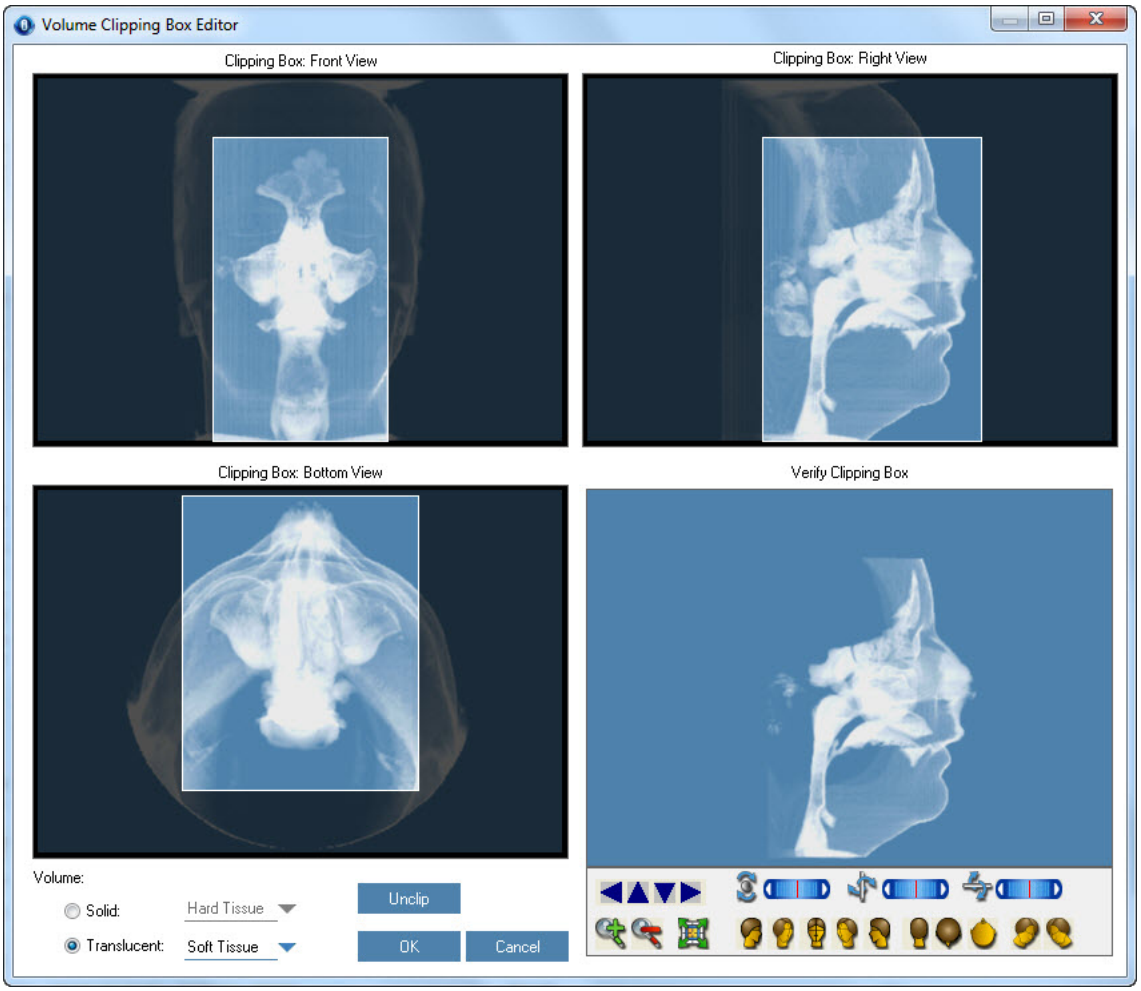
2 Click **Edit....**

3 On the Volume Clipping Box Editor window, select **Translucent**.

4 Select **Soft Tissue** from the drop-down list.

5 In the **Front**, **Right**, and **Bottom** images, click and drag the edges of the boxes to define the clipping box.

Click and drag when your mouse pointer turns into a double-headed arrow. The figure below illustrates the clipping box boundaries needed to view an example patient's airway.



6 Click **OK** to view the image in the Dolphin 3D window using the clipping box you defined.

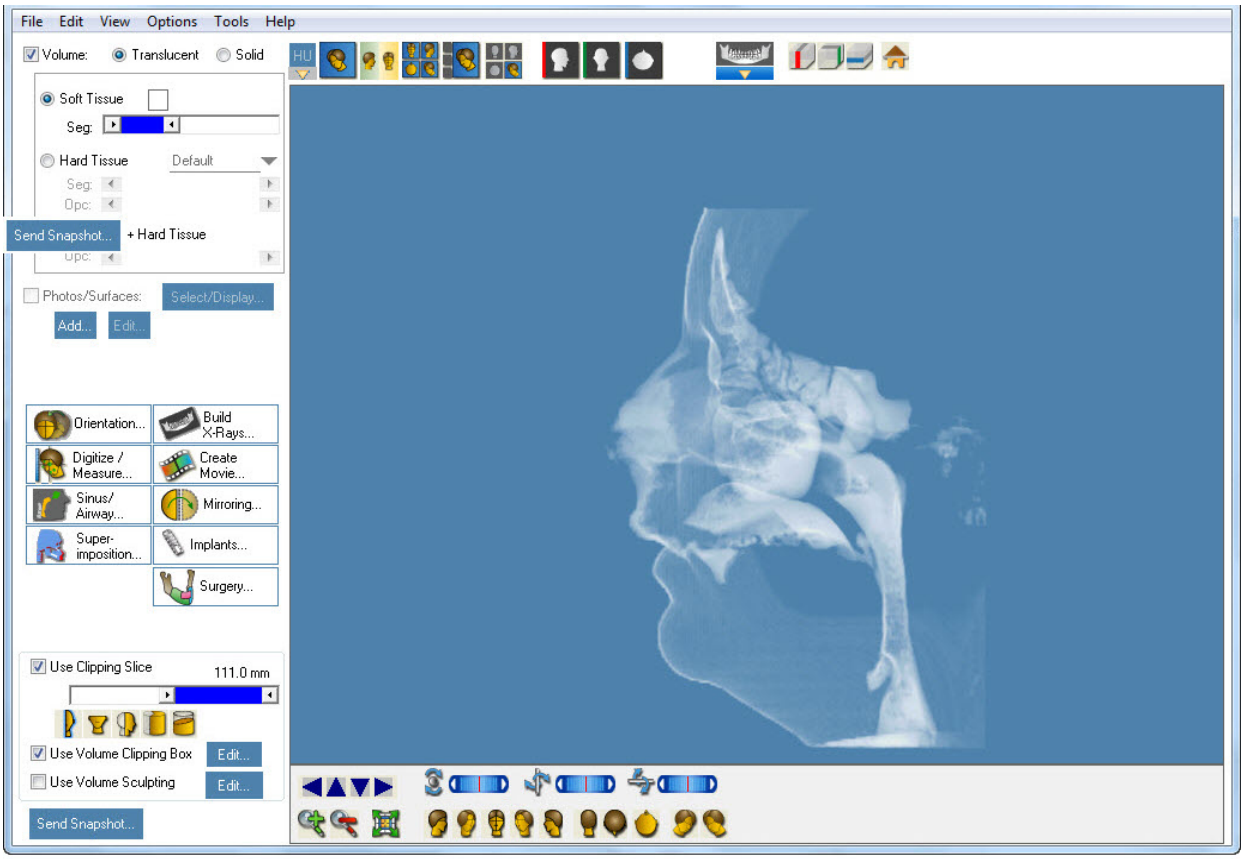
To use this clipping box in conjunction with a clipping slice:

1 On the Dolphin 3D window, check the **Use Clipping Slice** box.

2 Click to set the clipping slice at the mid-sagittal plane.

3 Click to rotate the image to the lateral view.

A cross section of the patient's airway appears in the Dolphin 3D window, as shown below.



Sculpting the Volume

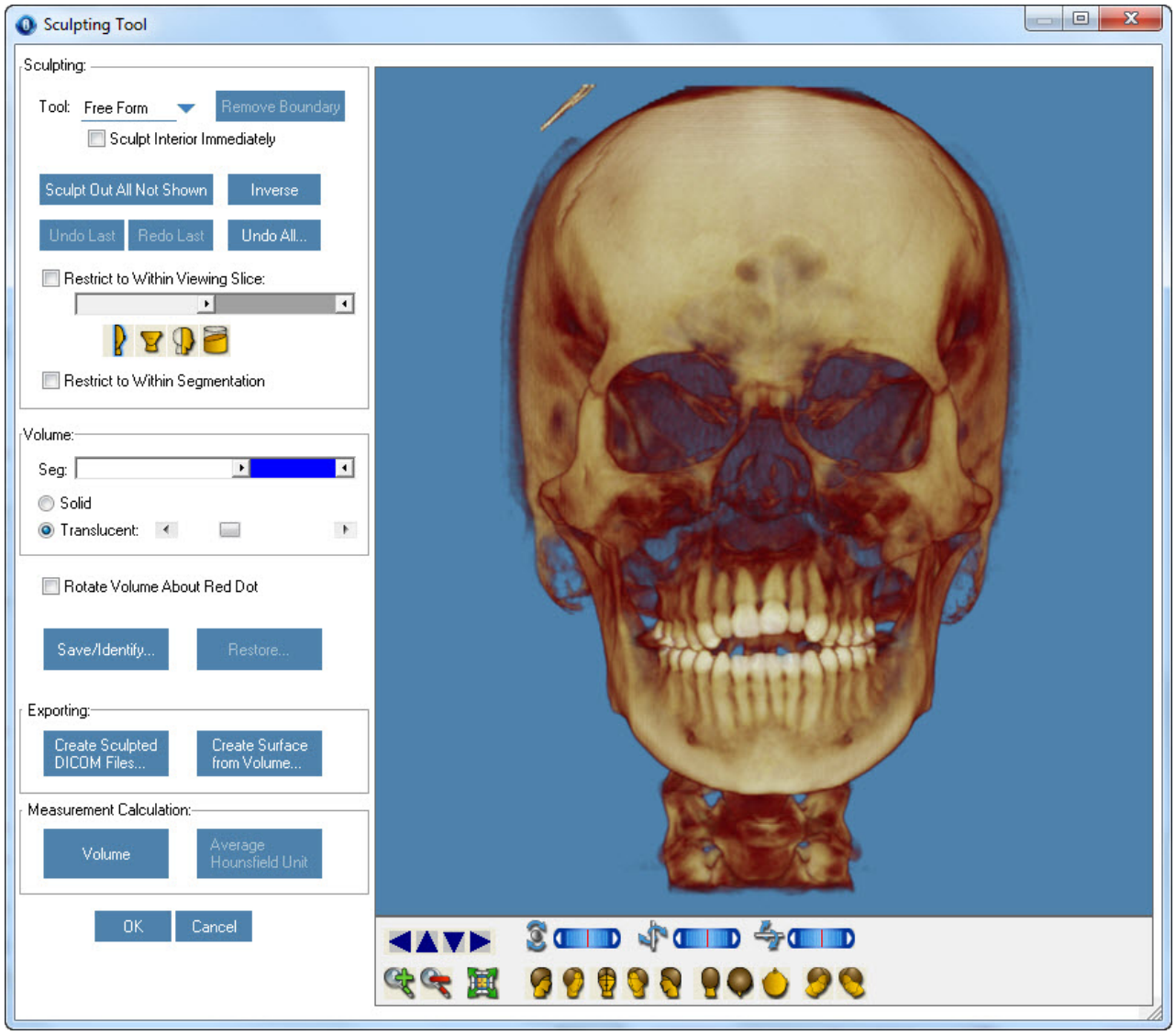
Sculpting the volume enables you to crop or remove portions of it. For example, some volumes have noise that you can remove using this feature.

To open the Sculpting Tool dialog box:

1 Check the **Use Volume Sculpting** box on the Dolphin 3D window.

2 Click **Edit...**.

The Sculpting Tool dialog box opens.



Tool	Sculpting tool shape to use. **Free Form:** Uses a custom sculpting tool shape. **Circle:** Uses a circular sculpting tool. **Square:** Uses a square sculpting tool. **Diamond:** Uses a diamond-shaped sculpting tool. For more information, see “Free-Form Sculpting” on page 28-10 and “Sculpting with Standard Tool Shapes” on page 28-11.
Remove Boundary	Removes a defined sculpting boundary. Only available for the **Free Form** tool. For more information, see “Free-Form Sculpting” on page 28-10.
Size	Sculpting tool size. Only Available for the **Circle**, **Square**, and **Diamond** tool. For more information, see “Sculpting with Standard Tool Shapes” on page 28-11.

Sculpt Interior Immediately	Sculpts the parts of the volume inside the sculpting boundary as soon as the boundary is defined. Only available for the **Free Form** tool. For more information, see “Free-Form Sculpting” on page 28-10.
Sculpt Out All Not Shown	Removes all parts of the volume not shown in the current view. For more information, see “Sculpting Out All Not Shown” on page 28-11.
Inverse	Selects all parts of the volume that are outside your current sculpting boundary. For more information, see “Using the Inverse Feature” on page 28-11.
Undo Last	Undoes the last sculpting operation.
Redo Last	Redoes the last “undone” sculpting operation.
Undo All...	Opens a menu with the following options for undoing all sculpting operations: **Close this menu:** Closes the menu. **Undo All - Current Session:** Undoes all sculpting operations performed in this session. **Undo All - Completely:** Undoes all the sculpting operations performed on this volume.
Restrict to Within Viewing Slice	Restricts sculpting operations to the areas within the selected cross-section of the volume. **slider:** Sets the location of the slice used for this cross section. : Sets the clipping slice at the mid-sagittal plane. : Sets the clipping slice at the axial plane. : Sets the clipping slice at the coronal plane. : Uses a pie-shaped clipping slice that includes the patient's arch. : Orients the clipping slice in the direction of the viewer. For more information, see “Restricting the Sculpting Area” on page 28-9.
Restrict to Within Segmentation	Restricts your sculpting operations to the areas within the selected volume segmentation. For more information, see “Restricting the Sculpting Area” on page 28-9.
Volume	Sets the segmentation and view for the volume. **Seg:** Sets the segment of the 3D image to use for the selected view. **Solid:** Displays a solid representation of the volume. **Translucent:** Displays a translucent representation of the volume. Available only if your computer graphics card supports advanced 3D rendering. For more information on these options, see “Viewing the Soft Tissue” on page 19-26.
Rotate Volume About Red Dot	Rotates the volume about a user-defined point. For more information, see“Rotating the Volume” on page 28-12.

Save/Identify...	Saves the sculpted volume and identifies it as either the maxilla or the mandible. For more information, see “Saving/Identifying and Restoring the Sculpted Volume” on page 28-13.
Restore...	Restores a previously-saved sculpted volume. For more information, see “Saving/Identifying and Restoring the Sculpted Volume” on page 28-13.
Exporting	Opens a menu of options for exporting the volume to a file. **Create Sculpted DICOM Files:** Exports the sculpted volume as one or more DICOM files. For more information, see “Exporting DICOM Files” on page 19-120. **Export Volume as Surface...:** Creates a surface from the volume and exports it to a file for use with applications that can import and process an surface. For more information, see“Creating a Surface From the Volume” on page 19-74.
Measurement Calculation	Options for calculating measurements for the volume. **Volume:** Calculates the volume in cubic millimeters (mm^3) and cubic centimeters (cm^3), taking the current sculpting, segmentation, and viewing slice into consideration. **Average Hounsfield Unit:** Calculates average hounsfield unit for the volume. Only available for scans imported using Dolphin Imaging version 11 or later. For more information, see “Performing Calculations” on page 28-12.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Restricting the Sculpting Area

To restrict sculpting to a particular viewing slice:

1 Check the **Restrict to Within Viewing Slice** box.

2 Move the slider to identify the location of the viewing slice.

Or,

Click to set the clipping slice at the mid-sagittal plane.

Or,

Click to set the clipping slice at the axial plane.

Or,

Click to set the clipping slice at the coronal plane.

Or,

Click to use a pie-shaped clipping slice that includes the patient's arch.

Or,

Click to orient the clipping slice in the direction of the viewer.

The image appears with the viewing slice you selected. Any sculpting operations that you perform will apply only to the visible part of the volume.

To restrict sculpting to a particular volume segment:

1 Check the **Restrict to Within Segmentation** box.

2 Adjust the **Seg** slider to set the segmentation that to use for this sculpting operation.

The image appears with the segmentation you selected. Any sculpting operations that you perform will apply only to the visible part of the volume.

Free-Form Sculpting

With free-form sculpting, you define a cropping polygon to use as your sculpting tool. In this way, you can sculpt using free-form shapes.

To use free-form sculpting:

1 Optionally, click the button for one of the predefined views to change to that orientation.

Or,

Click and drag the volume to rotate it.

2 Optionally, check the **Sculpt Interior Immediately** box to remove the part of the volume within your cropping polygon as soon as the polygon is defined.

3 Draw the cropping polygon.

For information on drawing a polygon, see “Selecting an Area of an Image” on page 6-4.

If you make a mistake and want to start over, click **Remove Cropping Border**.

If you checked the **Sculpt Interior Immediately** box, the part of the volume within your cropping polygon is removed when you close the polygon. Otherwise, the mouse pointer changes to a pair of scissors.

4 Click inside the polygon to remove the part of the photograph that is inside the polygon.

Or,

Click outside the polygon to remove the part of the photograph that is outside the polygon.

Sculpting with Standard Tool Shapes

For your convenience, Dolphin 3D offers three standard tool shapes (circle, square, and diamond) that you can use to sculpt the volume.

To sculpt with the standard tool shapes:

1 Optionally, click the button for one of the predefined views to change to that orientation.

Or,

Click and drag the volume to rotate it.

2 Select the tool shape to use from the **Tool** drop-down list.

3 Select the tool size to use from the **Size** drop-down list.

The mouse pointer changes to indicate the shape and size of the sculpting tool that you have selected.

4 Click the volume to remove parts of it in the shape and size of the selected sculpting tool.

Sculpting Out All Not Shown

Using this feature, you can remove all parts of the volume not shown in the current view. For example, you can remove all parts of the volume that are not within a particular viewing slice or volume segment.

To sculpt out all not shown:

1 Optionally, check the **Restrict to Within Viewing Slice** box and select a viewing slice to sculpt out parts of the volume that are not in that slice.

2 Optionally, check the **Restrict to Within Segmentation** box and adjust the Seg slider to set the segmentation to sculpt out parts of the volume that are not in that segment.

For more information, see “Restricting the Sculpting Area” on page 28-9.

3 Click **Sculpt Out All Not Shown**.

Using the Inverse Feature

With the Inverse feature, you can sculpt away the inverse of the selected part of the volume.

To use the Inverse feature:

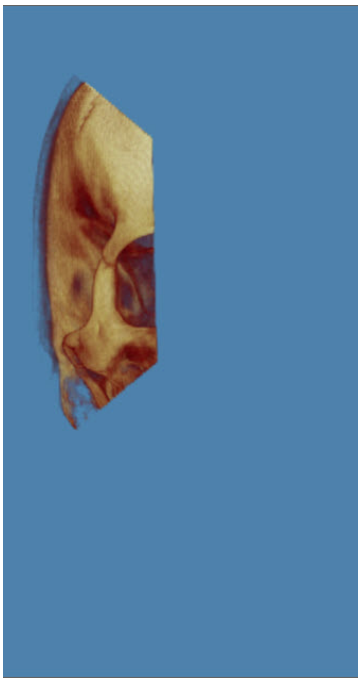
1 Sculpt away part of the volume.

2 Click **Inverse**.

The following figure illustrates this feature. In this example, part of the volume is sculpted away using the free-form the sculpting tool. Clicking **Inverse** sculpts away the inverse of the original selection.

1 Sculpt away part of the volume

2 Click Inverse



Rotating the Volume

In addition to the usual features for rotating a volume, you can rotate the sculpted volume about a user-defined point. This useful when you want to work in an area of interest (a condyle, for example) and want that area to stay in the window instead of getting rotated out of view, because the rotation is based on the center of the volume.

To rotate the volume about a user-defined point:

1 Check the **Rotate Volume About Red Dot** box.

2 Move the red dot that appears to any location on the volume.

3 Rotate the volume as described in “Moving or Reorienting the Volume” on page 19-24.

The volume rotation is centered about the red dot.

Performing Calculations

To calculate the volume measurement of a sculpted volume:

1 On the Sculpting Tool dialog box, click **Volume**.

The volume measurement based on the current segmentation and sculpting in cubic millimeters (mm^3) and cubic centimeters (cm^3) is displayed.

To calculate the average Hounsfield Unit of a sculpted volume:

1 On the Sculpting Tool dialog box, click **Average Hounsfield Unit.**

The average Hounsfield Unit of the segmented and sculpted volume is calculated and displayed.

Note: *This calculation can be done only on scans imported using Dolphin Imaging version 11 or later.*

Saving/Identifying and Restoring the Sculpted Volume

When you exit volume sculpting, you can save the sculpted volume. It is restored the next time you enter volume sculpting. In addition, you can save two versions of the sculpted volume, identifying them as the maxilla and the mandible. Later, you can restore one or both of these sculpted volumes.

These volumes that you store and identify as maxilla and mandible cannot contain overlapping parts of the volume. For example, the sculpted volume identified as the maxilla cannot include parts of the volume saved and identified as the mandible. If the second sculpted volume you save overlaps with the first, the overlapping parts are removed from the first saved sculpted volume.

To save and identify the sculpted volume:

1 Click **Save/Identify...**.

A context menu appears offering options to identify the volume as either the maxilla or the mandible.

2 Click **Identify As Maxilla** to save and identify the sculpted volume as the maxilla.

Or,

Click **Identify As Mandible** to save and identify the sculpted volume as the mandible.

To restore a previously saved and identified volume:

1 Click **Restore...**.

A context menu appears offering options to restore volumes previously saved and identified.

2 Click **Restore Maxilla** to restore a volume previously saved and identified as the maxilla.

Or,

Click **Restore Mandible** to restore a volume previously saved and identified as the mandible.

Or,

Click **Restore Maxilla+Mandible** to restore volumes previously saved and identified as the maxilla and the mandible.

Exiting from Volume Sculpting

To save your sculpted volume and exit:

1 Click **OK** to save your sculpted volume.

Your sculpted volume saved. It will be restored the next time you enter volume sculpting.

To exit without saving:

1 Click **Cancel** to exit without saving.

If you have saved and identified parts of the sculpted volume as the maxilla and/or mandible, the Sculpting Canceling dialog box opens.

2 Select an option on this dialog box. Then, click **OK**.

Cancel all sculpting but keep maxilla/or mandible identified during this sculpting session	Keeps the sculpted volumes that you have saved and identified as the maxilla and/or mandible. All other work from this sculpting session is discarded.
Cancel all	Discards all the work you have done in this sculpting session.

29 Reports

With the Dolphin 3D Report Editor, you can design and print reports from Dolphin 3D. This editor is true WYSIWYG (what you see is what you get), and automatically shares page layouts among all your computers.

Using this full-featured design environment, you can freely place images, labels, and other layout components on the report pages. Once you have created a report, you can:

- add annotations (text, arrows, and so on) prior to printing
- print it
- view it on your computer screen
- generate image snapshots of the report pages either on the Windows clipboard or as image files
- save it as part of a patient's record
- send it to a referral
- save your design as a template for later report generation

Accessing the Dolphin 3D Report Editor

Using the Dolphin 3D Report Editor, you can create and edit the reports that use images and series of cross sections from Dolphin 3D as well as 2D images from image layouts.

To open the Dolphin 3D Report Editor:

1 Click **Send Snapshot...** on the Dolphin 3D window.

Or,

Click **Send Snapshot...** on the Build X-rays Tool window.

Or,

Click **Send Snapshot...** on the Sinus/Airway window.

Or,

Click **Send Snapshot...** on the Mirroring Tool window.

Or,

Click **Send Snapshot...** on the Superimposition window.

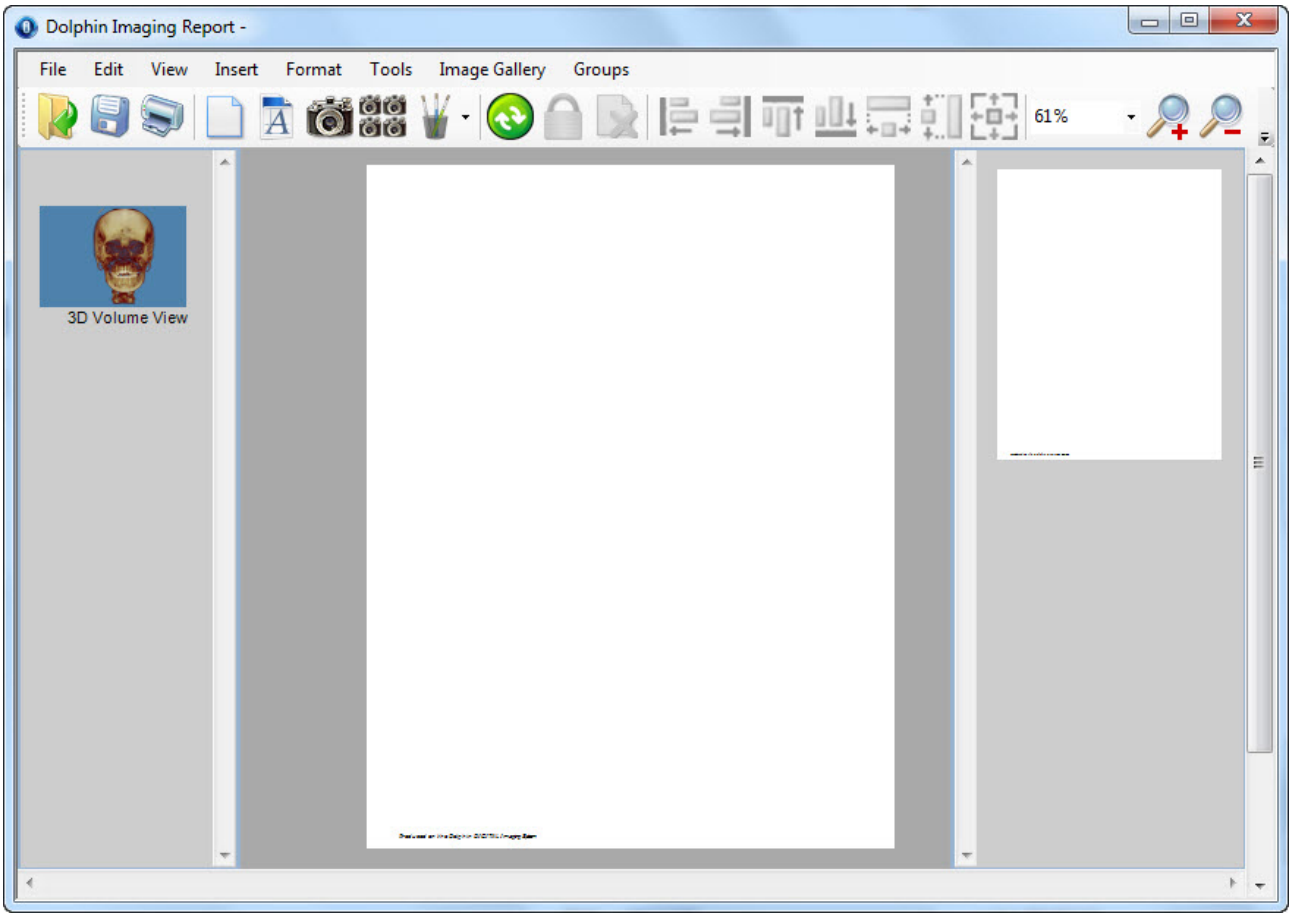
Or,

Click **Send Snapshot...** on the 3D Implant Simulation window.

2 Select **Send To Report**.

The Dolphin 3D Report Editor window opens and displays the image you just sent to it in the Image Gallery on the left. In addition, the Open dialog box appears so that you can select an existing report template.

3 Select a report template, and click **Open**.

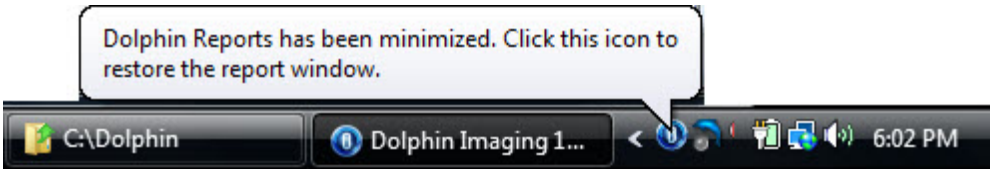


Menu Bar	Menus to access program features.
Tool Bar	Buttons to access program features.
Image Gallery	Thumbnails of the images and cross sections that you have sent to the Dolphin 3D Report Editor for use in your reports.
Preview	A preview of the report.
Page Gallery	Thumbnails of the pages in this report template.

To minimize the Dolphin 3D Report Editor:

1 Select **Exit** from the **File** menu.

The Dolphin 3D Report Editor window is minimized to your tray and remains available there until you exit Dolphin 3D. You can click the Dolphin Imaging icon in your tray to restore the window.



Using the Tool Bar

The Dolphin 3D Report Editor tool bar contains the following buttons:

	Opens an existing report template. For more information, see “Opening a Report Template” on page 29-12.
	Saves the current report template. For more information, see “Saving the Report Template” on page 29-12.
	Prints the current report. For more information, see “Printing Reports” on page 29-59.
	Adds a new page to this report. For more information, see “Adding Pages” on page 29-15.
	Adds a new text label to this report. For more information, see “Using Text Labels” on page 29-39.
	Adds a new image to this report. For more information, see “Adding an Image to a Report Template” on page 29-16.
	Adds cross sections to this report. For more information, see “Adding Cross Sections to a Report Template” on page 29-26.
	Opens a menu of available annotations types. For more information, see “Using Annotations” on page 29-43.
	Assigns images or cross sections from the Image Gallery to any empty image and cross sections objects based on the image type assigned to those objects. For more information, see “Adding an Image to a Report Template” on page 29-16 and “Adding Cross Sections to a Report Template” on page 29-26.

	Toggles Locked mode for the selected objects. Locked objects cannot be moved or resized, which prevents accidental misalignment of images. You can still drag images or cross sections from the Image Gallery to a locked placeholder or change a locked object's properties. For more information, see “Locking and Unlocking Objects” on page 29-55.
	Deletes the selected objects or pages from the report. For more information, see “Deleting Objects” on page 29-52 and “Deleting Pages” on page 29-16.
	Aligns two or more objects with the left side of the first object selected. For more information, see “Aligning Objects” on page 29-49.
	Aligns two or more objects with the right side of the first object selected. For more information, see “Aligning Objects” on page 29-49.
	Aligns two or more objects with the top of the first object selected. For more information, see “Aligning Objects” on page 29-49.
	Aligns two or more objects with the bottom of the first object selected. For more information, see “Aligning Objects” on page 29-49.
	Resizes two or more objects to be the same width as the first object selected. For more information, “Making Several Objects the Same Size” on page 29-47.
	Resizes two or more objects to be the same height as the first object selected. For more information, see “Making Several Objects the Same Size” on page 29-47.
	Resizes two or more objects to be the same width and height as the first object selected. For more information, see “Making Several Objects the Same Size” on page 29-47.
	Sets the magnification percentage. For more information, see “Changing the Magnification” on page 29-14.
	Zooms in on the report. For more information, see “Changing the Magnification” on page 29-14.
	Zooms out from the report. For more information, see “Changing the Magnification” on page 29-14.
	Changes the magnification so that the report fits in the window. For more information, see “Changing the Magnification” on page 29-14.

Using the Menu Bar

At the top of the Dolphin 3D Report Editor window, there are menus that you can use to access program features.

- **File** menu
- **Edit** menu
- **View** menu
- **Insert** menu
- **Format** menu
- **Tools** menu
- **Image Gallery** menu
- **Groups** menu

The File Menu

The **File** menu contains the following choices:

New Template	Creates a new report template. For more information, see “Creating a New Report Template” on page 29-12.
Open Template...	Opens an existing report template for editing. For more information, see “Opening a Report Template” on page 29-12.
Save Template	Saves the current report template. For more information, see “Saving the Report Template” on page 29-12.
Save Template As...	Saves the current report template under a new name. For more information, see “Saving the Report Template” on page 29-12.
Save Report to Dolphin 2D...	Saves the current report, including all images and patient information, into an image layout slot viewable on the Dolphin Imaging main screen. For multi-page reports, Dolphin Imaging saves all the report pages into the image slot. For more information, see “Saving Reports to Image Layouts” below.
Export Page to Image...	Exports the currently selected page in the report to an image file on your computer. For more information, see “Exporting a Report Page as an Image” on page 29-61.
Page Setup...	Opens the Page Setup dialog box so that you can adjust the paper size, background color, margins, page orientation, and preset printer for the currently selected page. For more information, see “Setting Up the Page” on page 17-12.
Print...	Prints the current report. For more information, see “Printing Reports” on page 29-59.
Print to preset printer(s)	Prints the current report, directing any pages with preset printer settings (see “Setting Up the Page” on page 17-12) to the appropriate printers. For more information, see “Printing Reports” on page 29-59.
Exit	Minimizes the Dolphin 3D Report Editor to your tray, where it remains available until you exit Dolphin 3D.

The Edit Menu

The **Edit** menu contains the following choices:

Undo	Undoes previous operations in order. You can undo any number of operations.
Redo	Redoes undone operations. You can redo any number of operations as long as you did not make any changes to the report template after the undo operation.
Copy page to Clipboard	Copies the current page and places it on the clipboard as an image.
Cut	Cuts one or more selected objects and places it on the clipboard. For more information, see “Cutting, Copying, and Pasting Objects” on page 29-53.
Copy	Copies one or more selected objects to the clipboard. For more information, see “Cutting, Copying, and Pasting Objects” on page 29-53.
Paste	Pastes one or more previously cut or copied objects from the clipboard. For more information, see “Cutting, Copying, and Pasting Objects” on page 29-53.
Delete	Deletes one or more selected objects. For more information, see “Deleting Objects” on page 29-52.
Select All	Selects all objects on the report.
Enhance Selected Image(s)...	Opens the Enhance Image dialog box so you can adjust the brightness, contrast, saturation, gamma and sharpening of one or more selected images. For more information, see “Enhancing Images” on page 29-36.
Load from Image Gallery	Assigns images and cross sections from the Image Gallery to any empty image and cross sections objects based on the image type assigned to those objects. For more information, see “Adding an Image to a Report Template” on page 29-16 and “Adding Cross Sections to a Report Template” on page 29-26.

The View Menu

The **View** menu contains the following choices:

Margins	Toggles display of the green margin lines.
Printable Area	Toggles display of the red “printable area” guidelines.
Image Titles	Show or hide the title labels for all images.
Image Borders	Show or hide the borders around all images.
Image Gallery	Toggles display of the image gallery. For more information, see “Using the Image Gallery” on page 29-9.
Page Gallery	Toggles display of the page gallery. For more information, see “Using the Page Gallery” on page 29-11.
Hide Labels	Toggles display of the all the labels in a report. For more information, see “Showing and Hiding Labels” on page 29-41.

The Insert Menu

The **Insert** menu contains the following choices:

Page	Adds a page at the end of the report template using the page settings of the previous page. For more information, see “Adding Pages” on page 29-15.
Label	Places a label on a page. For more information, see “Using Text Labels” on page 29-39.
Image	Places an image on a page. For more information, see “Adding an Image to a Report Template” on page 29-16.
Cross Sections	Places an cross sections for a montage on a page. For more information, see “Adding Cross Sections to a Report Template” on page 29-26.
Measurements Table	Places a measurements table on a page. For more information, see “Using Measurements Tables” on page 29-36.
Group	Displays a list of previously saved groups of objects so that you can choose one to insert into the report. For more information, see “Inserting Saved Object Groups” on page 29-55.
Page(s) from existing template...	Appends a previously saved report template to the end of the current report. For more information, see “Adding Pages” on page 29-15.

The Format Menu

The **Format** menu contains the following choices:

Background Color...	Sets the background color of the currently selected page.
Image Corner Rounding...	Toggles rounded corners on the images. For more information, see “Rounding Image Corners” on page 29-18
Align	Aligns the selected objects on the left, right, top, or bottom. For more information, see “Aligning Objects” on page 29-49.
Make Same Size	Resizes the selected objects to be the same height, same width, or both the same height and width. For more information, see “Making Several Objects the Same Size” on page 29-47.
Center	Centers the selected objects horizontally or vertically on the page. For more information, see “Centering Objects” on page 29-50.

Horizontal Spacing	Adjusts the horizontal spacing of the selected objects as follows: **Make Equal:** Spaces the selected objects evenly. **Increase:** Increases the space between the selected objects. **Decrease:** Decreases the space between the selected objects. **Remove:** Removes the space between the selected objects, making them flush with each other. For more information, see “Changing Object Spacing” on page 29-51.
Vertical Spacing	Adjusts the vertical spacing of the selected objects as follows: **Make Equal:** Spaces the selected objects evenly. **Increase:** Increases the space between the selected objects. **Decrease:** Decreases the space between the selected objects. **Remove:** Removes the space between the selected objects, making them flush with each other. For more information, see “Changing Object Spacing” on page 29-51.
Order	Adjusts the ordering of the objects as follows: **Bring to Front:** Places the selected object in front of other objects. **Send to Back:** Places the selected object behind other objects. For more information, see “Changing Object Layering” on page 29-52.
Snap To	Aligns the selected objects as follows: **Margin:** Aligns the selected objects along the left, right, top, or bottom page margin. **Printer Hard Margin:** Aligns the selected objects along the left, right, top, or bottom hard margin. If you have specified a printer on the Page Setup dialog box (see “Setting Up the Page” on page 17-12), the hard margins specify how close to the paper edge the specified printer can print. Otherwise, the hard margins are at the paper edges. For more information, see “Aligning Objects” on page 29-49.

The Tools Menu

The **Tools** menu contains the following choices:

Link Labels to Image	Links the selected labels and image so that data tokens such as the image title, timepoint information, and so on can be read from that image when rendering the label text. For more information, see “Linking Labels to an Image” on page 29-42.
Unlink Labels from Image	Breaks the link between labels and an image. For more information, see “Linking Labels to an Image” on page 29-42.
Link Measurements to Image	Links the selected measurements and image. For more information, see “Using Measurements Tables” on page 29-36.

Unlink Measurements to Image	Breaks the link between measurements and an image. For more information, see “Using Measurements Tables” on page 29-36.
Options...	Opens a dialog box where you can set options for editor. For more information, see “Setting Options” on page 29-56.

The Image Gallery Menu

The **Image Gallery** menu contains the following choices:

Hide/Show	Toggles display of the Image Gallery. For more information, see “Using the Image Gallery” on page 29-9.
Fill Template from Gallery	Assigns images from the Image Gallery to any empty image and cross sections objects based on the image type assigned to those objects. For more information. see “Adding an Image to a Report Template” on page 29-16 and “Adding Cross Sections to a Report Template” on page 29-26.
Fill from Dolphin Timepoint	Lists timepoints for the current patient so that you can import all images from a timepoint into the Image Gallery for use in the report. For more information, see “Adding Images and Cross Sections to the Gallery” on page 29-10.
Clear	Clears all images from the Image Gallery. For more information, see “Using the Image Gallery” on page 29-9.

The Groups Menu

The **Groups** menu contains the following choices:

Group Objects	Groups the selected objects into a single object.
Ungroup Objects	Splits the selected object group into individual objects.
Save Group As...	Stores a group of objects for later reuse.
Insert Group	Inserts a previously stored object group on the current design.

For more information. see “Using Object Groups” on page 29-53.

Using the Image Gallery

The image gallery displays thumbnails of the images and cross sections you have sent to it for use in your reports. You can click and drag any of these images or cross sections to report pages to add them to your report template. For more information, see “Adding an Image to a Report Template” on page 29-16 and “Adding Cross Sections to a Report Template” on page 29-26.

To scroll through the images and cross sections in the gallery:

1 Click and drag the scroll bar to the right of the image gallery.

To clear all images from the gallery:

1 Select **Clear** from the **Image Gallery** menu.

To toggle display of the image gallery:

1 Select **Image Gallery** from the **View** menu.

Or,

Select **Hide** from the **Image Gallery** menu to hide the image gallery if it is showing.

Or,

Select **Show** from the **Image Gallery** menu to show the image gallery if it is hidden.

Or,

Right-click the Image Gallery pane in a place not occupied by an image, and select **Hide Image Gallery** from the context menu to hide the image gallery.

Adding Images and Cross Sections to the Gallery

To add a Dolphin 3D image or cross sections to the gallery:

1 In Dolphin 3D, navigate to the window where you can view the image or cross sections to use in your report template.

For example, for a lateral soft tissue view, you could navigate to the Dolphin 3D window (see “Understanding the Dolphin 3D Window” on page 19-11). For a cross-sections x-ray view, you would navigate to the Build X-Rays Tool window (see Chapter 21, Build X-rays).

2 Set up the image or cross sections to use in your report template.

For example, for a lateral soft tissue view, you would select the button for the lateral view in the Dolphin 3D window (see “Viewing the Soft Tissue” on page 19-26 and “Moving or Reorienting the Volume” on page 19-24). For a cross-sections x-ray view, you would generate the cross-sections view in the Build X-Rays Tool window (see “Building a Cross-Sections X-ray View” on page 21-24).

3 Click **Generate Snapshot**.

4 Select **Send To Report** from the menu.

If this is the first image you have sent to the Dolphin 3D Report Editor, it opens in a new window and displays the image or cross sections you just sent to it in the Image Gallery on the left.

If you close the Dolphin 3D Report Editor window, it is minimized to your tray and remains available there until you exit Dolphin 3D. Depending on the options you have set for the Dolphin 3D Report Editor, it may open whenever you send another image or cross sections to the gallery, or the image or cross sections you sent may appear briefly above the tray. For more information, see “Setting Options” on page 29-56.

To add the images from a timepoint to the gallery:

1 Select **Fill from Dolphin Timepoint** from the **Image Gallery** menu.

Or,

Right-click the Image Gallery pane in a place not occupied by an image, and select **Fill from Timepoint** from the context menu.

2 Select a timepoint from the sub-menu.

All the images for the selected timepoint appear in the image gallery.

Previewing Images and Cross Sections in the Gallery

To preview an image or cross sections in the image gallery:

1 Right-click the image or cross sections to preview.

A close-up view appears.

Using the Page Gallery

The page gallery displays thumbnails of the report template's pages.

To scroll through the pages in the gallery:

1 Click and drag the scroll bar to the left of the page gallery.

To view a page from the gallery:

1 Double-click a page in the gallery to display it in the center pane in the window.

To toggle display of the page gallery:

1 Select **Page Gallery** from the **View** menu.

Or,

Right-click the page gallery. Then select **Hide Page Previews** from the context menu to hide the page gallery.

Managing Report Templates

This section describes how to create a new report template, open an existing report template, save a report template, and delete a report template.

Creating a New Report Template

To create a new report template:

1 Select **New Template** from the **File** menu.

The Page Setup dialog box opens.

2 Enter page setup options for the new template.

For information on setting these options, see “Setting Up the Page” on page 17-12.

3 Click **OK**.

The new template appears in the window.

Opening a Report Template

To open an existing report template:

1 Click .

Or,

Select **Open Template...** from the **File** menu.

A dialog box appears where you can select the template to open.

2 Select a template from the list, and click **Open**.

Saving the Report Template

Saving your report template automatically shares your layout design among all Dolphin stations on your network.

To save the report template:

1 Click .

Or,

Select **Save Template** or **Save Template As...** from the **File** menu.

If you had previously saved this template and you did not select **Save Template As...**, the template is saved, overwriting the old version.

If you have not previously saved this template or if you selected **Save Template As...**, a dialog box opens where you can specify a name for this template.

2 Select an existing template name to use for this template from the list.

Or,

Type the name for this template in the field.

3 Click **Save**.

If you selected an existing template name, your new template is written over the existing template.

Report templates are saved in the **`Dolphin\Working`** folder on your server, so that saved templates are available to all computers on your network, and they are backed up along with the rest of your Dolphin Imaging data.

Deleting a Report Template

To delete a report template:

1 Click .

Or,

Select **Open Template...** from the **File** menu.

A dialog box appears where you can select a template to open. This dialog box also offers the option to delete a template.

2 Select the template to delete from the list. Then, click **Delete**.

A dialog box appears asking you to confirm the deletion.

3 Click **Yes** to delete the template.

Editing Report Templates

This section describes how to edit a report template. It describes:

- setting up and working with report pages
- adding images, cross section montages, measurement tables, text labels, and annotations
- working with objects, including resizing, repositioning, deleting, and cutting, copying, and pasting
- using object groups
- locking and unlocking objects
- setting options for all report templates and for the Dolphin 3D Report Editor itself

Setting Up the Page

You use the Page Setup dialog box to set basic properties of each report page. The first step in creating a new template is to enter page setup options. After creating the template initially, you can change these options at any time. For more information, see “Setting Up the Page” on page 17-12.

Working With Report Pages

To view a different page in a multi-page report template:

1 Click and drag the scroll bar to the right of the page gallery until the page appears in the center part of the window.

Changing the Magnification

To zoom in:

1 Click .

To zoom out after zooming in:

1 Click .

To fit the design in the window:

1 Click .

To select a magnification factor:

1 Select a magnification percentage from the drop-down list on the tool bar.

Viewing Margins and Guidelines

To toggle display of the green margin lines:

1 Select **Margins** from the **View** menu.

To toggle display of the red “printable area” guidelines:

1 Select **Printable Area** from the **View** menu.

Adding Pages

To add a blank page to the report template:

1 Click '

Or,

Select **Page** from the **Insert** menu.

The Dolphin 3D Report Editor adds a page to the end of the report template using the page settings of the previous page.

To add pages from an existing report template or a Dolphin Imaging layout:

1 Select **Page(s) from existing template...** from the **Insert** menu.

The Select Layout dialog box opens.

2 Select the **Report Layouts** tab to add all the pages from an existing report template to the end of this report template.

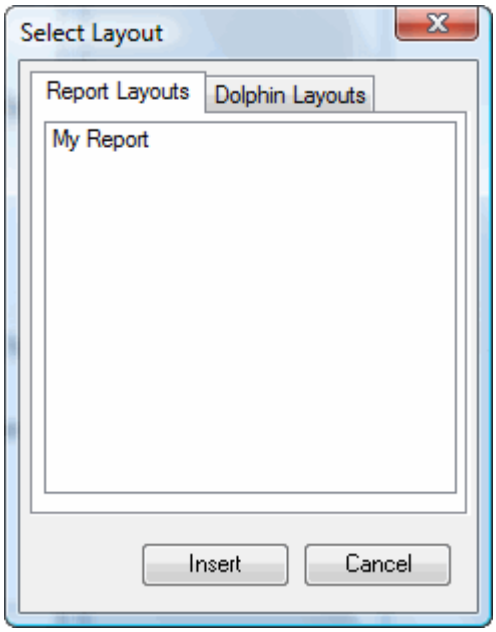
Or,

Select the **Dolphin Layouts** tab to add a page containing a Dolphin Imaging layout to the end of this report template.

3 Select the existing report template or Dolphin Imaging layout to add to this report template.

4 Click **Insert**.

One or more new pages appear at the end of the report template. This enables you to combine several templates into a single report.



Report Layouts	Lists existing report templates. Select one to add all of its pages to the end of this report template.
Dolphin Layouts	Lists Dolphin Imaging layouts. Select one to add a page containing that layout to the end of this report template.
Insert	Adds the selected existing report template or Dolphin Imaging layout to this report template.

Deleting Pages

To delete a page from the report template:

1 Click and drag the scroll bar to the right of the page gallery until the page appears in the center part of the window.

2 Click the page to select it.

A red outline appears around the page.

3 Click .

Or,

Select **Delete** from the **Edit** menu.

A dialog box appears asking you to confirm the deletion.

4 Click **Yes** to delete the page.

Reordering Pages

To change the order of the pages in a multi-page report template:

1 Right-click the page in the page gallery that you want to move.

2 Select **Move Page to Number** from the context menu.

3 Select the new page number for the selected page from the sub-menu.

Using Images and Cross Sections

An image can be a patient image from Dolphin 3D or Dolphin 2D, or it can be any image imported from your computer (such as a logo). Cross sections are meant for including montages such as cross-section, TMJ, or nerve canal views.

The Image Gallery contains thumbnails of the images and cross sections you plan to use in your report template.

Adding an Image to a Report Template

To drag and drop an image from the gallery to your report template:

1 Navigate to the page in your report template where the image should appear.

2 Click and drag the scroll bar to the right of the image gallery until the image appears.

3 Drag the image from the gallery and drop it onto the page.

Or,

Drag the image from the gallery and drop it into an existing image placeholder on the page.

To use the tool bar or menus to add an image to your report template:

1 Navigate to the page in your report template where the image should appear.

2 Click .

Or,

Select **Image** from the **Insert** menu.

Or,

Right-click the report page and select **Add Image** from the context menu.

Your cursor changes to a placeholder-drawing icon ( ).

3 Click and drag to draw an image placeholder of the appropriate size for this image.

4 Right-click the image placeholder.

5 Select **3D Image Type** from the context menu to add a Dolphin 3D image to this report template. Then, select the type of 3D image to use from the sub-menu.

Or,

Select **2D Image Type** from the context menu to add a Dolphin 2D image to this report template. Then, select the type of 2D image to use from the sub-menu.

You can also set the image type for a placeholder by setting its properties. You would do this, for example, to add a logo or other image file from your computer to a report template. For more information, see “Setting Image Properties” on page 29-19.

To replace image placeholders with images from the image gallery:

1 Click .

Or,

Select **Load from Image Gallery** from the **Edit** menu.

Or,

Select **Fill Template from Gallery** from the **Image Gallery** menu.

If an image of the specified type is in the Image Gallery, it appears in the placeholder. If the gallery contains more than one image of the appropriate type for an empty placeholder, the most recently added image is used. Initially, the image appears using the Draw 1:1 sizing option, which may make it too big for the placeholder. In this case, you can resize it so that it fits properly. For more information, see “Sizing Images Within Placeholders” below.

If no image of the specified type is in the Image Gallery, the placeholder remains empty. Later, you can add an image of that type to the gallery and click to place it in the placeholder.

Rounding Image Corners

To toggle rounded corners for the images:

1 Select **Image Corner Rounding...** from the **Format** menu.

Sizing Images Within Placeholders

Two options determine how to size images within placeholders:

Draw 1:1	Scales the image according its resolution. Depending on the placeholder size, the image may be too large or small for the placeholder.
Show Whole Image	Scales the image so that it is as large as possible but still fits entirely within the placeholder.

To change the sizing option:

1 Right-click the image.

2 Select the sizing option from the context menu.

To change the placeholder size to match the image size:

1 Right-click the image.

2 Select **Snap to Image Size** from the context menu.

Displaying Image Borders

You can display an image border that is the same size and shape as the image placeholder.

To toggle display of an image's borders:

1 Right-click the image.

2 Select **Show Border** from the context menu.

3 Deselect the image by clicking somewhere else on the page.

When you deselect the image, the placeholder boundary disappears, and you can see whether the image border displays.

Note: *You can specify whether to display the borders for an image and set the image border's color and width by setting image properties. For more information, see “Setting Image Properties” on page 29-19 and “Layout Tab” on page 29-20.*

To toggle display of all image borders:

1 Select **Image Borders** from the **View** menu.

2 Select **Show All** from the sub-menu to show the borders on all the images.

Or,

Select **Hide All** from the sub-menu to hide the borders on all the images.

Displaying Image Titles

You can display an image title for each of the images.

On the properties for an image, you can specify whether to display its title. For more information, see “Setting Image Properties” on page 29-19.

To toggle display of all image titles:

1 Select **Image Titles** from the **View** menu.

2 Select **Show All** from the sub-menu to show the titles for all the images.

Or,

Select **Hide All** from the sub-menu to hide the titles for all the images.

Setting Image Properties

By setting image properties, you can specify the following information:

- Layout options for formatting the image
- Image source and title
- Options for displaying a ruler
- Options for displaying a tracing on the image
- Options for displaying measurements on the image

To set image properties:

1 Right-click the image, and select **Properties** from the context menu.

Or,

Double-click the image.

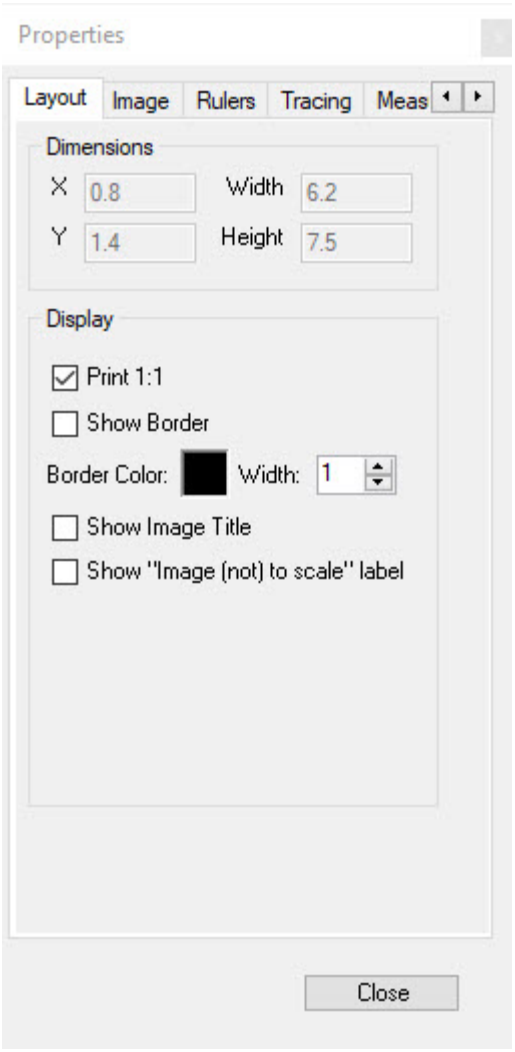
2 Click a tab, and set any options on that tab.

If the tab you want is not visible, click or to navigate to it.

3 When you finish setting properties, click **Close**.

Layout Tab

On this tab, you can view and set options that determine the formatting of the image on the report template.



Dimensions	Current position, height, and width of the image. **X:** Horizontal distance, in inches, from the left side of the image to the left side of the page. **Y:** Vertical distance, in inches, from the top of the image to the top of the page. **Width:** Width of the image in inches. **Height:** Height of the image in inches.
Display	Options for displaying this image: **Print 1:1:** Displays the image according to its resolution. **Show Border:** Displays a border around the image. **Border Color:** Color of the image border. **Width:** Width of the border in millimeters (mm). **Show Image Title:** Displays the title of the image. You can customize this title on the **Image** tab (see “Image Tab” below). **Show “image (not) to scale” label:** Displays “Image drawn to size” on images using the Print 1:1 option and “Image not drawn to size” on images that don't use the Print 1:1 option.

Image Tab

On this tab, you can set the image source and customize the image title.

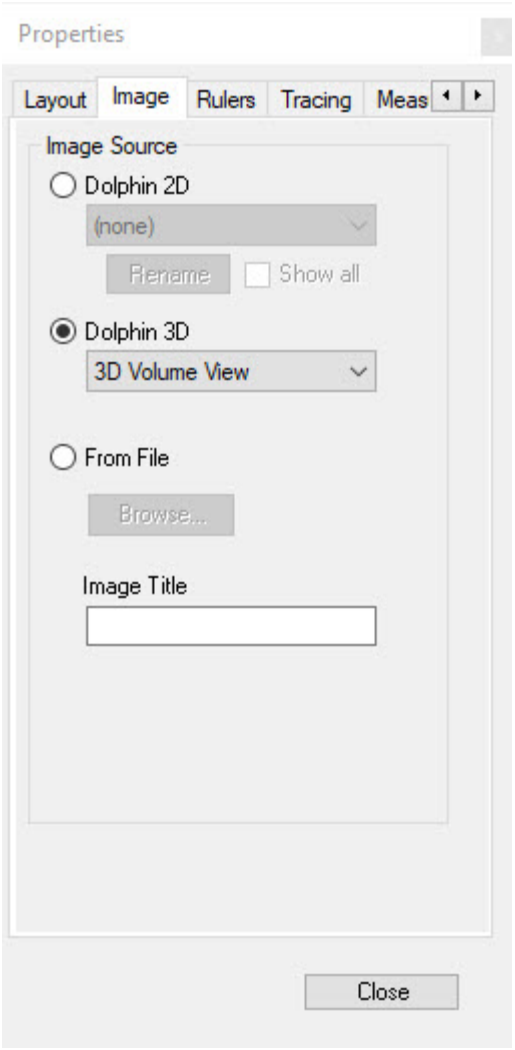


Image Source	Source of the image. **Dolphin 2D:** Loads the selected image from Dolphin 2D into this image placeholder. • **Rename:** Changes the selected image slot's name. • **Show All:** Includes all Dolphin 2D image slots in the drop-down list. Otherwise, the drop-down list only includes the 2D images that are actually available for this patient. **Dolphin 3D:** Loads the selected image from Dolphin 3D into this image placeholder. **From File:** Loads an image file from your computer (such as a logo) into this image placeholder. • **Browse...:** Navigates to an image file on your computer.
Image Title	Custom title to use instead of the title embedded in the image.

Rulers Tab

On this tab, you can set options displaying rulers on the image.

Rulers	Toggles the display of rulers on the image and sets options for the appearance of those rulers. **Left, Right, Top, and Bottom:** Displays a ruler along the specified edge of the image. **Settings...:** Set options for the appearance of the rulers (see “Ruler Settings” below).

Ruler Settings

To set ruler options:

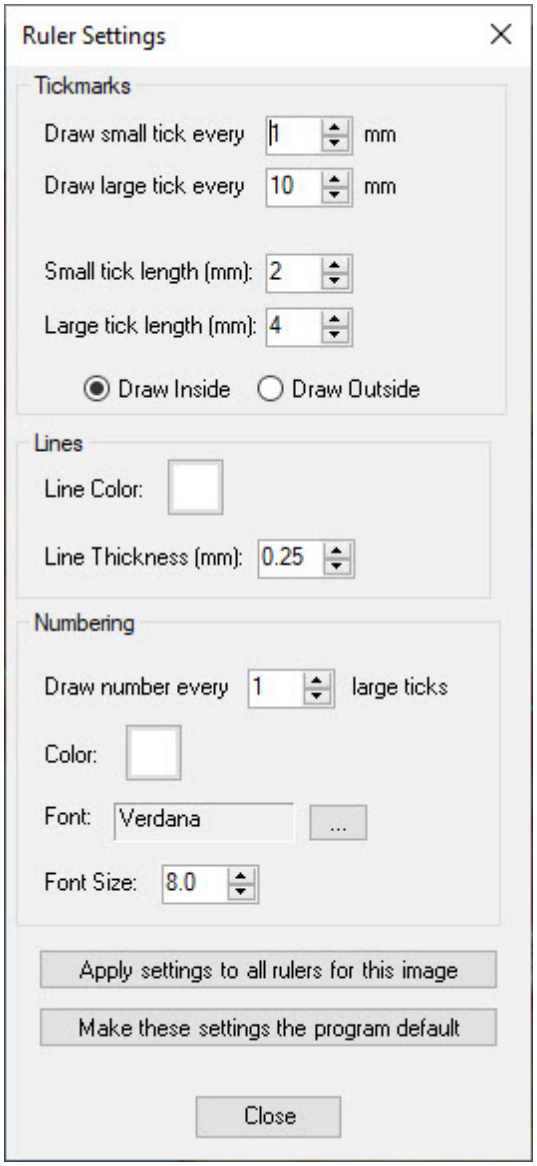
1 Check the box for the ruler to display on the image or cross sections.

2 Click **Settings...** to specify the appearance of the ruler.

The Ruler Settings dialog box opens.

3 Set any options for the appearance of the ruler.

4 Click **Close**.

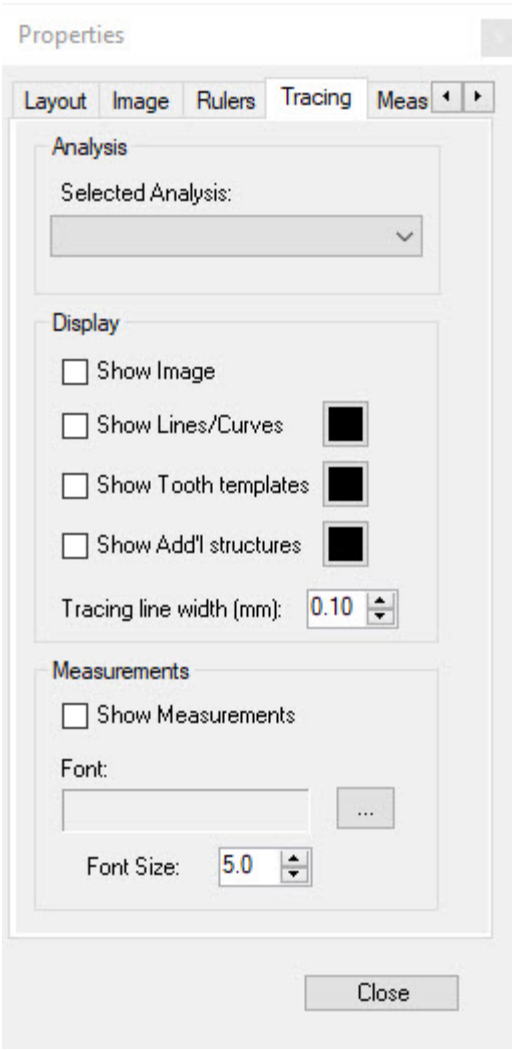


Tickmarks	Options for the appearance of tick marks on the ruler. **Draw small tick every:** Space, in millimeters (mm), between small tick marks on the ruler. **Draw large tick every:** Space, in millimeters (mm), between large tick marks on the ruler. **Small tick length (mm):** Length of the small tick marks in millimeters (mm). **Large tick length (mm):** Length of the large tick marks in millimeters (mm). **Draw Inside:** Draws the rulers inside the image or cross sections boundary. With this option, the ruler may hide some anatomy. **Draw Outside:** Draws the rulers outside the image or cross sections boundary. With this option, the ruler will not to hide any anatomy, but it may appear off the paper or be hidden by other objects.
Lines	Color and width of the tick mark lines on the ruler. **Line Color:** Color for the tick mark lines on the ruler. **Line Thickness (mm):** Thickness of the tick mark lines in millimeters (mm).

Numbering	Options for the appearance of numbers on the ruler. **Draw numbers every *n* large ticks:** Frequency of numbers on the ruler. **Color:** Color for the numbers on the ruler. **Font:** Font for the numbers on the ruler. • **...:** Opens the Font dialog box so you can change the font. For more information, see “Setting Font Options” on page 3-50. **Font Size:** Font size for the numbers on the ruler.
Apply settings to all rulers for this image	Uses these ruler settings for all rulers on this image or cross sections. Makes all rulers on the image or cross sections look identical.
Make these settings the program default	Uses these ruler settings as the defaults for all rulers on all new images or cross sections. You can override these default settings for individual rulers.

Tracing Tab

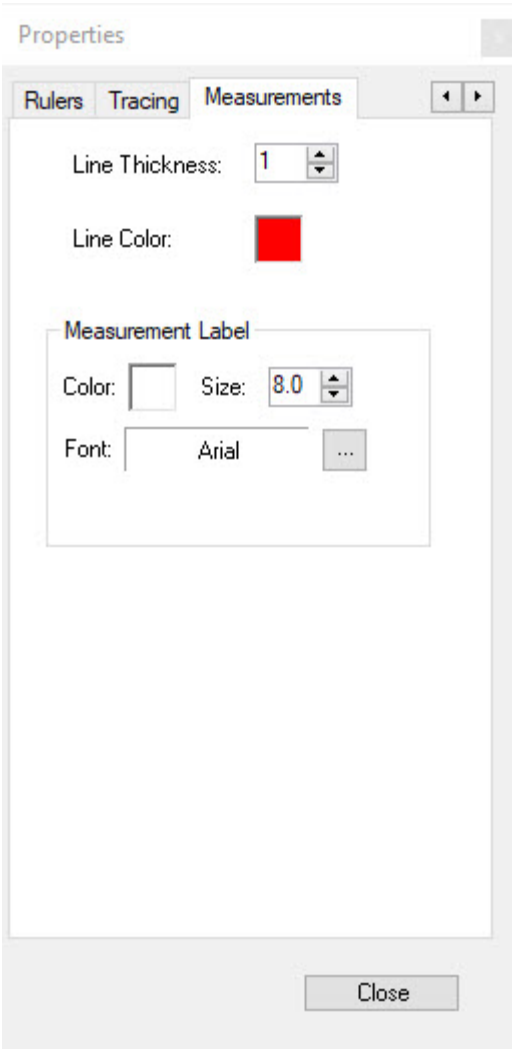
On this tab, you can set options for displaying a tracing on the image.



Selected Analysis	Analysis for which to set tracing preferences.
Display	Options for each item to display on the tracing. **Show Image:** Displays the image along with the tracing. **Show Lines/Curves:** Displays the tracing as defined in the patient's cephalometric analysis. **Show Tooth Templates:** Displays the templates for the patient's teeth. **Show Add'l Ceph Structures:** Displays the cephalometric structures. **Color Samples:** Color for the associated element. **Tracing Line Width (mm):** Width in millimeters (mm) for the tracing lines.
Measurements	Options for displaying measurements on the tracing: **Show Measurements:** Displays measurement numbers as defined in the patient's cephalometric analysis. **Font:** Displays the font selected for the measurement numbers. • **...:** Opens the Font dialog box so you can change the font. For more information, see "Setting Font Options" on page 3-50. **Font Size:** Font size for the measurement numbers.

Measurements Tab

On this tab, you can set options for displaying measurements on the image.



Line Thickness	Thickness of the measurement lines.
Line Color	Color to use for the measurement lines.
Measurements Label	Options for displaying measurement labels on the image: **Color:** Color of the label text. **Size:** Font size for the label text. **Font:** Font selected for the label text. **...:** Opens the Font dialog box so you can change the font. For more information, see “Setting Font Options” on page 3-50.

Adding Cross Sections to a Report Template

To drag and drop cross sections from the gallery to your report template:

1 Navigate to the page in your report template where the cross sections should appear.

2 Click and drag the scroll bar to the right of the image gallery until the cross sections appear.

3 Drag the cross sections from the gallery and drop it onto the page.

Or,

Drag the cross sections from the gallery and drop it into an existing cross sections placeholder on the page.

To use the tool bar or menus to add cross sections to your report template:

1 Navigate to the page in your report template where the cross sections should appear.

2 Click .

Or,

Select **Cross Sections** from the **Insert** menu.

Or,

Right-click the report page and select **Add Image Group** from the context menu.

Your cursor changes to a placeholder-drawing icon ( ).

3 Click and drag to draw a cross sections placeholder of the appropriate size for these cross sections.

4 Right-click the cross sections placeholder.

5 Select **Image Type** from the context menu. Then, select the type of cross sections (**Cross Sections**, **Left Cross Sections**, or **Right Cross Sections**) to use from the sub-menu.

You can also set the image type for a placeholder by setting its properties. For more information, see “Setting Image Properties” on page 29-19.

6 Click .

Or,

Select **Load from Image Gallery** from the **Edit** menu

If cross sections of the specified type are in the Image Gallery, they appear in the placeholder. If the gallery contains more than one set of cross sections of the appropriate type for an empty placeholder, the most recently added set is used. Slice images are always rendered 1:1 according to the image resolution.

If no cross sections of the specified type are in the Image Gallery, the placeholder remains empty.

Later, you can add cross sections of that type to the gallery and click to place them in the placeholder.

Displaying a Series of Slices

The Dolphin 3D Report Editor enables you to display a series of slices by selecting the starting slice and specifying the number of slices to display.

To specify a series of slices to display:

1 Right-click the cross sections on the report page, and select **Pick Starting Slice** from the context menu.

2 From the sub-menu, select the number of the first slice in the series to display.

The slice you picked appears in the upper left of the cross sections series followed by as many of the remaining slices from the series as can fit within the cross sections placeholder's current dimensions without cropping any slice. To limit the number of slices to display or format them differently, see “Formatting the Slices” on page 29-29.

Displaying a Collection of Slices

The Dolphin 3D Report Editor enables you to select individual slices from a cross sections series to display as a collection.

To pick the slices to display:

1 Right-click the cross sections on the report page, and select **Pick Slices...** from the context menu.

A dialog box opens where you can pick slices.

2 Pick the slices to display.

Click individual slices to toggle whether they are selected or deselected. Selected slices are outlined in blue. Deselected slices are outlined in red.

3 Click **OK**.

The cross sections placeholder displays as many selected slices as can fit within its current dimensions without cropping any slice. To format the display differently, see “Formatting the Slices” on page 29-29.

+	Zooms in on the slice images.
-	Zooms out on the slice images.
Select All	Selects all the slices in the series,
Deselect All	Deselects all the slices in the cross sections series.
Toggle Selected	Changes the selection status for all the slices in the cross sections series, selecting those that were deselected and deselecting those that were selected.

Formatting the Slices

To set formatting options for cross sections:

1 Right-click the cross sections on the report page, and select **Properties** from the context menu.

Or,

Double-click the cross sections.

The Properties dialog box opens. For more information on the properties you can set, see “Setting Cross Sections Properties” on page 29-32.

To show as many slices as possible within the cross sections placeholder's current dimensions without cropping any slice:

1 In the Layout group box on the **General** tab, select **No cropping**.

To specify the number of rows and columns:

1 In the Layout group box on the **General** tab, select **Define rows and columns**.

2 Set the number of rows and columns for the cross sections so that the placeholder can accommodate only the slices that should appear.

Setting the number of rows and columns may cause the slices to be cropped.

3 If the slices are cropped, resize the placeholder to display more of the slice images (see “Resizing Objects” on page 29-46).

Or,

SHIFT+click and drag a slice to select the part of each slice to display.

To toggle the slices between ascending and descending order:

1 Right-click the cross sections on the report page, and select **Reverse Slice Order** from the context menu.

Splitting a Cross Sections Series

You can easily split a cross sections series across two pages in your report template. The Dolphin 3D Report Editor creates a new page to contain the second half of the series of cross sections.

To split a cross sections series:

1 Right-click the cross sections on the report page, and select **Split** from the context menu.

2 Select **Copy entire page layout** from the sub-menu to create a new page with the second half of the cross sections series, along with copies of all the objects on the page.

Or,

Select **Exclude non-group images** from the sub-menu to create a new page with the second half of the cross sections series, along with any labels and logos on the page.

For a particular text label, you can specify whether to include it during a split.

To omit a text label during a cross sections split:

1 Right-click the text label placeholder, and select **Can delete during group split** from the context menu.

Displaying a Cross-Section Ruler

The cross-sections or nerve canals x-ray view can include a ruler that indicates the size and locations of the slice images.

To toggle display of the cross-sections ruler:

1 Right-click the image.

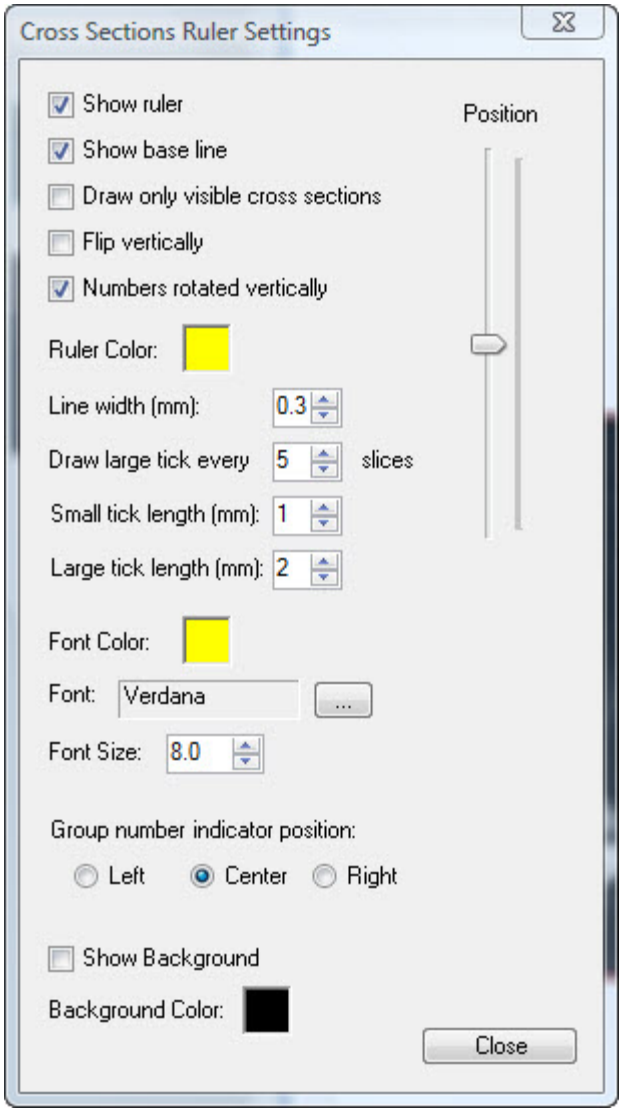
2 Select **Show Cross Sections Ruler** from the context menu.

To set properties for the cross-sections ruler:

1 Right-click the panoramic image.

2 Select **Cross Sections Ruler Properties** from the context menu.

3 Set any properties for the ruler. Then, click **Close**.



Show Ruler	Displays the ruler on the panoramic image.
Position	Sets the vertical location of the ruler on the panoramic image.
Show base line	Displays the ruler's horizontal base line.
Draw only visible cross sections	Limits the cross sections indicated on the ruler to those appearing in the report. For example, if the report only includes the first five out of ten cross-section images, the ruler on the panoramic image only shows those first five cross sections. For more information, see “Displaying a Series of Slices” on page 29-27 and “Displaying a Collection of Slices” on page 29-27.
Flip vertically	Flips the ruler 180 degrees vertically.
Numbers rotated vertically	Rotates the numbers on the ruler by 90 degrees.
Ruler Color	Color for the ruler.
Line width (mm)	Width of ruler's base line and tick marks.

Draw large tick every *n* slices	Number of slices between large tick marks on the ruler.
Small tick length (mm)	Length of the small tick marks in millimeters (mm).
Large tick length (mm)	Length of the large tick marks in millimeters (mm).
Font Color	Color for the numbers on the ruler.
Font	Font for the numbers on the ruler. **...:** Opens the Font dialog box so you can change the font. For more information, see “Setting Font Options” on page 3-50.
Font Size	Font size for the numbers on the ruler.
Group number indicator position	Location in relation to the ruler for the number that identifies the cross-section group when there is more than one.
Show Background	Uses a background color to set off the ruler.
Background Color	Color for the background.

Setting Cross Sections Properties

By setting cross sections properties, you can specify the following information:

- General options for formatting the cross sections
- Options for image labels
- Options displaying rulers on the cross sections

To set cross sections properties:

1 Right-click the cross sections on the report page, and select **Properties** from the context menu.

Or,

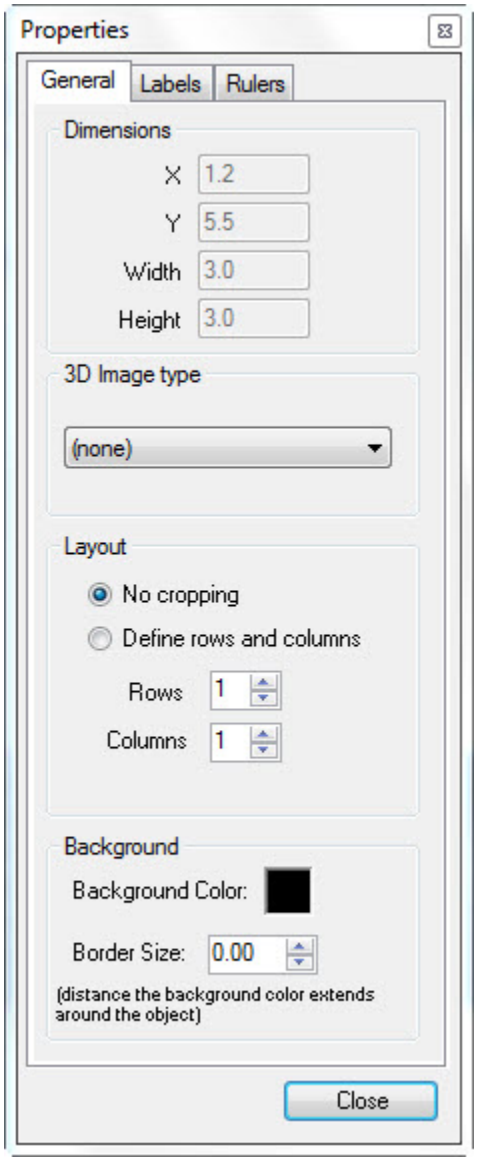
Double-click the cross sections.

2 Click a tab, and set any options on that tab.

3 When you finish setting properties, click **Close**.

General Tab

On this tab, you can view and set general options that determine the formatting of cross sections on the report template.



Dimensions	Current position, height, and width of the cross sections. **X:** Horizontal distance, in inches, from the left side of the cross sections to the left side of the page. **Y:** Vertical distance, in inches, from the top of the cross sections to the top of the page. **Width:** Width of the cross sections in inches. **Height:** Height of the cross sections in inches.
3D Image Type	Type of cross sections to load into this placeholder.
Layout	Options for displaying the cross sections: **No cropping:** Displays as many slices as possible within the placeholder's current dimensions without cropping any slice. **Define rows and columns:** Displays the cross sections in the specified number of rows and columns. Some slices may be cropped if the space allotted for each slice is less than its actual size. If the space allotted for each slice is larger than its actual size, there will be blank space between the slices. If selecting this option causes the slices to be cropped, SHIFT+click and drag a slice to select the part of each slice to display. This may enable you to fit more slices on a page while still displaying the relevant anatomy. • **Rows:** Number of rows to allot for the cross sections. • **Columns:** Number of columns to allot for the cross sections.
Background	**Background Color:** Color of the cross sections' background. **Border Size:** Width in millimeters (mm) of the border of background color to use around the cross sections.

Labels Tab

On this tab, you can set options for the labeling slices.

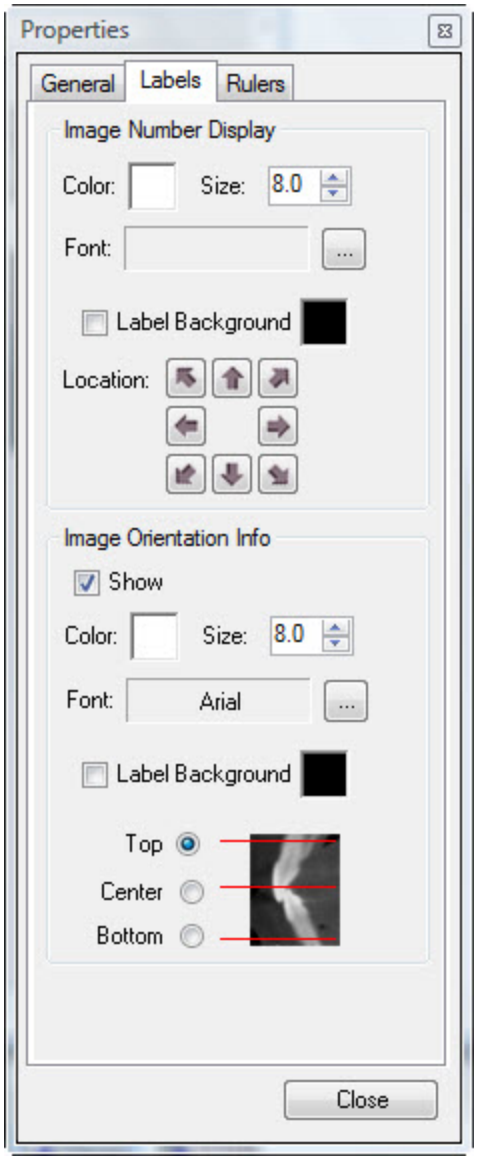


Image Number Display	Options for slice number labels. **Color:** Color of the slice numbers. **Size:** Font size for the slice numbers. **Font:** Font selected for the slice numbers. • **...:** Opens the Font dialog box so you can change the font. For more information, see “Setting Font Options” on page 3-50. **Label Background:** Uses a background color to set off the slice numbers. **Location:** Location for the slice numbers.
Image Orientation	Options for displaying image orientation information labels (usually “L”’ for lingual or “B”’ for buccal). **Show:** Displays image orientation information labels. **Color:** Color for the labels. **Font:** Font selected for the labels. • **...:** Opens the Font dialog box so you can change the font. For more information, see “Setting Font Options” on page 3-50. **Label Background:** Uses a background color to set off the labels. **Top:** Places the labels at the top of the slice images. **Center:** Places the labels at the center of the slice images. **Bottom:** Places the labels at the bottom of the slice images.

Rulers Tab

On this tab, you can set options for displaying rulers on the cross sections.

Rulers	Toggles the display of rulers and sets options for their appearance. **Left, Right, Top, and Bottom:** Displays a ruler along the specified edge of the cross sections. **Settings...:** Set options for the appearance of the rulers (see “Ruler Settings” on page 29-22). **Each Slice:** Displays a ruler on each slice. **Whole group:** Displays rulers on the cross sections series as a whole.

Enhancing Images

After adding images or cross sections to a report template, you can enhance them, if needed. If you enhance cross sections, the enhancements are applied to all images in the series.

To enhance an image or cross sections:

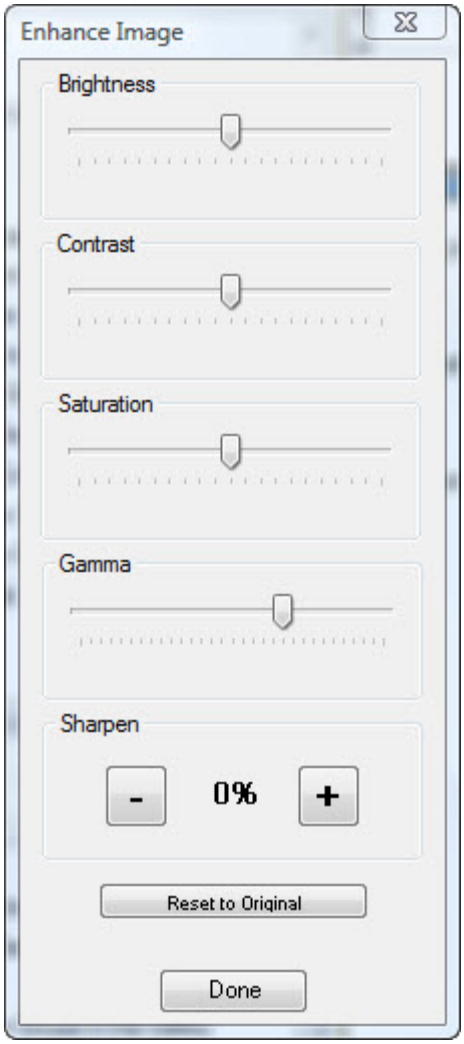
1 Select **Enhance Selected Image(s)...** from the **Edit** menu.

Or,

Right-click the image or cross sections. Then, select **Enhance...** from the context menu.

The Enhance Image dialog box opens.

2 Set enhancement options. Then, click **Done**.



Brightness	Sets the brightness of the image.
Contrast	Sets the light/dark contrast of the image.
Saturation	Sets the color saturation of the image.
Gamma	Sets the light/dark contrast of the image.
Sharpen	Sets the sharpness of the image. **+:** Increases the sharpness of the image. **-:** Decreases the sharpness of the image.
Reset to Original	Undoes all enhancement operations.

Using Measurements Tables

If you have digitized cephalometric landmarks for the patient in Dolphin 2D, you can add the measurements table to a report. Once you have added the measurements table, you can set properties for it, such as the analysis for which to display measurements.

To add just the measurements table:

1 Navigate to the page in your report template where the measurements table should appear.

2 Select **Measurements Table** from the **Insert** menu.

Your cursor changes to a placeholder-drawing icon ( ).

3 Click and drag to draw a placeholder of the appropriate size for this measurements table.

To add a measurements table linked to an image:

1 Add the 2D Digitized Lateral Ceph or 2D Digitized Frontal Ceph image to your report.

For more information, see “Adding an Image to a Report Template” on page 29-16.

2 Select **Measurements Table** from the **Insert** menu.

Your cursor changes to a placeholder-drawing icon ( ).

3 Click and drag to draw a placeholder of the appropriate size for this measurements table.

The measurements table is automatically linked to the Digitized Ceph image.

To set display options for the measurements table:

1 Right-click the measurements table, and select **Analysis** from the context menu. Then, select the analysis for which to display measurements from the sub-menu

Or,

Right-click the measurements table, and select **Show Wiggle-gram** from the context menu to display deviations from the norms graphically using a line.

Or,

Right-click the measurements table, and select **Show Values** from the context menu to display deviations from the norms numerically.

Alternatively, you can set these options on the Properties dialog box.

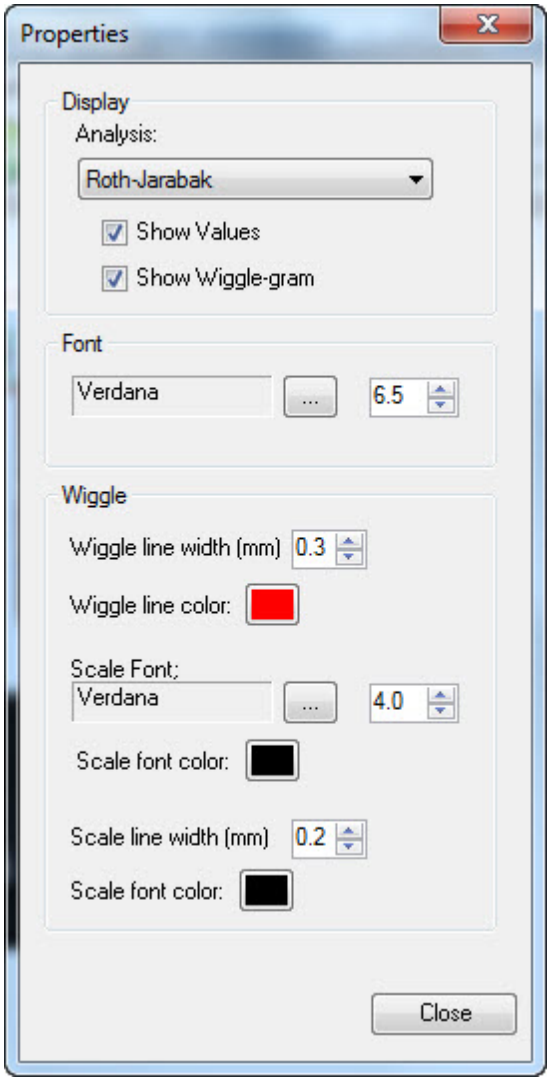
To set properties for the measurements table:

1 Right-click the measurements table, and select **Analysis** from the context menu.

Or,

Double-click the measurements table.

2 Set any options for the table. Then, click **Close**.



Display	Options for how the table should appear. **Analysis:** Analysis for which to display measurements. **Show Values:** Displays deviations from the norms numerically. **Show Wiggle-gram:** Displays deviations from the norms graphically using a line.
Font	Font for the measurement numbers. • **...:** Opens the Font dialog box so you can change the font. For more information, see “Setting Font Options” on page 3-50. • **spinner:** Sets the font size.
Wiggle	Options for displaying the wiggle-gram: **Wiggle line width (mm):** Line width for the wiggle-gram. **Wiggle line color:** Color of the wiggle-gram line. **Scale Font:** Font for the wiggle-gram scale. • **...:** Opens the Font dialog box so you can change the font. For more information, see “Setting Font Options” on page 3-50. • **spinner:** Sets the font size. **Scale font Color:** Color of the wiggle-gram scale. **Scale line width:** Line width to use for the wiggle-gram scale **Scale font color:** Color of the wiggle-gram scale line.

Using Text Labels

With text labels, you can add static text to your report templates and you can pull in data from the current patient's record, such as the patient's name and age. You can also add other variable information such as the page number or print date.

To add a text label:

1 Navigate to the page in your report template where the text label should appear.

2 Click .

Or,

Click . Then, select **Text**.

Or,

Select **Label** from the **Insert** menu.

Or,

Right-click the report page, and select **Add Label** from the context menu.

Your cursor changes to a label-drawing icon ( ).

3 Click and drag to draw a text label placeholder of the appropriate size.

4 Double-click the text label placeholder.

Or,

Right-click the text label placeholder, and select **Properties** from the context menu.

The Properties dialog box opens.

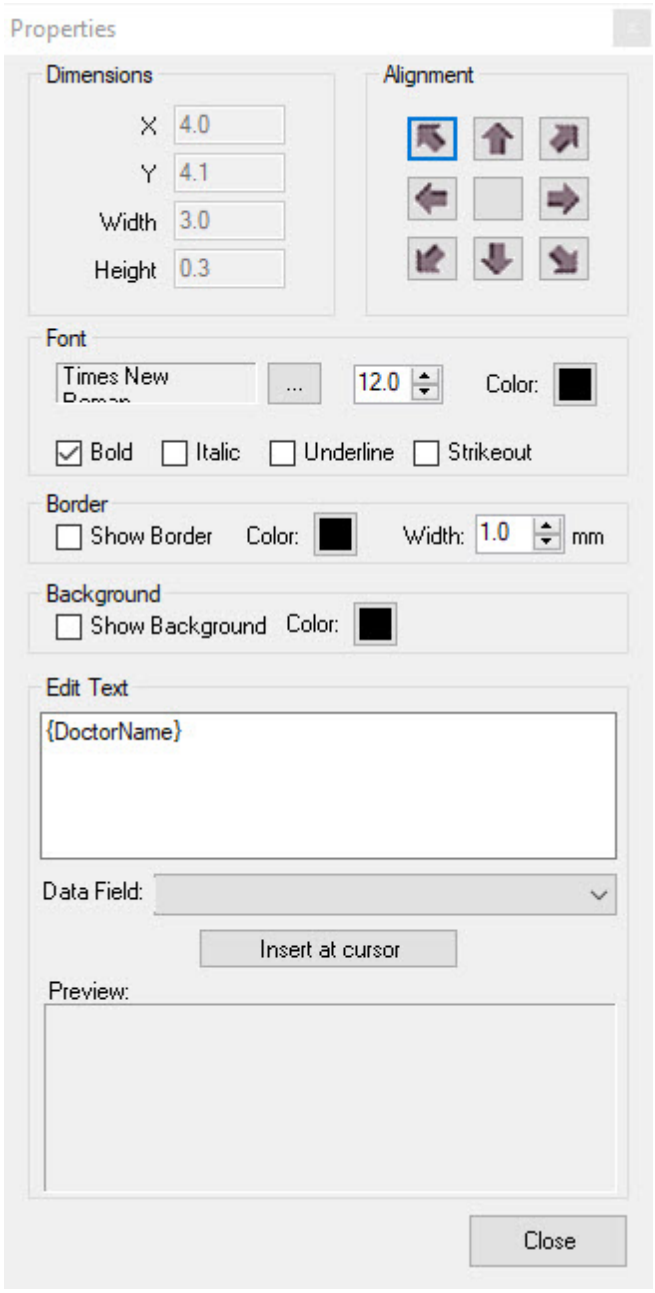
5 (Optional) Enter any static text or this label in the **Edit Text** field.

6 (Optional) In the **Edit Text** field, place the cursor where you want to insert data from the patient record or other variable information (such as the date). Then, select a data field from the **Data Field** drop-down list, and click **Insert at cursor** to insert that data field at the current cursor location.

The Preview box shows the text that will appear for this text label when the selected data fields are replaced with the appropriate data.

Note: *If one or more data fields in a label reference data in a patient's record (such as the patient's name, age, or doctor) or data specific to a particular image (such as the image title or analysis), you need to link the label to a patient image so that the data fields can be replaced by the appropriate information. For more information, see "Linking Labels to an Image" on page 29-42.*

7 Set any other properties for the text label. Then, click **Close**.



Dimensions	Current position, height, and width of the text label. **X:** Horizontal distance, in inches, from the left side of the text label to the left side of the page. **Y:** Vertical distance, in inches, from the top of the text label to the top of the page. **Width:** Width of the text label in inches. **Height:** Height of the text label in inches.
Alignment	Alignment for the text label within its placeholder.

Font	Font options for the text label. **field:** Displays the font selected for the text label. **...:** Opens the Font dialog box so you can change the font. For more information, see “Setting Font Options” on page 3-50. **spinner:** Sets the font size. **Color:** Color of the text. **Bold:** Uses boldface for the text label. **Italic:** Uses italics for the text label. **Underline:** Underlines the text label. **Strikeout:** Strikes out the text label.
Border	Options for placing a border around the text label. **Show Border:** Displays a border around the text label. **Border Color:** Color of the text label border. **Width:** Width of the border in millimeters (mm).
Background	Options for using a background color to set off the label. **Show Background:** Uses a background color. **Color:** Color to use.
Edit Text	Text options for this text label. **field:** Text for this label. **Data Field:** Data field from the patient record or other variable data. **Insert at cursor:** Inserts the selected data field at the current cursor position in the field. **Preview:** Previews the appearance of this text label when the data fields are replaced with the appropriate data.

Showing and Hiding Labels

To toggle display of all text labels:

1 Select **Show Labels** from the **View** menu to show all the text labels.

Or,

Select **Hide Labels** from the **View** menu to hide all the text labels.

Hiding labels is useful, for example, to hide patient information for privacy reasons.

Aligning Text in Label Placeholders

To set the horizontal alignment of the text in a label placeholder:

1 Right-click the text label.

2 Select **Horizontal Alignment** from the context menu.

3 Select **Left** from the sub-menu to align the text to the left.

Or,

Select **Center** from the sub-menu to align the text in the center.

Or,

Select **Right** from the sub-menu to align the text to the right.

To set the vertical alignment of the text in a label placeholder:

1 Right-click the text label.

2 Select **Vertical Alignment** from the context menu.

3 Select **Top** from the sub-menu to align the text on the top.

Or,

Select **Center** from the sub-menu to align the text in the center.

Or,

Select **Bottom** from the sub-menu to align the text on the bottom.

Linking Labels to an Image

If one or more data fields in a label reference data in a patient's record (such as the patient's name, age, or doctor) or data specific to a particular image (such as the image title or analysis), you need to link the label to a patient image so that the data fields can be replaced by the appropriate information. You can link more than one text label to a particular image in a single step.

To link one or more text labels to an image:

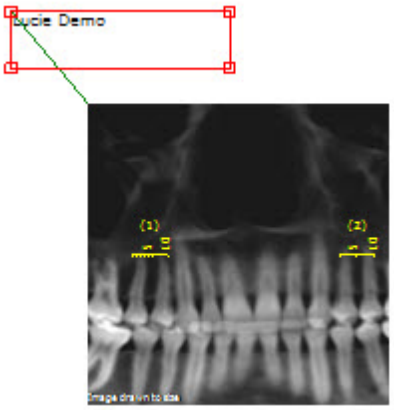
1 Click an object to select it. Then, CTRL+click other objects to select them as well.

You can select several text labels, but only one image.

Note: *If you select a label that is already linked to an image, the existing link will be replaced by the new link you are creating.*

2 Select **Link Labels to Image** from the **Tools** menu.

A line appears between each text label and the image.



To remove the link between one or more text labels and an image:

1 Click the text label to unlink.

2 Optionally, CTRL+click other text labels to select them as well.

3 Select **Unlink Labels from Image** from the **Tools** menu.

Using Annotations

With annotations, you can add lines, arrows, ellipses, and rectangles to your report templates. You can also add text labels as described in “Using Text Labels” on page 29-39.

Adding a Line

To add a line:

1 Click . Then, select **Line**.

Your cursor changes to a drawing icon ( ).

2 Click and drag to draw the line.

You can set the line's color, thickness, or style (solid, dashed, or dashed-dotted) by setting its properties. For more information, see “Setting Annotation Properties” on page 29-46.

To make the line horizontal or vertical and lock it that way:

1 Right-click the line, and select **Lock Orientation** from the context menu.

2 Select **Horizontal** from the sub-menu to lock the line in a horizontal orientation.

Or,

Select **Vertical** from the sub-menu to lock the line in a vertical orientation.

At this point, you can move the line and it will stay in its locked orientation.

Adding an Arrow

To add an arrow:

1 Click . Then, select **Arrow**.

Your cursor changes to a drawing icon ( ).

2 Click and drag to draw the arrow.

You can set the arrow's color, thickness, style (solid, dashed, or dashed-dotted), and arrowhead characteristics by setting its properties. For more information, see “Setting Annotation Properties” on page 29-46.

To make the arrow horizontal or vertical and lock it that way:

1 Right-click the arrow, and select **Lock Orientation** from the context menu.

2 Select **Horizontal** from the sub-menu to lock the arrow in a horizontal orientation.

Or,

Select **Vertical** from the sub-menu to lock the arrow in a vertical orientation.

At this point, you can move the arrow and it will stay in its locked orientation.

Adding an Ellipse

To add an ellipse:

1 Click . Then, select **Ellipse**.

Your cursor changes to a drawing icon ( ).

2 Click and drag to draw the ellipse.

You can set the ellipse's line color, thickness, or style (solid, dashed, or dashed-dotted) by setting its properties. For more information, see “Setting Annotation Properties” on page 29-46.

Adding a Rectangle

To add a rectangle:

1 Click . Then, select **Rectangle**.

Your cursor changes to a drawing icon ( ).

2 Click and drag to draw the rectangle.

You can set the rectangle's line color, thickness, or style (solid, dashed, or dashed-dotted) by setting its properties. For more information, see “Setting Annotation Properties” on page 29-46.

Changing an Annotation's Shape

To change the shape of an annotation:

1 Right-click the annotation.

2 Select **Shape** from the context menu. Then, select the shape from the sub-menu.

You can also change an annotation's shape by setting its properties (see “Setting Annotation Properties” below).

Setting Annotation Properties

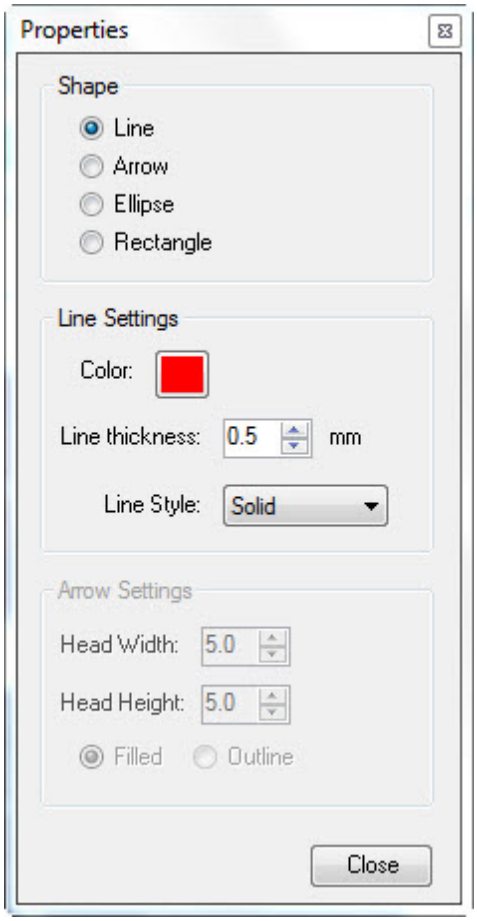
Once you have drawn a line, arrow, ellipse, or rectangle, you can set its properties to specify the line color, thickness, or style (solid, dashed, or dashed-dotted). In the case of arrows, you also can set the arrowhead characteristics.

To set annotation properties:

1 Double-click the annotation.

The Properties dialog box opens.

2 Set any properties for the annotation. Then, click **Close**.



Shape	Annotation shape (line, arrow, ellipse, or rectangle).
Line Settings	Options for the line or lines used to draw the annotation. **Color:** Color of the annotation line or lines. **Thickness:** Width of the line or lines in millimeters (mm). **Line Style:** Line style (solid, dashed, or dashed-dotted).
Arrow Settings	Arrowhead characteristics. Only available for arrows. **Head Width:** Width of the arrowhead in millimeters (mm). **Head Length:** Length of the arrowhead in millimeters (mm). **Filled:** Used solid arrowhead. **Outline:** Uses an arrowhead outline.

Resizing Objects

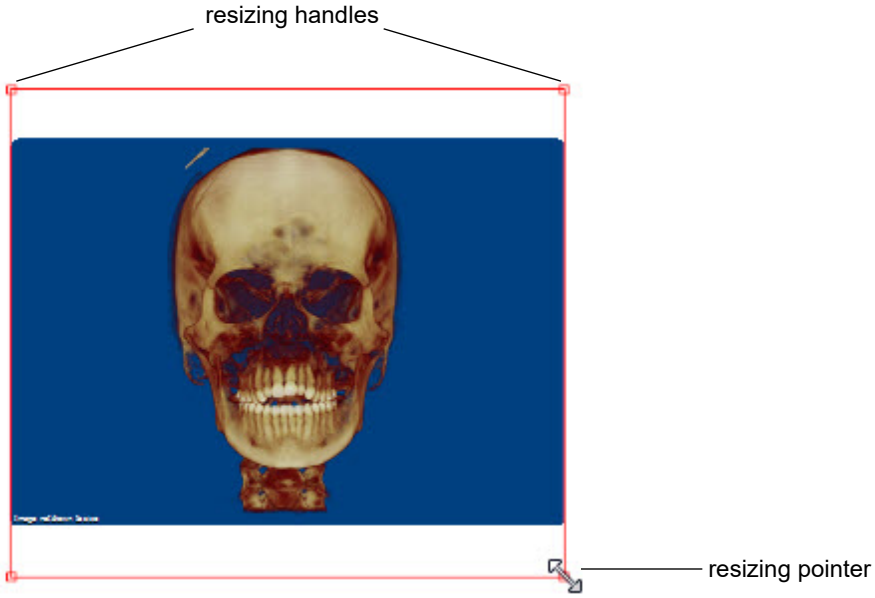
To resize a single object, you can click and drag its resizing handles as described in “Using the Resizing Handles” below, or you can set its properties (see “Using Text Labels” on page 29-39, “Setting Image Properties” on page 29-19, “Setting Cross Sections Properties” on page 29-32, and “Setting Annotation Properties” on page 29-46). You also can set several objects to be the same size.

Using the Resizing Handles

To resize an object using the resizing handles:

1 Click and drag one of the resizing handles to resize the object.

When you place your mouse pointer over a resizing handle, the pointer turns into a double-headed arrow. The figure below illustrates the resizing handles and pointer.



Note: *You can also use the object properties to specify the size of an object. For more information, see "Using Text Labels" on page 29-39, "Setting Image Properties" on page 29-19, "Setting Cross Sections Properties" on page 29-32, and "Setting Annotation Properties" on page 29-46.*

Making Several Objects the Same Size

To make several objects the same size:

1 Click the object to which you want to resize other objects.

2 CTRL+click the other objects that you want to resize.

These objects will be resized to match the first object you selected.

3 Click to make the objects the same width.

Or,

Select **Make Same Size** from the **Format** menu. Then, select **Width** from the sub-menu to make the objects the same width.

Or,

Click to make the objects the same height.

Or,

Select **Make Same Size** from the **Format** menu. Then, select **Height** from the sub-menu to make the objects the same height.

Or,

Click to make the objects the same width and height.

Or,

Select **Make Same Size** from the **Format** menu. Then, select **Both** from the sub-menu to make the objects the same width and height.

Repositioning Objects

To reposition objects, you can click and drag them, align them with each other, center them on the page, or set the spacing between them. You can also reposition a single object by setting its properties (see “Using Text Labels” on page 29-39, “Setting Image Properties” on page 29-19, “Setting Cross Sections Properties” on page 29-32, and “Setting Annotation Properties” on page 29-46).

You also can change the layering of objects to control how they overlap.

Clicking and Dragging Objects

To move a single object:

1 Click and drag the object to a new position in the report template.

Note: *You can also use the object properties to specify the location of an object. For more information, see “Using Text Labels” on page 29-39, “Setting Image Properties” on page 29-19, “Setting Cross Sections Properties” on page 29-32, and “Setting Annotation Properties” on page 29-46.*

To move several objects:

1 Click one of the objects to select it. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects in this report template.

2 Click and drag the objects to a new position in the report template.

Aligning Objects

You can align several objects with each other or with the page margins.

To align two or more objects:

1 Click object to which you want to align other objects.

2 CTRL+click the other objects that you want to align to the first object you selected.

3 Click to align the left sides of the objects.

Or,

Select **Align** from the **Format** menu. Then, select **Left** from the sub-menu to align the left sides of the objects.

Or,

Click to align the right sides of the objects.

Or,

Select **Align** from the **Format** menu. Then, select **Right** from the sub-menu to align the right sides of the objects.

Or,

Click to align the tops of the objects.

Or,

Select **Align** from the **Format** menu. Then, select **Top** from the sub-menu to align the tops of the objects.

Or,

Click to align the bottoms of the objects.

Or,

Select **Align** from the Format menu. Then, select **Bottom** from the sub-menu to align the bottoms of the objects.

To align objects to the page margin:

1 Click the object that you want to align to the page margin.

2 Optionally, CTRL+click the other objects that you want to move when aligning the first-selected object to the page margin.

If you select more than one object, the objects retain their placement relative to each other when the object selected first is aligned to the margin.

3 Select **Snap To** from the **Format** menu.

4 Select **Margin**, then select **Left**, **Right**, **Top**, or **Bottom** to align to that page margin.

Or,

Select **Printer Hard Margin**. Then, select **Left**, **Right**, **Top**, or **Bottom** to align to that printer hard margin.

If you have specified a printer on the Page Setup dialog box (see “Setting Up the Page” on page 17-12), the hard margins specify how close to the paper edge the specified printer can print. Otherwise, the hard margins are at the paper edges.

Centering Objects

You can center one or more objects horizontally or vertically.

To center objects:

1 Click an object that you want to center.

Or,

Click an object that you want to center. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects.

2 Select **Center** from the **Format** menu.

3 Select **Horizontally** from the sub-menu to center horizontally.

Or,

Select **Vertically** from the sub-menu to center vertically.

Changing Object Spacing

You can change the spacing of objects either horizontally or vertically.

To change the horizontal spacing of several objects:

1 Click and drag to select several adjacent objects.

Or,

Click one of the objects to select it. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects.

2 Select **Horizontal Spacing** from the **Format** menu.

3 Select **Make Equal** to space the selected objects evenly.

Or,

Select **Increase** to increase the space between the selected objects.

Or,

Select **Decrease** to decrease the space between the selected objects.

Or,

Select **Remove** to remove the space between the selected objects.

To change the vertical spacing of several objects:

1 Click and drag to select several adjacent objects.

Or,

Click one of the objects to select it. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects.

2 Select **Vertical Spacing** from the **Format** menu.

3 Select **Make Equal** to space the selected objects evenly.

Or,

Select **Increase** to increase the space between the selected objects.

Or,

Select **Decrease** to decrease the space between the selected objects.

Or,

Select **Remove** to remove the space between the selected objects.

Changing Object Layering

You can change the layering of objects to control how they overlap.

To change the layering of objects:

1 Click the object to move to the front or back.

2 Select **Order** from the **Format** menu.

3 Select **Bring to Front** from the sub-menu to bring the selected object to the front.

Or,

Select **Send to Back** to send the selected object to the back.

Deleting Objects

You can delete a single object, or you can delete several objects simultaneously.

To delete a single object:

1 Click an object, and click .

Or,

Right-click an object, and select **Delete** from the context menu to delete it.

Or,

Click an object to select it. Then, press DEL on your keyboard.

Or,

Click an object to select it. Then, select **Delete** from the **Edit** menu.

A dialog box opens asking you to confirm the deletion.

2 Click **Yes** to delete the object.

To delete several objects:

1 Click and drag to select several adjacent objects.

Or,

Click one of the objects to select it. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects.

2 Click .

Or,

Select **Delete** from the **Edit** menu.

Or,

Press DEL on your keyboard.

A dialog box opens asking you to confirm the deletion.

3 Click **Yes** to delete the selected objects.

Cutting, Copying, and Pasting Objects

You can cut or copy one or more objects to the clipboard. Then, you can paste them elsewhere in your design.

To cut or copy objects to the clipboard:

1 Click an object to select it.

Or,

Click and drag to select several adjacent objects.

Or,

Click one of the objects to select it. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects.

2 Select **Cut** from the **Edit** menu to cut the objects to the clipboard, removing them from their present locations.

Or,

Select **Copy** from the **Edit** menu to copy the objects to the clipboard, leaving them in their present locations.

To paste objects from the clipboard:

1 Select **Paste** from the **Edit** menu to paste the objects from the clipboard into the current location.

Using Object Groups

Grouping objects enables you to combine several objects into a single object. Then, you can use the objects in the group as a unit, or save the object group for later reuse.

Grouping and Ungrouping Objects

To group several objects:

1 Click and drag to select several adjacent objects.

Or,

Click one of the objects to select it. Then, CTRL+click other objects to select them as well.

Or,

Select **Select All** from the **Edit** menu to select all objects.

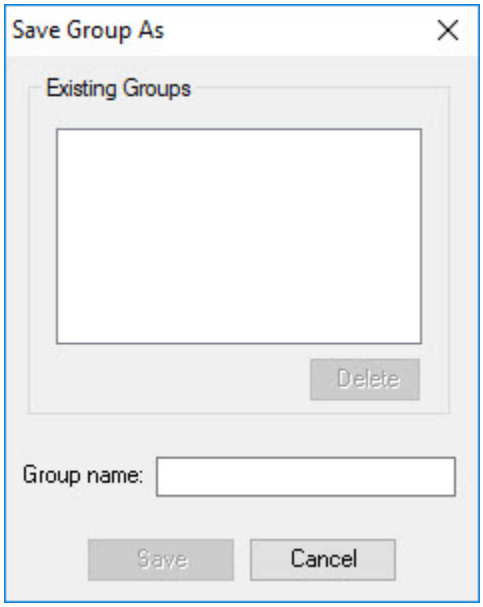
2 Select **Group Objects** from the **Groups** menu.

To ungroup the objects in an object group:

1 Click one of the objects in the object group to select the group.

2 Select **Ungroup Objects** from the **Groups** menu.

Saving Object Groups



To save an object group for later reuse:

1 Click one of the objects in the object group to select the group.

2 Select **Save Group As...** from the **Groups menu**.

The **Save Group As** dialog box opens.

3 Enter a name for this object group in the **Group name** field.

Or,

Select an object group from the **Existing Groups** list to overwrite an existing object group.

4 Click **Save**.

5 If you are overwriting an existing group, click **Yes** on the confirmation dialog box that appears.

Existing Groups	Lists existing object groups.
Delete	Deletes the object group selected in the **Existing Groups** list.
Group name	Name to use when saving this object group.
Save	Saves the object group.

Inserting Saved Object Groups

To insert a previously saved object group into your design:

1 Select **Insert Group** from the **Groups** menu.

Or,

Select **Group** from the **Insert** menu.

2 Select the object group to insert from the sub-menu.

Deleting Saved Object Groups

To delete a previously saved object group:

1 Click an object group.

2 Select **Save Group As...** from the **Groups** menu.

The Save Group As dialog box opens.

3 Select the object group to delete from the **Existing Groups** list.

4 Click **Delete**.

Locking and Unlocking Objects

Locking objects prevents them from being moved or resized, avoiding accidental misalignment of images. You can still drag images or cross sections from the Image Gallery to a locked placeholder or change a locked object's properties.

To lock one or more objects:

1 Click an unlocked object to select it.

Or,

Click and drag to select several adjacent unlocked objects.

Or,

Click one of the unlocked objects to select it. Then, CTRL+click other unlocked objects to select them as well.

2 Click .

Or,

Right-click and select **Locked** from the context menu.

To unlock one or more objects:

1 Click a locked object to select it.

Or,

Click and drag to select several adjacent locked objects.

Or,

Click one of the locked objects to select it. Then, CTRL+click other locked objects to select them as well.

When you select a locked object, the tool bar button has a blue outline as follows: .

2 Click .

Or,

Right-click and select **Locked** from the context menu.

Setting Options

You can set options for all your report templates and for the Dolphin 3D Report Editor itself.

To set options:

1 Select **Options...** from the **Tools** menu.

The Options dialog box opens. This dialog box offers the following tabs:

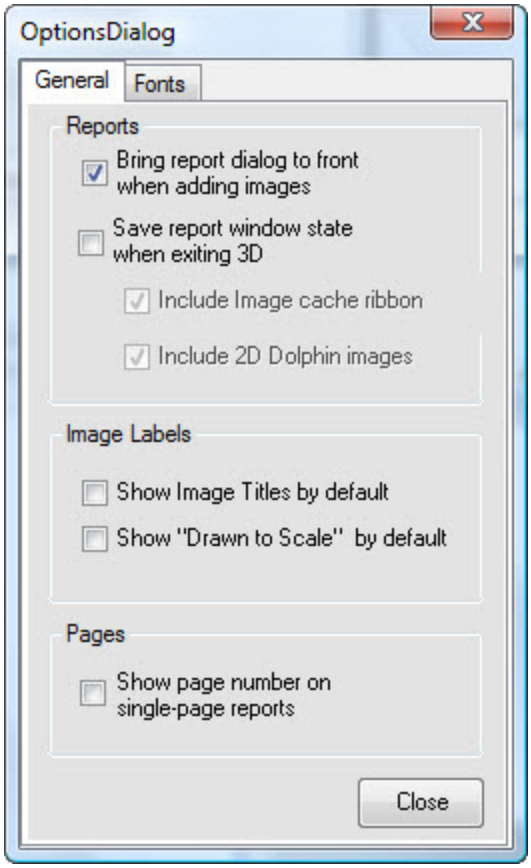
General	General options for the behavior of the Dolphin 3D Report Editor along with image and page options for all reports. For more information, see “General Tab” below.
Fonts	Default fonts to use on all reports. For more information, see “Fonts Tab” on page 29-58.

2 Click any tab to set options on it.

3 Close the dialog box when you finish setting options.

General Tab

On this tab, you can specify general options for the behavior of the Dolphin 3D Report Editor and set image and page options for all reports.



Bring report dialog to front when adding images	Opens the Dolphin 3D Report Editor window or restores it from the system tray every time you send an image to it.
Save report window state when exiting 3D	Saves the state of the Dolphin 3D Report Editor window when you exit Dolphin 3D so that it returns to that state the next time you use it. **Include Image cache ribbon:** Saves the Dolphin 3D images in the Image Gallery when saving the Dolphin 3D Report Editor window's state. **Include 2D Dolphin images:** Saves the Dolphin 2D images in the Image Gallery when saving the Dolphin 3D Report Editor window's state.
Show Image Titles by default	Displays image titles on all images by default. You also can toggle the display of image titles for all images in a report by selecting Image Titles from the **View** menu (see “Displaying Image Titles” on page 29-19) or for a single image by setting its properties (see “Setting Image Properties” on page 29-19).

Show "Drawn to Scale" by default	Displays "Image drawn to size" on images using the Print 1:1 option and "Image not drawn to size" on images that don't use the Print 1:1 option by default on all images. You can specify whether to show these labels for individual images by setting their properties (see "Setting Image Properties" on page 29-19).
Show page number on single-page reports	Displays a page number even if a report is only one page long.

Fonts Tab

On this tab, you can specify default fonts.

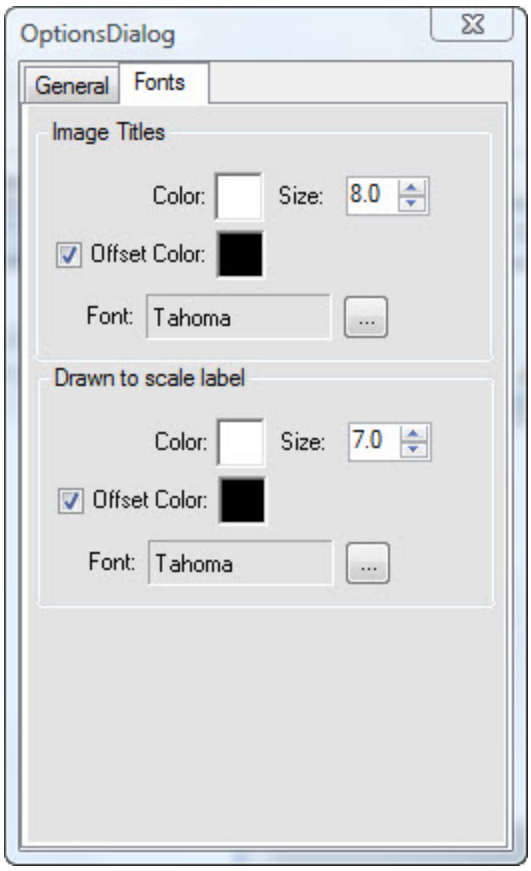


Image Titles	Font options for the titles that can appear on images. **Color:** Color for the image titles. **Size:** Font size for the image titles. **Offset Color:** Uses a background color to set off the image titles. **Font:** Font selected for the image titles. • **...:** Opens the Font dialog box so you can change the font. For more information, see "Setting Font Options" on page 3-50. • **spinner:** Sets the font size.
Drawn to scale label	Font options for the "Image drawn to size" and "Image not drawn to size" labels that can appear on images. **Color:** Color for these labels. **Size:** Font size for these labels. **Offset Color:** Uses a background color to set off these labels. **Font:** Font selected for these labels. • **...:** Opens the Font dialog box so you can change the font. For more information, see "Setting Font Options" on page 3-50. • **spinner:** Sets the font size.

Printing Reports

To print a report:

1 Click .

Or,

Select **Print** from the **File** menu.

The Print dialog box is displayed.

2 Select any printing options, and click **OK**.

You can preset printers for individual report pages, so that different pages in a single report can be sent to different printers. For example, you can send pages with x-rays to one type of printer and pages with photographs and images of the volume to another while still maintaining the numbering of the pages. For information on presetting printers for report pages, see “Setting Up the Page” on page 17-12.

To print a report, directing pages to preset printers if appropriate:

1 Select **Print to preset printer(s)** from the **File** menu.

To suppress printing of a page:

1 Click the page in the page gallery that you want to suppress.

The icon appears on the page to indicate that the page will not print when you print the report.

To remove printing suppression for a page:

1 Click a page with the icon to print it when you print the report.

Or,

Right-click a page with a icon. Then, select **Include Page in Printout** from the context menu.

Saving Reports to Image Layouts

To save the current report into an image layout:

1 Select **Save Report to Dolphin 2D...** from the **File** menu.

A dialog box opens where you can select the image layout and slot in which to save the report.

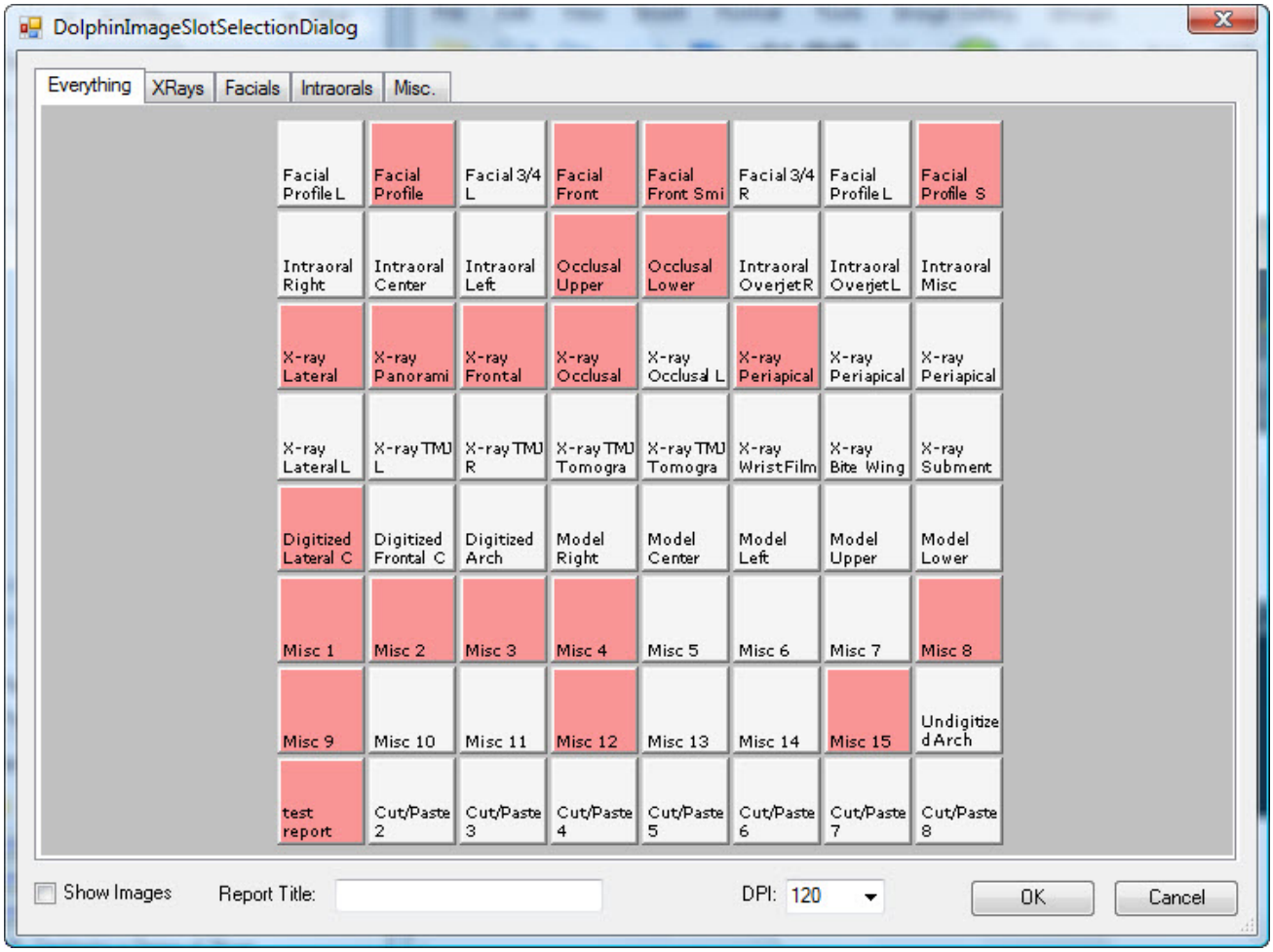
2 Select the tab for the image layout to which to save the report.

3 Select the image slot in which to save the report.

4 Enter a title for the report in the **Report Title** field.

5 Specify any other options. Then, click **OK**.

The current report, including all images and patient information, is saved into the selected image slot.



tabs	Layouts into which you can save the report.
Image Layout	Layout into which you can save the report into it.
Show Images	Displays the images stored in slots that are already in use. When this box is not checked, used slots appear in pink.
Report Title	Title for this report.
DPI	Resolution for this report as a number of Dots Per Inch (DPI).

Exporting a Report Page as an Image

To export a page to an image file:

1 Select **Export Page to Image...** from the **File** menu.

The Save Page to Image File dialog box opens.

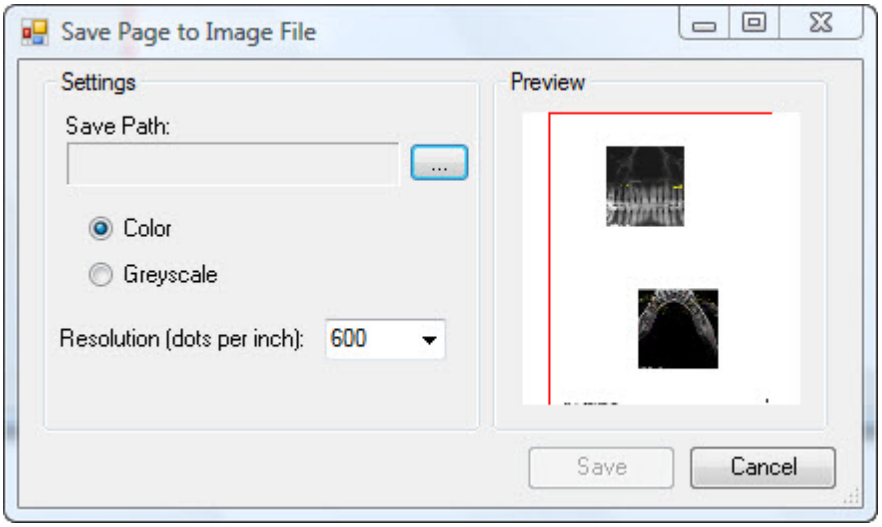
2 Click the button labeled **...**.

The **Save As** dialog box opens.

3 Specify the image file in which to save the current page.

4 Optionally, select the type of image (**JPEG**, **PNG**, or **bitmap**) from the **Save As Type** drop-down list. Then, click **Save**.

5 Set any other options on the Save Page to Image File dialog box. Then, click **Save**.



Save Path	Image file in which to save the current page. **...:** Browse to the file.
Color	Saves this page as a color image.
Greyscale	Saves this page as a gray scale image.
Resolution (dots per inch)	Resolution for this page as a number of Dots Per Inch (DPI).
Preview	Preview of the page you are exporting.

30 Orthognathic Surgical Planning (Medical Device)

The Dolphin 3D Orthognathic Surgical Planning module enables you to plan surgery using the patient's 3D volume and present the resulting plan to both the referring doctor and to the patient. Creating surgery plans with this tool enables you to simulate all aspects of the surgical process and outcome on both the hard and soft tissue. For presentation purposes, you can compare “before” and “after” surgery side by side using a three dimensional representation of the patient.

Using your surgery plan, you can design splints for any phase of treatment. You can design splints based on a surgery plan you have created from the patient’s 3D volume or from a 3D scan of the patient’s arch models (without having a 3D scan of the patient). Then, you can create industry-standard STL files[1] to be printed by the regulatory-cleared printing process of your choice.

Note: *The Orthognathic Surgical Planning feature is meant to assist dental clinicians and trained assisting staff in treatment planning. The results of this process should not be used as the primary source of patient evaluation and should be verified by other independent methods.*

Starting Orthognathic Surgical Planning

To create a surgery simulation, you need a volume representation of the area affected by the surgery. You also need a panoramic x-ray view created from the volume (see “Building a Panoramic X-ray” on page 21-13).

For greatest accuracy in the dentition, you may also want to overlay model arch surfaces over the teeth in the volume (see “Working With Arch Model Surfaces” on page 19-83). For the most realistic surgery simulation, and especially for case presentation purposes, you may want to superimpose the patient's 2D or 3D photo over the volume (see “Working with 2D Photos” on page 19-67 or “Working with 3D Photos” on page 19-56).

To start orthognathic surgical planning:

1 On the Dolphin 3D window, click

.

Or,

Select **Orthognathic Surgical Planning...** from the **Tools** menu.

1. Additional fees may apply.

2 From the sub-menu, select **Restore Last Saved Workup...** to resume work on the last workup you saved to your Dolphin database.

Or,

Select **Restore From**, then select a saved workup from the sub-menu to resume work on one of the workups you saved to your Dolphin database.

Or,

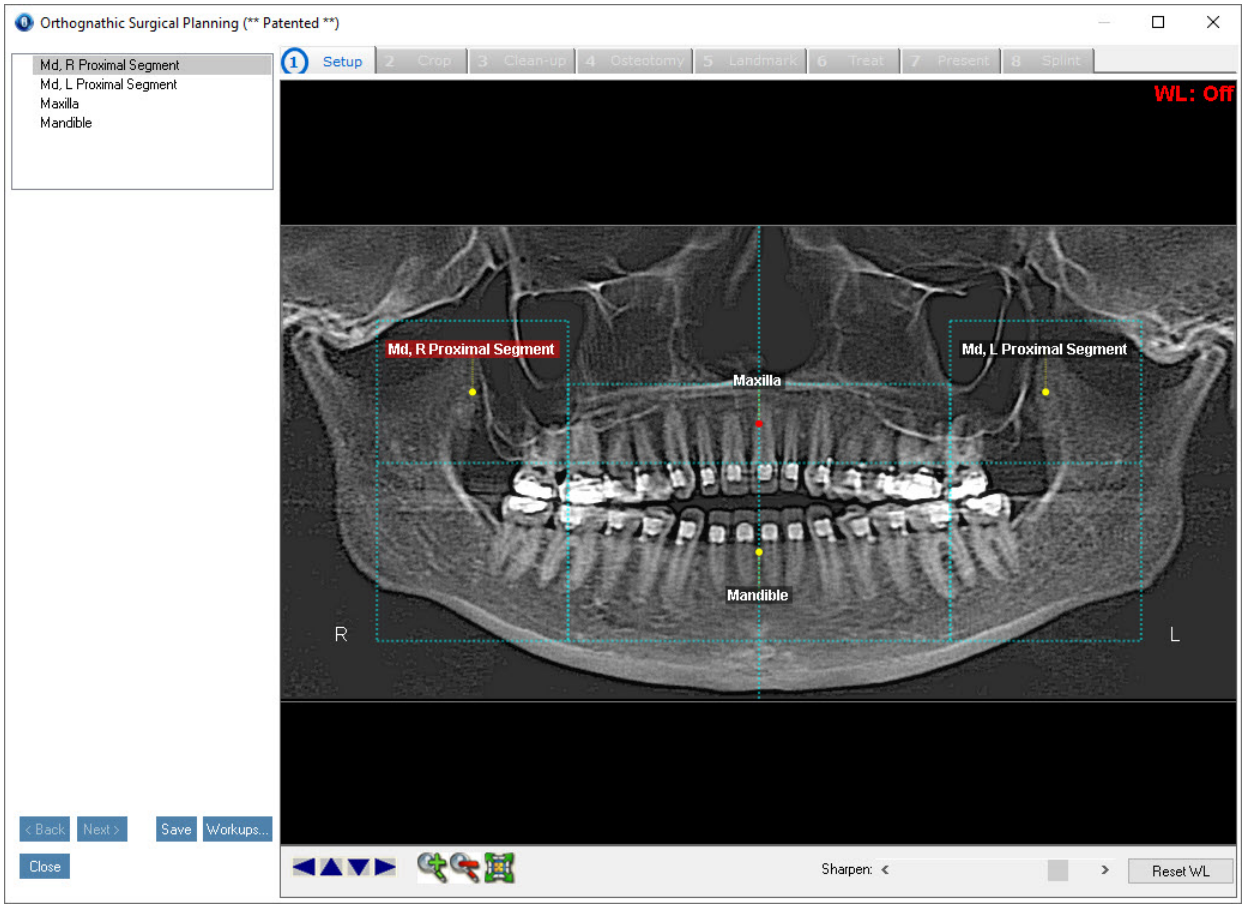
Select **Start New Workup...** to start a new orthognathic surgical planning workup for this patient.

As part of your surgical planning process, you can create and store up to five independent workups for each patient and timepoint.

If you have existing segmented surfaces stored in STL files, you can use them as a starting point for a new orthognathic surgical planning workup for this patient. For more information, see “Using an Externally Segmented Maxilla and Mandible” on page 30-139.

You can also access the Digital Splints/Guides Fabrication for Arch Models feature from this sub menu. For more information, see “Designing Splints From Arch Models” on page 30-143.

The following figure illustrates the Orthognathic Surgical Planning window.



The Orthognathic Surgical Planning window uses tabs to divide the 3D surgery simulation process into several steps.

1 Setup	Locate the major areas involved in the surgery using the patient's panoramic x-ray. For more information, see “Step 1: Setup” on page 30-5.
2 Crop	Locate the major areas involved in the surgery using the volume and create a surface representation of each area. For more information, see “Step 2: Crop” on page 30-7.
3 Clean-up	Clean up the surface representations of the maxilla and mandible to remove any extraneous information, such as braces. Optionally, superimpose high-resolution model arch surfaces. For more information, see “Step 3: Clean-up” on page 30-10.
4 Osteotomy	Plan the cuts for one or more osteotomies. You can simulate cuts to the maxilla, proximal segments of the mandible, and anterior mandible. For more information, see “Step 4: Osteotomy” on page 30-19.
5 Landmark	Digitize landmarks so that Dolphin Imaging can track the movements of the osteotomy segments in later steps of the 3D surgery planning process. For more information, see “Step 5: Landmarks” on page 30-76.
6 Treat	Enter the information necessary to simulate the planned surgical treatment. For more information, see “Step 6: Treat” on page 30-80.
7 Present	Review and present the surgical treatment plan. For more information, see “Step 7: Present” on page 30-118.
8 Splint	Generate intermediate and final surgical splints. For more information, see “Step 8: Splint” on page 30-125.

The following options appear on all tabs of the Orthognathic Surgical Planning window.

< Back	Go back to the previous surgical treatment planning step.
Next >	Go on to the next surgical treatment planning step.
Save	Save your work in the Dolphin database. For more information, see “Saving a Workup” on page 30-137.
Workups...	Opens a menu for managing your orthognathic surgical workups for this patient. As part of your surgical planning process, you can create and store up to five independent workups for each patient and timepoint. **Save Orthognathic Surgical Workup:** Saves your current workup into the selected slot. **Restore Orthognathic Surgical Workup:** Loads a previously saved workup. **Edit Orthognathic Surgical Workup Description:** Edit the description of a workup slot. **Remove Orthognathic Surgical Workup:** Removes the workup stored in the selected slot. For more information, see “Starting Orthognathic Surgical Planning” on page 30-1 and “Managing Surgical Workups” on page 30-137.
Close	Closes the Orthognathic Surgical Planning window.

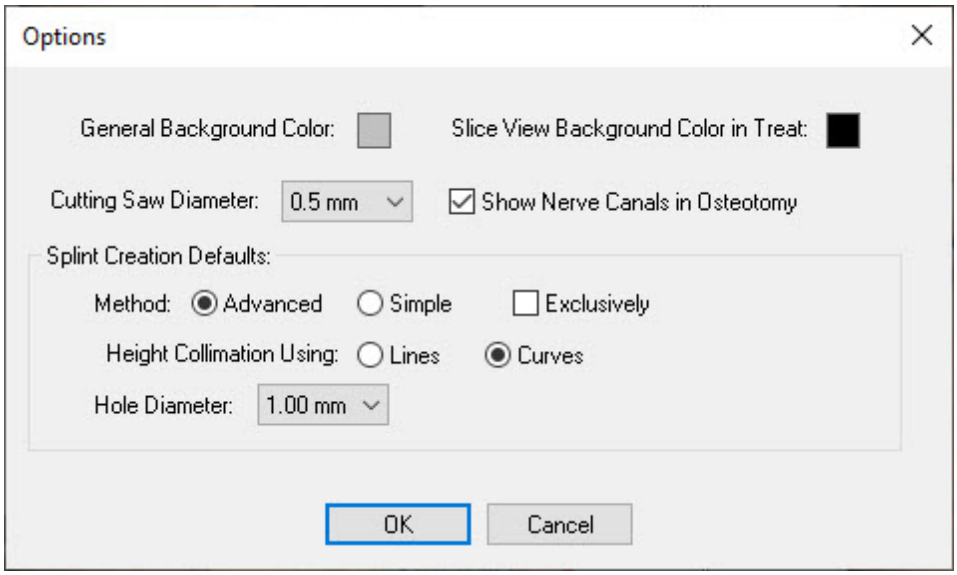
Setting Options

Most 3D surgery tabs have an **Options** button that you can use to specify the window background color, the diameter of the cutting saw, whether to display nerve canals, and default options for creating splints.

To set these options:

1 Click **Options...**.

2 Set the options. Then, click **OK**.



General Background Color	Color for the window background for views other than slice views.
Slice View Background Color in Treat	Color for the window background when in a slice view. For more information on viewing slices, see “Standard Slice Views” on page 19-38.
Cutting Saw Diameter	Cutting saw diameter (0.5 mm by default).
Show Nerve Canals in Osteotomy	Displays the nerve canals on the images used to simulate osteotomies.

Splint Creation Defaults	Default options for Step 8: Splint. **Method:** Default method for splint creation. • **Advanced:** Recommended method, which enables creation of splints with variable height thicknesses along the arches, rounded edges (including the back ends), and small holes along the arches. • **Simple:** Older method of creating splints, which you can use if you have splints created before Dolphin Imaging version 11.9. • **Exclusively:** Use the default method exclusively, meaning that the splint creation method can't be changed on Step 8: Splint. **Height Collimation Using:** Default option for contouring the splint. • **Lines:** Use lines to contour the splint. • **Curves:** Use curves to contour the splint. **Hole Diameter:** Default diameter for holes in the splint.

Step 1: Setup

The first step in the surgery planning process is to locate the major areas that will be involved in the surgery using the patient's panoramic x-ray. When you initially open this tab, it shows the patient's panoramic x-ray with boxes drawn in the approximate locations of the maxilla, the mandible, and right and left proximal segments of the mandible.

To specify the locations of the maxilla, the mandible, and right and left proximal segments of the mandible:

1 Click and drag the edges of the boxes on the patient's panoramic x-ray so that they encompass each of the areas involved in the surgery.

2 When you have a box properly drawn around one of the areas, click and slightly drag the dot associated with that area's name on the panoramic x-ray.

This associates the area name with the boxed-in location. When an area has been properly identified on the x-ray, a green check mark appears next to the area's name in the list in the upper left of the window.

3 When you've drawn boxes around all four areas and associated them with the appropriate names, click **Save**.

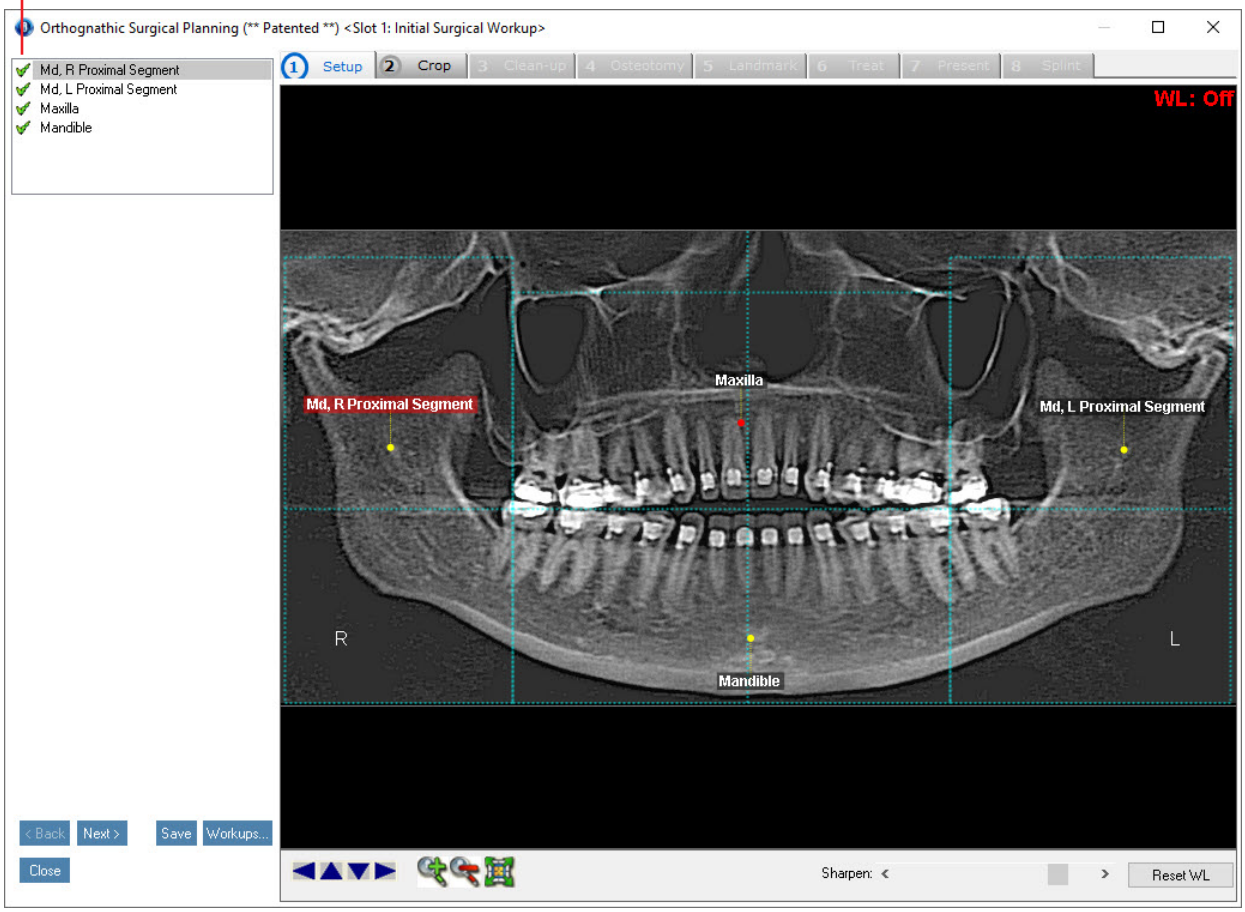
4 Select the slot in which to save this workup.

5 Enter a description for this workup, and click **OK**.

This description will be used as the name of the selected workup slot so that you can easily identify this workup later.

6 Click **Next >**.

A green check mark indicates that the segment is associated with a box on the x-ray



The following options are specific to this tab. For information on the options that appear on all tabs in this window, see “Starting Orthognathic Surgical Planning” on page 30-1.

list	Areas that the surgery can involve. Pick an area in this list to perform surgery planning for that area.
Sharpen	Sharpens the image.
Reset WL	Sets the window leveling to the default setting. For more information, see “Setting Window Leveling” on page 21-48.

For information on the arrow buttons and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Step 2: Crop

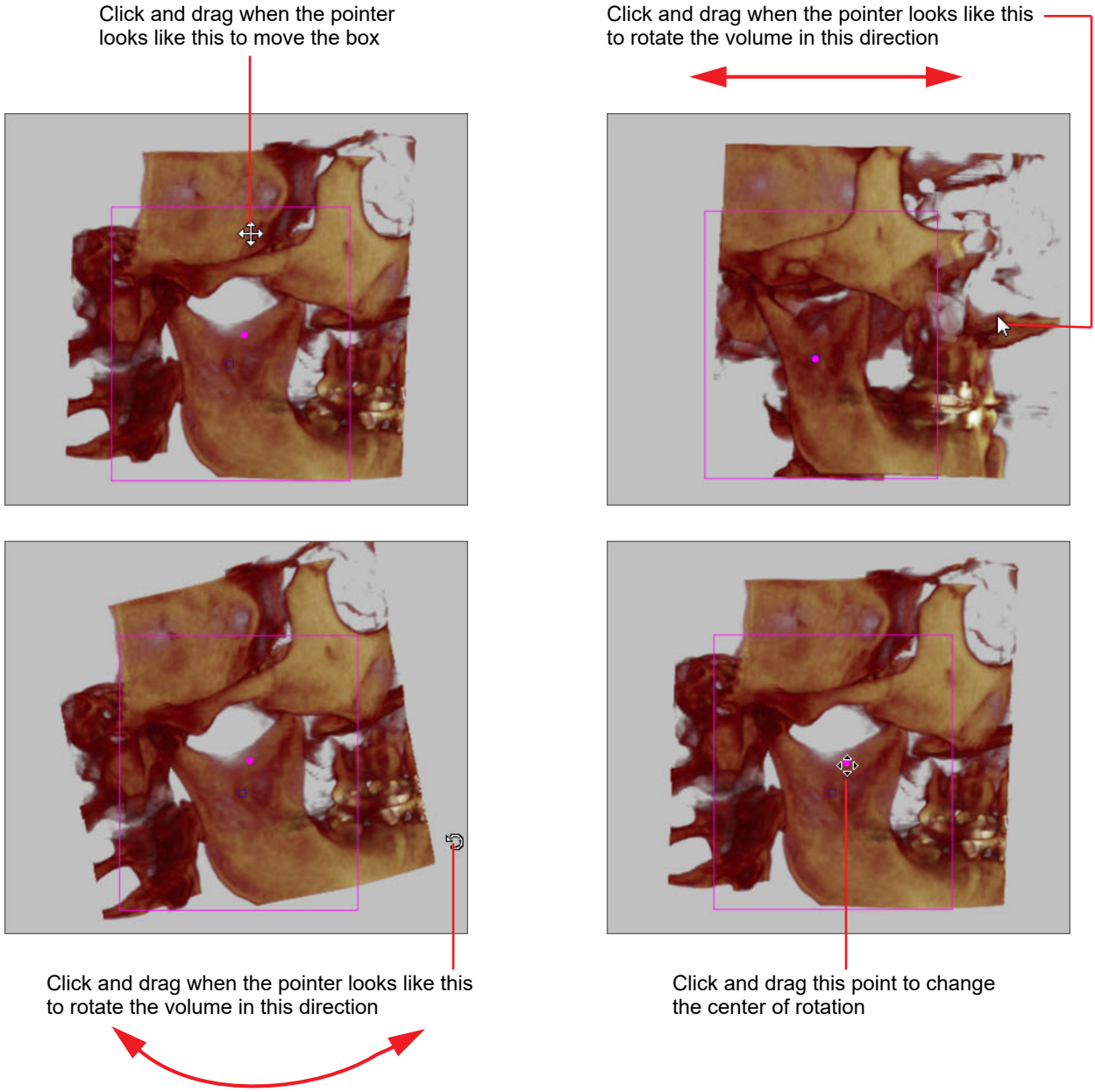
In this step, you locate the major areas that will be involved in the surgery using the volume and create surface representations of them.

To create a surface representation of an area:

1 In the list in the upper left, click the area for which to create a surface if it isn't already selected.

2 Using the two translucent views, place the boxes so that they encompass the selected area.

Click and drag a box to reposition it. Click and drag the edges of a box to change its size or shape. Click and drag outside the box to rotate the image. Click and drag the dot to change the center of rotation.



You can also zoom in by clicking **Zoom Fit**.

You can use the sliders below each pane to change the view of the volume in that pane, which may help you identify the structures that should be included in each area. The Solid view in the lower-left pane shows the part of the volume currently selected.

3 Adjust the **Seg** slider below the **Solid** view in the lower-left pane so that the image appears slightly "noisy" or "fuzzy."

This ensures that the surface you create will include as much bone as possible.

4 When you have the area properly selected, click **Apply Now!** to create the surface.

The surface appears in the lower-right pane, and a check mark appears beside the name of this area in the list in the upper left of the window.

When you are working with the mandible, a context menu appears with options for including or excluding the proximal segments.

5 When you are working with the mandible, select **Add Proximal segments (lengthier process)** to add the proximal segments to the surface you are creating.

Or,

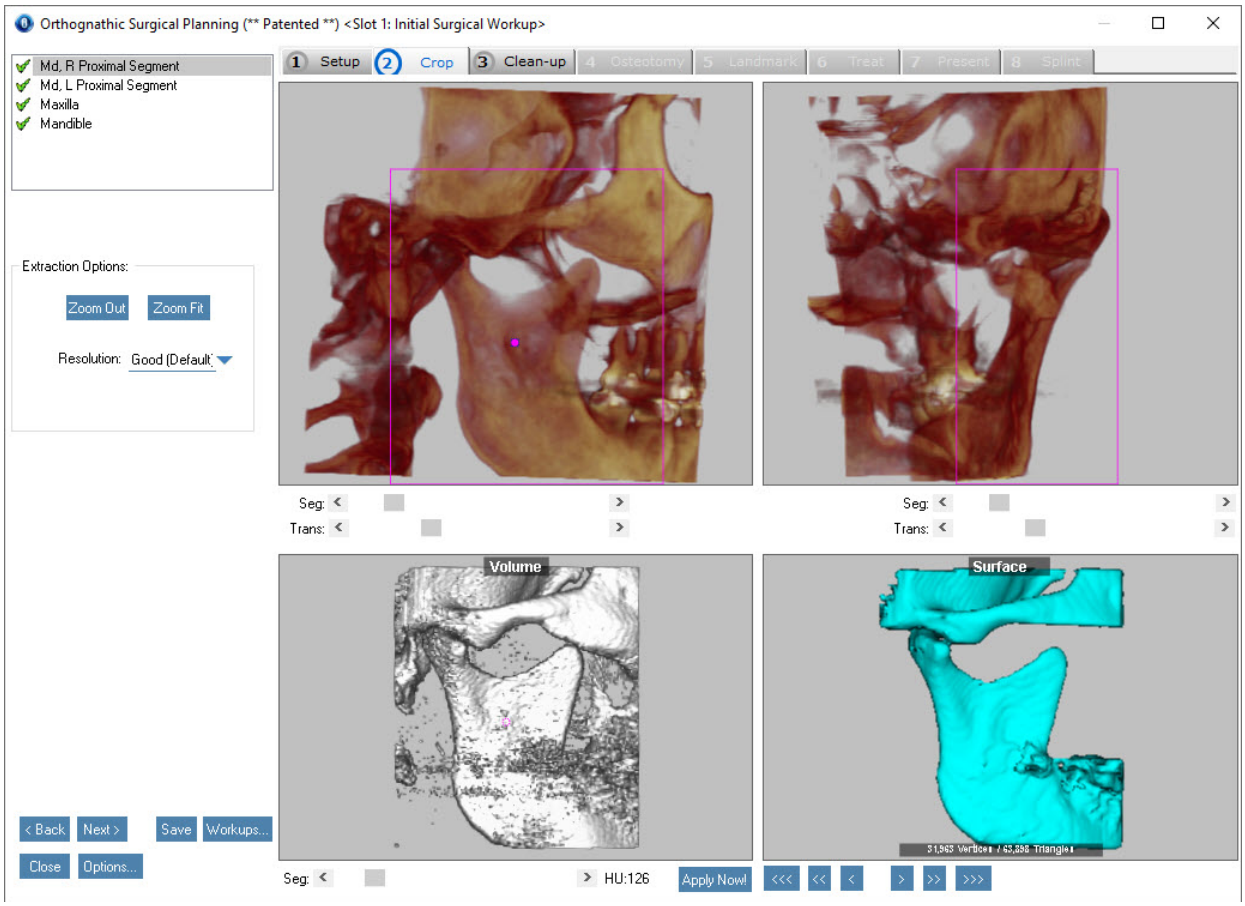
Select **Do Not Add Proximal Segments** to omit the proximal segments from the surface you are creating.

If you chose to add the proximal segments, the surfaces you have previously created for the left and right proximal segments are added to the mandible when the surface is created.

6 Click **Save**.

To go on to the next step:

1 Click **Next >** when you finish creating surface representations of all four areas.



The following options are specific to this tab. For information on the options that appear on all tabs in this window, see “Starting Orthognathic Surgical Planning” on page 30-1.

list	Areas that the surgery can involve. Pick an area in this list to perform surgery planning for that area.
Zoom Out	Zooms back out after you have clicked **Zoom Fit**.
Zoom Fit	Magnifies the translucent images so that the boxed-in areas take up most of the panes.
Resolution	Image resolution, either Good (the default) or Full, to use when rendering the images.
Limit Vertices to (near)	Number of surface vertices created when creating the surface at full resolution. Only Available when **Full** is selected as the resolution. This feature enables you to have greater control over the resolution of the created surface and any export files created from it. 1 million is the default number of surface vertices created. ***Note:*** *If you limit the number of vertices, there is the potential for error in the created surface shape. For this reason, you should visually examine the created surface to make sure if it matches the shape of the volume.*
Options...	Specify the window background color, the diameter of the cutting saw, and to display nerve canals, and default options for creating splints. For more information, see “Setting Options” on page 30-4.

Seg	Sets the segment of the volume used for the image.
Trans	Sets the transparency of the image.
Apply Now!	Creates a surface using your current selections.
<<<, <<, <, >, >>, >>>	Fine-tune the created surface by changing the segmentation in the lower two panes by predefined increments, where <<< and >>> change the segmentation the most, and < and > change it the least.

Step 3: Clean-up

In this step, you clean up the surface representations of the maxilla and mandible to remove any extraneous information. If the patient was wearing braces when the scan was created, it is recommended that you sculpt them out of the surface.

This window offers several options, such as clipping slices, to make it easier to sculpt out the extraneous information. You can also overlay a high-resolution model arch surface if you have one for this patient.

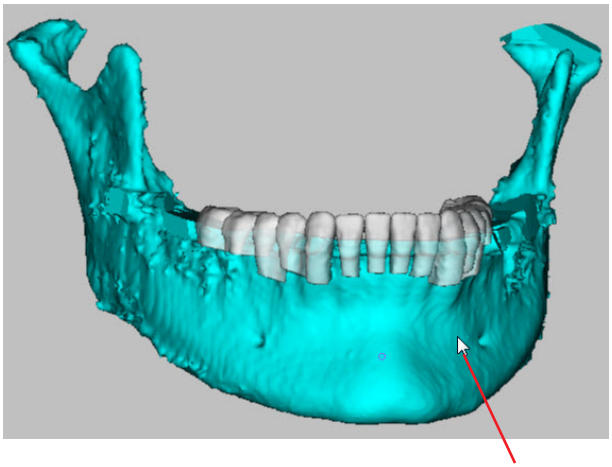
To select a surface to clean up:

1 In the list in the upper left, click the area to clean up if it isn't already selected.

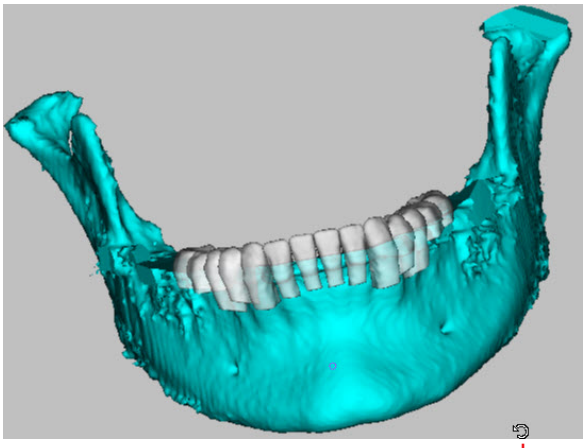
To rotate the image:

1 Optionally, check the **Rotate At Red Dot** box, then click and drag the red dot to the point around which to rotate the image.

2 Click and drag to rotate the image.



Click and drag when the pointer looks like this to rotate the volume in this direction



Click and drag when the pointer looks like this to rotate the volume in this direction

To use a clipping slice:

1 Check the **Restrict to Within Clipping Slice** box.

2 Specify the clipping slice to use. as described in “Using a Clipping Slice” on page 28-1.

For example, you can place the clipping slice at the midline to clean up the right side of the surface without worrying about accidentally cropping out information on the left side of the surface.

To remove extraneous information from the surface:

1 Draw the cropping polygon.

Click a point that is not on the surface to begin your polygon. For information on drawing a polygon, see “Selecting an Area of an Image” on page 6-4.

When you close the polygon, the mouse pointer changes to a pair of scissors.

2 Click inside the polygon to remove the part of the photo or surface that is inside the polygon.

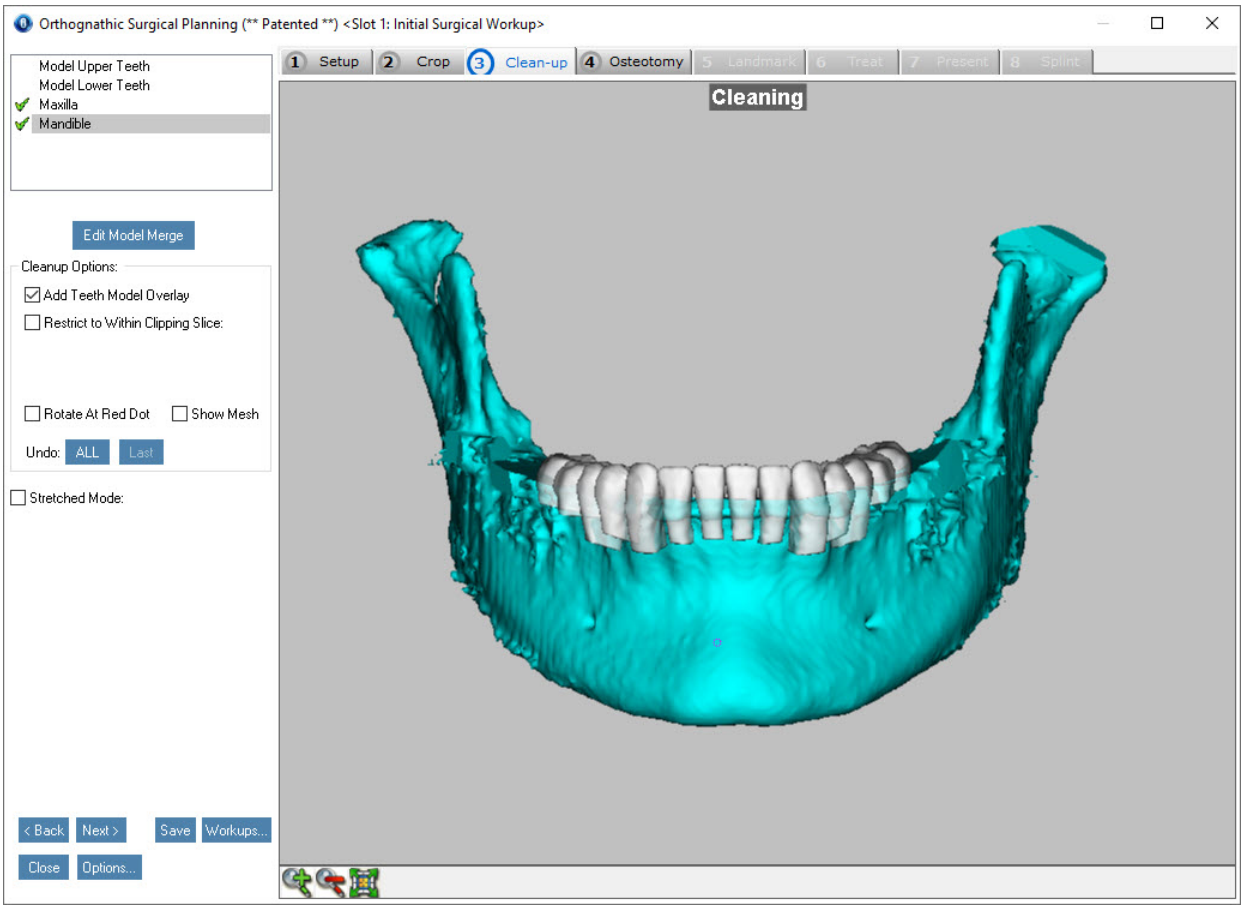
Or,

Click outside the polygon to remove the part of the photo or surface that is outside the polygon.

To save and go on to the next step:

1 Click **Save**.

2 Click **Next >**.



The following options are specific to this tab. For information on the options that appear on all tabs in this window, see “Starting Orthognathic Surgical Planning” on page 30-1.

list	Areas that the surgery can involve. Pick an area in this list to perform surgery planning for that area.
Edit Model Merge	Changes the merging of the model teeth with the volume. Only available after you have added the overlay of the model teeth (see “Adjusting the Superimposition” on page 30-13).
Add Teeth Model Overlay	Overlays a model arch surface on this surface. For information on model arch surfaces, see “Overlaying the Model Arch Surface” on page 30-12 and “Working With Arch Model Surfaces” on page 19-83.
Restrict to Within Clipping Slice	Restricts your sculpting to the areas within the selected cross-section of the volume. For more information, see “Using a Clipping Slice” on page 28-1.
Rotate at Red Dot	Places a the red dot on the image so that you can rotate the image around that point.
Show Mesh	Displays a mesh representation of the surface.
Undo	Undoes sculpting operations. **ALL:** Undoes all sculpting operations. **Last:** Undoes only the last sculpting operation.
Stretched Mode	Temporarily distorts the surface so that the teeth form a line rather than an arch. For more information, see “Cleaning Up With Overlaid Model Teeth” on page 30-17.
Define Panoramic Curve	Displays the panoramic curve used to create the image in stretched mode. You can modify the curve by clicking and dragging the yellow dots. Only available when the **Stretched Mode** box is checked.
Options...	Specify the window background color, the diameter of the cutting saw, and to display nerve canals, and default options for creating splints. For more information, see “Setting Options” on page 30-4.
Remove Boundary	Removes a cropping polygon you have drawn on the image.

For information on the magnification controls that appear below the image, see “Changing the Magnification” on page 19-25.

Overlaying the Model Arch Surface

Overlaying the upper and lower model arch surfaces on the maxilla and mandible surfaces makes them part of the osteotomies you will define for your surgical treatment plan on **Step 4: Osteotomy** (see “Step 4: Osteotomy” on page 30-19). In addition, you will be able to use them on **Step 6: Treat** to set the initial occlusion as the first step in simulating treatment (see “Step 6: Treat” on page 30-80).

To add the model arch surfaces:

1 Check the **Add Teeth Model Overlay** box.

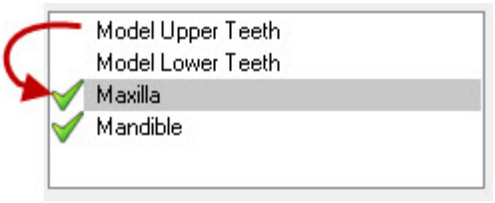
A model arch surface for this patient appears in the window, and the model arch surfaces you have for this patient appear in the list in the upper left of the window. For information on model arch surfaces, see “Working With Arch Model Surfaces” on page 19-83.

To overlay a model arch surface on the maxilla or mandible surface:

1 Click a model arch surface in the list in the upper left of the window.

2 Drag it to the surface on which to overlay it.

For example, click **Model Upper Teeth** and drag it to **Maxilla**.



The selected model arch is superimposed onto the selected surface.

3 Adjust the superimposition, if necessary, as described in “Adjusting the Superimposition” on page 30-13.

To save and return to **Step 3: Clean-up**:

1 Click **OK**.

Adjusting the Superimposition

To adjust the superimposition:

1 Click **Edit Model Merge**.

The Merging Model Teeth window opens. It contains the following tabs:

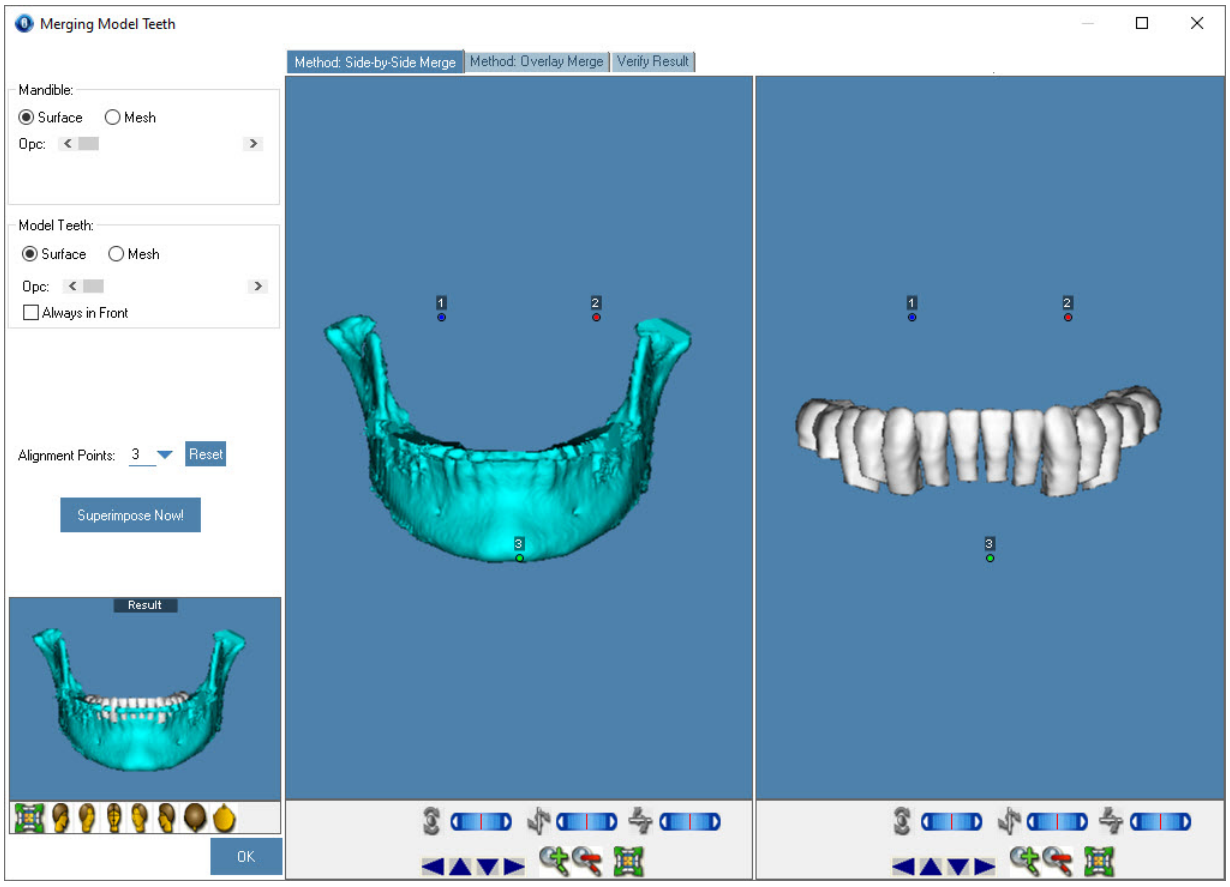
Method: Side-by-Side Merge	Align the two surfaces by viewing them side by side and identifying corresponding points.
Method: Overlay Merge	Adjust the superimposition of the two surfaces using the wheel-shaped alignment tool and other movement controls to move the model arch teeth in relation to the mandible or maxilla surface.
Verify Result	Verify the superimposition of the two surfaces.

The following options appear on all the tabs.

Maxilla or Mandible	Display options for the maxilla or mandible. **Surface:** Displays the maxilla or mandible as a surface. **Mesh:** Displays a mesh representation of the maxilla or mandible. **Opc:** Sets the opacity of the maxilla or mandible.
Model Teeth	Display options for the model teeth: **Surface:** Displays the model teeth as a surface. **Mesh:** Displays a mesh representation of the model teeth. **Opc:** Sets the opacity of the model teeth. **Always in Front:** Displays the model teeth in front of the maxilla or mandible regardless of their actual positions in the superimposition.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

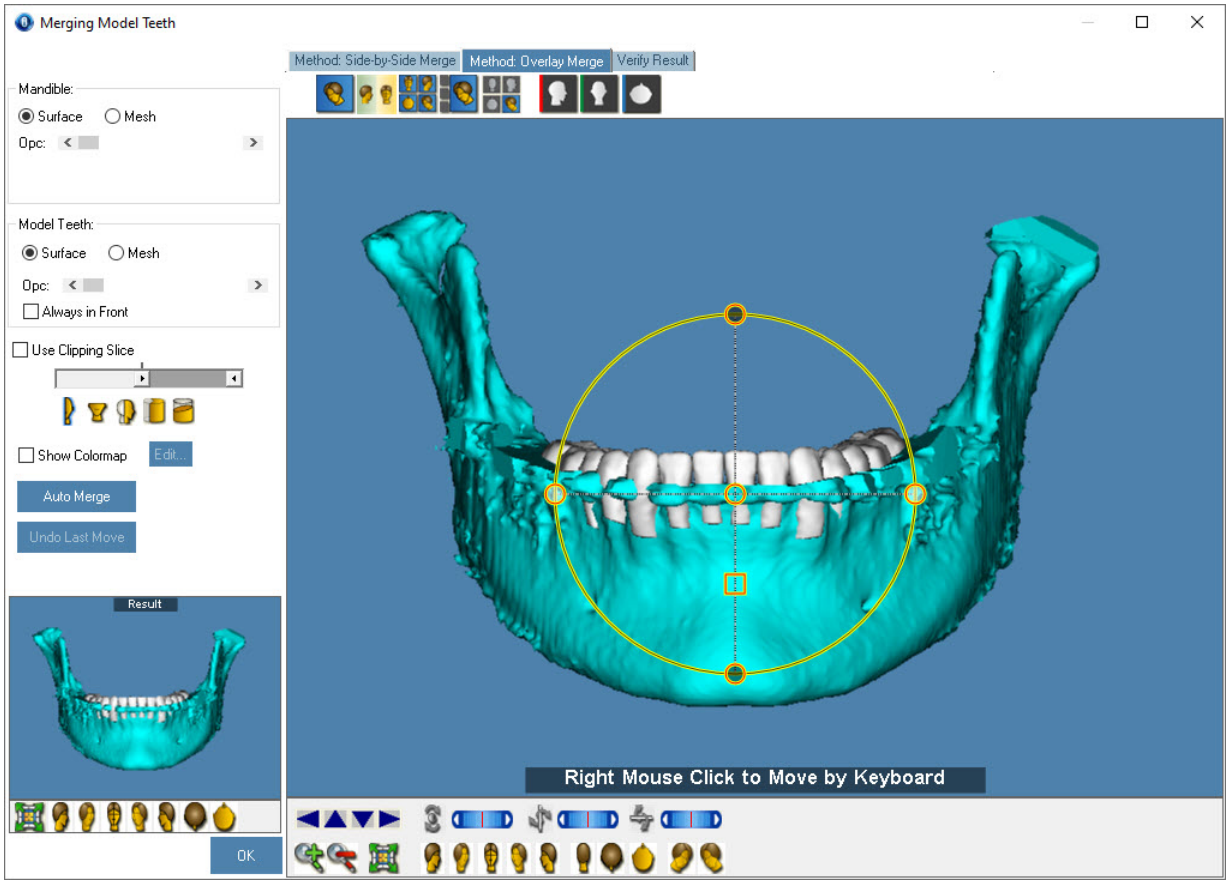
The following figure illustrates the **Method: Side-by-Side Merge** tab. For information on how to align the model teeth and volume on this tab, see “Using Side-by-Side Superimposition” on page 26-4.



The following options are specific to this tab:

Alignment Points	Number of points to use when superimposing the model teeth over the volume.
Reset	Resets all options in this dialog box to their default values.
Superimpose Now!	Superimposes the model teeth over the volume and displays the result in the Result window.
Result	Preview of the results of your superimposition.

The following figure illustrates the **Method: Overlay Merge** tab. For information on how to align the model teeth and volume on this tab, see “Using Overlay Superimposition” on page 26-6.



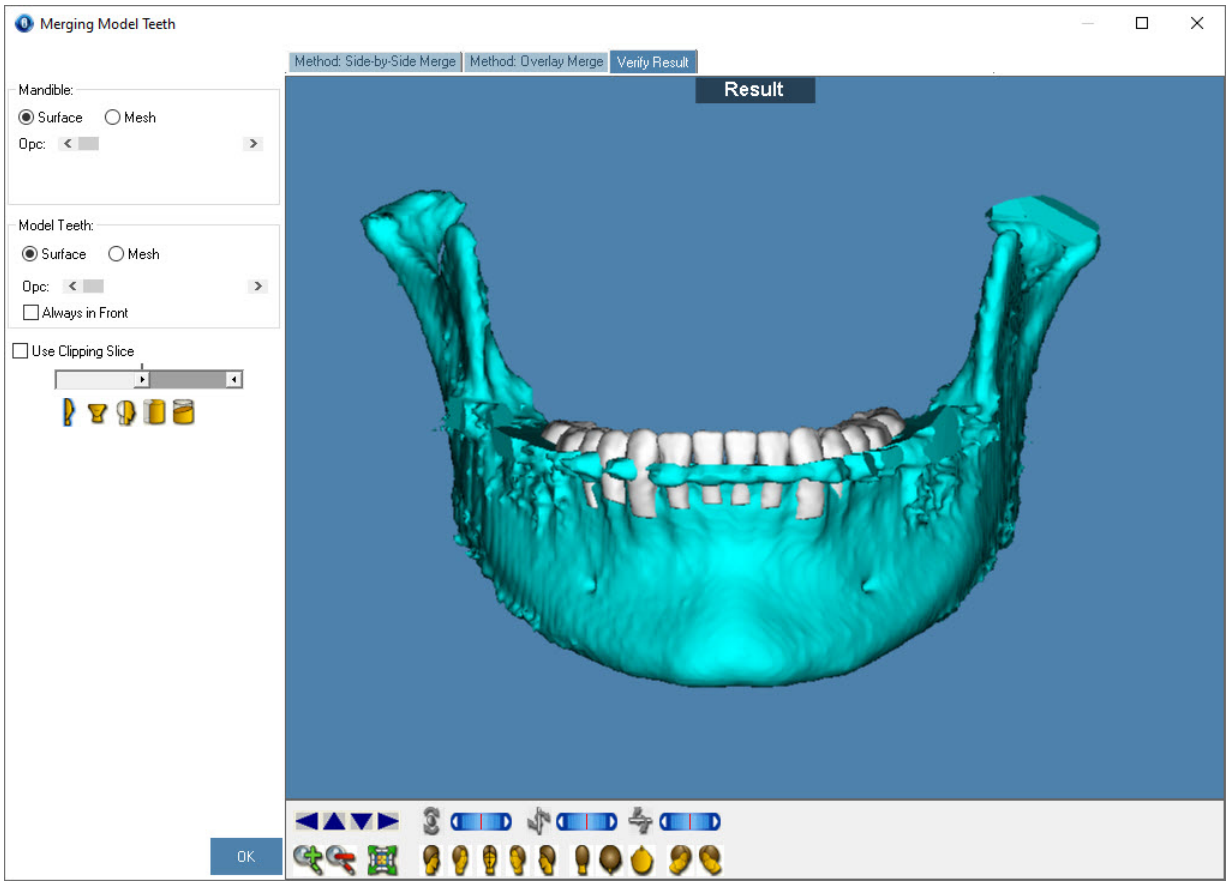
The following options are specific to this tab:

Use Clipping Slice	Defines the cross-section of the image to display. For more information, see “Using a Clipping Slice” on page 28-1.
Show Colormap	Uses a color map that maps colors to distances in the superimposition. **Edit...:** Set options for the color map. For more information, see “Viewing a Vertical Collision Color Map” on page 30-101.
Auto Merge	Automatically merges the two surfaces after you have manually aligned them fairly closely. For more information, see “Adjusting the Superimposition” on page 30-13.

Undo Last Move	Undoes your last operation.
Result	Preview of the results of your superimposition.

For information on the layout buttons that appear above the image, see “Layouts and Slices” on page 19-32.

The following figure illustrates the **Verify Result** tab. For information on this tab, see “Analyzing and Verifying the Result” on page 26-14.



The following options are specific to this tab:

Use Clipping Slice	Defines the cross-section of the image to display. For more information, see “Using a Clipping Slice” on page 28-1.

Cleaning Up With Overlaid Model Teeth

Once you have merged the model teeth with the volume, you can clean up the result fairly easily.

To clean up:

1 Check the **Stretched Mode** box.

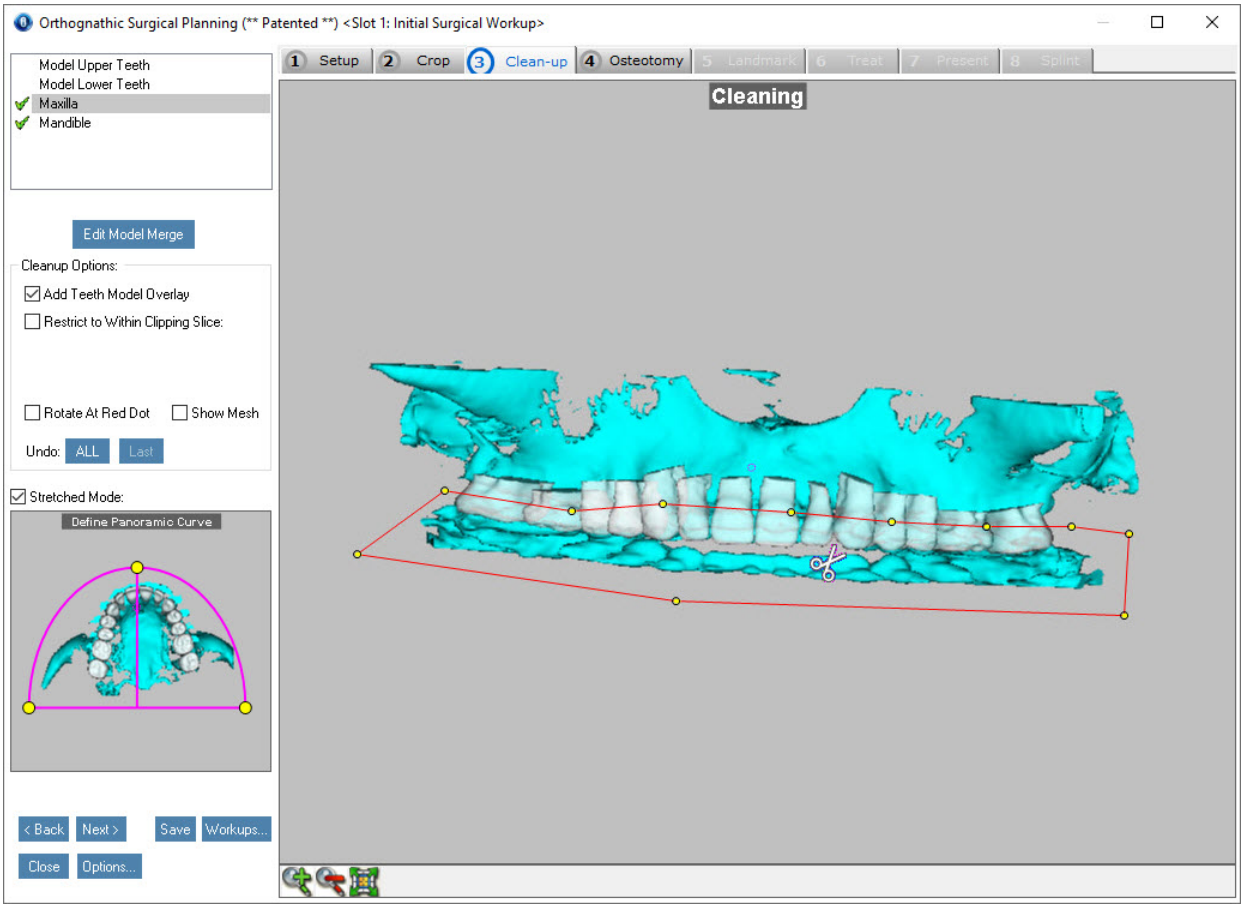
2 Optionally, click and drag the yellow dots on the Define Panoramic Curve image to redefine the curve used to create the stretched-mode image.

3 Draw a polygon that includes the teeth from the original volume scan as shown below.

For information on drawing a polygon, see “Selecting an Area of an Image” on page 6-4.

When you close the polygon, the mouse pointer changes to a pair of scissors.

4 Click inside the polygon to sculpt away the teeth from the original volume scan so that only the model teeth remain.



Cropping Out Braces

To crop out braces:

1 When you already have most of the extraneous information sculpted out, check the **Restrict to Within Clipping Slice** box.

2 Click to set the clipping slice at the axial plane.

For more information, see “Using a Clipping Slice” on page 28-1.

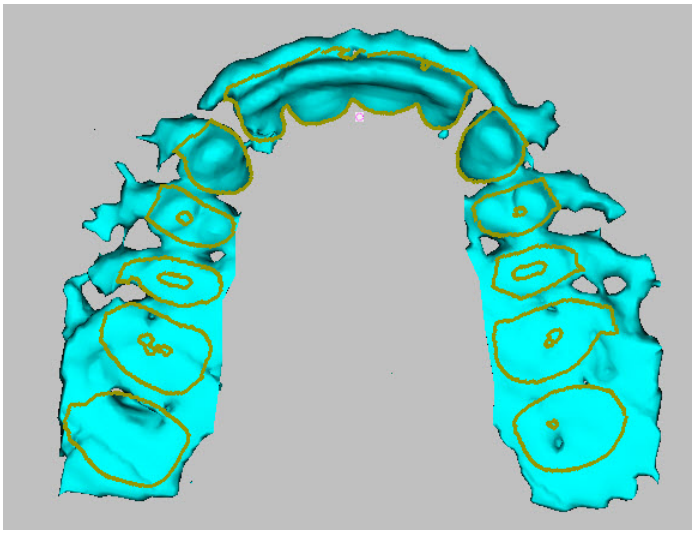
3 Rotate the mandible so that you are viewing it from the top.

Or,

Rotate the maxilla so that you are viewing it from the bottom.

4 Adjust the sliders so that only the teeth are within the clipping slice.

5 Adjust the sliders further until yellow outlines appear around one or more teeth (see below).



6 Use the yellow outlines as a guide for sculpting out the braces.

Depending on the angle of the mandible or maxilla, you may need to repeat steps 5 and 6 several times, cleaning up around a few teeth at a time.

Step 4: Osteotomy

In this step, you indicate where you intend to place the cuts for one or more osteotomies. You can simulate cuts to the maxilla, proximal segments of the mandible, and anterior mandible. For more information on the available osteotomy types, see “Le Fort I” on page 30-20, “Proximal Segments” on page 30-48, and “Anterior Mandible” on page 30-58.

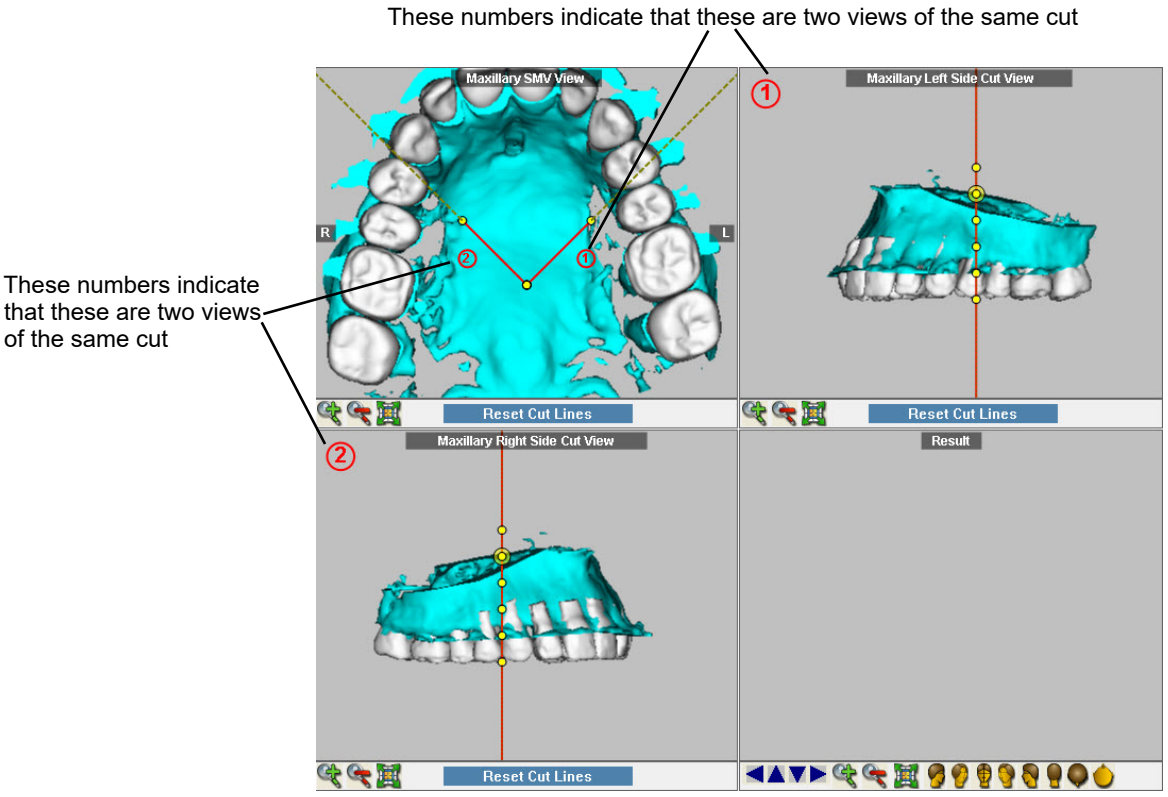
To simulate one or more osteotomies:

1 Check the box for each type osteotomy to simulate.

2 For each selected osteotomy type, choose the specific osteotomy to simulate from the drop-down list.

The list below the Osteotomies group box lists the osteotomies of the types you selected. The osteotomies are numbered to indicate sequences that should be performed in a specific order.

For some osteotomies, red numbers appear indicating how the image views in the panes correspond. In the example below, the ① in the Maxillary SMV View and Maxillary Left Side Cut View panes indicates the correspondence between two views of the same cut.



3 To include one or more extractions, select an option from the **Extraction** drop-down list.

Or,

Select **None** from the **Extraction** drop-down list if you don't want any extractions.

Or,

If a selected osteotomy has other options, select an option from the **Options** drop-down list.

4 Optionally, adjust the **Opc** slider to change the opacity of the surface display.

Or,

Change the display to a translucent view of the volume rather than a surface as described below.

These changes to the view can make it much easier to see the nerve canals (if they were defined for the volume) and the roots of the teeth.

5 In the list below the Osteotomies group box, select the osteotomy to perform.

6 Click and drag the points to define the cuts.

If there are large points, move them first to move several associated points as a group. Then, you can move the small points individually to contour the cut.

7 Click **Cut Now**.

The result appears in the Result pane. In the list below the Osteotomies group box, a green check mark indicates the osteotomies you have completed.

To see a translucent view of the volume rather than a surface:

1 Check the **Show Original Volume** box.

2 Adjust the **Seg** and **Opc** sliders, if necessary, to adjust the segmentation and opacity of the volume display.

To save and go on to the next step:

1 Click **Save**.

2 Click **Next >**.

Le Fort I

Several osteotomy options are available for Le Fort I. For details on these options, see “1-Piece (Basic Le Fort I)” on page 30-21, “2-Piece (Sagittal Split)” on page 30-24, “2-Piece (Asymmetry)” on page 30-26, “2-Piece (Inverted Y)” on page 30-28, “2-Piece (Anterior-Posterior)” on page 30-30, “3-Piece (Y Cut)” on

page 30-32, “3-Piece (with Palate)” on page 30-36, “3-Piece (Asymmetry)” on page 30-41, “4-Piece” on page 30-43, and “4-Piece (Asymmetry)” on page 30-46.

To simulate a maxillary osteotomy:

1 Check the **Le Fort I** box.

2 Select the type of osteotomy from the drop-down list.

If you select a Le Fort I osteotomy other than other than 1 Piece (Basic Le Fort 1), two entries are added to the list of osteotomies to perform:

a LeFort 1 - Basic: You must perform the 1 Piece (Basic Le Fort 1) osteotomy first to separate the maxilla from the skull

b The osteotomy you selected: This entry is for further cuts to the separated maxilla needed to simulate the selected osteotomy.

3 Select any extractions or other options, if appropriate, from the drop-down list labeled either **Extraction** or **Options** (depending on the osteotomy type).

4 Click and drag the points so that the lines indicate the locations of the planned cuts.

When you move the points in one pane, make sure that you also verify the placement of the cut lines in the other panes.

5 Click **Cut Now** to see the result in the Result pane.

6 Click **Save** to save your work.

1-Piece (Basic Le Fort I)

To specify this cut:

1 Click and drag the points in the LeFort | SMV View and LeFort | Frontal View panes to define the cuts.

Move the large points first, which move the entire associated cut lines.

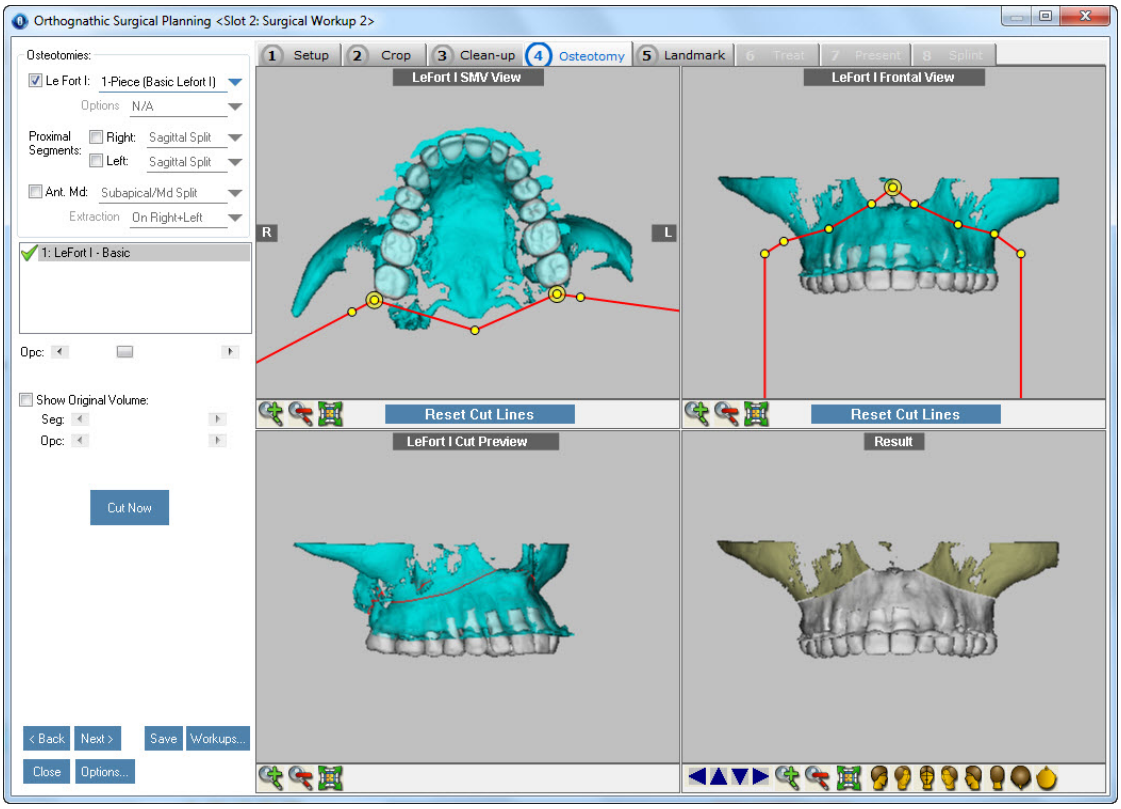
2 Preview the vertical cuts at the back of the teeth in the LeFort | Cut Preview pane to check the angulation.

3 If the angulation is not optimal, rotate the maxilla as necessary in the LeFort | SMV View pane.

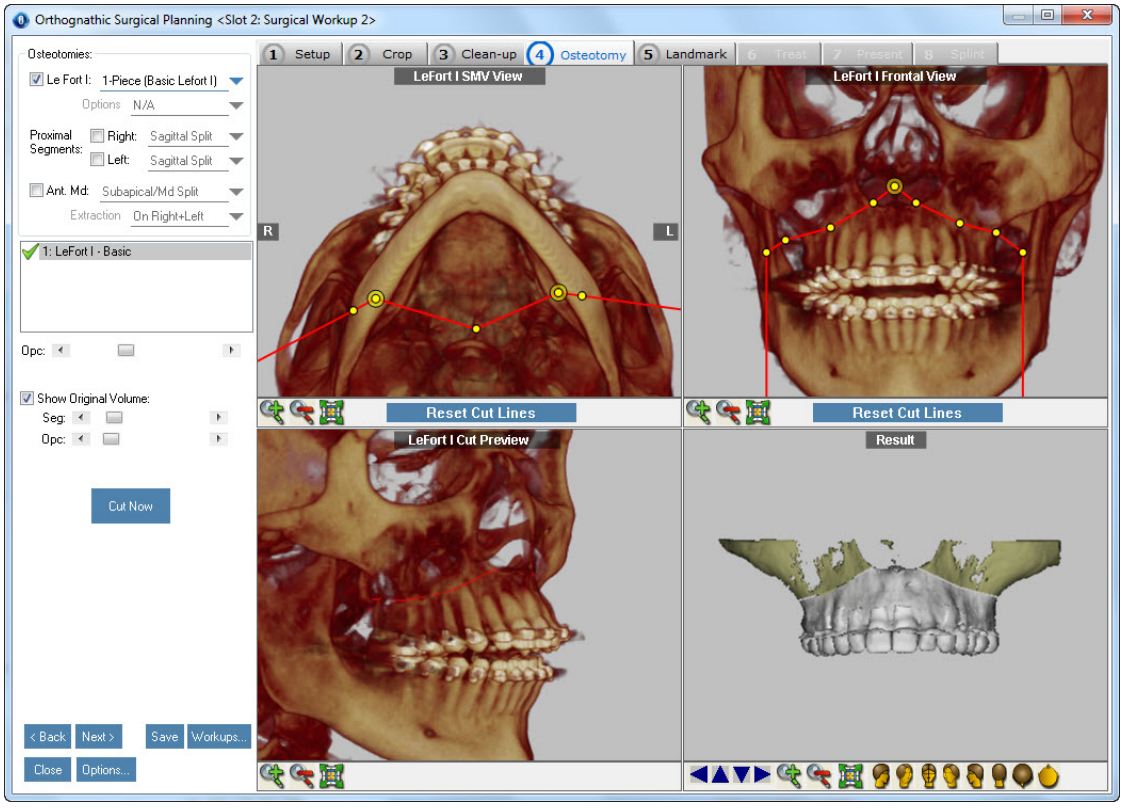
4 Click **Cut Now** to see the result in the Result pane.

Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

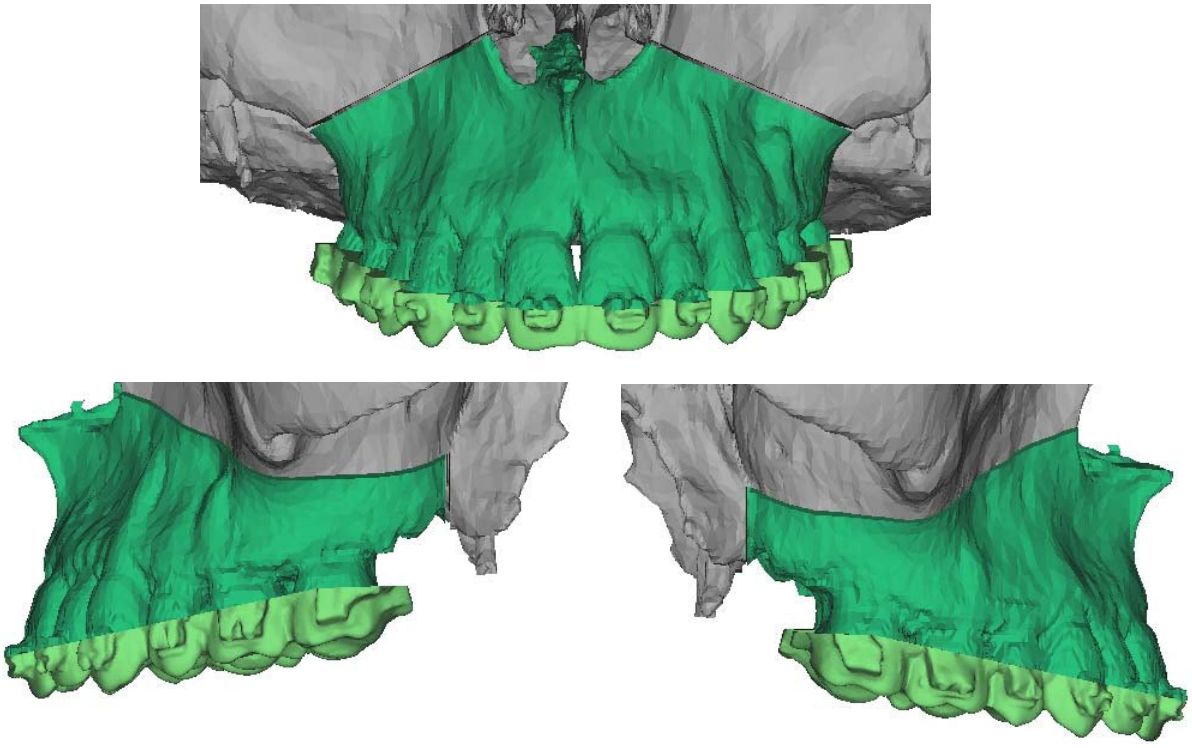
Step 4: Osteotomy



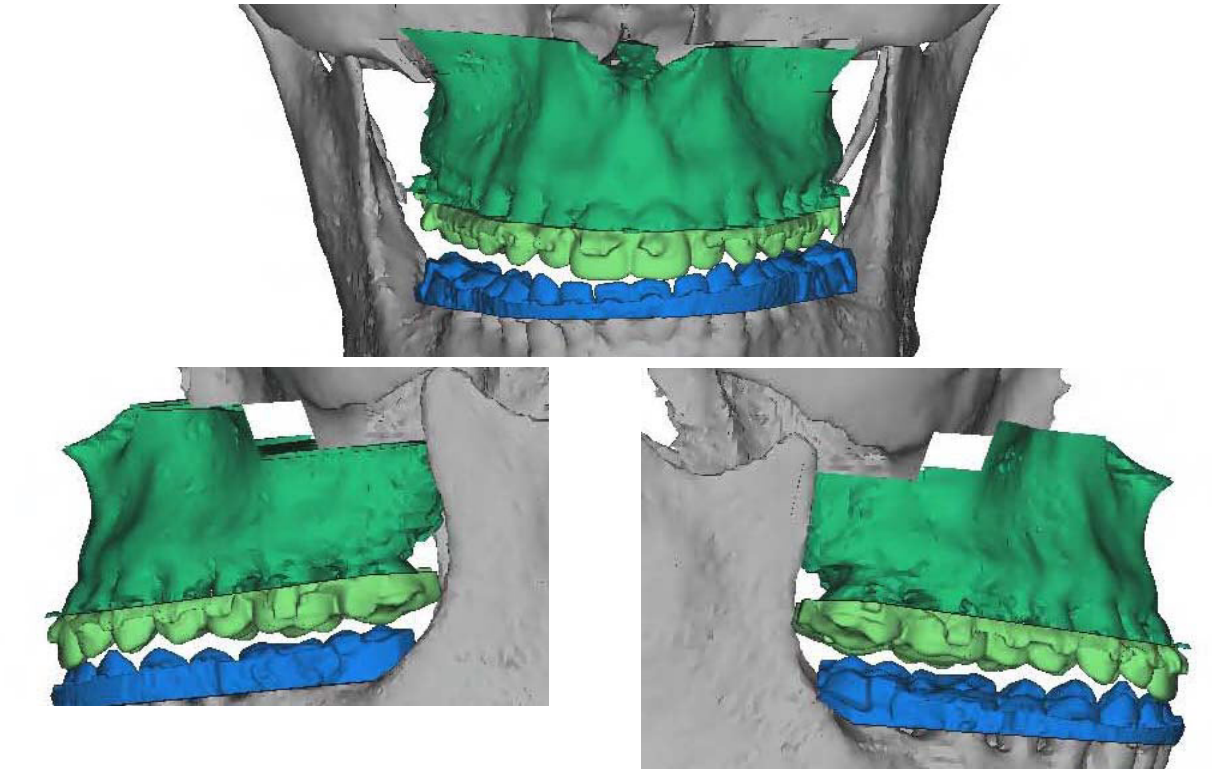
Check the **Show Original Volume** box to see the roots of the teeth as shown below.



The following figures illustrate this osteotomy:



The following figures illustrate this osteotomy option used in a different way:



2-Piece (Sagittal Split)

To specify this cut:

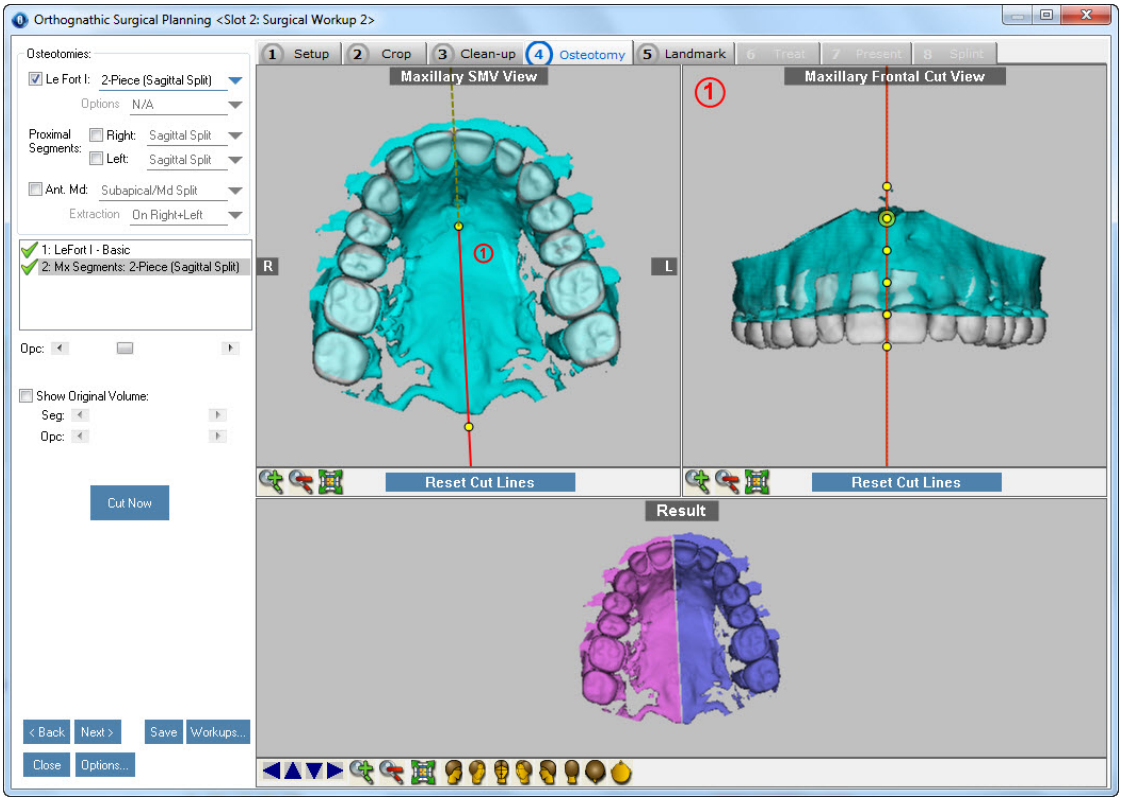
1 Click and drag the upper point in the Maxillary SMV View pane to place it below the roots of the teeth.

2 In the Maxillary Frontal Cut View pane, move the large point, which moves the entire cut line, and place it above the roots of the teeth.

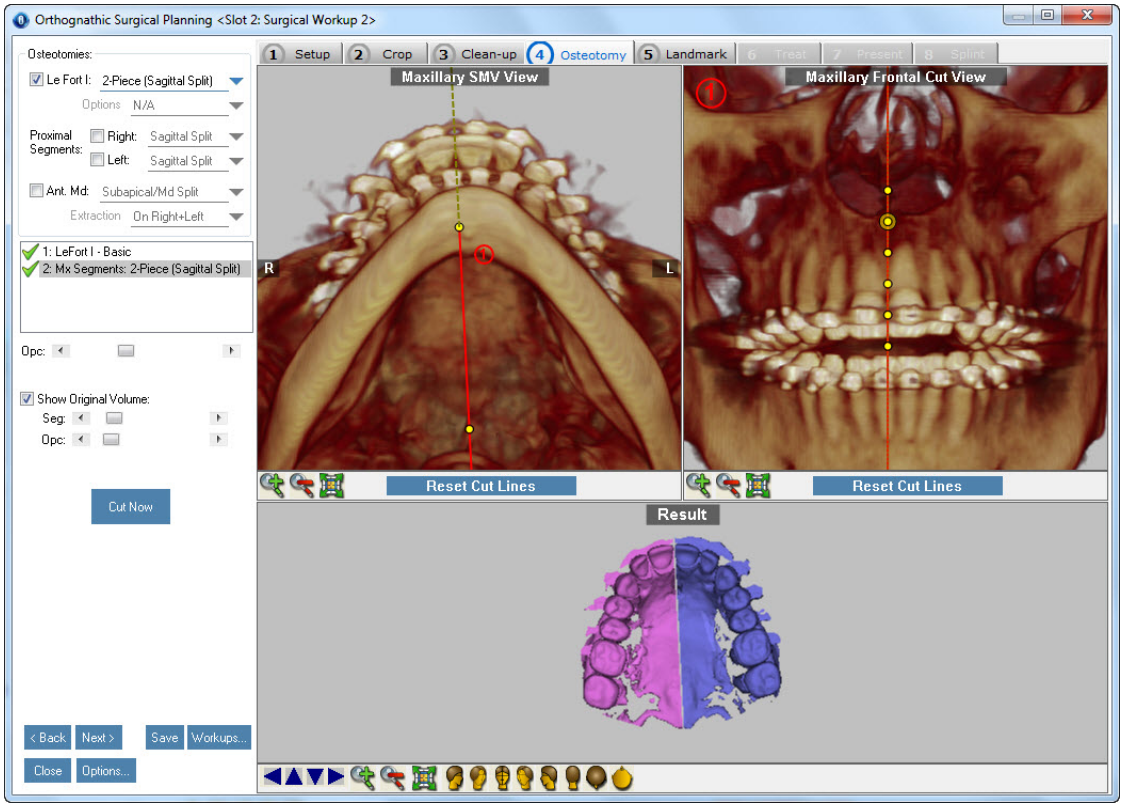
3 Optionally, move the small points in the Maxillary Frontal Cut View pane individually to contour the cut between the teeth.

4 Click **Cut Now** to see the result in the Result pane.

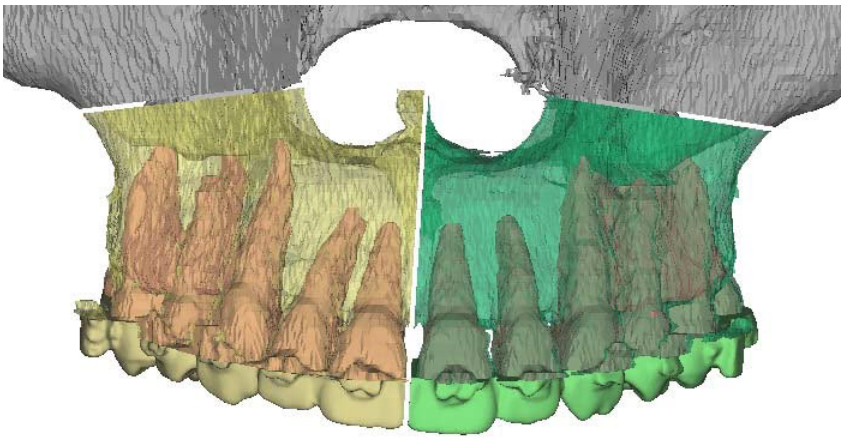
Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

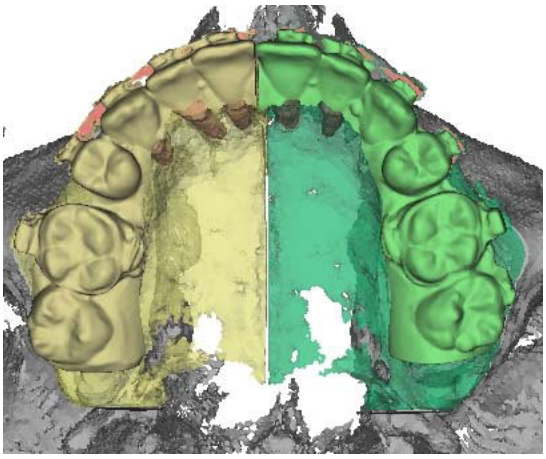


Check the **Show Original Volume** box to see the roots of the teeth as shown below.



The following figures illustrate this osteotomy:





2-Piece (Asymmetry)

Although similar to 2-Piece (Sagittal Split), do not use this cut for a sagittal split due to the underlining logic. Use 2-Piece (Sagittal Split), described on page 30-24, instead.

To specify this cut:

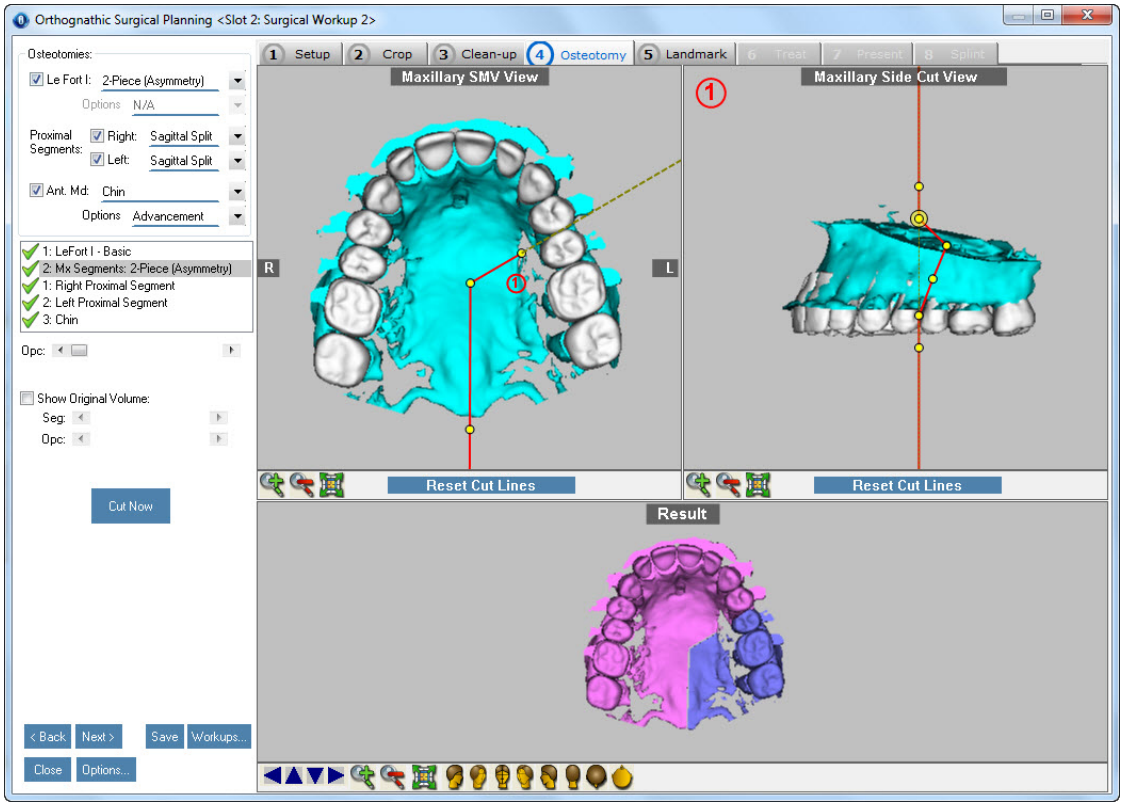
1 Click and drag the upper point in the Maxillary SMV View pane to place it below the roots of the teeth.

2 In the Maxillary Frontal Cut View pane, move the large point, which moves the entire cut line, and place it above the roots of the teeth.

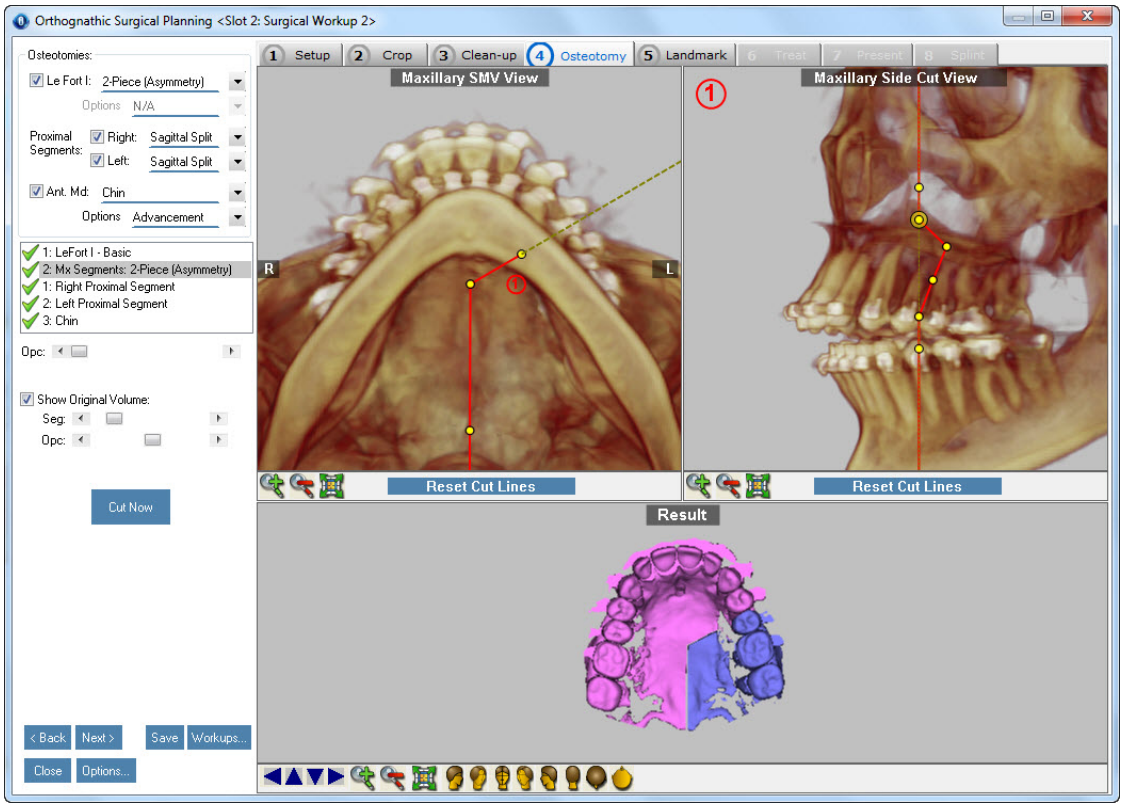
3 Optionally, move the small points in the Maxillary Frontal Cut View pane individually to contour the cut between the teeth.

4 Click **Cut Now** to see the result in the Result pane.

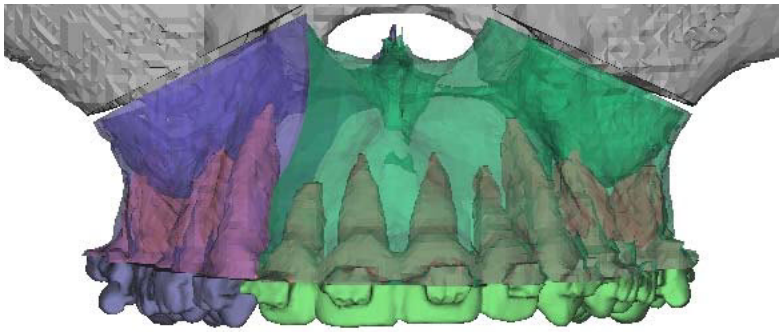
Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

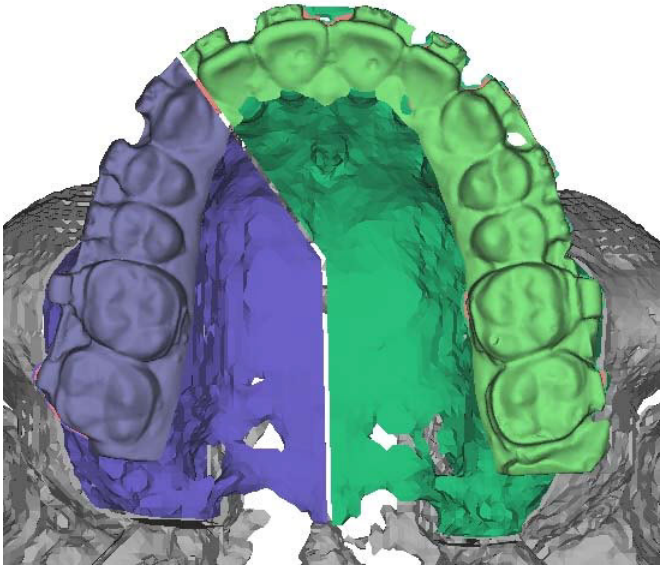


Check the **Show Original Volume** box to see the roots of the teeth as shown below.



The following figures illustrate this osteotomy:





2-Piece (Inverted Y)

To specify this cut:

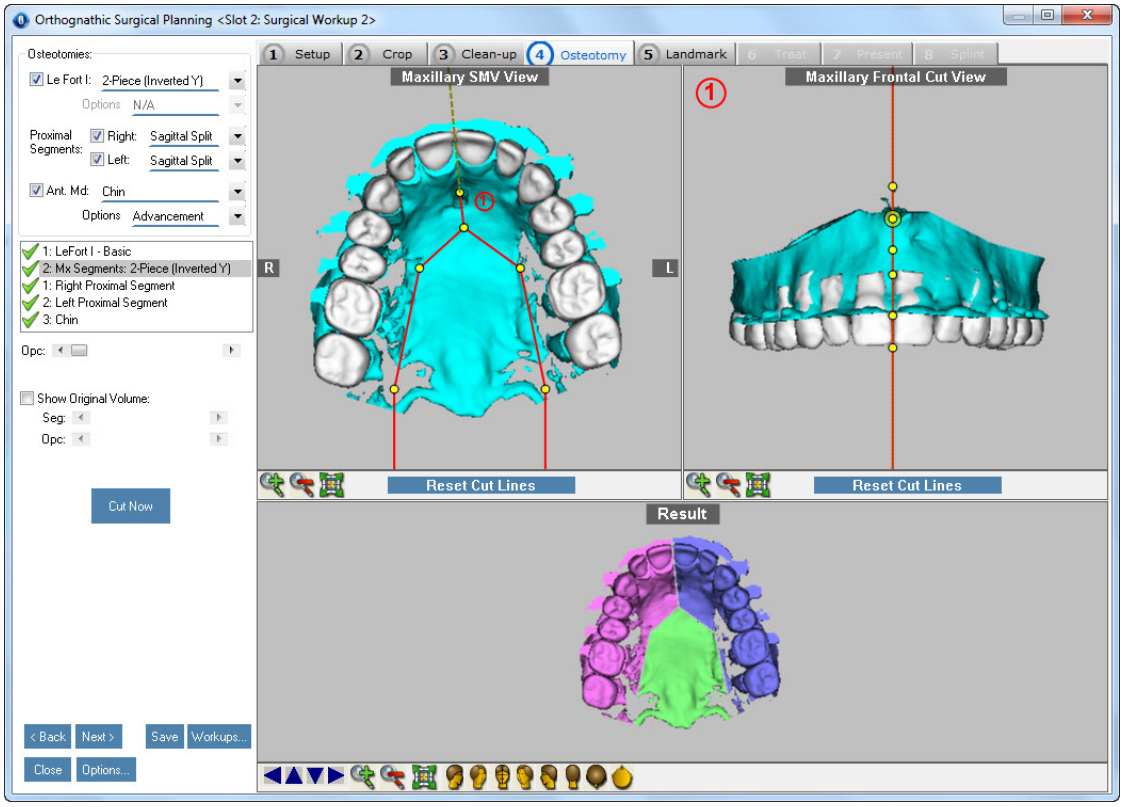
1 Click and drag the upper point in the Maxillary SMV View pane to place it below the roots of the teeth.

2 In the Maxillary Frontal Cut View pane, move the large point, which moves the entire cut line, and place it above the roots of the teeth.

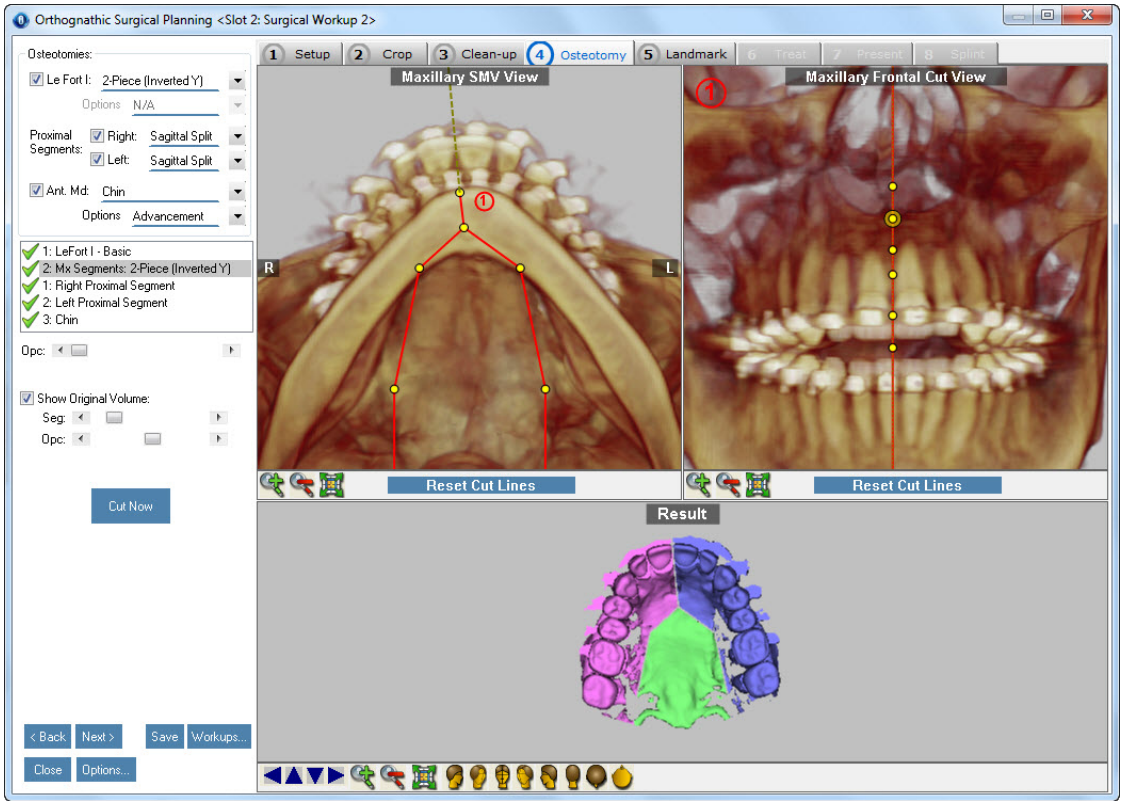
3 Move the small points in the Maxillary SMV View and Maxillary Frontal Cut View panes individually to contour the cut.

4 Click **Cut Now** to see the result in the Result pane.

Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*



To see the roots of the teeth, check the **Show Original Volume** box as illustrated below.



2-Piece (Anterior-Posterior)

To specify this cut:

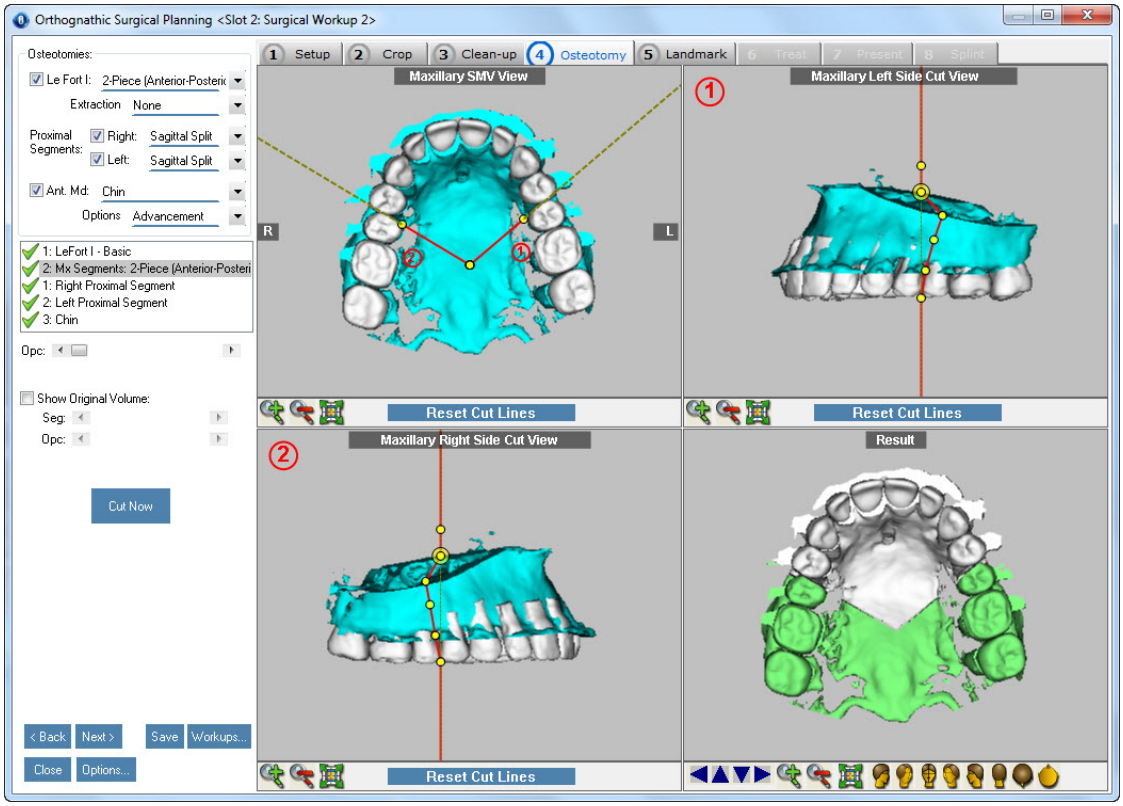
1 Click and drag the points in the Maxillary SMV View pane to define the cut.

2 In the Maxillary Left Side Cut View and Maxillary Right Side Cut View panes, move each of the large points to moves the associated cut line as a whole.

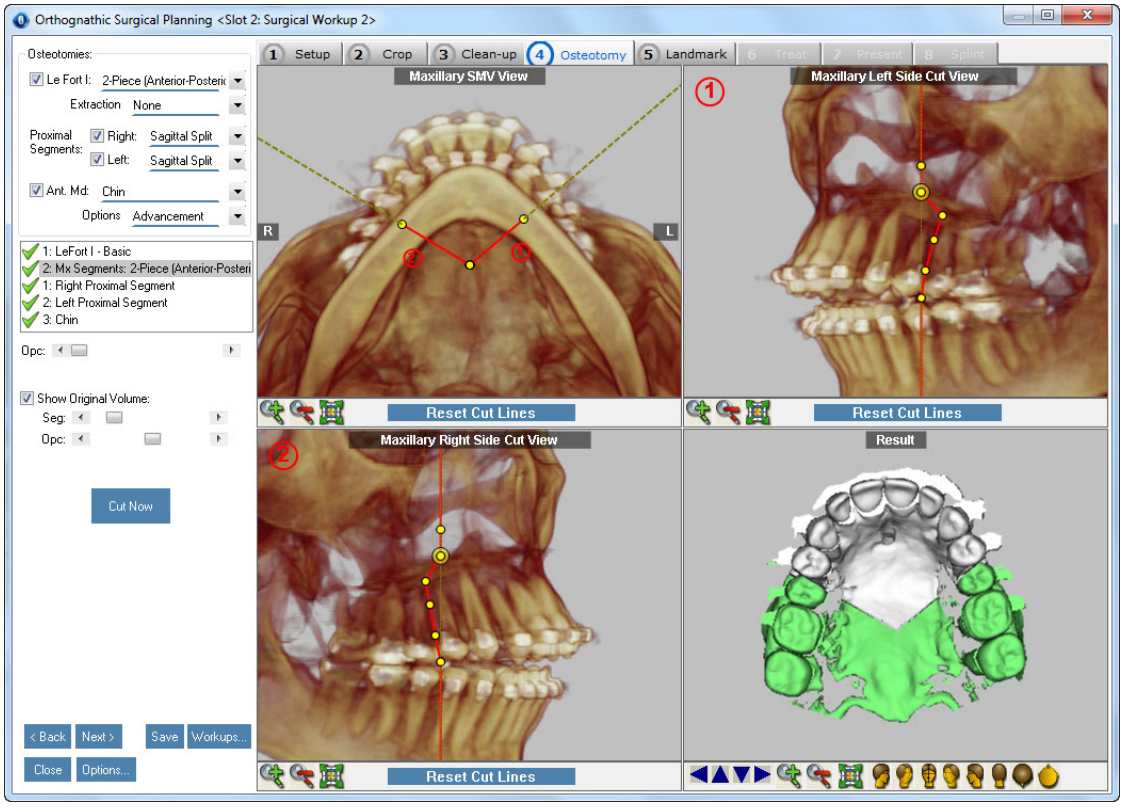
3 Move the small points in the Maxillary Left Side Cut View and Maxillary Right Side Cut View panes individually to contour the cut between the teeth.

4 Click **Cut Now** to see the result in the Result pane.

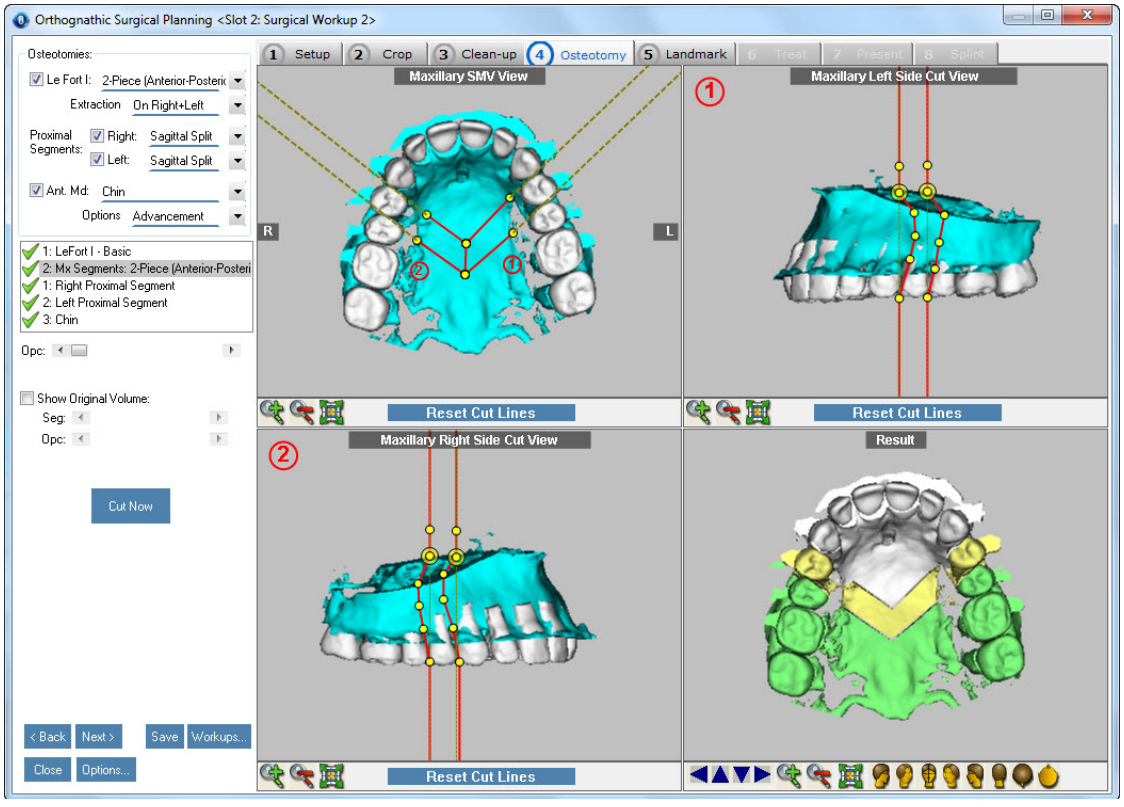
Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

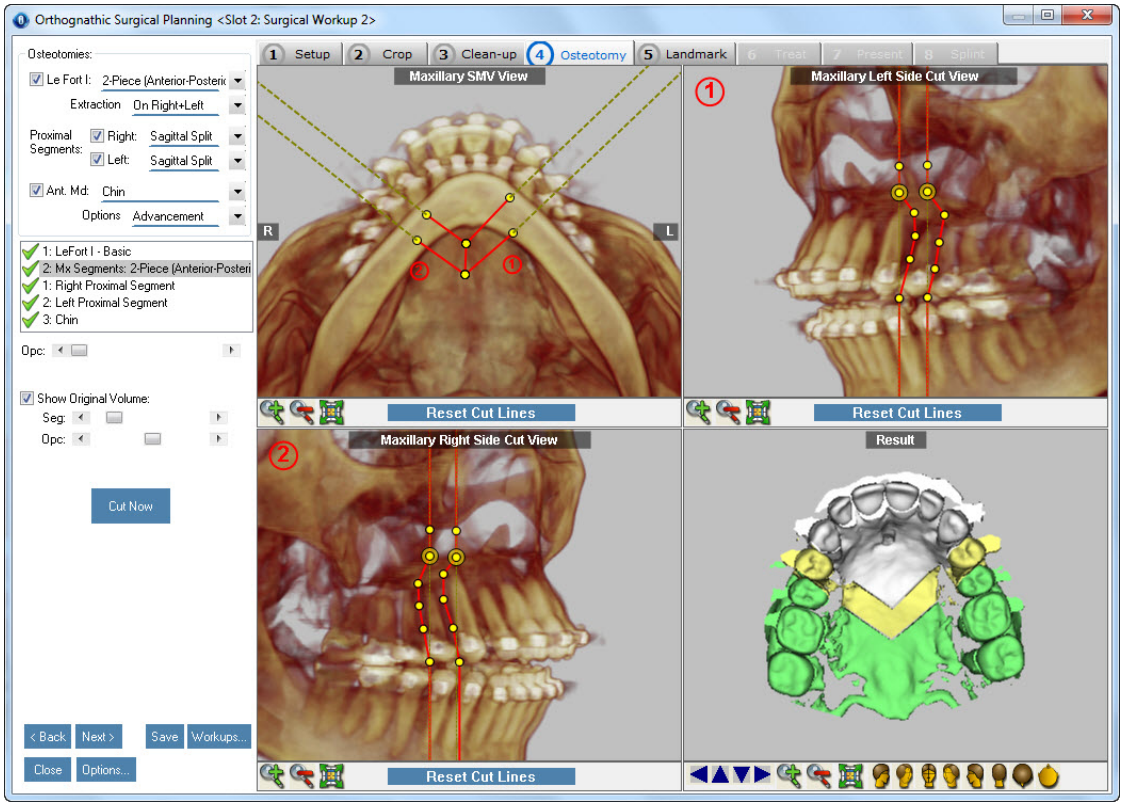


Check the **Show Original Volume** box to see the roots of the teeth as shown below.



This cut offers the following extraction options: **None**, **On Right+Left**, **On Right**, and **On Left**. The following figures illustrate the cuts when **On Right+Left** is selected.





3-Piece (Y Cut)

To specify this cut:

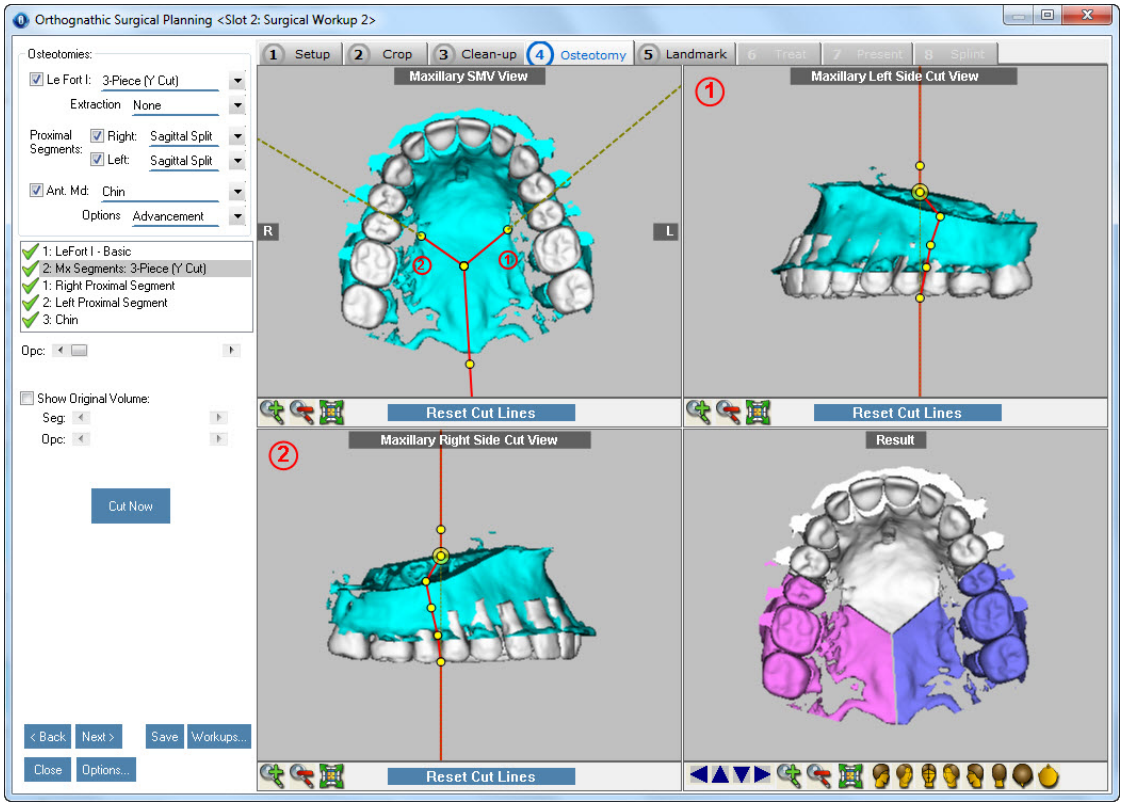
1 Click and drag the points in the Maxillary SMV View pane to define the cut.

2 In the Maxillary Left Side Cut View and Maxillary Right Side Cut View panes, move each of the large points to moves the associated cut line as a whole.

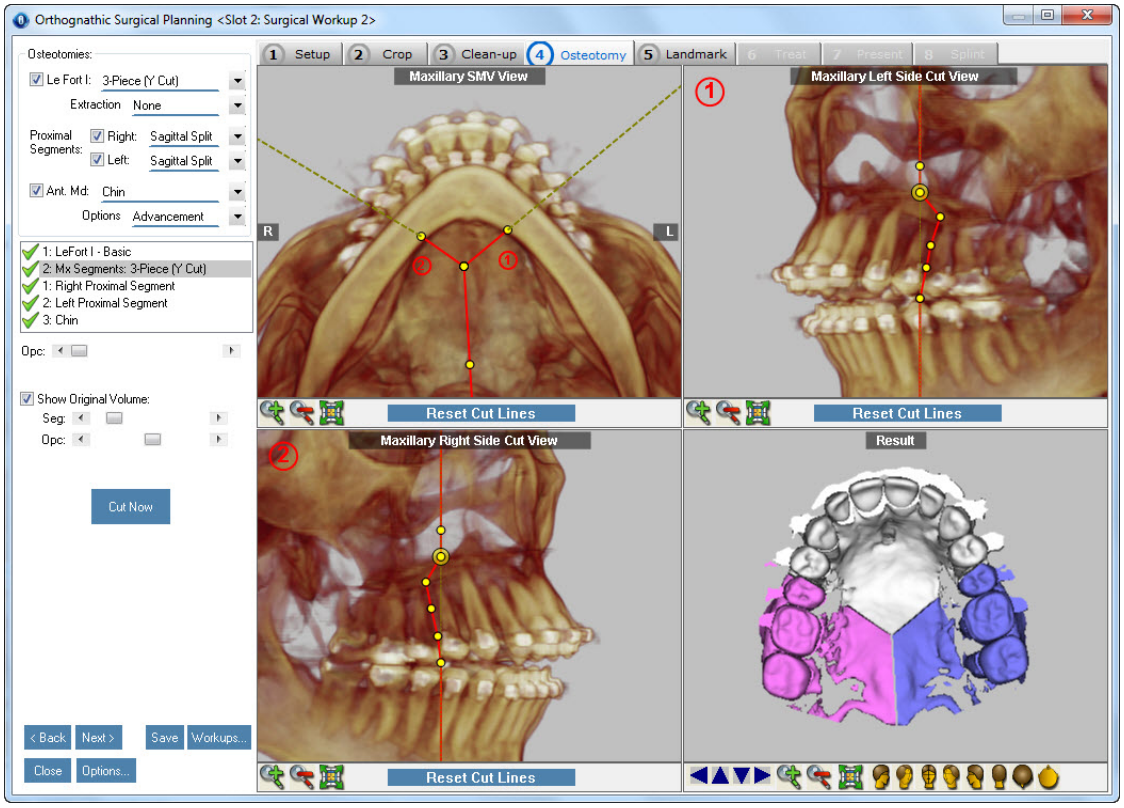
3 Move the small points in the Maxillary Left Side Cut View and Maxillary Right Side Cut View panes individually to contour the cut between the teeth.

4 Click **Cut Now** to see the result in the Result pane.

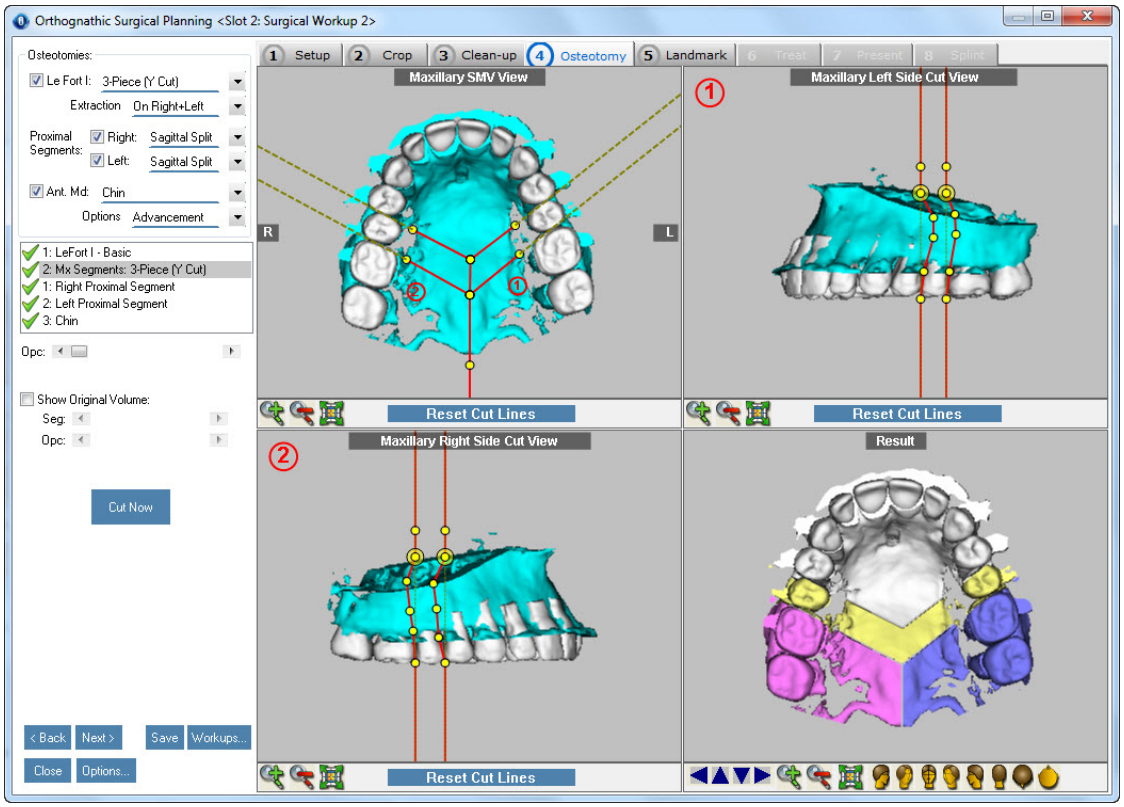
Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

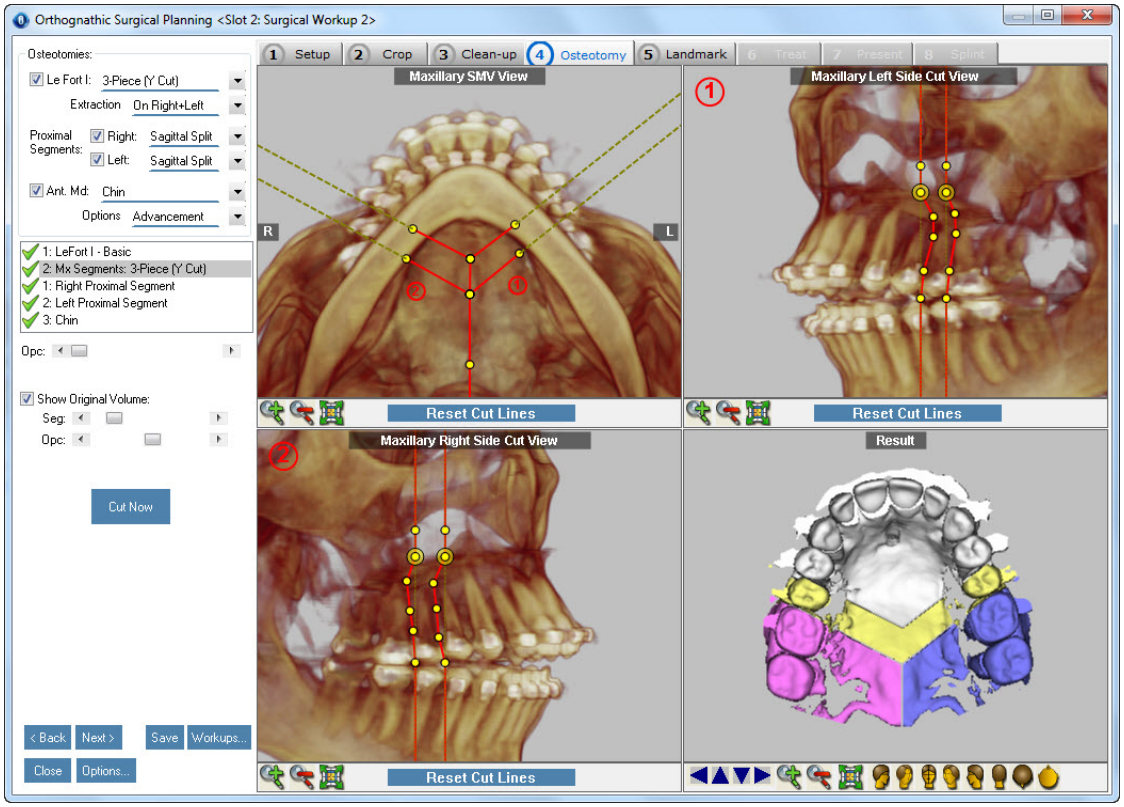


Check the **Show Original Volume** box to see the roots of the teeth as shown below.

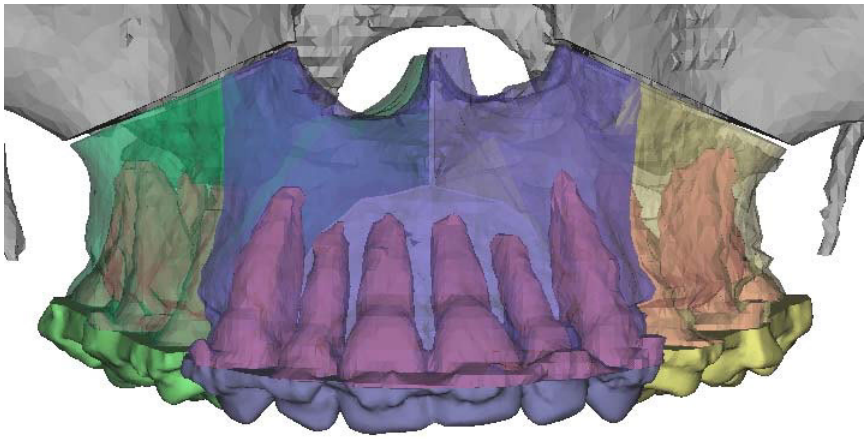


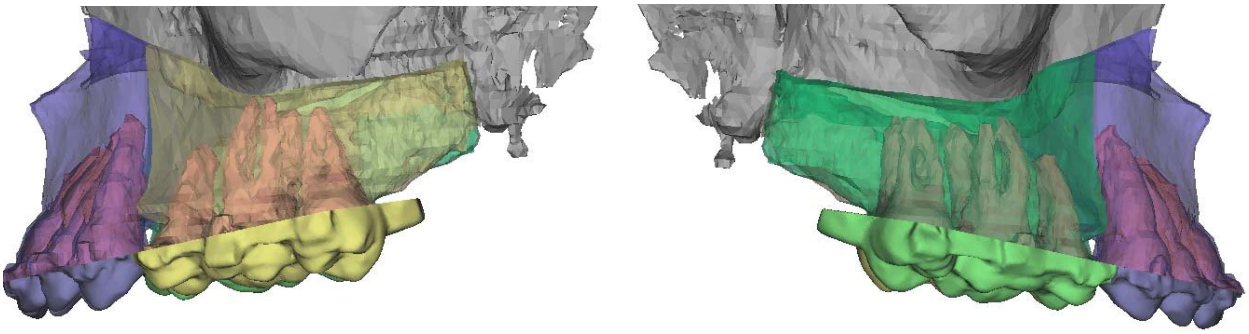
This cut offers the following extraction options: **None**, **On Right+Left**, **On Right**, and **On Left**. The following figures illustrate the cuts when **On Right+Left** is selected.

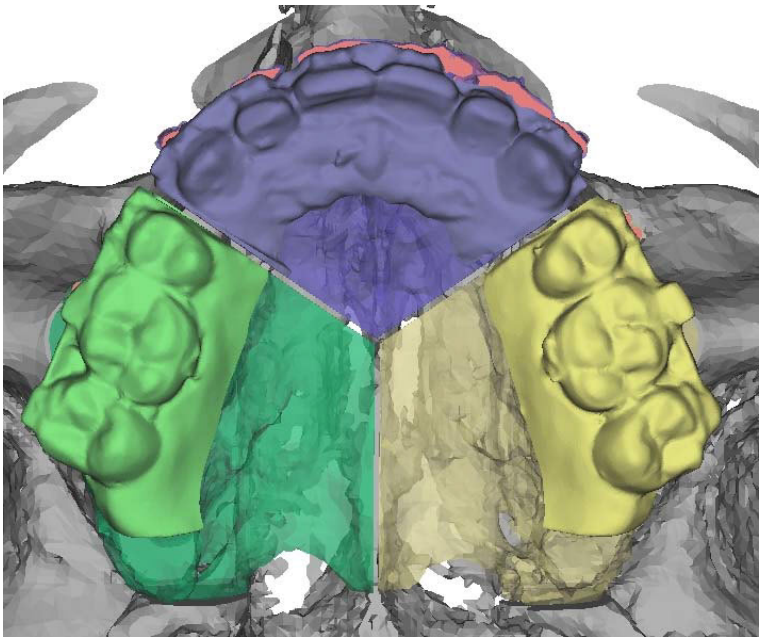




The following figures illustrate this osteotomy:







3-Piece (with Palate)

This cut is similar to the 3-Piece (Y Cut) described on page 30-32.

To specify this cut:

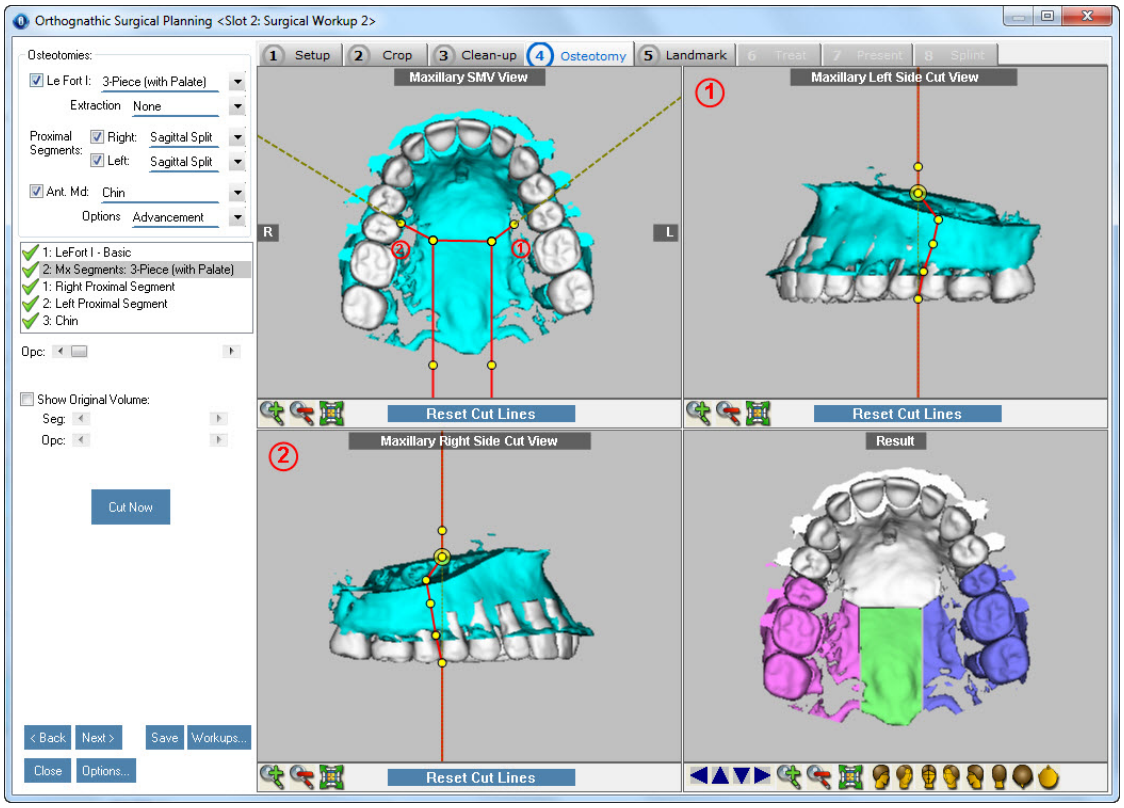
1 Click and drag the points in the Maxillary SMV View pane to define the cut.

2 In the Maxillary Left Side Cut View and Maxillary Right Side Cut View panes, move each of the large points to moves the associated cut line as a whole.

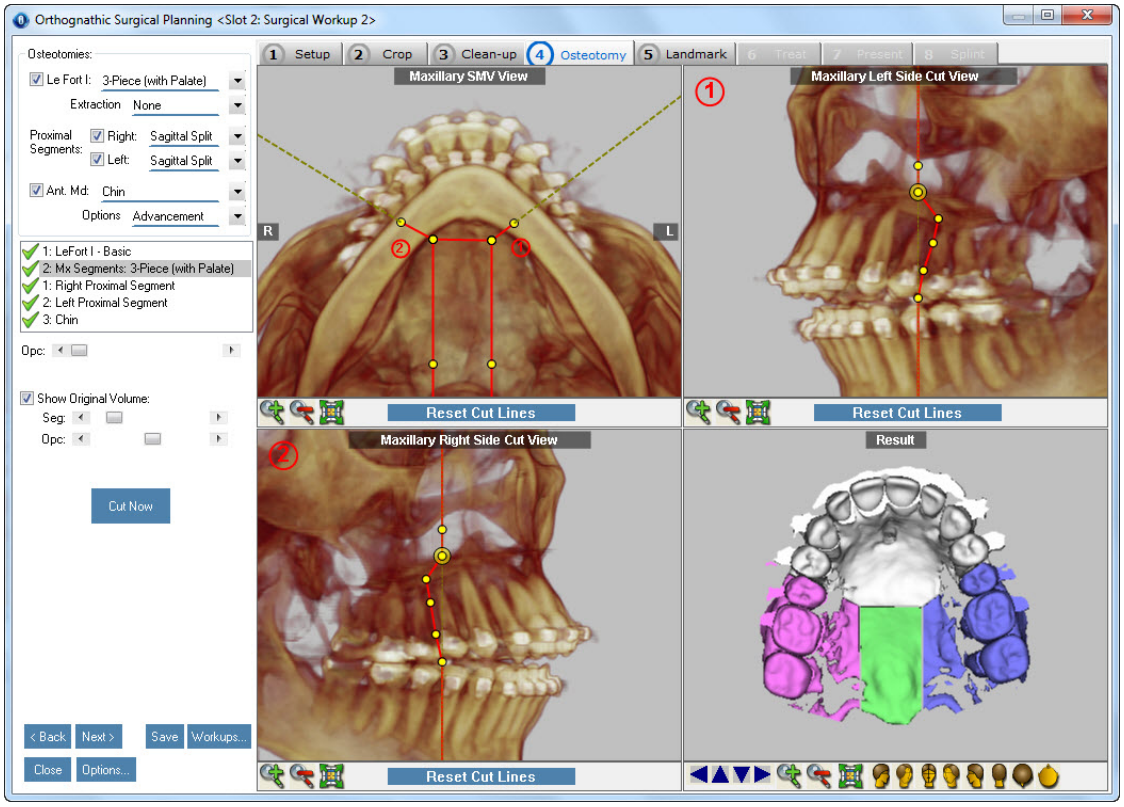
3 Move the small points in the Maxillary Left Side Cut View and Maxillary Right Side Cut View panes individually to contour the cut between the teeth.

4 Click **Cut Now** to see the result in the Result pane.

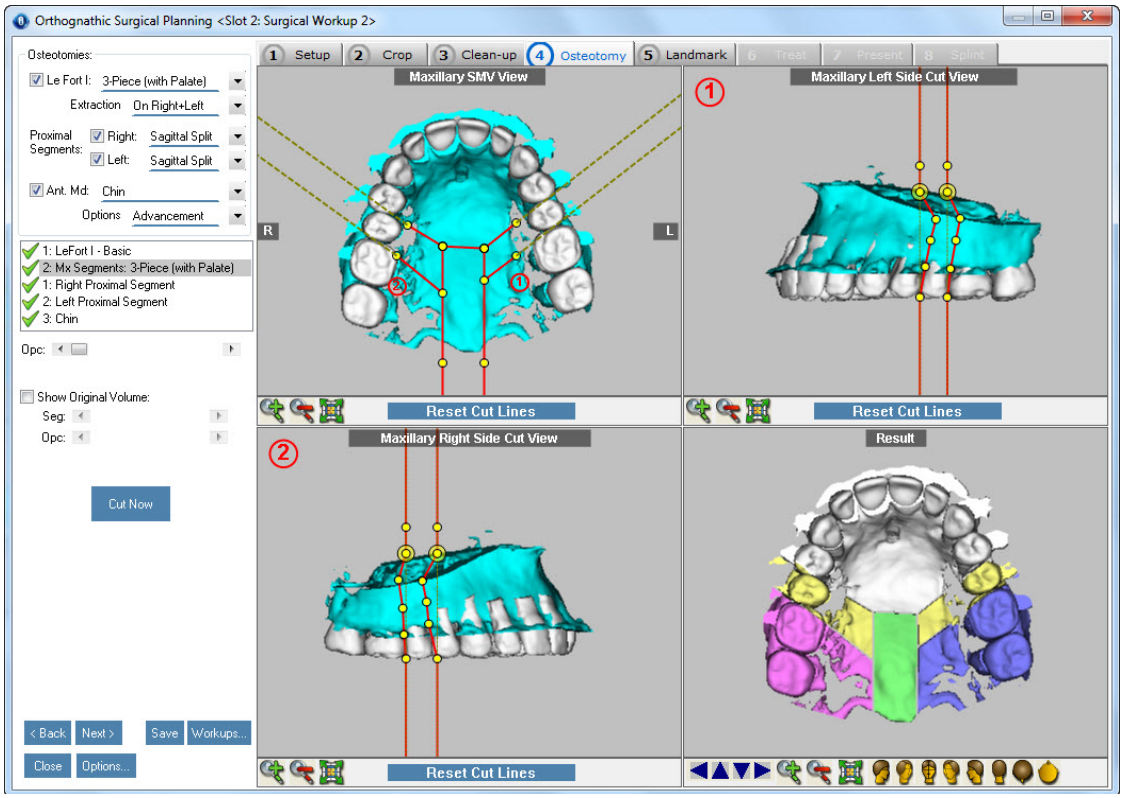
Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*



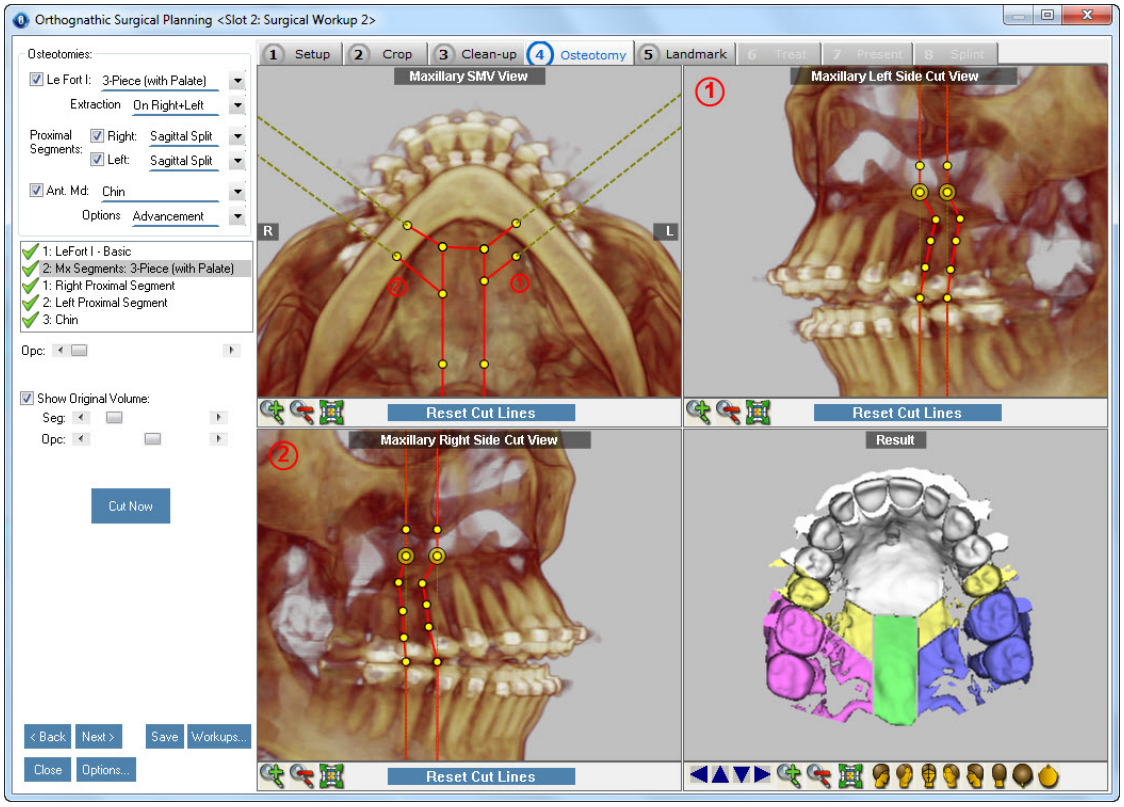
Check the **Show Original Volume** box to see the roots of the teeth as shown below.



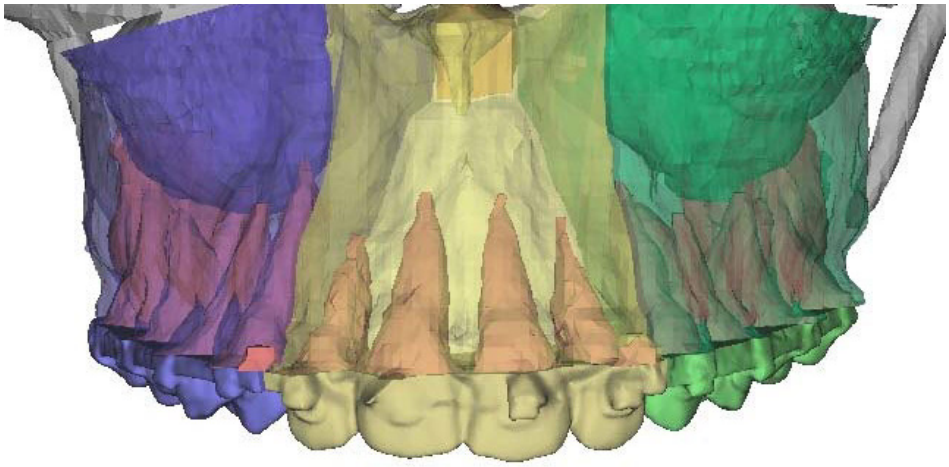
This cut offers the following extraction options: **None**, **On Right+Left**, **On Right**, and **On Left**. The following figures illustrate the cuts when **On Right+Left** is selected.

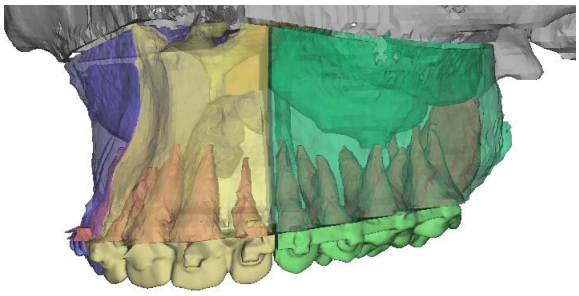


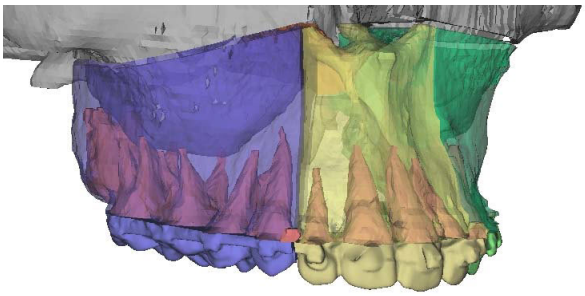
Step 4: Osteotomy

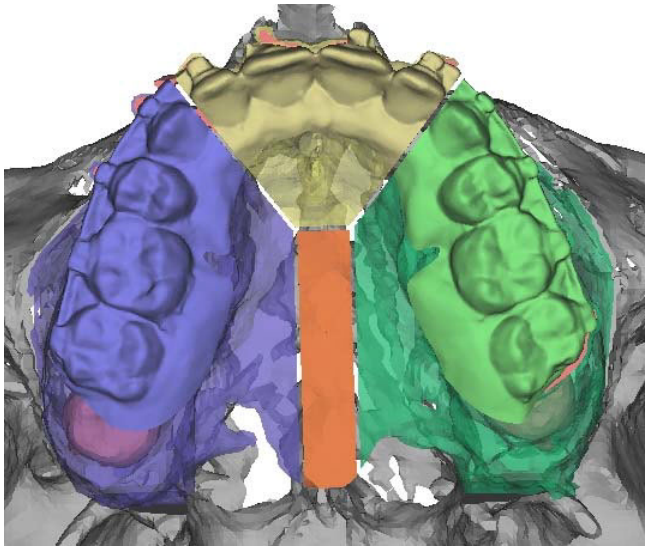


The following figures illustrate this osteotomy:

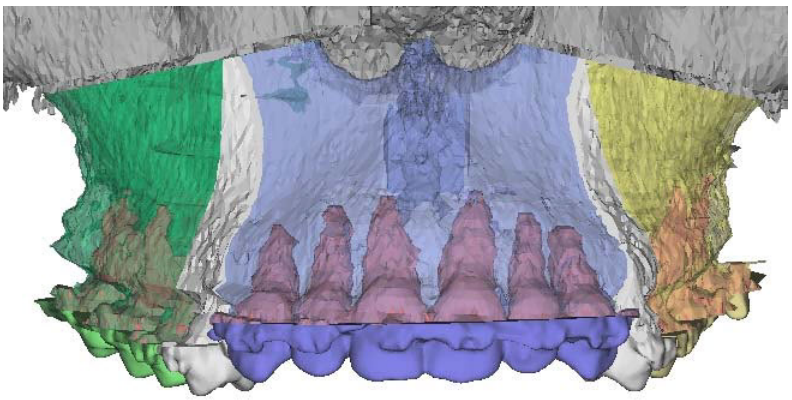


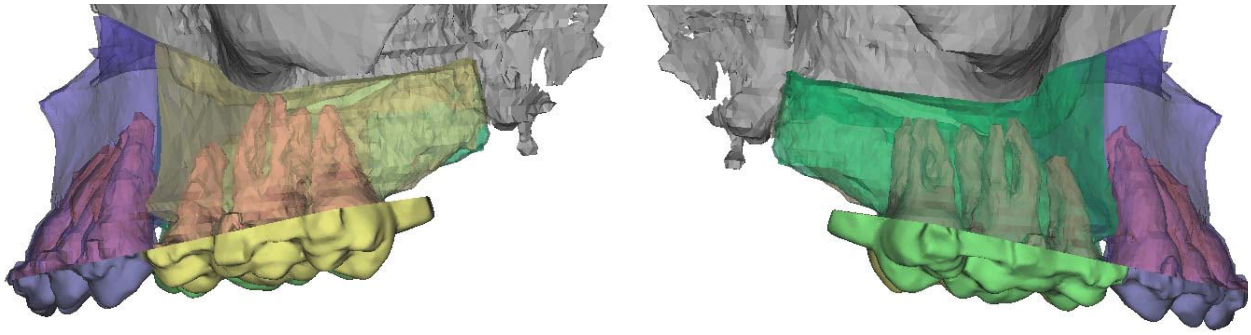


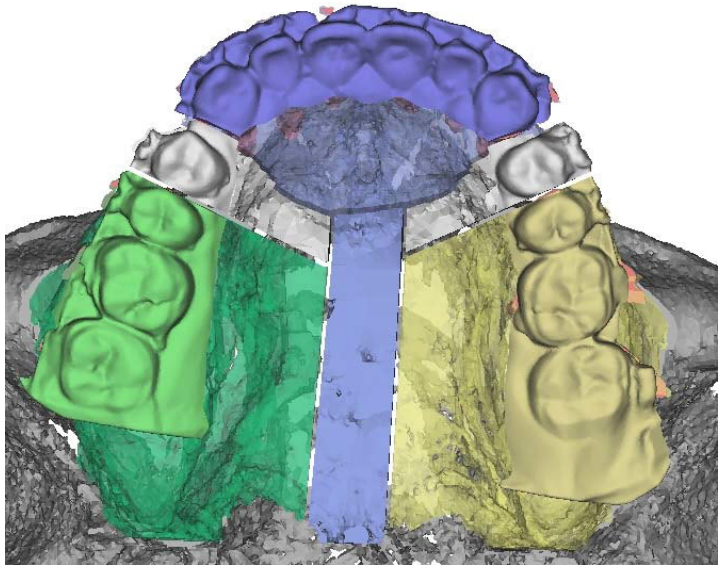




The following figures illustrate this osteotomy with teeth removed:







3-Piece (Asymmetry)

The following figures illustrate this osteotomy.

To specify this cut:

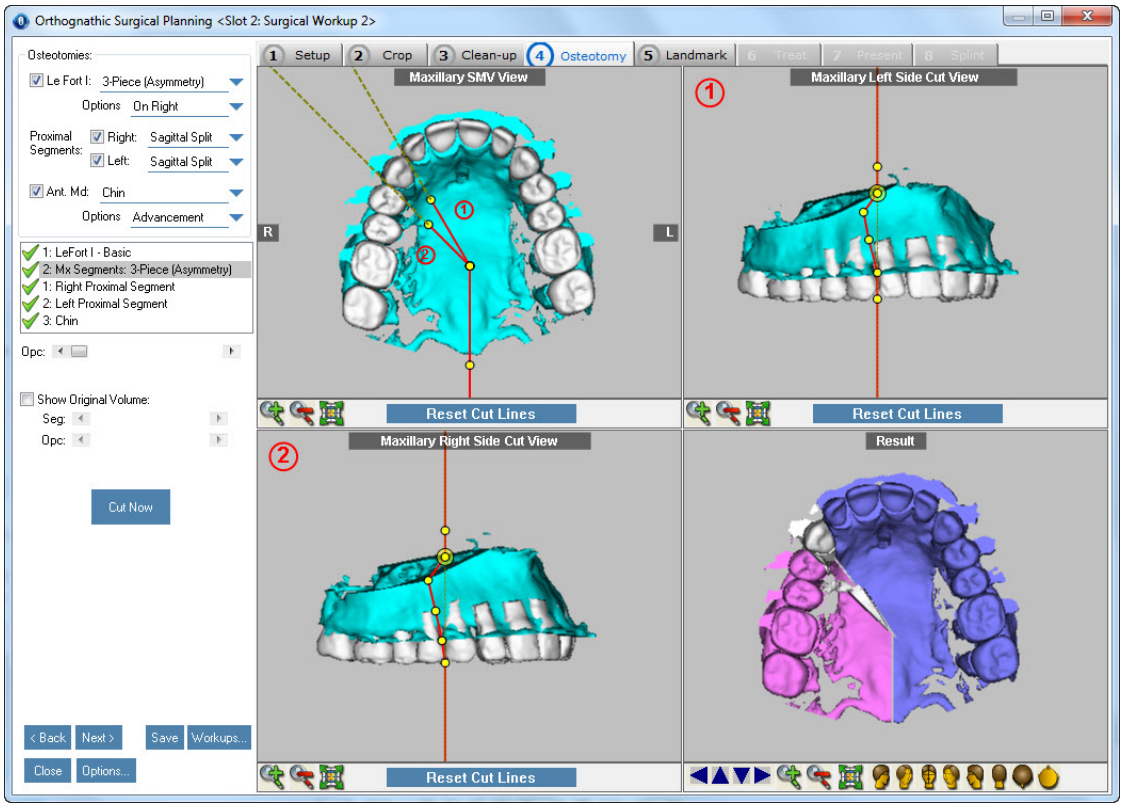
1 Click and drag the points in the Maxillary SMV View pane to define the cut.

2 In the Maxillary Left Side Cut View and Maxillary Right Side Cut View panes, move each of the large points to moves the associated cut line as a whole.

3 Move the small points in the Maxillary Left Side Cut View and Maxillary Right Side Cut View panes individually to contour the cut between the teeth.

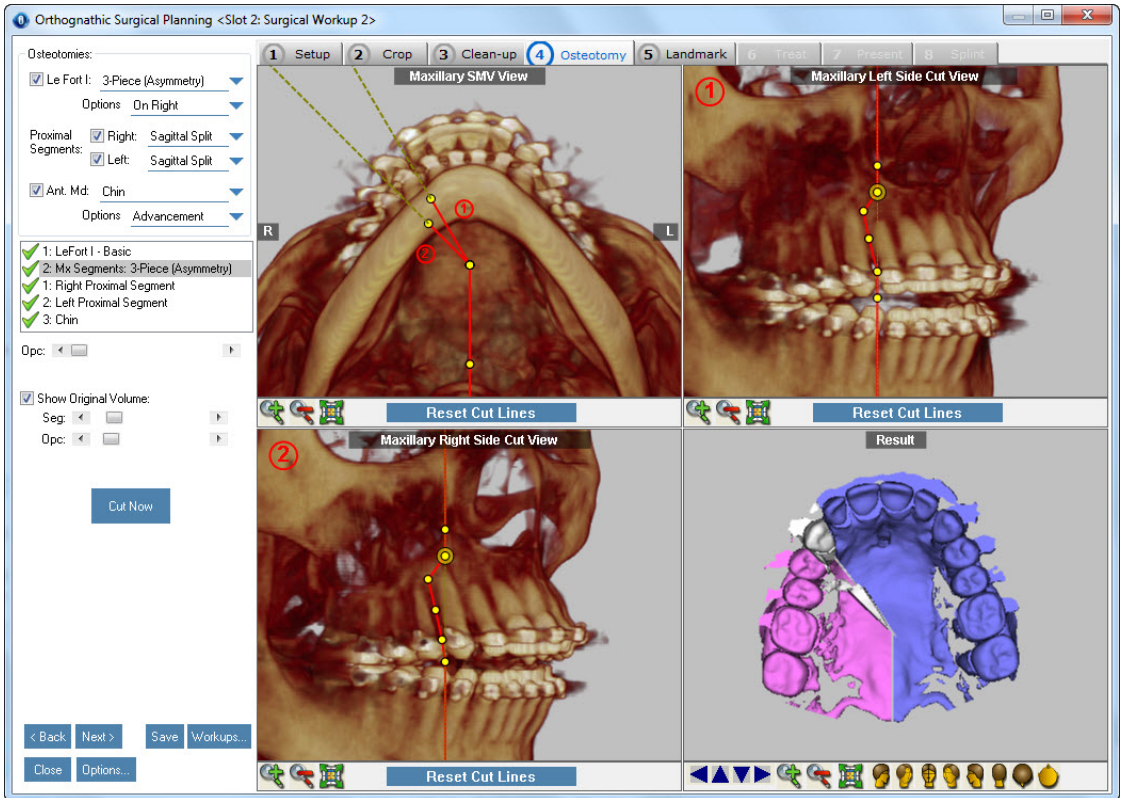
4 Click **Cut Now** to see the result in the Result pane.

Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

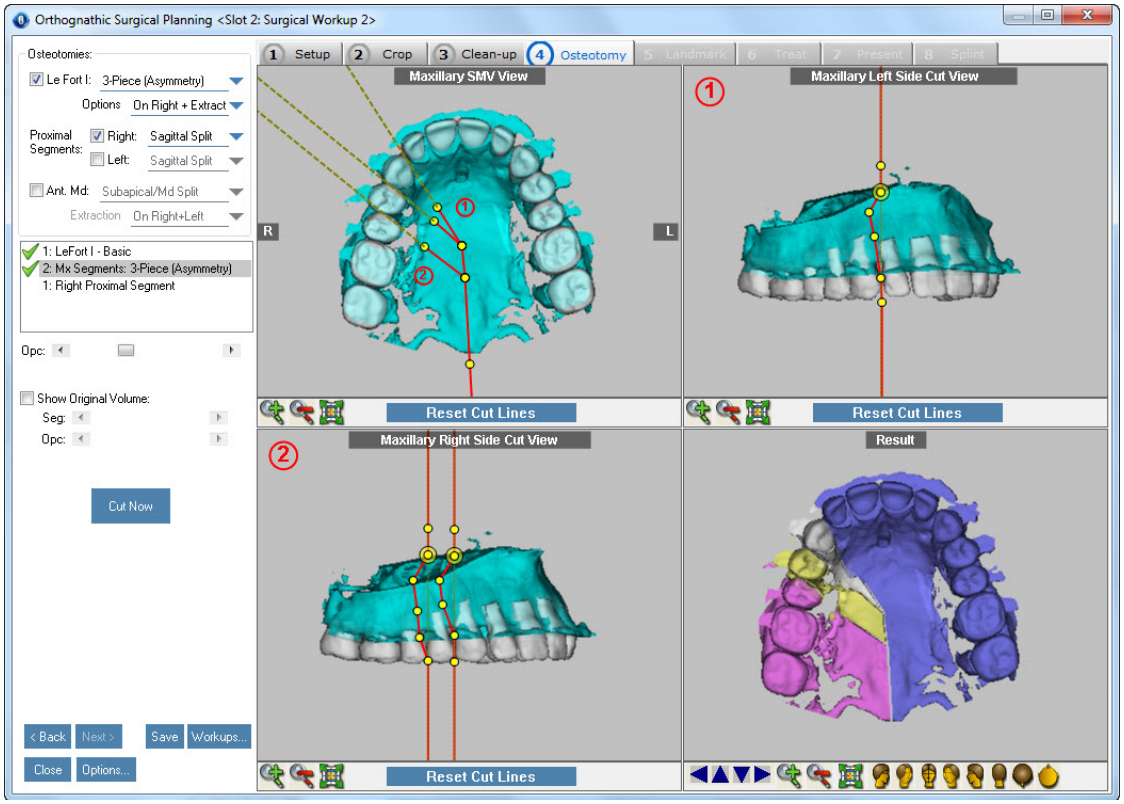


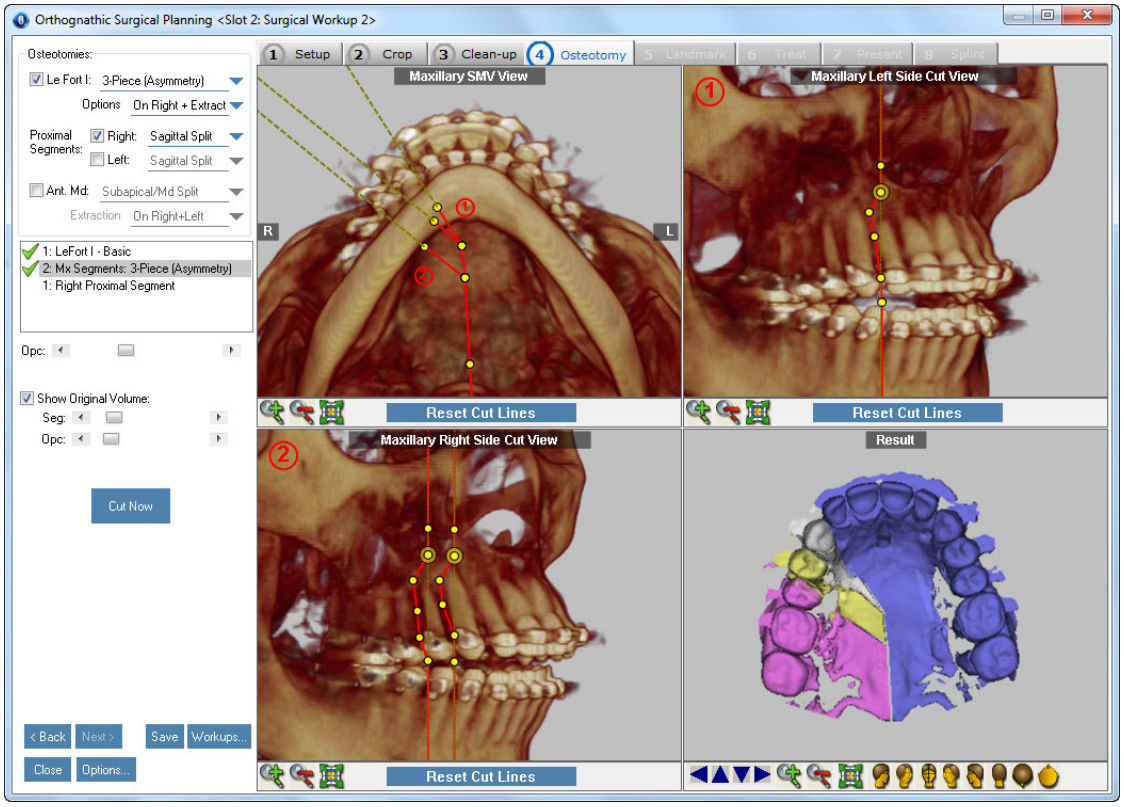
Check the **Show Original Volume** box to see the roots of the teeth as shown below.

Step 4: Osteotomy



This cut also offers extraction options. The following figures illustrate the cuts when **On Right+Extraction** is selected.





4-Piece

To specify this cut:

1 Click and drag the points in the Maxillary SMV View pane to define the cut.

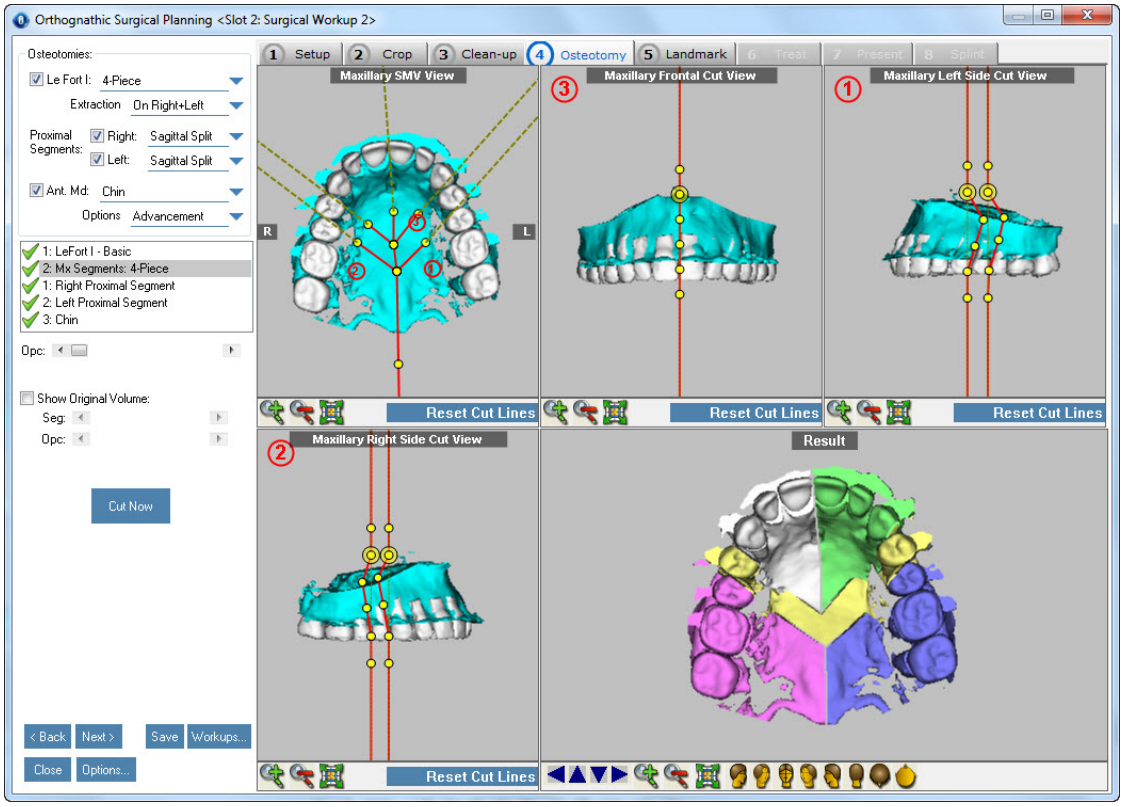
2 In the Maxillary Frontal Cut View, Maxillary Left Side Cut View, and Maxillary Right Side Cut View panes, move each of the large points to moves the associated cut line as a whole.

3 Move the small points in the Maxillary Frontal Cut View, Maxillary Left Side Cut View, and Maxillary Right Side Cut View panes individually to contour the cut between the teeth.

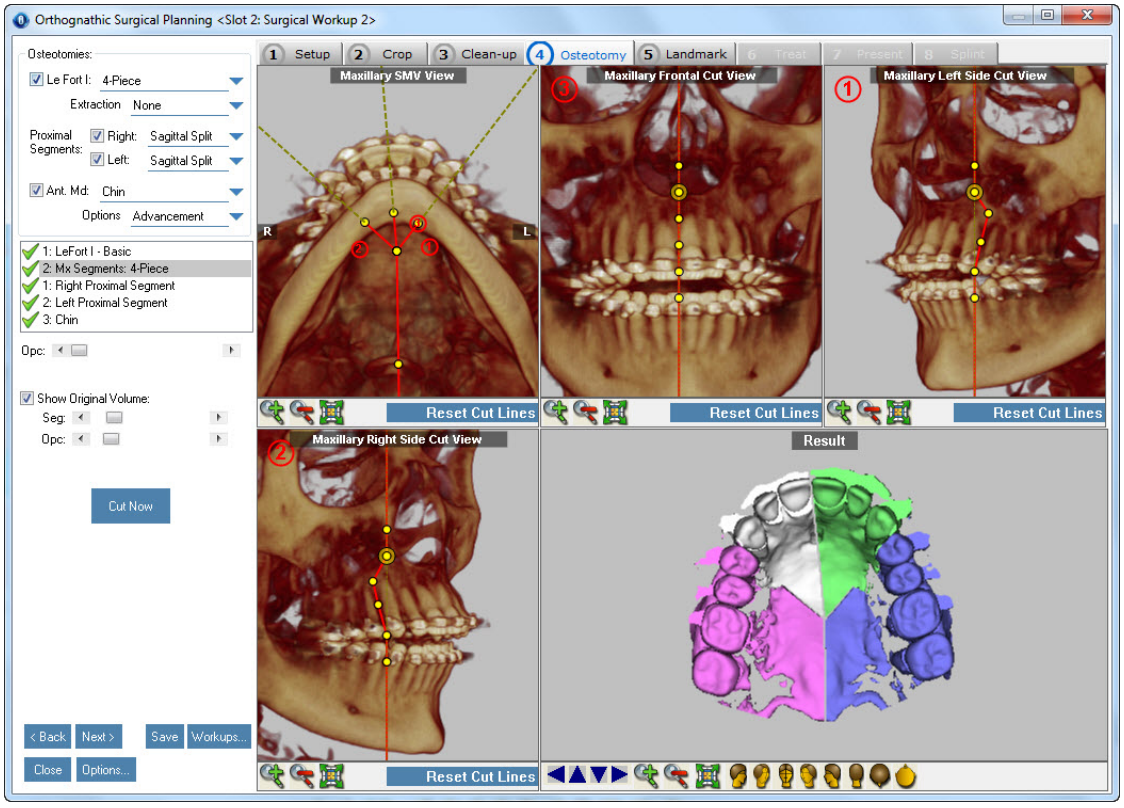
4 Click **Cut Now** to see the result in the Result pane.

Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

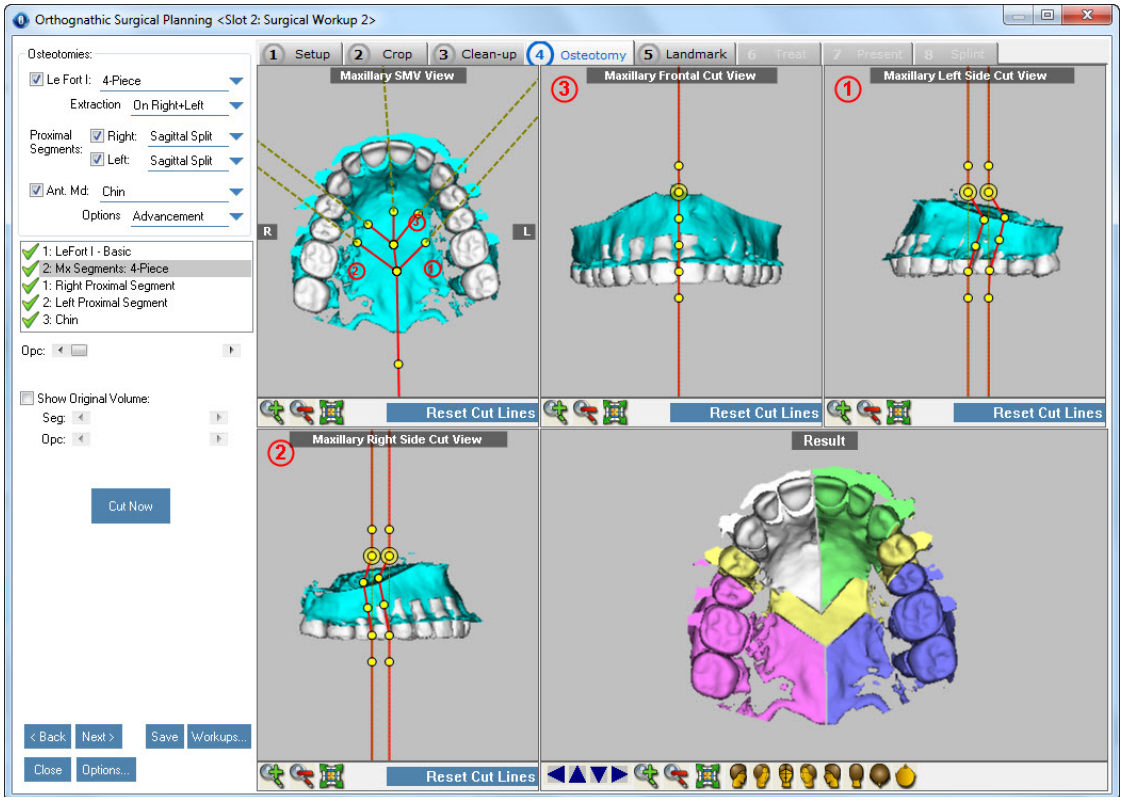
Step 4: Osteotomy

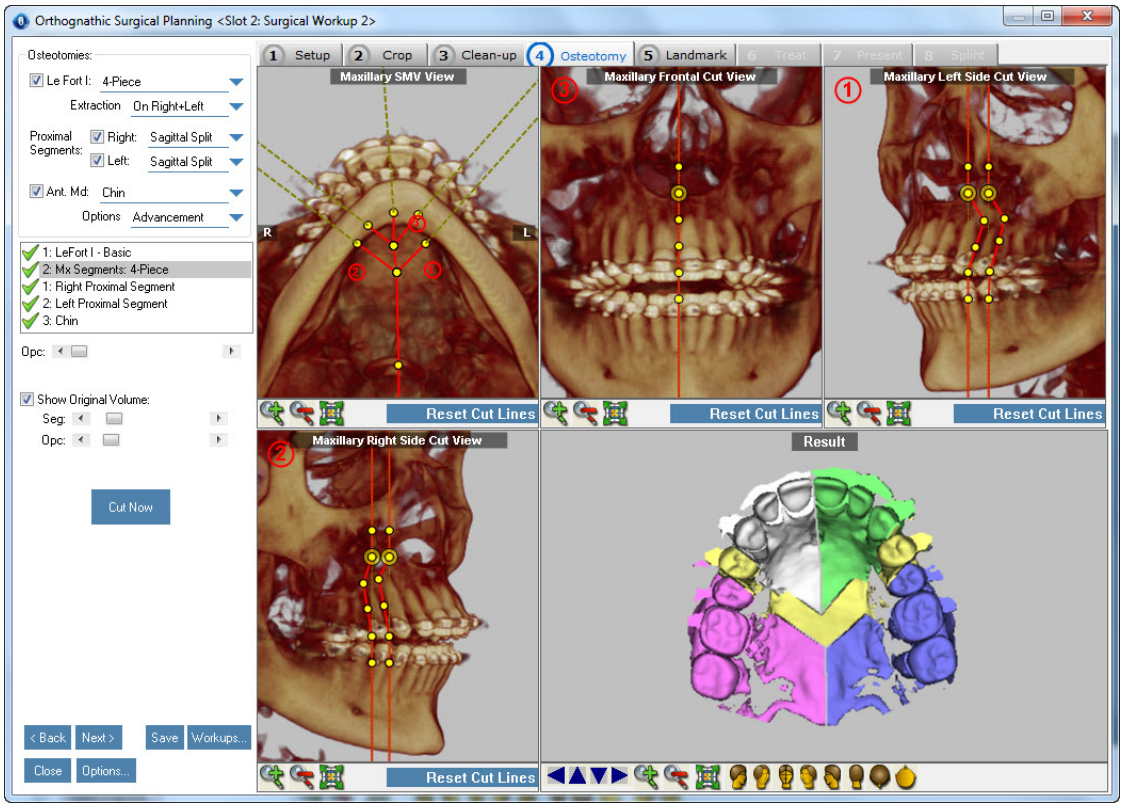


Check the **Show Original Volume** box to see the roots of the teeth as shown below.



This cut offers the following extraction options: **None**, **On Right+Left**, **On Right**, and **On Left**. The following figures illustrate the cuts when **On Right+Left** is selected.





4-Piece (Asymmetry)

Although similar to 4-Piece, do not use this cut for a symmetry midline cut through the incisors due to the underlining logic. Use 4-Piece, described page 30-43, instead.

To specify this cut:

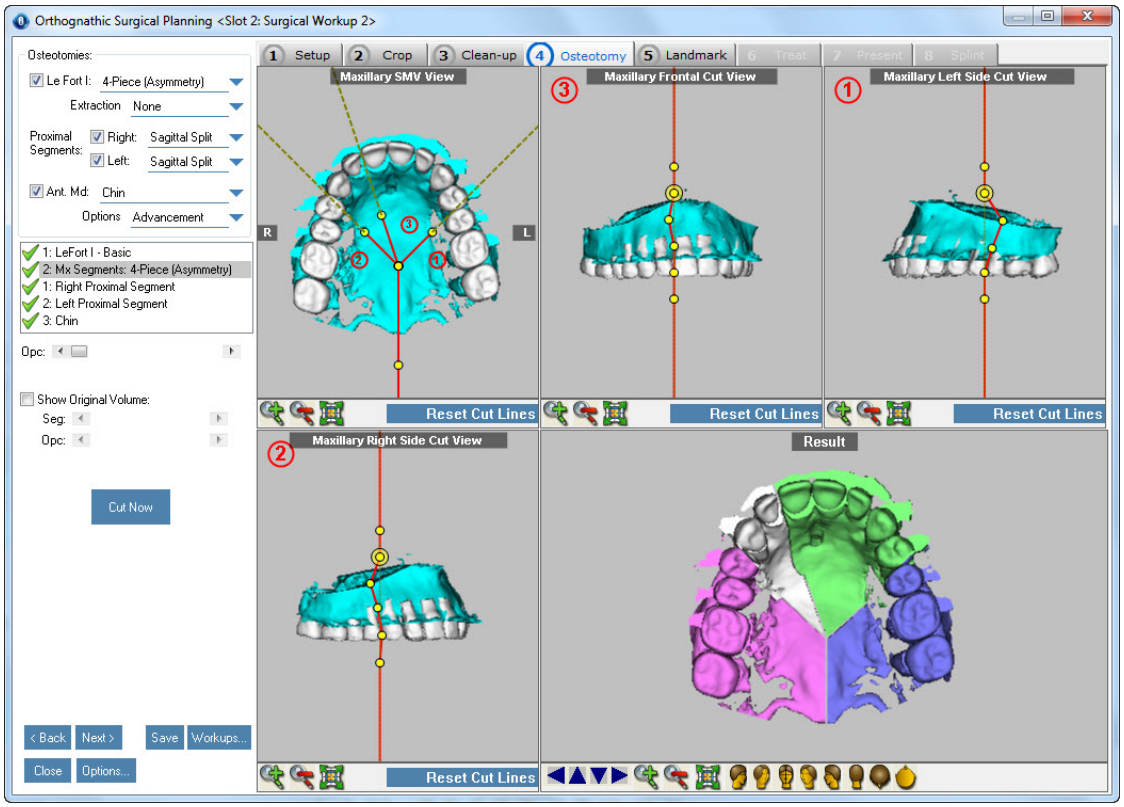
1 Click and drag the points in the Maxillary SMV View pane to define the cut.

2 In the Maxillary Frontal Cut View, Maxillary Left Side Cut View, and Maxillary Right Side Cut View panes, move each of the large points to moves the associated cut line as a whole.

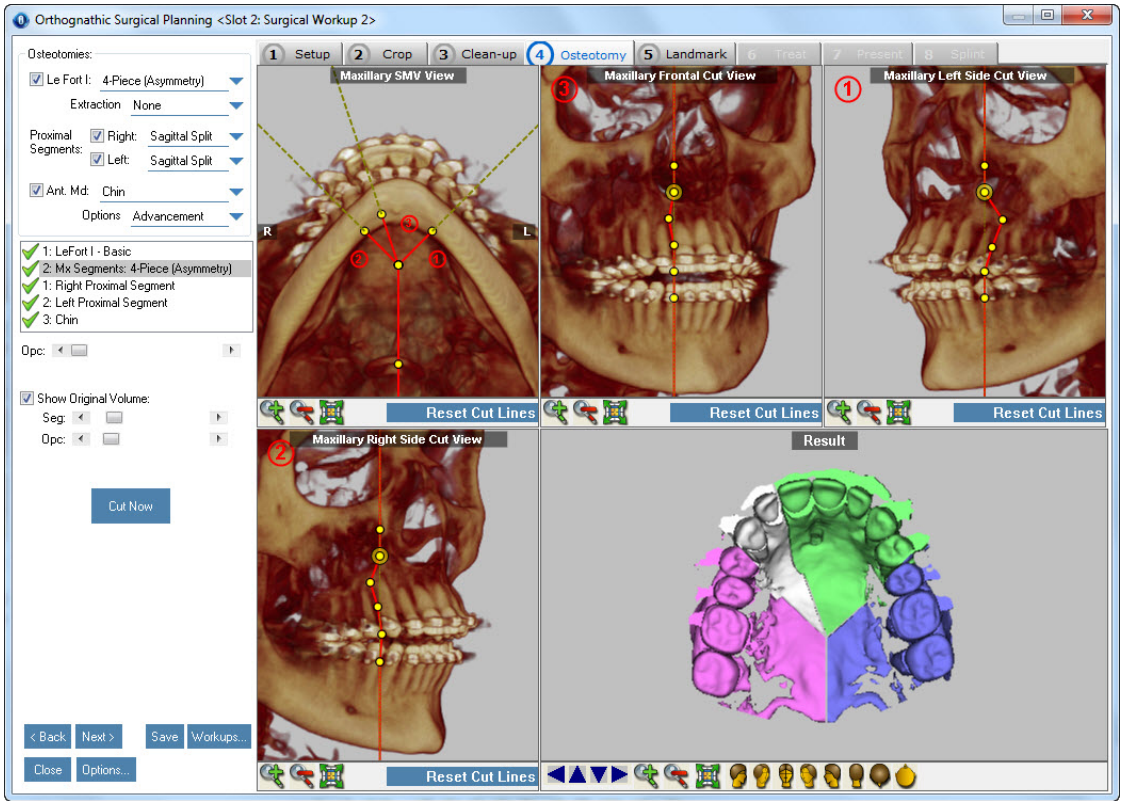
3 Move the small points in the Maxillary Frontal Cut View, Maxillary Left Side Cut View, and Maxillary Right Side Cut View panes individually to contour the cut between the teeth.

4 Click **Cut Now** to see the result in the Result pane.

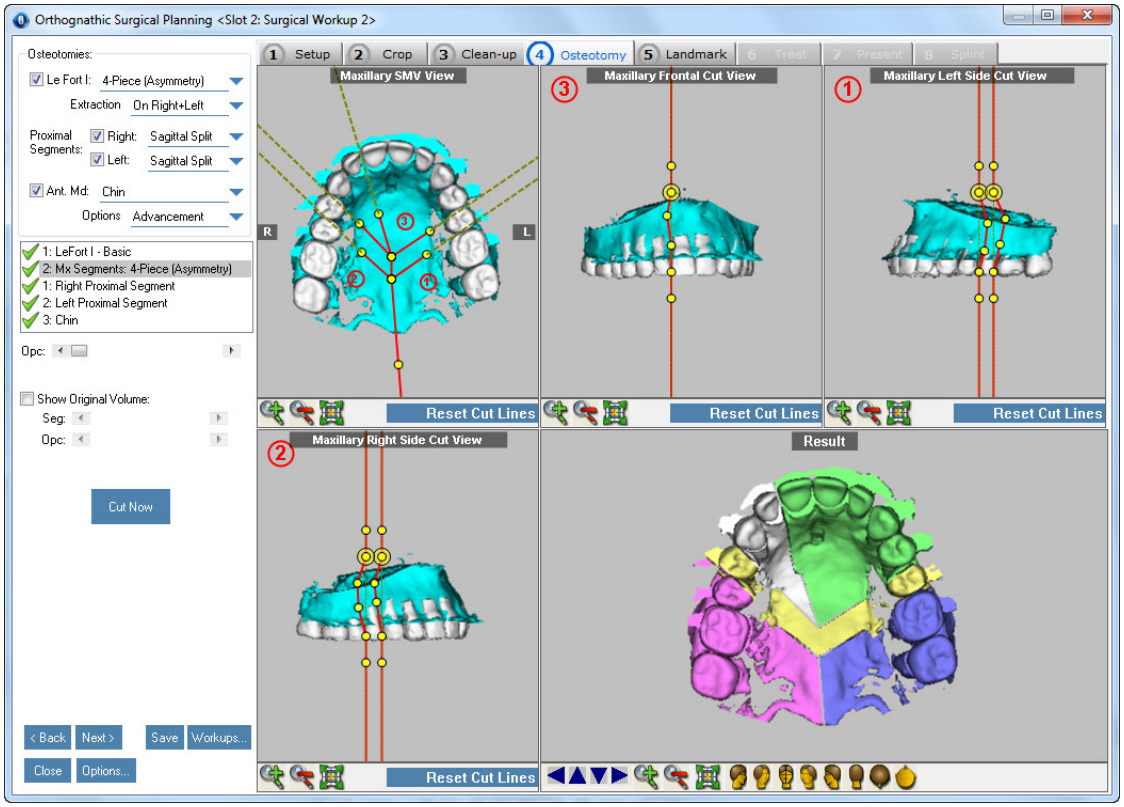
Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

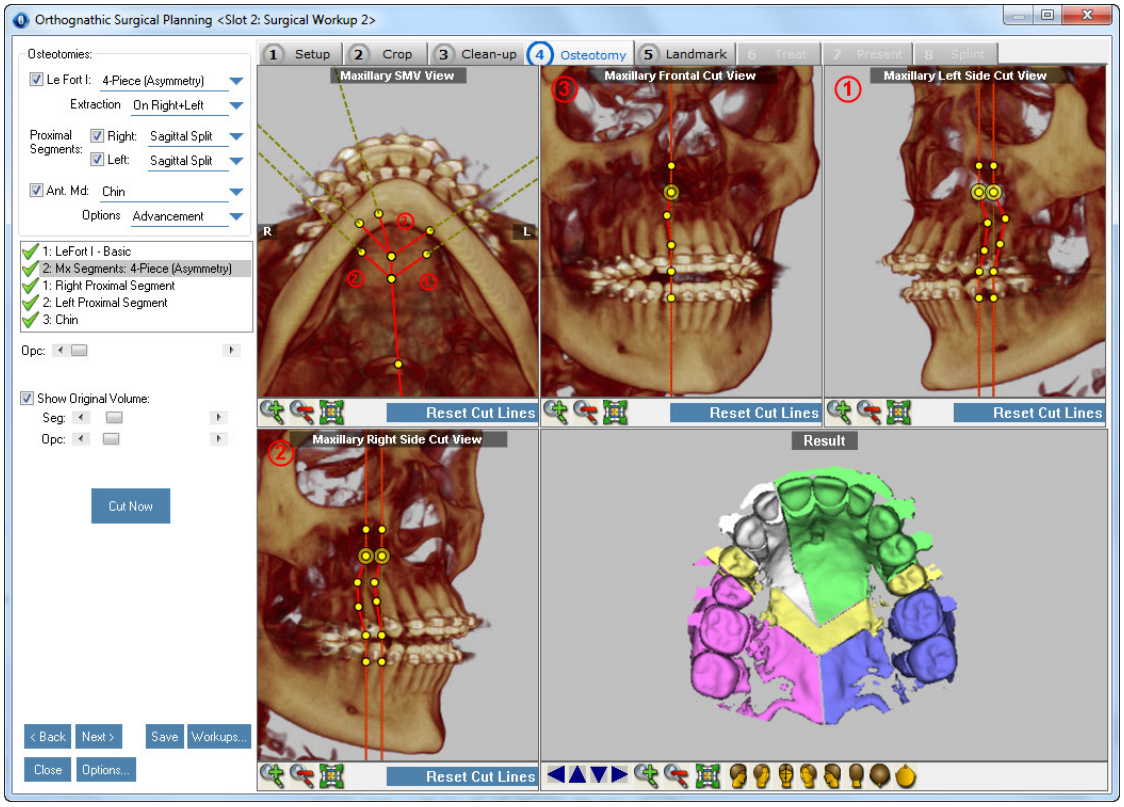


Check the **Show Original Volume** box to see the roots of the teeth as shown below.



This cut offers the following extraction options: **None**, **On Right+Left**, **On Right**, and **On Left**. The following figures illustrate the cuts when **On Right+Left** is selected.





Proximal Segments

You can plan cuts on the left and right proximal segments independently. Several osteotomy options are available for the proximal segments. For detailed information on these options, see “Quick Cut” on page 30-49, “Sagittal Split” on page 30-50, “Inverted L” on page 30-53, and “Inverted L and Vertical Ramus” on page 30-57.

To simulate a proximal segment osteotomy:

1 Next to Proximal Segments, check either the **Left** or **Right** box.

2 Select the type of osteotomy from the drop-down list.

3 Specify the planned cuts.

The process for specifying the cuts depends on the type of osteotomy you are planning.

4 Click **Cut Now** to see the result in the Result pane.

5 Click **Save** to save your work.

Quick Cut

With this option, you can do a quick cut for presentation purposes without spending the time in defining more realistic cut locations.

To specify the cuts:

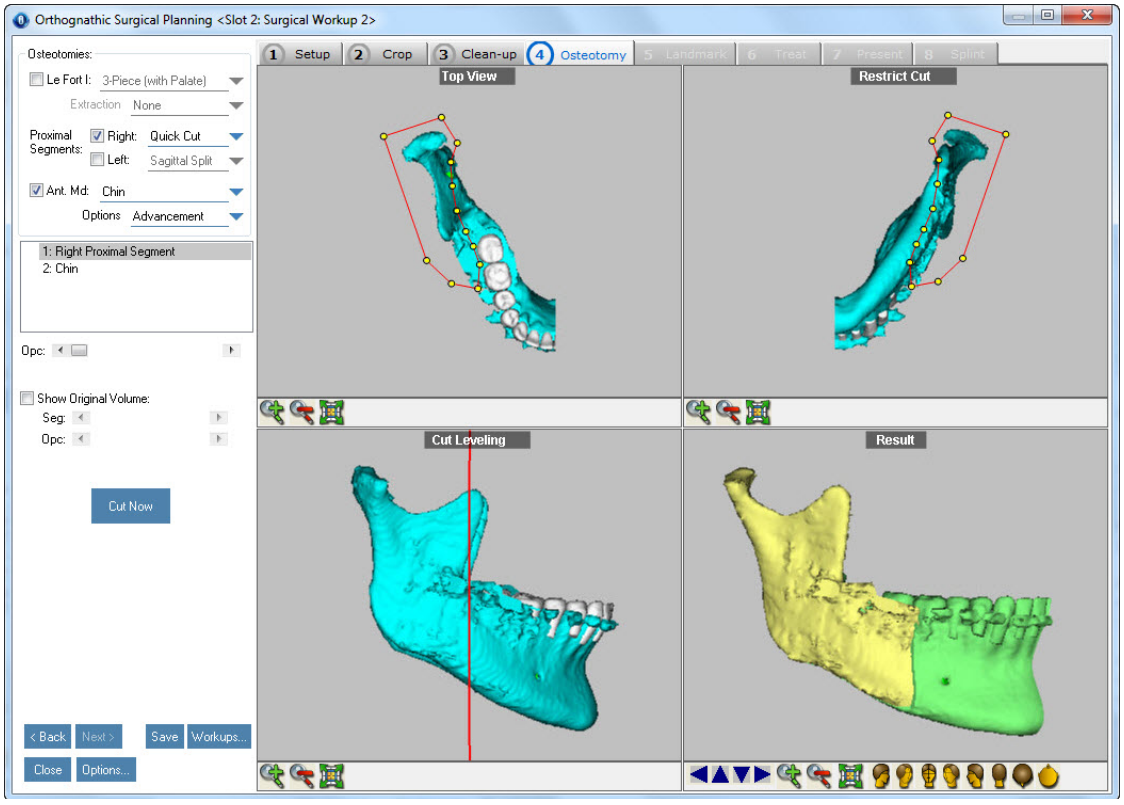
1 In the Cut Leveling pane, rotate the surface for the optimal angulation using the red line as a guide.

2 Use the Top View and Restrict Cut panes to draw a polygon to define the cut.

For information on drawing a polygon, see “Selecting an Area of an Image” on page 6-4.

3 Click **Cut Now** to see the result in the Result pane.

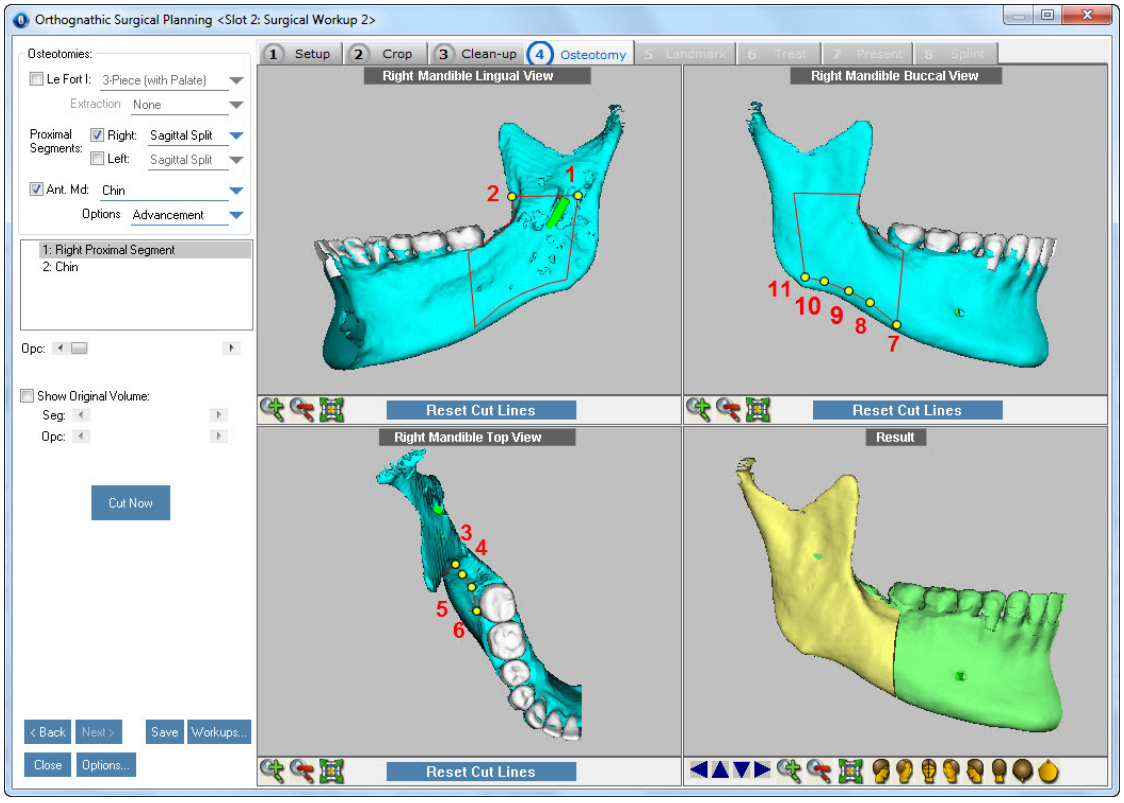
Note: *The following image illustrates how to use the user interface to plan the cuts. This image is for illustration purposes only and does not necessarily show optimal cut placement.*



Sagittal Split

The following figure illustrates this cut, and the steps below describe how to identify points for this cut.

Note: *The following images illustrates how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*



To specify this cut:

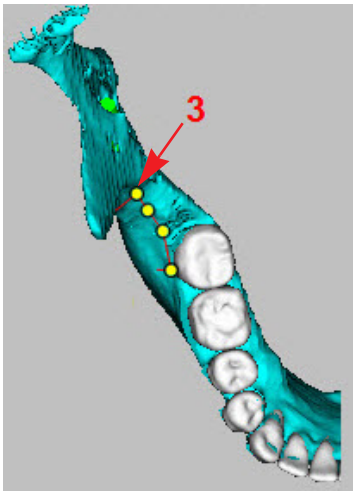
1 Rotate the image, if necessary, so that its orientation is similar to the figure above.

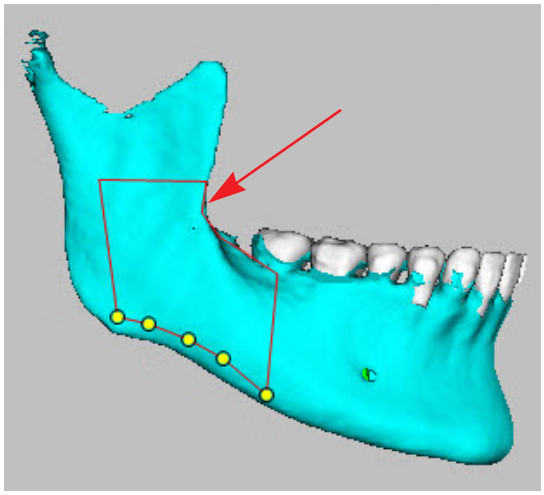
2 In the Right or Left Mandible Lingual View pane, click the points labeled 1 and 2.

Point 1 should be placed above and behind the nerve, and point 2 should be placed at the anterior border of the ramus.

3 In the Right or Left Mandible Top View pane, click the points labeled 3, 4, 5, and 6.

When clicking point 3, check the images in the Right or Left Mandible Lingual View and Right or Left Mandible Buccal View panes to verify that the cut line is in the curve “corner” of the mandible.

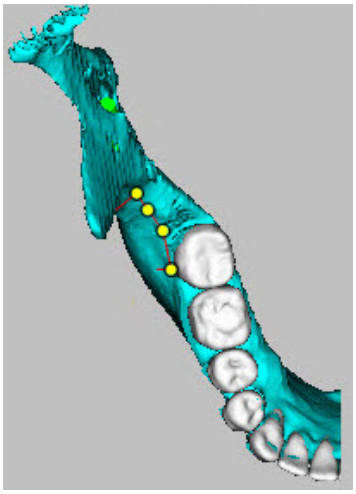




4 In the Right or Left Mandible Buccal View pane, click the points labeled 7, 8, 9. 10, and 11.

The cut lines should not overlap any teeth.

Correct

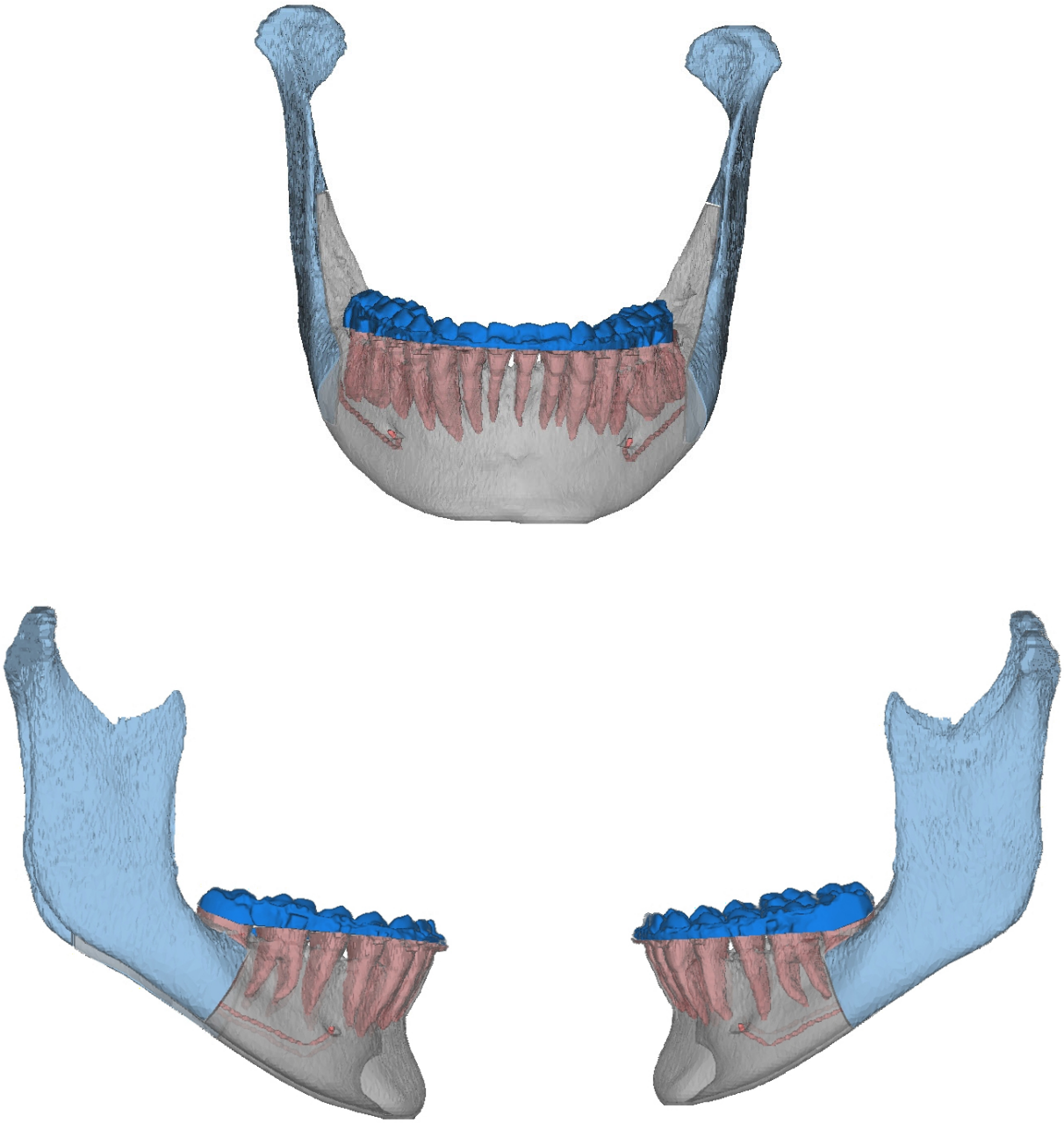


Incorrect

5 Rotate the volume, if necessary, so that its orientation in the Right or Left Mandible Lingual View, Right or Left Mandible Buccal View, and Mandible Top View panes is as if you were to cut straight down.

6 Click **Cut Now** to see the result in the Result pane.

The following figures illustrate a bilateral sagittal split osteotomy (BSSO):



Inverted L

To specify this cut:

1 If the nerve canals were defined for the volume, adjust the **Opc** slider so that they are visible.

2 In the Right or Left Mandible Lingual View and Right or Left Mandible Buccal View panes, click inside the cutting polygon and drag it to the appropriate location.

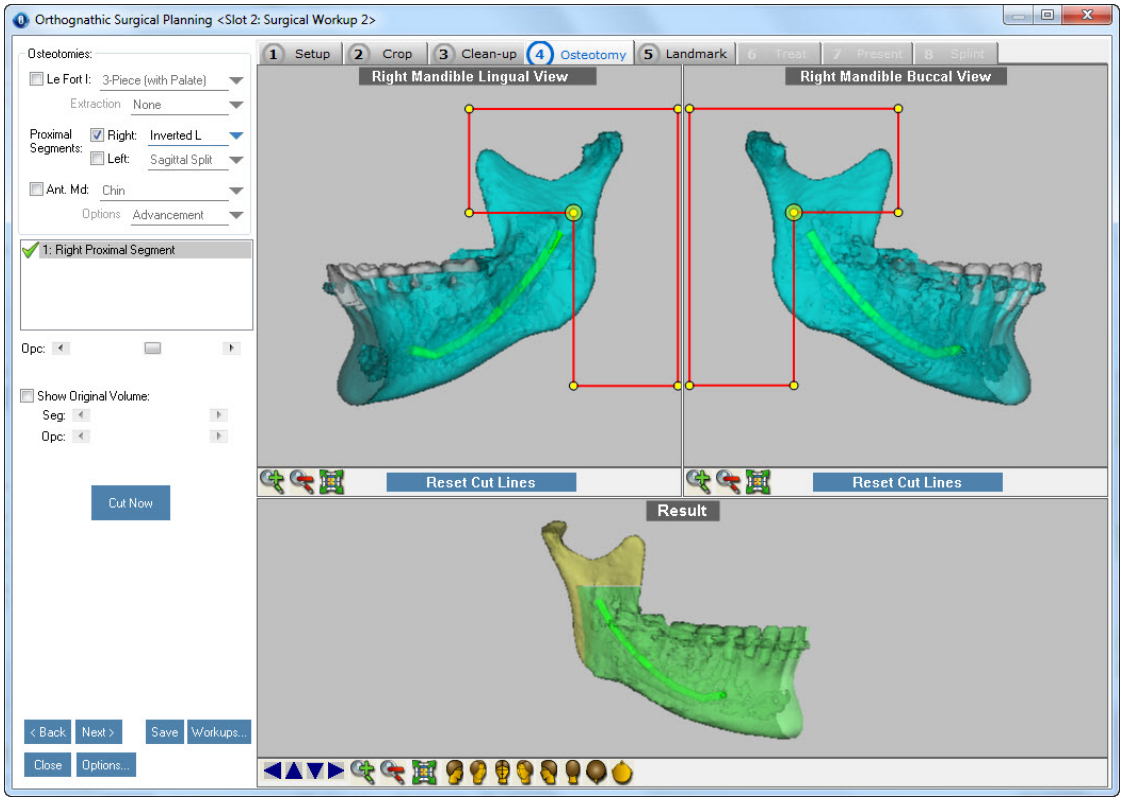
Or,

Click and drag the large move the large point to move the entire cutting polygon.

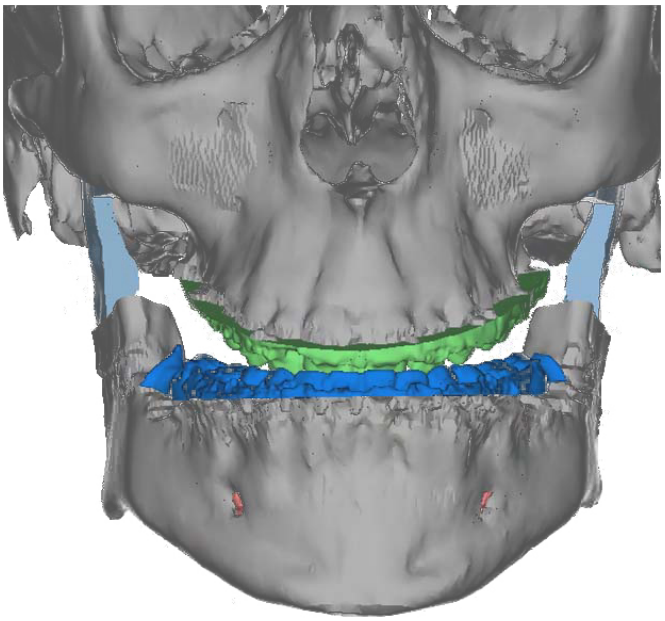
3 If necessary, click and drag the small points to reshape the cutting polygon.

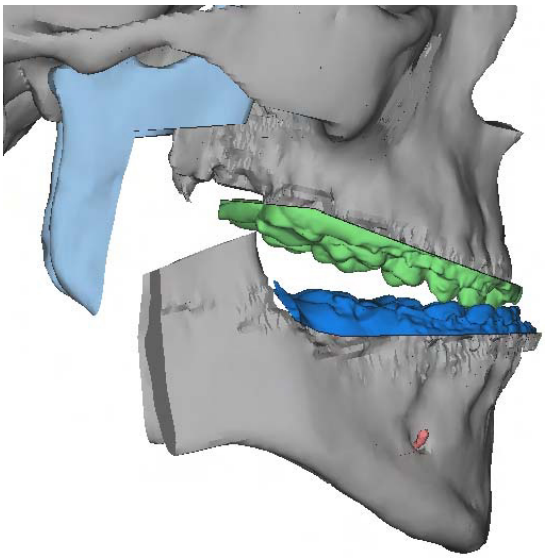
4 Click **Cut Now** to see the result in the Result pane.

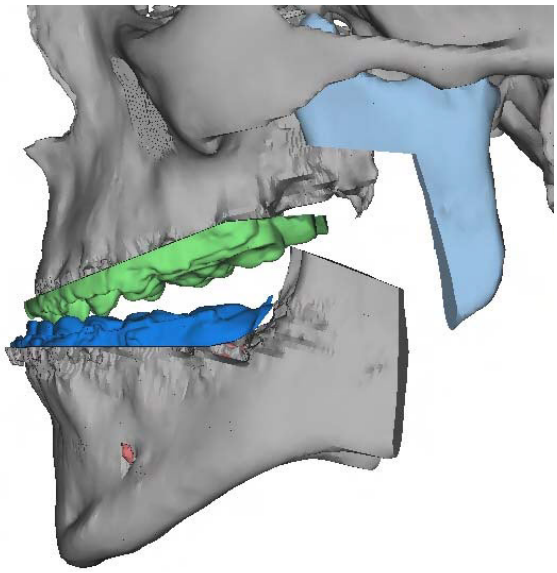
Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*



The following figures illustrate this osteotomy:







Vertical Ramus

To specify this cut:

1 If the nerve canals were defined for the volume, adjust the **Opc** slider so that they are visible.

2 In the Right or Left Mandible Lingual View and Right or Left Mandible Buccal View panes, click inside the cutting polygon and drag it to the appropriate location.

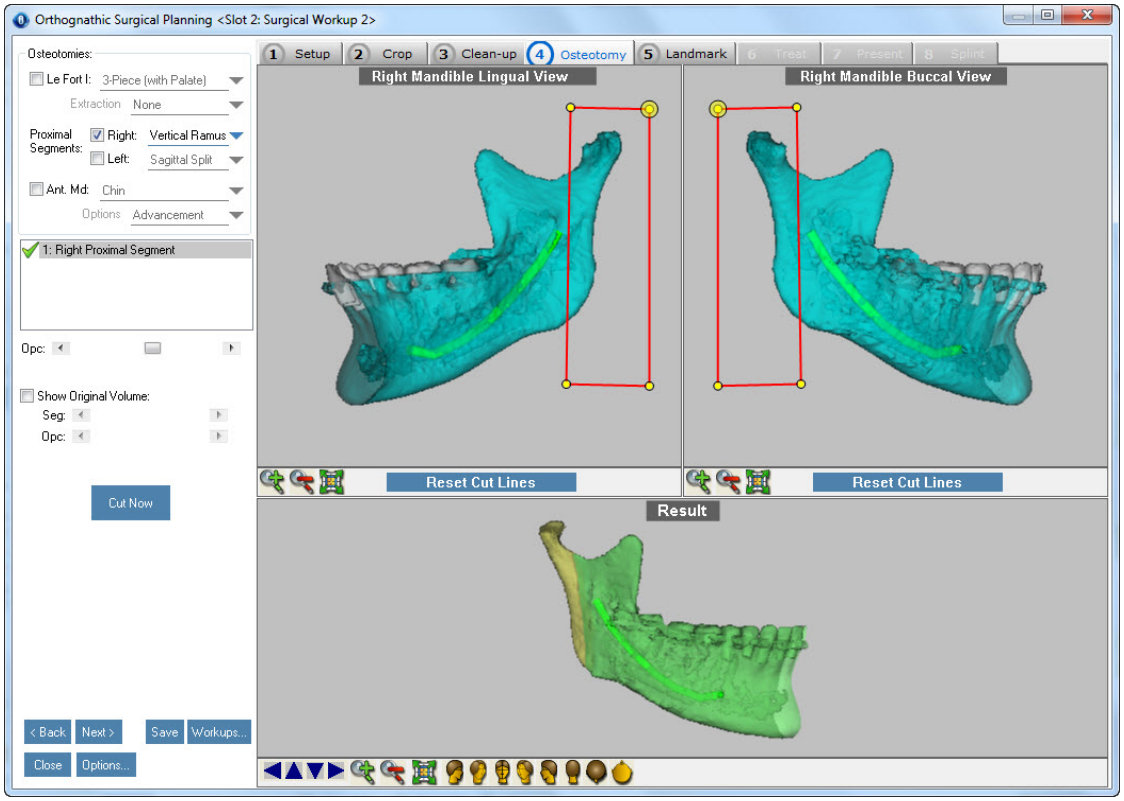
Or,

Click and drag the large move the large point to move the entire cutting polygon.

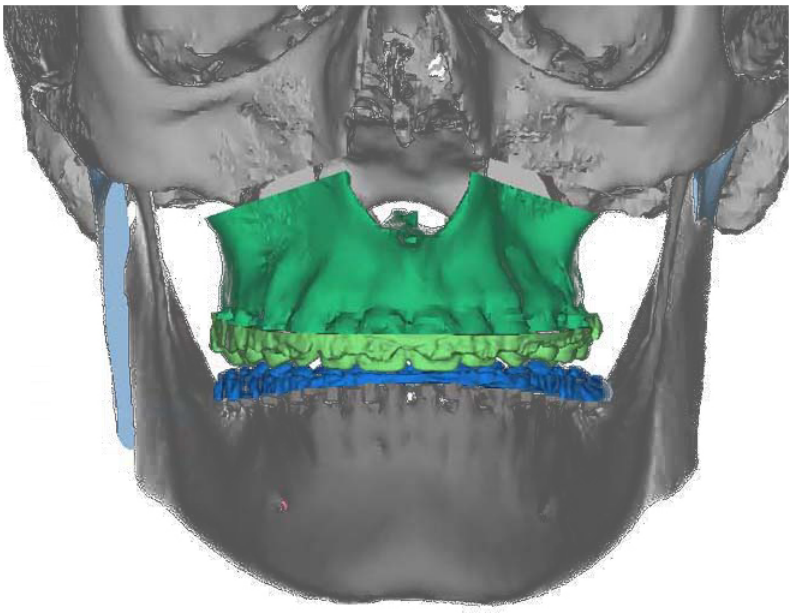
3 If necessary, click and drag the small points to reshape the cutting polygon.

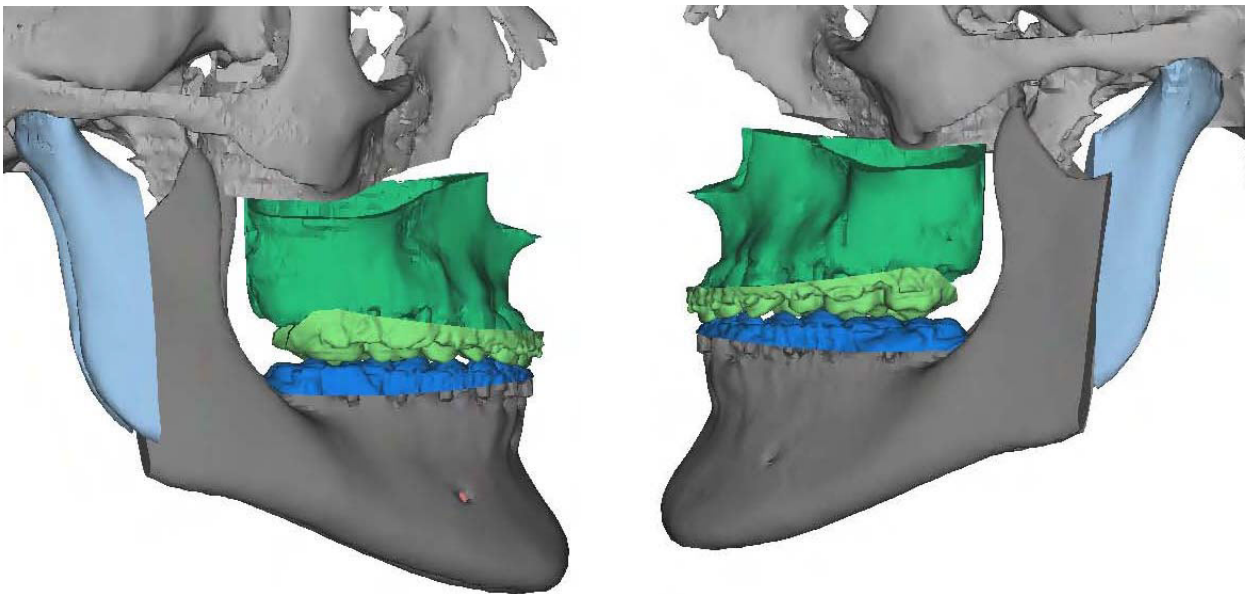
4 Click **Cut Now** to see the result in the Result pane.

Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*



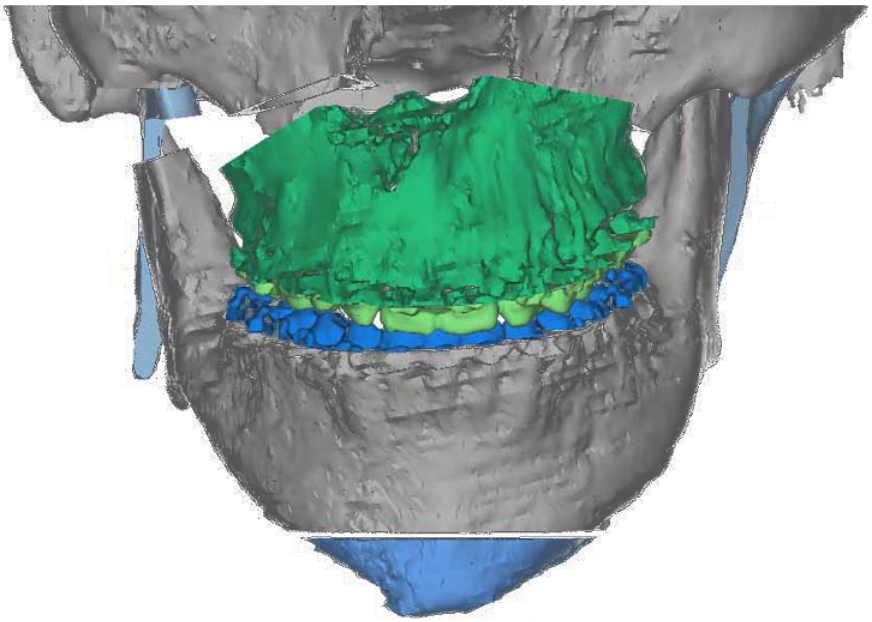
The following figures illustrate this osteotomy:



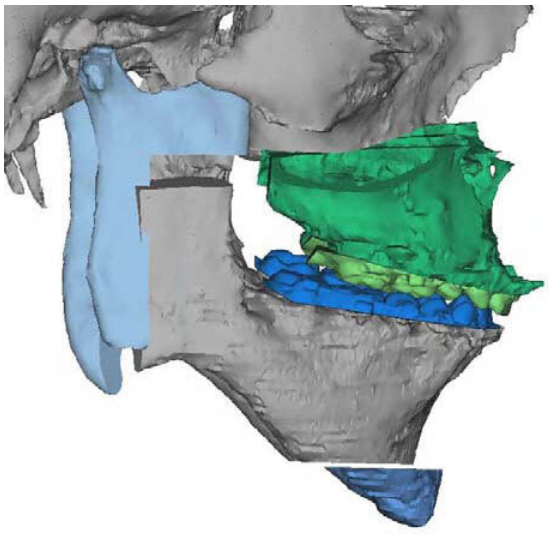


Inverted L and Vertical Ramus

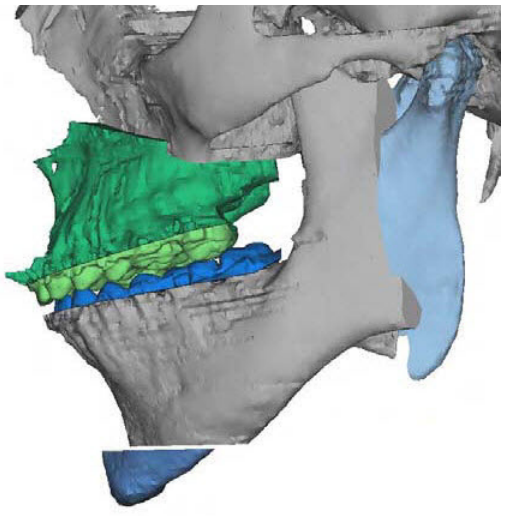
The following figures illustrate a patient with the inverted L osteotomy on one side and the vertical ramus osteotomy on the other:



Inverted L



Vertical Ramus



Anterior Mandible

Several osteotomy options are available for the anterior mandible. For detailed information on them, see “Chin” on page 30-58, “Subapical” on page 30-61, “Mandibular Segment” on page 30-64, “Md Midline Split” on page 30-68, “Subapical/Chin” on page 30-69, and “Subapical/Md Split” on page 30-73.

Note: *The anterior mandible osteotomy cut can be performed in the post-operative segment positions. For example, if you are simulating a BSSO and have moved the anterior mandible and want to experiment with cutting the chin at the post-operative segment positions, you can go through the treatment simulation process through* ***Step 6: Treat****, return to* ***Step 4: Osteotomy****, check the* ***Show Segments in Post-op Positions*** *box, and make the chin cut at the post-operative segment positions, and then return to* ***Step 6: Treat*** *to continue the treatment simulation process.*

To simulate an anterior mandible osteotomy:

1 Check the **Ant. Md.** box.

2 Select the type of osteotomy from the drop-down list.

3 Select any extractions or other options, if appropriate, from the drop-down list labeled either **Extraction** or **Options** (depending on the osteotomy type).

4 Optionally, if you are returning to **Step 4: Osteotomy** from **Step 6: Treat** (as described in the note above), check the **Show Segments in Post-op Positions** box to show the post-operative segment positions.

5 Specify the planned cuts.

The process for specifying the cuts depends on the type of osteotomy you are planning.

6 Click **Cut Now** to see the result in the Result pane.

7 Click **Save** to save your work.

Chin

This cut offers advancement and retraction options.

To specify this cut:

1 If the nerve canals were defined for the volume, adjust the **Opc** slider so that they are visible.

2 Select **Advancement** or **Retraction** from the Options drop-down list.

3 In the Chin Cut panes, click inside the cutting polygon and drag it to the appropriate location.

4 Optionally, click and drag the large point to rotate the cutting polygon.

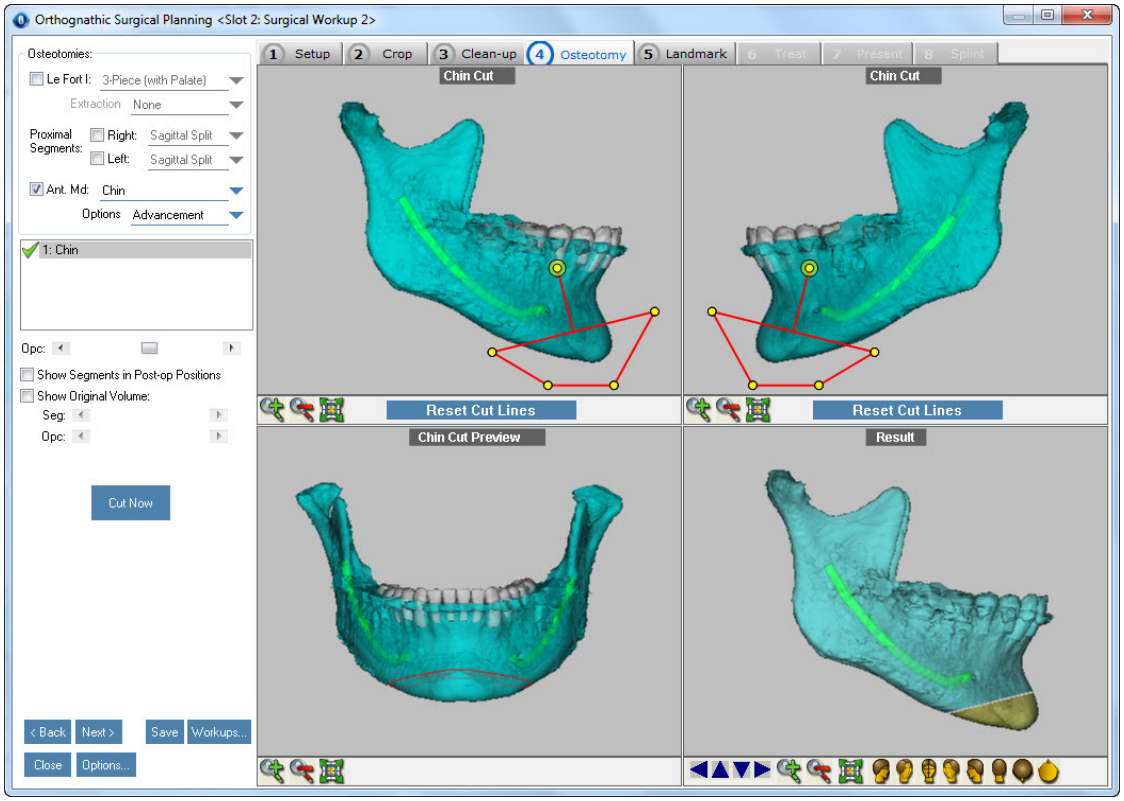
5 Optionally, click and drag the small points to reshape the cutting polygon.

The Chin Cut Preview pane shows a preview of the cut.

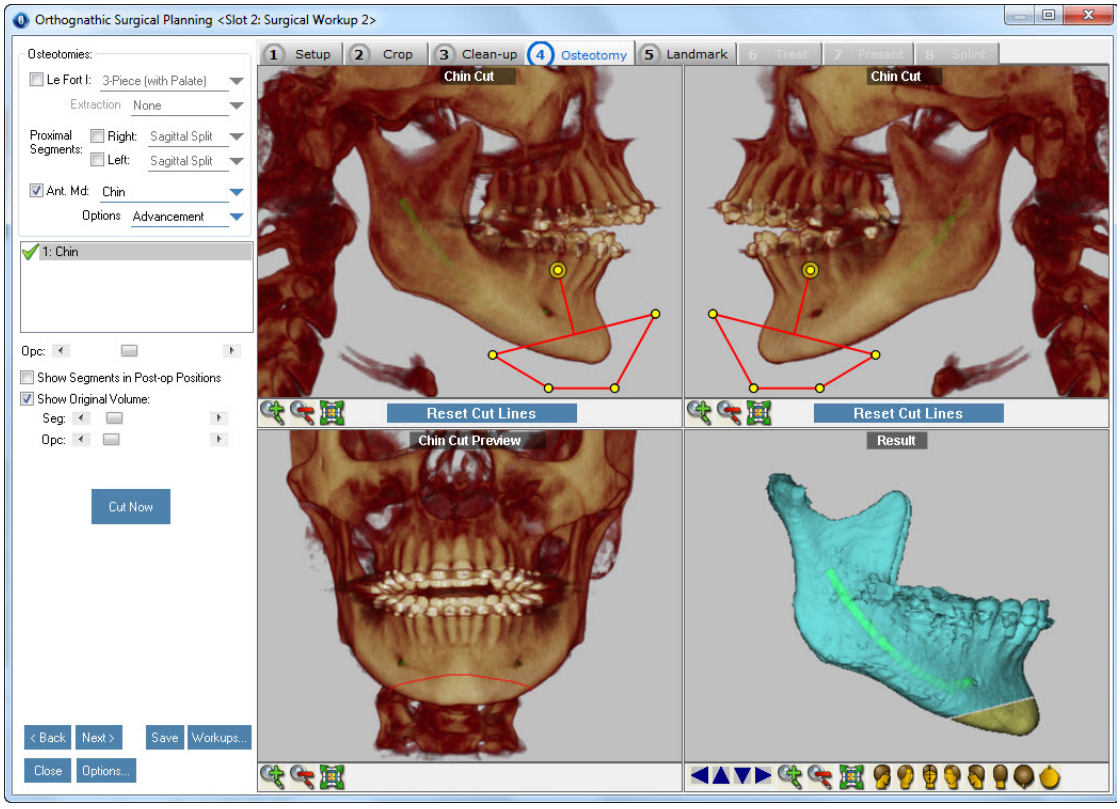
6 Click **Cut Now** to see the result in the Result pane.

The figure below illustrates this cut with the **Advancement** option.

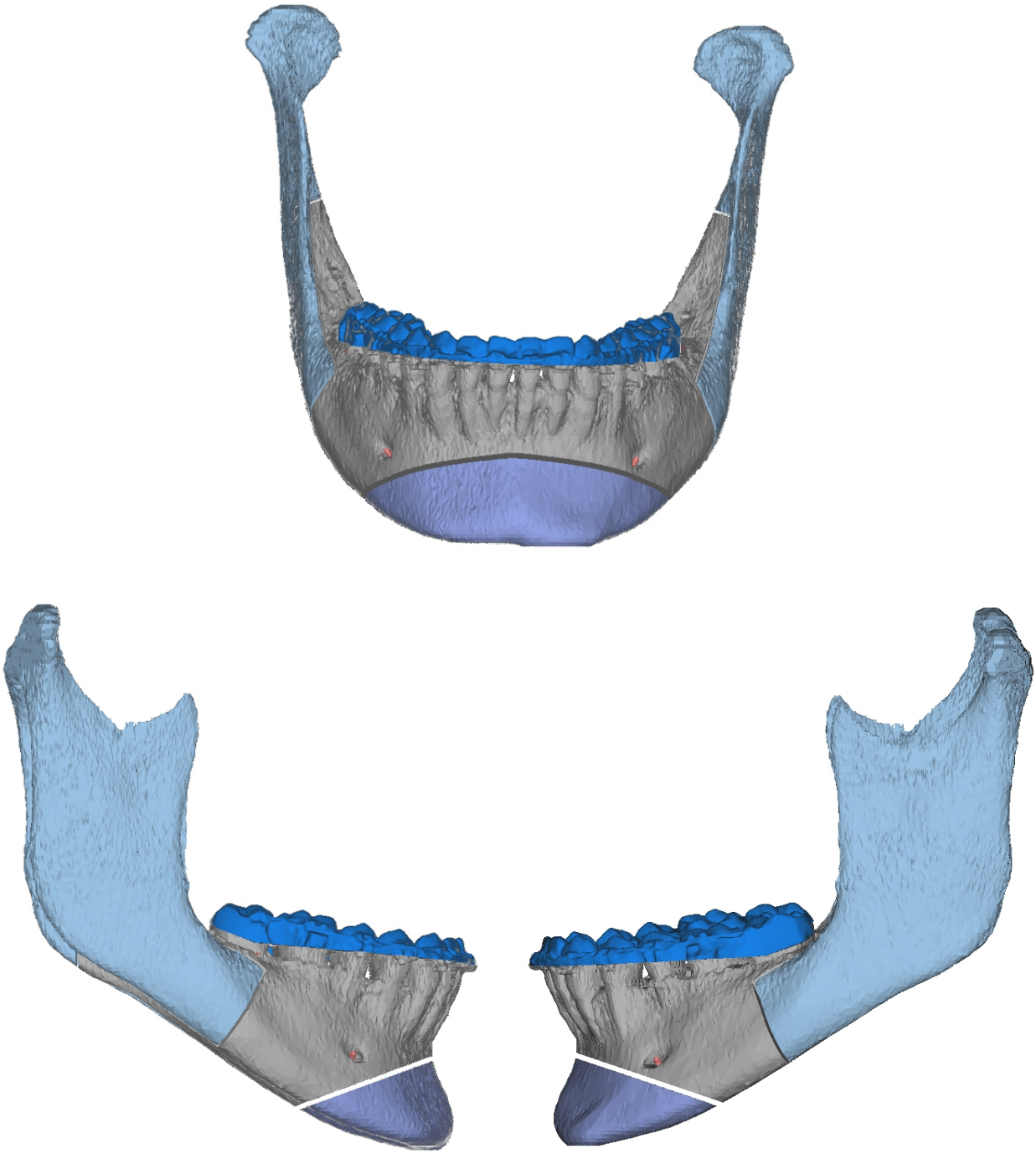
Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*



Check the **Show Original Volume** box to see the roots of the teeth as shown below.



The following figures illustrate this osteotomy:



Subapical

To specify this cut:

1 If the nerve canals were defined for the volume, adjust the **Opc** slider so that they are visible.

2 In the Mandibular Frontal View pane, move the large point so that it is centered and the horizontal cut line is in the correct location.

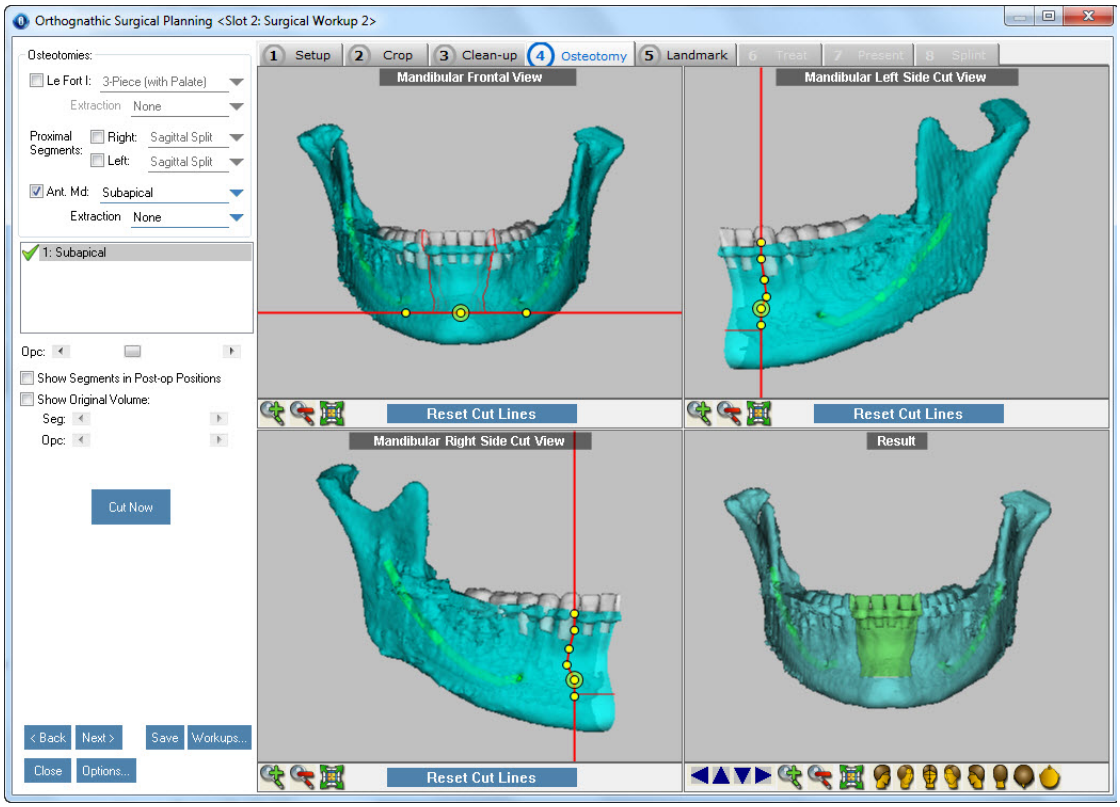
3 In the Mandibular Frontal View plane, move the small points to change the angulation of the cut line.

4 In the Mandibular Left Side Cut View and Mandibular Right Side Cut View panes, move each of the large points to moves the associated cut line as a whole.

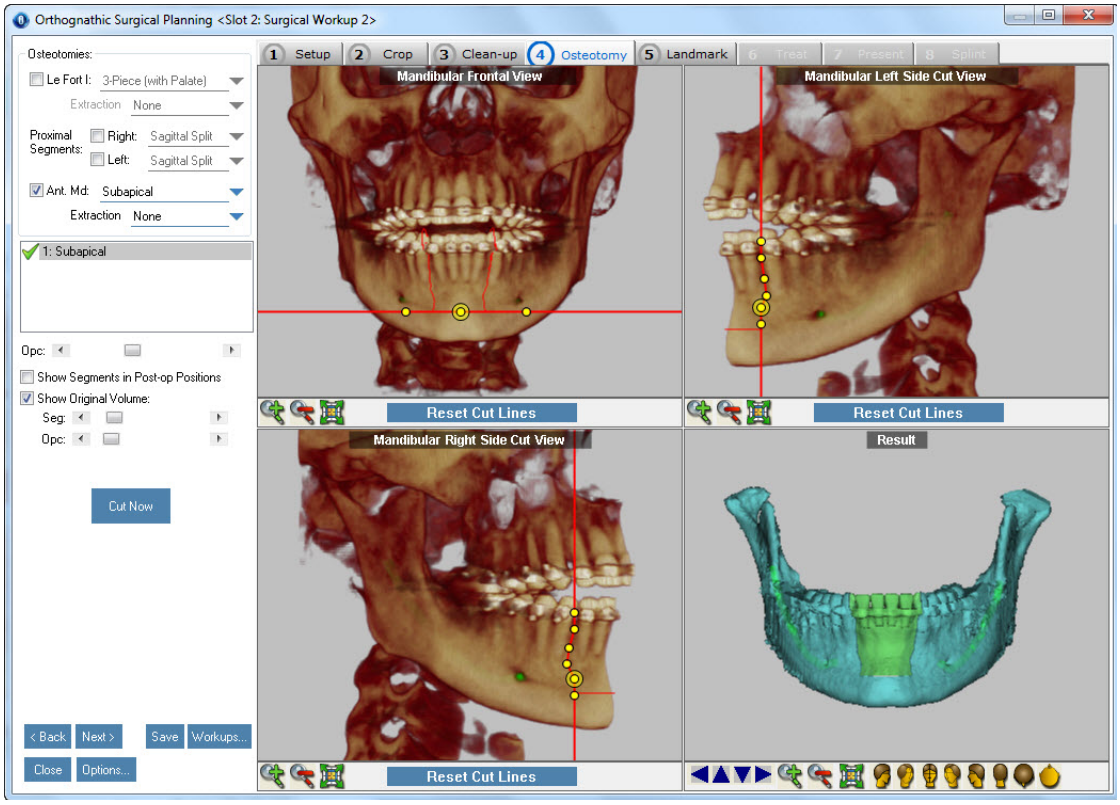
5 In the Mandibular Left Side Cut View and Mandibular Right Side Cut View panes, move the small points individually to contour the cut between the teeth.

6 Click **Cut Now** to see the result in the Result pane.

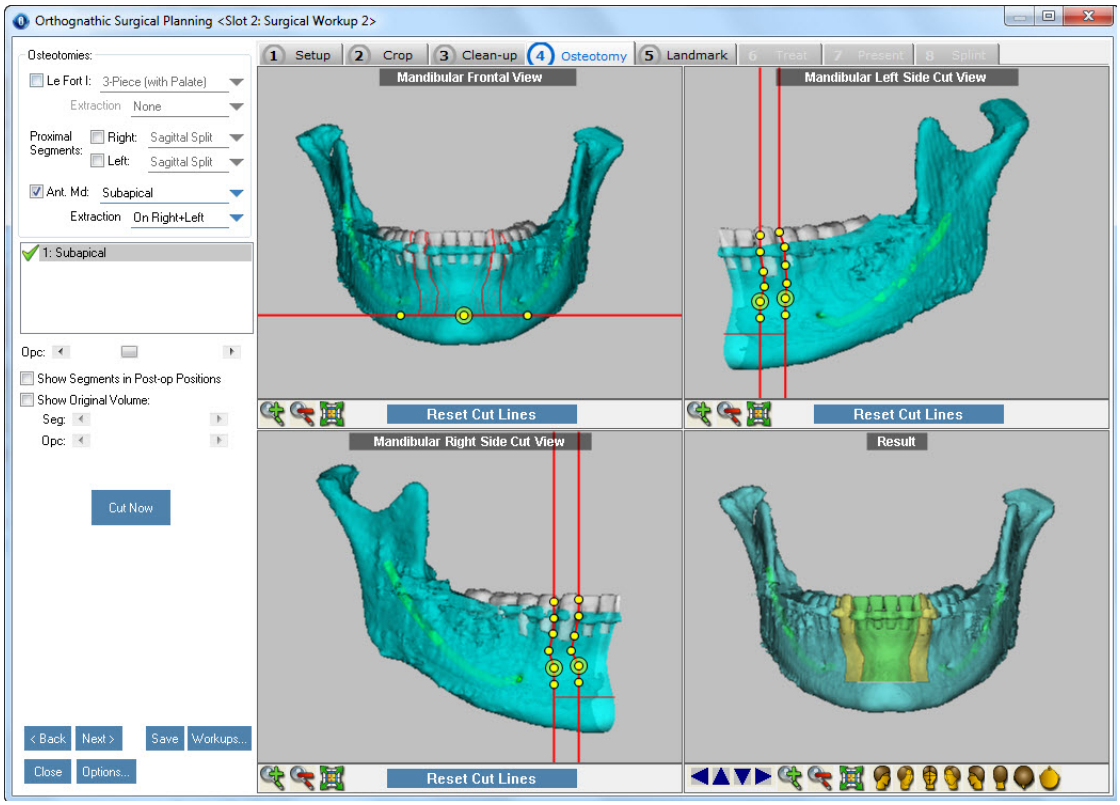
Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

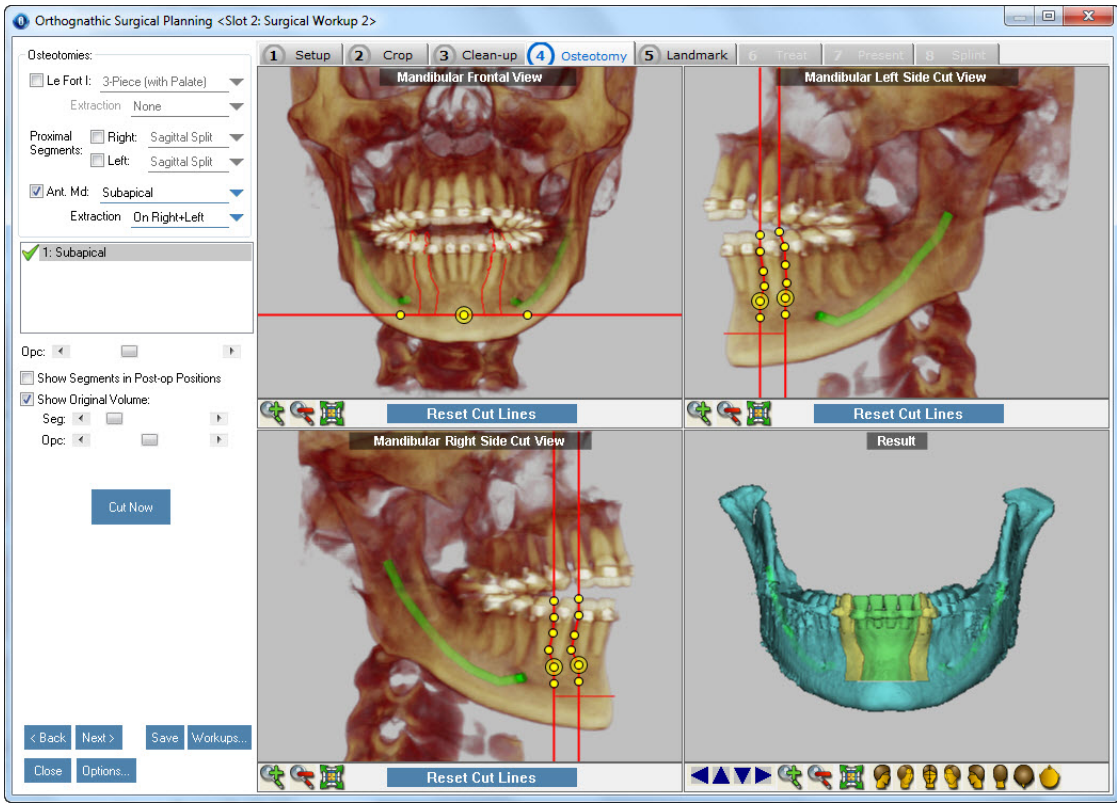


Check the **Show Original Volume** box to see the roots of the teeth as shown below.

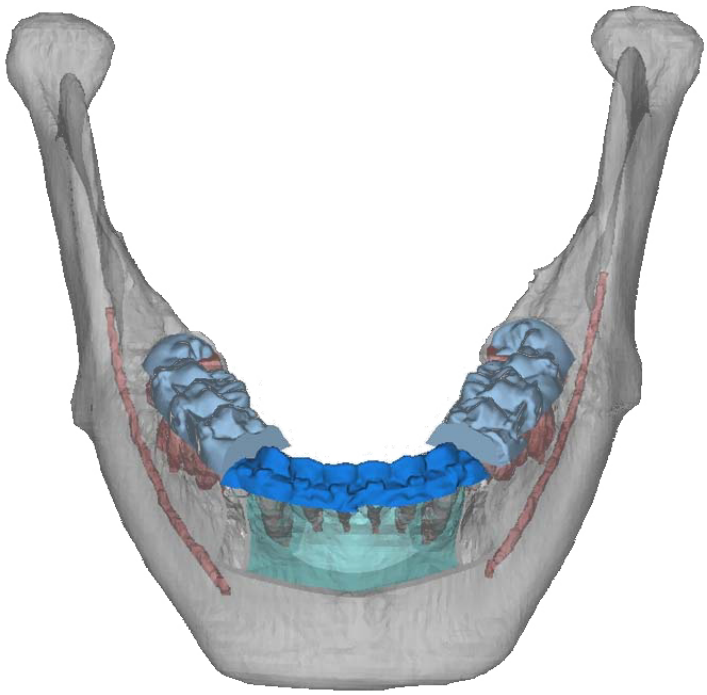


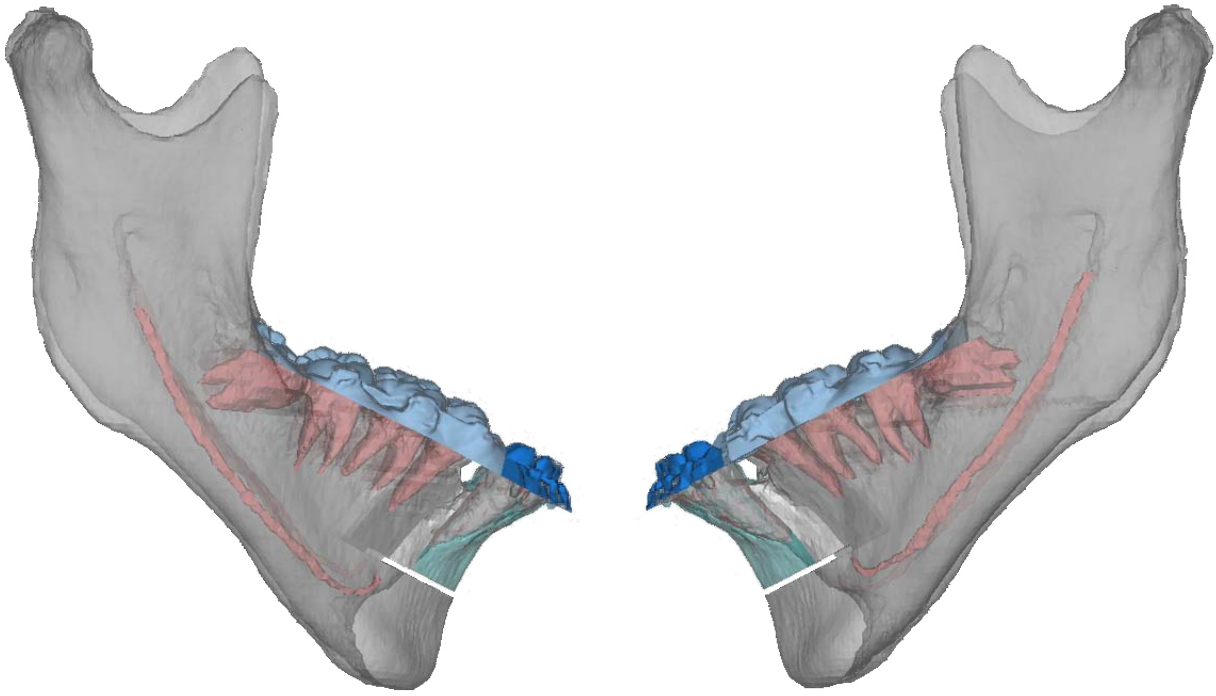
This cut offers the following extraction options: **None**, **On Right+Left**, **On Right**, and **On Left**. The following figures illustrate the cuts when **On Right+Left** is selected.





The following figures illustrate this osteotomy:





Mandibular Segment

To specify this cut:

1 If the nerve canals were defined for the volume, adjust the **Opc** slider so that they are visible.

2 In the Mandibular Frontal View pane, move the large point so that it is centered.

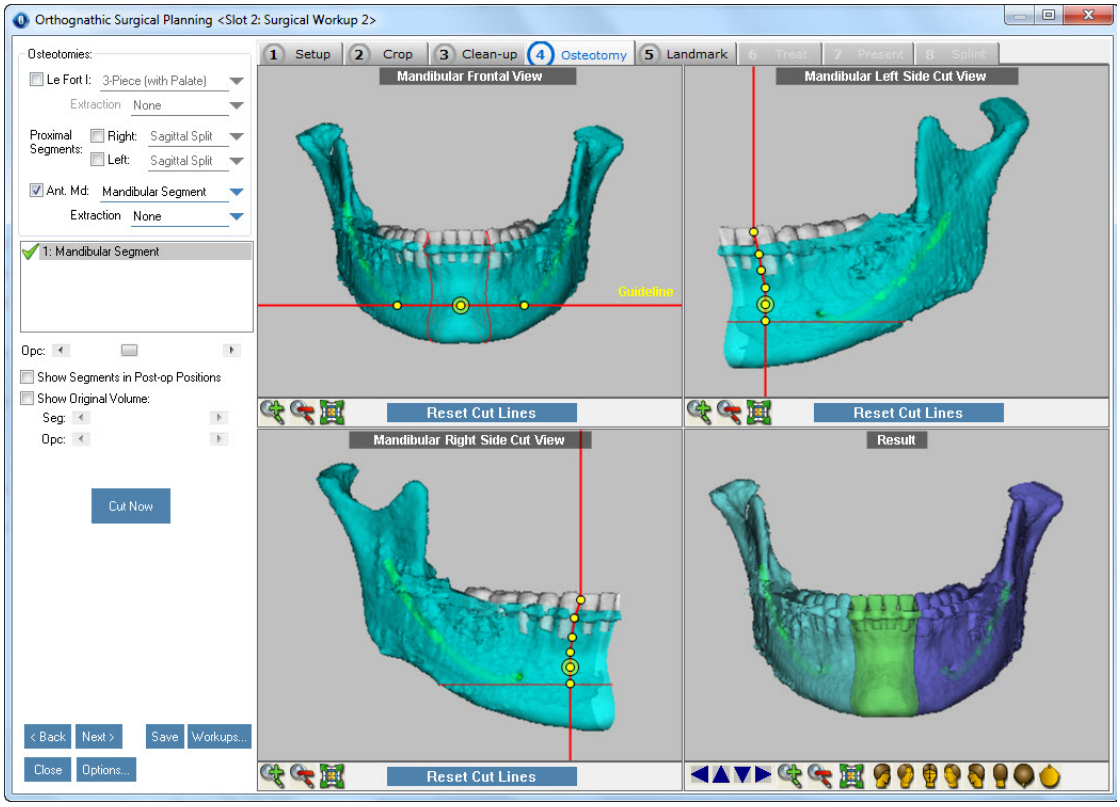
3 Optionally, in the Mandibular Frontal View plane, move the small points to change the angulation of the guideline.

4 In the Mandibular Left Side Cut View and Mandibular Right Side Cut View panes, move each of the large points to moves the associated cut line as a whole.

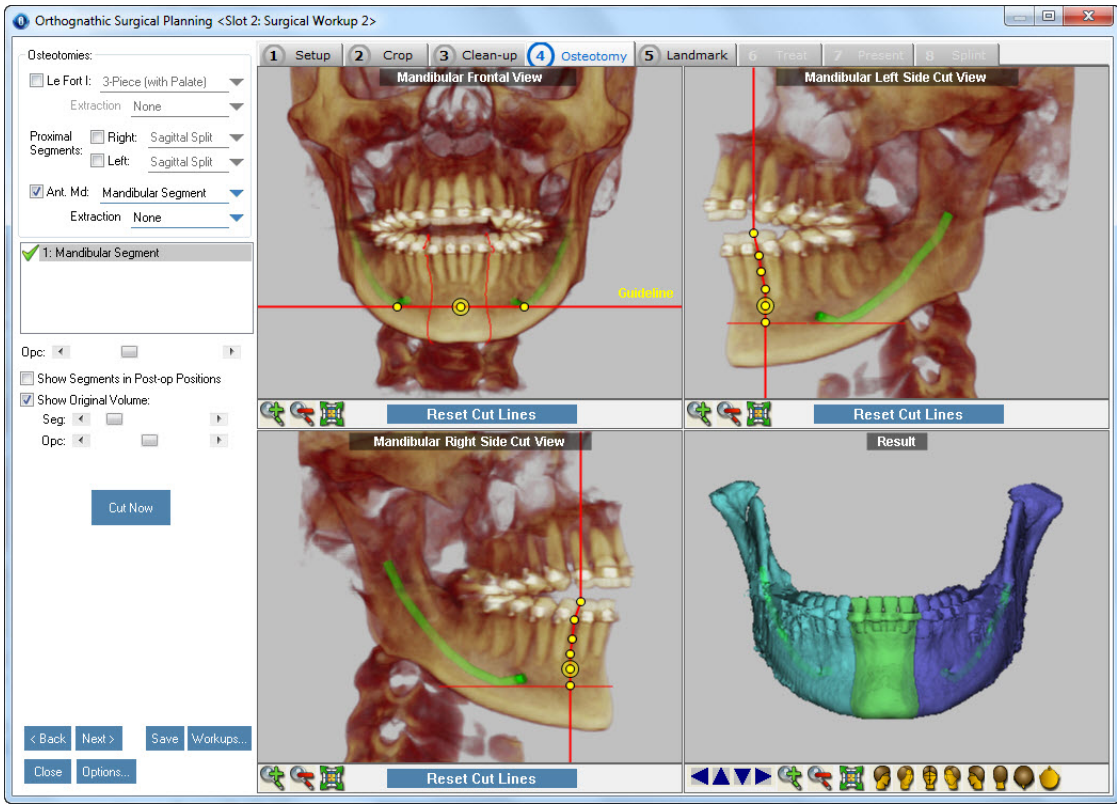
5 In the Mandibular Left Side Cut View and Mandibular Right Side Cut View panes, move the small points individually to contour the cut between the teeth.

6 Click **Cut Now** to see the result in the Result pane.

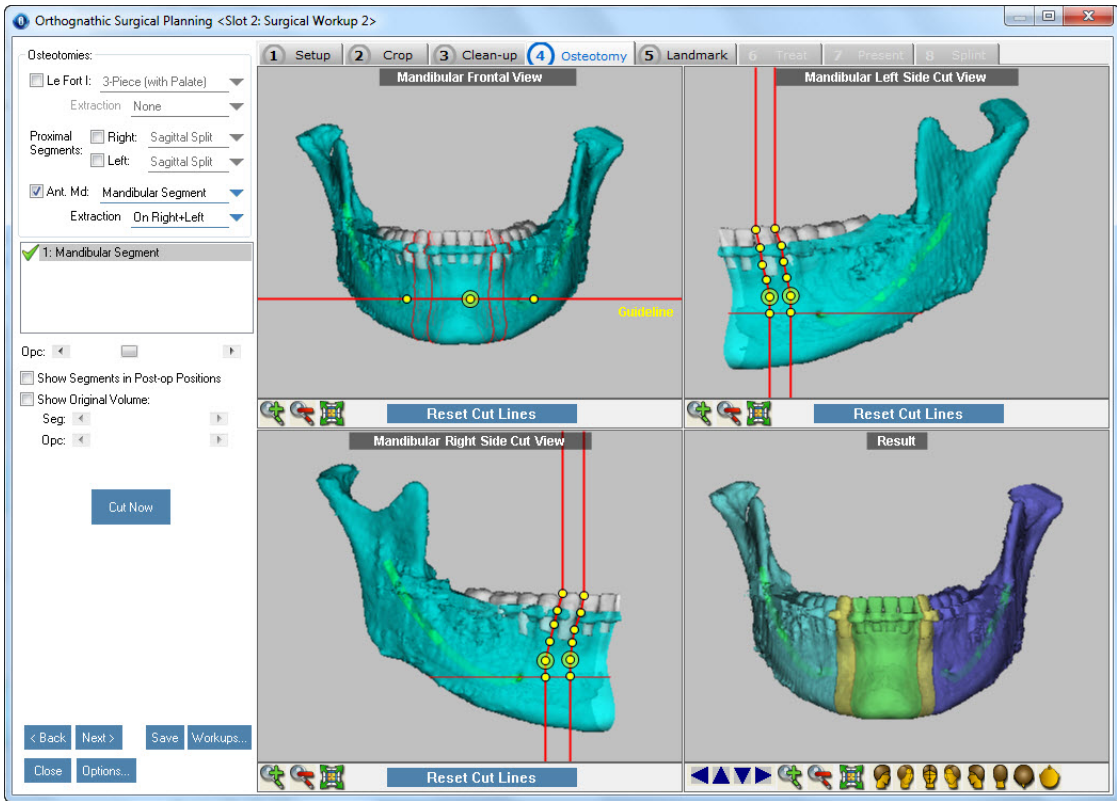
Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

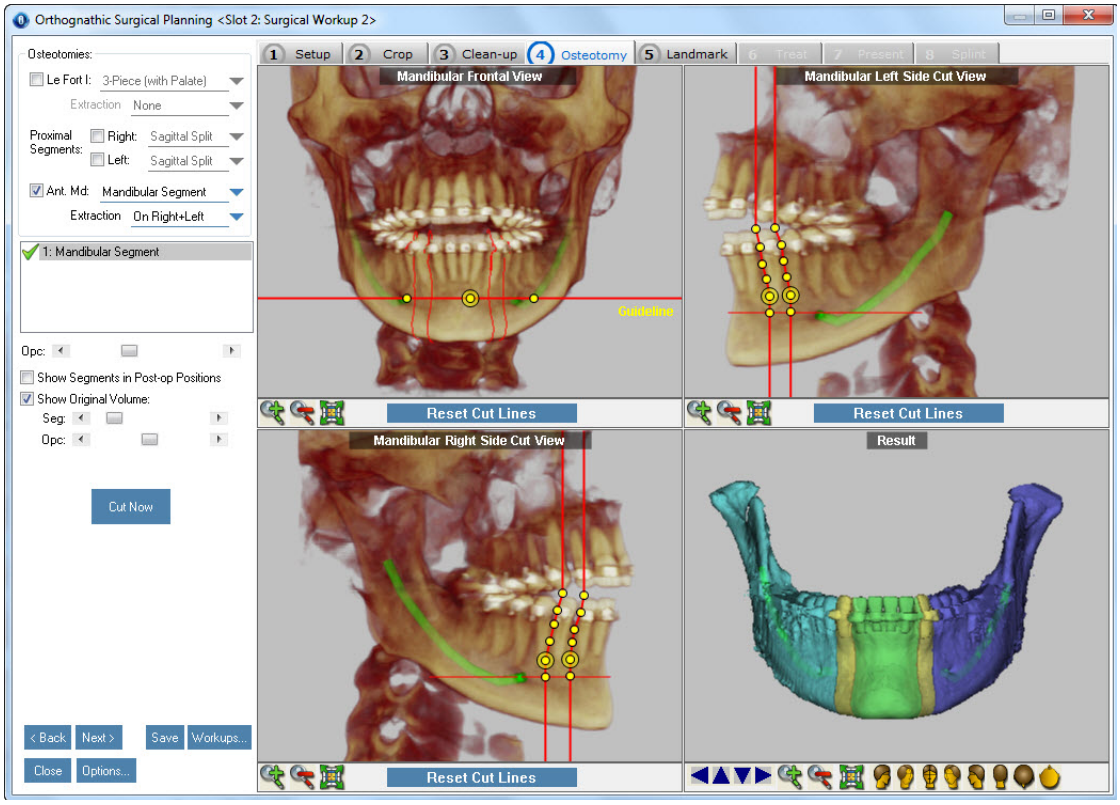


Check the **Show Original Volume** box to see the roots of the teeth as shown below.

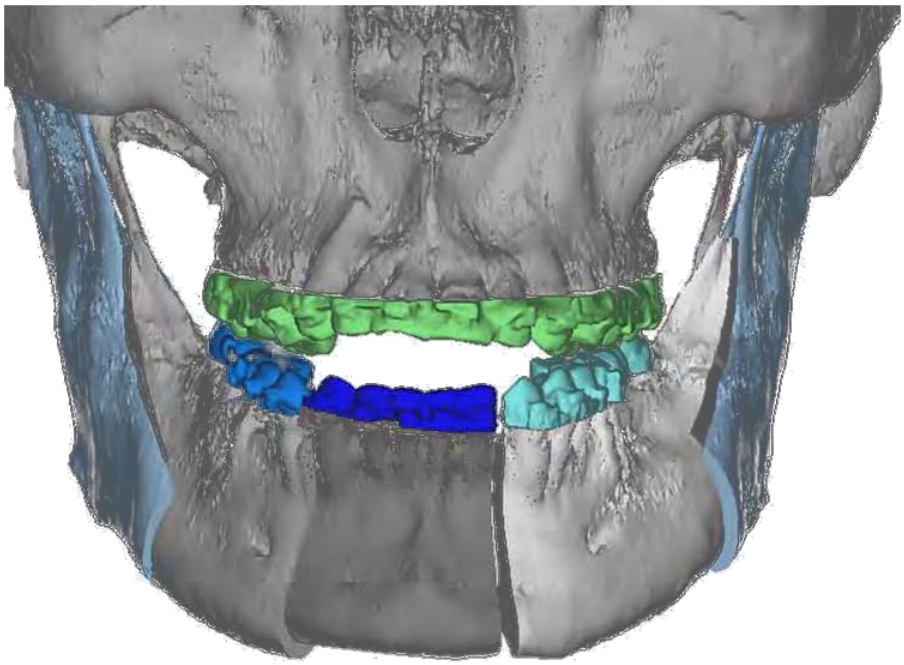


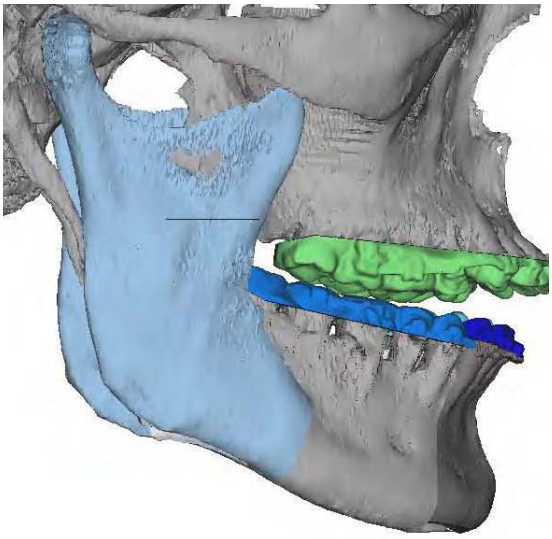
This cut offers the following extraction options: **None**, **On Right+Left**, **On Right**, and **On Left**. The following figures illustrate the cuts when **On Right+Left** is selected.

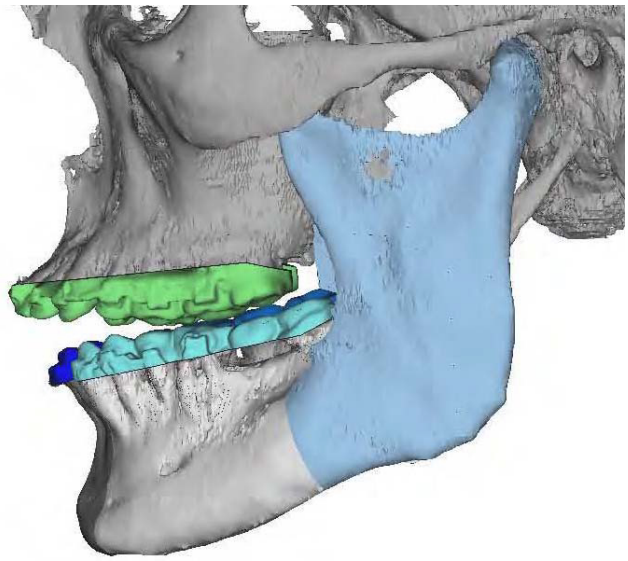




The following figures illustrate this osteotomy and a bilateral sagittal split osteotomy (BSSO) on the same patient:







Md Midline Split

To specify this cut:

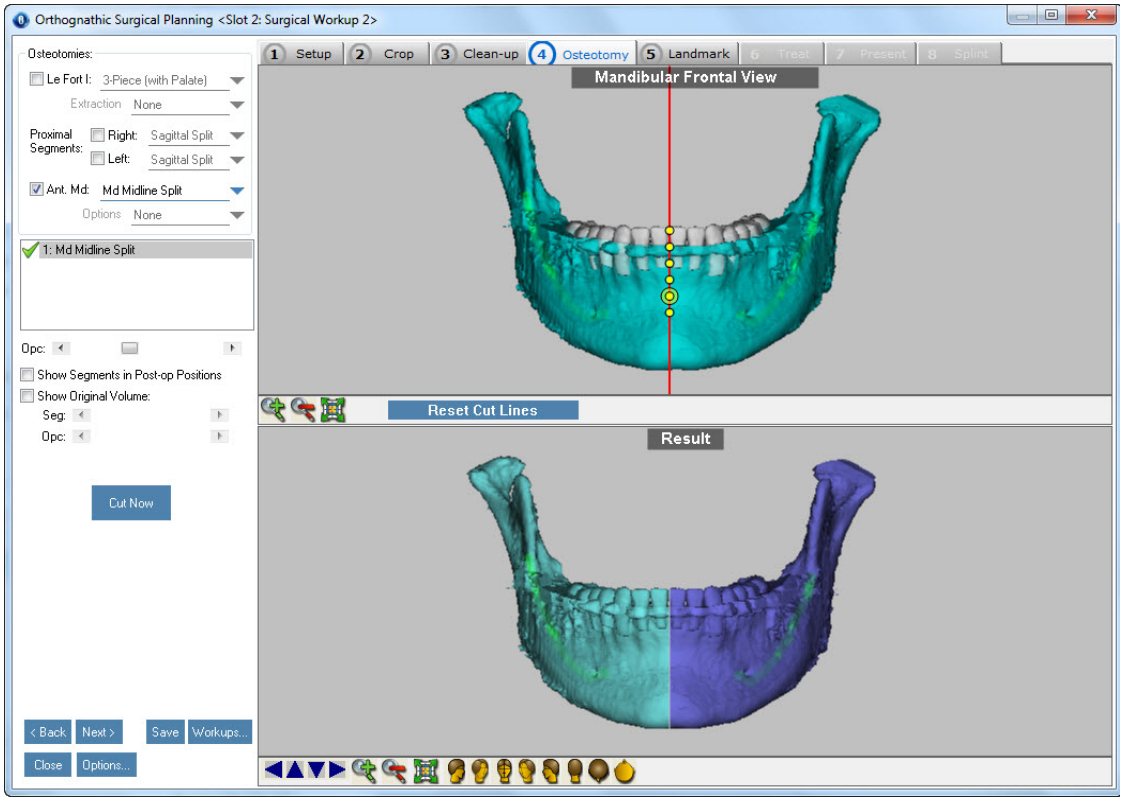
1 If the nerve canals were defined for the volume, adjust the **Opc** slider so that they are visible.

2 In the Mandibular Frontal View pane, move the large point so that it is centered.

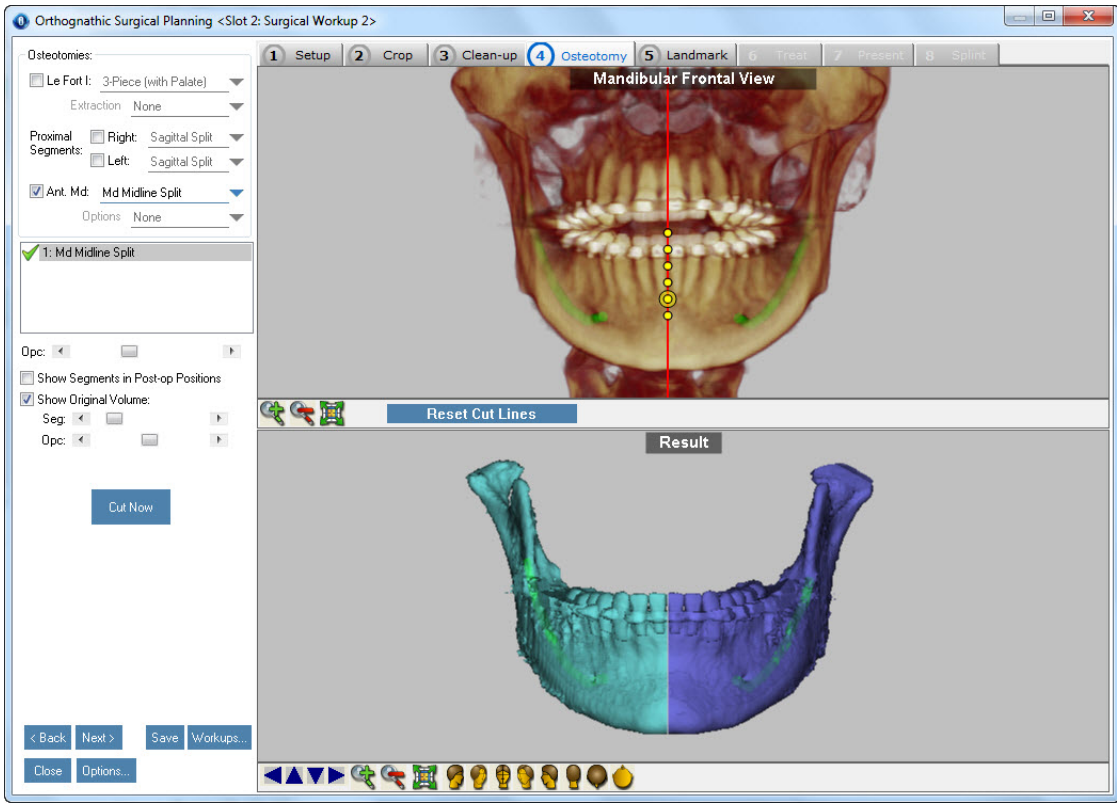
3 In the Mandibular Frontal View plane, move the small points individually to contour the cut between the teeth.

4 Click **Cut Now** to see the result in the Result pane.

Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*



Check the **Show Original Volume** box to see the roots of the teeth as shown below.



Subapical/Chin

To specify this cut:

1 If the nerve canals were defined for the volume, adjust the **Opc** slider so that they are visible.

2 In the Mandibular Frontal View pane, move the large point so that it is centered and the horizontal cut line is in the correct location.

3 In the Mandibular Frontal View plane, move the small points to change the angulation of the cut line.

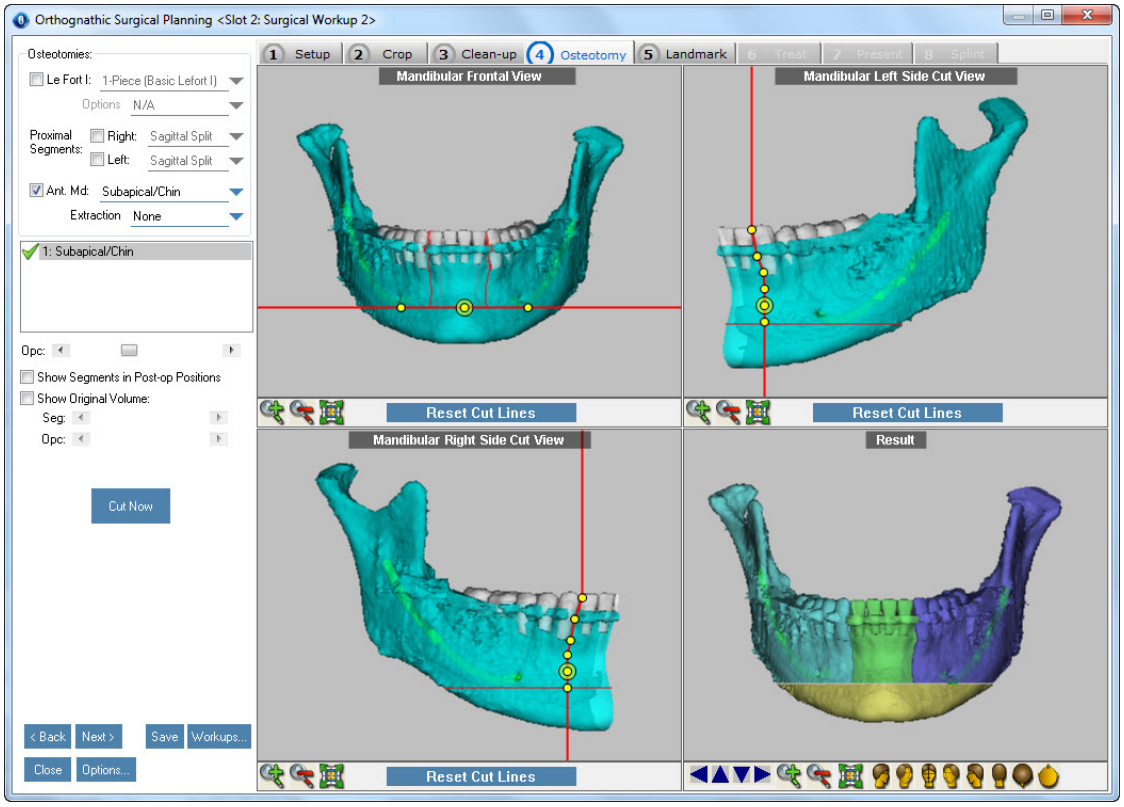
4 In the Mandibular Left Side Cut View and Mandibular Right Side Cut View panes, move each of the large points to moves the associated cut line as a whole.

5 In the Mandibular Left Side Cut View and Mandibular Right Side Cut View panes, move the small points individually to contour the cut between the teeth.

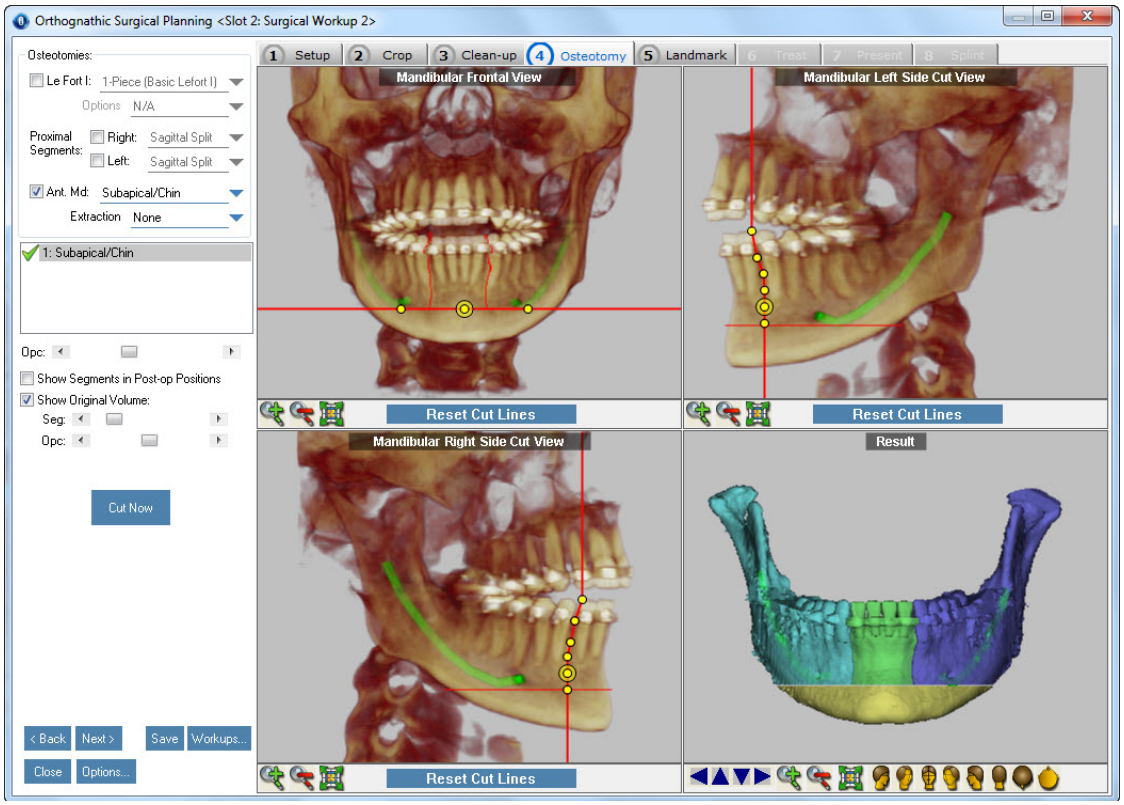
6 Click **Cut Now** to see the result in the Result pane.

Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

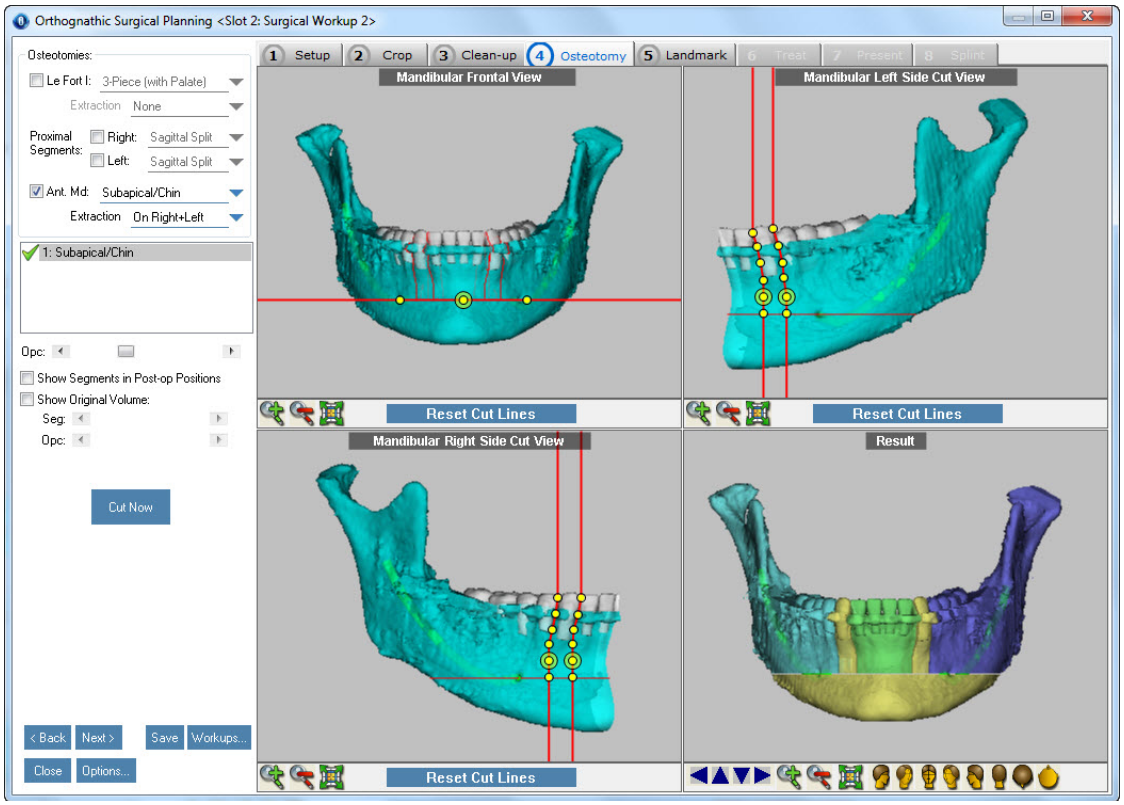
Step 4: Osteotomy

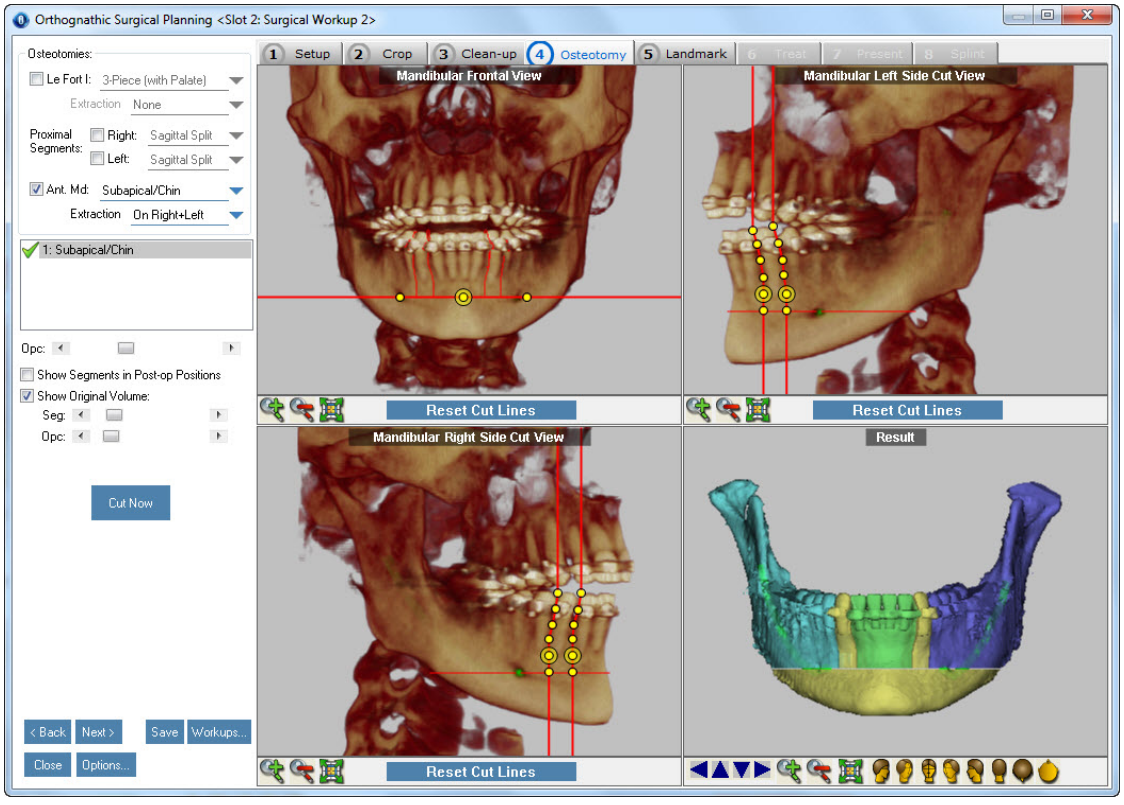


Check the **Show Original Volume** box to see the roots of the teeth as shown below.

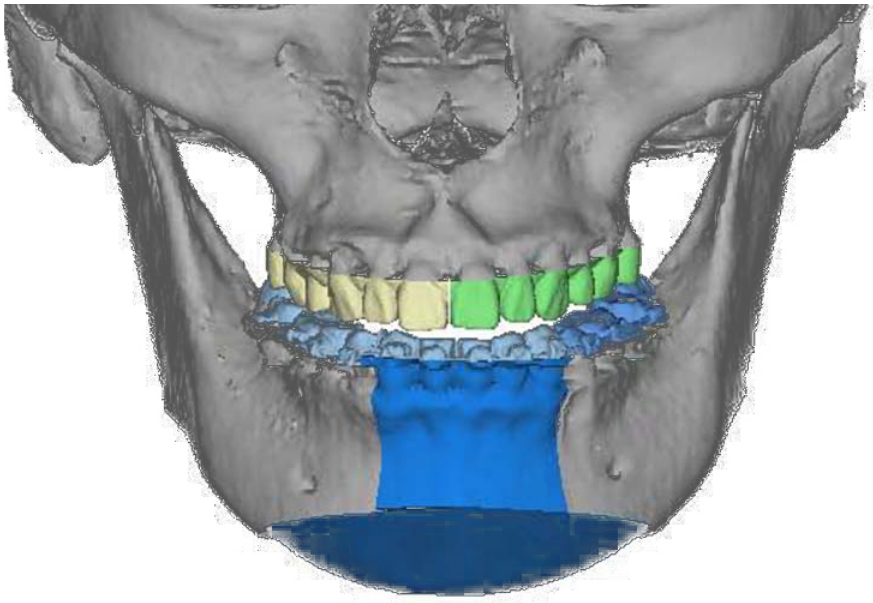


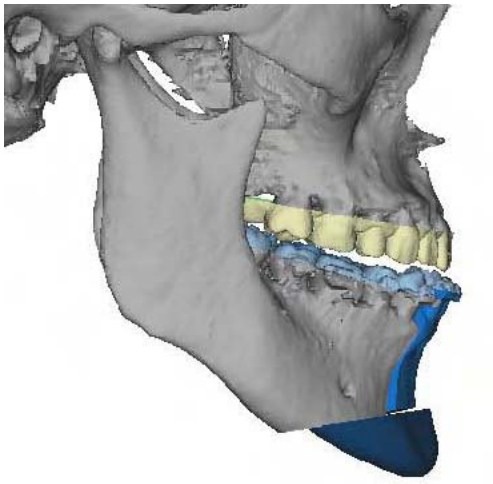
This cut offers the following extraction options: **None**, **On Right+Left**, **On Right**, and **On Left**. The following figures illustrate the cuts when **On Right+Left** is selected.

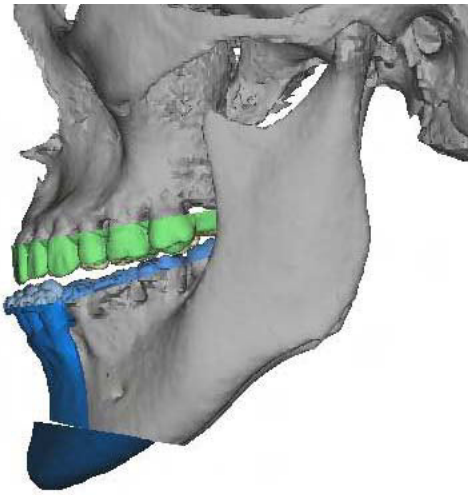




The following figures illustrate this osteotomy







Subapical/Md Split

To specify this cut:

1 If the nerve canals were defined for the volume, adjust the **Opc** slider so that they are visible.

2 In the Mandibular Frontal View pane, move the large point so that it is centered and the horizontal cut line is in the correct location.

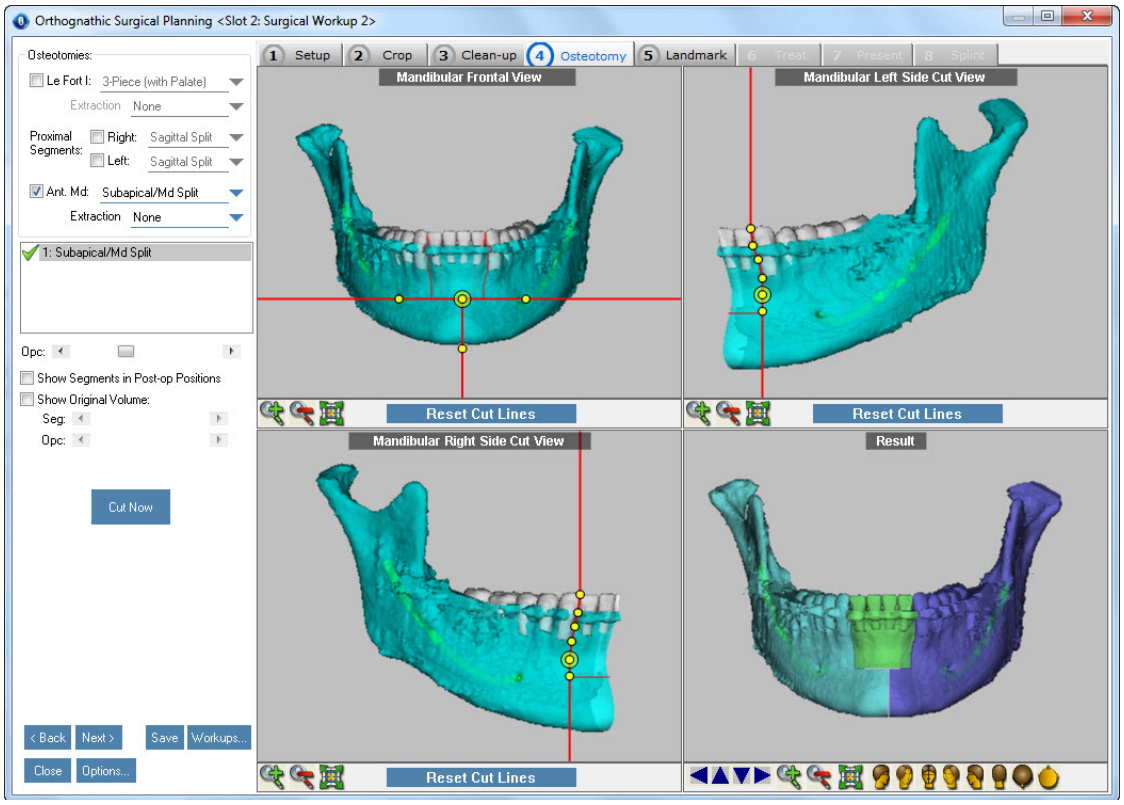
3 In the Mandibular Frontal View pane, move the small points to change the angulation of the cut line.

4 In the Mandibular Left Side Cut View and Mandibular Right Side Cut View panes, move each of the large points to moves the associated cut line as a whole.

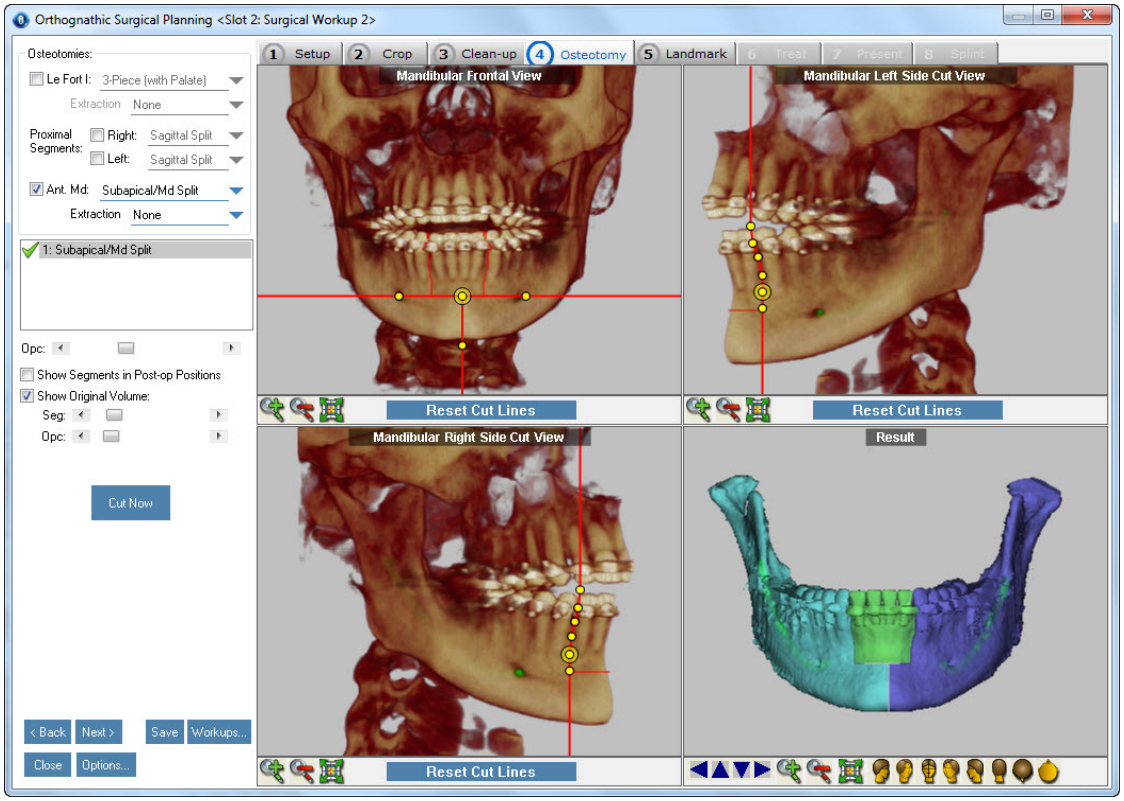
5 In the Mandibular Left Side Cut View and Mandibular Right Side Cut View panes, move the small points individually to contour the cut between the teeth.

6 Click **Cut Now** to see the result in the Result pane.

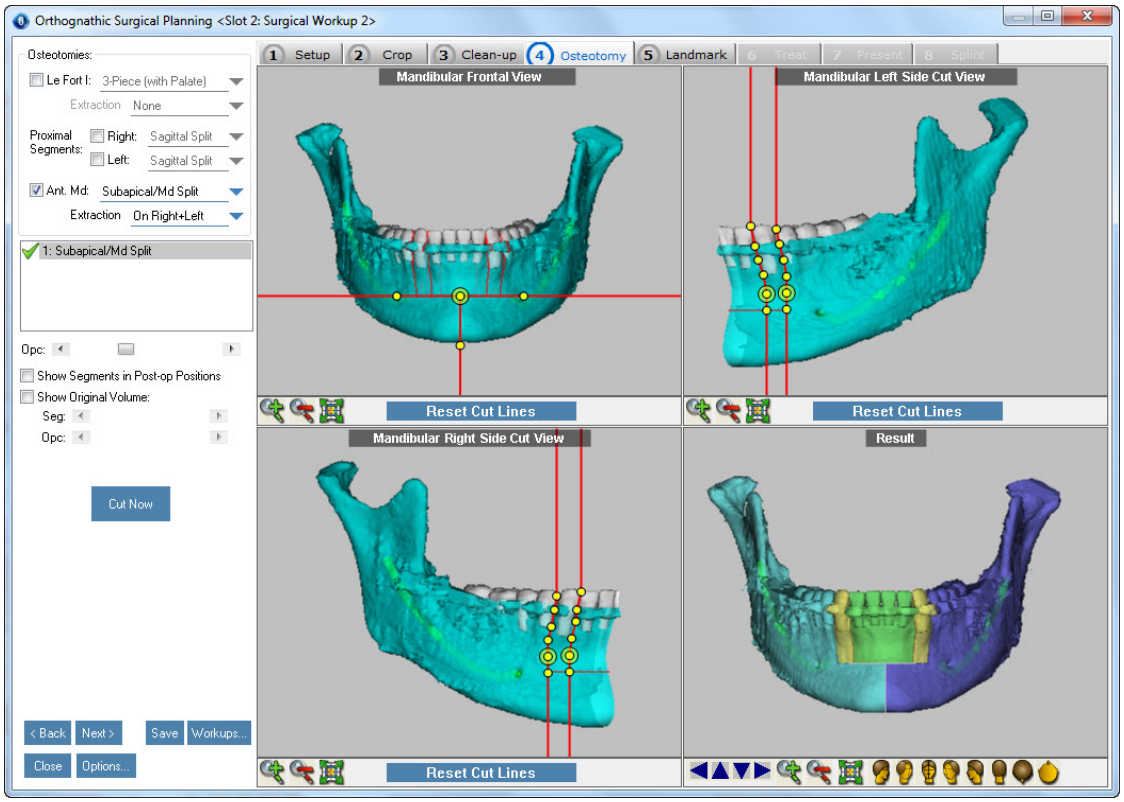
Note: *The following images illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

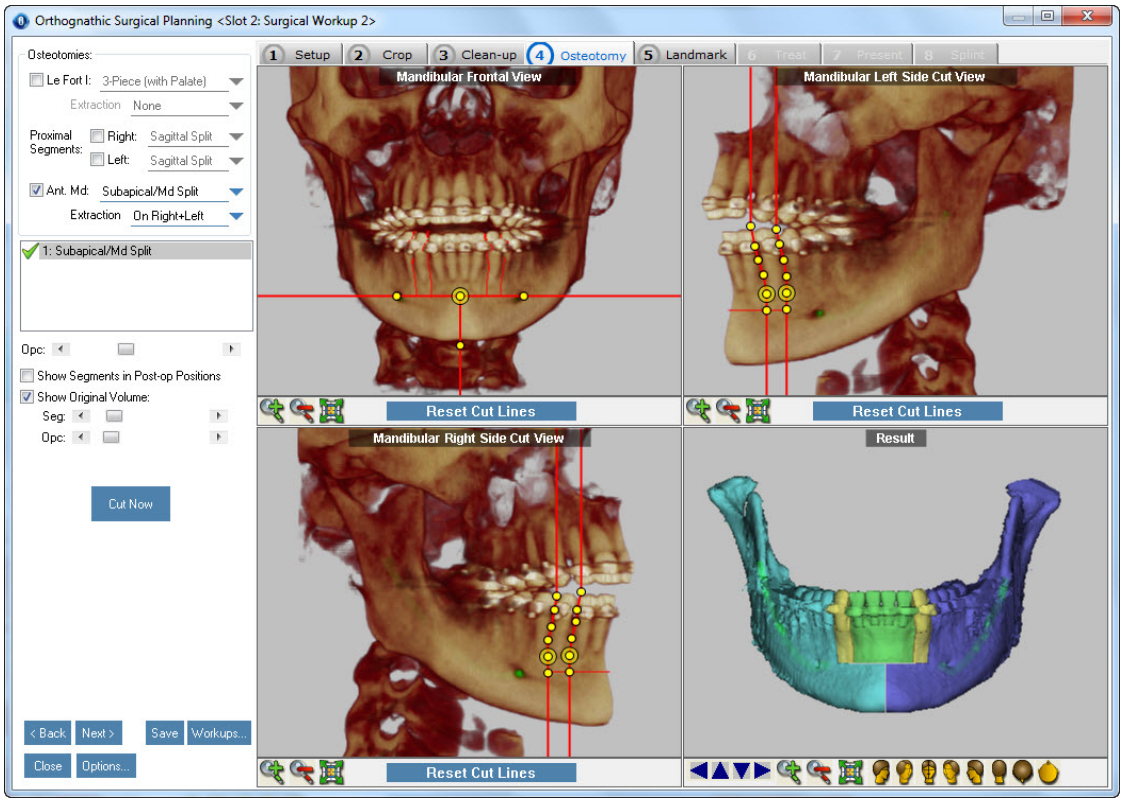


Check the **Show Original Volume** box to see the roots of the teeth as shown below.

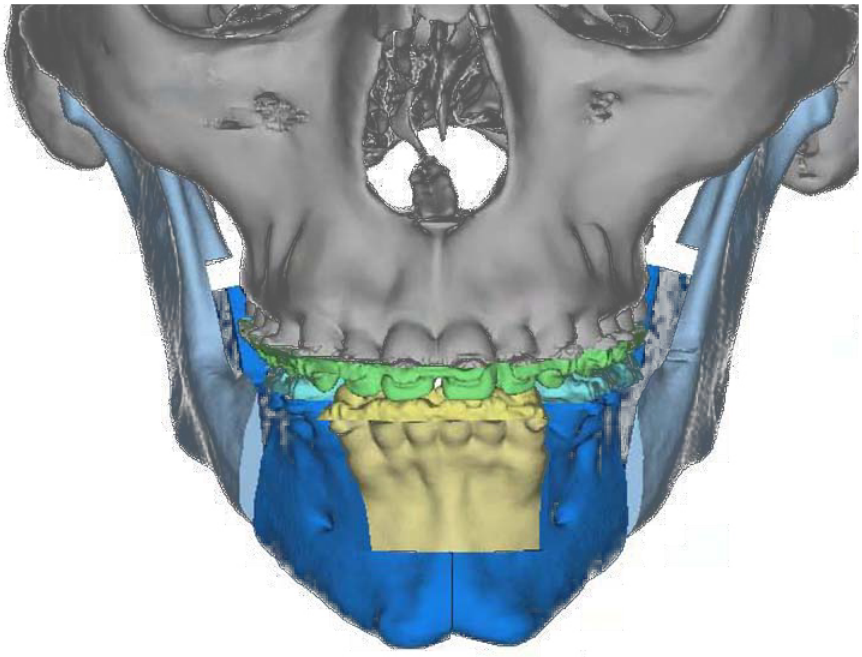


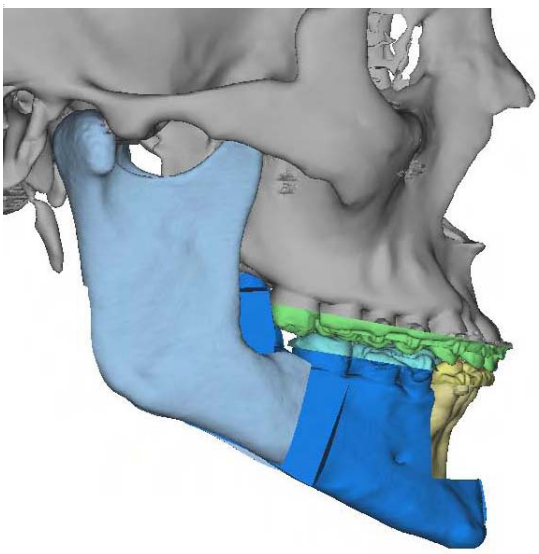
This cut offers the following extraction options: **None**, **On Right+Left**, **On Right**, and **On Left**. The following figures illustrate the cuts when **On Right+Left** is selected.

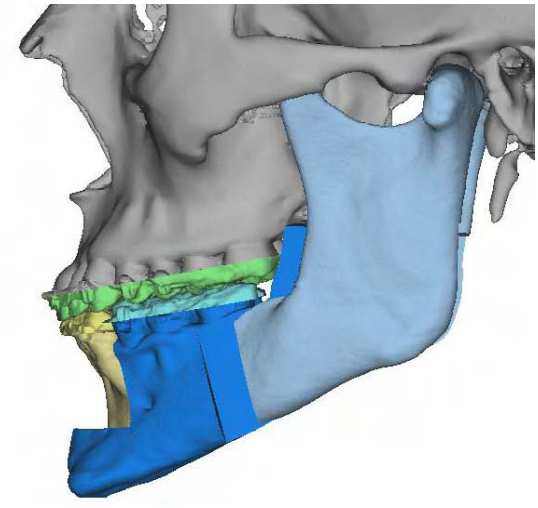




The following figures illustrate this osteotomy.







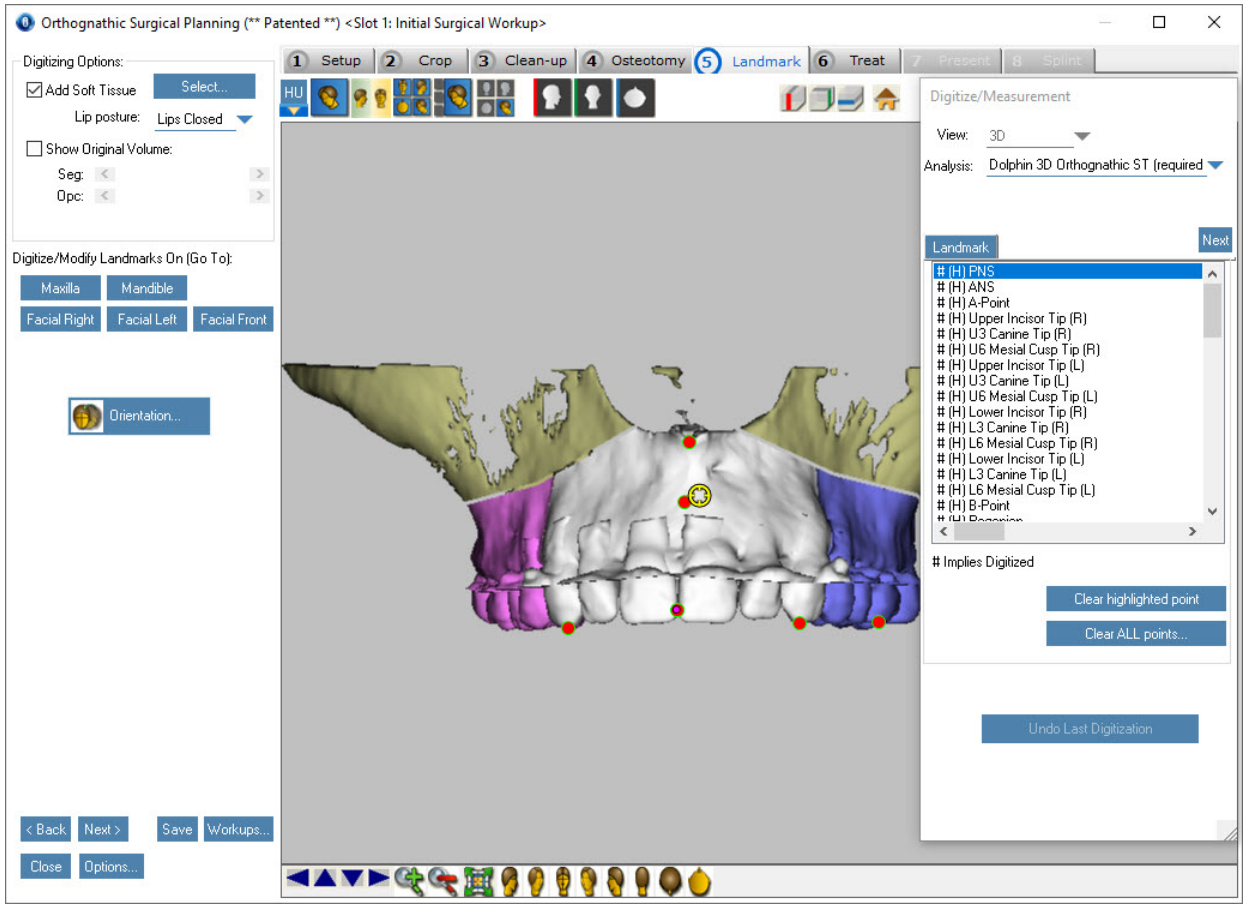
Step 5: Landmarks

In this step, you digitize landmarks on the image so that Dolphin Imaging can track the movements of the osteotomy segments that you will specify in later steps of the 3D surgery planning process.

The Dolphin 3D Orthognathic ST (required) analysis is required. However, an additional analysis, [Orthognathic Optional Points], is also available. These points are used to calculate measurements that you can display on the **Step 6: Treat** tab. On this analysis, you need only digitize the points needed to calculate the measurements to display.

When digitizing the landmarks:

- If a landmark was not captured in the volume or 3D photo (for example, the scan does not include the Neckline Back soft tissue landmarks), you should digitize it in its approximate location outside of the volume and 3D photo.
- If a landmark relates to a cut that will not be performed (for example, the Chin Side Cut Point landmarks in a case with no chin cut), digitize the landmark as if the cut was planned for this patient.
- If you are only interested in using the hard tissue for your treatment simulation, digitizing the soft tissue landmarks is not required.



The following options are specific to this tab. For information on the options that appear on all tabs in this window, see “Starting Orthognathic Surgical Planning” on page 30-1.

Add Soft Tissue	Digitize soft tissue landmarks in addition to the hard tissue landmarks that appear on the Digitize/Measurement palette by default. **Select...:** Soft tissue representation to use when digitizing soft tissue landmarks. **Lip Posture:** Position of the lips (**Lips Closed** or **Lips Opened**). For more information, see “Setting Soft Tissue Options” below.
Show Original Volume	Displays the volume. **Seg:** Sets the segmentation for the volume. **Opc:** Sets the opacity of the volume.
Digitize/Modify Landmarks On (Go To)	View to use for digitizing landmarks (**Maxilla**, **Mandible**, **Facial Right**, **Facial Left**, or **Facial Front**). For more information, see “Digitizing Landmarks” on page 30-79.
	Orient the image so that it appears properly in the window. For more information, see Chapter 20, Volume Orientation.

Options...	Specify the window background color, the diameter of the cutting saw, and to display nerve canals, and default options for creating splints. For more information, see “Setting Options” on page 30-4.
	Opens a menu from which you can select an existing Hounsfield Unit color scheme to use for the slice and volume or edit the color mapping to create a new color scheme. ***Note:*** *Only available for scans imported using Dolphin Imaging version 11 or later.* For more information, see “Using the Hounsfield Unit View” on page 19-42.

For information on the layout and slice buttons that appear above the image, see “Layouts and Slices” on page 19-32. For information on the predefined view buttons and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Setting Soft Tissue Options

To specify the representation to use when digitizing soft tissue points:

1 Check the **Add Soft Tissue** box if it isn't checked already.

2 Click **Select...**.

3 Select the soft tissue representation to use from the representations available for this patient.

For example, you may be able to select a 3D photo, a 2D photo wrap, or a soft tissue surface previously created from the volume.

For the most realistic simulation of facial surface changes resulting from surgical treatment, you need to specify whether the patient's mouth in the soft tissue surface is opened or closed.

To specify the lip posture:

1 Select **Lips Opened** from the **Lip Posture** drop-down list if the patient's lips are open in the soft tissue surface or photo.

Or,

Select **Lips Closed** if the patient's lips are closed.

If you select **Lips Opened**, extra points about the lips are displayed so you can better contour the lips.

Digitizing Landmarks

To digitize landmarks:

1 Select the analysis to digitize from the **Analysis** drop-down list.

The Dolphin 3D Orthognathic ST (required) analysis is required. The optional [Orthognathic Optional Points] analysis lists points used to calculate measurements that you can display on the **Step 6: Treat** tab. On this analysis, you need only digitize the points needed to calculate the measurements to display.

2 Optionally, click one of the buttons under Digitize/Modify Landmarks On (Go To) to start with a particular group of landmarks.

For example, if you have previously digitized the landmarks for this patient but need to modify a few landmarks on the mandible, you could click **Mandible** to move the selection bar to the first landmark in the group pertaining to the mandible.

3 Click each landmark listed on the Digitize palette.

As you go through the list of landmarks, the selection bar in the **Landmarks** list indicates the current landmark. The image on the **Step 5: Landmarks** tab displays the portion of the anatomy where the selected landmark is found. For example, the mandible is displayed when the B-Point landmark is selected.

Dolphin Imaging does not automatically check the validity of the landmark locations. You must verify that the landmarks are placed properly by you or your technician. If you briefly hold and “hover” your mouse at a digitized landmark, a tool tip displays the landmark’s name to help you verify the landmarks you have digitized.

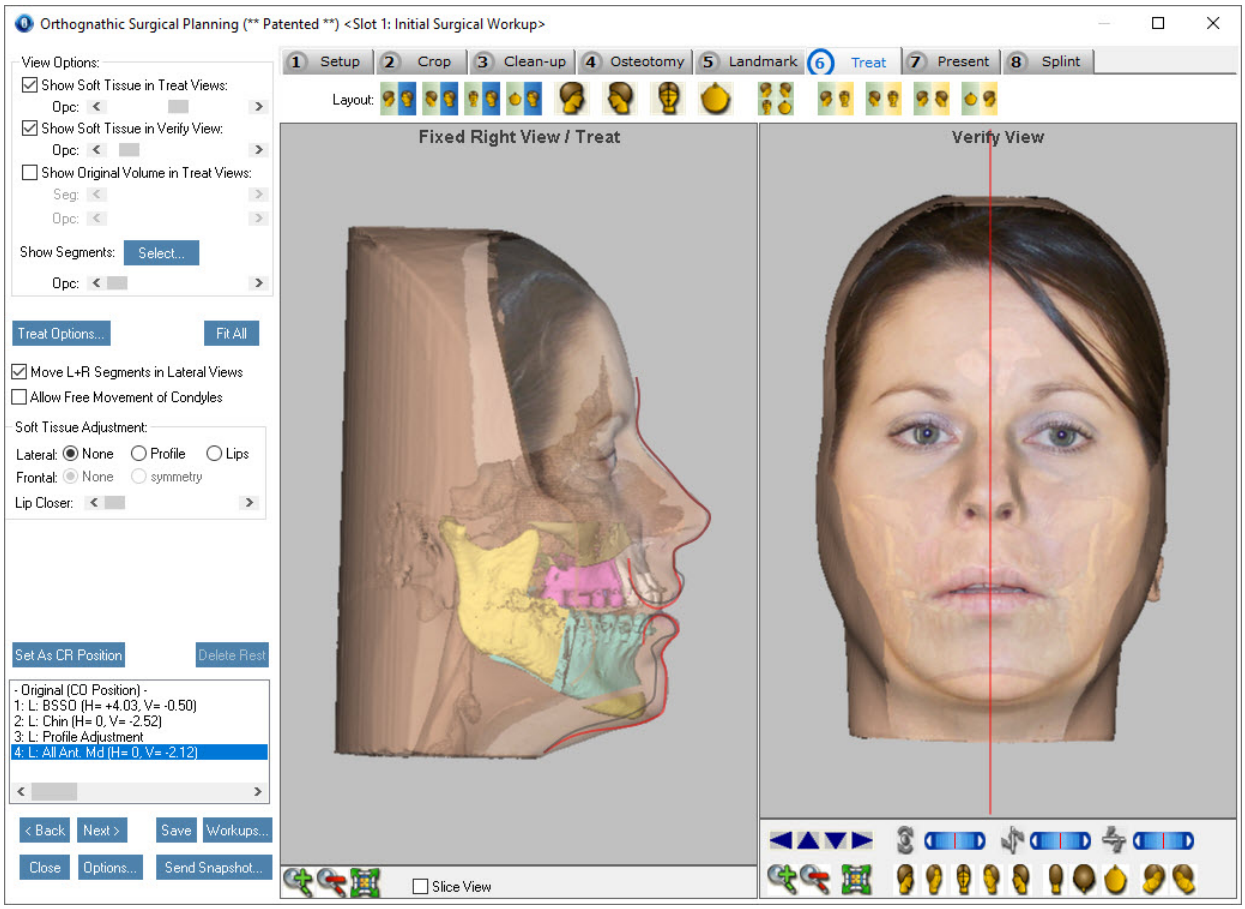
When you finish digitizing all the landmarks, the selection bar in the **Landmarks** list is on **<<End of List>>**.

4 Click **Save** to save the digitized landmarks.

5 Click **Next >** when you finish digitizing landmarks to go on to the next step.

Step 6: Treat

In this step, you enter the information necessary to simulate the planned surgical treatment.



The following options are specific to this tab. For information on the options that appear on all tabs in this window, see “Starting Orthognathic Surgical Planning” on page 30-1.

Show Soft Tissue in Treat Views	Displays the soft tissue in the treatment views. **Opc:** Sets the opacity of the soft tissue.
Show Soft Tissue in Verify View	Displays the soft tissue in the result verification views. **Opc:** Sets the opacity of the soft tissue.
Show Original Volume in Treat Views	Displays the original volume in both the treatment and verification views. **Seg:** Sets the segmentation for the volume. **Opc:** Sets the opacity of the volume.

Show Segments	Display options for the osteotomy segments. For more information, see “Setting Segment Display Options” on page 30-90. **Select:** Segments to display. **Opc:** Sets the opacity of the segments.
view options	**Slice View:** Displays a slice rather than the soft tissue or volume in the pane. **Mx:** Displays only the maxilla in the pane. Available only for SMV (bottom) views. **Md:** Displays only the mandible in the pane. Available only for SMV (bottom) views. **Both:** Displays both the maxilla and the mandible in the pane. Available only for SMV (bottom) views.
Treat Options	Opens a menu of treatment options. **Close This Menu:** Closes the menu. **Show Landmark Offset and Measurement Tables...:** Opens the Landmark Offset and Measurement Tables window. For more information, see “Showing Landmark Offset and Measurement Tables” on page 30-92. **Show Measurements on Images:** Toggles display of measurements in the treatment views. For more information, see “Showing Measurements” on page 30-94. **Show Gridlines:** Opens a sub-menu of options for grid lines on the images. For more information, see “Showing Grid Lines” on page 30-94. • **Show Lateral Gridlines:** Displays grid lines on all lateral treatment views. • **Show Frontal Gridlines:** Displays grid lines on all frontal treatment views. • **Show SMV Gridlines:** Displays grid lines on all bottom (SMV) treatment views. • **Show Grid Planes in Verify View As Well:** Displays the grid lines as planes on the Verify image. • **Show Gridlines in All Fixed Views:** Displays grid lines on all treatment views. • **Unshow Gridlines in All Fixed Views:** Removes the grid lines for all treatment views. • **Set Grid Dimensions...:** Set the distances between lines on the grids for each view (lateral, frontal, and SMV). • **Set Grid Color...:** Set the color to use for the grid lines. **Show Mid-Sagittal Plane in Verify View:** Toggles display of the mid-sagittal plane in the Verify View pane. **Lateral Profile Show Options:** Profile image to display (pre-op profile, post-op profile, or both) in the treatment views. For more information, see “Setting Soft Tissue Display Options” on page 30-96. • **Show Pre-Op Lateral Profile:** Displays the pre-op profile in black on the treatment views. • **Show Post-Op Lateral Profile:** Displays the post-op profile in red on the treatment views.

Allow Adjustment of Midline: Enables you to move the dotted yellow midline that appears on frontal views in the Treat pane.

Soft Tissue Options: Opens a sub-menu of options for the patient's soft tissue. For more information, see “Setting Soft Tissue Movement Options” on page 30-97.

- **Realtime Soft Tissue Update:** Update the soft tissue in real time. Otherwise, the soft tissue update is performed when you release the mouse button. Depending on the capabilities of your computer, enabling this option might result in slower performance in display.
- **Soft Tissue Rules Editor...:** Opens the Dolphin3D Soft Tissue Rules window. For more information, see “Setting Soft Tissue Movement Options” on page 30-97.
- **Show Supporting Surface Only (Without 3D Photo Skin):** Displays the soft tissue surface rather than the patient's photo.

Show Vertical Collision Colormap...: Opens the arch vertical collision color map. For more information, see “Viewing a Vertical Collision Color Map” on page 30-101.

Piggyback Surfaces/Arch Model Options: Opens a sub-menu of options for loading arch model surfaces, linking them to segments, and merging them with segments.

- **Importing and Linking of Piggyback Surfaces/Arch Models:** Load arch models in initial or final occlusion and link them to cut segments. For more information, see “Importing and Linking Piggyback Surfaces and Arch Models” on page 30-103.
- **Arch Model in Initial Occlusion Merging Options:** Opens a sub-menu of options for merging the model arch surfaces in the initial occlusion position with the maxilla and mandible. For more information, see “Using Upper and Lower Arch Models to Set the Initial Occlusion” on page 30-103.
    - **Merge Upper Arch Model to Maxilla:** Merge upper model arch in the initial occlusion position to the maxilla.
    - **Merge Mandible to Lower Arch Model:** Merge the mandible to the lower model arch surface in the initial occlusion position.
- **Arch Models in Final Occlusion Merging Options:** Opens a sub-menu of options for merging the model arch surfaces with the volume segments. For more information, see “Using Arch Models to Set the Final Occlusion” on page 30-105.
    - **Merge Upper Arch Model to Linked Segment...:** Merge the upper model arch surface to the linked segment.
    - **Merge Lower Arch Model to Linked Segment...:** Merge the lower model arch surface to the linked segment.
    - **Merge Maxillary Segment to Upper Arch Model...:** Merge the maxillary segment to the upper model arch surface.
    - **Merge Mandibular Segment to Lower Arch Model...:** Merge the mandibular segment to the lower model arch surface.

	Move Mandible According to Initial Occlusion of the Teeth Model Overlay: Moves the mandible so that the occlusion returns to the way it was initially in the overlay of the model teeth. For more information, see “Moving the Mandible to Match the Initial Occlusion of the Model Arches” on page 30-105. **Consolidate Orthognathic Moves...:** Consolidates several operations into a single entry in the treatment simulation history. For more information, see “Consolidating Orthognathic Moves” on page 30-113. **Return Genioplasty/Chin Back to HOME Position:** Returns the chin back to the HOME position. **Create/Edit Mandibular Inferior Border Osteotomy...:** Create or edit a mandibular inferior border osteotomy simulation. For more information, see “Doing a Mandibular Inferior Border Osteotomy” on page 30-115.
Fit All	Sets the magnification of all the images so that they fit in the window.
Move L+R Segments in Lateral Views	Moves the corresponding segments on both the left and right sides when using the lateral views to simulate treatment.
Allow Free Movement of Condyles	Allow the ramus, condyles, and mandible to move freely, rather than just rotating.
Soft Tissue Adjustment	Options for fine-tuning the soft tissue. For more information, see “Adjusting the Soft Tissue” on page 30-89. **Lateral:** Options for fine-tuning the soft tissue in the lateral view. • **None:** Disables fine-tuning of the soft tissue in the lateral view. • **Profile:** Enables fine-tuning of the patient's profile. • **Lips:** Enables fine-tuning of the patient's lips. **Frontal:** Options for fine-tuning the soft tissue in the frontal view. • **None:** Disables fine-tuning of the soft tissue in the frontal view. • **Symmetry:** Enables facial symmetry fine-tuning. **Lip Closer:** Sets the lip posture.
Set as CR Position	Sets the highlighted item in the history list as the centric relation starting point for subsequent measurement and offset values. Removes all operations in the history list after the highlighted item, and adds a new entry, CR Position, to the end of the list as the new highlighted item. For more information, see “Setting the CR Position” on page 30-89.
Delete Rest	Deletes all operations performed after the selected operation.
Options...	Specify the window background color, the diameter of the cutting saw, and to display nerve canals, and default options for creating splints. For more information, see “Setting Options” on page 30-4.

Send Snapshot...	Opens a menu with the following options: **Close This Menu:** Closes the menu. **Save To Dolphin Layout/Database:** Saves the image to a slot in an image layout and stores it in your database. For more information, see “Saving, Exporting, Uploading, and Printing” on page 19-117. **Send To Report:** Uses this image in a Dolphin 3D report. For more information, see Chapter 29, Reports. **Copy To Clipboard:** Copies the image to the clipboard. Then, you can paste it into another application. For more information, see “Copying an Image to the Clipboard” on page 19-119. **Print:** Prints the image. For more information, see “Printing an Image” on page 19-123. **Export To File:** Exports the image to a file. For more information, see “Exporting an Image” on page 19-119.
Key Input	Use your keyboard to enter movement values. Available only after you have selected a segment to move. For more information, see “Typing In Movement Values” on page 26-11.
layout buttons	Select the layout of the window. This window offers the following layouts and predefined views along with some of the standard ones. For more information, see “Selecting the View” below. For more information on the standard layouts and predefined views, see “Layouts and Slices” on page 19-32 and “Moving or Reorienting the Volume” on page 19-24. : Displays the right/verify layout. In this layout, you simulate surgical treatment using the right lateral view in the left pane and verify the result using the frontal view in the right pane. Displays the left/verify layout. In this layout, you simulate surgical treatment using the left lateral view in the left pane and verify the result using the frontal view in the right pane. : Displays the front/verify layout. In this layout, you simulate surgical treatment using the frontal view in the left pane and verify the result using the frontal view in the right pane. : Displays the bottom/verify layout. In this layout, you simulate surgical treatment using the bottom view in the left pane and verify the result using the frontal view in the right pane. : Displays the right view. : Displays the left view. : Displays the frontal view. : Displays the bottom view

	: Displays the 4 volume layout. In this layout, you can simulate surgical treatment using four different views of the volume. : Displays the right/frontal layout. In this layout, you simulate surgical treatment using the right lateral view in the left pane and the frontal view in the right pane. : Displays the left/frontal layout. In this layout, you simulate surgical treatment using the left lateral view in the left pane and the frontal view in the right pane. : Displays the right/left layout. In this layout, you simulate surgical treatment using the right lateral view in the left pane and the left lateral view in the right pane. : Displays the bottom/right layout. In this layout, you simulate surgical treatment using the bottom view in the left pane and the right lateral view in the right pane.
Slice View	Displays the bony anatomy as contours in DICOM slice. For more information, see "Selecting the View" below. **slider:** Sets the location of the slice. ***Note:*** *You cannot select an individual segment to move in this view. Instead, you select the segment in the volume view, then switch to the slice view to specify movements. However, the multi-segment movement options are still available on the context menu when you right-click the Treat pane. For more information, see "Simulating Treatment" on page 30-87.*
Mx	Displays the maxilla only. Available only for bottom (SMV) views.
Md	Displays the mandible only. Available only for bottom (SMV) views.
Both	Displays both the maxilla and mandible. Available only for bottom (SMV) views.

For information on the predefined view buttons and magnification controls that appear below the images, see "Moving or Reorienting the Volume" on page 19-24 and "Changing the Magnification" on page 19-25.

Selecting the View

When planning a patient's surgical treatment, you may want to look at more than one view of the volume, both for convenience in specifying movement values and for verifying the treatment result.

To select a view:

1 In the View Options group box, check the boxes for the display options you want.

You can display the patient's soft tissue in the Treat views, the Verify views, or both. Checking the **Show Original Volume** box displays the original volume in both the Treat and Verify views.

2 Select the segments (maxillary, mandibular, or both) to display in the Treat and Verify views.

3 Optionally, use the **Opc** sliders to set the opacity of the soft tissue, volume, and/or segments.

4 Optionally, use the **Seg** slider to set the segmentation for the volume.

5 Click the button for the layout to use.

Four of the side-by-side layouts (, , and) have a Treat view on the left and a Verify view on the right. All other layouts offer Treat views only.

6 If you selected a bottom (SMV) view, select the **Mx** option below the image to view the maxilla only.

Or,

Select the **Md** option below the image to view the mandible only.

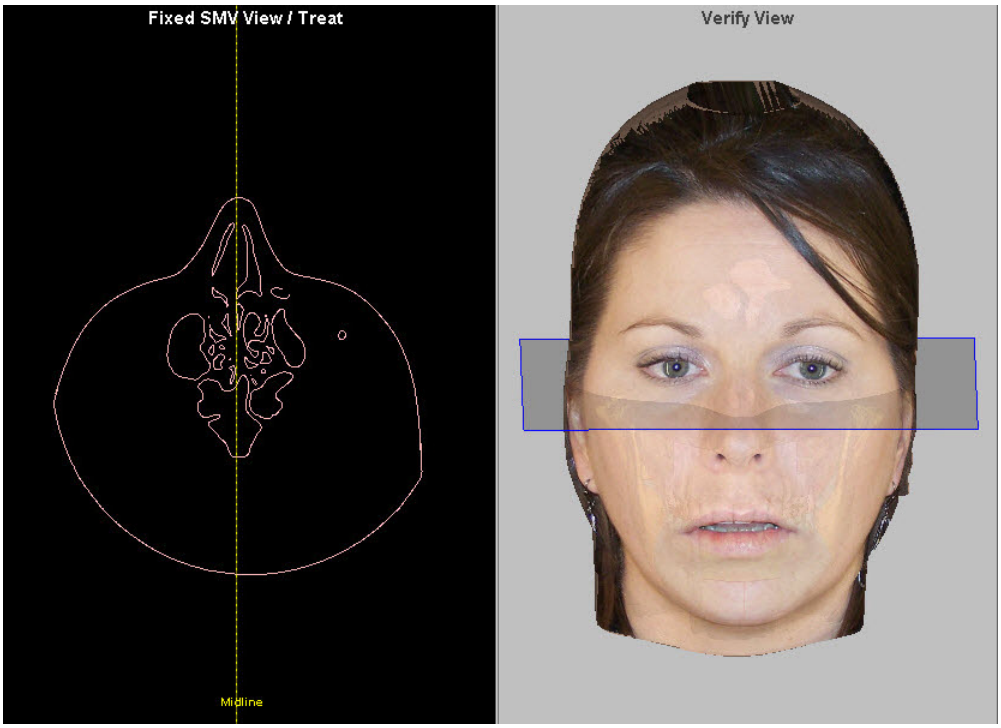
Or,

Select the **Both** option below the image to view both the maxilla and mandible.

To view the bony anatomy as contours in DICOM slice:

1 Check the **Slice View** box below one of the panes in a layout.

If you are using a layout with a Verify view, the slice plane appears on the Verify view to show the location of the slice.



2 Adjust the slider to specify the location of the slice.

For information on setting the background color in this view, see “Setting Options” on page 30-4.

Note: *You cannot select an individual segment to move in this view. Instead, you select the segment in the volume view, then switch to the slice view to specify movements. However, the multi-segment movement options are still available on the context menu when you right-click the Treat pane. For more information, see “Simulating Treatment” on page 30-87.*

To change the orientation of the image in the Verify pane:

1 Click the button for one of the predefined views to orient the image for that view.

Or,

Click and drag the image to rotate it.

Simulating Treatment

Note: *If you merged the patient's upper and lower arch models to the segmented maxilla and mandible in **Step 3: Clean-up**, you may want to use them to set the initial occlusion as the first step in simulating treatment. For more information, see "Using Upper and Lower Arch Models to Set the Initial Occlusion" on page 30-103*

To select the osteotomy segment to move:

1 In the Treat pane, click the segment to move as a result of the planned surgical treatment.

Or,

Right-click the Treat pane, and select **Move All Maxillary Segments** to move all segments of the maxilla.

Or,

Right-click the Treat pane, and select **Move All Anterior Mandibular Segments** to move all anterior segments of the mandible.

Or,

Right-click the Treat pane, and select **Move All Maxillary+Anterior Mandibular Segments** to move all segments of the maxilla and anterior segments of the mandible.

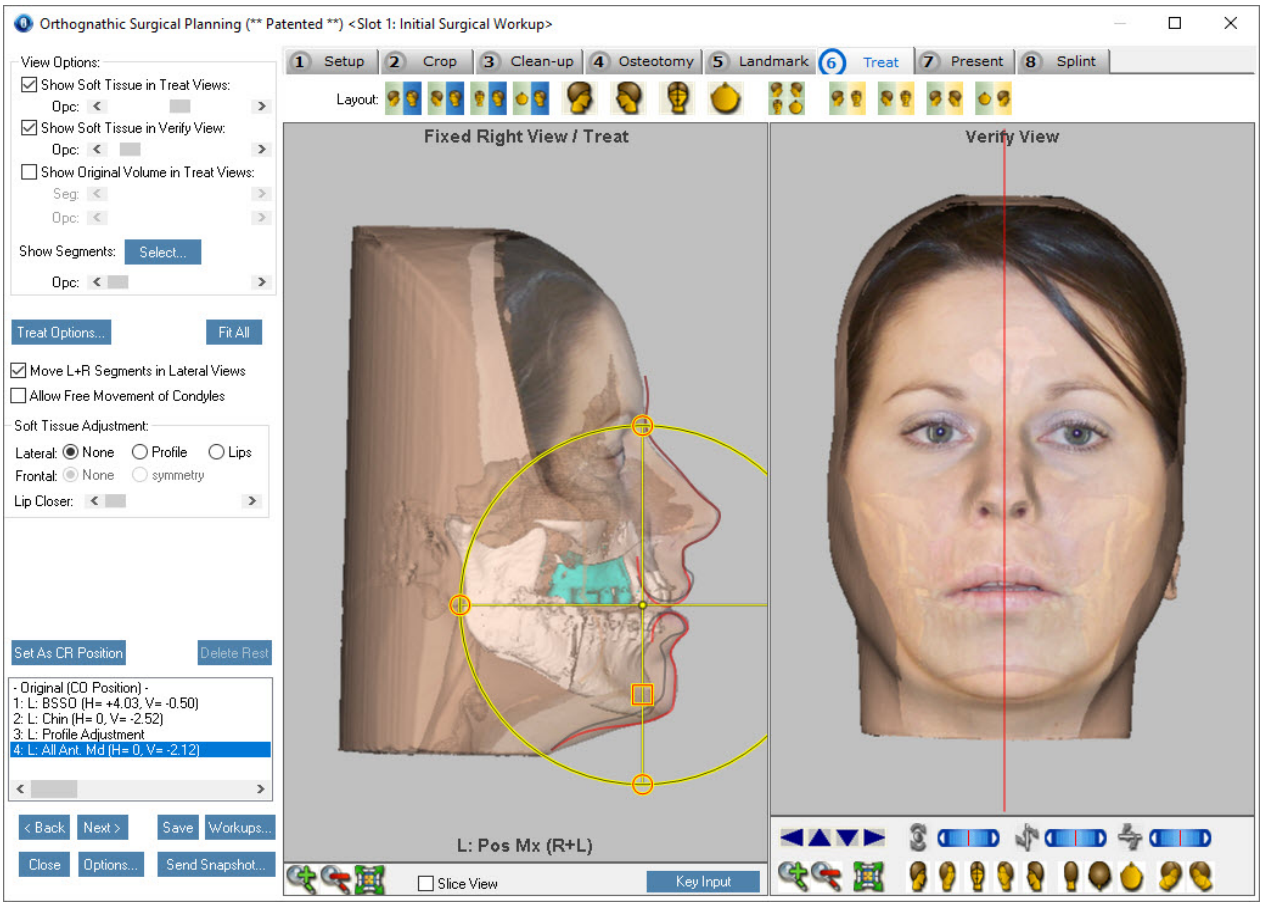
Or,

Right-click the Treat pane, and select **Move All Mandibular Segments** to move all segments of the mandible.

Or,

Right-click the Treat pane, and select **Move All Maxillary+Mandibular Segments** to move all segments of the maxilla and the mandible.

The wheel-shaped movement control that appears over the image, and the **Key Input** button appears below the Treat pane as shown below. In this illustration, the measurements and lateral grid lines are displayed on the image. For information on these and other treatment options, see "Setting Treatment Options" on page 30-89.



To specify movement of the segment that you expect from the planned surgery:

1 Move the segment using either of the following methods:

- Use a wheel-shaped movement control to specify the planned movement visually.
- Type movement values into the Input by Keyboard dialog box.

For information on these two methods for specifying movement, see “Manually Aligning the Superimposition” on page 26-9.

To automatically rotate segments at the hinge axis:

1 Right-click the Treat pane, and select **Auto Rotate All Mandibular Segments @ Hinge** to automatically rotate all segments of the mandible at the hinge axis.

Or,

Right-click the Treat pane, and select **Auto Rotate All Maxillary+Mandibular Segments @ Hinge** to automatically rotate all segments of the maxilla and mandible at the hinge axis.

Adjusting the Soft Tissue

Once you have specified the surgical treatment to simulate, you can adjust the soft tissue, if necessary, to create the most accurate rendering possible of the post-treatment result. Depending on your current view, you can adjust the soft tissue profile or adjust the symmetry of the frontal view. You can also reposition the patient's lips.

To adjust the soft tissue:

1 Select **Lateral** to adjust the patient's soft tissue profile.

Or,

Select **Frontal** to adjust the patient's facial symmetry.

Each of these options is only available when the corresponding view is in the Treat pane.

2 If you selected **Lateral**, select **Profile** to adjust the patient's entire profile.

Or,

If you selected **Lateral**, select **Lips** to reposture the patient's lips.

Or,

If you selected **Frontal**, select **Symmetry** to adjust the patient's facial symmetry.

3 Click and drag the points on the patient's image to adjust the soft tissue.

4 Optionally, click and drag the **Lip Closer** slider to close the patient's lips.

Setting the CR Position

You can set any item in the history list as the centric relation starting point for subsequent measurement and offset values.

To set the CR position:

1 Select the item in the history list to use as the CR position.

2 Click **Set as CR Position**.

All operations in the history list after the selected item will be removed, and a new entry, CR Position, is added to the end of the history list as the new highlighted item.

Setting Treatment Options

You can set a variety of treatment options on this step:

- **Show Landmark Offset and Measurement Tables...:** Opens the Landmark Offset and Measurement Tables window. For more information, see “Showing Landmark Offset and Measurement Tables” on page 30-92.
- **Show Measurements on Images:** Toggles display of measurements in the treatment views. For more information, see “Showing Measurements” on page 30-94.

- **Show Gridlines:** Opens a sub-menu of options for grid lines on the images. For more information, see “Showing Grid Lines” on page 30-94.
- **Lateral Profile Show Options:** Profile image to display (pre-op profile, post-op profile, or both) in the treatment views. For more information, see “Setting Soft Tissue Display Options” on page 30-96.
- **Soft Tissue Options:** Opens a sub-menu of options for the patient's soft tissue. For more information, see “Setting Soft Tissue Movement Options” on page 30-97.
- **Show Vertical Collision Colormap...:** Opens the arch vertical collision color map. For more information, see “Viewing a Vertical Collision Color Map” on page 30-101.
- **Piggyback Surfaces/Arch Model Options:** Opens a sub-menu of options for loading arch model surfaces, linking them to segments, and merging them with segments. For more information, see “Importing and Linking Piggyback Surfaces and Arch Models” on page 30-103, “Using Upper and Lower Arch Models to Set the Initial Occlusion” on page 30-103, and “Using Arch Models to Set the Final Occlusion” on page 30-105.
- **Move Mandible According to Initial Occlusion of the Teeth Model Overlay:** Moves the mandible so that the occlusion returns to the way it was initially in the overlay of the model teeth. For more information, see “Moving the Mandible to Match the Initial Occlusion of the Model Arches” on page 30-105.
- **Consolidate Orthognathic Moves...:** Consolidates several operations into a single entry in the treatment simulation history. For more information, see “Consolidating Orthognathic Moves” on page 30-113.
- **Return Genioplasty/Chin Back to HOME Position:** Returns the chin back to the HOME position.
- **Create/Edit Mandibular Inferior Border Osteotomy...:** Create or edit a mandibular inferior border osteotomy simulation. For more information, see “Doing a Mandibular Inferior Border Osteotomy” on page 30-115.

Setting Segment Display Options

You can select the osteotomy segments to display and customize the colors to use for them, either for this workup or as your default color scheme.

To select segment to display:

1 Next to **Show Segments**, click **Select...**.

2 Check the box in the S column for each segment to display.

To set segment colors:

1 Click the color sample for the segment to change.

2 Select a new color for that segment, and click **OK**.

The image in the right pane is updated to reflect your choice.

3 Optionally, click **Save Colors As Default** use this color scheme in all your future work-ups.

To revert the color changes you've made:

1 Click **Restore Colors To Saved Default** to revert back to the color scheme you've previously saved as your default scheme.

Or,

Click **Restore Colors To Dolphin Default** to revert back to the Dolphin default color scheme.

To close the dialog box:

1 Click **OK**.

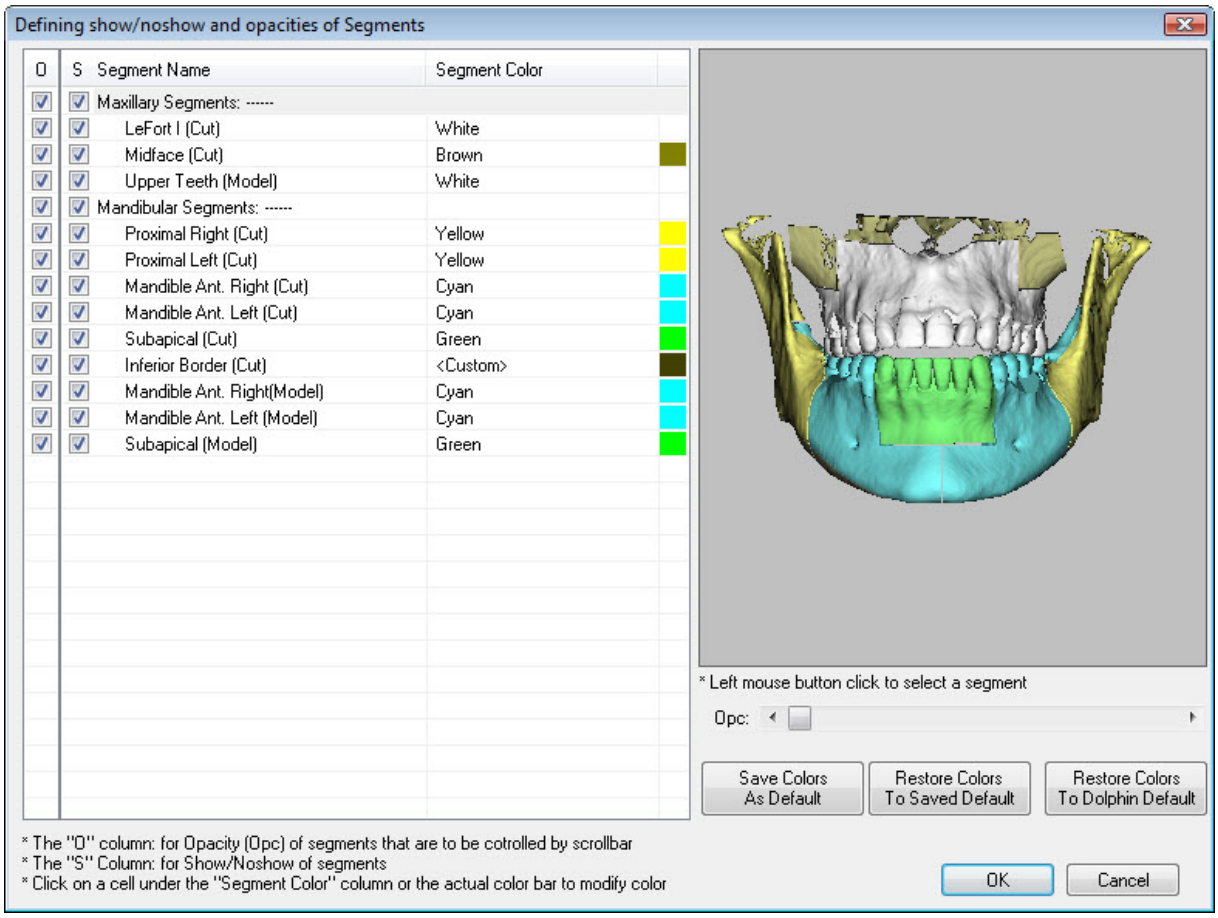


Table	Lists the segments and the colors assigned to them. The table contains the following columns. **O:** Use the slider in the right pane and on the **Step 6: Treat** tab to set the opacity of the segment or group of segments. **S:** Display the segment or group of segments in the right pane on the **Step 6: Treat** tab and on the **Step 7: Present** tab. **Segment Name:** Names of the osteotomy segments. **Segment Color:** Name of the color assigned to each segment. **Color sample:** Sample of the color assigned to each segment.
Image	Current color scheme for the segments.
Opc	Sets the opacity of the image.
Save Colors As Default	Saves this color scheme as the default for use in all future work-ups.

Restore Colors To Saved Default	Reverts back to the color scheme previously saved as the default scheme.
Restore Colors To Dolphin Default	Reverts back to the Dolphin default color scheme.

Showing Landmark Offset and Measurement Tables

Using this option, you can view two types of tables:

- Landmark Offset: this table summarizes the landmark movements resulting from the planned surgical treatment.
- Measurements: this table summarizes the measurements resulting from the planned surgical treatment. On this table, you can also specify which measurements to display in the Treat views.

As you move the segments in the Treat view, the offset and measurement values in this dialog are updated accordingly.

In addition to viewing the tables, you can copy them to the clipboard so that you can paste them into other applications, such as Microsoft Excel.

To view tables of landmark offsets and measurements:

1 Click **Treat Options...**.

2 Select **Show Landmark Offset and Measurement Tables** from the menu.

The Show Landmark Offset and Measurement Tables dialog box opens.

3 Select the **Landmark Offsets** tab to view a table of landmark offsets.

Or,

Select the **Measurements** tab to view a table of measurements.

When you select the **Measurements** tab, the measurements also appear on the image in the Treat view. When you close the **Measurements** tab, the measurements on the image in the Treat view disappear unless the **Show Measurements on Images** option is selected (see “Showing Measurements” on page 30-94).

To change the measurements displayed in the measurements table:

1 Select a view from the **View** drop-down list.

2 Select the group of measurements to include from the **Group** drop-down list.

To specify which measurements to display on the Treat views:

1 Check the box for each measurement.

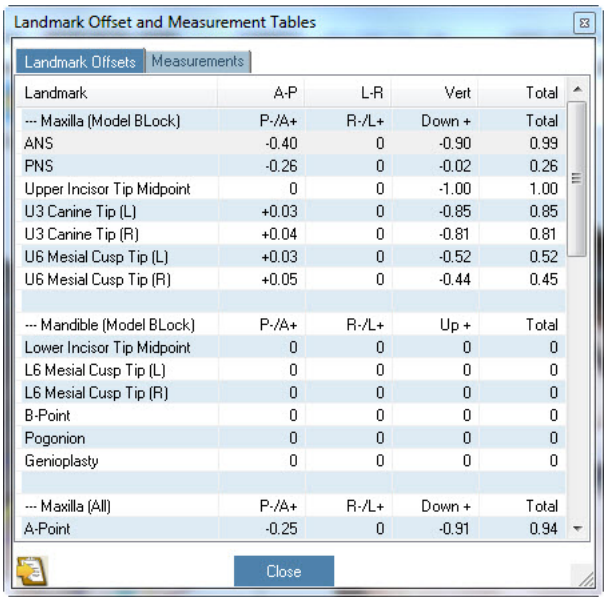
To copy the current table to the clipboard:

1 Click .

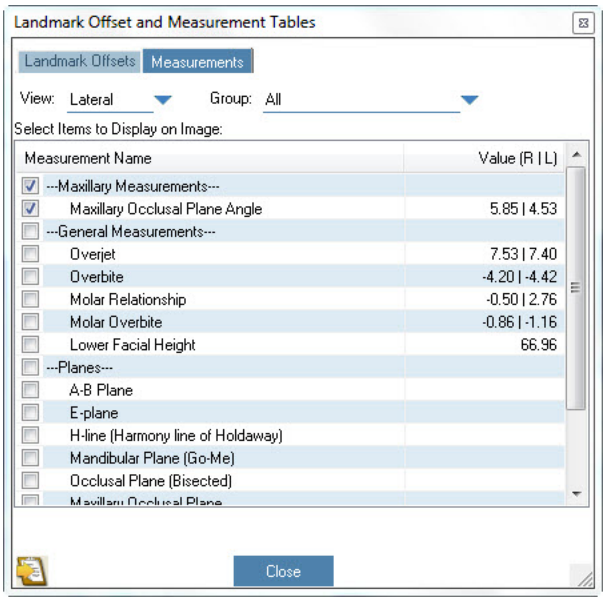
The table you are currently viewing is copied to the clipboard so that you can paste the table into another application, such as Microsoft Excel.

2 Click **OK** to close the confirmation dialog box.

Landmark Offsets Table



Measurements Table



Landmark Offsets	Table of landmark offsets. Includes the following columns: **A-P:** Movement values for landmarks in the anterior and posterior directions. A positive value indicates that the landmark moved in the anterior direction, while a negative value indicates that it moved in the posterior direction. **L-R:** Movement values for landmarks to the left or right. A positive value indicates that the landmark moved to the left, while a negative value indicates that it moved to the right. **Vert:** Vertical movement values for landmarks. A positive value indicates that the landmark moved down, while a negative value indicates that it moved up. **Total:** Overall movement values for landmarks.
Measurements	Table of measurements. Includes the following columns: **Measurement Name:** Measurements grouped by type. **Value (R | L):** Value for each measurement. If there are right and left values for a measurement, the value for the right side appears first.
View	View (**Lateral**, **Frontal**, or **SMV**) to use for the measurements table. Available only on the **Measurements** tab.

Group	Group of measurements to include in the measurements table. Only available on the **Measurements** tab. **All:** Includes all measurements in the table. **Maxillary Measurements:** Includes measurements related to the maxilla only. **Mandibular Measurements:** Includes measurements related to the mandible only. **General Measurements:** Includes only general measurements (measurements not related to the maxilla, mandible, or planes). **Planes:** Includes only planes in the table.
	Copies the table to the clipboard so that you can paste it into another application, such as Microsoft Excel.
Close	Closes the dialog box.

Showing Measurements

To toggle the measurements display:

1 Click **Treat Options...**. Then, select **Show Measurements on Images** from the menu.

Or,

Right-click the Treat view, and select **Show Measurements** from the menu.

To select the measurements to display, see “Showing Landmark Offset and Measurement Tables” above.

Showing Grid Lines

You can use a grid to help you in planning surgical movement. You can display grid lines on the fixed treatment views and display the grid as planes in the verify views. You can also configure the grid.

To toggle display of the grid lines on the treatment views:

1 Click **Treat Options...**.

2 Select **Show Gridlines** from the menu.

3 Click the type of grid lines to display (lateral, frontal, or SMV).

Or,

Right-click the Treat image and select the **show grid lines** option for the current view from the menu.

Or,

Click **Show Gridlines in All Fixed Views** to display a grid on all the Treat views.

Or,

Click **Unshow Gridlines in All Fixed Views** to hide the grid on all the Treat views.

4 Optionally, click and drag the grid lines to change their locations.

The new distances between the grid lines appear at the edge of the window pane.

To toggle display of the grid lines as planes on the verify views:

1 Click **Treat Options...**.

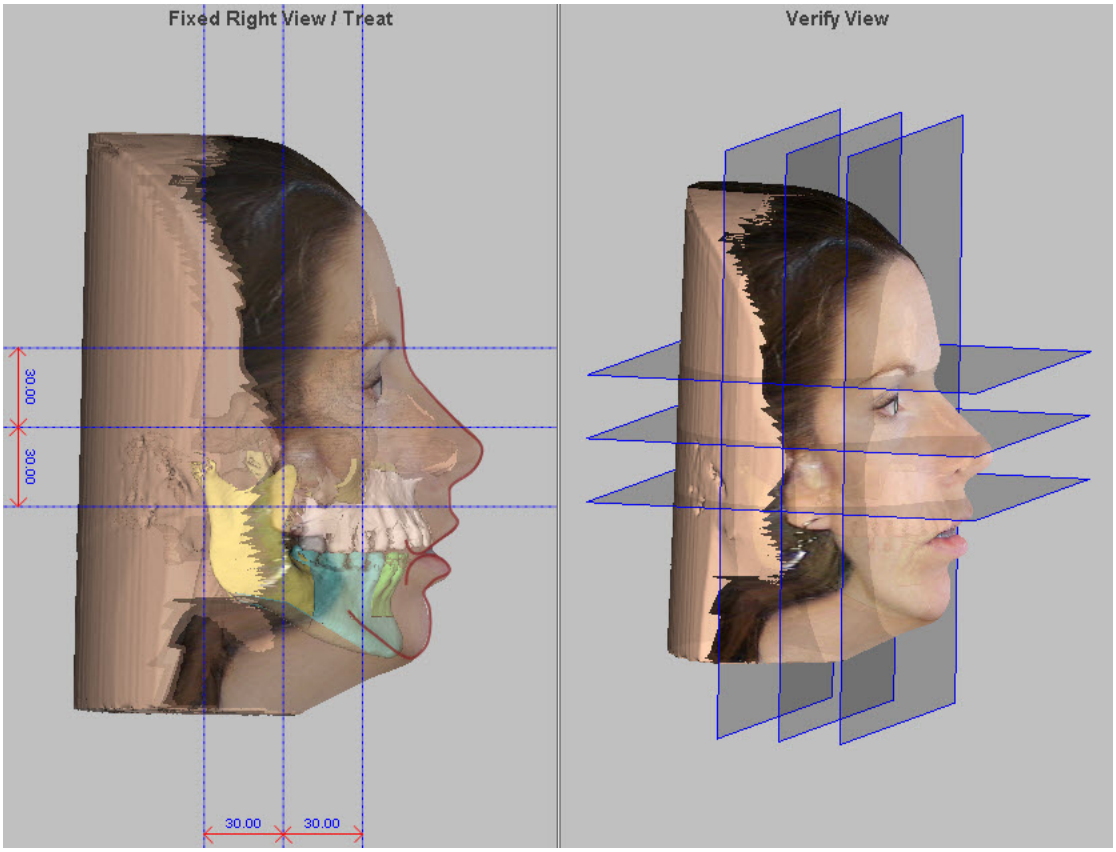
2 Select **Show Gridlines** from the menu.

3 Click **Show Grid Planes in Verify View As Well** to display a grid on the verify views.

Or,

Right-click the verify image and select **Show Grid Planes in Verify View As Well** from the context menu.

In the following figure, lateral grid lines are displayed in the Treat view and grid planes are displayed in the Verify view.



To set the color of the grid lines:

1 Click **Treat Options...**.

2 Select **Show Gridlines** from the menu.

3 Click **Set Grid Color...**.

4 Select the color to use, and click **OK**.

To set the distances between lines in the grid:

1 Click **Treat Options...**.

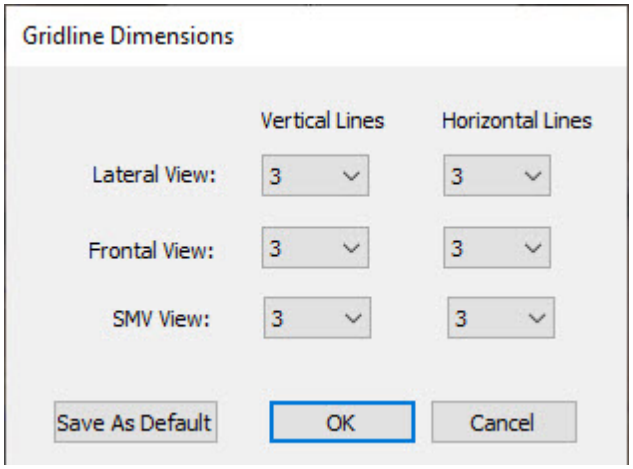
2 Select **Show Gridlines** from the menu.

3 Click **Set Grid Dimensions...**.

4 Select the distances between the horizontal and vertical lines on the grid for each view.

5 Optionally, click **Save As Default** to use these settings as the defaults.

6 Click **OK**.



Lateral View	Distances between grid lines on the lateral views. **Vertical Lines:** Distance between vertical lines on the grid. **Horizontal Lines:** Distance between horizontal lines on the grid.
Frontal View	Distances between grid lines on the frontal views. **Vertical Lines:** Distance between vertical lines on the grid. **Horizontal Lines:** Distance between horizontal lines on the grid.
SMV View	Distances between the grid lines on the bottom (SMV) views. **Vertical Lines:** Distance between vertical lines on the grid. **Horizontal Lines:** Distance between horizontal lines on the grid.
Save As Default	Uses the current settings as the defaults.

Setting Soft Tissue Display Options

To toggle display of the pre- and post-operative soft tissue profiles on lateral views:

1 Click **Treat Options...**.

2 Select **Lateral Profile Show Options** from the menu.

3 Click **Show Lateral Pre-Op Profile** to toggle display of the pre-op profile.

Or,

Click **Show Lateral Post-Op Profile** to toggle display of the post-op profile.

The pre-op profile appears in black, and the post-op profile appears in red.

To toggle display of the patient's photo:

1 Click **Treat Options...**.

2 Select **Soft Tissue Options** from the menu.

3 Click **Show Supporting Surface Only (Without 3D Photo Skin)** to toggle display of the patient's photo.

Or,

Right-click the Treat or Verify pane, and select **Show Supporting Surface Only (Without 3D Photo Skin)**.

Setting Soft Tissue Movement Options

With these options, you can specify whether to update the patient's soft tissue in real time and set movement rules for the soft tissue.

To toggle real-time soft tissue movement:

1 Click **Treat Options...**.

2 Select **Soft Tissue Options** from the menu.

3 Click **Realtime Soft Tissue Update** to toggle real-time soft tissue movement.

To set soft tissue rules:

1 Click **Treat Options...**.

2 Select **Soft Tissue Options** from the menu.

3 Select **Soft Tissue Rules Editor...**.

4 Select the treatment simulation operation for which to set soft tissue rules from the **Tx Operation** drop-down list.

5 Select the movement type tab (**A-P**, **Vertical**, or **Rotate**) for the type of movement for which to set soft tissue rules.

For example, to set soft tissue rules to apply for horizontal movement when simulating the Le Fort I (Lateral) treatment operation, you would select **Le Fort I (Lateral)** from the **Tx Operation** drop-down list. Then, you would select the **A-P** tab.

6 Enter movement rules for any of the listed soft tissue landmarks as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.

For example, suppose you selected **Le Fort I (Lateral)** from the **Tx Operation** drop-down list, and selected the **A-P** tab. Then, you entered 50 in the **Horiz %** field for the **Upper Lip**. Using this

example, advancing the patient's maxilla would cause the patient's upper lip to move half as quickly. If you entered 33 in the **Horiz %** field for the **Upper Lip**, advancing the patient's maxilla would cause the patient's upper lip to move one-third as quickly.

In some cases when you specify a percentage for soft tissue rotational movement, you need to select the landmark around which to rotate the soft tissue. If this is the case, the **Rotate About Landmark** drop-down list becomes active.

7 If the **Rotate About Landmark** drop-down list is active, select the landmark around which to rotate the soft tissue.

8 When you finish specifying soft tissue rules, click **OK**.

To test the soft tissue rules:

1 Adjust the **A-P** slider to test horizontal soft tissue movement.

Or,

Adjust the **V** slider to test vertical soft tissue movement.

Or,

Adjust the **R** slider to test rotational soft tissue movement.

To save your soft tissue rules:

1 Click **Save/Restore Rules...**.

2 Select **Save As Default Rules** from the menu to save the current rules as the default rules for all subsequent new orthognathic workups.

Or,

Select **Save Rules to File...** from the menu to save the current rules to a file.

3 If you selected **Save Rules to File...**, specify the file in which to store these rules. Then, click **Save**.

To load a set of soft tissue rules:

1 Click **Save/Restore Rules...**.

2 Select **Revert to Default Rules** to load the default rules.

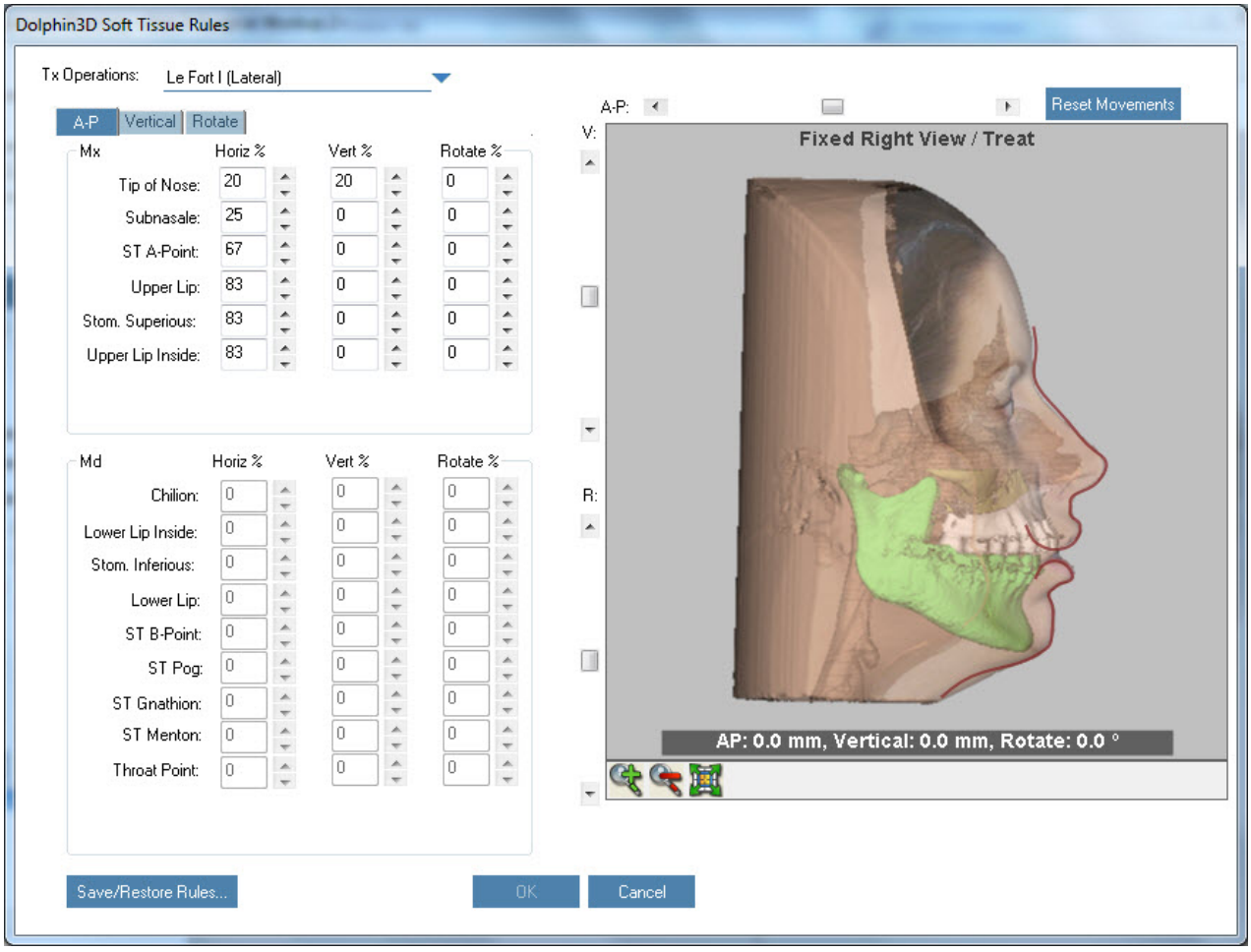
Or,

Select **Revert to Dolphin Installed Rules** to load the rules initially installed with Dolphin Imaging.

Or.

Select **Restore Rules from File...** to load the rules previously saved in a file.

3 If you selected **Restore Rules from File...**, specify the file from which to load the rules. Then, click **Open**.



Tx Operation	Treatment simulation operation for which to set soft tissue rules. **Le Fort I (Lateral):** Specify soft tissue rules for when the maxilla is moved. **BSSO (Lateral):** Specify soft tissue rules for when the anterior segment of the mandible is moved. **Mandible (Lateral):** Specify soft tissue rules for when the mandible is moved.
Movement Type	Types of movement relating to the selected treatment simulation operation. **A-P:** Sets soft tissue rules for horizontal movement. **Vertical:** Sets soft tissue rules for vertical movement. **Rotate:** Sets soft tissue rules for rotational movement.
Tip of Nose	Soft tissue movement for the tip of nose as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
SubNasale	Soft tissue movement for the subnasale as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
ST A-Point	Soft tissue movement for the soft tissue A-point as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.

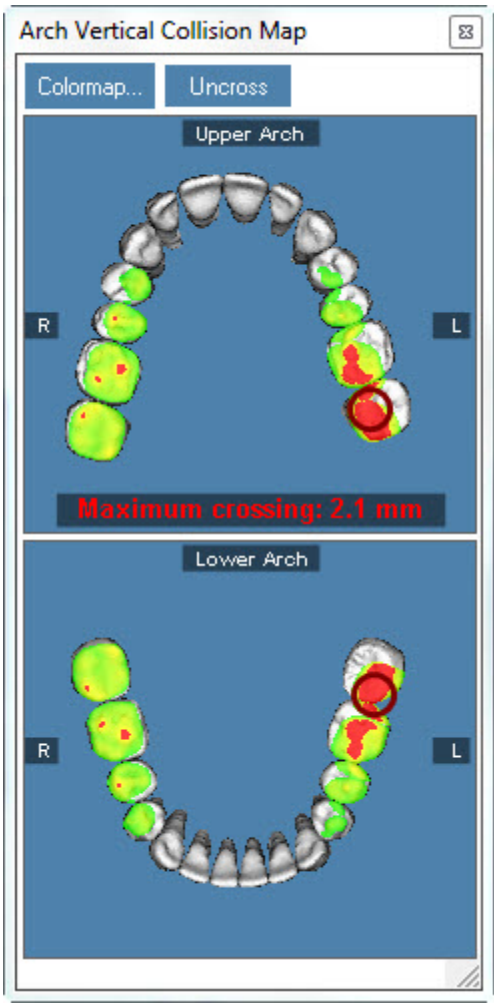
Upper Lip	Soft tissue movement for the upper lip as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
Stom. Superious	Soft tissue movement for the stomion superius as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
Upper Lip Inside	Soft tissue movement for the inside of the upper lip as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
Rotate About Landmark	Landmark around which to rotate the soft tissue. Available only when you have specified rotational movement and need to specify the center of rotation.
Chilion	Soft tissue movement for the chilion as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
Lower Lip Inside	Soft tissue movement for the inside of the lower lip as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
Stom. Inferious	Soft tissue movement for the stomion inferius as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
Lower Lip	Soft tissue movement for the lower lip as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
St B-Point	Soft tissue movement for the soft tissue B-point as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
St Pog	Soft tissue movement for the soft tissue pogonion as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
St Gnathion	Soft tissue movement for the soft tissue gnathion as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
St Menton	Soft tissue movement for the soft tissue menton as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
Throat Point	Soft tissue movement for the throat point as percentages of the horizontal, vertical, and rotational movement for the selected treatment simulation operation.
Rotate About Landmark	Landmark around which to rotate the soft tissue. Available only when you have specified rotational movement and need to specify the center of rotation.
A-P	Simulates horizontal movement for the selected treatment simulation operation on the preview image by applying your soft tissue rules.
Reset Movements	Resets the preview image to its initial state (before any treatment and soft tissue movement simulation).
V	Simulates vertical movement for the selected treatment simulation operation on the preview image by applying your soft tissue rules.
R	Simulates rotational movement for the selected treatment simulation operation on the preview image by applying your soft tissue rules.

Save/Restore Rules...	Opens a menu with the following options: **Save As Default Rules:** Saves the current rules as the default rules for all subsequent new orthognathic workups. **Save Rules to File...:** Saves the current rules to a file. **Revert to Default Rules:** Loads the default rules. **Revert to Dolphin Installed Rules:** Loads the rules initially installed with Dolphin Imaging. **Restore Rules from File...:** Loads rules previously saved in a file.
Preview Image	Previews the result of your soft tissue rules for simulated treatment operations.

For information on the magnification controls that appear below the image, see “Changing the Magnification” on page 19-25.

Viewing a Vertical Collision Color Map

To assist you in your surgical treatment planing, you can view a color map that graphically illustrates collisions between the upper and lower arches. Then, you can have Dolphin 3D make the adjustments necessary to eliminate the collisions. You can leave the collision color map open while performing surgical movements to see real-time information about overlap and spacing.



To view the color map:

1 Click **Treat Options...**.

2 Select **Show Vertical Collision Colormap...** from the menu.

The red areas denote vertical intersections or crossings between upper and lower teeth. If there are intersections, the dark-red circled area indicates the maximum intersection, and that intersection distance is displayed under the top window If there are no intersections, the dark-red circled area indicates the minimum clearance between the upper and lower teeth.

Green areas indicate the amount of clearance between upper and lower teeth. You can customize the colors used to indicate the amount of clearance (see below).

3 Place the mouse pointer over an area to magnify it.

Colormap...	Set the colors to use in the color map.
Uncross	Makes the adjustments necessary to eliminate collisions.

To have Dolphin 3D make the adjustments necessary to eliminate the collisions:

1 Click **Uncross**.

In most cases, this button rotates the mandible on the hinge axis until there is no red overlap. However, in the case of a BSSO, this button moves the anterior mandible straight down.

To set the colors to use in the color map:

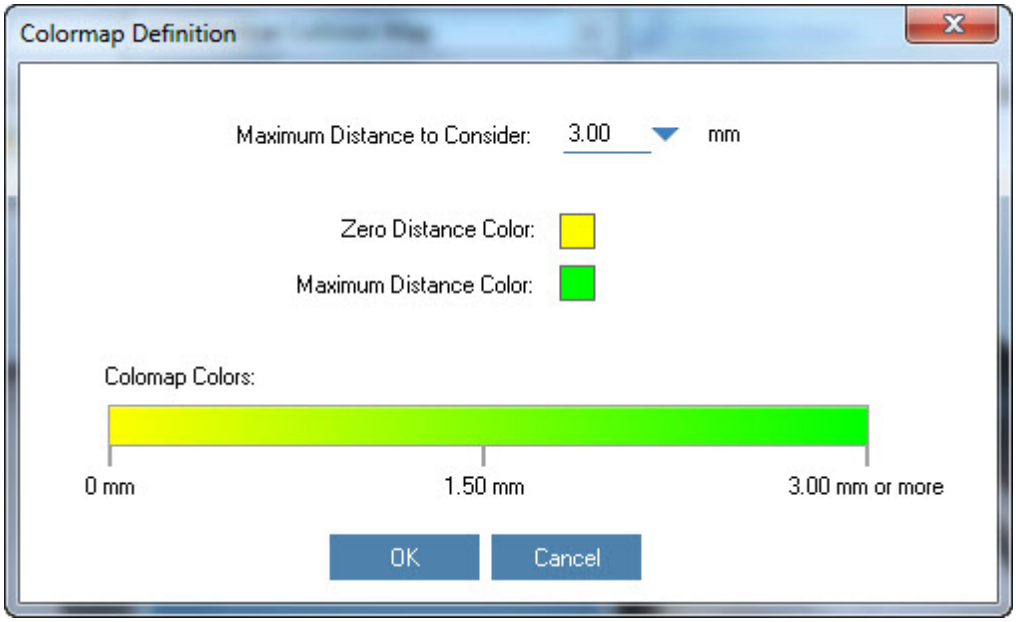
1 Click **Colormap...**.

2 Select the maximum distance to consider when building the color map from the drop-down list.

3 Click the color samples to set the colors to represent zero distance and the maximum distance.

The color map always uses red to indicate intersections. You can only customize the colors used to indicate clearance distances.

4 Click **OK**.



Maximum Distance to Consider	Maximum distance (in mm) to consider when building the color map.
Zero Distance Color	Color that represents zero distance.
Maximum Distance Color	Color that represents the maximum distance.

Using Upper and Lower Arch Models to Set the Initial Occlusion

A set of upper and lower arch models can have two independent occlusal positions:

- The original position as they were imported. This position is typically established by:
  a scanning the upper and lower intro-oral or stone models
  b using the specialized third-party program to merge them into optimal occlusion
  c exporting the arch models to STL files (one arch per file) in their relatively correct occlusal positions

  These STL files are then imported into Dolphin 3D as described in “Defining the Occlusion” on page 19-86.
- the position after they were merged with the volume in Dolphin 3D (described in “Superimposing the Arch Model Surfaces Over the Volume” on page 19-101)

These two occlusal positions are stored separately and independently, so changing the occlusal position in one does not affect the occlusal position of the other. However, you can link these two initial positions in the following ways:

- If the arch models are not part of the osteotomies you've defined as part of your surgical treatment plan, see “Importing and Linking Piggyback Surfaces and Arch Models” below,
- If the arch model surfaces are part of the osteotomies you've defined as part of your surgical treatment plan (that is, they are included in the **Step 3: Clean-up** tab and the osteotomies defined on the **Step 4: Osteotomy tab**), see “Moving the Mandible to Match the Initial Occlusion of the Model Arches” on page 30-105.

Importing and Linking Piggyback Surfaces and Arch Models

The following steps describe how to link two arch model initial occlusal positions: their original position when they were imported and their position after they were superimposed over the volume in Dolphin 3D. Use these steps if the arch model surfaces are not part of the osteotomies you've defined as part of your surgical treatment plan (that is, they are not included in the **Step 3: Clean-up** tab and the osteotomies defined on the **Step 4: Osteotomy tab**).

Note: *If the arch models are part of the osteotomy, see “Moving the Mandible to Match the Initial Occlusion of the Model Arches” on page 30-105.*

To load the arch models in their initial occlusal position:

1 Complete the first five steps of the Orthognathic Surgical Planning module.

  For more information, see “Step 1: Setup” on page 30-5, “Step 2: Crop” on page 30-7, “Step 3: Clean-up” on page 30-10, “Step 4: Osteotomy” on page 30-19, and “Step 5: Landmarks” on page 30-76.

2 On the **Step 6: Treat** tab, click **Treat Options...**.

3 Select **Piggyback Surfaces/Arch Model Options** from the menu.

4 Select **Importing and Linking of Piggyback Surfaces/Arch Models** from the sub-menu.

The Importing and Linking of Piggyback Surfaces/Arch Models dialog box opens.

5 Check the **Add Arch Models in Initial Occlusion** box.

6 Enter the location of the STL file for the upper arch model in the **Upper** field.

Or,

Click **Browse...** and browse to the upper arch model STL file.

7 Enter the location of the STL file for the lower arch model in the **Lower** field.

Or,

Click **Browse...** and browse to the lower arch model STL file.

8 Click **Load STL Files Now**.

9 After the files have loaded, click **OK** to close the dialog box.

To merge the upper arch model with the segmented maxilla:

1 Click **Treat Options...**.

2 Select **Piggyback Surfaces/Arch Model Options** from the menu.

3 Select **Arch Model in Initial Occlusion Merging Options** from the sub-menu.

4 Select **Merge Upper Arch Model to Maxilla**.

Once the upper arch is merged with the maxilla, the lower arch is automatically moved by the same amount as the upper arch so that they are still in occlusion.

To merge the lower arch model with the segmented mandible:

1 Click **Treat Options...**.

2 Select **Piggyback Surfaces/Arch Model Options** from the menu.

3 Select **Arch Model in Initial Occlusion Merging Options** from the sub-menu.

4 Select **Merge Mandible to Lower Arch Model**.

The segmented mandible is moved relative to the stationary segmented maxilla so that the original occlusion of upper and lower arch models is maintained.

To verify that the arch models are in initial occlusion, you can check the Defining Show/Noshow and Opacities of Segment dialog box. If you toggle display of the piggybacked segments, **Init Occl Upper Teeth (Model)** and **Init Occl Lower Teeth (Model)**, you will see that the arch models are merged with the segmented maxilla and mandible. If they weren't, the arch models would be in some arbitrary location away from the appropriate segments.

Moving the Mandible to Match the Initial Occlusion of the Model Arches

Use these steps if the arch model surfaces are part of the osteotomies you've defined as part of your surgical treatment plan.

Note: *If the arch models are not part of the osteotomy, see “Importing and Linking Piggyback Surfaces and Arch Models” on page 30-107.*

To link the two arch model initial occlusal positions (their original position when they were imported and their position after they were superimposed over the volume in Dolphin 3D):

1 On **Step 3: Clean-up**, overlay the arch models on the maxilla and mandible surfaces to use them as the high-resolution replacements for the volume’s low-resolution tooth crowns (see “Overlaying the Model Arch Surface” on page 30-12).

2 On **Step 3: Clean-up**, click **Edit Model Merge** to merge the upper arch model to the segmented maxilla and the lower arch model to the segmented mandible (see “Adjusting the Superimposition” on page 30-13).

Following these two steps includes the upper and lower arch models in the osteotomies defined on the **Step 4: Osteotomy** tab.

3 On **Step 6: Treat**, begin the treatment simulation by clicking **Treat Options...** and selecting **Move Mandible According to Initial Occlusion of the Teeth Model Overlay**.

This will move the segmented mandible (along with its merged lower arch model) into alignment with the stationary segmented maxilla (along with its merged upper arch model) in order to match the original occlusal position of the arch models.

4 On the dialog box that appears, select **Yes** to move only the anterior BSSO segments.

Or,

Select **No** to move the entire mandible, including the condyles.

Using Arch Models to Set the Final Occlusion

Arch models can have a final occlusion position before you import them into Dolphin 3D. Typically, this position results from:

1 Cutting the stone models and moving the pieces into post-operative positions with optimal occlusion according to the treatment plan. Note that for a single jaw surgery, one of the arches would be uncut.

2 Scanning all the pieces of each arch as a set, resulting in a cut upper arch scan and a cut lower arch scan.

3 Positioning these two scans into final occlusion.

4 Exporting each of the two arches in final occlusion to an STL file.

When the arches are exported to STL files (one arch per file), they retain their correct final occlusal positions.

Once you have created STL files of the arch models in final occlusion, you can import them into Dolphin 3D as described in “Importing and Linking Piggyback Surfaces and Arch Models” on page 30-103. Then, the typical work flow depends on the type of surgery being planned. For example, for single jaw surgery involving the lower jaw, you would:

1 Select the uncut maxilla and merge it with the upper arch model.

The lower arch model automatically moves by the same amount as the upper arch model so that the arch models are still in occlusion.

2 Select each mandibular cut segment and merge it with the corresponding section of the lower arch model.

In this way, you can easily move the mandibular cut segments you created on **Step 4: Osteotomy** to post-operative positions with the optimal occlusion you planned using the physical arch models.

For double jaw surgery, assume, for example, that the maxillary segments are moved into final position first, and the mandibular segments are subsequently moved into final position:

1 Move at least one of the cut maxillary pieces into its final position as planned.

2 Select one of the maxillary cut segments that is in final position and merge it with the corresponding section of the upper arch model.

The lower arch model automatically moves by the same amount as the upper arch model so that the arch models are still in occlusion.

3 Select each maxillary cut segment that is not yet in its final position and merge it with the corresponding section of the upper arch model.

4 Select each mandibular cut segment and merge it with the corresponding section of the lower arch model.

In this way, you can easily move both the maxillary and mandibular cut segments you created on **Step 4: Osteotomy** to post-operative positions with the optimal occlusion you planned using the physical arch models.

For information on selecting a cut segment to merge with an arch model, see “Selecting a Cut Segment to Merge With an Arch Model” on page 30-108. For information on aligning a cut segment with an arch model and merging them together, see “Merging Cut Segments With Arch Models” on page 30-109.

When you finish this process, you can verify that the arch models are in final occlusion on the Defining Show/Noshow and Opacities of Segment dialog box (see “Setting Segment Display Options” on page 30-90). If you toggle display of the piggybacked segments, **Final Occl Upper Teeth (Model)** and **Final Occl Lower Teeth (Model)**, you will see that the arch models are merged with the segmented maxilla and mandible. If they weren't, the arch models would be in some arbitrary location away from the appropriate segments.

Importing and Linking Piggyback Surfaces and Arch Models

To load the arch models in their final occlusal position:

1 Complete the first five steps.of the Orthognathic Surgical Planning module.

For more information, see “Step 1: Setup” on page 30-5, “Step 2: Crop” on page 30-7, “Step 3: Clean-up” on page 30-10, “Step 4: Osteotomy” on page 30-19 and “Step 5: Landmarks” on page 30-76.

2 On the **Step 6: Treat** tab, click **Treat Options...**.

3 Select **Piggyback Surfaces/Arch Model Options** from the menu.

4 Select **Importing and Linking of Piggyback Surfaces/Arch Models** from the sub-menu.

The Importing and Linking of Piggyback Surfaces/Arch Models dialog box opens.

5 Check the **Add Arch Models in Final Occlusion** box.

6 Enter the location of the STL file for the upper arch model in the **Upper** field.

Or,

Click **Browse...** and browse to the upper arch model STL file.

7 Enter the location of the STL file for the lower arch model in the **Lower** field.

Or,

Click **Browse...** and browse to the lower arch model STL file.

8 Click **Load STL Files Now**.

Do not close this dialog box yet. At this point, you need to link the arch models to the maxilla and mandible on the **Linking** tab (see below).

To link the arch models to the maxilla and mandible:

1 After the STL files have loaded, click the **Linking** tab.

2 Click the table cell to the right of **Final Occl Upper Teeth (Model)** to link the upper arch model to a maxillary segment.

Or,

Click the table cell to the right of **Final Occl Lower Teeth (Model)** to link the lower arch model to a mandibular segment.

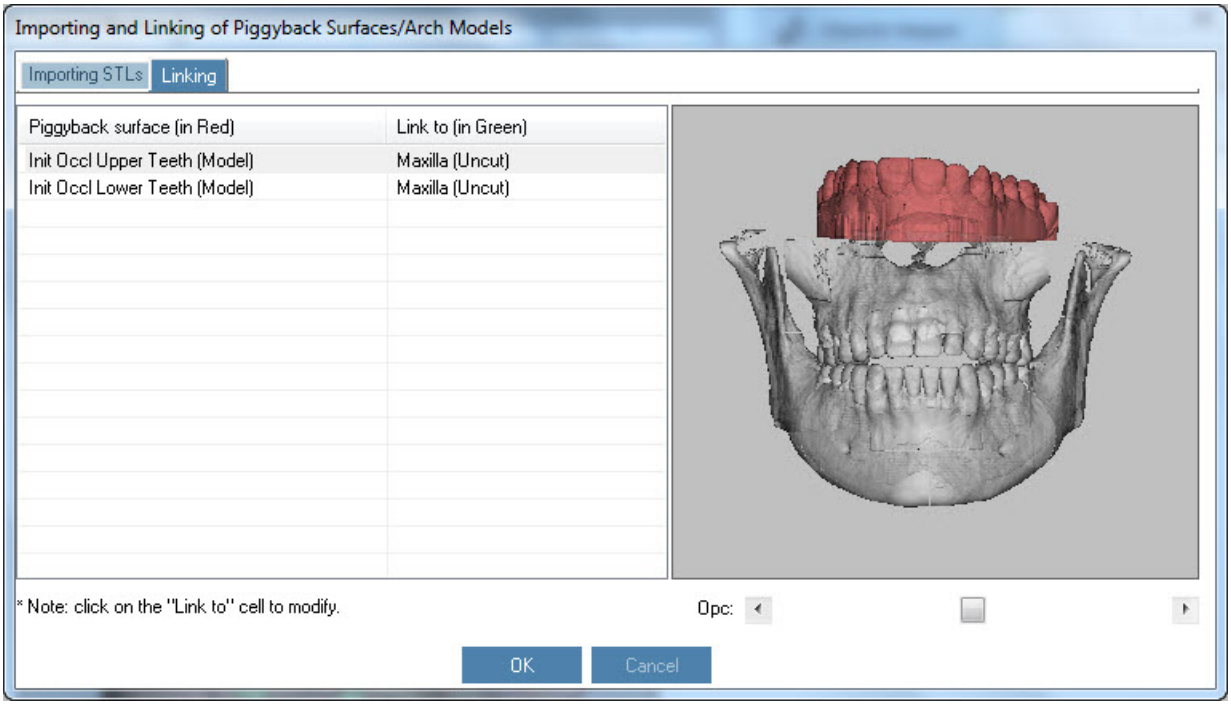
3 Select the segment to which to link the arch models from the drop-down list that appears.

Regardless of which arch model you chose to use to create the link, both arch models are linked to the same segmental piece. This way, both model arches move automatically whenever that cut segment moves, maintaining the final occlusion.

4 Click **OK** to close the dialog box.

At this point, you need to select the cut segments you created on **Step 4: Osteotomy** one by one, then align and merge each one with the corresponding section of the appropriate arch model. For information

on selecting a cut segment to merge with an arch model, see “Selecting a Cut Segment to Merge With an Arch Model” below. For information on aligning a cut segment with an arch model and merging them together, see “Merging Cut Segments With Arch Models” on page 30-109.



Selecting a Cut Segment to Merge With an Arch Model

To select a cut segment and arch model to merge:

1 On the **Step 6: Treat** tab, click **Treat Options...**.

2 Select **Piggyback Surfaces/Arch Model Options** from the menu.

3 Select **Arch Model in Final Occlusion Merging Options** from the sub-menu.

4 Select **Merge Maxillary Segment to Upper Arch Model...** to select a maxillary cut segment to merge with the upper arch model.

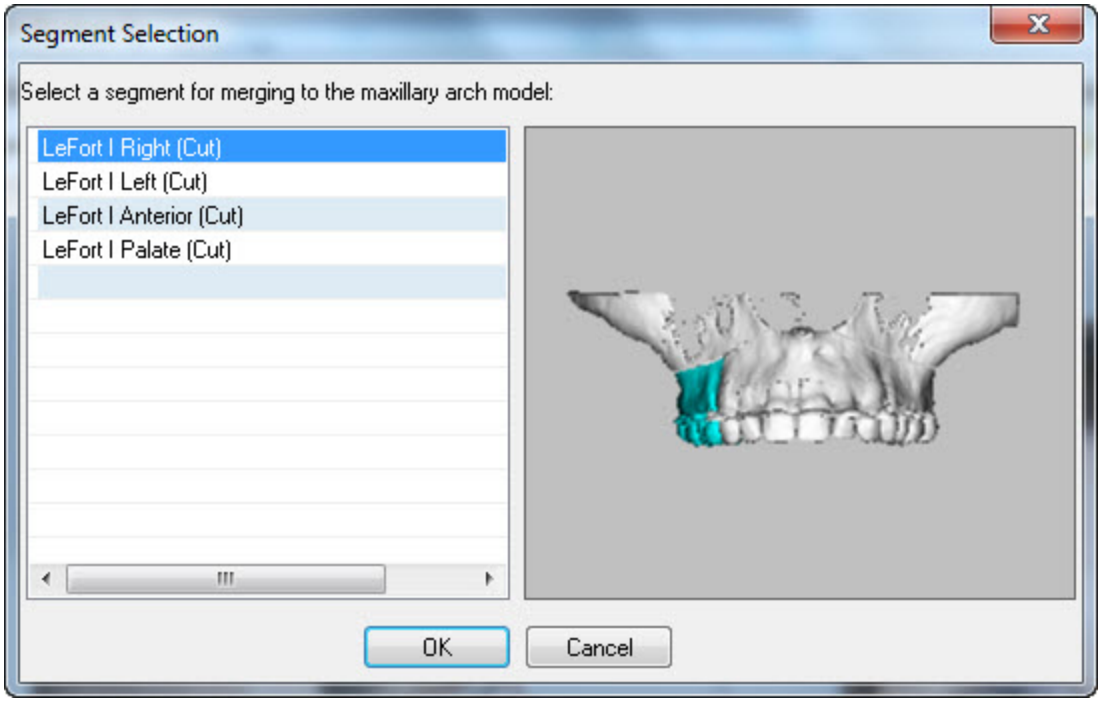
Or

Select **Merge Mandibular Segment to Lower Arch Model...** to select a mandibular cut segment to merge with the lower arch model.

The Segment Selection dialog box opens. The figure below illustrates this dialog box for the upper arch.

5 Select the segment to merge to the arch model. Then, click **OK**.

A dialog box opens so that you can align the arch model and cut segment and merge them together as described in “Merging Cut Segments With Arch Models” on page 30-109.



Merging Cut Segments With Arch Models

Once you have selected a cut segment that you want to merge with an arch model, you can align them and merge them together. Depending on the planned treatment, you may merge several cut segments with each arch model.

The dialog box where you align and merge the cut segment with the arch model opens automatically when you click **OK** on the Segment Selection dialog box (see “Selecting a Cut Segment to Merge With an Arch Model” above). You can also open this dialog box manually as described below.

To open the dialog box if it isn't already open:

1 On the **Step 6: Treat** tab, click **Treat Options...**.

2 Select **Piggyback Surfaces/Arch Model Options** from the menu.

3 Select **Arch Model in Final Occlusion Merging Options** from the sub-menu.

4 Select **Merge Upper Arch Model to Linked Segment...** to align and merge a maxillary cut segment with the upper arch model..

Or

Select **Merge Lower Arch Model to Linked Segment...** to align and merge a mandibular cut segment with the lower arch model.

The dialog box where you align and merge a cut segment with an arch model contains the following tabs:

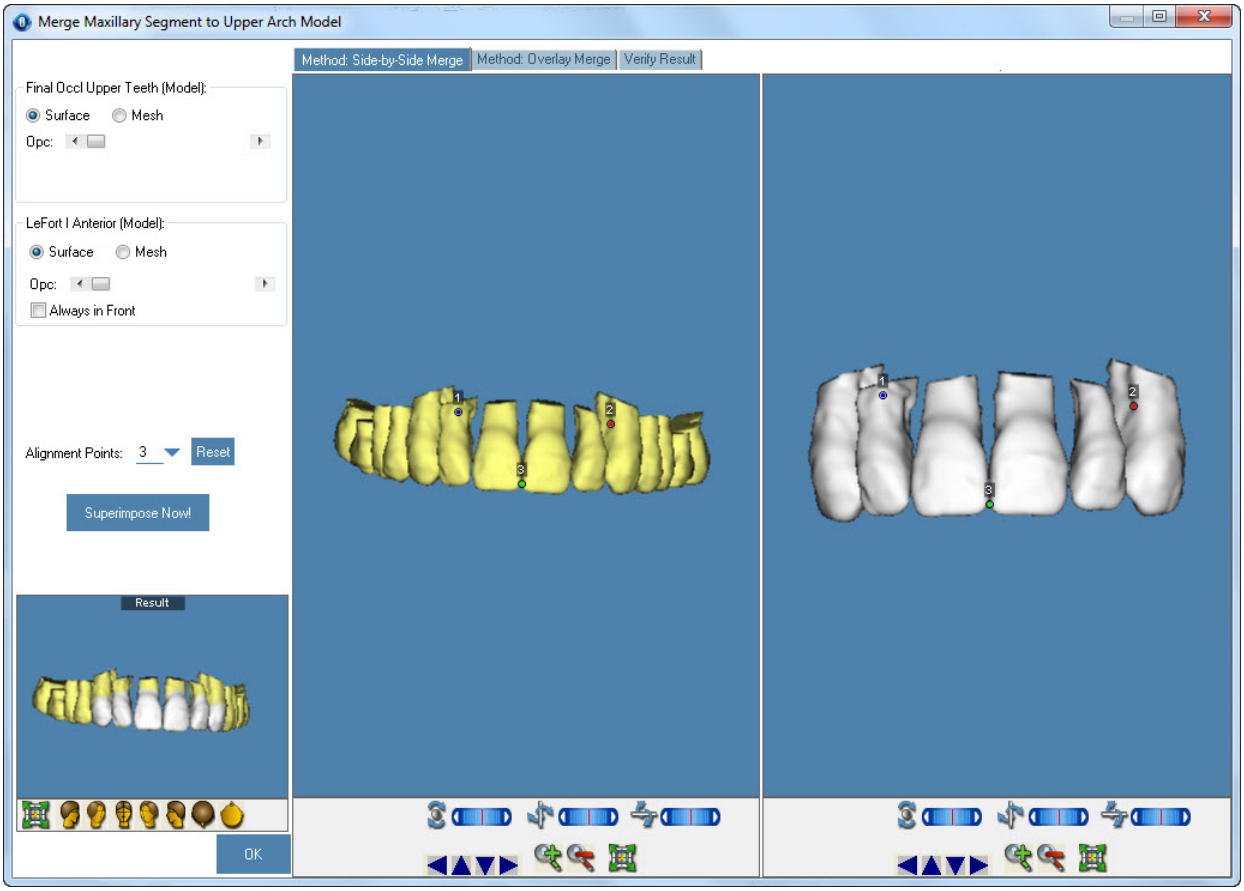
Method: Side-by-Side Merge	Align the cut segment and arch model by viewing them side by side and identifying corresponding points.
Method: Overlay Merge	Align the cut segment and arch model using the wheel-shaped alignment tool and other movement controls.
Verify Result	Verify the alignment between the cut segment and arch model.

The following options appear on all the tabs.

arch model	Display options for the arch model you are merging with a cut segment. **Surface:** Displays the arch model as a surface. **Mesh:** Displays a mesh representation of the arch model. **Opc:** Sets the opacity of the arch model.
cut segment	Display options for the cut segment you are merging with an arch model. **Surface:** Displays the cut segment as a surface. **Mesh:** Displays a mesh representation of the cut segment. **Opc:** Sets the opacity of the cut segment. **Always in Front:** Displays the cut segment in front of the arch model regardless of their actual positions.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

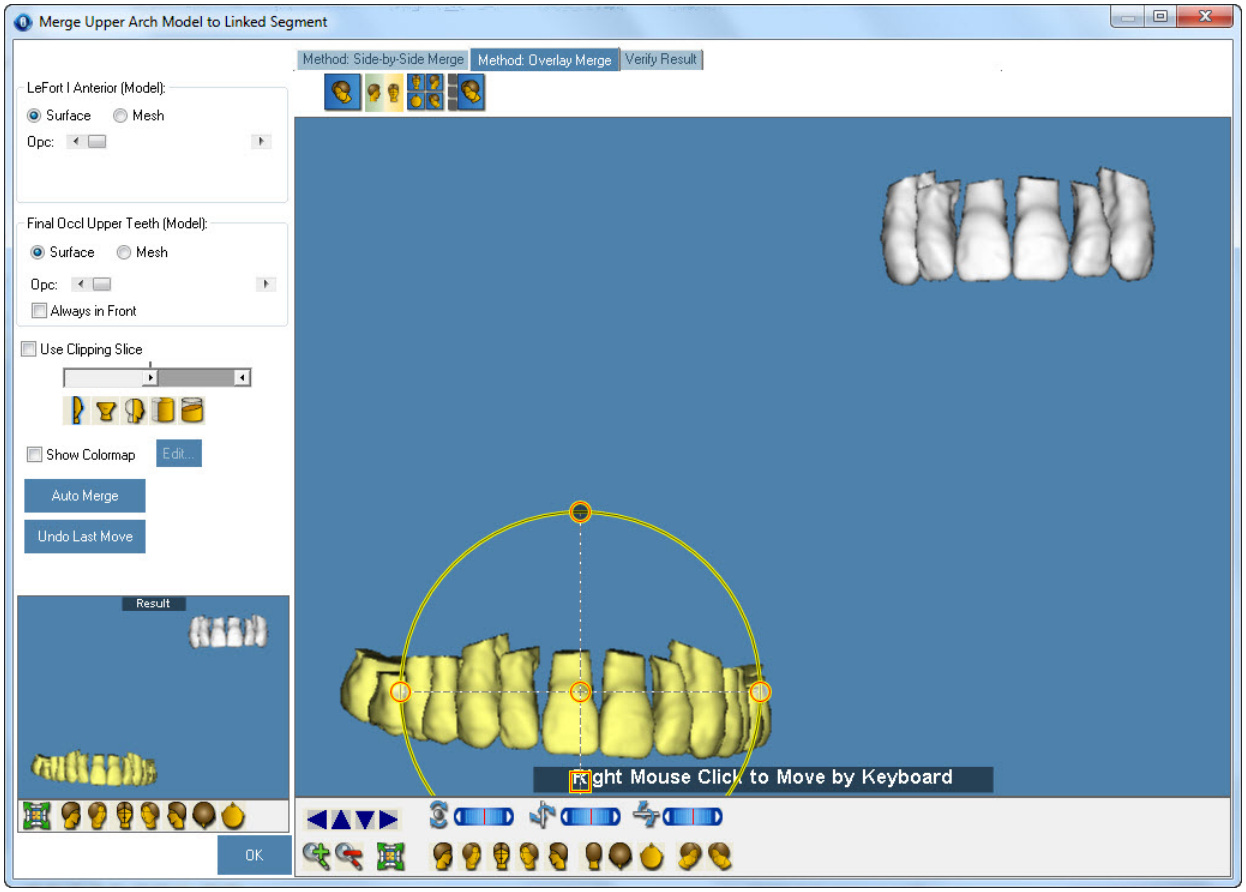
The following figure illustrates the **Method: Side-by-Side Merge** tab. The arch model is in the left pane, and the cut segment is on the right. For information on how to align and merge the arch model and cut segment on this tab, see “Using Side-by-Side Superimposition” on page 26-4.



The following options are specific to this tab:

Alignment Points	Number of points to use to align the arch model and the cut segment.
Reset	Resets all options in this dialog box to their default values.
Superimpose Now!	Merges the arch model and cut segment and displays the result in the Result window.
Result	Preview of the results.

The following figure illustrates the **Method: Overlay Merge** tab. For information on how to align the arch model and the cut segment on this tab using the wheel-shaped alignment tool, see “Using Overlay Superimposition” on page 26-6.

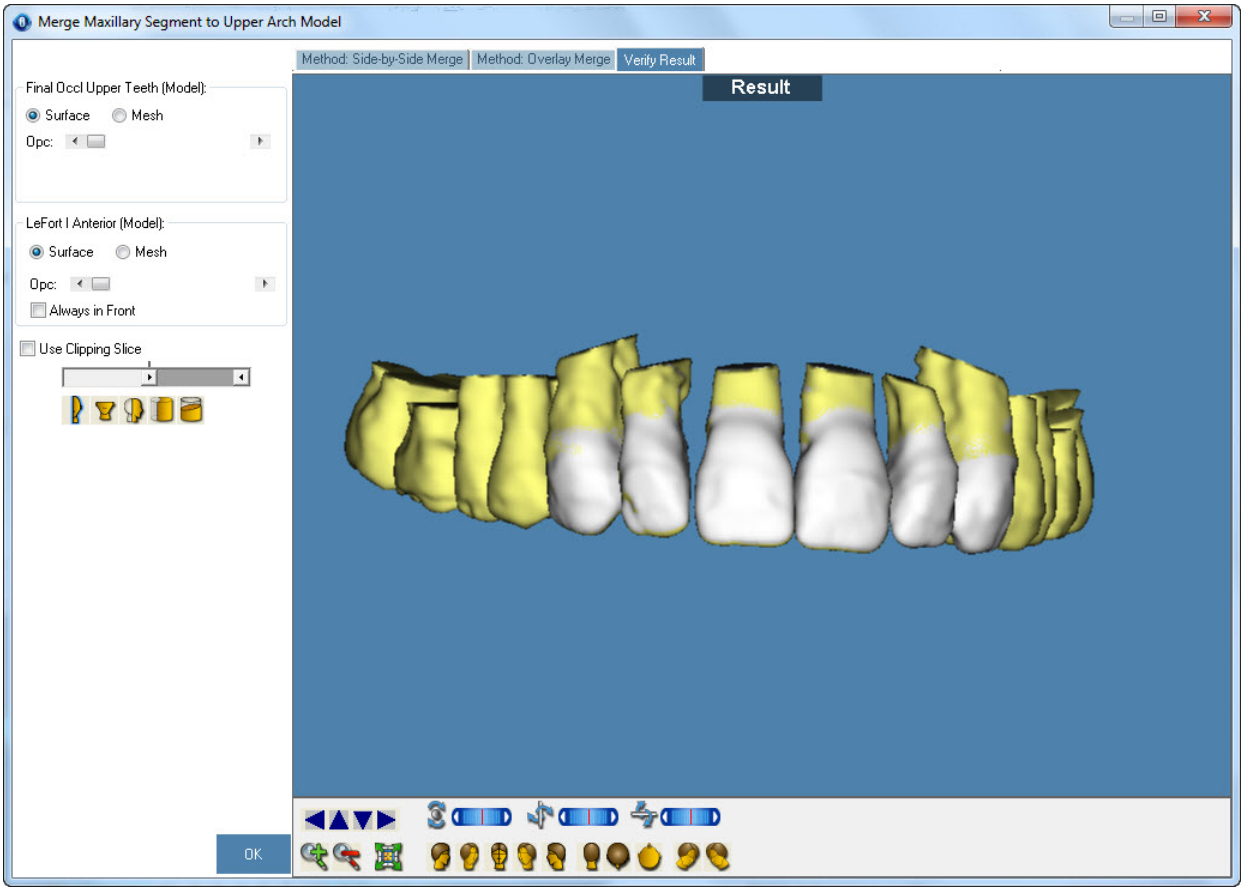


The following options are specific to this tab:

Use Clipping Slice	Defines the cross-section of the image to display. For more information, see “Using a Clipping Slice” on page 28-1.
Show Colormap	Uses a color map that maps colors to distances in the alignment. **Edit...:** Set options for the color map. For more information, see “Viewing a Vertical Collision Color Map” on page 30-101.
Auto Merge	Automatically merges the arch model and the cut segment after you have manually aligned them fairly closely. For more information, see “Adjusting the Superimposition” on page 30-13.
Undo Last Move	Undoes your last operation.
Result	Preview of the results.

For information on the layout buttons that appear above the image, see “Layouts and Slices” on page 19-32.

The following figure illustrates the **Verify Result** tab. For information on this tab, see “Analyzing and Verifying the Result” on page 26-14.



The following options are specific to this tab:

Use Clipping Slice	Defines the cross-section of the image to display. For more information, see “Using a Clipping Slice” on page 28-1.

Consolidating Orthognathic Moves

You can combine the history listings for several orthognathic moves into a single list item with a custom description.

To combine items from the history list:

1 Click **Treat Options...**.

2 Select **Consolidate Orthognathic Moves...** from the menu.

The Consolidate Orthognathic Moves dialog box opens and lists the surgical treatment planning operations you have performed thus far on the **Step 6: Treat** tab.

3 Select the history items to combine.

To select items in the history list, click the first item to combine, then click the last item. Any items between the two items you clicked are automatically selected.

Note: *The - Original (CO) Position - and +++ CR Position +++ list items cannot be consolidated with other items.*

4 Enter the description to use for the consolidated list item in the **Consolidation Description** field.

5 Click **Consolidate Now**.

To undo consolidation operations:

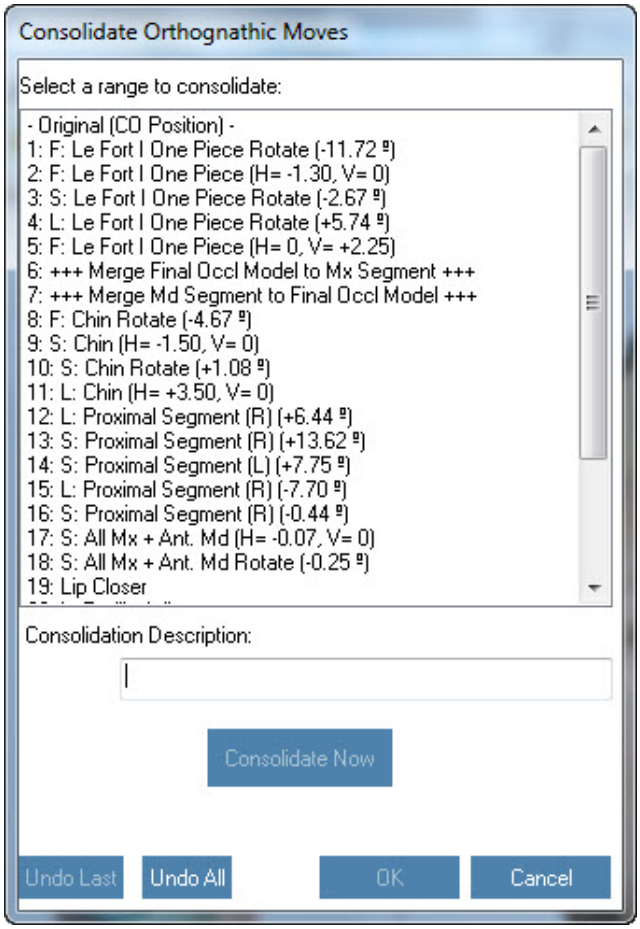
1 Click **Undo Last** to undo the most recent consolidation.

Or,

Click **Undo All** to undo all consolidations.

To save your changes and close this dialog box:

1 Click **OK**.



Select a range to consolidate	Items that you can consolidate.
Consolidation Description	Description to display in the history list on the **Step 6: Treat** tab for the consolidated list item.
Consolidate Now	Consolidates the selected items and applies the specified description to the new list item.
Undo Last	Undoes the last consolidation.
Undo All	Undoes all list item consolidations.

Doing a Mandibular Inferior Border Osteotomy

You can use this option to simulate a mandibular inferior border osteotomy performed (or re-performed) in the post-operative position.

This option is for display only. The soft tissue and measurements are not updated by this operation. In addition, it does not affect the history list on the **Step 6: Treat** tab (or it will not be affected up to the entry before the previous anterior mandibular osteotomy segments moved apart relatively)

You can specify whether to display the cut lines for the mandibular inferior border osteotomy in the **Step 6: Treat** tab by checking or unchecking the **Inferior Border (Cut)** segment on the Defining Show/Noshow and Opacities of Segments dialog box. For more information, see “Setting Segment Display Options” on page 30-90.

To simulate a mandibular inferior border osteotomy:

1 Click **Treat Options...**.

2 Select **Create/Edit Mandibular Inferior Border Osteotomy** from the menu.

The Mandibular Inferior Border Osteotomy dialog box opens. In all the panes, you can click and drag to rotate the surface.

3 In the Define Cut pane, draw a polygon to define the cut.

4 If the cut contour specified on the Define Cut pane goes across both side of the mandible but you only want one side, define a “restrict” polygon in the Restrict Cut pane to enclose the portion to keep.

The “restrict” polygon should not intersect the “cut” contour.

5 Verify the planned cut in the Cut Preview pane.

6 Click **Cut Now**.

The result appears in the Result pane.

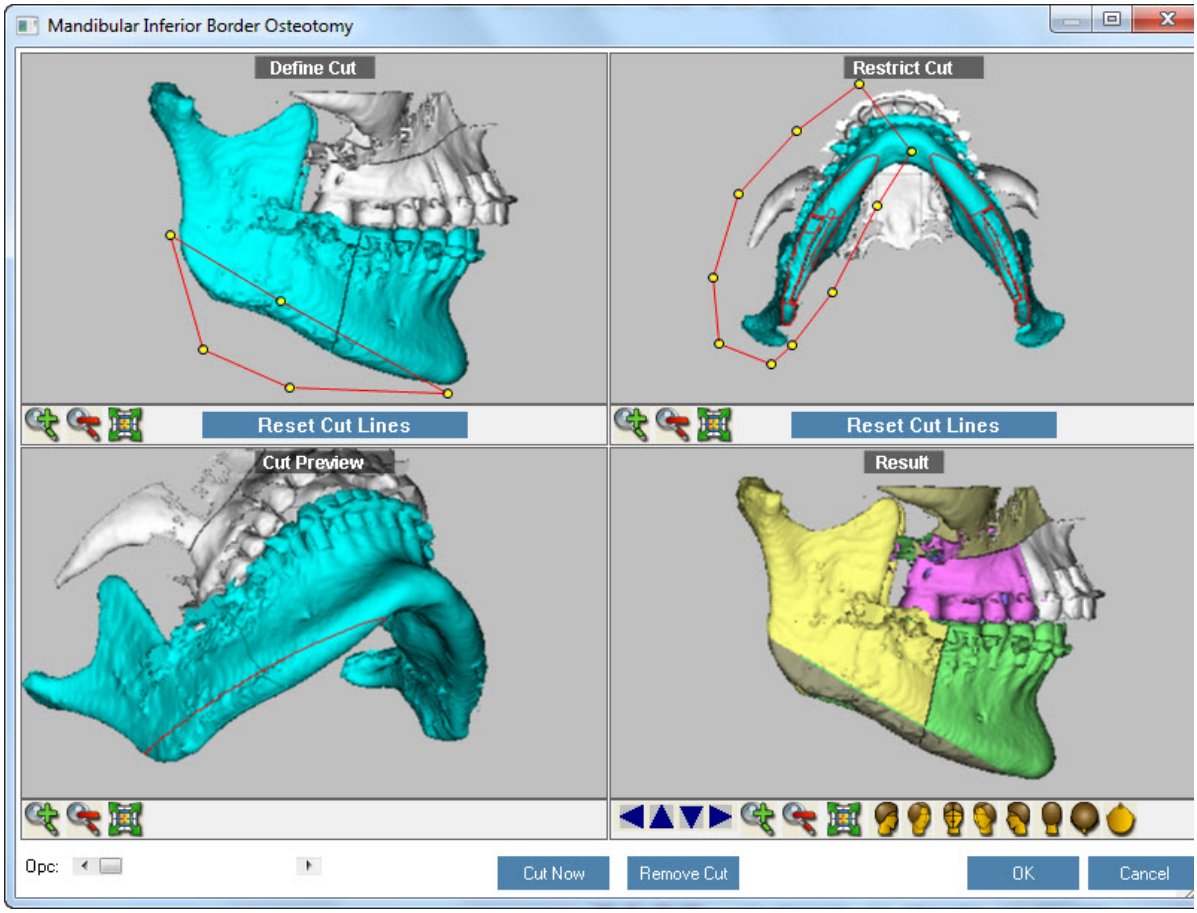
Note: *The images below illustrate how to use the user interface to plan the cuts. These images are for illustration purposes only and do not necessarily show optimal cut placement.*

To undo the mandibular inferior border osteotomy cut:

1 Click **Remove Cut**.

To save your work and return to the **Step 6: Treat** tab:

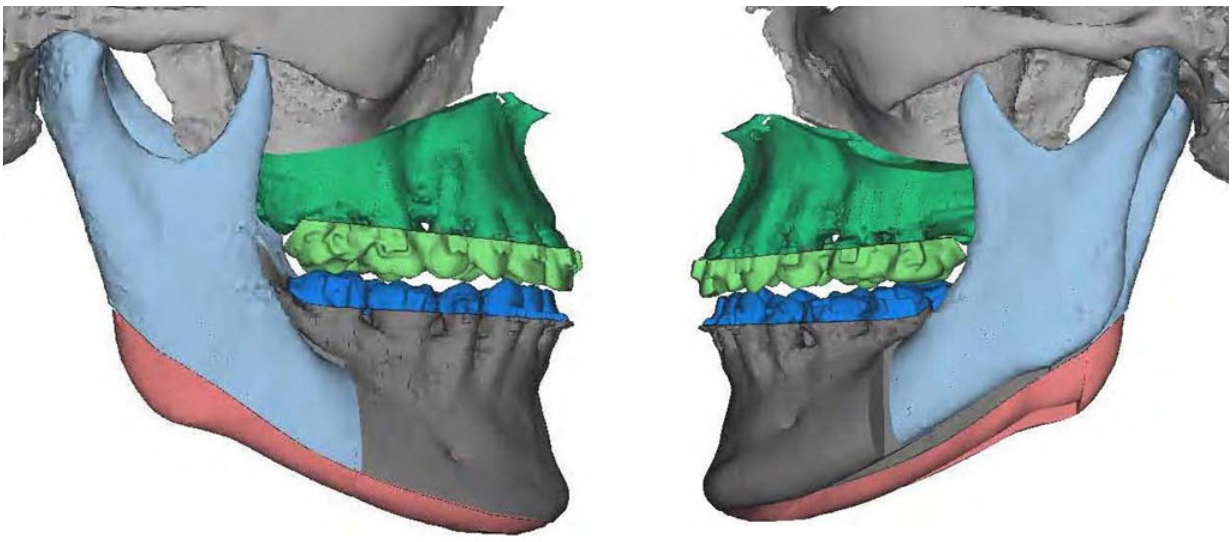
1 Click **OK**.



Define Cut	Draw a polygon to define the cut.
Restrict Cut	If the cut contour specified on the Define Cut pane goes across both side of the mandible but you only want one side, define a “restrict” polygon to enclose the portion to keep.
Cut Preview	Previews the cut so that you can verify that it is correctly specified.
Result	Result of the cut. Only appears after you click **Cut Now** (see below).
Opc	Sets the opacity of the images in the four panes.
Cut Now	Makes the cuts specified in the upper two panes.
Remove Cut	Undoes the cut.

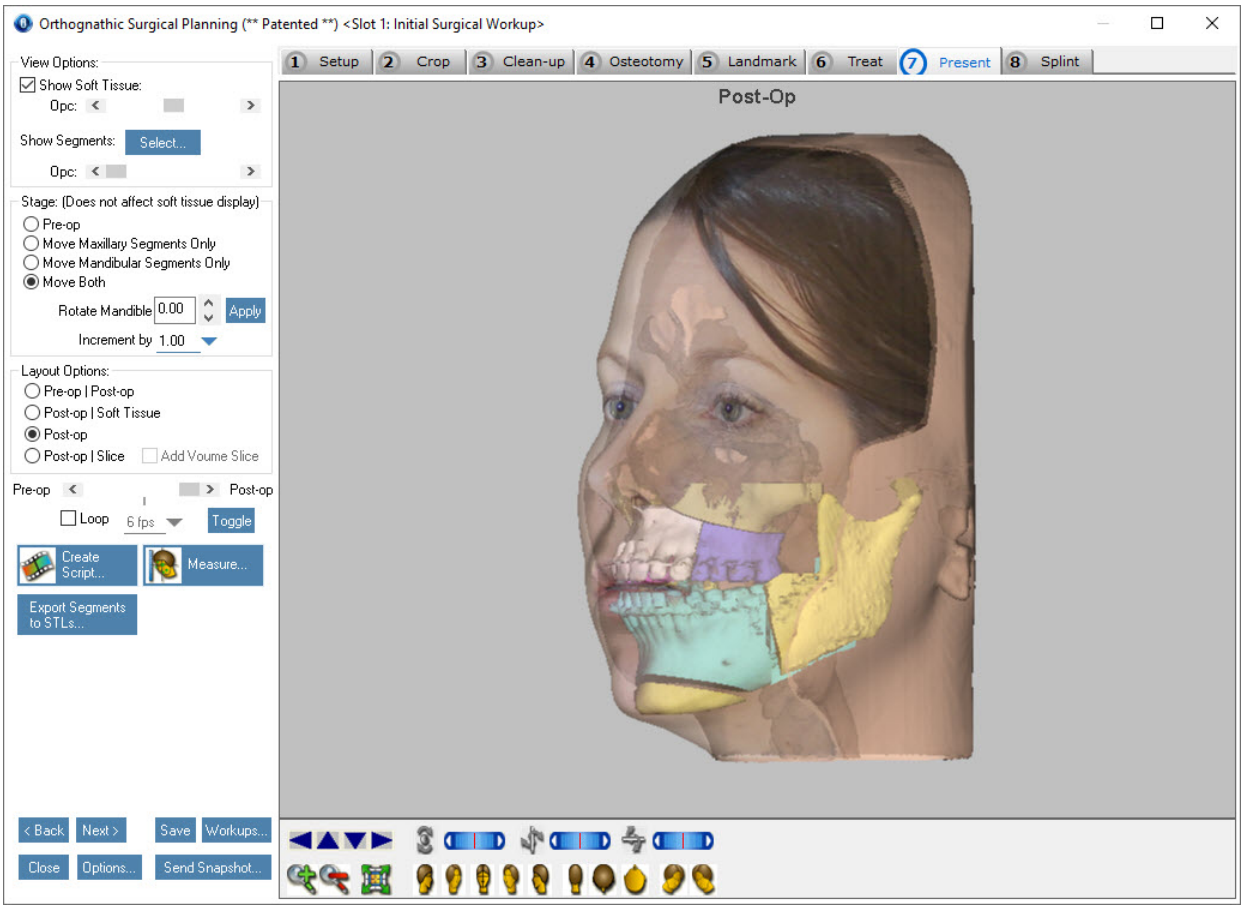
For information on the predefined view buttons and magnification controls that appear below the images, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

The following figures illustrate a mandibular inferior border osteotomy with a bilateral sagittal split osteotomy (BSSO) on the same patient:



Step 7: Present

In this step, you can review and present the surgical treatment plan. It provides various view options so that you can compare the pre-operative state with the post-operative result. You can also create a movie from your treatment plan.



The following options are specific to this tab. For information on the options that appear on all tabs in this window, see “Starting Orthognathic Surgical Planning” on page 30-1.

Show Soft Tissue	Displays the soft tissue. **Opc:** Sets the opacity of the soft tissue.
Show Segments	Osteotomy segments to display. **Select:** Identify the segments to display and set display options for them. For more information, see “Setting Segment Display Options” on page 30-90. **Opc:** Sets the opacity of the segments.

Stage	Stage of treatment to display. This selection does not affect the appearance of the soft tissue. **Pre-op:** Displays the pre-operative stage of treatment. **Move Maxillary Segments Only:** Displays the intermediate stage of treatment where the maxillary segments will be moved first. **Move Mandibular Segments Only:** Displays the intermediate stage of treatment where the mandibular segments will be moved first. **Move Both:** Displays the final stage of treatment where the maxillary and mandibular segments will be moved. **Rotate Mandible:** Number of degrees to rotate the patient's mandible. **Apply:** Applies the specified rotation. **Increment by:** Number of degrees to change the mandible's rotation when you click ^ or v .
Layout Options	Layout to use. For more information, see "Presenting the Surgical Treatment Plan" below. **Pre-op|Post-op:** Displays the pre-operative and post-operative images side by side. **Post-op|Soft Tissue:** Displays the post-operative image of the segments beside a post-operative image of the soft tissue. **Post-op:** Displays the post-operative image only. **Post-op|Slice:** Displays the post-operative image of the segments beside a post-operative slice image. • **Add Volume Slice:** Adds an image of the volume to the slice view.
Pre-op, Post-op	Sets the locations of segments in the post-operative image between the pre-operative and post-operative positions. The patient's soft tissue moves as appropriate to reflect the movement of the osteotomy segments. For more information, see "Presenting the Surgical Treatment Plan" below.
Loop	Displays a looping animation of the pre-operative to post-operative movement of the osteotomy segments. For more information, see "Presenting the Surgical Treatment Plan" below. **drop-down list:** Number of frames per second for the animation.
Toggle	Toggles the segments in the post-op images between the pre-operative and post-operative positions. For more information, see "Presenting the Surgical Treatment Plan" below.
	Opens the 3D Movie Script Editor. For more information, see Chapter 23, Dolphin 3D Movies.
	Opens the Digitize/Measurement palette so that you can take measurements on the post-operative image. For more information. see "Digitize and Measurements (Medical Device)" and "Measuring Cut Gap Distances" on page 30-123.
Export Segments to STLs...	Exports the defined osteotomy segment surfaces as STLs in their post-operative positions. For more information. see "Exporting Segment STLs" on page 30-136.

Options...	Specify the window background color, the diameter of the cutting saw, and to display nerve canals, and default options for creating splints. For more information, see “Setting Options” on page 30-4.
Send Snapshot...	Opens a menu with the following options: **Close This Menu:** Closes the menu. **Save To Dolphin Layout/Database:** Saves the image to a slot in an image layout and stores it in your database. For more information, see “Saving, Exporting, Uploading, and Printing” on page 19-117. **Send To Report:** Uses this image in a Dolphin 3D report. For more information, see Chapter 29, Reports. **Copy To Clipboard:** Copies the image to the clipboard. Then, you can paste it into another application. For more information, see “Copying an Image to the Clipboard” on page 19-119. **Print:** Prints the image. For more information, see “Printing an Image” on page 19-123. **Export To File:** Exports the image to a file. For more information, see “Exporting an Image” on page 19-119.

For information on the rotation sliders, arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Presenting the Surgical Treatment Plan

To present the surgical treatment plan:

1 Set display options for the presentation image in the View Options group box.

2 Select the stage of treatment to use for the presentation in the Stage group box.

3 Optionally, set options for rotating the mandible.

To enter the number of degrees to rotate the mandible:

a Enter the number of degrees in the **Rotate Mandible** field.

b Click **Apply**.

To rotate the mandible incrementally:

a Select an increment from the **Increment by** drop-down list.

b Click ^ or v to rotate the mandible.

4 Select the image layout to use for the presentation in the Layout Options group box.

5 If you selected **Post-op|Slice** in the Layout Options group box, select the slice you want to display as described below.

6 Move the slider from **Pre-op** to **Post-op** to transition between the pre-operative and post-operative images.

Or,

Check the **Loop** box and select a frames-per-second value in the drop-down list to display a looping animation of the transition between the pre-operative and post-operative images.

Or,

Click **Toggle** to toggle between the pre-operative and post-operative images.

To select the slice you want to display for the **Post-op|Slice** layout:

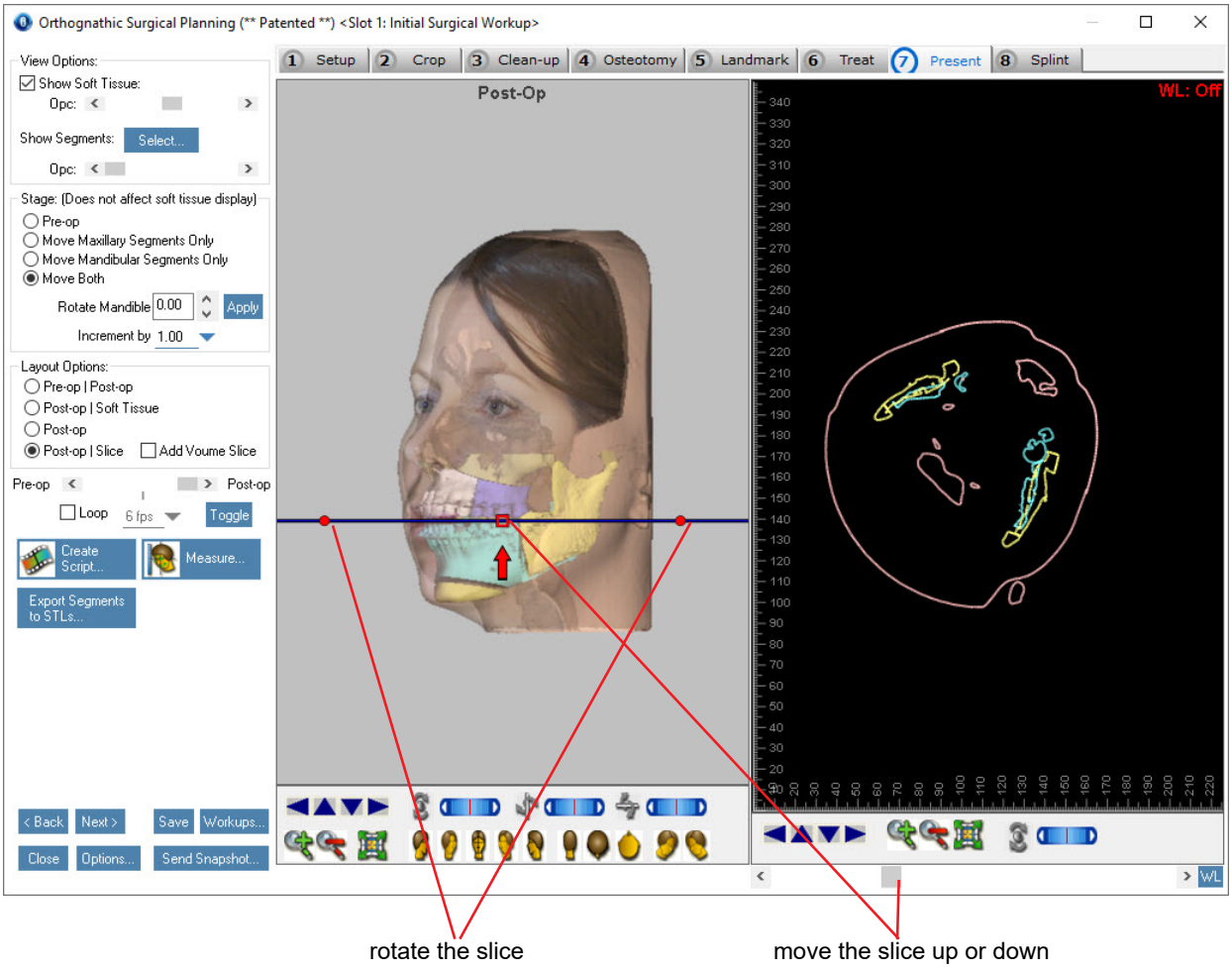
1 Move the slice up or down by clicking and dragging the red square in the left pane.

Or,

Move the slice up or down by moving the slider below the right pane.

2 Rotate the slice by clicking and dragging the red dots in the left pane.

With this option, you can slice through the located segments in order to measure the bone proximal interferences. For information on taking measurements, see “Viewing and Taking Measurements” on page 22-8 and “Measuring Distance to the Midline” on page 22-18.



Exporting Segments

Once you have reached **Step 7: Present**, you can export the defined osteotomy segment surfaces as STLs in their post-operative positions.

To export the segments:

1 Click **Export Segments to STLs...**.

2 Select **Export segments to individual files, inside one ZIP file** to export the surfaces into separate files packaged into a .ZIP file.

Or,

Select **Export segments to a single composite STL file** to export all the surfaces into a single .STL file.

Exporting multiple surfaces into separate files can be useful if you intend to import one or more of the exported surfaces into another program, such as for 3D printing.

3 If you are exporting the surfaces into separate files, enter the folder in which to save the files in the **Export to ZIP File** field.

Or,

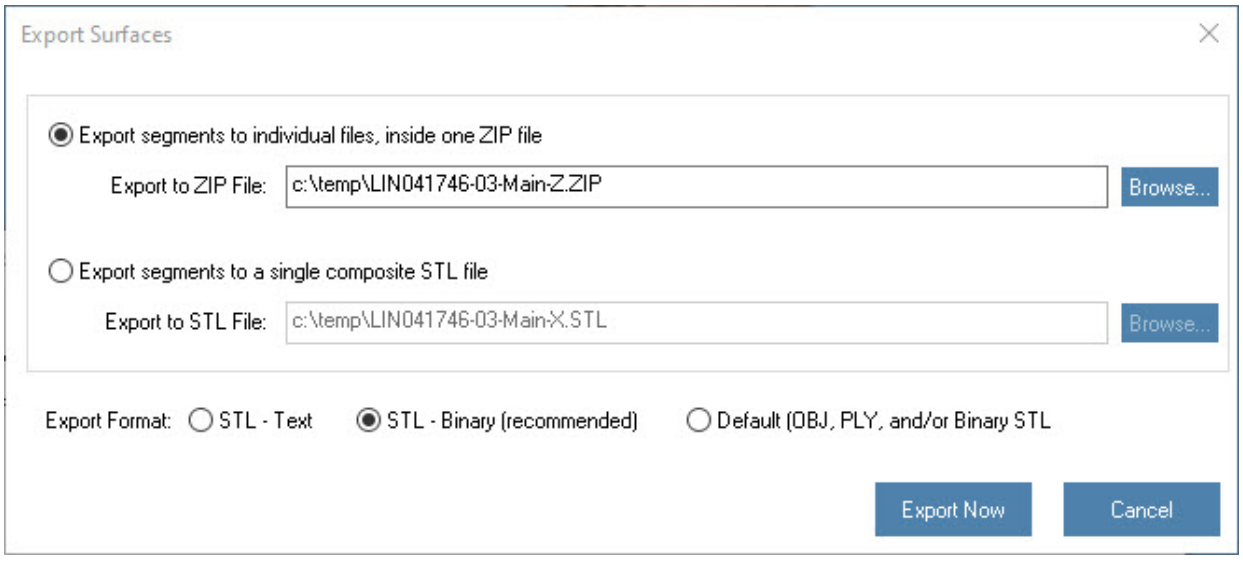
If you are exporting all the surfaces into the same file, enter the folder and file in which to store the surfaces in the **Export to STL File** field.

Or,

Click **Browse...** to select the folder and file in which to store the surfaces.

4 Select the file format to use to export the surfaces.

5 Click **Export Now**.



Export segments to individual files, inside one ZIP file	Exports the surfaces into separate files packaged in a .ZIP file. This can be useful if you intend to import one or more of the exported surfaces into another program, such as for 3D printing. **Export to ZIP File:** Folder and file in which to save the .ZIP file containing the exported files. **Browse...:** Browse to the appropriate folder and file.
Export segments to a single composite STL file	Exports all the surfaces into a single .STL file. **Export to File:** Folder and file in which to save all the exported surfaces. **Browse...:** Browse to the appropriate folder and file.
Exported STL Format	Exported file format. Possible values are **STL - Text**, **STL - Binary (recommended)**, and **Default (OBJ, PLY, and/or Binary STL)**. Select **Default (OBJ, PLY, and/or Binary STL)** to export the surfaces in their original file formats.
Export Now	Exports surfaces in the selected format to the specified folder and file.

Measuring Cut Gap Distances

You can easily measure the gaps or overlaps between segments that will result from your planned surgical treatment.

To measure the gaps or overlaps between segments:

1 Uncheck the **Show Soft Tissue** box in the View Options group box.

1 Select **Post-op** in the Layout Options group box.

2 Click

.

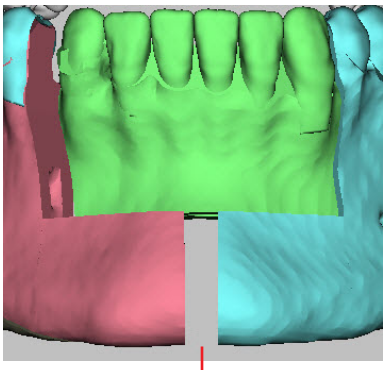
The Digitize/Measurement palette opens.

3 Select the **2D Cut Gap Distance** tab.

For information on the other tabs, see Chapter 22, Digitize and Measurements (Medical Device).

4 Rotate the segments so that the gap or overlap between two segments is visible but the cut surface planes are not.

The following example illustrates how it should look.



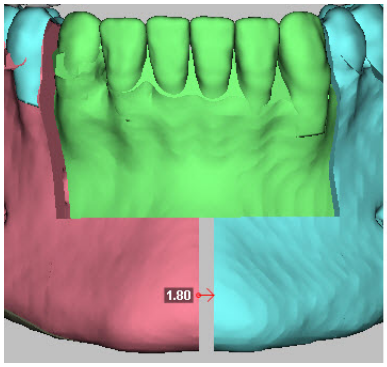
correct orientation to measure this gap

5 Click the edges of the two segments for which to measure the gap or overlap.

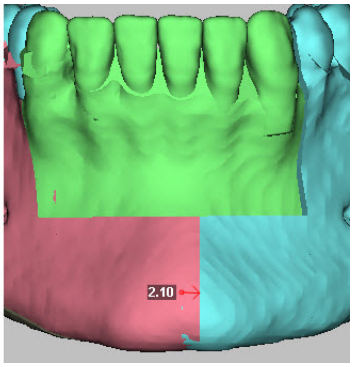
You don't need to click precisely at the segments' cut surfaces. Dolphin 3D automatically places points at the edges. Then, it calculates the distance between the two points to give you the width of the gap. The edge gap measurement appears on the image and in the list on the **2D Cut Gap Distance** tab of the Digitize/Measurement palette. The following examples illustrate measurement of a gap and an overlap.

Note: *When measuring an overlap, adjusting the opacity of the segments (using the **Opc** slider) may make it easier to see the overlap.*

Gap Measurement



Overlap Measurement



To remove a gap measurement:

1 Click the measurement to remove in the list on the **2D Cut Gap Distance** tab of the Digitize/Measurement palette.

2 Click **Remove Highlighted Cut Gap**.

To remove all gap measurements:

1 Click **Remove All Cut Gaps**.

2 Click **Yes** to confirm the removal.

Step 8: Splint

In this step, you can create surgical splints for:

- the pre-op positions for both maxilla and mandible
- the post-op maxillary segments positions with pre-op mandibulary position (intermediate splint for a double jaw surgery)
- the post-op mandibulary segments positions with pre-op maxillary position (intermediate splint for a double jaw surgery)
- the post-op positions for both maxillary and mandibulary positions.

For each stage, you can explicitly create a gap between the upper and lower teeth, or leave them at their planned positions.

Once you have specified the splint's dimensions, you can preview what it will look like both with and without the patient's teeth. Then, you can create industry-standard STL files[1] to be printed by the regulatory-cleared printing process of your choice.

Note: *Carefully inspect the splint preview in relation to the patient's teeth to find any discrepancies before creating industry-standard STL files[1] to be printed by the regulatory-cleared printing process of your choice. As a best practice, you should also test the fit of the fabricated splints, either on the patient or the physical models, prior to surgery.*

There are two methods that you can use to create splints:

- **Advanced:** Recommended method, which enables creation of splints with variable height thicknesses along the arches, rounded edges (including the back ends), and small holes along the arches. For more information, see "Creating Splints With the Advanced Method" below.
- **Simple:** Older method of creating splints, which you can use if you have splints created before Dolphin Imaging version 11.9. For more information, see "Creating Splints With the Simple Method" on page 30-130.

Creating Splints With the Advanced Method

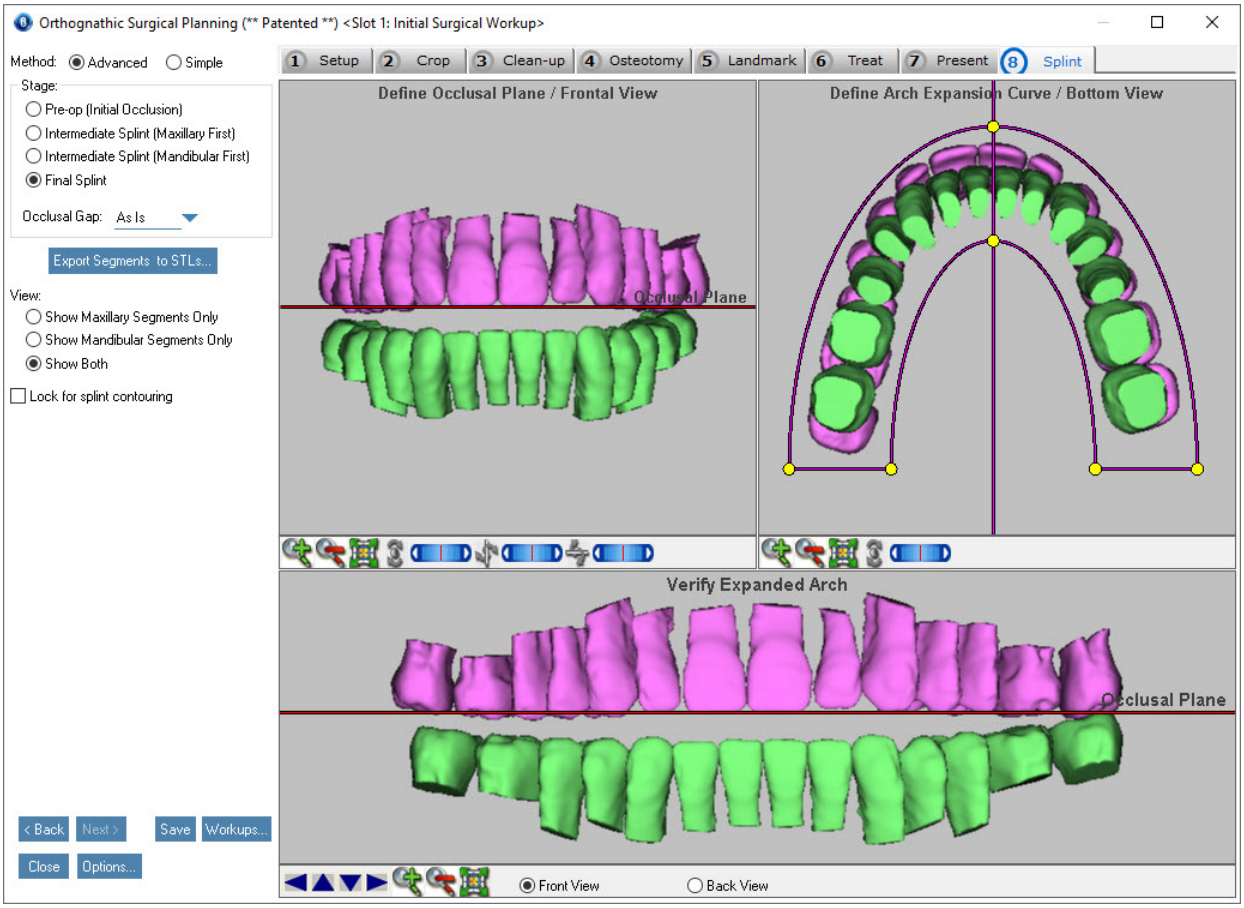
The advanced splint creation method is the recommended method for creating splints. It enables you to create splints with variable height thicknesses along the arches, rounded edges (including the back ends), and small holes along the arches.

To select the advanced splint creation method if it isn't already selected:

1 Select **Advanced** as the splint creation method.

Options for the advanced method appear.

1. Additional fees may apply.



The following options are specific to this tab when the **Advanced** splint creation method is selected. For information on the options that appear on all tabs in this window, see “Starting Orthognathic Surgical Planning” on page 30-1. For information on the options that appear when the **Simple** splint creation method is selected, see “Creating Splints With the Simple Method” on page 30-130.

Method	Select the splint creation method you want to use: **Advanced:** Recommended method, which enables creation of splints with variable height thicknesses along the arches, rounded edges (including the back ends), and small holes along the arches. **Simple:** Older method of creating splints, which you can use if you have splints created before Dolphin Imaging version 11.9. For more information, see “Creating Splints With the Simple Method” on page 30-130.

Stage	Stage of treatment for which to create splints. **Pre-op (Initial Occlusion):** Create splints for the pre-operative stage of treatment. **Intermediate Splint (Maxillary First):** Create splints for the intermediate stage of treatment where the maxillary segments will be moved first. **Intermediate Splint (Mandibular First):** Create splints for the intermediate stage of treatment where the mandibular segments will be moved first. **Final Splint:** Create splints for the final stage of treatment where the maxillary and mandibular segments will be moved.
Occlusal Gap	Occlusal gap in millimeters. If you use this option, the gap is created by rotating the mandible or mandibular segments about the hinge axis.
Export Segments to STLs...	Exports the segments as individual industry-standard STL files[a] that can be printed by the regulatory-cleared printing process of your choice. For more information. see “Exporting Segment STLs” on page 30-136.
View	Segments to display: **Show Maxillary Segments Only:** Displays only the maxillary segments. **Show Mandibular Segments Only:** Displays only the mandibular segments. **Show Both:** Displays both the maxillary and mandibular segments.
Lock for splint contouring	Changes the image layout and adds options that you use to define the splint's contour and specify holes to be added to the splint (see below).
Options...	Specify the window background color, the diameter of the cutting saw, and to display nerve canals, and default options for creating splints. For more information, see “Setting Options” on page 30-4.
Front View	Displays a frontal view of the expanded arch.
Back View	Displays a back view of the expanded arch.

a. Additional fees may apply.

For information on the rotation sliders and magnification controls that appear below the images, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

To specify the dimensions of the splint:

1 Select the stage of treatment [**Pre-op Initial Occlusion)**, **Intermediate Splint (Maxillary First)**, **Intermediate Splint (Mandibular First)**, or **Final Splint**] for which to create this splint.

2 In the Define Occlusal Plane/Frontal View pane, identify the occlusal plane by rotating the arches to achieve the best frontal view and clicking and dragging the red horizontal line.

3 In the Define Arch Expansion Curve/Bottom View pane, identify the midline by rotating the arches and clicking and dragging the red vertical line.

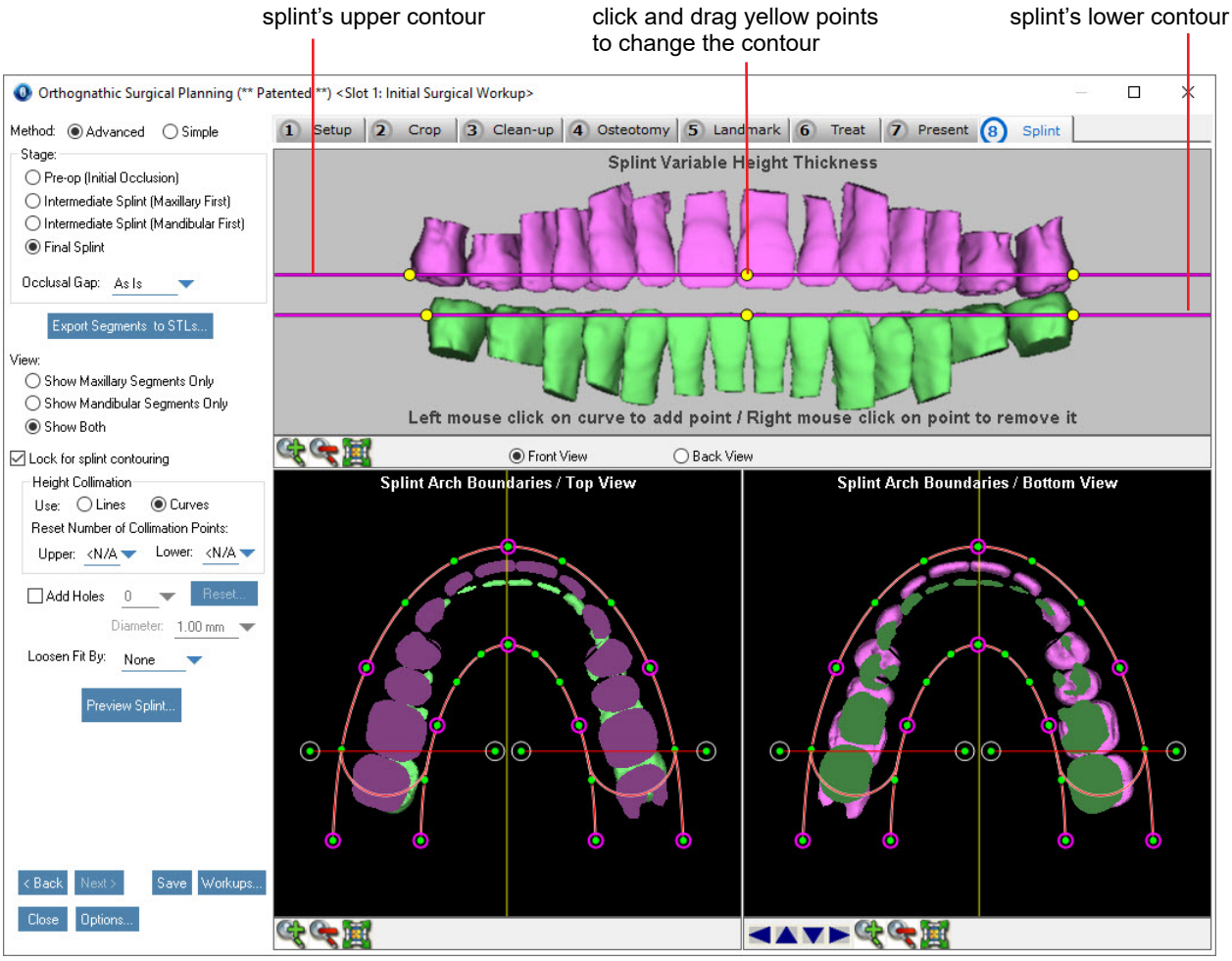
The midline is used to define the default contouring of the arch curves.

4 In the Define Arch Expansion Curve/Bottom View pane, click and drag the yellow points to contour the outer and inner curves to best mimic the shape of the arch shape.

These curves are used to stretch the arches into the panoramic-like view shown in the Verify Expanded Arch pane, which is used to make defining the variable height thicknesses of the splint easier.

5 Check the **Lock for splint contouring** box.

Additional options appear below the **Lock for splint contouring** check box, and the image layout changes so that you can define the splint's contour.



Height Collimation	Sets options for contouring the splint. **Lines:** Use lines to contour the splint. **Curves:** Use curves to contour the splint. **Reset Number of Collimation Points:** Sets the number of yellow points to use for contouring the height of the splint in the Splint Variable Height Thickness pane. • **Upper:** Number of yellow points for defining the upper contour. • **Lower:** Number of yellow points for defining the upper contour.
Add Holes	Adds holes to the splint. **drop-down list:** Number of holes. **Diameter:** Diameter of the holes. **Reset...:** Moves the holes so that they are evenly distributed along the arches.

Preview Splint	Previews the splint at the selected resolution: **Higher Resolution**, **Medium Resolution (Recommended)**, or **Lower Resolution**. For more information, see “Previewing the Splint” on page 30-133.

To contour the height of the splint:

1 Select **Lines** in the Height Collimation group box to define the splint’s contour using lines.

Or,

Select **Curves** to define the splint’s contour using curves.

2 Define the splint’s contour by clicking and dragging the yellow points in the Splint Variable Height Thickness pane.

Click and drag yellow points on the upper line/curve to define the splint’s upper contour. Use the yellow points on the lower line/curve to define the splint’s lower contour.

To add yellow points in the Splint Variable Height Thickness pane:

1 Click the location where you want to add a new yellow point on one of the lines/curves. Then, click **Yes**.

Or,

Select the number of yellow points you want on the upper line/curve from the **Upper** drop-down list.

Or,

Select the number of yellow points you want on the lower line/curve from the **Lower** drop-down list.

To remove yellow points in the Splint Variable Height Thickness pane:

1 Right-click a point to remove it.

You must have at least two points on each line/curve.

To contour the arch of the splint:

1 In the Splint Arch Boundaries/Top View and Splint Arch Boundaries/Bottom View panes, click and drag the dots to define the contour of the splint.

Move the dots surrounded by circles first. Then, move the other dots to fine-tune the splint's contour.

To add holes:

1 Check the **Add Holes** box.

2 Select the number of holes from the drop-down list.

Red dots representing the holes appear in the Splint Arch Boundaries/Top View and Splint Arch Boundaries/Bottom View panes.

3 Select the diameter of the holes from the **Diameter** drop-down list.

The red dots resize to represent the diameter you selected.

4 Click and drag the red dots to specify the locations of the holes.

When you move a red dot to the proper location, it changes to yellow.

To evenly distribute the holes along the arches:

1 Click **Reset...**.

2 Click **Yes** on the confirmation dialog box that appears.

The dots change to red and move so that they are evenly distributed.

To save your work:

1 Click **Save**.

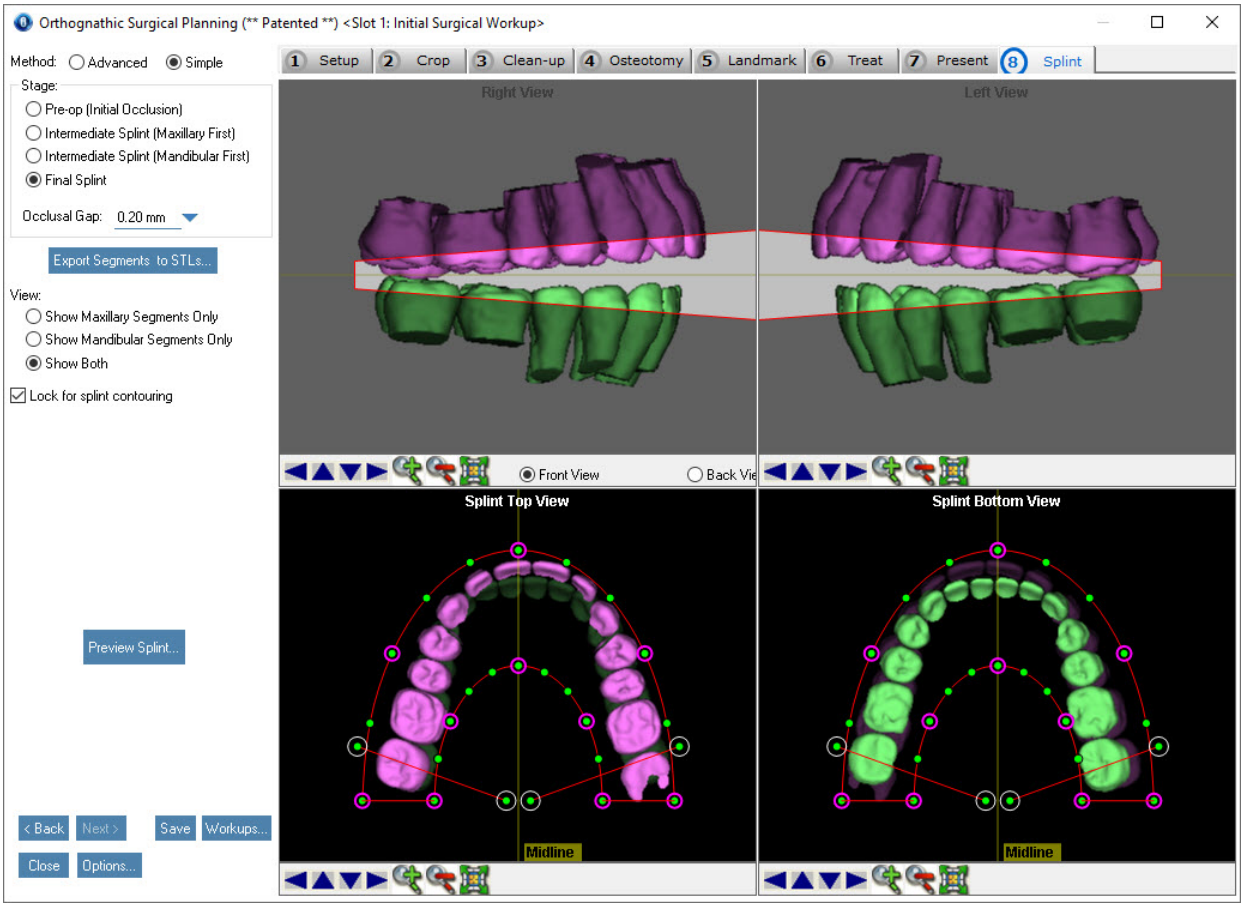
Creating Splints With the Simple Method

Splints created before Dolphin Imaging version 11.9 were created using the simple method. The simple method is being maintained to support splints created before the advanced method was introduced.

To select the simple splint creation method:

1 Select **Simple** as the splint creation method.

Options for the simple method appear.



The following options are specific to this tab when the **Simple** splint creation method is selected. For information on the options that appear on all tabs in this window, see “Starting Orthognathic Surgical Planning” on page 30-1. For information on the options that appear when the **Advanced** splint creation method is selected, see “Creating Splints With the Advanced Method” on page 30-125.

Method	Select the splint creation method you want to use: **Advanced:** Recommended method, which enables creation of splints with variable height thicknesses along the arches, rounded edges (including the back ends), and small holes along the arches. For more information, see “Creating Splints With the Advanced Method” on page 30-125. **Simple:** Older method of creating splints, which you can use if you have splints created before Dolphin Imaging version 11.9.
Stage	Stage of treatment for which to create splints. **Pre-op:** Create splints for the pre-operative stage of treatment. **Move Maxillary Segments Only:** Create splints for the intermediate stage of treatment where the maxillary segments will be moved first. **Move Mandibular Segments Only:** Create splints for the intermediate stage of treatment where the mandibular segments will be moved first. **Move Both (Final):** Create splints for the final stage of treatment where the maxillary and mandibular segments will be moved.
Occlusal Gap	Occlusal gap in millimeters. If you use this option, the gap is created by rotating the mandible or mandibular segments about the hinge axis.
Export Segments to STLs...	Exports the segments as individual industry-standard STL files[a] that can be printed by the regulatory-cleared printing process of your choice. For more information, see “Exporting Segment STLs” on page 30-136.
View	Segments to display: **Show Maxillary Segments Only:** Displays only the maxillary segments. **Show Mandibular Segments Only:** Displays only the mandibular segments. **Show Both:** Displays both the maxillary and mandibular segments.
Lock for splint contouring	Locks the movement controls in the Right View and Left View panes and enables them in the Splint Top View and Splint Bottom View planes. This enables you to specify the contour of the splint.
Preview Splint	Opens a menu of resolution options (**Higher Resolution**, **Medium Resolution**, **Lower Resolution**) for previewing the splint. This option only appears when the **Lock for Splint contouring** box (see above) is checked. When you select a resolution option, the Preview Surgical Guide window opens and displays a preview of the splint. For more information, see “Previewing the Splint” on page 30-133.
Options...	Specify the window background color, the diameter of the cutting saw, and to display nerve canals, and default options for creating splints. For more information, see “Setting Options” on page 30-4.

a. Additional fees may apply.

For information on the rotation sliders and magnification controls that appear below the images, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

To specify the dimensions of the splint:

1 Select the stage of treatment [**Pre-op**, **Move Maxillary Segments Only**, **Move Mandibular Segments Only**, or **Move Both (Final)**] for which to fabricate this splint.

2 In the Right View and Left View panes, click and drag the green dots so that the highlighted area is the shape of the splint and the gray line is at the occlusal plane.

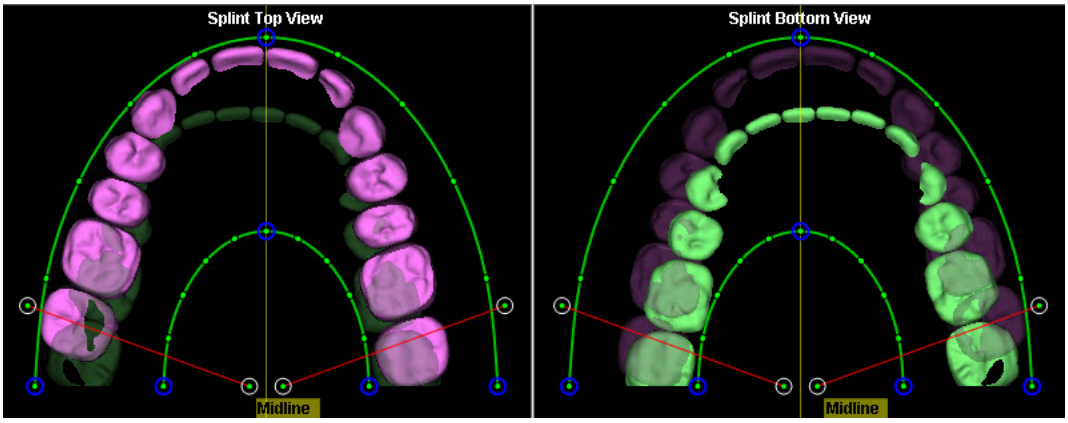
When you move the green dots, the shape of the highlighted area changes shape and image of the teeth rotates.

3 In the Splint Top View or Splint Bottom View pane, click and drag the red line to the midline.

The midline is used to define the default contouring arch curves.

4 Check the **Lock for splint contouring** box.

With this option selected, you can no longer move the segments. Dots appear in the Splint Top View and Splint Bottom View panes so that you can change the splint's contour.



5 In the Splint Top View and Splint Bottom View panes, click and drag the dots to define the contour of the splint.

Move the larger dots first, because they move the nearby smaller dots as a unit. Then, move the smaller dots to fine-tune the splint's contour.

To save your work:

1 Click **Save**.

Previewing the Splint

Once you've specified the splint's dimensions, you can preview what it will look like both with and without the patient's teeth. After you have carefully inspected the splint preview, you can create industry-standard STL files[1] to be printed by the regulatory-cleared printing process of your choice (see "Creating an STL File for Fabrication" on page 30-135).

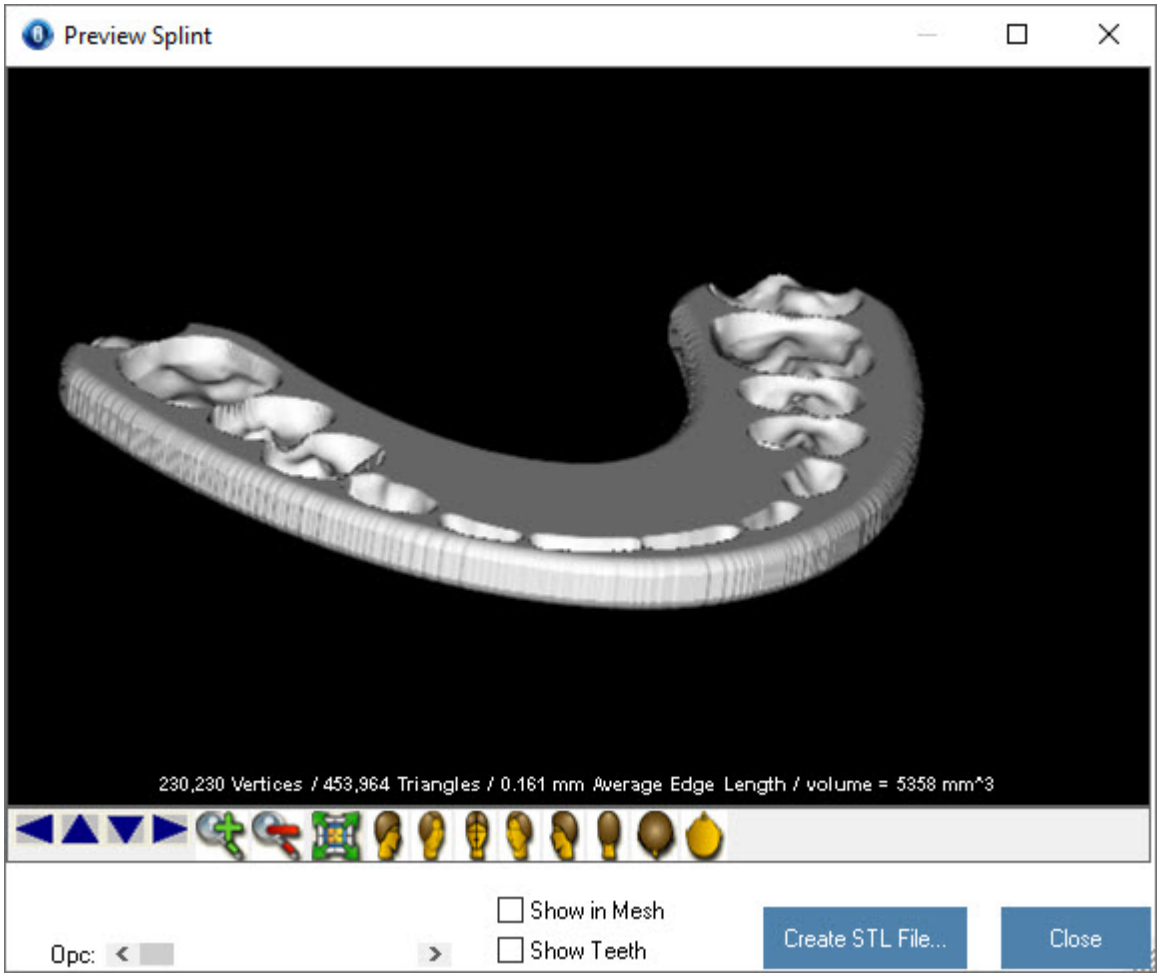
To preview what the splint will look like:

1 Click **Preview Splint...**.

2 Select the resolution to use for the preview.

The medium resolution is recommended, because it provides the best combination of image quality and rendering speed for most purposes.

The Preview Splint dialog box opens and displays a preview of the splint.



1. Additional fees may apply.

Opc	Sets the opacity of the splint preview image.
Show in Mesh	Displays a mesh representation of the splint.
Show Teeth	Displays the teeth in addition to the splint.
Engrave...	Opens the Mesh Engraving dialog box so that you can add an engraved label to the splint. For more information, see “Engraving Text Labels on a Splint” on page 30-134.
Create STL File...	Creates an industry-standard STL file[a] to be printed by the regulatory-cleared printing process of your choice. For more information, see “Creating an STL File for Fabrication” on page 30-135.

a. Additional fees may apply.

For information on the arrow buttons, predefined view buttons, and magnification controls that appear below the image, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Engraving Text Labels on a Splint

To add engraved labels to the splint:

1 On the Preview Splint dialog box, click **Engrave...**.

The Mesh Engraving dialog box opens over the Preview Splint window, and a representation of the engraved label is added to the preview image.

2 Enter the text of the label you want to engrave in the **Text** field.

3 Optionally, select the font size and engraving depth.

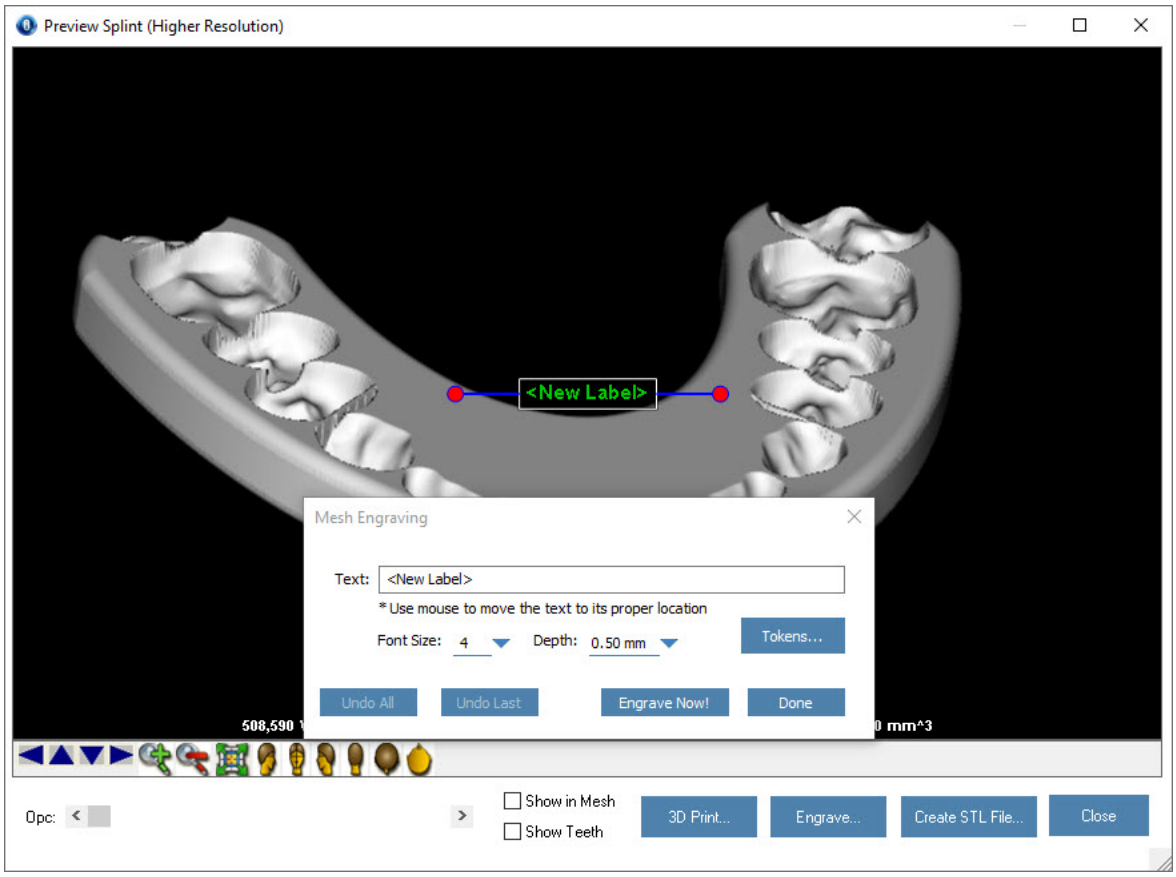
4 Click and drag the label to the location where you want it engraved.

Click and drag the red dots to rotate the text label.

5 Click **Engrave Now!** to engrave the label on the splint.

The label is added to the splint, and another label placeholder appears so that you can add another engraved label.

6 Click **Done** when you finish adding engraved labels to close the Mesh Engraving dialog box.



Text	Text to engrave on the splint.
Font Size	Font size for the text to be engraved.
Depth	Depth of the engraving.
Undo All	Removes all the engraved labels you've added to this splint.
Undo Last	Removes the last engraved label you added to this splint.
Engrave Now!	Adds the specified engraved label to this splint.

Creating an STL File for Fabrication

After previewing and verifying the splint design, you can create an industry-standard STL file[1] to be printed by the regulatory-cleared printing process of your choice.

To export an industry-standard STL files[1] to be printed by the regulatory-cleared printing process of your choice:

1 On the Preview Splint dialog box, click **Create STL File...**.

2 Select the type of STL file to export from the menu.

1. Additional fees may apply.

Exporting a binary STL file is recommended.

3 Check **I Agree**, then click **OK**.

4 Specify the file in which to save the STL file and click **Save**.

As a best practice, you should test the fit of the fabricated splints, either on the patient or the physical models, prior to surgery.

5 Once the STL file has been created, click **Go to File Location** to open the folder containing the file.

Or,

Click **OK**.

Exporting Segment STLs

You can export the segments in their final planned locations as individual STL files for use in creating splints. Each exported file will contain one segment.

To export the segments as individual STL files:

1 On **Step 8: Splints**, click **Export Segments to STLs...**.

2 Select **Export segments to individual files, inside one ZIP file** to export the surfaces into separate files packaged into a .ZIP file.

Or,

Select **Export segments to a single composite STL file** to export all the surfaces into a single .STL file.

Exporting multiple surfaces into separate files can be useful if you intend to import one or more of the exported surfaces into another program, such as for 3D printing.

3 If you are exporting the surfaces into separate files, enter the folder in which to save the files in the **Export to ZIP File** field.

Or,

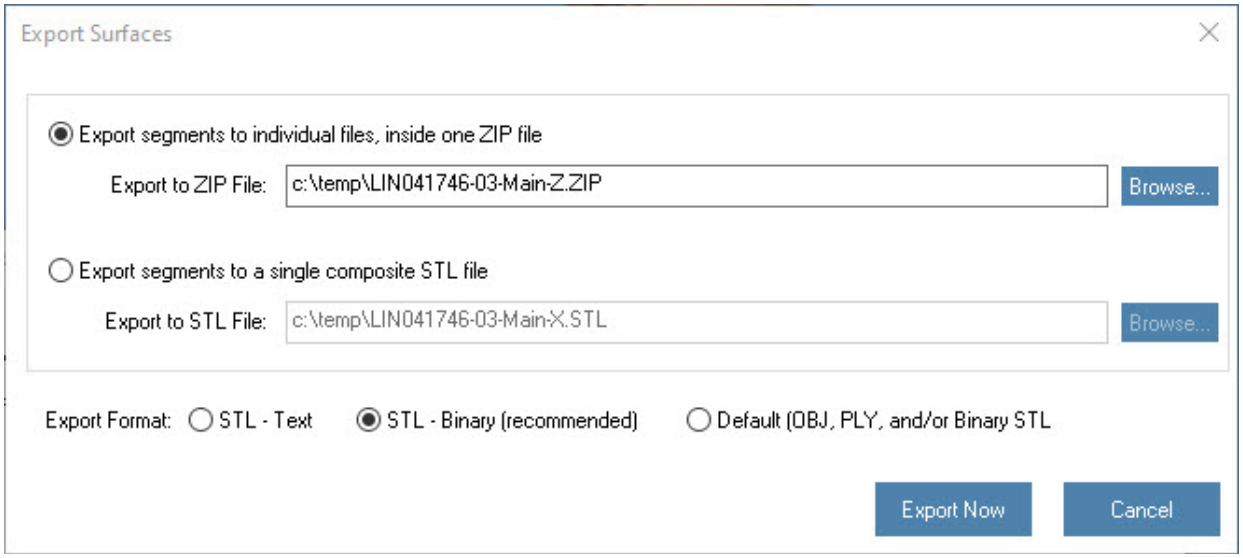
If you are exporting all the surfaces into the same file, enter the folder and file in which to store the surfaces in the **Export to STL File** field.

Or,

Click **Browse...** to select the folder and file in which to store the surfaces.

4 Select the file format to use to export the surfaces.

5 Click **Export Now**.



Export segments to individual files, inside one ZIP file	Exports the surfaces into separate files packaged in a .ZIP file. This can be useful if you intend to import one or more of the exported surfaces into another program, such as for 3D printing. **Export to ZIP File:** Folder and file in which to save the .ZIP file containing the exported files. **Browse...:** Browse to the appropriate folder and file.
Export segments to a single composite STL file	Exports all the surfaces into a single .STL file. **Export to File:** Folder and file in which to save all the exported surfaces. **Browse...:** Browse to the appropriate folder and file.
Exported STL Format	Exported file format. Possible values are **STL - Text**, **STL - Binary (recommended)**, and **Default (OBJ, PLY, and/or Binary STL)**. Select **Default (OBJ, PLY, and/or Binary STL)** to export the surfaces in their original file formats.
Export Now	Exports surfaces in the selected format to the specified folder and file.

Managing Surgical Workups

As part of your surgical planning process, you can create and store up to five independent workups for each patient and timepoint.

Saving a Workup

To save the current surgical workup:

1 Click **Save**.

If this is the first time you are saving this workup, a menu appears listing the available slots.

2 If a menu of available slots appears, select the slot in which to save the workup.

If you are saving the workup into an unused slot, a dialog box opens so that you can enter a description of this workup. If the selected slot already contains a saved surgical workup, a dialog box opens asking whether to overwrite it.

3 If you are saving the workup into an unused slot, make any changes to the default description. Then, click **OK**.

Or,

If you are saving the workup into a slot that already contains a saved workup, click **Yes** to overwrite the surgical workup previously saved in the slot with the current workup.

To save a previously saved surgical workup into a different slot:

1 Click **Workups...**.

2 Select **Save Orthognathic Surgical Workup** from the menu.

3 Select the slot in which to save the workup from the sub-menu.

If the selected slot already contains a saved surgical workup, a dialog box opens asking whether to overwrite it.

4 If the confirmation dialog box appears, click **Yes** to overwrite the surgical workup previously saved in the slot with the current workup.

Or,

Click **No** to cancel saving the workup to the selected slot.

Editing a Workup Description

To edit the description of a surgical workup:

1 Click **Workups...**.

2 Select **Edit Orthognathic Surgical Workup Description** from the menu.

3 Select the slot for which to edit the workup description from the sub-menu.

4 Enter a new description for the workup. Then, click **OK**.

Removing a Workup

To remove a previously saved surgical workup:

1 Click **Workups...**.

2 Select **Remove Orthognathic Surgical Workup** from the menu.

3 Select the slot from which to remove the previously saved workup from the sub-menu.

4 Click **Yes** to delete the workup.

Using an Externally Segmented Maxilla and Mandible

If you have existing segmented surfaces stored in STL files, you can use them as a starting point for a new orthognathic surgical planning workup for this patient. In this case, you can skip some of the steps that you would have otherwise have needed to complete.

To start orthognathic surgical planning with existing segmented surfaces:

1 On the Dolphin 3D window, click

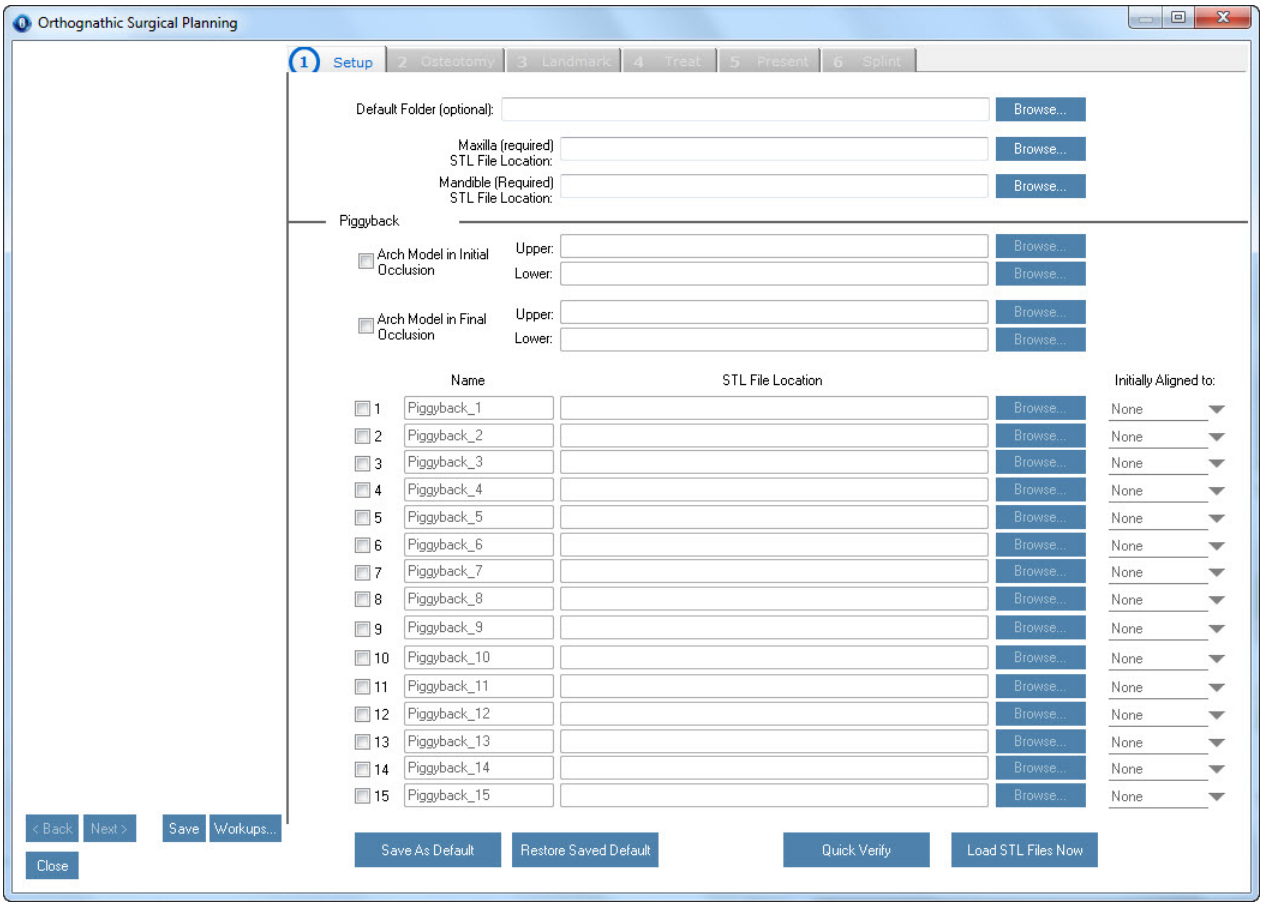
.

Or,

Select **Orthognathic Surgical Planning...** from the **Tools** menu.

2 From the sub-menu, select **Start New Workup (With Externally Segmented Mx Md STLs)...**.

The Orthognathic Surgical Planning dialog box opens. In **Step 1** of this process, you load STL files for the maxilla, mandible, model arches, and other surfaces (see below). All other steps are the same as steps you would perform if you used the Orthognathic Surgical Planning module to segment the maxilla and mandible. Only the step numbers are different.



1 Setup	Locate the major areas involved in the surgery using the patient's panoramic x-ray.
2 Osteotomy	Indicate where you intend to place the cuts for one or more osteotomies. You can simulate cuts to the maxilla, proximal segments of the mandible, and anterior mandible. For more information, see “Step 4: Osteotomy” on page 30-19.
3 Landmark	Digitize landmarks on the image so that Dolphin Imaging can track the movements of the osteotomy segments that you will specify in later steps of the 3D surgery planning process. For more information, see “Step 5: Landmarks” on page 30-76.
4 Treat	Enter the information necessary to simulate the planned surgical treatment. For more information, see “Step 6: Treat” on page 30-80.
5 Present	Review and present the surgical treatment plan. For more information, see “Step 7: Present” on page 30-118.
6 Splint	Generate intermediate and final surgical splints. For more information, see “Step 8: Splint” on page 30-125
< Back	Goes back to the previous surgical treatment planning step.
Next >	Goes on to the next surgical treatment planning step.
Save	Saves your work in the Dolphin database. For more information, see “Saving a Workup” on page 30-137.
Workups...	Opens a menu of options to manage your orthognathic surgical workups for this patient. **Save Orthognathic Surgical Workup:** Saves your current workup into the specified slot. **Restore Orthognathic Surgical Workup:** Loads a previously saved workup. **Edit Orthognathic Surgical Workup Description:** Edit the description of a workup slot. **Remove Orthognathic Surgical Workup:** Removes the workup stored in the selected slot. For more information, see “Starting Orthognathic Surgical Planning” on page 30-1 and “Managing Surgical Workups” on page 30-137.
Close	Closes the Orthognathic Surgical Planning window.

Step 1: Setup

The first step in the surgery planning process is to load the STL files containing the externally segmented maxilla and mandible, along with other optional surfaces.

To identify the STL files containing the externally segmented maxilla and mandible:

1 Enter the location of the STL file containing the segmented maxilla.

Or,

Click **Browse...** to browse to the file location. The, click **Open**.

2 Enter the location of the STL file containing the segmented mandible

Or,

Click **Browse...** to browse to the file location. The, click **Open**.

You can also load a variety of “piggyback” surfaces, including arch models in the initial or final occlusal position. A piggyback surface is one that is linked to an osteotomy segment so they move together. Piggyback surfaces are for display only and not cut in the **Step 2: Osteotomy** tab.

To identify the STL files containing arch models in initial or final occlusion:

1 Check the **Arch Model in Initial Occlusion** box if you have STL files containing arch model surfaces in the initial occlusion position.

Or,

Check the **Arch Model in Final Occlusion** box if you have STL files containing arch model surfaces in the final occlusion position.

2 For each selected surface, enter the location of the STL file containing the surface.

Or,

Click **Browse...** to browse to the file location. The, click **Open**.

To identify the STL files containing other surfaces:

1 Check the boxes for any other surfaces to import at this time.

2 Optionally, enter a descriptive name for each surface.

3 For each surface, enter the location of the STL file containing the surface.

Or,

Click **Browse...** to browse to the file location. The, click **Open**.

4 Optionally, select the initial linking (maxilla or mandible) for surfaces other than arch models in the initial or final occlusal positions.

These additional piggyback surfaces are assumed to be aligned already to and in the coordinates of the DICOM volume.

The initial linking is used on the **Step 2: Osteotomy** tab only to determine whether to display the piggyback surface.

Each general piggyback surface can be further linked to a specific osteotomy segment in the **Step 4: Treat** tab so it moves as that segment moves. For example, you can initially link externally segmented roots of mandibulary teeth to mandible. Then, when you reach **Step 4: Treat** in the treatment planning process, you can link the piggyback surface to the anterior mandibular segment.

To load the STL files:

1 Click **Quick Verify** to perform a quick validation that all the specified STL files are valid.

2 Click **Load STL Files Now** to load the STL files.

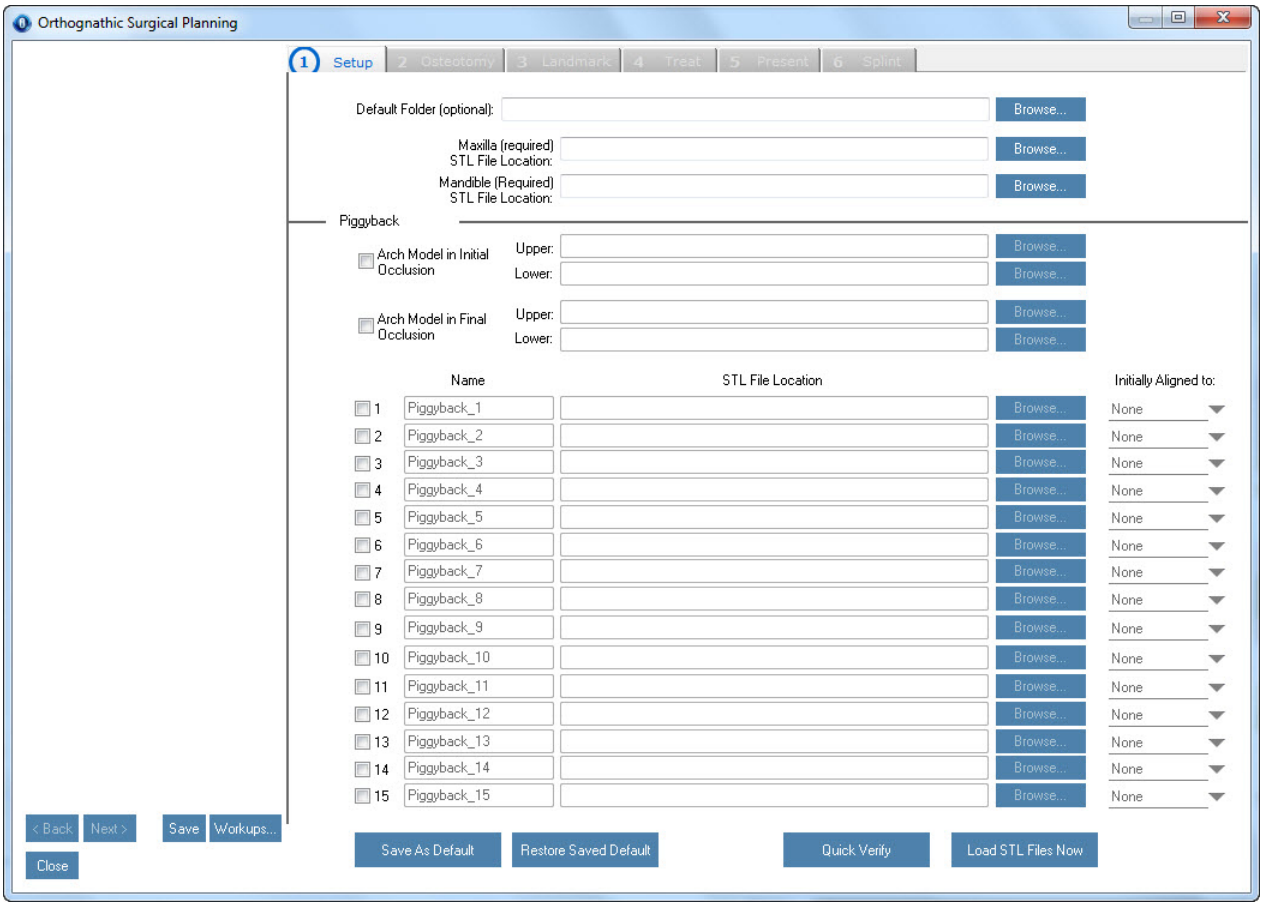
3 Click **Save** to save the loaded surfaces in your database.

4 Select the slot in which to save this workup.

5 Enter a description for this workup, and click **OK**.

This description will be used as the name of the selected workup slot so that you can easily identify this workup later.

6 Click **Next >**.



Default Folder (optional)	Location to use as the default for loading STL files.
Maxilla (Required) STL File Location.	Location of the STL file for the segmented maxilla. **Browse...:** Browse for the STL file.
Mandible (Required) STL File Location.	Location of the STL file for the segmented maxilla. **Browse...:** Browse for the STL file.
Arch Model in Initial Occlusion	STL files containing the models of the upper and lower arches in the initial occlusion position. **Upper:** Location of the STL file for the upper arch. **Lower:** Location of the STL file for the lower arch. **Browse...:** Browse for the STL file.

Arch Model in Final Occlusion	STL files containing the models of the upper and lower arches in the final occlusion position. **Upper:** Location of the STL file for the upper arch. **Lower:** Location of the STL file for the lower arch. **Browse...:** Browse for the STL file.
other piggyback surfaces	Other piggyback surfaces to load. **numbered check box:** Loads the specified surface. **Name:** Optional descriptive name for the surface. **STL File Location:** Location of the STL file for the surface. **Browse...:** Browse for the STL file. **Initially Aligned to:** Initial linking (maxilla, mandible, or none) for the surface.
Save As Default	Saves the specified STL file locations as defaults.
Restore Saved Default	Uses STL file locations previously saved as defaults.
Quick Verify	Quickly verifies that the specified STL files are valid.
Load STL Files Now	Loads the specified STL files.

Designing Splints From Arch Models

If you have created asurgical mock-up or plan using cut stone models, you can scan it and import the scan into Dolphin 3D and use it to design a surgical or TMJ splint.

To start designing a splint from a patient's arch models:

1 On the Dolphin 3D window, click

.

2 From the sub-menu, select **Digital Splints/Guides Fabrication for Arch Models**.

3 On the Digital Splints/Guides Fabrication for Arch Models window, select the **Wafers/Splints Fabrication** tab if it isn't already selected.

4 Select **New Workup...** to begin a new workup.

As part of your surgical planning process, you can create and store up to 15 independent workups.

5 Select **Using Both Arch Models** to use both of the patient's arch models in this workup.

Or,

Select **Using Upper Arch** to use only the patient's upper arch model in this workup.

Or,

Select **Using Lower Arch** to use only the patient's lower arch model in this workup.

The Import Arch Models dialog box opens.

6 Select the source from which to load the arch model scan(s) that you want to use in this workup.

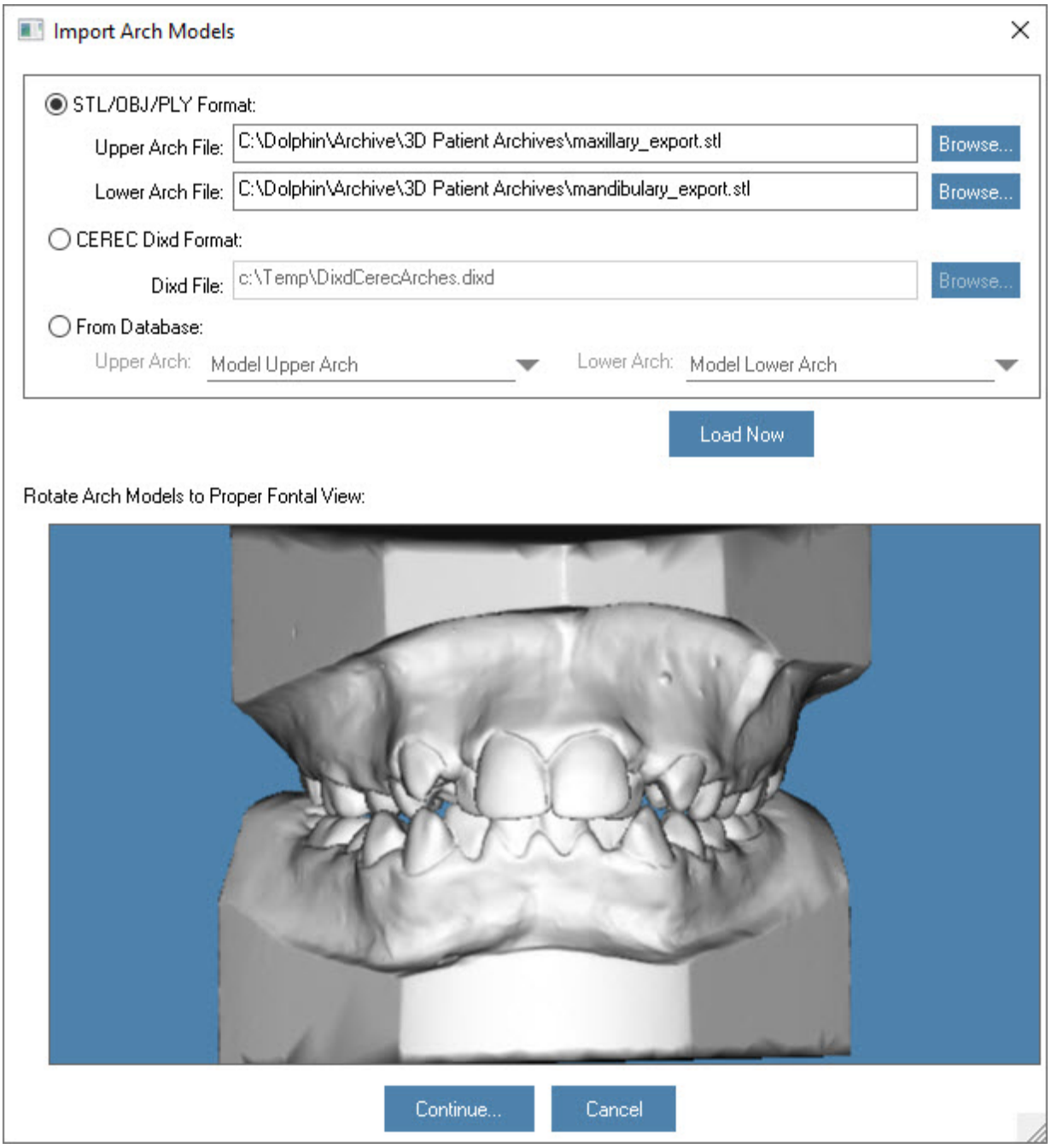
You can import arch model scans from files in STL, OBJ, PLY, or CEREC Dixd format, or you can use arch model scans that have already been stored in your Dolphin database.

7 Click **Load Now**.

8 If necessary, click and drag the image preview to orient the arch model(s) to a proper frontal view.

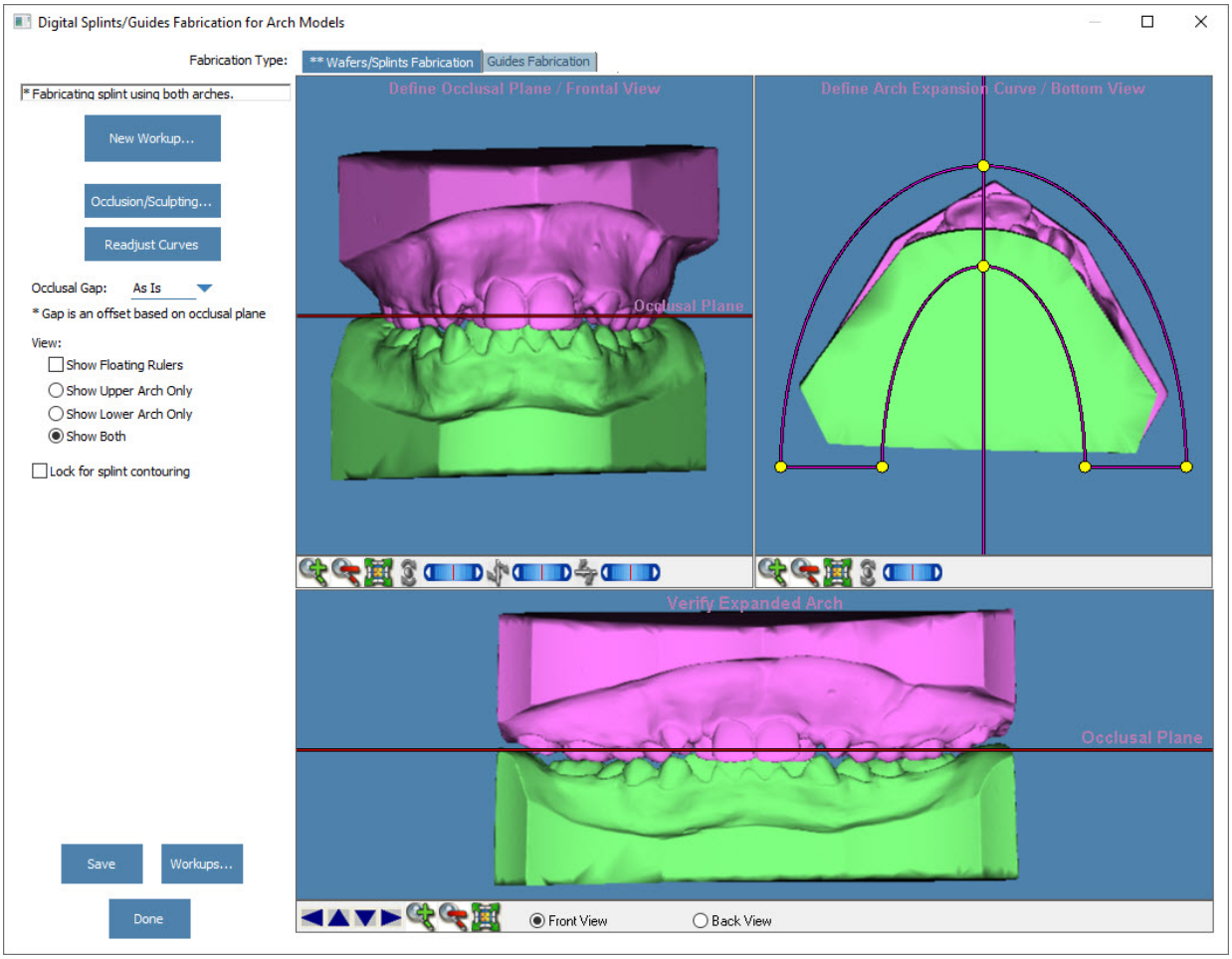
9 Click **Continue...** to close this dialog box and create a new workup with the loaded arch model(s).

The following figure illustrates this dialog box after loading both upper and lower arch models.



STL/OBJ/PLY Format	Load one or more arch model scans in STL, OBJ, or PLY format. **Upper Arch File:** STL file containing a scan of the patient's upper arch. This field only appears if you chose to include the upper arch model in this workup. **Lower Arch File:** STL file containing a scan of the patient's lower arch. This field only appears if you chose to include the lower arch model in this workup. **Browse...:** Browse for the STL file.
CEREC Dixd Format	Load one or more arch model scans in CEREC Dixd format. **Dixd File:** CEREC Dixd file containing the arch model scan for this workup. **Browse...:** Browse for the CEREC Dixd file.
From Database	Load one or more arch model scans stored in your Dolphin database. **Upper Arch:** The patient's upper arch model stored in your database. This drop-down list only appears if you chose to include the upper arch model in this workup. **Lower Arch File:** The patient's lower arch model stored in your database. This drop-down list only appears if you chose to include the lower arch model in this workup.
Load Now	Loads the specified arch model(s).
Rotate Arch Models to Proper Frontal View	Displays a preview of the loaded arch model(s) so that you can orient the image for a frontal view.
Continue...	Closes this dialog box and creates a new workup with the loaded arch model(s).

The arch model(s) you loaded appear on the **Wafers/Splints Fabrication** tab of the Digital Splints/Guides Fabrication for Arch Models window.



The following options are specific to the **Wafers/Splints Fabrication** tab of the Digital Splints/Guides Fabrication for Arch Models window.

New Workup...	Opens a sub-menu with the following choices for starting a new workup: **Using Both Arch Models:** Start a new workup using both of the patient's arch models. **Using Upper Arch:** Start a new workup using only the patient's upper arch model. **Using Lower Arch:** Start a new workup using only the patient's lower arch model.
Sculpting or Occlusion/ Sculpting	Opens the Edit Arch Models - Dental Occlusion and Occlusal Plane window. • If you are using one arch model, this button is labeled **Sculpting**, and you can sculpt the arch model, if necessary, on the Edit Arch Models - Dental Occlusion and Occlusal Plane window. • If you are using both arch models, this button is labeled **Occlusion/Sculpting**, and you can specify the occlusion and sculpt the arch models, if necessary, on the Edit Arch Models - Dental Occlusion and Occlusal Plane window. For more information, see "Sculpting Arch Models and Modifying Occlusion" on page 30-147

Readjust Curves	Returns lines, points, and curves on the arch model images to their default positions.
Occlusal Gap	Occlusal gap in millimeters. If you use this option, the gap is created by rotating the mandible or mandibular segments about the hinge axis.
View	Configures the views of the arch models: **Show Floating Rulers:** Displays rulers on the arch model images. If you are using both arch models, the following options appear: **Show Upper Arch Only:** Displays only the upper arch model. **Show Lower Arch Only:** Displays only the lower arch model. **Show Both:** Displays both arch models.
Lock for splint contouring	Changes the image layout and adds options that you use to define the splint's contour and specify holes to be added to the splint. For more information, see “Specifying the Dimensions” on page 30-148.
Save	Saves the current workup. For more information, see “Saving and Managing Splint Workups” on page 30-151.
Workups...	Opens a menu with the following options: **Save As...:** Saves the current workup into a different workup slot. **Restore...:** Restores a previously saved workup. **Edit Descriptions...:** Edits the descriptions of saved workups. **Delete...:** Deletes a saved workup. For more information, see “Saving and Managing Splint Workups” on page 30-151.

For information on the rotation sliders and magnification controls that appear below the images, see “Moving or Reorienting the Volume” on page 19-24 and “Changing the Magnification” on page 19-25.

Sculpting Arch Models and Modifying Occlusion

You have the option of sculpting arch models after importing them. If you are using both arch models, you can also modify the occlusion if they were put into their proper occlusion positions by the external intraoral scanning process.

To sculpt the arch model(s) and modify the occlusion:

1 If you are using one arch model, click **Sculpting**.

Or,

If you are using both arch models, click **Occlusion/Sculpting**.

The Edit Arch Models - Dental Occlusion and Occlusal Plane window opens and displays one or both of the following tabs:

Define Occlusion	Used to specify the occlusion by moving the lower arch relative to the upper arch. This tab only appears if you are using both arch models.

Sculpting	Used to sculpt arch surfaces.

2 If you are using both arch models, set the occlusion as described in “Defining the Occlusion” on page 19-86.

3 Optionally, sculpt the arch surfaces as described in “Sculpting the Imported Surfaces” on page 19-92.

4 Click **OK** to save your work and close the Edit Arch Models - Dental Occlusion and Occlusal Plane window.

Specifying the Dimensions

To specify the dimensions of the splint:

1 In the Define Occlusal Plane/Frontal View pane, identify the occlusal plane by rotating the arch(es) to achieve the best frontal view and clicking and dragging the red horizontal line.

2 In the Define Arch Expansion Curve/Bottom View pane, identify the midline by rotating the arch(es) and clicking and dragging the red vertical line.

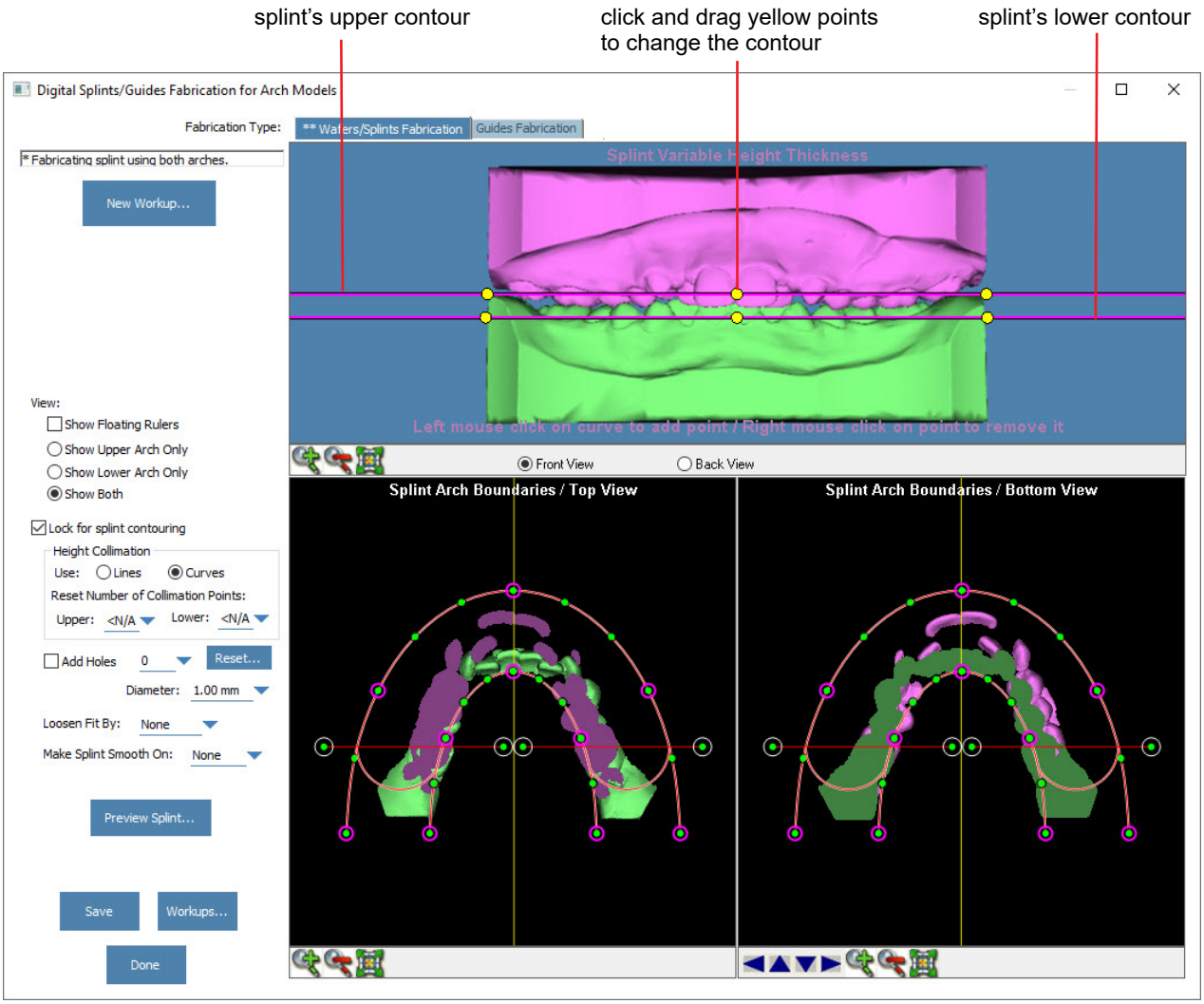
The midline is used to define the default contouring of the arch curves.

3 In the Define Arch Expansion Curve/Bottom View pane, click and drag the yellow points to contour the outer and inner curves to best mimic the shape of the arch shape.

These curves are used to stretch the arches into the panoramic-like view shown in the Verify Expanded Arch pane, which is used to make defining the variable height thicknesses of the splint easier.

4 Check the **Lock for splint contouring** box.

Additional options appear below the **Lock for splint contouring** check box, and the image layout changes so that you can define the splint's contour.



Height Collimation	Sets options for contouring the splint. **Lines:** Use lines to contour the splint. **Curves:** Use curves to contour the splint. **Reset Number of Collimation Points:** Sets the number of yellow points to use for contouring the height of the splint in the Splint Variable Height Thickness pane. • **Upper:** Number of yellow points for defining the upper contour. • **Lower:** Number of yellow points for defining the upper contour.
Add Holes	Adds holes to the splint. **drop-down list:** Number of holes. **Diameter:** Diameter of the holes. **Reset...:** Moves the holes so that they are evenly distributed along the arches.
Loosen Fit By	Specify how tightly the splint should fit to the patient's arch.

Make Splint Smooth On	Surface on which to make the splint smooth (**None**, **Upper**, or **Lower**). You might use this option to create TMJ splints, for example.
Preview Splint...	Opens a menu of resolution options (**Higher Resolution**, **Medium Resolution**, **Lower Resolution**) for previewing the splint. When you select an option, the Preview Surgical Guide window opens and displays a preview of the splint. From this window, you can add text labels to be engraved on the splint and create an STL file to use for fabrication.For more information, see “Previewing the Splint” on page 30-133.

To contour the height of the splint:

1 Select **Lines** in the Height Collimation group box to define the splint’s contour using lines.

Or,

Select **Curves** to define the splint’s contour using curves.

2 Define the splint’s contour by clicking and dragging the yellow points in the Splint Variable Height Thickness pane.

Click and drag yellow points on the upper line/curve to define the splint’s upper contour. Use the yellow points on the lower line/curve to define the splint’s lower contour.

To add yellow points in the Splint Variable Height Thickness pane:

1 Click the location where you want to add a new yellow point on one of the lines/curves. Then, click **Yes**.

Or,

Select the number of yellow points you want on the upper line/curve from the **Upper** drop-down list.

Or,

Select the number of yellow points you want on the lower line/curve from the **Lower** drop-down list.

To remove yellow points in the Splint Variable Height Thickness pane:

1 Right-click a point to remove it.

You must have at least two points on each line/curve.

To contour the arch of the splint:

1 In the Splint Arch Boundaries/Top View and Splint Arch Boundaries/Bottom View panes, click and drag the dots to define the contour of the splint.

Move the dots surrounded by circles first. Then, move the other dots to fine-tune the splint's contour.

To add holes:

1 Check the **Add Holes** box.

2 Select the number of holes from the drop-down list.

Red dots representing the holes appear in the Splint Arch Boundaries/Top View and Splint Arch Boundaries/Bottom View panes.

3 Select the diameter of the holes from the **Diameter** drop-down list.

The red dots resize to represent the diameter you selected.

4 Click and drag the red dots to specify the locations of the holes.

When you move a red dot to the proper location, it changes to yellow.

To evenly distribute the holes along the arches:

1 Click **Reset...**.

2 Click **Yes** on the confirmation dialog box that appears.

Thedots change to red and move so that they are evenly distributed.

Saving and Managing Splint Workups

As part of your surgical splint design process, you can create and store up to 15 independent workups.

Saving a Workup

To save the current workup:

1 Click **Save**.

If this is the first time you are saving this workup, a dialog box appears listing the available slots.

To save a previously saved workup into a different slot:

1 Click **Workups...**.

2 Select **Save As...** from the menu.

A dialog box appears listing the available slots.

To select a workup slot:

1 Select the slot in which to save the workup. Then, click **Save**.

If the selected slot already contains a saved workup, a dialog box opens asking whether to overwrite it.

2 If you are saving into a slot that already contains a saved workup, click **Yes** to overwrite the previously saved workup with the current workup.

Or,

Click **No** to select a different workup slot.

To add a description for the workup:

1 On the Workup Description dialog box, make any changes to the default description, and click **OK**.

Or,

Click **Select from Library...** to select a workup description previously added to the workup description library.

2 If you clicked **Select from Library...**, select a workup description. Then, click **Select**.

For more information on the workup description library, see “Maintaining a Library of Workup Descriptions” on page 30-153.

3 Select the slot in which to save the workup. Then, click **Save**.

If the selected slot already contains a saved workup, a dialog box opens asking whether to overwrite it.

4 If the confirmation dialog box appears, click **Yes** to overwrite the workup previously saved in the slot with the current workup.

Or,

Click **No** to cancel saving the workup to the selected slot.

Editing a Workup Description

To edit the description of a workup:

1 Click **Workups...**.

2 Select **Edit descriptions...** from the menu.

3 Select the slot for which to edit the workup description.

4 Click **Rename** to enter a new name description for this workup.

Or,

Click **Select from Library...** to select a workup description previously added to the workup description library.

5 If you clicked **Rename**, enter a new description for the workup. Then, click **OK**.

Or,

If you clicked **Select from Library...**, select a workup description. Then, click **Select**.

For more information on the workup description library, see “Maintaining a Library of Workup Descriptions” on page 30-153.

Deleting Workups

To remove one or more previously saved workups:

1 Click **Workups...**.

2 Select **Delete..,** from the menu.

3 Check the box for each slot from which to delete a previously saved workup. Then, click **Delete**.

4 Click **Yes** to confirm the deletion.

Maintaining a Library of Workup Descriptions

You can save frequently used workup descriptions in a library for easy reuse.

To add a workup description to the library:

1 On the Workup Description dialog box, click **Select from Library...**.

The Workup Description dialog box appears when you save or rename a workup. For more information, see “Saving a Workup” on page 30-151 and “Editing a Workup Description” on page 30-152.

2 If you don’t have any workup descriptions in your library, click **OK** on the message that appears.

3 Click **Add New...**.

4 Enter the workup description, and click **OK**.

To delete a workup description from the library:

1 On the Workup Description dialog box, click **Select from Library...**.

The Workup Description dialog box appears when you save or rename a workup. For more information, see “Saving a Workup” on page 30-151 and “Editing a Workup Description” on page 30-152.

2 Select a workup description, and click **Delete**.

Part V: Internet Sharing

This part of the *Dolphin Imaging User's Guide* describes the following features:

- AnywhereDolphin enables you to store, organize, share, and distribute patient records through private, password-protected accounts on the AnywhereDolphin web site (www.anywheredolphin.com).
- BeamReaders is a third-party service that offers a radiology reports and image portfolios. From Dolphin Imaging, you can easily transfers the current patient's record, along with work-order notes, to BeamReaders. Refer to www.beamreaders.com for more information about the services they provide.

This part of the *Dolphin Imaging User's Guide* also describes the setup procedures necessary to support these features.

31 AnywhereDolphin and BeamReaders Setup

This chapter describes the setup procedures necessary to support the AnywhereDolphin and BeamReaders features.

Note: *If your practice uses both features, you only need to perform these set up procedures once.*

These features require that your practice has a current support contract and an active AnywhereDolphin account.

AnywhereDolphin is service that enables your practice to store, organize, share, and distribute patient records through private, password-protected accounts on the Anywhere Dolphin web site (www.anywheredolphin.com) and using the MyOrthodontist and Dolphin Mobile apps on mobile devices. For information on the MyOrthodontist and Dolphin Mobile apps, refer to the *Dolphin MyOrthodontist Setup and User's Guide*, the *Dolphin Mobile and Dolphin Ocean Installation Guide for Android and iOS*, and the *Dolphin Mobile Client User's Guide*.

BeamReaders is a third-party service that offers a radiology reports and image portfolios. From Dolphin Imaging, you can easily transfers the current patient's record, along with work-order notes, to BeamReaders. Refer to www.beamreaders.com for more information about the services they provide.

Both of these features require the Dolphin Sonar module to transfer patient records between Dolphin Imaging and the AnywhereDolphin or BeamReaders web site.

Setting up Dolphin Sonar

To set up the Dolphin Sonar module:

1 On the Dolphin Imaging Main Screen, click

. Then, click **Show Sonar Window**.

Or,

On the Dolphin Imaging Main Screen, click

. Then, click **Upload Current Patient**.

Or,

On the Dolphin Imaging Main Screen, click

. Then, click **Download Patient**.

Or,

On the Archive Patient Files dialog box, select **Save/Backup Patient to Internet**. Then, click **OK**.

If the Dolphin Sonar module has not been previously set up, you may see the following message:

2 If this message appears, click **Yes**.

The Welcome to Dolphin Sonar dialog box appears.

3 Click **Continue...**.

The Dolphin Sonar Secured Login dialog box appears.

4 On the Dolphin Sonar Secured Login dialog box, click **Options**.

The Sonar Options dialog box appears (see below).

To change Dolphin Sonar options:

1 On the Dolphin Sonar Secured Login dialog box, click **Options**.

Or,

On the Dolphin Sonar dialog box, click **Options**.

Or,

Click in the Microsoft Windows tray on the Dolphin Sonar Server. Then, select **Options...**.

The Sonar Options dialog box appears (see below).

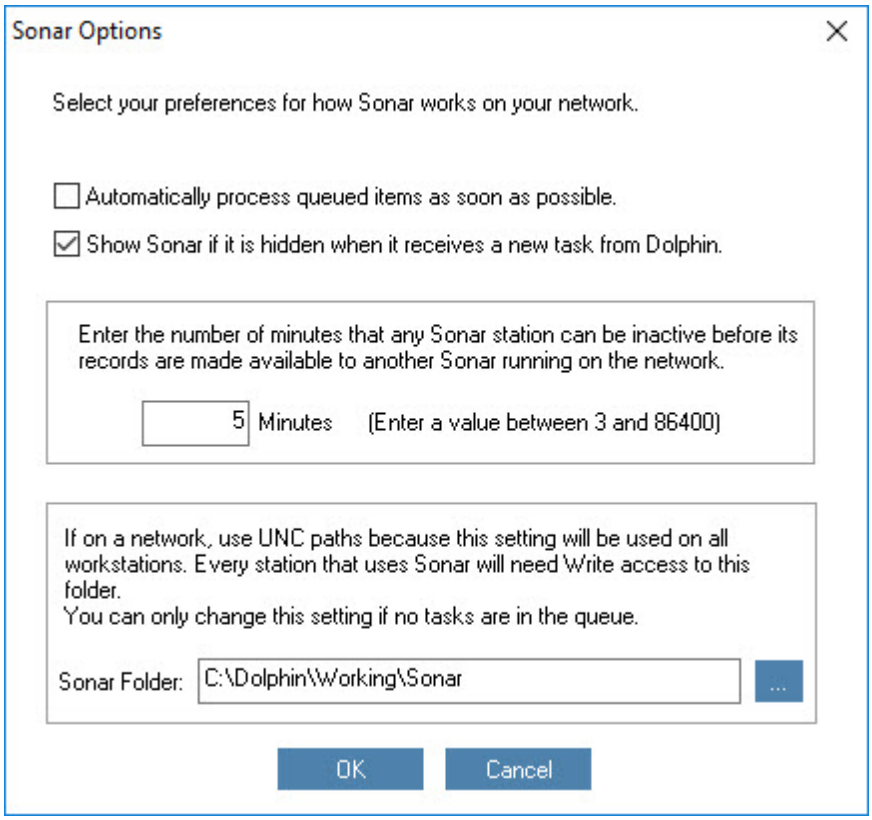
To set Dolphin Sonar options:

1 On the Sonar Options dialog box, set any options, and click **OK**.

If the folder specified as the Sonar Folder does not exist, a message appears asking whether you would like to create the folder.

2 If this message appears, click **Yes**.

3 Click **OK** on the Sonar Options dialog box to save your settings.



Automatically Process Queued Items as Soon as Possible	Instructs the Dolphin Sonar module to upload or download patient records to AnywhereDolphin as soon as possible after they are queued.
Show Sonar if it is Hidden When it Receives a New Task From Dolphin	Shows the Dolphin Sonar dialog box on the Sonar Server whenever the Dolphin Sonar module receives a new task.
Minutes	Number of minutes that your workstation must be inactive before items in your Sonar queue are made available to other workstations on your network for processing. For example, you could use this option to process all upload and download operations for all workstations in your practice at once on a single workstation.
Sonar Folder	Name of the folder to use to store the queue.

Setting Up the AnywhereDolphin Cloud Service

This section describes how to set up the AnywhereDolphin cloud service. The setup options configure email messages used to communicate with AnywhereDolphin, MyOrthodontist, and Dolphin Mobile users and determine the information that users see on the AnywhereDolphin web site and the MyOrthodontist and Dolphin Mobile apps.

Note: *If your practice uses more than one of these features, you only need to set up the AnywhereDolphin cloud service once.*

For information on the MyOrthodontist and Dolphin Mobile apps, refer to the *Dolphin MyOrthodontist Setup and User's Guide*, the *Dolphin Mobile and Dolphin Ocean Installation Guide for Android and iOS*, and the *Dolphin Mobile Client User's Guide*.

You must complete the following procedures *before* setting up the AnywhereDolphin cloud service:

- install and set up the Dolphin Ocean Server (refer to the *Dolphin Mobile and Dolphin Ocean Installation Guide for Android and iOS*)
- set up email account options in the SMS/Email Manager for the user who will send and receive email messages associated with these features

Note: *If you have the Dolphin Imaging Security Utilities installed, you can only set up the AnywhereDolphin cloud service if your Dolphin Imaging user account has the Edit Menu privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

To set up AnywhereDolphin:

1 From the **Edit** menu, select **AnywhereDolphin**. Then, select **My Orthodontist Setup** from the sub-menu.

The dialog box opens that contains tabs with options for setting up AnywhereDolphin. The information that you can enter on these tabs is described in detail below.

Setup	On this tab, you enter information about your practice, including the practice's name, login credentials for AnywhereDolphin, and email account information.
Defaults	On this tab, you specify the default items to share with patients and billing parties and the templates to use for various email messages.
Payment Processor	This tab only appears in Dolphin Management, and it does not apply to MyOrthodontist. On this tab, you can specify your preferred payment processor so that billing parties can post payments via AnywhereDolphin.
AnywhereDolphin Messages	On this tab, you can customize the messages that your patients/billing parties see when they access AnywhereDolphin.
AnywhereDolphin Logo	On this tab, you can customize the logo that your patients/billing parties see when they access AnywhereDolphin.
MyOrthodontist	This tab is specific to MyOrthodontist. Here you specify: • whether or not patients can view the tooth chart for elastics instructions. • whether patients or billing parties can search for and schedule the next visit to your office. • which templates to use for MyOrthodontist-specific email communication.

Push Notifications	This tab is specific to MyOrthodontist. Here you specify whether MyOrthodontist users should get push notifications when the practice shares a document, questionnaire, Aquarium video, etc. with the patient.

2 Complete the information on the **Setup** tab, and click **OK**.

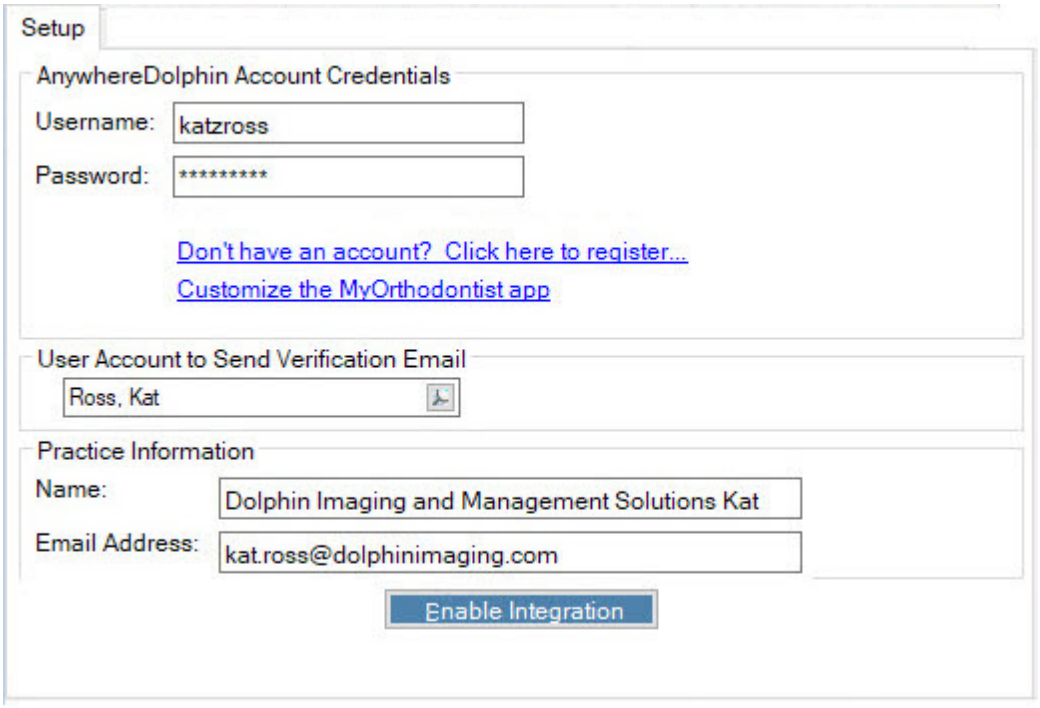
You must click **OK** on the **Setup** tab to save the information on it before completing any of the other tabs.

3 Optionally, enter or customize the information on the other tabs.

4 When you are finished completing the information on all of the tabs, click **OK**.

Setup Tab

On this tab, you specify information about your practice, including the practice's name, login credentials for AnywhereDolphin, and email account information.



Username	The AnywhereDolphin user name for your practice.
Password	The AnywhereDolphin password your practices uses. This password is saved globally for all users in your practice.
User Account to Send Verification Email	This is the Dolphin Imaging user account to which patients and/or billing parties verify themselves to your practice. This is also the account that sends verification emails to patients/billing parties.

Name:	The name of your practice
Email Address	The practice email address
Enable Integration	Click to allow Dolphin to automatically log you into AnywhereDolphin using the credentials above. From the AnywhereDolphin Integration page, you can approve the integration. This button changes to Disable Integration after you have enabled the integration. ***Note:*** *Versions prior to Dolphin Management 10.5 used a different method of setting up AnywhereDolphin integration, which still works. However, new features such as Secure Messaging, will not work unless you set it up using this new method. For information on Secure Messaging, see .*

To complete the Setup tab:

1 Click the Setup tab if it isn't already selected.

2 In the AnywhereDolphin Account Credentials group box, enter the user name and password that your practice uses to access AnywhereDolphin.

Or

Click the link to register with AnywhereDolphin, and follow the directions from there.

We save the practice account password globally for all users; when you update the password on the this tab, Dolphin updates it automatically for all users.

3 For **User Account to Send Verification Email**, enter or click the to look up the user account to which your patients and/or billing parties verify themselves to your practice.

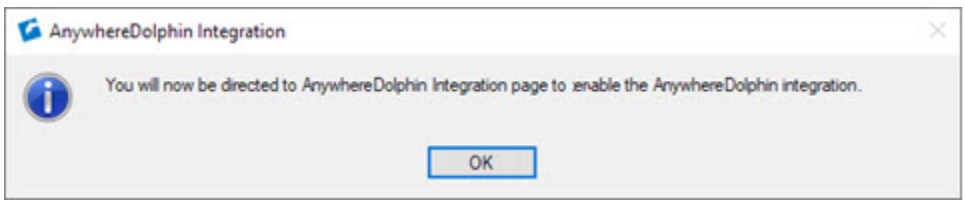
This is also the account that sends verification emails to patients and billing parties.

4 For **Name**, enter the name under which the mobile app can search for your practice.

5 For **Email Address**, enter your practice email address.

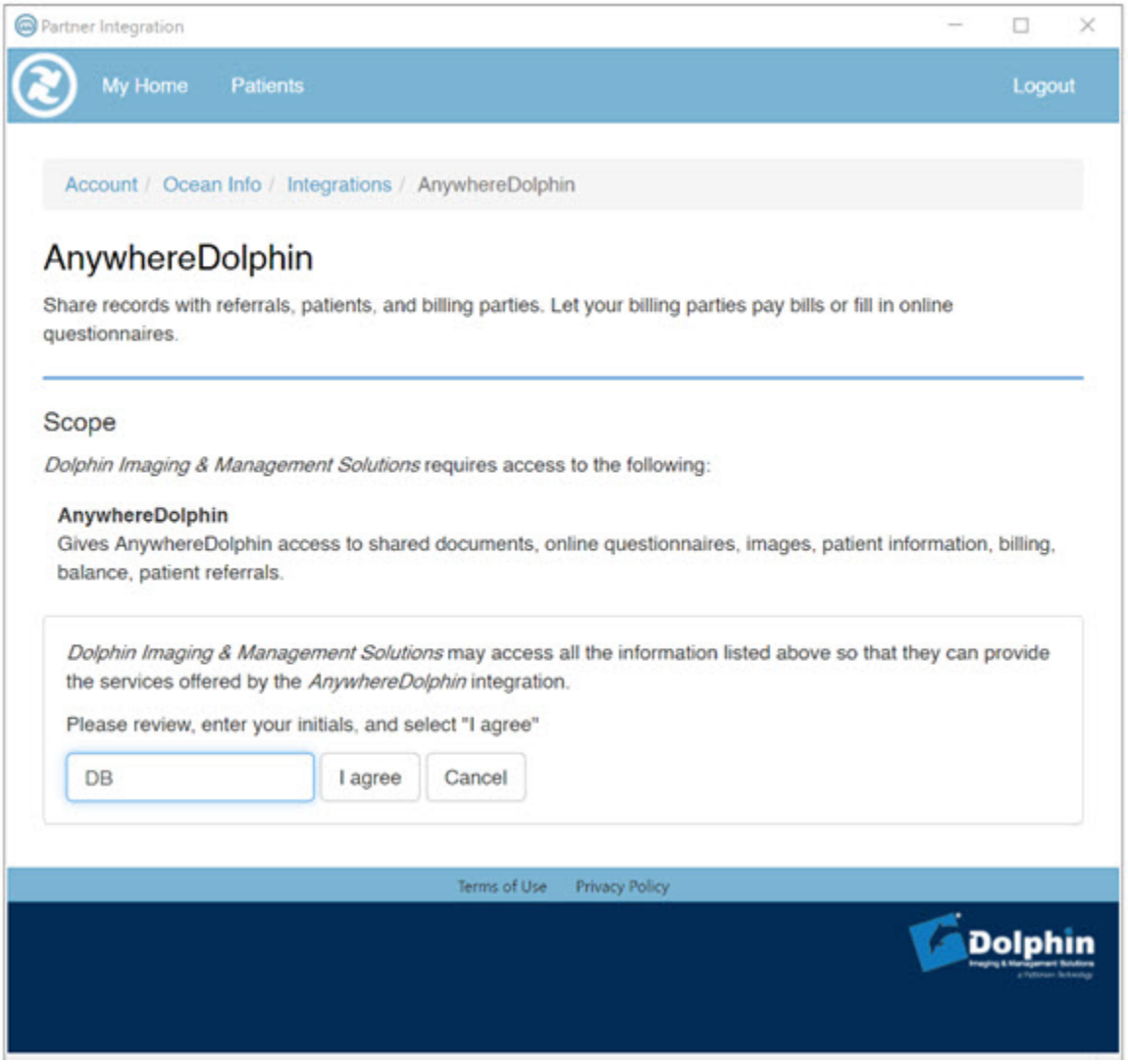
6 Click the Enable Integration button.

The following message opens:



7 Click **OK**.

The AnywhereDolphin Partner Integration opens:



8 Key in your initials.

9 Click the **I agree** button.

10 Click the **X** to close the AnywhereDolphin Partner Integration window.

The Disable Integration button now appears at the bottom of the Setup tab.

11 For **User Account to Send Verification Email**, enter or click the to look up the Dolphin Imaging user account to which your patients and/or billing parties verify themselves to your practice.

This is also the account that sends verification emails to patients and billing parties.

12 For **Name**, enter the name under which the mobile app can search for your practice.

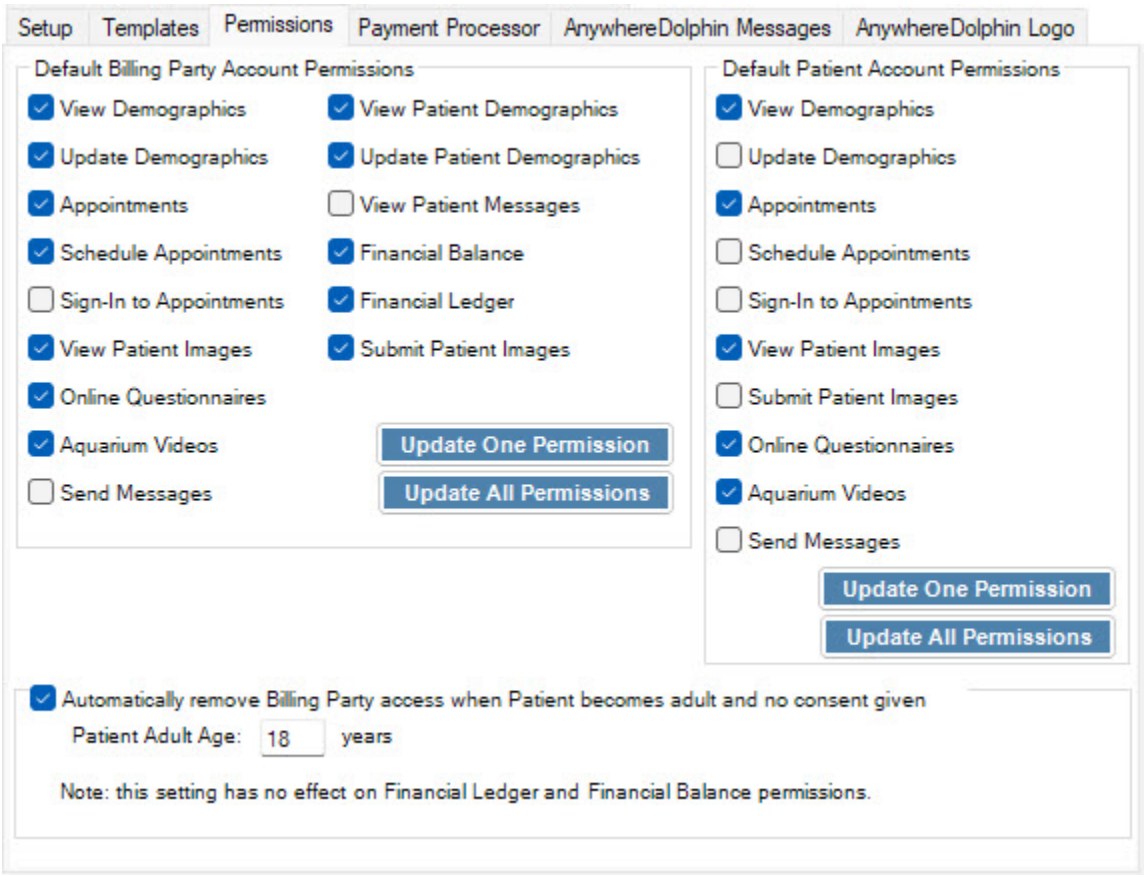
13 For **Email Address** enter the email address used for your practice.

14 Click **OK**.

You must click **OK** to save the information on the **Setup** tab before completing any of the other tabs

Permissions Tab

On the Permissions tab, you specify the default items to share with patients and billing parties.



Default Billing Party Account Permissions	Items that you want to make accessible by default to any billing party with an AnywhereDolphin account. **View Demographics:** Basic billing party demographic information. **Update Demographics:** Update basic billing party demographic information. **Appointments:** Patient appointment information. This option applies only if you have Dolphin Management. **Schedule Appointments:** Schedule patient appointments. This option applies only if you have Dolphin Management. **Patient Images:** Patient images from Dolphin Imaging. This option applies only to My Orthodontist. **Online Questionnaire:** Shared online questionnaires. **Aquarium Videos:** Specific Aquarium videos if you also have Dolphin Aquarium installed. This option applies only to My Orthodontist. **View Patient Demographics:** Basic patient demographic information. **Update Patient Demographics:** Update basic patient demographic information. **Financial Balance:** Account balance information for billing party/patient combination. This option applies only if you have Dolphin Management. **Financial Ledger:** Ledger for billing party/patient combination. This option applies only if you have Dolphin Management. Update All Permissions Click to make the selected permissions above the same for all users. This option applies only if you have Dolphin Management.

Default Patient Account Permissions	Items that you want to make accessible by default to any patient with an AnywhereDolphin account. **View Demographics:** Basic patient demographic information. **Update Demographics:** Update basic patient demographic information. **Appointments:** Patient appointment information. This option applies only if you have Dolphin Management. **Schedule Appointments:** Schedule patient appointments. This option applies only if you have Dolphin Management. **Patient Images:** Patient images from Dolphin Imaging. This option applies only to My Orthodontist. **Online Questionnaire:** Shared online questionnaires. **Aquarium Videos:** Specific Aquarium videos if you also have Dolphin Aquarium installed. This option applies only to My Orthodontist. Update All Permissions Click to make the selected permissions above the same for all patient users. This option applies only if you have Dolphin Management.
Automatically remove Billing Party access when Patient becomes adult and no consent given	Click to active the following field: **Patient Adult Age: __years** 18 is the default age that if the patient does not give consent, the billing party will no longer have access to any patient information with the exception of Financial Ledger and Financial Balance.

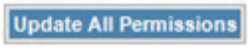
To complete the Permissions tab:

1 Click the Permissions tab.

2 In the **Default Billing Party Account Permissions** group box, check the items that you want to make accessible by default to all billing parties with an AnywhereDolphin account.

View Demographics	Basic billing party demographic information.
Update Demographics	Update billing party basic demographic information.
Appointments	Access Patient appointment information. This information applies only to Dolphin Management.
Schedule Appointments	Schedule appointments through Dolphin mobile or online applications This option applies only to Dolphin Management.
Sign-In to Appointments	Sign in to patient appointments from a location near, but outside of the practice (such as a parking lot). This is used for our mobile app, MyOrthodontist.
Online Questionnaire	Access shared online questionnaires.

View Patient Images	View patient images from Dolphin Imaging, if you also have it installed. This option applies only to MyOrthodontist.
Submit Patient Images	Granted to billing parties by default, this permission allows billing parties and patients to submit initial and progress photos to the practice via MyOrthodontist. This option applies only to MyOrthodontist.
Aquarium Videos	Specific Aquarium videos if you also have Dolphin Aquarium installed. This option applies only to MyOrthodontist.
Send Messages	Allow billing parties to send secure SMS messages to the practice from MyOrthodontist (v 5.x). This requires your practice have a MyOrthodontist license and either the 2-Way SMS Processor or the Dolphin Secure Messaging license.
View Patient Demographics	View patient demographic information.
Update Patient Demographics	Update patient demographic information.
View Patient Messages	Allow billing parties to view secure SMS messages between the patient and the practice. This requires your practice have a MyOrthodontist license and either the 2-Way SMS Processor or the Dolphin Secure Messaging license.
Financial Balance	Access account balance information for billing party/patient combination. This information applies only to Dolphin Management.
Financial Ledger	Access ledger for billing party/patient combination. This information applies only to Dolphin Management.

3 Click 

to make the selected permissions above the same access for all billing party users.

You can change individual settings for each billing party on the AnywhereDolphin User Settings dialog box or the MyOrthodontist/AnywhereDolphin User Settings dialog box (if you have a MyOrthodontist license).

4 In the **Default Patient Account Permissions** group box, check any or all of the following items you want all patients to access by default:

View Demographic	Access basic patient demographic information.
Update Demographics	Update basic patient demographic information.
Appointments	Access patient appointment information.
Schedule Appointments	Schedule appointments through Dolphin mobile or online apps.
Sign-In to Appointments	Sign in to patient appointments from a location near, but outside of the practice (such as a parking lot). This is used for our mobile app, MyOrthodontist.

View Patient Images	Access patient images from Dolphin Imaging, if you also have it installed. This is used for our mobile app, My Orthodontist.
Submit Patient Images	Submit initial and progress photos to the practice via MyOrthodontist. This option applies only to MyOrthodontist.
Online Questionnaire	Access shared online questionnaires.
Aquarium Videos	Access specific Aquarium videos if you also have Dolphin Aquarium installed. This is used for our mobile app, My Orthodontist.
Send Messages	Send secure SMS messages to the practice from MyOrthodontist (v 5.x). This requires your practice have a MyOrthodontist license and either the 2-Way SMS Processor or the Dolphin Secure Messaging license.

5 Click Update All Permissions to make the selected permissions above the same access for all patient users.

6 Check **Automatically remove Billing Party access when Patient becomes adult and no consent given**.

This activates the Patient Adult Age field.

7 Enter the patient's age at which the billing party's access is automatically removed. The default age is 18.

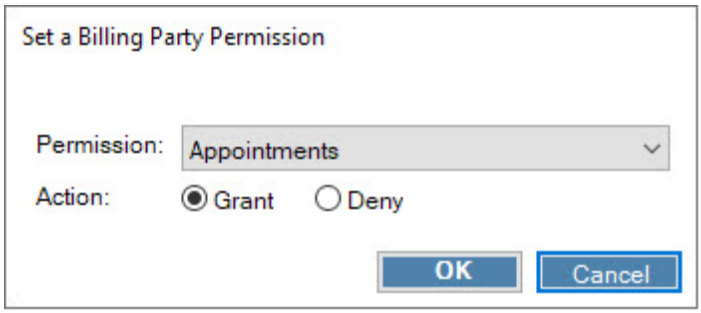
Note: *The billing party can still access financial balance and financial ledger information, however.*

To change access to *one* permission for all billing party and/or all user accounts.

1 Click the Permissions tab.

2 In the **Default Billing Party Account Permissions** group box, click the Update One Permission button.

The following dialog box opens:



3 Click the **Permission** drop-down to select the one permission for which you want to change access.

4 Click **Grant** to grant this permission, or click **Deny** to deny this permission to all users.

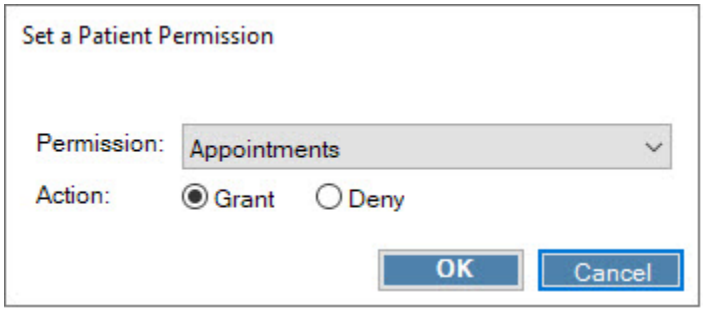
5 Click **OK**.

A message box opens, requesting that you confirm you want to update the permission as you specified in the previous two steps.

6 Click **Yes** to update the permission as described in the message box.

7 In the **Default Patient Account Permissions** group box, click the Update One Permission button.

The following dialog box opens:



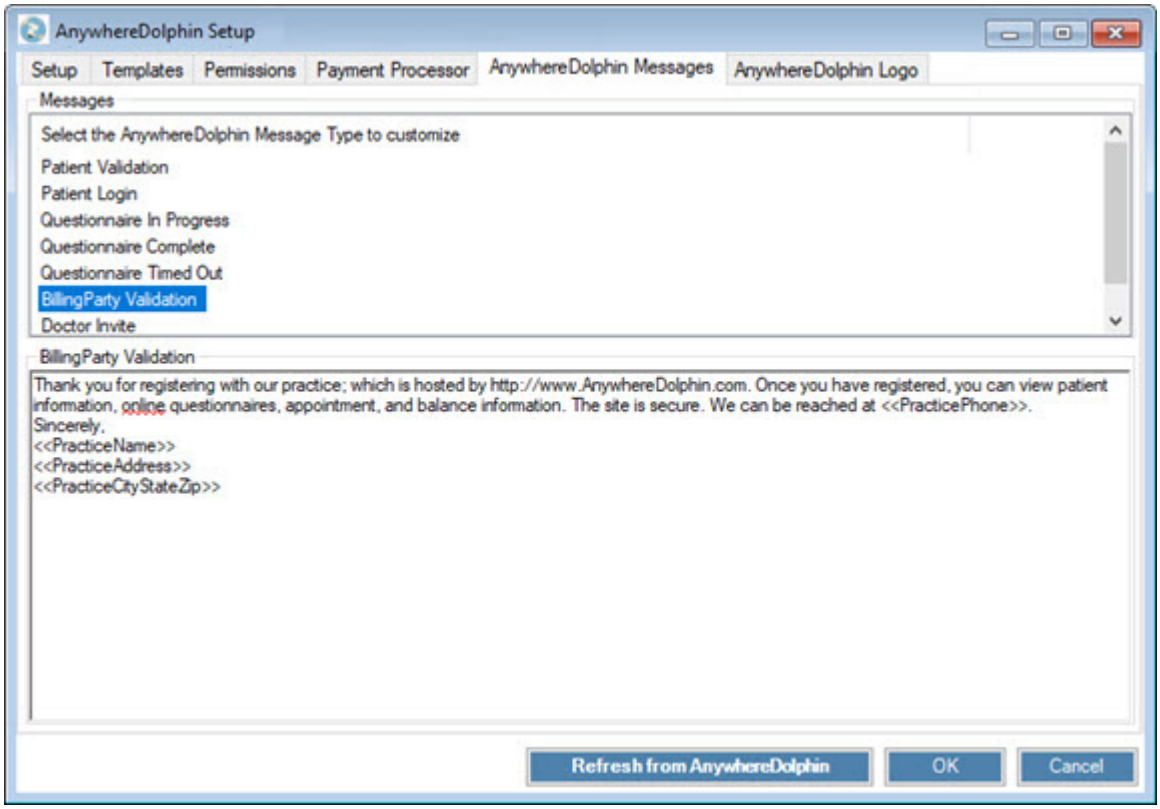
8 Repeat from Step 3 through Step 6 to change the selected permission for all patient users.

AnywhereDolphin Messages Tab

The AnywhereDolphin Messages tab is where you can customize the messages your patients/billing parties see when they access AnywhereDolphin.

To customize these messages:

1 Click the AnywhereDolphin Messages tab.



You can customize the following messages:

Billing Party Validation	This message is inserted into to the login information email that billing parties receive from AnywhereDolphin after their account has been validated.
Doctor Invite	Referring or co-treating doctors see this message when they regsiter with AnywhereDolphin.
NewOnlinePatientQuestionnaire Error	This message is displayed if a potential new patient has a problem scheduling an appointment via New Online Patient Forms.
NewOnlinePatientQuesionnaire Message	This message is displayed when a potential new patient has signed up with your practice via New Online Patient Forms.
NewOnlinePatientQuestionnaire Schedule Appt	This message is displayed when a potential new patient indicates the wish to scheduled an appointment via New Online Patient Forms.
NewOnlinePatientQuesionnaire Welcome	This message is displayed when a potential new patient indicates the desire to be added to your system via New Online Patient Forms.

Patient Login	This message is inserted into the login information email that patients receive from AnywhereDolphin.com after their account has been validated.
Patient Validation	Patients see this message on the AnywhereDolphin.com validation screen.
Questionnaire Complete	Patients see this message after submitting a completed questionnaire.
Questionnaire In Progress	Patients see this message after saving an in-progress questionnaire.
Questionnaire Timed Out	Patients see this message when inactivity has caused the questionnaire to time out.

New Online Patient Forms is included with Dolphin Service Club, but you must still be licensed for it. Contact your Dolphin sales representative for assistance, and refer to the documentation for that product for setup instructions.

2 Select the message you want to edit.

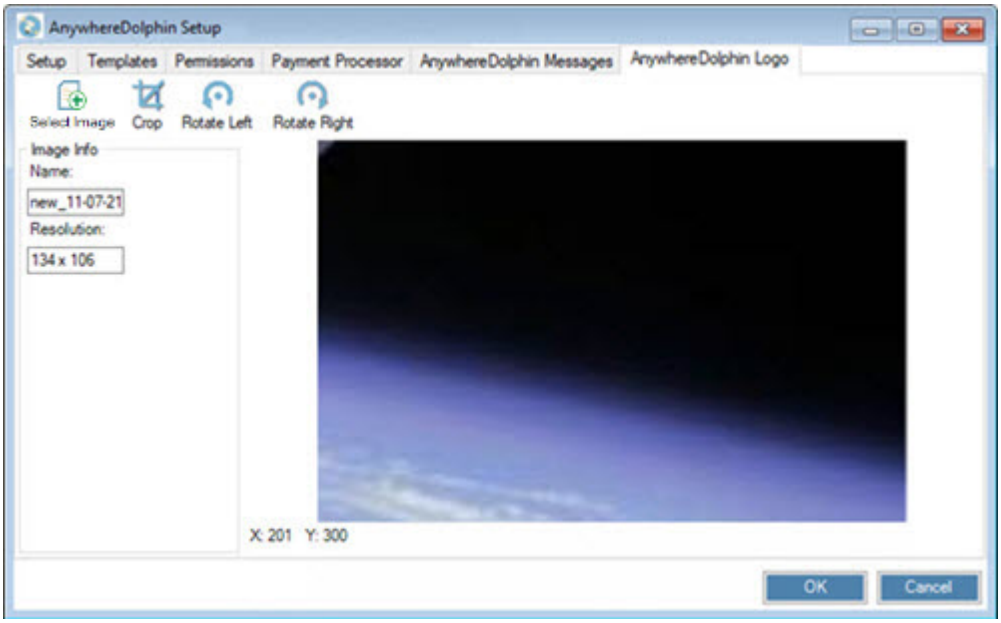
3 Click on the message text to edit it.

4 Click the **Refresh from AnywhereDolphin** button to update the message contents on AnywhereDolphin.

AnywhereDolphin Logo Tab

To change the logo that is displayed when your patients or billing parties access AnywhereDolphin:

1 Click the AnywhereDolphin Logo tab.



2 Click

to browse for an image on your computer.

3 Optionally, crop and/or rotate the image as described below.

4 Click **OK**.

You are prompted to enter your AnywhereDolphin password before the image can be uploaded.

5 If prompted to do so, enter your AnywhereDolphin password.

To crop the image:

1 Click and drag to draw a cropping rectangle around the part of the image you want to keep.

2 Click

to crop out everything outside the cropping rectangle.

To rotate the image:

1 Click

, or

.

32 AnywhereDolphin

With AnywhereDolphin, you can store, organize, share, and distribute patient records through private, password-protected accounts on the AnywhereDolphin web site (www.anywheredolphin.com).

Individuals who do not own any Dolphin products can use Dolphin Imaging Viewer to see patient records that you have shared via AnywhereDolphin. Dolphin Imaging Viewer is a free, and freely-distributable, stand-alone Dolphin patient viewing program. For more information, see www.dolphinimaging.com/product/ImagingViewer.

Note: *AnywhereDolphin is meant for image record sharing. It is not meant to provide an archive of patient records. For information on archiving patient records, see "Using Patient Archives" on page 4-49.*

AnywhereDolphin requires that you have a current support contract and that the Dolphin Sonar module has been set up (see "Setting up Dolphin Sonar" on page 31-1).

Note: *If you have already set up Dolphin Sonar (for example, to send patient data to BeamReaders), you don't need to do it again.*

Logging In and Out

Before you can get patients from the Internet or save patients to the Internet, you must log into AnywhereDolphin. Depending on how Dolphin Sonar is set up on your system, you may need to log in whenever you open any dialog boxes associated with the AnywhereDolphin or BeamReaders features, or you may be prompted to log in only when you try to transfer patient data.

To log in to AnywhereDolphin:

1 Click

, and select an option from the context menu.

All options on the context menu except **Upload Preferences** require you to be logged in.If you need to log in, the Dolphin Sonar Secured Login dialog box appears.

2 Type your AnywhereDolphin user name and password in the fields. Then, click **OK**.

If you do not have an AnywhereDolphin account, click the link on the Dolphin Sonar Secured Login dialog box to go to AnywhereDolphin and set up an account.

To log out:

1 On the Dolphin Sonar dialog box, click **Logout**.

Or,

Exit Dolphin Imaging.

If you exit Dolphin Imaging without logging out, a prompt appears.

2 If a prompt appears asking if you want to log out, click **Yes**.

Getting Patients from the Internet

Note: *If the Dolphin Imaging Security Utilities are installed, you need the Archive Load Patients privilege to get a patient from the Internet. For more information, see "Installing the Security Utilities" on page 1-11 and the Dolphin Management User Guide or Dolphin Management online help (**Dolphin Management User Guide.PDF** or **DM_Help.chm** in your **C:\Dolphin** folder).*

To get patients from the Internet:

1 On the Dolphin Imaging main screen, click

, then select **Download Patient**.

Or,

On the Patient Lookup dialog box, click **Archive**. Then, select **Get Patient From Internet**, and click **OK**.

2 If necessary, log in to AnywhereDolphin as described in "Logging In and Out" on page 32-1.

A dialog box appears where you can select the patient you want to get from the Internet (see below). This dialog box lists patient records that you have uploaded to AnywhereDolphin (indicated by "Owner" in the Record Owner column) and patient records that others have uploaded to AnywhereDolphin and elected to share with you. For more information on sharing patient records, refer to the AnywhereDolphin web site (www.anywheredolphin.com).

3 Select one or more patients to get from the Internet.

To select multiple patients that are next to each other in the list, click one patient, then SHIFT+click another patient. To select multiple patients that are not next to each other in the list, click one patient, then CTRL+click the other patients that you want to select.

4 Set any options for downloading the patient. Then, click **Download**.

5 If you changed any of the download options, click **Yes** on the dialog box that appears if you want to save the new settings for future downloads,

If the patient you selected already exists in your Dolphin database, a dialog box appears prompting you to specify how you want to handle the downloaded patient record so that no existing pictures for the patient are overwritten with pictures from the Internet.

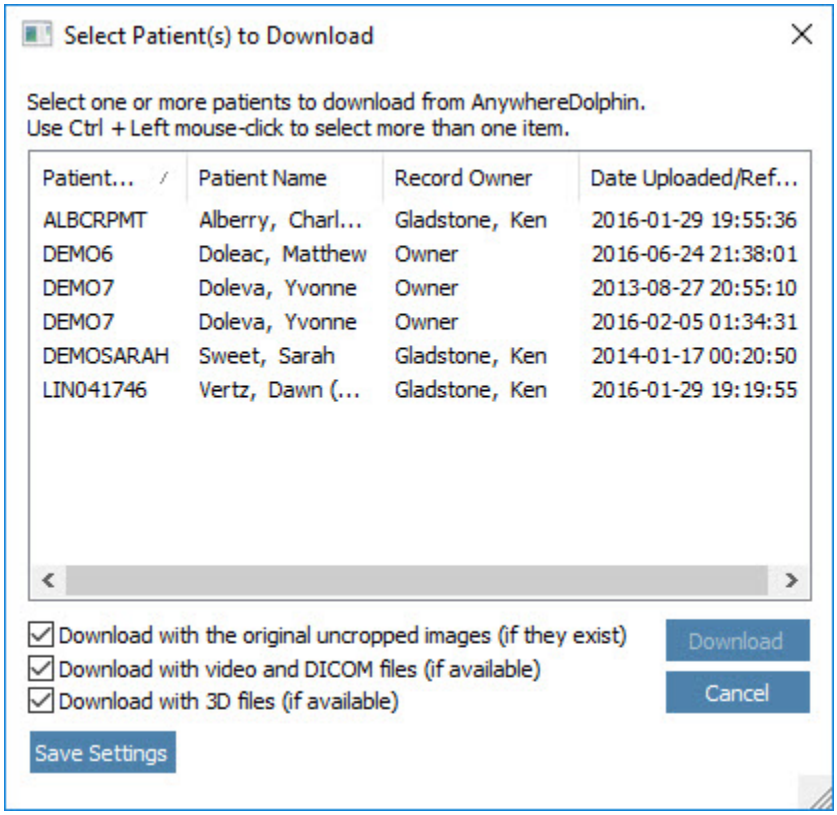
6 If the patient you selected already exists, select **Create New** and enter a new patient ID to create a new record in your Dolphin database for the downloaded patient record. Then, click **Create New**.

Or,

Select **Merge with existing dolphin patient** to merge the downloaded patient record with the information for that patient that already exists in your Dolphin database. Then, click **Merge**.

Depending on how Dolphin Sonar is set up on your system, the patient's record may download immediately, or the Dolphin Sonar dialog box may appear with the download task listed in the Dolphin Sonar queue. If the Dolphin Sonar window opens, see “Processing Dolphin Sonar Queues” on page 32-10 for information on how to start the download process.

The Dolphin Sonar dialog box tracks the download process and indicates when it completes.



Patient ID	ID for the patient.
Patient Name	Patient's name.
Record Owner	AnywhereDolphin user who owns the patient record. “Owner” in this column indicates that you own the patient record.
Date Uploaded/Referred	Date that this record was uploaded to Anywhere Dolphin or shared with you.
Download with the original uncropped images (if they exist)	Downloads any original, uncropped images that exist for this patient on the AnywhereDolphin site.
Download with video and DICOM files (if available)	Downloads any available video or DICOM files for this patient.
Download with 3D files (if available)	Downloads any available 3D volume files for this patient.
Save Settings	Saves the settings you have made on this dialog box.
Download	Gets the selected patient from the Internet.

Saving Patients to the Internet

Dolphin Imaging offers two options for uploading patients to the Internet:

- Use the AnywhereDolphin Upload/Share wizard to upload and share patient records immediately.
- Use the Upload Current Patient process to upload patient records for later sharing. This process can be configured to upload patient records in the background so that uploading patients does not interrupt work on any of your Dolphin workstations.

In either case, Dolphin Imaging uses the Dolphin Sonar module to upload patient records to the Internet. The Dolphin Sonar server must have Internet access and must have the Dolphin Imaging software installed.

Depending on how you have configured Dolphin Sonar on your workstation, the patient records may upload in the background. In this way, uploading patients to the Internet does not interrupt work on any of your Dolphin workstations. The frequency that the Dolphin Sonar server uploads patients from the queue to AnywhereDolphin depends on preferences that you set for the server.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Archive Save Patients privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

Using the Upload/Share Wizard

With the Upload/Share wizard, you can upload patient records and share them immediately with referring doctors. The wizard prompts you for the recipient, so you don't need to go to the AnywhereDolphin web site to specify the recipient.

If a patient's record was already uploaded to the Internet, you can use the Upload/Share wizard just to specify the recipients with whom you want to share it.

Before using the Upload/Share wizard to share a patient's records, the recipients must have valid e-mail addresses entered for them in the Dolphin database. For more information, see "Adding or Changing Patients" on page 4-38.

To start the Upload/Share wizard:

1 Click

.

2 Select **Upload/Share Wizard...**.

3 If necessary, log in to AnywhereDolphin as described in "Logging In and Out" on page 32-1.

The Upload/Share wizard launches, and the Share With dialog box appears. The options that appear on this dialog box depend on whether this patient's record was previously uploaded to AnywhereDolphin and, if so, whether it's currently being shared with anyone.

Selecting Recipients

To select a new recipient with whom to share images for this patient:

1 Click **START SHARING WITH** to begin sharing with the listed recipients.

Or,

Enter email address or AnywhereDolphin user name in the field, and select the type of recipient (**Doctor** or **Patient**).

2 Click **Next >**.

To change what you've previously shared or stop sharing with a recipient:

1 Click **CHANGE WHAT'S ALREADY SHARED WITH**.

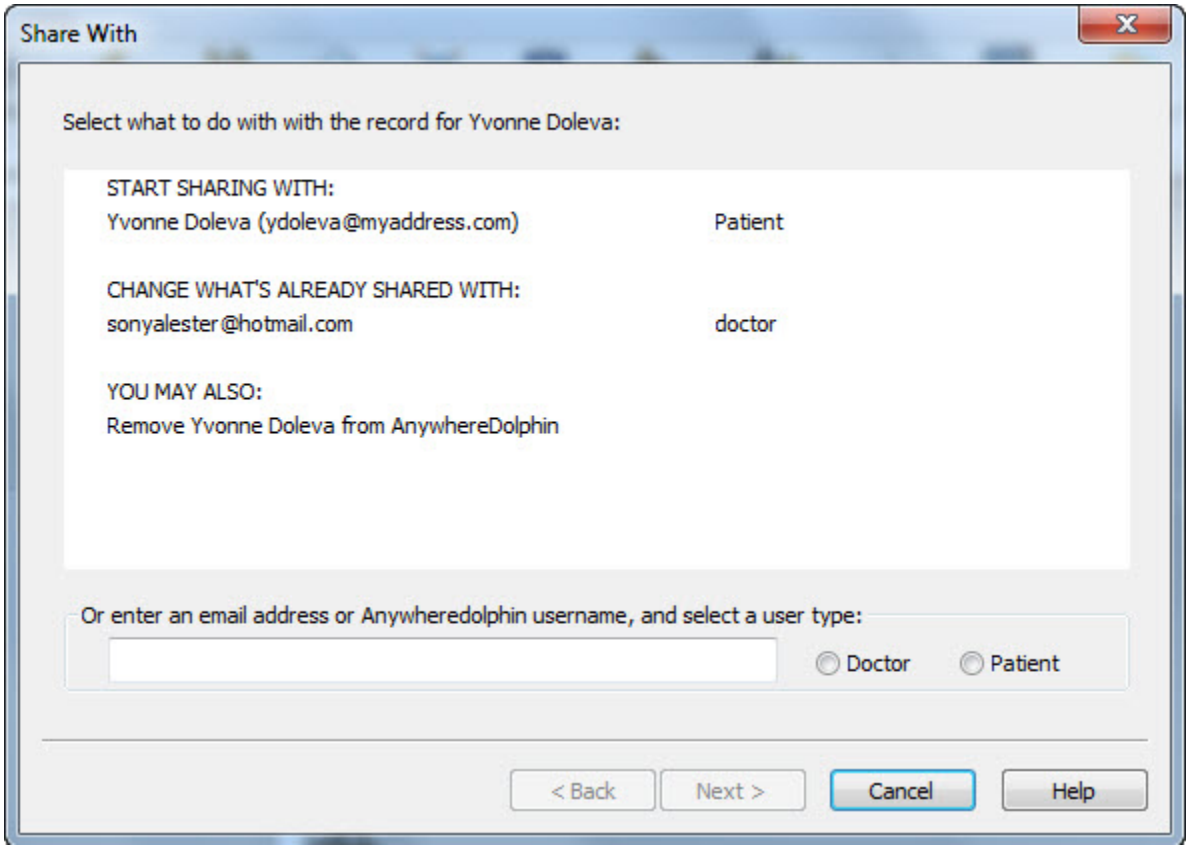
2 Click **Next >**.

To remove previously shared images from AnywhereDolphin.

1 Click **YOU MAY ALSO**.

2 Click **Next >**.

3 Click **Remove** on the confirmation dialog box that appears.



START SHARING WITH	Begins sharing images with the selected recipient.
CHANGE WHAT'S ALREADY SHARED WITH	Changes the images shared with a recipient, or stops sharing images with a recipient. Available only if the patient record was already uploaded to AnywhereDolphin and shared with one or more online referrals.
YOU MAY ALSO	Removes previously shared images from AnywhereDolphin. Available only if the patient record was already uploaded to AnywhereDolphin.
Or enter an email address or Anywheredolphin user name, and select a user type	Begins sharing images with the recipient specified by email address or AnywhereDolphin user name. **Doctor:** The specified recipient is a referral doctor. **Patient:** The specified recipient is a patient.

Selecting Images

After you specify recipients, the Share What dialog box opens and lists the images available for this patient, grouped by timepoint.

To select the images to share:

1 On the Share What dialog box, click each image that you want to share.

Or,

Click **All** to select all of the patient's images for sharing.

Or,

Click **None** to deselect all selected images.

Or,

Click **Reset to Previously Shared** to reset the image list to match what is already shared on the server.

Or,

Click **Stop Sharing...** to stop sharing images previously shared with this recipient.

The **Reset to Previously Shared** and **Stop Sharing...** options only appear if you chose **CHANGE WHAT'S ALREADY SHARED WITH** on the Share With dialog box (see "Selecting Recipients" on page 32-5).

2 Click **Next >**.

3 If you clicked **Stop Sharing...**, click **Stop Sharing** on the confirmation dialog box that appears.

Setting Sharing Options

The final step of the Upload/Share wizard enables you to specify the types of images to upload and any limitations on the recipient's use of this patient's images. You can also write a note to accompany the images.

To set sharing options:

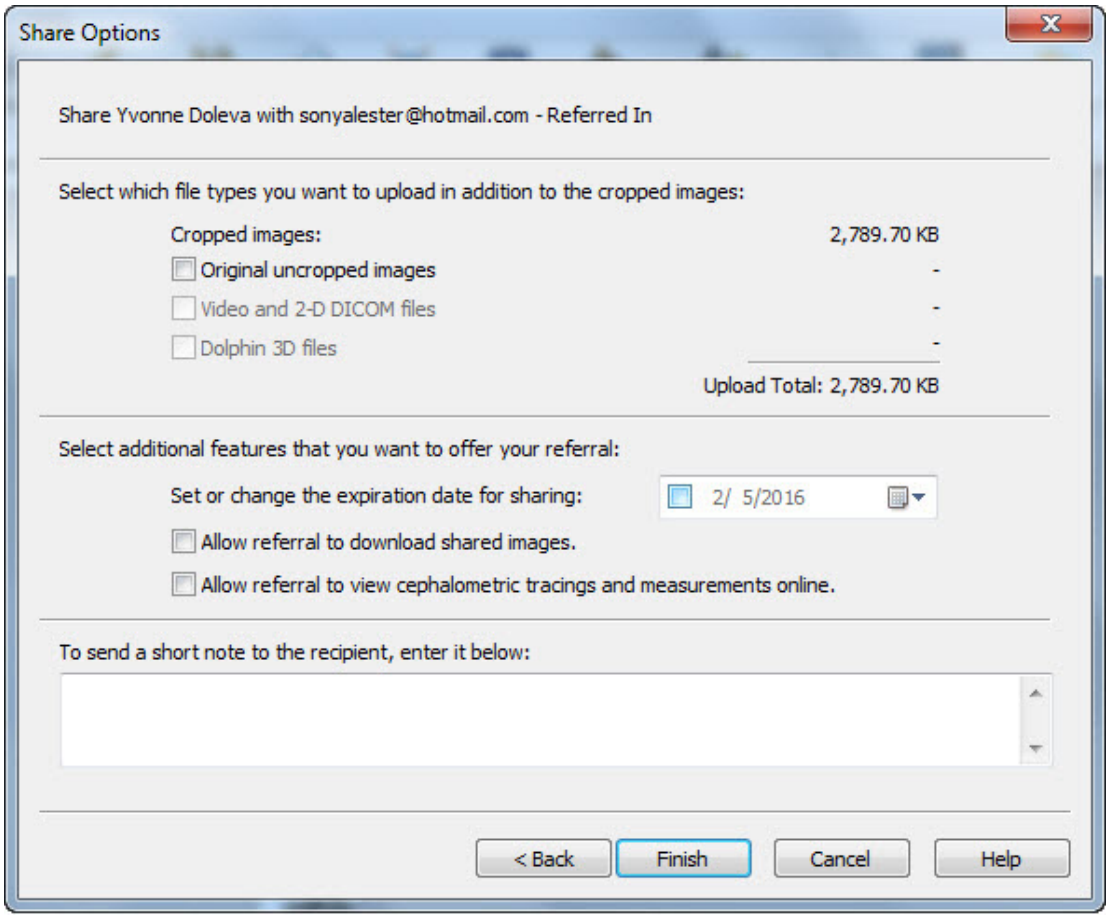
1 Check the box for each type of images that you want to upload in addition to the cropped images.

2 Specify any limitations that you want for the recipient's use of this patient's images.

3 Enter any note that you want to send to the recipient along with the images.

4 Click **Finish**.

The Dolphin Sonar window may appear and list the patient that you are sharing. For more information, see "Processing Dolphin Sonar Queues" on page 32-10.



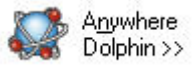
Select which files you want to upload in addition to the cropped images	Specifies any image files to upload in addition to the cropped images. **Original uncropped images:** Uploads any original, uncropped images that exist for this patient to the AnywhereDolphin site. **Video and 2-D DICOM files:** Uploads any available video or 2D DICOM files for this patient. **Dolphin 3D files:** Uploads any available 3D volume files for this patient.
Select additional features that you want to offer your referral	Specifies features to apply to the uploaded images: **Set or change the expiration date for sharing:** Date on which to stop sharing the images with the recipient. **Allow referral to download shared images:** Allows the recipient to download the shared images. This option only appears if the recipient is a referral doctor. **Allow referral to view cephalometric tracings and measurements online:** Allows the recipient to view cephalometric tracings and measurements online. This option only appears if the recipient is a referral doctor.
To send a short note to the recipient, enter it below	Adds a note to the shared patient record.

Uploading Patients for Later Sharing

With this process, you upload patient records to the Internet. Then, you can go to the AnywhereDolphin web site later to specify the recipients with whom you want to share them.

Initiating the Upload Process

To upload the currently selected patient from the Dolphin Main Screen:

1 On the Dolphin Imaging main screen, click 

, then select **Upload Current Patient**.

Or,

On the Patient Lookup dialog box, click **Archive...**. Then, select **Save Patient To Internet**, and click **OK**.

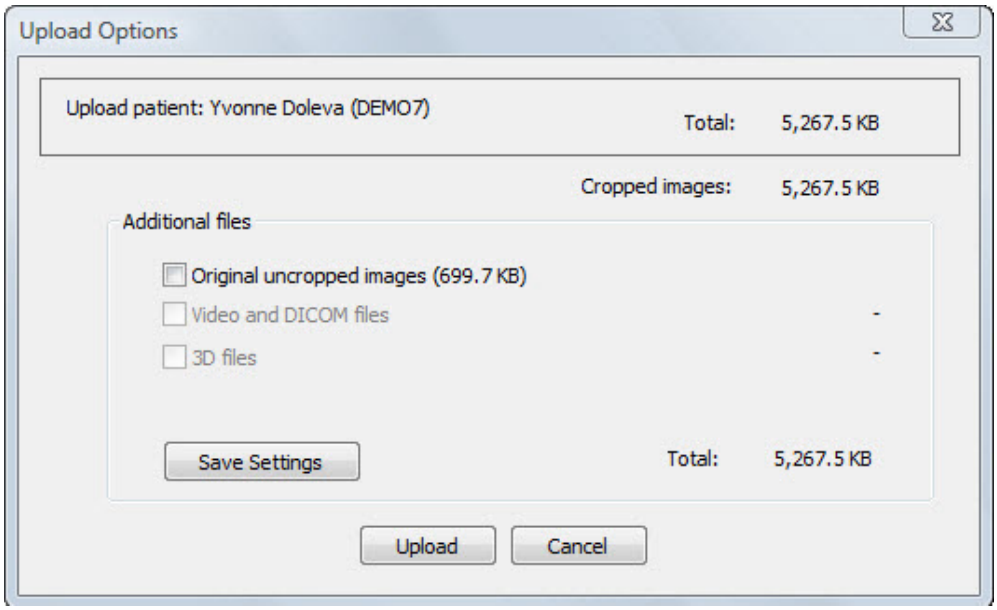
2 If necessary, log in to AnywhereDolphin as described in “Logging In and Out” on page 32-1.

The Upload Options dialog box appears.

3 Set any options for uploading the patient. Then, click **Upload**.

Depending on how Dolphin Sonar is set up on your system, the patient's record may upload immediately, or the Dolphin Sonar dialog box may appear with the upload task listed in the Dolphin Sonar queue. If the Dolphin Sonar dialog box opens, see “Processing Dolphin Sonar Queues” on page 32-10 for information on how to start the upload process.

The Dolphin Sonar dialog box tracks the upload process and indicates when the upload completes. In addition, a message appears above the Microsoft Windows tray confirming completion of the upload task. Depending on how you have configured your AnywhereDolphin account, AnywhereDolphin may send you an email message confirming that the patient was successfully uploaded. When an upload task completes, the message above the Microsoft Windows tray, the Dolphin Sonar window, and any email confirmation you receive provide a link that you can click to open a browser window and navigate to the patient record that was just uploaded to AnywhereDolphin. Then, you can easily share the patient's record with the patient, referring doctor, and so on.



Original uncropped images	Uploads any original, uncropped images that exist for this patient to the AnywhereDolphin site.
Video and DICOM files	Uploads any available video or DICOM files for this patient.
3D files	Uploads any available 3D volume files for this patient.
Save Settings	Save the settings you have made on this dialog box.
Upload	Uploads the selected patient to the Internet.

Setting Upload Preferences

To set upload preferences:

1 Click

.

2 Select **Upload Preferences**.

3 Select **Include original uncropped images (if they exist)** to include original, uncropped images when uploading a patient's record.

Or,

Select **Include video and DICOM files (if they exist)** to include any available video or DICOM files when uploading a patient's record.

Or,

Select **Include 3D files (if they exist)** to include any available 3D volume files when uploading a patient's record.

When you select one of these options, a check mark appears next to it on the menu. To disable an option, select it again from the menu, and the check mark disappears.

Processing Dolphin Sonar Queues

The Dolphin Sonar queue contains tasks for uploading patient records to and downloading them from AnywhereDolphin. It is only necessary to manually process the Dolphin Sonar queue if you have not set the Dolphin Sonar module to automatically process queued items as soon as possible. If you have set this option for the Dolphin Sonar module, the queue is processed automatically.

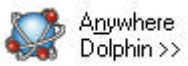
A Dolphin Sonar queue that is not configured for automatic processing can become inactive if a Dolphin Imaging user places tasks in it and either:

- closes the Dolphin Sonar window before processing the pending items in the queue
- leaves pending items in the queue for more than the number of minutes configured in their Dolphin Sonar options

In this case, another Dolphin Imaging user can access the pending items in the inactive queue and process them. Using this feature, you can process the Dolphin Sonar queues for several workstations at one time.

Processing the Dolphin Sonar Queue

To process the Dolphin Sonar Queue:

1 On the Dolphin Imaging Main Screen, click 

. Then, click **Show Sonar Window**.

Or,

Click the in the Microsoft Windows tray on the Dolphin Sonar server. Then, click **Show Dolphin Sonar**.

2 If the Dolphin Sonar Secured Login dialog box appears, log in to AnywhereDolphin as described in “Logging In and Out” on page 32-1.

Or,

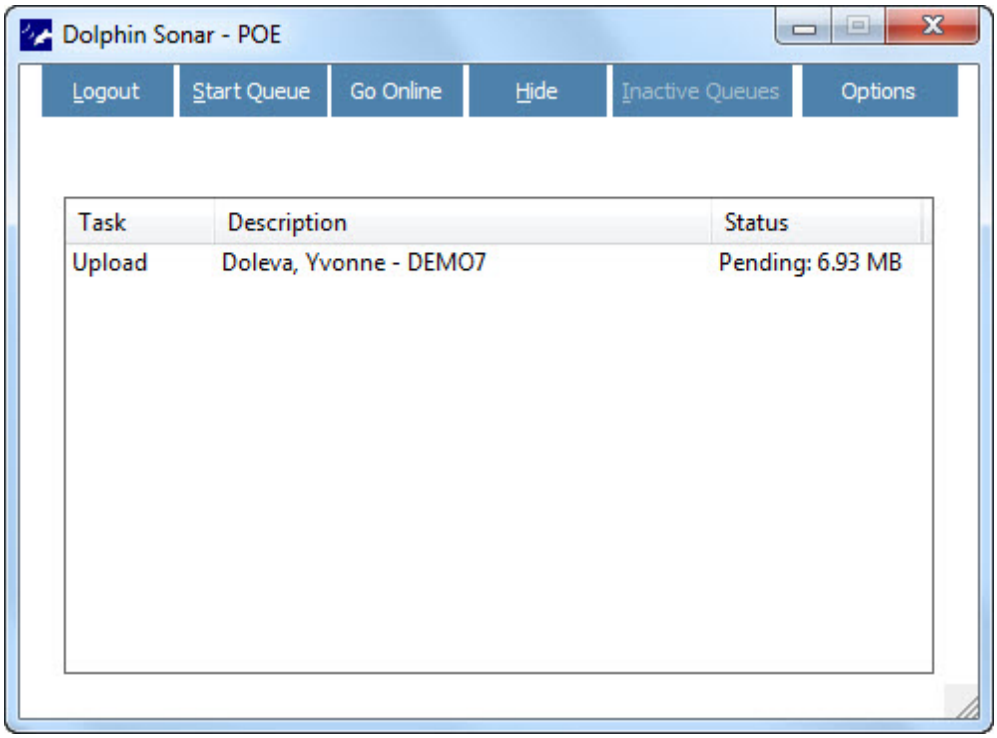
If the Dolphin Sonar dialog box appears and has a **Login** button, click **Login** and log in to AnywhereDolphin.

3 On the Dolphin Sonar dialog box, click **Start Queue** to start processing the tasks in the Dolphin Sonar queue.

The **Start Queue** button changes to **Stop Queue**, so you can stop queue processing.

The Status column indicates the progress of an upload or download task. When an upload task completes, the Status column contains a link that you can click to view the uploaded patient record online. When a download task completes, the Status column indicates a status of **Completed**.

Note: *If you close the Dolphin Sonar window before processing the items in the queue, your queue becomes inactive. Other computers on your network can then access your queue and process the pending items in it. For more information, see "Processing Inactive Queues" on page 32-12.*



Login or Logout	Logs in to or out from AnywhereDolphin.
Start Queue or Stop Queue	Starts or stops queue processing.
Go Online	Opens a browser window and navigates to the AnywhereDolphin web site.
Hide	Minimizes the Dolphin Sonar dialog box.
Inactive Queues	Displays pending tasks in inactive Dolphin Sonar queues for other computers on your network. This option enables you to process the pending tasks in inactive queues.
Options	Sets options for the Dolphin Sonar module.
Task	Queued Dolphin Sonar task.
Description	Description of the Dolphin Sonar task.

Status	Current status of the Dolphin Sonar task. Possible status values are: **Pending:** The patient record is waiting in the queue. **Processing:** The patient record is currently being transferred. **Complete:** The patient record has been transferred. **View Online:** Displays the patient record on AnywhereDolphin.

To remove an item from the Dolphin Sonar queue:

1 Right-click the item you want to remove in the queue.

2 Select **Remove From Queue** from the context menu.

Or,

Select the item you want to remove in the queue. Then, press DEL on your keyboard.

To clear all completed tasks from the Dolphin Sonar queue:

1 Right-click an item in the queue

2 Select **Clear Completed Items** from the context menu.

To view an uploaded patient record on AnywhereDolphin:

1 Click the **View Online** link in the Status column for the item you want to view.

Or,

Right-click the item you want to view in the queue. Then, select **Go To Record Online** from the context menu.

Processing Inactive Queues

To process inactive queues:

1 On the Dolphin Imaging main screen, click

. Then, click **Show Sonar Window**.

Or,

If the Dolphin Sonar module is already started, click in the Microsoft Windows tray on the Dolphin Sonar server. Then, click **Show Dolphin Sonar**.

2 If the Dolphin Sonar Secured Login dialog box appears, log in to AnywhereDolphin as described in “Logging In and Out” on page 32-1.

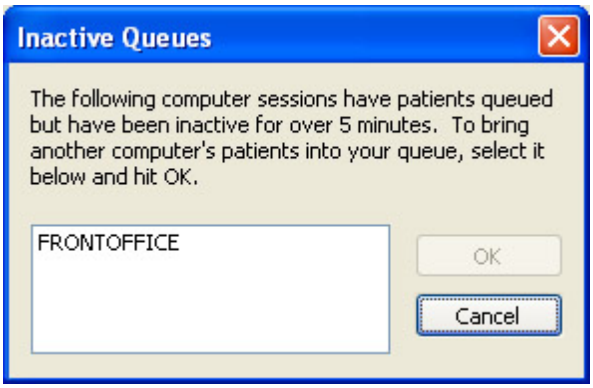
Or,

If the Dolphin Sonar dialog box appears and has a **Login** button, click **Login** and log in to AnywhereDolphin.

If there are any items in inactive queues, the **Inactive Queues** button is active on the Dolphin Sonar dialog box.

3 Click **Inactive Queues**.

The **Inactive Queues** dialog box opens and lists the inactive queues that you can process.



4 To process one of the inactive queues, select it and click **OK**.

A message appears indicating the number of items that have been imported from the inactive queue to your Dolphin Sonar queue. In rare cases, you may see a message indicating that no items could be imported. This message only appears when someone else in your office is processing inactive queues at the same time that you are, and that person imported the inactive queue items before you did.

5 Click **OK**.

The imported items appear in your queue on the Dolphin Sonar window.

6 Process your queue to transfer the items to or from AnywhereDolphin.

Sending AnywhereDolphin Invitations

You can invite patients, billing parties, and referring doctors to set up AnywhereDolphin accounts so that they can securely access information about your practice and patient information that you have shared with them on the AnywhereDolphin web site.

To send an AnywhereDolphin invitation:

1 Select the patient on the Patient Lookup dialog box. Then, click **Details...**.

2 Verify that the patient's birth date has been entered on the **Patient** tab of the Edit a Patient dialog box.

The patient's birth date is required to create an AnywhereDolphin account.

3 If you sending an invitation to a patient, verify that the patient's email address has been entered on the **Patient** tab of the Edit a Patient dialog box.

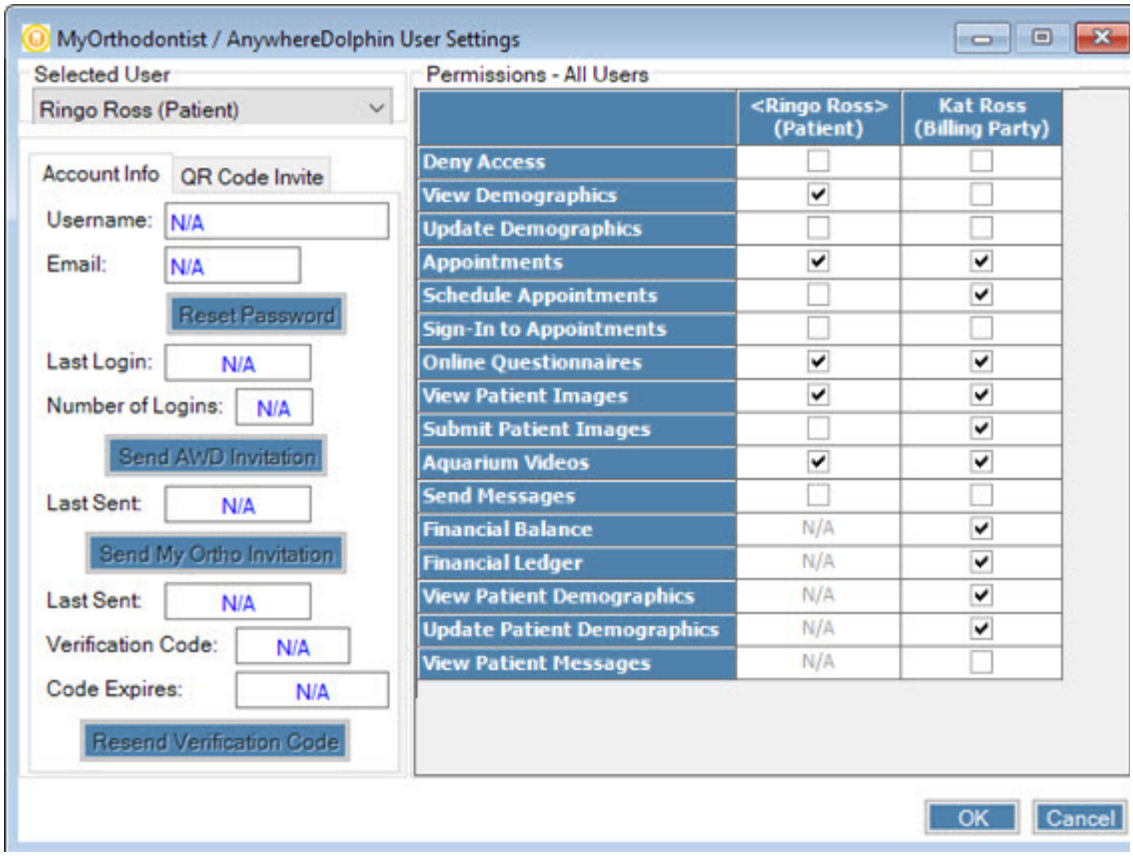
Or,

If you sending an invitation to a billing party, verify that the billing party's email address has been entered on the **Billing Parties** tab of the Edit a Patient dialog box.

These email addresses are required, because various email messages are exchanged with the patient or billing party as part of the account setup process.

4 Click MyOrthodontist.

The My Orthodontist / AnywhereDolphin User Settings dialog box opens. The **Selected User** drop-down list contains the name of the currently selected patient or billing party.

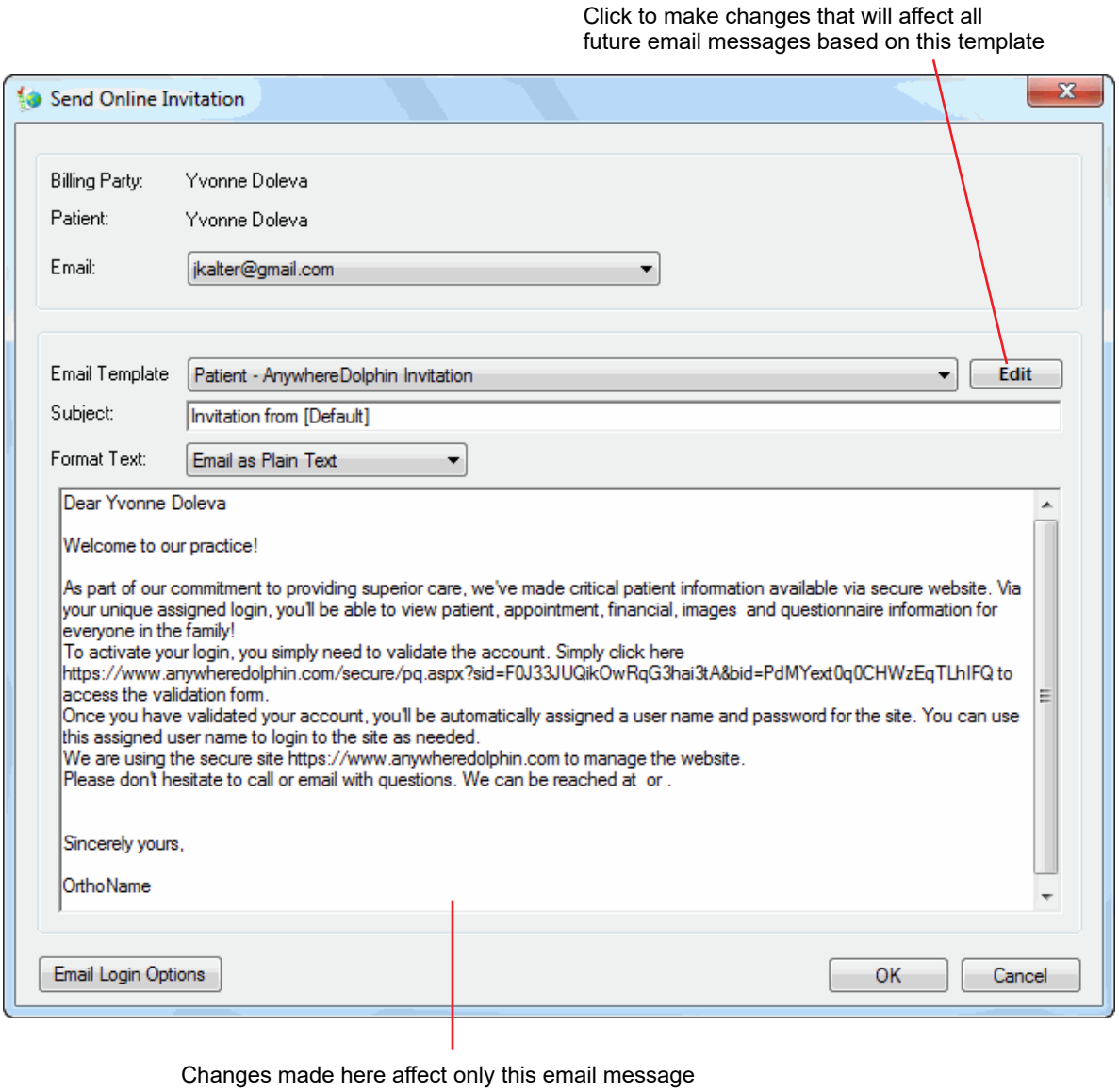


5 Click **Send AWD Invitation**.

6 Select one of the AnywhereDolphin Invitation templates from the **Email Template** drop-down list.

The email template you selected appears in the lower part of the window. If you like, you can make changes in this dialog box that will affect only this email message.

Note: *If you want to make changes that will affect all future email messages based on this template, click **Edit** to edit the email template itself. For more information, refer to the "Email Templates" section of the Dolphin Management online help.*



7 Click **OK** to send the invitation email message.

8 Click **OK** to close the My Orthodontist / AnywhereDolphin User Settings dialog box.

When the recipient opens the email invitation, they will be directed to the AnywhereDolphin web site and prompted for the information necessary to set up an account.

33 BeamReaders

BeamReaders is a third-party service that offers radiology reports and image portfolios. From Dolphin Imaging, you can easily transfers the current patient's record, along with work-order notes, to BeamReaders. Refer to www.beamreaders.com for more information about the services they provide.

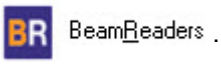
Transferring patient data from Dolphin Imaging to BeamReaders requires that you have a current support contract, an AnywhereDolphin account, and that the Dolphin Sonar module has been set up (see "Setting up Dolphin Sonar" on page 31-1).

Note: *If you have already set up Dolphin Sonar (for example, to use AnywhereDolphin), you don't need to do it again.*

Logging In and Out

Before you can transferring patient data from Dolphin Imaging to BeamReaders, you must log into AnywhereDolphin. Depending on how Dolphin Sonar is set up on your system, you may need to log in whenever you open any dialog boxes associated with the BeamReaders or AnywhereDolphin features, or you may be prompted to log in only when you try to transfer patient data.

To log in:

1 Click 

.

If you need to log in, the Dolphin Sonar Secured Login dialog box appears.

2 Type your AnywhereDolphin user name and password in the fields. Then, click **OK**.

If you do not have an AnywhereDolphin account, click the link on the Dolphin Sonar Secured Login dialog box to go to AnywhereDolphin and set up an account.

To log out:

1 On the Dolphin Sonar dialog box, click **Logout**.

Or,

Exit Dolphin Imaging.

If you exit Dolphin Imaging without logging out, a prompt appears.

2 If a prompt appears asking if you want to log out, click **Yes**.

Sending Patient Records to BeamReaders

To transfer data for the currently selected patient to BeamReaders:

1 On the Dolphin Imaging main screen, click .

2 If necessary, log in as described in “Logging In and Out” on page 33-1.

The BeamReaders dialog box appears (see below).

3 Check the box for each BeamReaders service that you want to order.

Refer to www.beamreaders.com for more information about the services BeamReaders provides.

4 Check one or more boxes to indicate the purpose of the BeamReaders study that you want to order.

5 Enter any work-order notes in the **Doctor Notes** field.

6 In the Requested Timepoints list, click the timepoints containing the patient records that you want send to BeamReaders.

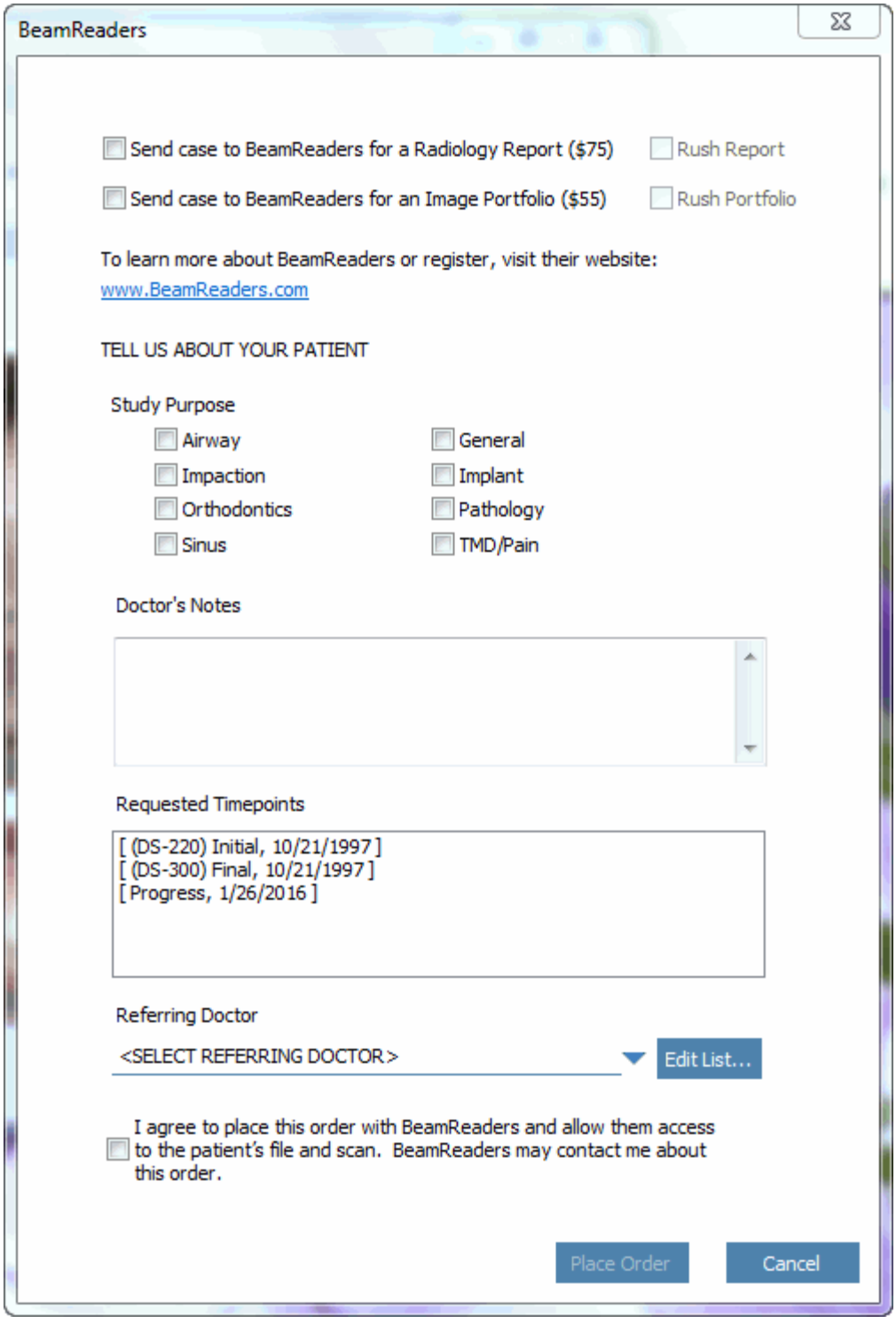
You can click more than one timepoint. Click a timepoint again to deselect it.

7 Select the referring doctor for this patient from the **Referring Doctor** drop-down list.

If the referring doctor isn’t in the drop-down list, click **Edit List...** to open the Doctor List dialog box and add a new referring doctor. For more information, see “Editing Doctors” on page 3-53.

8 Check the box at the bottom of the dialog box to agree to the terms for placing a BeamReaders order.

9 Click **Place Order**.


BeamReaders
Send case to BeamReaders for a Radiology Report ($75)
Rush Report
Send case to BeamReaders for an Image Portfolio ($55)
Rush Portfolio
To learn more about BeamReaders or register, visit their website:
www.BeamReaders.com
TELL US ABOUT YOUR PATIENT
Study Purpose
Airway
General
Impaction
Implant
Orthodontics
Pathology
Sinus
TMD/Pain
Doctor's Notes
Requested Timepoints
[(DS-220) Initial, 10/21/1997]
[(DS-300) Final, 10/21/1997]
[Progress, 1/26/2016]
Referring Doctor
<SELECT REFERRING DOCTOR>
Edit List...
I agree to place this order with BeamReaders and allow them access to the patient's file and scan. BeamReaders may contact me about this order.
Place Order
Cancel

Send case to BeamReaders for a Radiology Report	Orders a radiology report.
Rush Report	Submits the radiology report request as a rush order. Only available if the **Send case to BeamReaders for a Radiology Report** box is checked
Send case to BeamReaders for an Image Portfolio	Orders an image portfolio.
Rush Portfolio	Submits the image portfolio request as a rush order. Only available if the **Send case to BeamReaders for an Image Portfolio** box is checked
Study Purpose	Purpose of the BeamReaders study that you want to order.
Doctor's Notes	Any work-order notes that you want to accompany this order.
Requested Timepoints	Timepoints available for this patient.
Referring Doctor	Referring doctor for this patient. **Edit List...:** Opens the Doctor List dialog box so that you can add or change information for a referring doctor. For more information, see "Editing Doctors" on page 3-53.
I agree...	Indicates that you agree to the terms for placing a BeamReaders order.
Place Order	Places your BeamReaders order.

Part VI: Dolphin Letters System (DLS)

This part of the *Dolphin Imaging User's Guide* describes how to use the Dolphin Letter System (DLS) module. This module simplifies and automates generation of referral and patient letters. Every letter can include your patient's digital pictures. You can choose from dozens of pre-defined, professionally written correspondence templates or easily customize your own. DLS can be fully integrated with all your Dolphin Imaging software modules.

- Chapter 34, Questionnaires describes creating and using questionnaires to collect information for later use with the Dolphin Letters System.
- Chapter 35, The Dolphin Letter System (DLS) describes creating letters that include patient images and information collected using your questionnaires. It also describes setting up custom templates that you can use in addition to the letter templates provided with the Dolphin Letters System.
- Chapter 36, Letter Templates describes the letter templates provided with the Dolphin Letters System.

34 Questionnaires

Using questionnaires, you can define the information to store in the database for later use with the Dolphin Letters System.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Edit Menu and Edit Questionnaires privileges granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

With this feature, you can define any number of questionnaires, each with a unique name. Once you have defined a questionnaire, you can use it to enter the information for a specific patient and timepoint (for instance, during the initial consultation).

For example, you may decide to run a questionnaire during patient treatment to store the treatment findings. Later, you could start the Dolphin Letter System, and the information needed for the patient letter would already be stored in the database.

Dolphin Imaging offers the following types of questionnaires:

- The multi-page questionnaire presents the questions in a series of dialog boxes. It is the standard questionnaire interface.
- The one-page questionnaire presents a single dialog box containing all the questions. It is bundled with the Dolphin Imaging Security Utilities and is only available if you have the utilities installed.
- The Dolphin Management Super Questionnaire feature is bundled with the Dolphin Imaging Security Utilities and is only available if you have the utilities installed.

If you have Dolphin Imaging Security Utilities installed, you can also generate PowerPoint Presentations from your customized questionnaires. You can link related media, such as graphics, video, or other animation, and the linked media becomes part of the presentation based on the patient's answers to the questionnaire.

For information on the one-page questionnaire, Super Questionnaire, and presentations, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).

Setting Up a Questionnaire

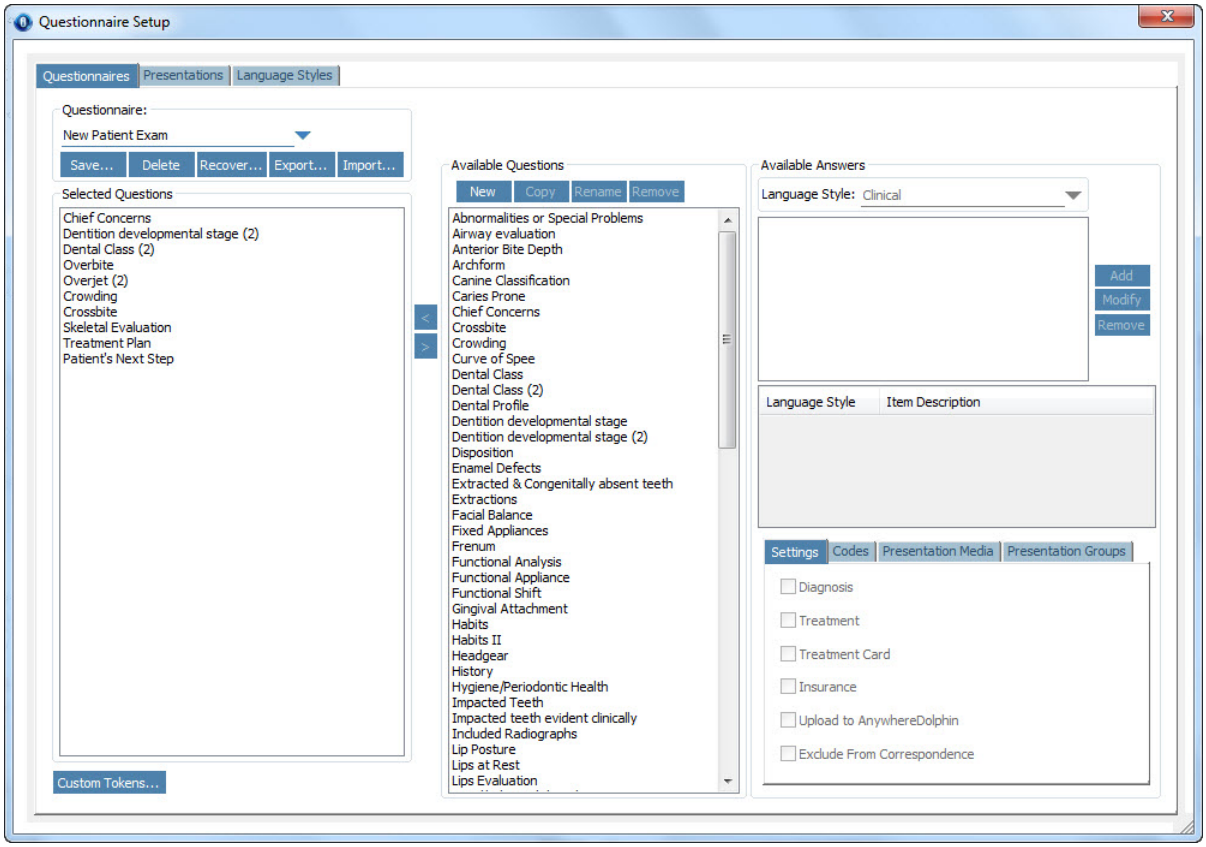
To set up or view questionnaires:

1 Select **Questionnaire Setup** from the **Edit** menu.

Or,

Select **Edit Diagnostic Lists** from the Dolphin Letter System (DLS) **Letters** menu.

The Questionnaire Setup dialog box appears.



Questionnaire	Lists existing questionnaires that you can view, modify, or delete. **New...:** Adds a new questionnaire. For more information, see “Adding a New Questionnaire” on page 34-5. **Save...:** Saves the current questionnaire. **Delete:** Marks the selected questionnaire as deleted. Deleted questionnaires are not removed from your database, so you can recover them. For more information, see “Deleting or Recovering a Questionnaire” on page 34-7. **Recover:** Recovers a questionnaire that has been marked as deleted. For more information, see “Deleting or Recovering a Questionnaire” on page 34-7. **Export...:** Exports the questionnaire to a .QST file. For more information, see “Importing and Exporting Questionnaires” on page 34-8. **Import...:** Imports a .QST file. For more information, see “Importing and Exporting Questionnaires” on page 34-8.
Selected Questions	Questions chosen for the questionnaire. For more information, see “Adding, Removing, and Reordering Questions” on page 34-6.
Custom Tokens...	Opens the Custom Tokens dialog box, so you can define custom tokens for questionnaires. For more information, see “Adding, Removing, and Reordering Custom Tokens” on page 34-6
Available Questions	Questions available to add to this questionnaire. **New:** Adds a new question to the list. For more information, see “Adding, Removing, and Reordering Questions” on page 34-6. **Copy:** Copies the selected question. For more information, see “Copying a Question” on page 34-9. **Rename:** Renames a question. For more information, see “Renaming a Question” on page 34-9. **Remove:** Removes the selected question from the list. For more information, see “Adding, Removing, and Reordering Questions” on page 34-6.
< or >	Move questions between the **Available Questions** and **Selected Questions** lists. “Adding, Removing, and Reordering Questions” on page 34-6

Available Answers	Answers available for the selected question (for example, if the question is crowding, the answer would be the type of crowding). **Language Style:** Language style (**Clinical**, **Dentist**, **Layman** or one of your custom styles). For more information, see “Adding and Removing Language Styles” on page 34-16. **Add:** Adds a code and phrase specific to your practice. For more information, see “Adding a Code to an Answer Item” on page 34-15. **Modify:** Modifies existing codes and/or phrases. For more information, see “Modifying an Answer Item” on page 34-12. **Remove:** Removes codes and/or phrases that are not applicable to your practice. For more information, see “Removing an Answer Item” on page 34-13. This group box contains the following tabs: **Settings:** Categorize answer items. For more information, see “Categorizing an Answer Item” on page 34-12. **Codes:** Add and maintain the codes associated with answer items. For more information, see “Using Codes” on page 34-14. **Presentation Media:** Associate presentation media with answer items. This feature is only available if you have the Dolphin Imaging Security Utilities installed. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder). **Presentation Groups:** Associate answer items with presentation groups. This feature is only available if you have the Dolphin Imaging Security Utilities installed. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).

Adding and Editing Questionnaires

The following procedures describe how to:

- Add a new questionnaire
- Modify an existing questionnaire
- Add, remove, and reorder questions in a questionnaire
- Add, remove, and reorder custom tokens in a questionnaire
- Delete and recover questionnaires
- Import and export questionnaires

Adding a New Questionnaire

To add a new questionnaire:

1 In the Questionnaire Setup dialog box, click **New**.

A dialog box appears where you enter a name for the questionnaire.

2 Enter a descriptive name for the questionnaire. Then, click **OK**.

For example, you might enter “Initial Exam Questions.”

3 Add, remove, or reorder the questions in the questionnaire.

For more information, see “Adding, Removing, and Reordering Questions” on page 34-6.

4 Add, remove, or reorder the custom tokens in the questionnaire.

For more information, see “Adding, Removing, and Reordering Custom Tokens” on page 34-6.

5 Click **Save...** to save the questionnaire.

6 Optionally, enter a new name for this questionnaire.

7 Click **OK**.

If a questionnaire already exists with the same name as this questionnaire, a dialog box opens asking whether you would like to overwrite it.

8 Click **Yes** to overwrite the existing questionnaire.

Or,

Click **No** if you do not want to overwrite the existing questionnaire.

Modifying an Existing Questionnaire

To modify an existing questionnaire:

1 In the Questionnaire Setup dialog box, select the questionnaire to modify from the **Questionnaire** drop-down list.

2 Add, remove, or reorder the questions in the questionnaire.

For more information, see “Adding, Removing, and Reordering Questions” on page 34-6.

3 Add, remove, or reorder the custom tokens in the questionnaire.

For more information, see “Adding, Removing, and Reordering Custom Tokens” on page 34-6.

4 Click **Save...** to save the questionnaire and close the Questionnaire Setup dialog box.

5 Optionally, enter a new name for this questionnaire.

6 Click **OK**.

If a questionnaire already exists with the same name as this questionnaire, a dialog box opens asking whether you would like to overwrite it.

7 Click **Yes** to overwrite the existing questionnaire.

Or,

Click **No** if you do not want to overwrite the existing questionnaire.

Adding, Removing, and Reordering Questions

To add a question to a questionnaire:

1 In the **Available Questions** list, select a question, and click **<** to move it to the **Selected Questions** list.

To remove a question from a questionnaire:

1 In the **Selected Questions** list, select a question, and click **>** to move it to the **Available Questions** list.

To change the order of questions in a questionnaire:

1 Click and drag questions in the **Selected Questions** list.

Adding, Removing, and Reordering Custom Tokens

To add a new custom token:

1 On the **Questionnaires** tab of the Questionnaire Setup dialog box, click **Custom Tokens...**.

The Customs Tokens dialog box opens.

2 Type the new custom token in the field.

3 To keep this token for future use, click **Keep**.

If you do not keep the custom token, it will be available for this questionnaire only.

4 To add this custom token to the questionnaire, click **>** to move it to the **Selected** list.

To remove a custom token from the questionnaire:

1 On the **Questionnaires** tab of the Questionnaire Setup dialog box, click **Custom Tokens...**.

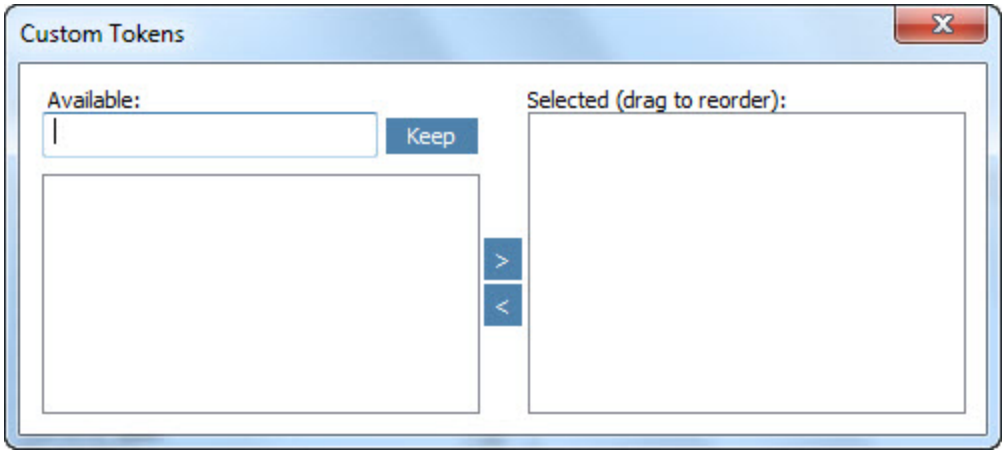
The Customs Tokens dialog box opens.

2 Select a token from the **Selected** list.

3 To remove this custom token from the questionnaire, click **<** to move it to the **Available** list.

To reorder the custom tokens:

1 Click and drag tokens in the **Selected** list.



Available	Available custom tokens. **field:** Name of a new custom token for this questionnaire. **Keep:** Keeps the new custom token for use with other questionnaires. **list:** Existing custom tokens available for use in this questionnaire.
> or <	Move custom tokens between the **Available** and **Selected** lists.
Selected	Custom tokens selected for use in this questionnaire.

Deleting or Recovering a Questionnaire

Deleting a questionnaire does not actually remove it from your database. It simply marks the questionnaire as deleted. Later, you can recover the questionnaire.

To delete a questionnaire:

1 In the Questionnaire Setup dialog box, select the questionnaire to delete from the **Questionnaire** drop-down list.

2 Click **Delete...**.

3 Click **Yes** to confirm the deletion.

To recover a deleted questionnaire:

1 Click **Recover...**.

A dialog box appears listing all the questionnaires marked as deleted.

2 Select the questionnaire to recover. Then, click **OK**.

Importing and Exporting Questionnaires

To import a questionnaire:

1 In the Questionnaire Setup dialog box, click **Import...**.

A dialog box opens so that you can browse to the file containing the questionnaire.

2 Browse to the file containing the questionnaire, and click **Open**.

Questionnaire files have a .QST extension.

If a questionnaire already exists with the same name as the questionnaire you are importing, a dialog box opens asking you to enter a new name for the imported questionnaire.

3 Enter a new name if necessary, and click **OK**.

To export a questionnaire:

1 In the Questionnaire Setup dialog box, click **Export...**.

A dialog box opens so that you can specify the file in which to save the questionnaire.

2 Specify the file in which you save the questionnaire, and click **Save**.

Setting up Questions

The following procedures describe how to:

- Create a new question
- Copy a question
- Rename a question
- Remove a question

Once you have your questions set up, you can use them to create questionnaires. For more information, see “Adding, Removing, and Reordering Questions” on page 34-6.

Creating a New Question

To create a new question and add it to the Available Questions group box:

1 Click **New** in the Available Questions group box.

The Add Question dialog box appears.

2 Enter the text for the question in the **Question Name** field.

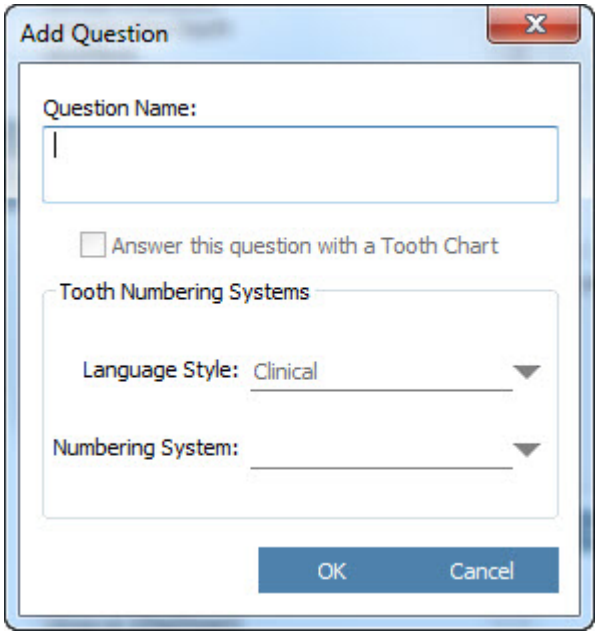
3 Check the **Answer this question with a Tooth Chart** box to select from a tooth chart when answering this question.

4 Select the language style (**Clinical**, **Layman**, **Dentist**, or one of your custom styles) to use for the answer to this question from the **Language Style** drop-down list.

For more information, see “Adding and Removing Language Styles” on page 34-16.

5 Select the type of numbering system to use on the tooth chart from the **Numbering System** drop-down list.

6 Click **OK**.



Question Name	Name of a question. Up to 40 characters.
Answer this question with a Tooth Chart	Enables the person running the questionnaire to select from a tooth chart when answering this question.
Tooth Numbering Systems	Options for answers to this question. **Language Style:** Language style to use for to use for the answer to this question. For more information, see “Adding and Removing Language Styles” on page 34-16. **Numbering System:** Numbering style for the tooth chart.

Copying a Question

To copy a question in Available Questions group box:

1 Click the question to copy.

2 Click **Copy**.

A dialog box appears containing a default name for the new question in a field.

3 Enter a name for the new question in the field. Then, click **OK**.

Renaming a Question

To rename a question in Available Questions group box:

1 Click the question to change.

2 Click **Rename**.

A dialog box appears containing the current name in a field.

3 Enter the new name for this question in the field. Then, click **OK**.

Removing a Question

To remove a question:

1 Click the question to remove.

2 Click **Remove**.

3 Click **Yes** in the confirmation dialog box that appears to delete the question.

Setting up Answers

The procedures in this section describe how to:

- Add an answer item
- Use different phrases for different language styles
- Categorize and answer item
- Modify an answer item
- Remove an answer item

Adding an Answer Item

To add an answer item:

1 In the Available Questions group box, select the question for which to add an answer item.

2 Click **Add** next to the **Available Answers** list.

The Add Choice dialog box appears.

3 Enter a diagnosis code in the **Code** field.

For a list of diagnosis codes and their definitions, see “DLS Diagnostic Lists and Codes” on page B-12

4 Enter a phrase describing this answer item in the **Phrase** field. Then, click **OK**.

This phrase appears in DLS letters when this answer item is selected. For each answer item, you must have a clinical phrase. If you wish to use additional language styles, you can then select the clinical phrase and modify it to add a phrase in another language style as described in “Adding and Removing Language Styles” on page 34-16. By using different language styles, you can tailor the phrasing of your letters appropriately for different recipients.

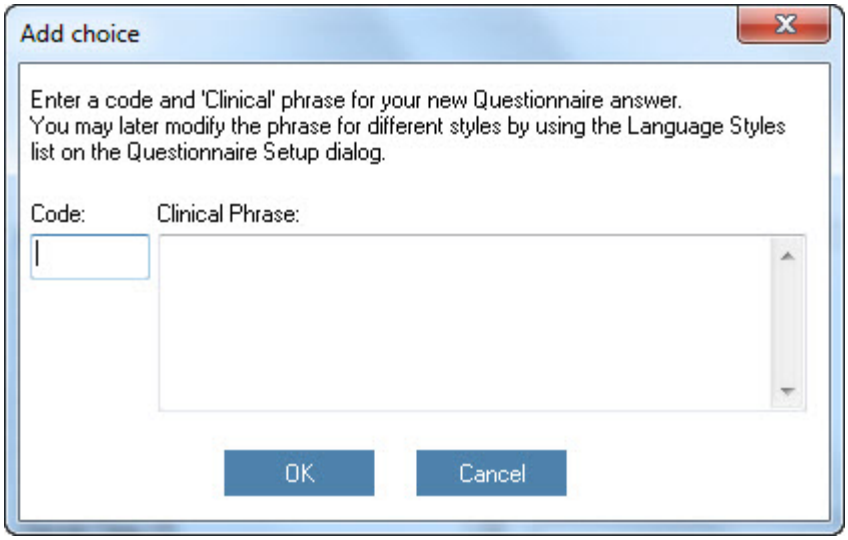
When adding a phrase, you can include any DLS reserved tokens. These tokens are replaced by the corresponding information from the Dolphin database. To use a token in the phrase, type the token name enclosed in curly braces ({ }) in the **Clinical Phrase** field. For example, you could enter the following:

{PatientFirstName} {PatientLastName} does not need treatment at this time.

Then, whenever you used this answer item in a questionnaire or DLS letter, Dolphin would insert the patient’s first and last name. For example, if the patient’s name is John Smith, this phrase appears in questionnaires and letters as follows:

John Smith does not need treatment at this time.

For a list of DLS reserved tokens and their definitions, see “Tokens” on page B-1.



Code	Diagnosis code of up to 12 alphanumeric characters. For a list of diagnosis codes and their definitions, see “DLS Diagnostic Lists and Codes” on page B-12.
Phrase	Phrase for this answer item. Up to 120 characters.

Using Different Phrases for Different Language Styles

Language styles enable you to tailor the phrasing of your letters appropriately for different recipients. For each language style, you define phrases for questionnaire answer items. When an answer item is used in a letter, the phrase from the appropriate language style is inserted.

For example, to send a letter outlining a treatment plan to a patient and to the patient's dentist, you could use the Layman language style for the letter to the patient, and that letter would use layman phrases to describe treatments. You could use the Dentist language style for the letter to the patient's dentist, and that letter would use phrases appropriate for describing treatments to a dentist.

To add a phrase in a language style other than clinical:

1 In the Available Questions group box, select the question for which to add a different language style phrase.

2 Select the language style to associate with the new phrase from the **Language Style** drop-down list.

3 Select the answer item for which to add a different language style phrase.

4 Click **Modify**.

The Modify Choice dialog box appears showing the clinical phrase for this item.

5 Type a different phrase in the field and click **OK**.

This phrase appears in DLS letters when this answer item is selected. When adding a phrase, you can include any DLS reserved tokens. These tokens are replaced by the corresponding information from the Dolphin database. To use a token in the phrase, type the token name enclosed in curly braces ({ }) in the field. For example, you could enter the following:

{PatientFirstName} {PatientLastName} does not need treatment at this time.

Then, whenever you used this answer item in a questionnaire or DLS letter, Dolphin would insert the patient's first and last name. For example, if the patient's name is John Smith, this phrase appears in questionnaires and letters as follows:

John Smith does not need treatment at this time.

For more information on DLS reserved tokens, see "Tokens" on page B-1.

Categorizing an Answer Item

To categorize an answer item:

1 Select an answer item from the **Available Answers** list on the Questionnaires Setup dialog box.

2 On the **Settings** tab, check the appropriate boxes for this answer item.

You can categorize the answer item as follows:

- **Diagnosis** - check if the answer pertains to diagnosis.
- **Treatment** - check if the answer pertains to treatment.
- **Treatment Card** - check to include this answer on the patient's treatment card.
- **Insurance** - check to include this answer on insurance correspondence.
- **Exclude From Correspondence** - check to exclude this answer from letters.

Modifying an Answer Item

To modify an answer item:

1 In the Available Questions group box, select the question for which to modify an answer item.

2 Click **Modify** next to the **Available Answers** list.

The Modify Choice dialog box appears, and the **Code** and **Clinical Phrase** fields contain the code and phrase associated with the question you selected in the first step.

3 Optionally, change the diagnosis code or phrase. Then, click **OK**.

For a list of diagnosis codes and their definitions, see "DLS Diagnostic Lists and Codes" on page B-12.

The phrase appears in DLS letters when this answer item is selected. For each answer item, you must have a clinical phrase. If you wish to use additional language styles, you can then select the clinical phrase and modify it to add a phrase in another language style as described in "Adding and Removing Language Styles" on page 34-16. By using different language styles, you can tailor the phrasing of your letters appropriately for different recipients.

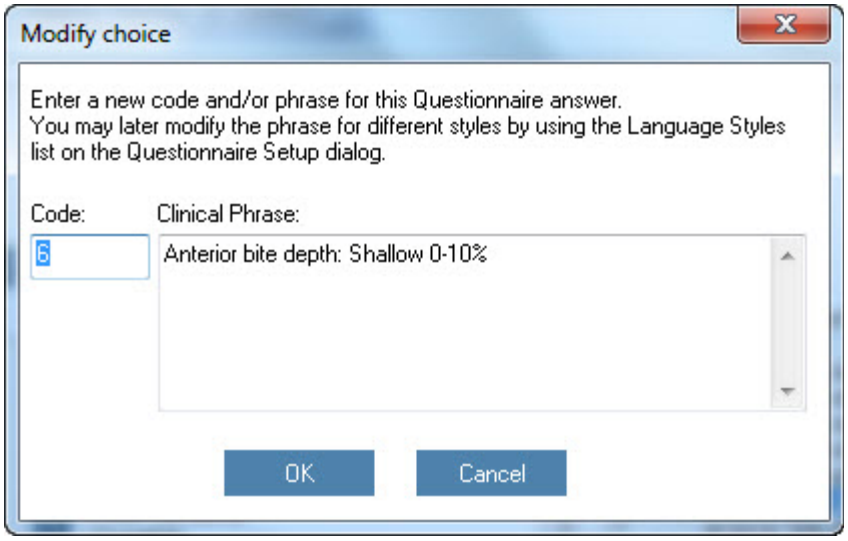
When adding a phrase, you can include any DLS reserved tokens. These tokens are replaced by the corresponding information from the Dolphin database. To use a token in the phrase, type the token name enclosed in curly braces ({ }) in the **Clinical Phrase** field. For example, you could enter the following:

{PatientFirstName} {PatientLastName} does not need treatment at this time.

Then, whenever you used this answer item in a questionnaire or DLS letter, Dolphin would insert the patient's first and last name. For example, if the patient's name is John Smith, this phrase appears in questionnaires and letters as follows:

John Smith does not need treatment at this time.

For a list of DLS reserved tokens and their definitions, see "Tokens" on page B-1.



Code	Diagnosis code of up to 12 alphanumeric characters. For a list of diagnosis codes and their definitions, see "DLS Diagnostic Lists and Codes" on page B-12.
Phrase	Phrase for this answer item. Up to 120 characters.

Removing an Answer Item

To remove an answer item for a diagnostic question:

1 In the Available Questions group box on the Questionnaire Setup dialog box, select the diagnostic question for which to remove an answer item.

2 Select the answer item to remove, and click **Remove**.

3 Click **Yes** in the confirmation dialog box that appears to delete the answer item.

Using Codes

On the **Codes** tab, you can:

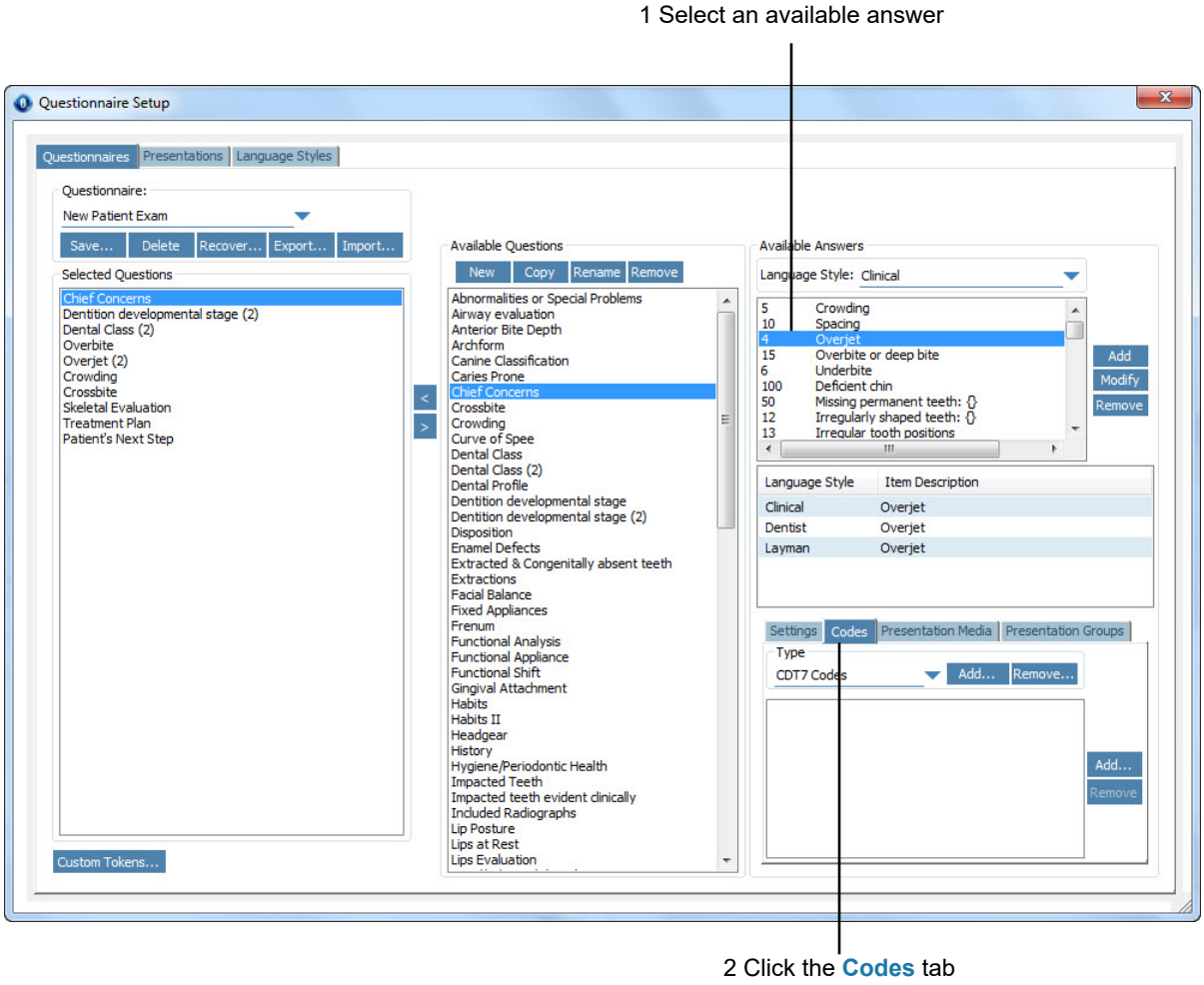
- add a code type
- remove a code type
- associate a code with an answer item
- remove a code from an answer item

For a list of diagnosis codes and their definitions, see “DLS Diagnostic Lists and Codes” on page B-12.

To access the **Codes** tab

1 Select an answer from the **Available Answers** list on the Questionnaires Setup dialog box.

2 Click the **Codes** tab in the lower right of the Questionnaire Setup dialog box.



Adding a Code Type

To add a code type:

1 On the **Codes** tab, click **Add...** in the **Type** group box.

The Code Type dialog box appears.

2 Enter a name for this code type, and click **OK**.

Removing a Code Type

To remove a code type:

1 On the **Codes** tab, select the code type to remove from the **Type** drop-down list.

2 Click **Remove...** in the Type group box.

3 Click **Yes** in the confirmation dialog box that appears to delete the code type.

Adding a Code to an Answer Item

To add a code to an answer item:

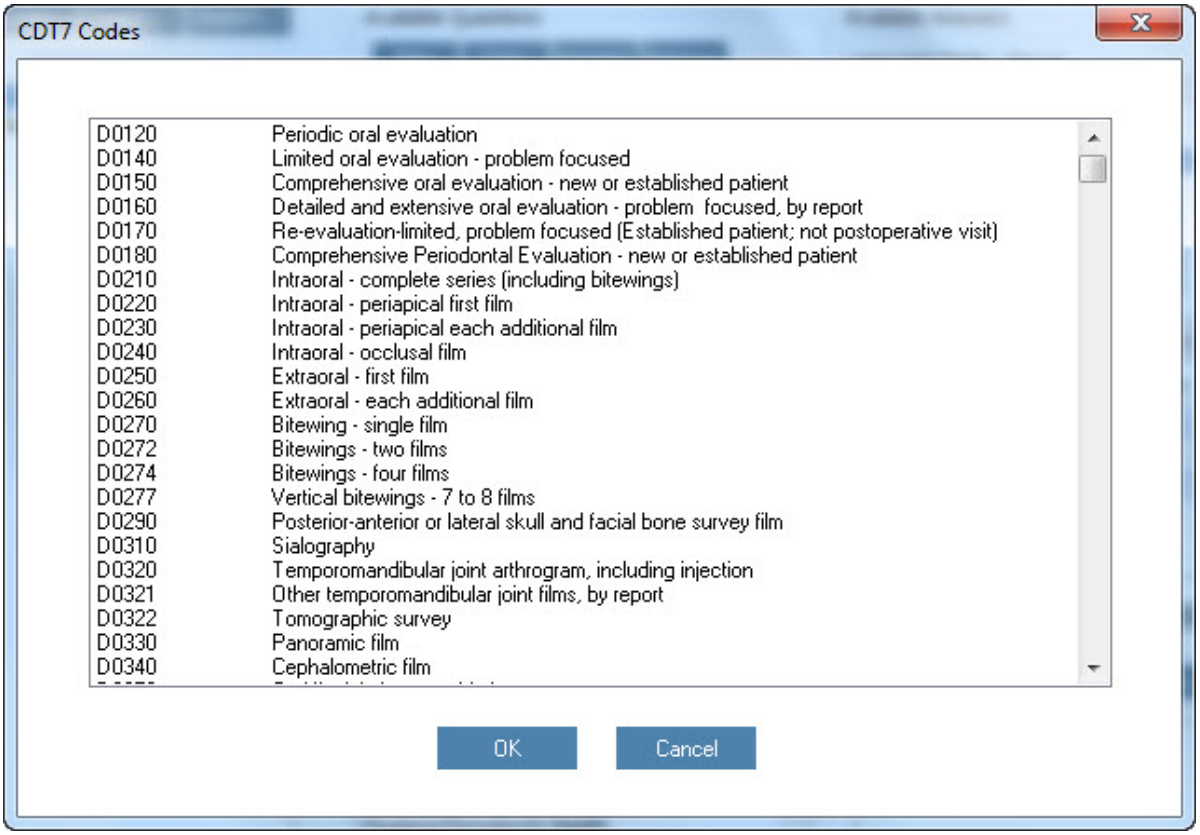
1 In the Available Answers group box, select the answer item to which to add a code.

2 Click the **Codes** tab.

3 Click **Add...** next to the codes list.

The Codes dialog box appears.

4 Select the code to add to this answer item. Then, click **OK**.



Removing a Code From an Answer Item

To remove a code from an answer item:

1 In the Available Answers group box, select the answer item from which to remove a code.

2 Click the **Codes** tab.

3 Select the code to remove, and click **Remove...** next to the code list.

4 Click **Yes** in the confirmation dialog box that appears to delete the code.

Adding and Removing Language Styles

Language styles enable you to tailor the phrasing of your letters appropriately for different recipients. For each language style, you define phrases for questionnaire answer items. When an answer item is used in a letter, the phrase from the appropriate language style is inserted.

For example, to send a letter outlining a treatment plan to a patient and to the patient's dentist, you could use the Layman language style for the letter to the patient, and that letter would use layman phrases to describe treatments. You could use the Dentist language style for the letter to the patient's dentist, and that letter would use phrases appropriate for describing treatments to a dentist.

For information on adding phrases for different language styles, see “Using Different Phrases for Different Language Styles” on page 34-11.

To add a language style:

1 Click the **Language Styles** tab in upper left of the Questionnaire Setup dialog box.

2 In the field, enter a name for this language style.

3 Click **Add**.

To remove a language style:

1 On the **Language Styles** tab, select the language style to remove.

2 Click **Remove**.

Running a Questionnaire

This section describes how to run multi-page questionnaires. The multi-page questionnaire presents the questions in a series of dialog boxes. It is the standard questionnaire interface available on all Dolphin Imaging installations.

Note: *If you have the Dolphin Imaging Security Utilities installed, you can use this feature only if your Dolphin Imaging user account has the Edit Questionnaires privilege granted in Employee Rights. For more information, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).*

For information on running a one-page questionnaire or Super Questionnaire, refer to the Dolphin Management User Guide or Dolphin Management online help (**`Dolphin Management User Guide.PDF`** or **`DM_Help.chm`** in your **`C:\Dolphin`** folder).

To run a multi-page questionnaire:

1 Select the patient and timepoint for which to enter information.

2 Select **Questionnaire** from the **Tools** menu.

Or,

Click

on the horizontal tool bar, then select **Questionnaire...** from the menu.

A dialog box appears where you select the questionnaire to run.

3 Select the questionnaire to run, and click **OK**.

The questionnaire starts. The dialog boxes displayed for the questionnaire depend on the questions and tokens you selected when you set up the questionnaire. The figure below shows an example of a questionnaire dialog box.

Note: *Diagnostic information is stored for each timepoint for each patient. For this reason, the diagnostic information that you enter in this dialog box applies only to the timepoint you selected in step 1. In this way, you can store diagnostic information for each timepoint.*

4 Enter the information for each dialog box for the questionnaire.

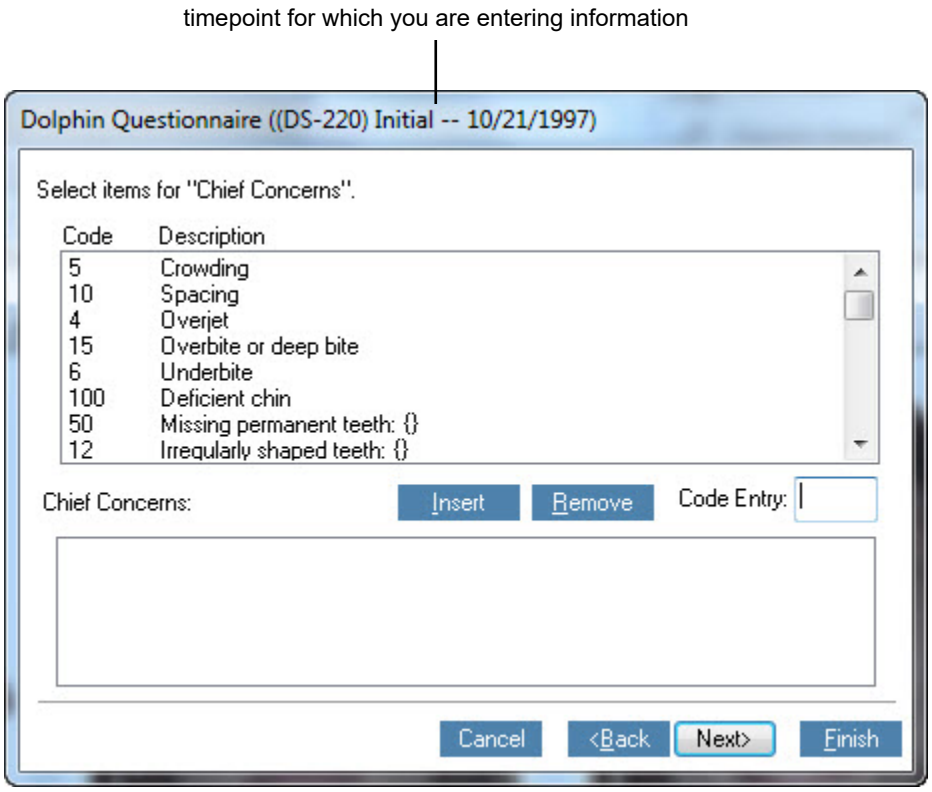
You can move an answer item from the upper list to the lower list in any of the following ways:

- Select the item, and click **Insert**.
- Double-click the item in the upper list to insert it into the lower list.
- Type the code for the item in the **Code Entry** field, and press ENTER.

To remove an answer item from the lower list, select it, and click **Remove**.

5 When you finish entering information on each dialog box, click **Next>** to move to the next dialog box in the questionnaire.

6 On the last dialog box for the questionnaire, click **Finish** to finish the questionnaire.



Code	Diagnosis code for an answer item. For a list of diagnosis codes and their definitions, see “DLS Diagnostic Lists and Codes” on page B-12.
Description	Description for an answer item.
Insert	Moves the selected answer item from the upper list to the lower list.
Remove	Removes the selected answer item from the lower list.
Code Entry	Diagnosis code for an answer item.
<Back	Returns to the previous dialog box for this questionnaire.
Next>	Goes to the next dialog box for this questionnaire.
Finish	Finish entering information for this questionnaire.

35 The Dolphin Letter System (DLS)

The Dolphin Letter System (DLS) provides a fast and easy way to create letters that include the patient's images.

DLS contains letter templates that simplify creating everyday letters to referrals, patients, and doctors. For example, you can use DLS to send a thank-you letter to a dentist that referred a patient or to send parents a letter showing how their son's dental hygiene needs to be improved. In addition, you can create new templates for custom letters. You can then use your custom letter templates just like any of the templates that were included with the software.

DLS is a highly customized program based on Microsoft Word. You can perform most of DLS's functions based on the instructions in this chapter and in other Dolphin supplemental documents. However, to take full advantage of the powerful features of Microsoft Word, we recommend that you refer to the Microsoft Word documentation and familiarize yourself with Microsoft Word.

Before you start DLS, you need to select a patient whose pictures you want to use in the letter and the timepoint for that patient. You can select a patient and timepoint using the Patient Lookup dialog box. Then, you can start DLS in one of two ways:

- You can use the Merge Letter wizard to begin with an existing template and questionnaire that prompts for the information necessary to complete the letter.
- You can start Word and write a free-form letter.

To start DLS:

1 Click

on the Dolphin Imaging main screen.

2 Select **Merge Letter...** to launch the Merge Letter wizard.

Or,

Select **Open Word...** to go directly to Word.

If you selected **Merge Letter...**, the Merge Letter wizard begins prompting you for information needed to complete the letter (see "Merging a Letter" below).

If you selected **Open Word...**, Word opens and you can begin typing your letter.

Merging a Letter

If you selected **Merge Letter...** when you started DLS, the Merge Letter wizard launches and displays a series of dialog boxes in which you can specify the information needed to complete the letter. The first dialog box prompts you to select the letter template you want to use.

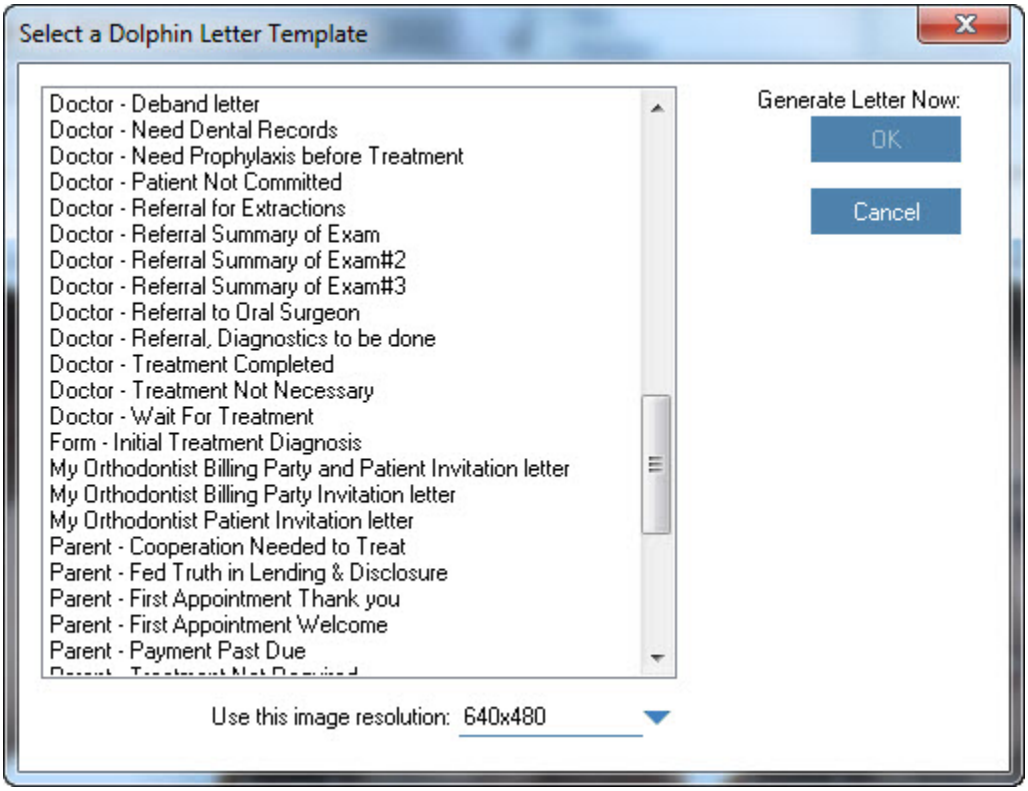
Selecting the Type of Letter

When you click Letters >> and select **Merge Letter...**, the Select a Dolphin Letter Template dialog box appears. It lists all the templates that you can use to create letters.

To select the type of letter you want to create:

1 Select a template from the list, and click **OK**.

DLS uses any information that you have entered into the database for the patient to construct the letter. If any information required to construct the letter has not been entered into the database for the patient, DLS may prompt you to enter the information now. The following sections describe the information that you may need to enter.



list	Templates for the types of letter you can create. For more information about the available templates, see Chapter 36, Letter Templates.
Use this image resolution	Image resolution to use in the letter to be generated. Typically, the default setting of 640 x 480 is sufficient for normal laser and ink-jet printers. However, you can pick a higher resolution.

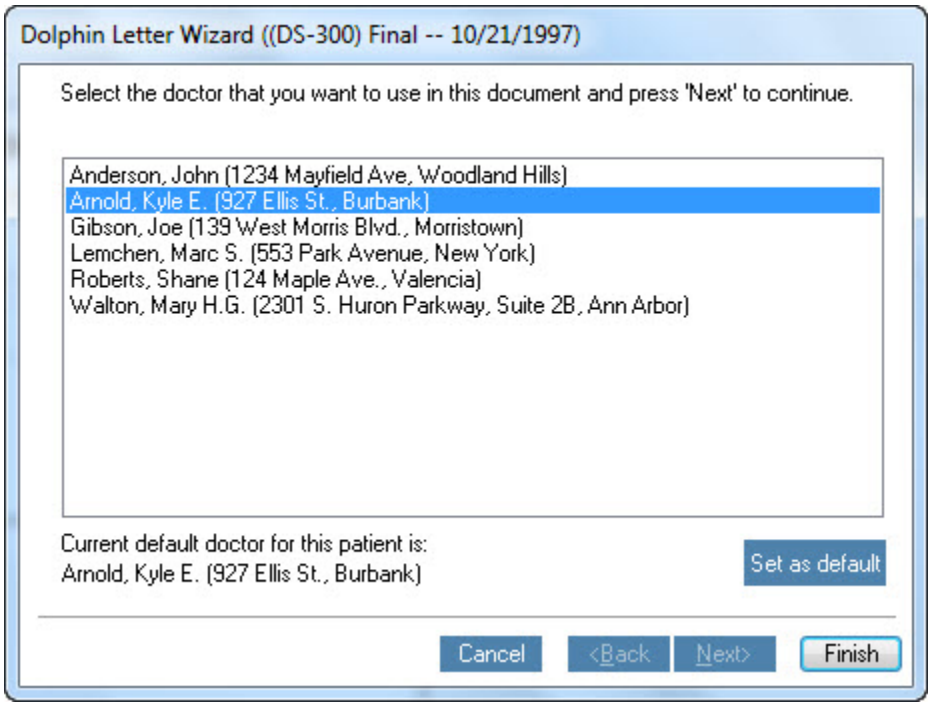
Selecting a Doctor

If the template you are using for this letter requires a doctor, a dialog box listing the doctors that you have entered in the database appears, similar to the figure below.

To select a doctor:

1 Select a doctor from the list, and click **Next>**.

If the doctor does not appear on the list, simply click **Next>** on this dialog box. Then, you can manually enter the doctor after the letter has been created.



list	Names and addresses of the doctors in your database.
Set as default	Sets the selected doctor as the default doctor for this patient.

Selecting Diagnoses

If the template you are using for this letter requires a diagnosis, a dialog box listing diagnoses and codes appears. For more information on diagnosis lists and codes, see “DLS Diagnostic Lists and Codes” on page B-12

To add a diagnosis:

1 Click a diagnosis in the upper list.

Or,

Type a diagnosis code in the **Code Entry** field.

Some diagnosis lists are meant for selecting a single diagnosis to insert into the letter. Other lists are set up for selecting multiple diagnoses. You can create documents that use either method.

Some letters are designed to accept a diagnosis from more than one diagnosis list. If this is the case, the diagnosis list appears for each diagnosis list from which the letter template expects a diagnosis.

Any items on the diagnosis list that have curly braces ({}) act as placeholders for user input. When you insert one of these items into your letter, DLS prompts you for a value to use for that placeholder.

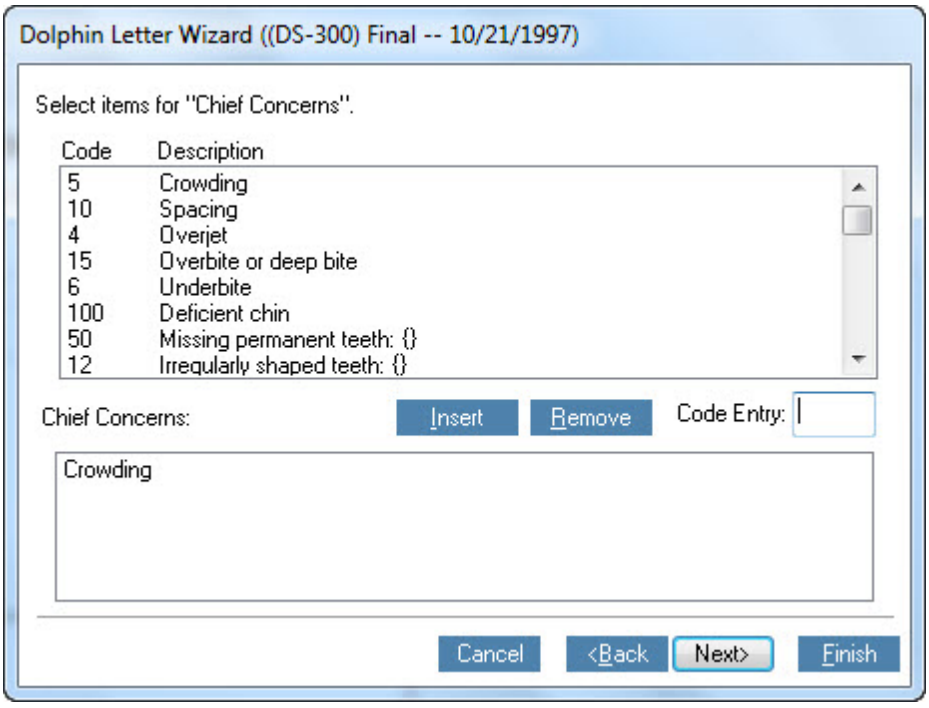
For a list of diagnosis codes and their definitions, see “DLS Diagnostic Lists and Codes” on page B-12.

2 Click **Insert**.

The diagnosis you selected appears in the lower list, which lists the diagnoses to insert into the letter.

Note: *Diagnostic information is stored for each timepoint for each patient. For this reason, the diagnostic information that you enter in this dialog box applies only to the timepoint you selected in on the Patient Lookup dialog box, before you started DLS. In this way, you can store diagnostic information for each timepoint.*

3 When you finish selecting diagnoses, click **Next>**.



upper list	Diagnoses that you can add to the letter. **Code:** Diagnosis code. For a list of diagnosis codes and their definitions, see “DLS Diagnostic Lists and Codes” on page B-12. **Description:** Description for the diagnosis.
Insert	Inserts the description for the selected diagnosis into the letter and in the lower list.
Remove	Removes the selected diagnosis from the diagnosis list.
Code Entry	Searches for one or more diagnoses by diagnosis code. To select more than one diagnosis separate the codes using either commas or spaces.
lower list	Diagnoses selected to insert into the letter. If you have previously gone through the Merge Letter wizard for this patient, any diagnoses that you selected appear automatically in this list.
<Back	Goes to the previous dialog box.
Next>	Goes to the next diagnosis list defined for this letter.
Finish	Skips any remaining diagnosis lists.

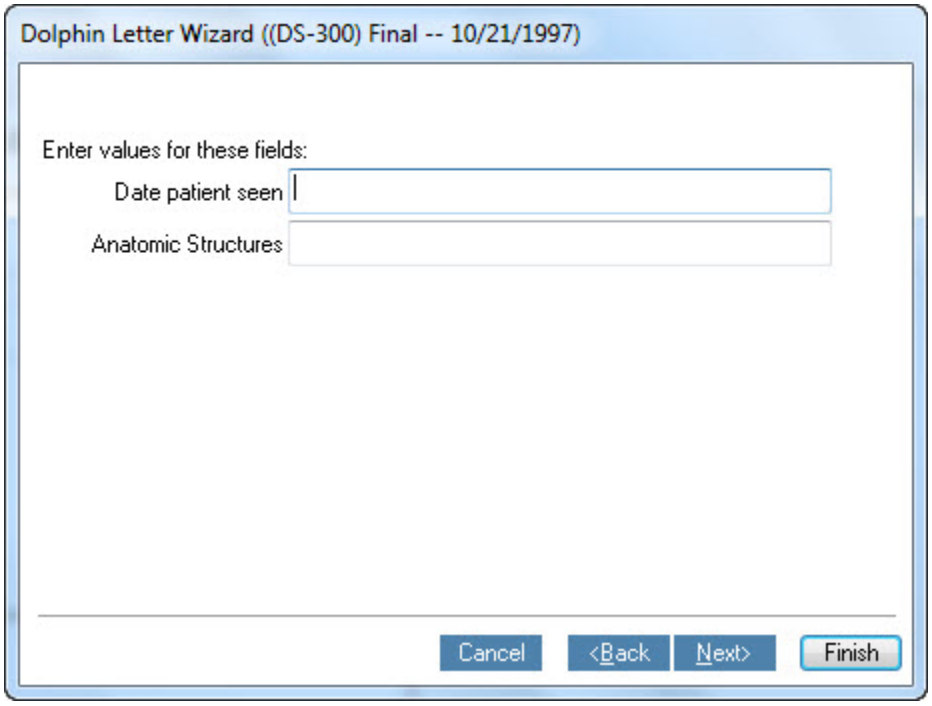
Entering Information for Custom Tokens

If the template you are using for this letter uses custom tokens, a dialog box that you use to enter values for the tokens appears. This dialog box is similar to the figure below. Custom tokens are placeholders for text that you supply. For example, Date of Last Dental could be replaced with June 27, 2000.

To enter information for the custom tokens:

1 Type values in each of the fields on the Custom Tokens dialog box.

2 When you finish entering information for the custom tokens, press **Next>** or **Finish**.



fields	Prompts for custom token values required by the letter template you selected. If you have previously gone through the Merge Letter wizard for this patient, any custom tokens for which you already provided values are automatically filled in.
<Back	Goes to the previous dialog box.
Next>	Goes to the next dialog box.
Finish	Finish entering information into DLS.

Completing the Letter

After you have completed all the dialog boxes, DLS compiles the information you entered and displays the completed letter (see below). At this point, you should make sure that the letter is correct. For example, you should check the following:

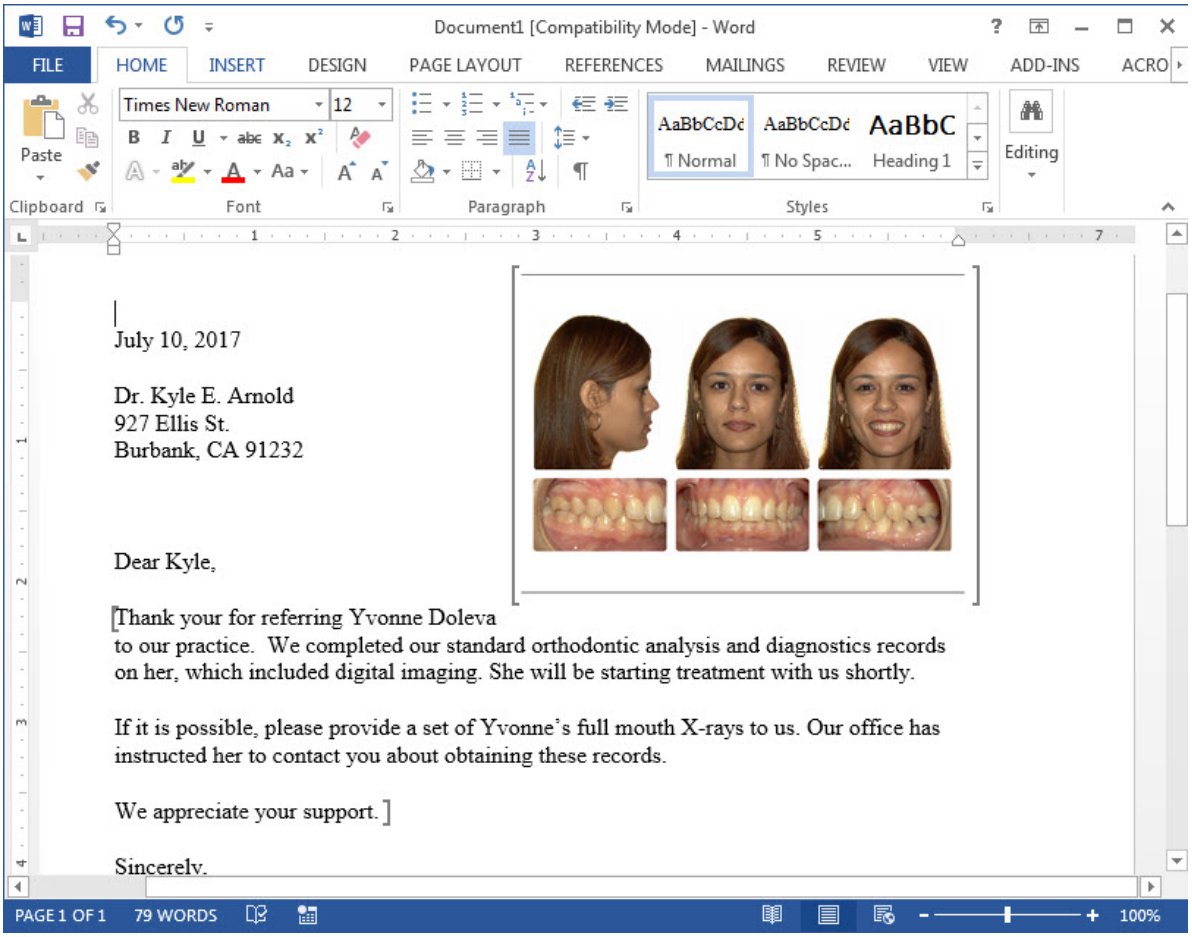
- Are any tokens referring to the patient's gender incorrect? If so, correct the patient's gender in the Patient Lookup dialog box as described in Chapter 4, Patient Charts.
- Are there any fields that were left blank causing the sentences to look fragmented?
- Are there any placeholders in the letter? Placeholders look like this: <FILL IN>. They represent information needed to complete the letter that has not been entered either in the Dolphin database or in the Merge Letter wizard.

- Do you want to add a paragraph or resize the image? Resize the image by clicking on it and then dragging one of the square boxes on the border.

You can also modify the letter using any of the functions that DLS and Microsoft Word offer. For more information on the additional features DLS offers, see “Working with Templates” below. For more information on using Microsoft Word, refer to the Microsoft Word documentation. Once you are happy with the letter, you can print it.

To print the letter:

1 Select **Print** from the Microsoft Word **File** menu.



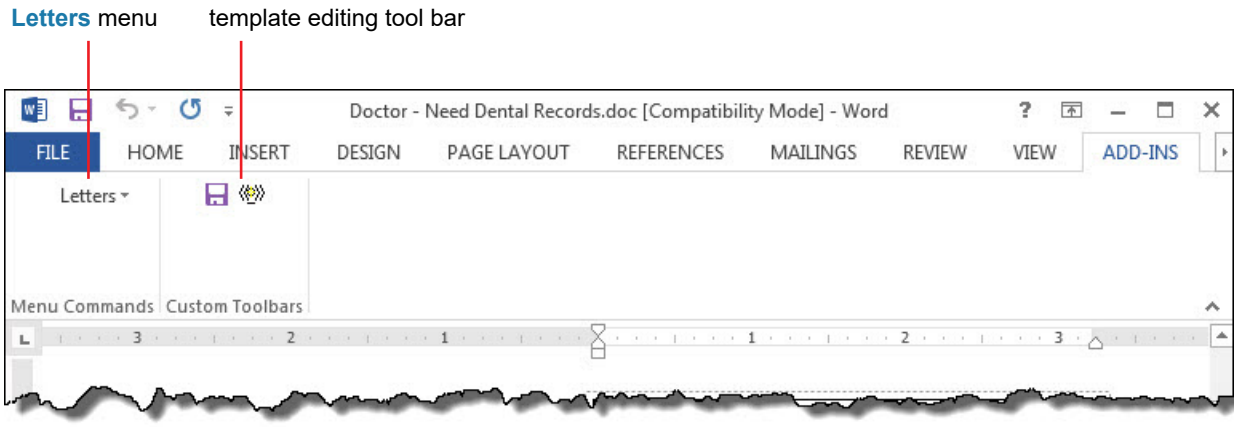
Working with Templates

With DLS, you can modify existing templates or create your own custom templates. To create a new template or edit an existing one, you use the DLS template editing features available on the Microsoft Word **ADD-INS** tab.

To access the template editing features:

1 Click the Word **ADD-INS** tab.

The **Letters** menu and template editing tool bar appear.



Letters menu	Contains the following choices: **Edit Diagnostic Lists:** Add, delete, or modify diagnostic lists. **Template:** Opens a sub-menu that offers the following options: • **Modify Existing...:** Modify an existing template (see “Modifying an Existing Template” below). • **Create New...:** Create a new template (see “Creating a New Template” on page 35-9). **Insert Layout Control:** Inserts an image layout control into the letter (see “Inserting an Image or Layout Control” on page 35-12). **Insert Image Control:** Inserts an image control into the letter (see “Inserting an Image or Layout Control” on page 35-12).
template editing tool bar	Buttons for template editing. : Inserts a document token. Document tokens are placeholders for patient or diagnostic information that will be filled in when a letter is created using the template. : Saves the template.

Modifying an Existing Template

To modify an existing template:

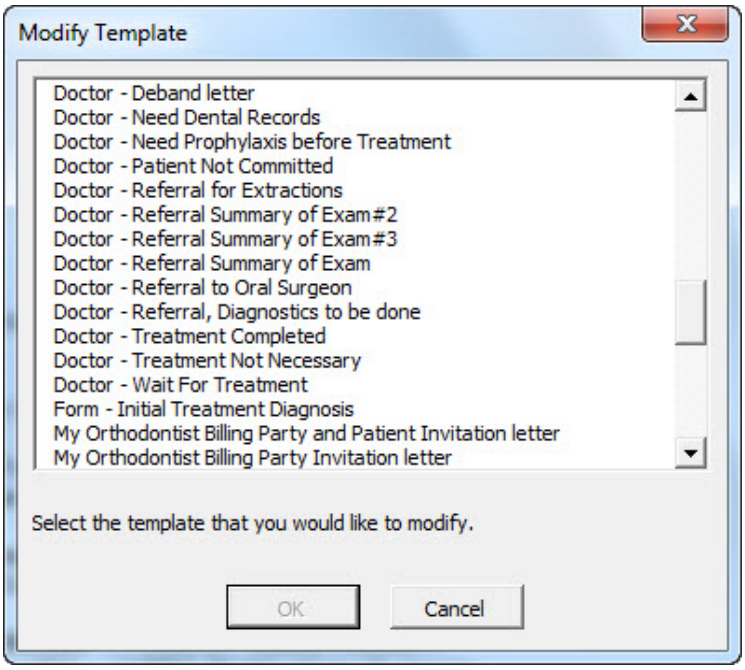
1 Select **Template** from the **Letters** menu on the Word **ADD-INS** tab. Then, select **Modify Existing...** from the sub-menu.

The Modify Template dialog box appears and shows all templates in DLS Template directory.

Note: *Only templates created as DLD templates work correctly to create DLS letters.*

2 Select the template you want to modify, and click **OK**.

The template you selected is displayed in DLS window.

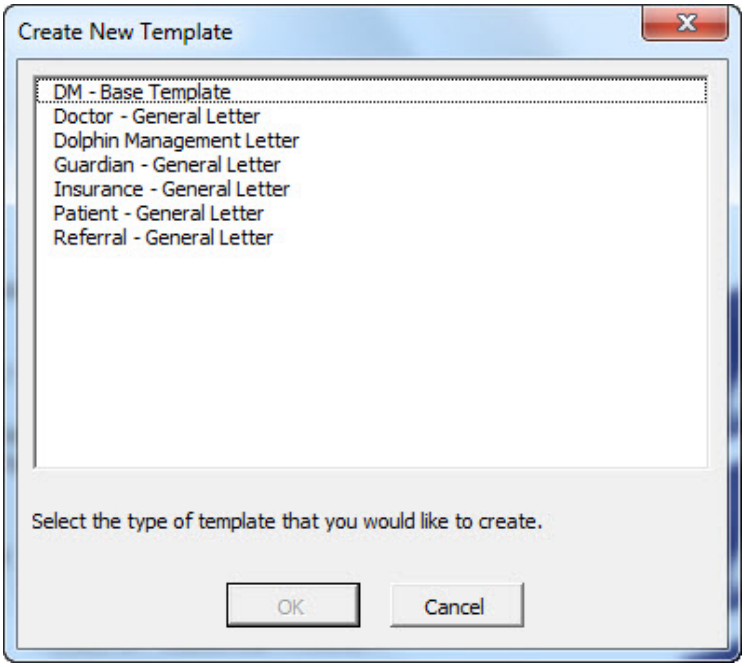


Creating a New Template

To create a new template:

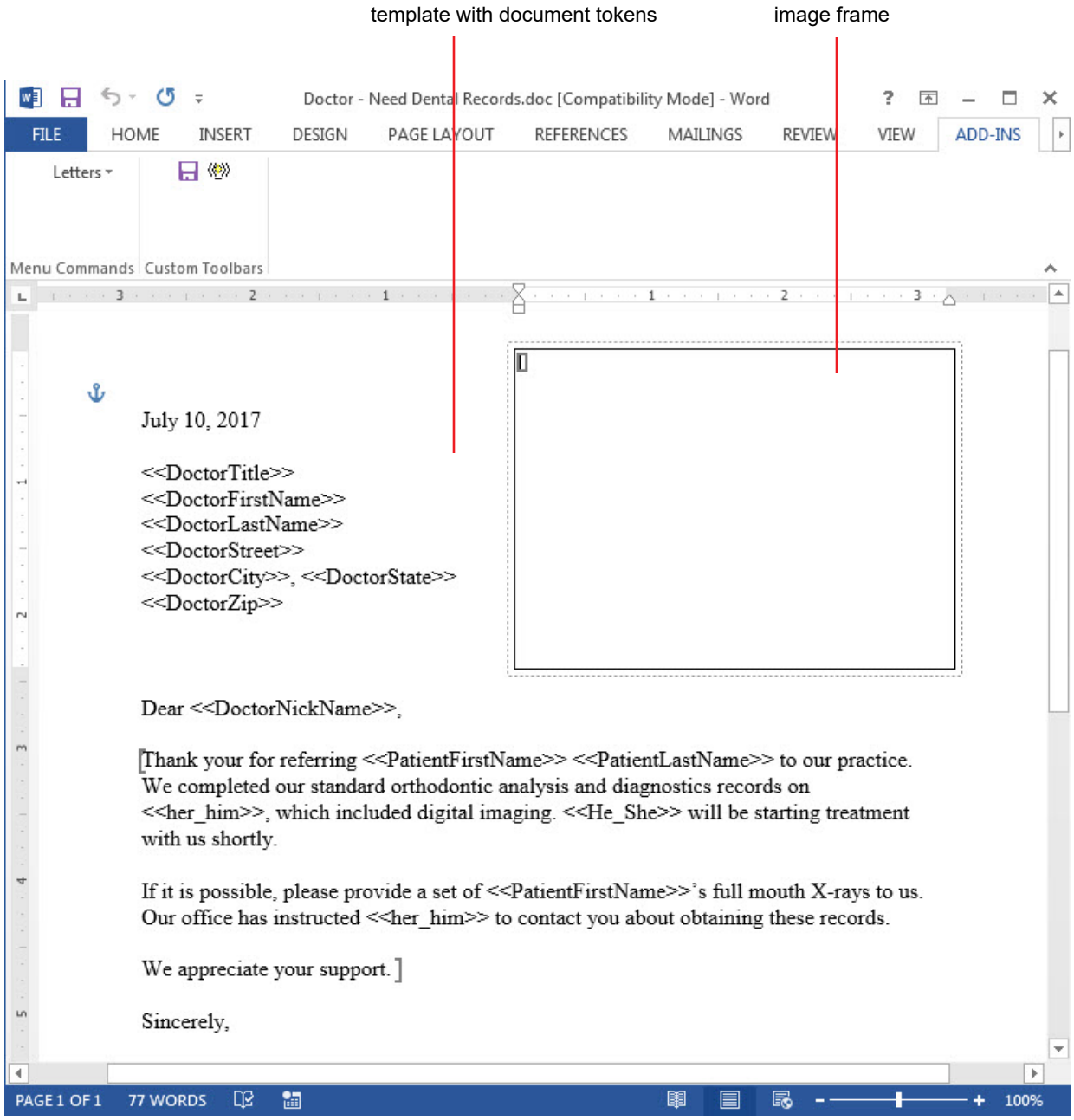
1 Select **Template** from the **Letters** menu. Then, select **Create New...** from the sub-menu.

The Create New Template dialog box is displayed:



Template Editing

When you create a new template, a skeleton template appears in DLS window. When you modify an existing template, the template you selected to modify appears. In addition to the regular text of the letter, templates include tokens and image frames that will be replaced with information and images specific to a particular patient when you use the template to create a letter.



You can make changes to the template such as adding paragraphs and changing formatting using any of the functions of Microsoft Word. For more information on editing using Microsoft Word, refer to the Microsoft Word documentation.

You can also make the following changes using the features offered by DLS:

- change the size and position of the patient's image that will be used in this letter (see "Changing an Image's Size or Position" below).
- add document tokens, which insert information as defined in the patient's chart in Dolphin Imaging or diagnoses from the diagnostic lists into the letter (see "Selecting Diagnoses" on page 35-4).
- add custom tokens, which prompt the person creating the letter based on this template to supply information (see "Entering Information for Custom Tokens" on page 35-5).
- add additional images (see "Inserting an Image or Layout Control" on page 35-12).

Changing an Image's Size or Position

To change an image's size or position:

- Click and drag one of the corner knobs on the image frame to change the image size.
- Click and drag the image frame to a new position to change the image position.
- Double-click in the center of the image frame and press DEL on your keyboard to delete the image frame. If you delete the image frame, no patient image will appear on letters created with this template.

For more information on working with image frames, refer to your Microsoft Word documentation.

Inserting a Document Token

To insert a document token:

1 Place the cursor at the point in your letter where you want to insert a document token.

For example, you would use a document token any place that you want to refer to the name of the patient, make a reference to the patient's gender (for instance, his/her or he/she), or refer to a diagnosis on one of your diagnostic lists.

2 Click on the Template Editing tool bar.

The Document Tokens dialog box appears.

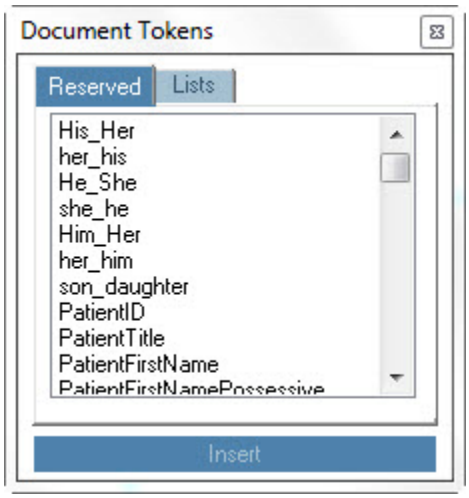
3 Select one of the tokens under the **Reserved** tab.

Or,

Select the **Lists** tab. Then, select one of the diagnosis groups.

4 Click **Insert** to insert the selected token into the document.

When you click Insert, the Document Tokens dialog box closes, and the selected token appears in your template.



Reserved	Reserved document tokens. See “Tokens” on page B-1 for a list of reserved tokens. When someone creates a letter using a template containing these tokens, the appropriate information as defined in the patient’s chart in Dolphin Imaging is inserted into the letter.
Lists	Diagnosis groups defined in DLS. When someone creates a letter using this template containing these tokens, the specified diagnosis list is presented so that a diagnosis can be inserted into the letter.
list	Document tokens you can insert into the letter template.
Insert	Inserts the selected token into the template.

Inserting a Custom Token

To insert custom tokens:

1 Type two less-than signs (<<), followed by the token name (for example, Amount owed), and then two greater-than signs(>>).

For example, to prompt the person creating a letter based on this template to enter the amount owed, you might type the following: <<Amount owed>>. When the Custom Tokens dialog box for this letter appeared, it would list **Amount Owed** as one of the fields requiring information.

Inserting an Image or Layout Control

An image control is a placeholder for an image. A layout control is a placeholder for an image layout. You can insert image and layout controls in any letter or letter template.

To insert an image or layout control:

1 Select **Insert Image Control** from the **Letters** menu on the Word **ADD-INS** tab to insert an image control.

Or,

Select **Insert Layout Control** from the **Letters** menu to insert a layout control.

An image or layout control is inserted into your letter or template.

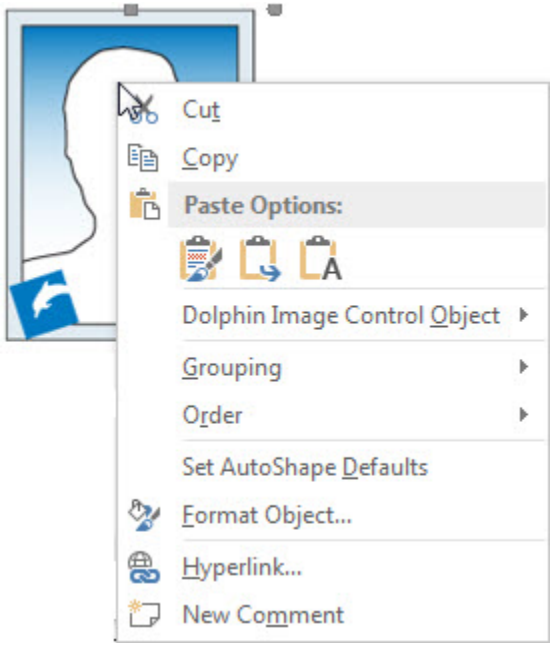
2 Click anywhere in the letter or template except within the image or layout control.

Specifying an Image for an Image Control

To specify a patient's image to use in place of an image control:

1 Right-click the image control.

A context menu appears, as shown below. On this context menu, all the options except Dolphin Image Control Object are standard Microsoft Word options. For more information on these options, refer to your Microsoft Windows documentation.



2 Select **Dolphin Image Control Object** from the context menu. Then, select **Properties** from the sub-menu.

The Image Control Properties dialog box is displayed. In this dialog box, leave the **Patient ID** field blank. When you create a letter using this template, DLS will automatically complete this field with the patient ID of the currently selected patient.

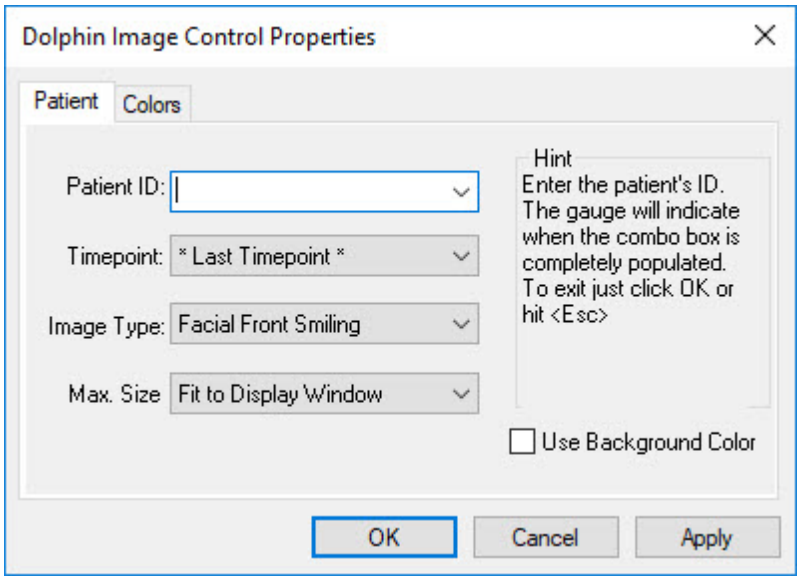
3 Select the timepoint containing the image you want to use from the **Timepoint** drop-down list.

4 Select the type of image you want to use from the **Image Type** drop-down list.

5 Click **Apply** to see the selected image in your letter.

6 Click **OK** to set the properties and close the dialog box.

If you want to change the image you selected, you can simply repeat this procedure, selecting a different image in the dialog box.



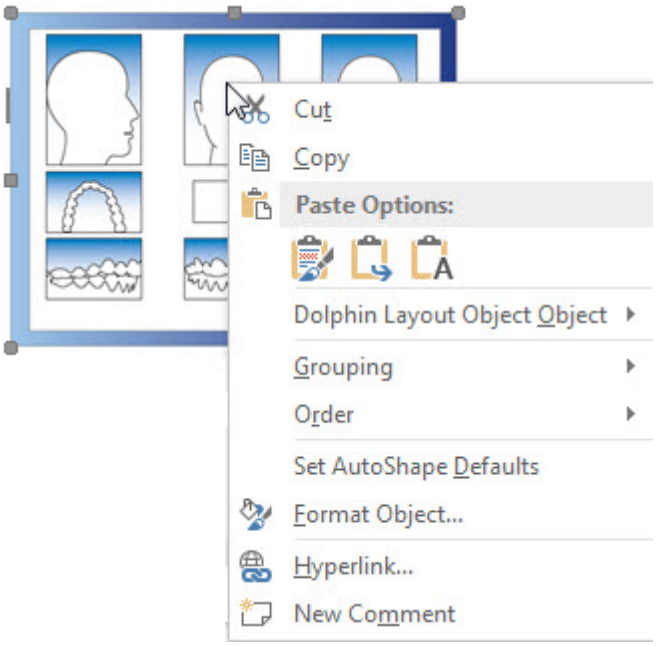
Patient ID	ID of the patient whose picture you want to use for this image control. If you leave this field blank, DLS automatically enters the ID of the currently selected patient when you use this template to create a letter.
Timepoint	Timepoint containing the image to use.
Image Type	Type of image to use.
Max Size	Maximum size for the image.
Use Background Color	Fills empty areas with a background color if the selected image is a different size or shape than the image control.
Apply	Adds the selected image to the letter.

Specifying a Layout for a Layout Control

To specify a layout to use in place of a layout control:

1 Right-click the layout control.

A context menu appears, as shown below. On this context menu, all the options except Dolphin Image Control Object are standard Microsoft Word options. For more information on these options, refer to your Microsoft Windows documentation.



2 Select **Dolphin Layout Object Object** from the context menu. Then, select **Properties** from the sub-menu.

The Dolphin Layout Object Properties dialog box is displayed.

3 Click **Find**.

The Patient Lookup dialog box opens.

4 Select the patient whose images you want to appear in this letter, and click **OK**.

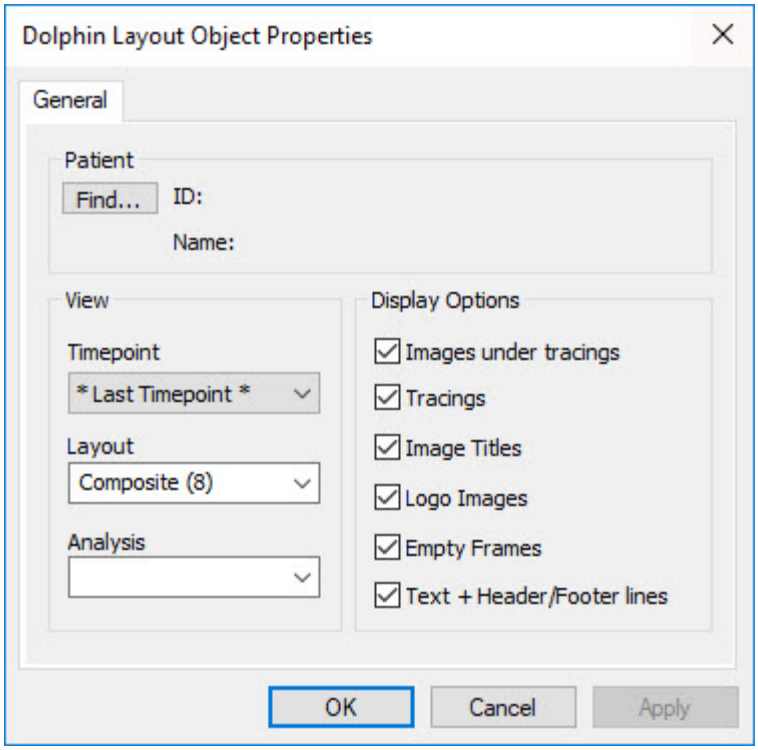
5 Select the timepoint containing the images you want to use from the **Timepoint** drop-down list.

6 Select the image layout you want to use from the **Layout** drop-down list.

7 Set any other options for this image layout control.

8 Click **OK** to set the properties and close the dialog box.

If you want to change the image layout you selected, you can simply repeat this procedure, selecting a different layout in the dialog box.



Find...	Opens the Patient Lookup dialog box so you can select the patient whose images you want to use for this layout control.
Timepoint	Timepoint containing the images to use.
Layout	image layout to use.
Analysis	Analysis to use.
Display Options	Display option for the layout object. **Images under tracings:** Displays tracings superimposed over the patient's pictures in layouts containing tracings. **Tracings:** Displays tracings in layouts containing them. **Image Titles:** Displays image titles on the layout object if the layout includes them. **Logo Images:** Displays logos on the layout object if the layout includes them. **Empty Frames:** Displays empty boxes for empty image slots in the layout. **Text + Header/Footer lines:** Displays text, header, or footer lines if the layout includes them.
Apply	Adds the selected image to the letter.

Saving a Template

To save the template:

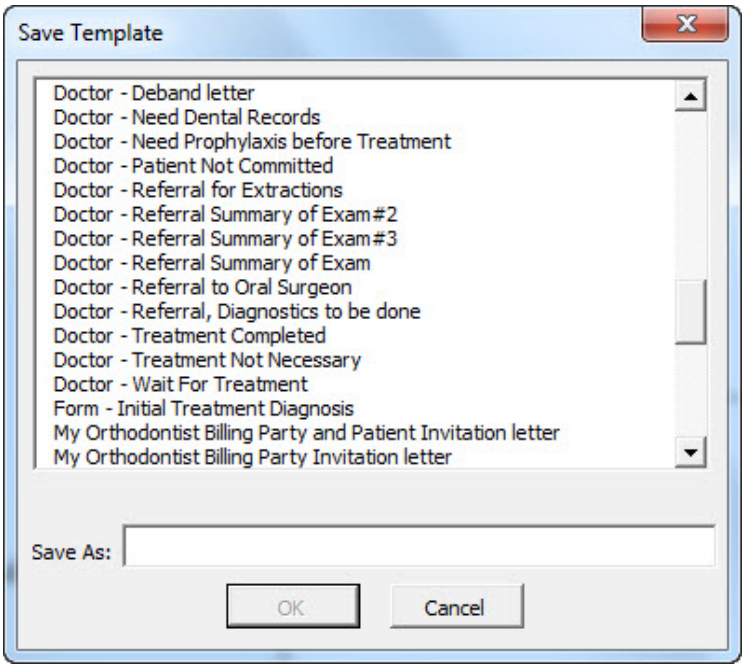
1 Click on the Template Editing tool bar to save the template.

The Save Template dialog box appears.

2 Enter a descriptive name for this template in the **Save As** field, and click **OK**.

The templates included with DLS usually begin with “Doctor - “, “Patient - “, or “Parent - “, so it's easy to identify and group the letter types. If you have edited an existing template, you may want to save it under a different name.

DLS checks the document for errors. If none were found, a message box confirms that the template has no errors. Otherwise, the message box indicates the location of any errors found and returns you to the template so you can correct them.



Testing Your Template

Once you have completed your template, you should test it to make sure it works as expected.

To test the template:

1 Click Letters >> on the Dolphin Imaging main screen.

2 Select **Merge Letter...** to launch the Merge Letter wizard.

3 Select your template from the Select a Dolphin Letter Template dialog box.

4 Complete all the steps to create a letter using your new template.

5 When you have finished the new letter, review it and make sure that it looks correct.

6 If it needs any changes, edit the template as described in “Modifying an Existing Template” on page 35-8 to fix it.

7 Repeat this process to retest your template and fix any problems with it until it works as expected.

Exiting from DLS

When you finish using DLS, you can exit back to Dolphin Imaging. If you have any unsaved changes, Word will prompt you to save them.

To exit from DLS:

1 Select **Close** from the Word **File** menu.

Word prompts you to save any modified or unsaved documents. Then, DLS exits when Word closes.

36 Letter Templates

This chapter describes the letter templates included with the Dolphin Letter System (DLS). You can use these templates to create new letters, or modify them to create your own letter templates. For more information on using DLS, see Chapter 35, The Dolphin Letter System (DLS).

In the sections that follow, a description, list of tokens, and sample letter are provided for each letter template. The section titles indicate the name of the template. For a list of DLS tokens and their definitions, see “Tokens” on page B-1.

Templates for Individual Letters

Doctor – Deband

Letter to referring dentist that the patient has just completed treatment. This letter informs the referring dentist of any post treatment concerns and includes the patient’s debanding panorex.

Tokens

DoctorCity	DoctorTitle	Date Appliance removed
DoctorFirstName	DoctorZip	Type of Retainer
DoctorLastName	her_him	Post Treatment Concerns
DoctorNickName	PatientFirstName	
DoctorState	PatientLastName	
DoctorStreet	UserName	

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

RE: <<PatientFirstName>> <<PatientLastName>>

Dear <<DoctorNickName>>,

<<PatientFirstName>> <<PatientLastName>> has completed the active phase of orthodontic treatment. Appliances were removed on <<Date Appliance removed>> and impressions were taken for <<Type of Retainer>> retainers. I have asked <<PatientFirstName>> to schedule an appointment with you in the next month or so for a recall exam, prophylaxis, topical fluoride treatment and bitewing radiographs, if indicated.

I will continue to supervise <<PatientFirstName>> in retention for the next 24-36 months. Specific post treatment concerns for <<her_him>> include:

<<Post Treatment Concerns>>

Please feel free to call me if you have other specific questions or concerns. I have included <<PatientFirstName>>'s debanding panorex for your examination.

It has been a pleasure to work with <<PatientFirstName>> thus far. Thanks again for the referral and for the opportunity to participate in the care of your patients. Your continued support and confidence are greatly appreciated.

Sincerely,

<<UserName>>

Doctor – Need Dental Records

This basic letter that first thanks a referring dentist for their support and then requests that they make a set of full mouth x-rays available for further diagnostics.

Tokens

DoctorCity	DoctorTitle
DoctorFirstName	DoctorZip
DoctorLastName	He_She
DoctorNickName	her_him
DoctorState	PatientFirstName
DoctorStreet	PatientLastName
	UserName

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

Dear <<DoctorNickName>>,

Thank your for referring <<PatientFirstName>> <<PatientLastName>> to our practice. We completed our standard orthodontic analysis and diagnostics records on <<her_him>>, which included digital imaging. <<He_She>> will be starting treatment with us shortly.

If it is possible, please provide a set of <<PatientFirstName>>'s full mouth X-rays to us. Our office has instructed <<her_him>> to contact you about obtaining these records.

We appreciate your support.

Sincerely,

<<UserName>>

Doctor - Need Prophylaxis before Treatment

Thanks a referring dentist for their support and then requests that they make meet with the patient and conduct a dental exam and prophylaxis.

Tokens

DoctorCity	DoctorTitle
DoctorFirstName	DoctorZip
DoctorLastName	He_She
DoctorNickName	PatientFirstName
DoctorState	PatientLastName
DoctorStreet	UserName

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

Dear <<DoctorNickName>>,

We truly appreciate you referring <<PatientFirstName>> <<PatientLastName>> to our practice. We have completed an orthodontic diagnostic analysis and standard orthodontic records on <<PatientFirstName>>, which includes digital imaging. <<He_she>> will be starting treatment shortly.

Prior to initiation of treatment, I have recommended that <<PatientFirstName>> visit your office for a dental exam and prophylaxis. <<He_she>> should be contacting your office soon.

Thank you again for recommending our practice.

Sincerely,

<<UserName>>

Doctor – Patient not Committed

During the exam, it was found that the patient needed treatment. The patient hasn't committed yet, however.

Tokens

DoctorCity	DoctorTitle
DoctorFirstName	DoctorZip
DoctorLastName	PatientFirstName
DoctorNickName	PatientLastName
DoctorState	UserName
DoctorStreet	

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

Dear <<DoctorNickName>>,

We truly appreciate your referring <<PatientFirstName>> <<PatientLastName>> to our practice. I have performed a thorough analysis of this patient including digital imaging. Orthodontic treatment is definitely indicated. However, the patient has not yet committed to treatment. My office will stay in touch with this patient, and we will let you know of any change in the situation.

We appreciate your support of our practice.

Sincerely,

<<UserName>>

Doctor – Referral, Diagnostics to be Done

Thanks a referring dentist for referring the patient. Informs the referring dentist that diagnostic records will be sent as soon as they are finished.

Tokens

DoctorCity	DoctorTitle
DoctorFirstName	DoctorZip
DoctorLastName	PatientFirstName
DoctorNickName	PatientLastName
DoctorState	UserName
DoctorStreet	

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

Dear <<DoctorNickName>>,

Thank you for referring <<PatientFirstName>> <<PatientLastName>> to me for orthodontic consultation and treatment. Your expression of confidence is greatly appreciated.

After complete diagnostic records have been prepared and analyzed, I will send you a full report.

Thanks again.

Sincerely,

<<UserName>>

Doctor – Referral for Extractions

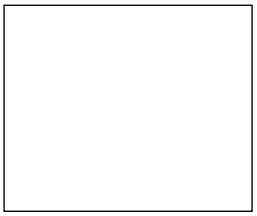
Indicates the extractions that the patient needs.

Tokens

DoctorCity	PatientBirthDate
DoctorFirstName	PatientFirstName
DoctorLastName	PatientHomePhone
DoctorState	PatientLastName
DoctorStreet	UserAddress1
DoctorTitle	UserAddress2
DoctorZip	UserName
	UserPhone

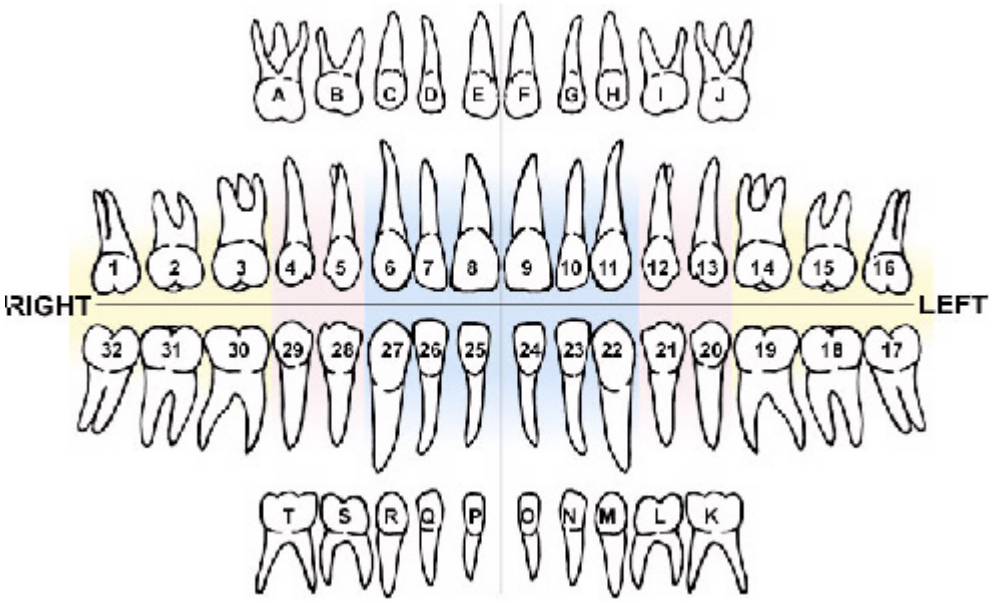
6/16/22

Patient: <<PatientFirstName>>
<<PatientLastName>>
Birthdate: <<PatientBirthday>>
Phone: <<PatientHomePhone>>



Referral To:
<<DoctorTitle>> <<DoctorFirstName>>
<<DoctorLastName>>
<<DoctorStreet>>
<<DoctorCity>>, <<DoctorState>>
<<DoctorZip>>
From:
<<UserName>>
<<UserAddress1>>
<<UserAddress2>>
<<UserPhone>>

RX – <<PatientFirstName>> requires the following extractions:



Remarks

Thank you,

Doctor – Referral Summary of Exam

This letter gives a summary of the diagnostic findings during a referred patient's visit.

Tokens

DoctorCity	PatientFirstName	Mandibular arch length
DoctorFirstName	PatientLastName	Posterior Crossbites
DoctorLastName	UserName	Dentition developmental stage
DoctorNickName	Anterior Bite Depth	Extracted & Congenitally absent teeth
DoctorState	Dental Class	Impacted teeth evident clinically
DoctorStreet	Overjet	TMJ Clinically evident or reported
DoctorTitle	Maxillary arch length	TMJ Pain
DoctorZip		

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

Dear <<DoctorNickName>>,

I recently saw your patient, <<PatientFirstName>> <<PatientLastName>>, for an orthodontic consultation. We enjoyed meeting <<PatientFirstName>>. Thank you for referring <<her_him>> to our office. A summary of the more pertinent findings from our clinical examination is included for your review.

- <<Dental Class>>
- <<Overjet>>
- <<Anterior Bite Depth>>
- <<Maxillary arch length>>
- <<Mandibular arch length>>
- <<Posterior Crossbites>>
- <<Dentition developmental stage>>
- <<Extracted & Congenitally absent teeth>>
- <<Impacted teeth evident clinically>>
- <<TMJ Clinically evident or reported>>
- <<TMJ Pain>>

We made orthodontic records and will let you know of our treatment plans soon. Thank you again for referring <<PatientFirstName>> and please call if you have any questions or comments.

Sincerely,

<<UserName>>

Doctor – Referral Summary of Exam #2

Thanks a dentist for referring their patient to you and informs them of the results of the examination.

Tokens

DoctorCity	PatientFirstName	Functional Analysis
DoctorFirstName	PatientLastName	History
DoctorLastName	Date patient seen	Orthodontic Diagnosis
DoctorState	UserName	Radiographic Interpretations
DoctorStreet	Anatomic Structures Affected	TM Joint Diagnosis
DoctorTitle	Chief Concerns	TMJ Symptoms
DoctorZip	Disposition	Treatment Recommendations

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

Re: <<PatientFirstName>> <<PatientLastName>>

Dear <<DoctorFirstName>>,

Thank you for referring <<PatientFirstName>> <<PatientLastName>> to our office for an orthodontic/TM joint evaluation. Your patient was seen on <<Date patient seen>> and a comprehensive clinical examination has revealed the following:

Chief Concern
• <<Chief Concerns>>

History
• <<History>>

Functional Analysis
• <<Functional Analysis>>

TMJ Symptoms
• <<TMJ Symptoms>>

Anatomic Structures Affected
• <<Anatomic Structures Affected>>

Radiographic Interpretations
• <<Radiographic Interpretations>>

Orthodontic Diagnosis
• <<Orthodontic Diagnosis>>

TM Joint Diagnosis
• <<TM Joint Diagnosis>>

Treatment Recommendations
• <<Treatment Recommendations>>

Disposition
• <<Disposition>>

Thank you again for referring <<PatientFirstName>> <<PatientLastName>> to our office. It is our goal to provide a comfortable, pleasant experience here, while offering the highest standards of care. Please call if you have any questions or concerns about <<PatientFirstName>>.

Sincerely,

<<UserName>>

Doctor – Referral Summary of Exam #3

Thanks a dentist for referring their patient to you and informs them of the results of the examination.

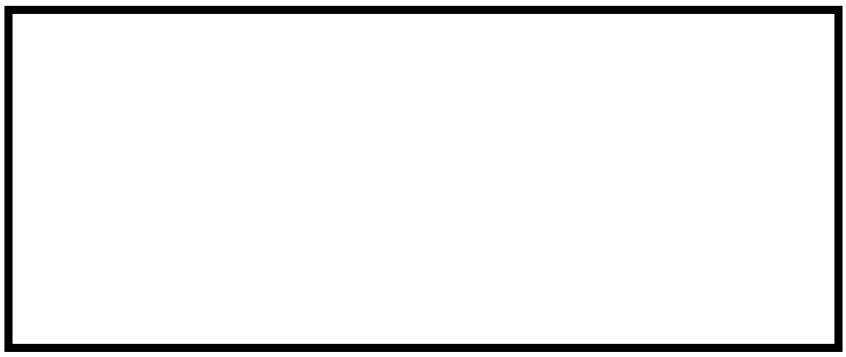
Tokens

DoctorLastName	UserAddress3	Habits
DoctorTitle	UserName	Impacted Teeth
PatientFirstName	UserPhone	Missing Teeth
PatientLastName	Crossbite	Overbite
UserAddress1	Crowding	Overjet
UserAddress2	Dental Class	Treatment Recommendations

<<UserName>>
<<UserAddress1>>
<<UserAddress2>>
<<UserAddress3>>
<<UserPhone>>

PRACTICE LIMITED TO ORTHODONTICS DIPLOMATE OF THE AMERICAN BOARD OF ORTHODONTICS

June 20, 2000



Dear <<DoctorTitle>> <<DoctorLastName>>:

Thank you for referring <<PatientFirstName>> <<PatientLastName>> for an orthodontic consultation. Enclosed are my initial findings and recommendations:

Molars	Overjet	Overbite	Profile
<<Dental Class>>	<<Overjet>>	<<Overbite>	<<Facial Balance>>
Crossbite	Crowding		Midline Off
<<Crossbite>>	<<Crowding>>		<<Midlines>>
Habits	Missing Teeth	Impacted Teeth	
<<Habits>>	<<Missing Teeth>>	<<Impacted Teeth>>	

I have recommended the following treatment:
• <<Treatment Recommendations>>

Feel free to contact me if you have questions or comments.

_____

<<UserName>>

Doctor – Referral to Oral Surgeon

This letter refers the patient to an oral surgeon and provides the patient's panoramic x-ray.

Tokens

DoctorCity	DoctorTitle
DoctorFirstName	DoctorZip
DoctorLastName	her_him
DoctorNickName	PatientFirstName
DoctorState	PatientLastName
DoctorStreet	UserName
	Reason for visit

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

Dear <<DoctorNickName>>,

In conjunction with <<PatientFirstName>> <<PatientLastName>>'s orthodontic treatment, I am referring <<her_him>> to your office for <<Reason for visit>>. Below is <<PatientFirstName>>'s panoramic x-ray for your examination. If you have any questions regarding this procedure please feel free to call me.

Sincerely,

<<UserName>>

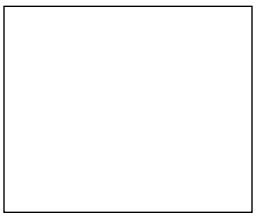
Doctor – Treatment Completed

Letter to referring dentist that the patient has just completed treatment and has entered the passive phase of orthodontics.

Tokens

DoctorCity	DoctorZip
DoctorFirstName	her_him
DoctorLastName	her_his
DoctorNickName	PatientFirstName
DoctorState	PatientLastName
DoctorStreet	she_he
DoctorTitle	UserName
	Mo. For Retainer

6/16/22



<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

RE: <<PatientFirstName>> <<PatientLastName>>

Dear <<DoctorNickName>>,

We have just completed <<PatientFirstName>> <<PatientLastName>>'s orthodontic treatment. In our office, this is always an occasion for celebration! <<PatientFirstName>>'s results are just what we have worked toward, and <<she_he>> is now healthier and happier.

<<PatientFirstName>> is now in the passive phase of orthodontic care. During this period, we've recommended a retainer and advised <<her_him>> in its use for a period of <<Mo. For Retainer>> months. We hope that <<PatientFirstName>> is committed to wearing the retainer at all times to maintain a corrected bite.

I have attached <<PatientFirstName>>'s final orthodontic records for your examination. We also asked <<her_him>> to schedule an examination with you soon for continuing care.

Thank you for your trust in us as part of <<her_his>> dental team. We treasure our relationships. They are the heart of our practice.

Sincerely,

<<UserName>>

Doctor – Treatment not Necessary

Letter to the dentist, thanking them for the referral. Notes that treatment is not required at this time.

Tokens

DoctorCity	DoctorTitle
DoctorFirstName	DoctorZip
DoctorLastName	PatientFirstName
DoctorNickName	PatientLastName
DoctorState	UserName
DoctorStreet	

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

Dear <<DoctorNickName>>,

I truly appreciate your referring <<PatientFirstName>> <<PatientLastName>> to our practice. After a careful orthodontic examination, I have determined that treatment is not necessary at this time. I've explained this fully to <<PatientFirstName>>.

Thank you for your support and referral.

Sincerely,

<<UserName>>

Doctor – Wait for Treatment

Thanks the dentist for the referral. Treatment is necessary but it would be best to wait until permanent dentition has erupted.

Tokens

DoctorCity	DoctorTitle
DoctorFirstName	DoctorZip
DoctorLastName	PatientFirstName
DoctorNickName	PatientLastName
DoctorState	UserName
DoctorStreet	

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

Dear <<DoctorNickName>>,

We truly appreciate your referring <<PatientFirstName>> <<PatientLastName>> to our practice. While orthodontic treatment is indicated on <<PatientFirstName>>, it would be most beneficial to wait until more of the permanent dentition has erupted.

I am placing this patient on recall and will keep you abreast of any developments.

Sincerely,

<<UserName>>

Form – Initial Treatment Diagnosis

Provides a form for recording the initial treatment diagnosis.

Tokens

PatientFirstName	Dental Class	Mandibular Position
PatientLastName	Dentition developmental stage	Maxilla Position
PatientBirthDate	Enamel Defects	Midlines
Airway evaluation	Functional Shift	Overbite
Canine Classification	Hygiene/Periodontic Health	Overjet
Chief Concerns	Lips Evaluation	Treatment Fee
Crossbite	Lips at Rest	Tx length (mos)

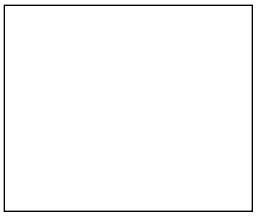
Date: 6/16/22

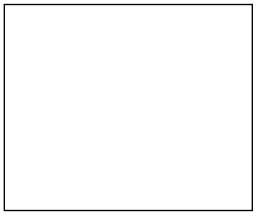
Patient: <<PatientFirstName>> <<PatientLastName>>

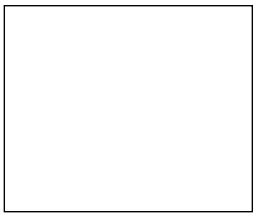
Birth: <<PatientBirthday>>

Chief Complaint
• <<Chief Concerns>>

Maxilla:	<<Maxilla Position>>
Mandible:	<<Mandibular Position>>
Lips	<<Lips Evaluation>>
Airway	<<Airway evaluation>>
Caries	
Crossbites	<<Crossbite>>
Functional Shift	<<Functional Shift>>
Missing Teeth	
Trauma/endo	
TMJ	
Molar Class	L: <<Dental Class>>
	R:
Canine Class	L: <<Canine Classification>>







Date: 6/16/22

Patient: <<PatientFirstName>> <<PatientLastName>>

Birth: <<PatientBirthday>>

Chief Complaint
• <<Chief Concerns>>

	R:
Overbite	<<Overbite>>
Overjet	<<Overjet>>
Midline	<<Midlines>>
Hygiene/Perio	<<Hygiene/Periodontic Health>>
Enamel Defects	<<Enamel Defects>>
Dentition Stage	<<Dentition developmental stage>>
Additional Notes	

Dx:

Tx:

ETT: <<Tx length (mos)>> months

Fees: <<Treatment Fee>>

Parent – Cooperation Needed to Treat

Letter to parent stating that treatment is needed but can't begin until the patient decides to cooperate.

Tokens

GuardianCity	GuardianTitle
GuardianFirstName	GuardianZip
GuardianLastName	PatientFirstName
GuardianState	son_daughter
GuardianStreet	UserName
	UserPhone

6/16/22

<<GuardianTitle>> <<GuardianFirstName>> <<GuardianLastName>>

<<GuardianStreet>>

<<GuardianCity>>, <<GuardianState>> <<GuardianZip>>

Dear <<GuardianTitle>> <<GuardianLastName>>,

We enjoyed meeting you and discussing your <<son_daughter>>'s need for orthodontic treatment. As I mentioned during our visit, treatment is necessary. However, before deciding whether to make this commitment, we would like you to give it careful consideration.

Patient cooperation is the most important aspect of successful orthodontic treatment. If <<PatientFirstName>> is not yet ready to make the necessary commitments, it may be best to postpone treatment.

Please give this some real thought and call us if you believe <<PatientFirstName>> is ready to begin treatment. Until then, please don't hesitate to call <<UserPhone>> if you have any questions.

Sincerely,

<<UserName>>

Parent – Fed Truth in Lending & Disclosure

Cover letter for sending the parent a copy of the *Federal Truth in Lending Disclosure Statement*.

Tokens

GuardianCity	GuardianStreet
GuardianFirstName	GuardianTitle
GuardianLastName	GuardianZip
GuardianState	UserName

6/16/22

<<GuardianTitle>> <<GuardianFirstName>> <<GuardianLastName>>

<<GuardianStreet>>

<<GuardianCity>>, <<GuardianState>> <<GuardianZip>>

Dear <<GuardianTitle>> <<GuardianLastName>>,

I am enclosing a copy of the Federal Truth in Lending Disclosure Statement, which we are required to send you. Please read carefully, sign and return to our office as soon as possible.

Sincerely,

Financial Coordinator

<<UserName>>

Parent – First Appointment Thank You

After the patient has already come in for initial records and before their consultation. Thanks them for their visit and reminds them when their next appointment is.

Tokens

GuardianCity	GuardianStreet	Appt. Time
GuardianFirstName	GuardianTitle	Appt. Date
GuardianLastName	GuardianZip	
GuardianState	UserName	

6/16/22

<<GuardianTitle>> <<GuardianFirstName>> <<GuardianLastName>>

<<GuardianStreet>>

<<GuardianCity>>, <<GuardianState>> <<GuardianZip>>

Dear <<GuardianTitle>> <<GuardianLastName>>,

We appreciate your scheduling an appointment with our office. At this appointment, we will be evaluating your need for orthodontic treatment and discussing with you what to expect should you decide to proceed with treatment.

All of us at the office look forward to meeting you. We'll see you at <<Appt. Time>> on <<Appt. Date>>.

Sincerely,

<<UserName>>

Parent – First Appointment Welcome

Thanks the parent for bringing their son/daughter in for an examination and then summarizes the patient's chief concerns, diagnostic findings, and treatment recommendations.

Tokens

GuardianCity	GuardianZip	Chief Concerns
GuardianFirstName	PatientFirstName	Next appointment
GuardianLastName	her_him	Orthodontic Diagnosis
GuardianState	UserName	Treatment Recommendations
GuardianStreet	UserPhone	
GuardianTitle		

6/16/22

<<GuardianTitle>> <<GuardianFirstName>> <<GuardianLastName>>

<<GuardianStreet>>

<<GuardianCity>>, <<GuardianState>> <<GuardianZip>>

Dear <<GuardianTitle>> <<GuardianLastName>>,

It was a pleasure meeting you and <<PatientFirstName>> during your first appointment. Our staff eagerly welcomes <<PatientFirstName>> to our practice and looks forward to seeing <<her_him>> again for <<her_him>> next appointment on <<Next appointment>>. Following is a recap of your initial examination:

Your Chief Concerns
• <<Chief Concerns|Layman>>

Our Diagnostic Findings
• <<Orthodontic Diagnosis|Layman>>

Treatment Recommendations
• <<Treatment Recommendations|Layman>>

If you have any questions or require any further information prior to your next appointment, please feel free to call us at <<UserPhone>>.

Sincerely,

<<UserName>>

Parent – Payment Past Due

Letter to parent, informing them that they have past due payments.

Tokens

GuardianCity	GuardianTitle
GuardianFirstName	GuardianZip
GuardianLastName	PatientFirstName
GuardianState	UserName
GuardianStreet	UserPhone
	$ Amount due

6/16/22

<<GuardianTitle>> <<GuardianFirstName>> <<GuardianLastName>>

<<GuardianStreet>>

<<GuardianCity>>, <<GuardianState>> <<GuardianZip>>

Dear <<GuardianTitle>> <<GuardianLastName>>,

Our records show that you are past due on your payments for <<PatientFirstName>>'s orthodontic care. We need to receive <<$ Amount due>> to bring this account up to date. For your convenience, overdue accounts can be charged on Visa, Mastercard, or American Express.

Please remit this amount immediately or call us at <<UserPhone>> to have the <<$ Amount due>> charged to your credit card.

We appreciate your cooperation and expect to hear from you soon.

Sincerely,

Financial Coordinator

<<UserName>>

Parent – Treatment Not Required

Thanks the parent for bringing in their son/daughter and then informs them that treatment is not required at this time.

Tokens

GuardianCity	GuardianTitle
GuardianFirstName	GuardianZip
GuardianLastName	PatientFirstName
GuardianState	UserName
GuardianStreet	

6/16/22

<<GuardianTitle>> <<GuardianFirstName>> <<GuardianLastName>>

<<GuardianStreet>>

<<GuardianCity>>, <<GuardianState>> <<GuardianZip>>

Dear <<GuardianTitle>> <<GuardianLastName>>,

It was a pleasure to meet you and <<PatientFirstName>> to discuss possible orthodontic treatment. As I mentioned during our visit, <<PatientFirstName>> is not required to have orthodontic treatment at this time.

We are pleased that you chose our office. Please let us know if there is any way in which we can be of help in the future.

Sincerely,

<<UserName>>

Patient – Certificate - Finished

A certificate that can be given to the patient when they finish treatment.

Tokens

PatientFirstName	UserName
PatientLastName	DateTreatmentFinished

The office of <<UserName>>

congratulates

<<PatientFirstName>> <<PatientLastName>>

for completing treatment on <<Date Treatmnt finished>>

<<UserName>> 6/16/22

Patient – Certificate - Finished Child

A certificate that can be given to the patient when they finish treatment.

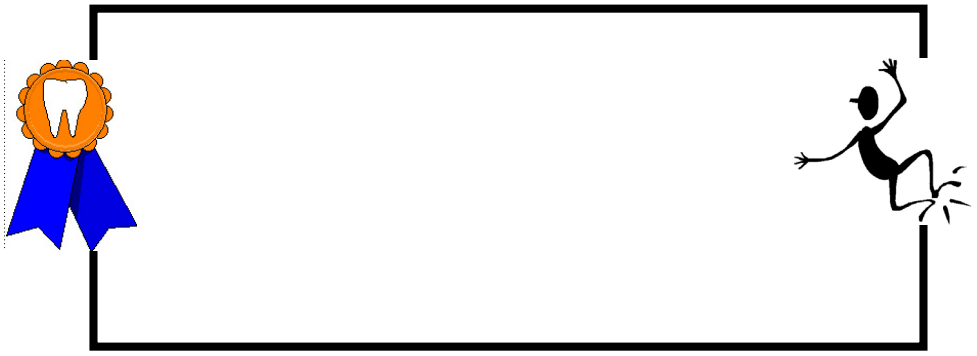
Tokens

PatientFirstName	UserName
PatientLastName	DateTreatmentFinished

The office of <<UserName>>

congratulates

<<PatientFirstName>> <<PatientLastName>>



for completing treatment on <<Date Treatmnt finished>>

<<UserName>> 6/16/22

Patient – Cooperation Needed to Treat

Letter to patient stating that treatment is needed but can't begin until they are willing to cooperate.

Tokens

PatientCity	PatientStreet
PatientFirstName	PatientTitle
PatientLastName	PatientZip
PatientNickName	UserName
PatientState	UserPhone

6/16/22

<<PatientFirstName>> <<PatientLastName>>

<<PatientStreet>>

<<PatientCity>>, <<PatientState>> <<PatientZip>>

Dear <<PatientNickName>>,

We enjoyed meeting you and discussing your need for orthodontic treatment. As I mentioned during our visit, treatment is necessary. However, before deciding whether to make this commitment, we would like you to give it careful consideration.

Patient cooperation is the most important aspect of successful orthodontic treatment. If the patient is not yet ready to make the necessary commitments, it may be best to postpone treatment.

Please give this some real thought and call us if you are ready to begin treatment. Until then, please don't hesitate to call <<UserPhone>> if you have any questions.

Sincerely,

<<UserName>>

Patient – Fed Truth in Lending & Disclosure

Cover letter for sending the patient a copy of the *Federal Truth in Lending Disclosure Statement*.

Tokens

PatientCity	PatientStreet
PatientFirstName	PatientTitle
PatientLastName	PatientZip
PatientNickName	UserName
PatientState	

6/16/22

<<PatientFirstName>> <<PatientLastName>>

<<PatientStreet>>

<<PatientCity>>, <<PatientState>> <<PatientZip>>

Dear <<PatientNickName>>,

I am enclosing a copy of the Federal Truth in Lending Disclosure Statement, which we are required to send you. Please read carefully, sign and return to our office as soon as possible.

Sincerely,

Financial Coordinator

<<UserName>>

Patient – Finished Photos

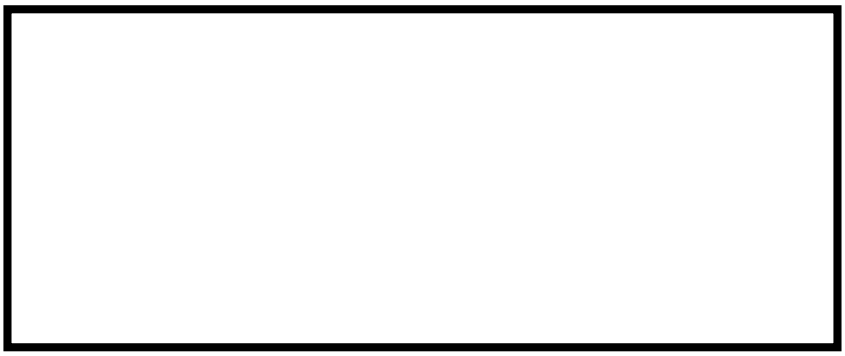
A certificate with patient photos can be given to the patient when they finish treatment.

Tokens

PatientFirstName	UserName
PatientLastName	Date braces off

The office of <<UserName>> congratulates

<<PatientFirstName>> <<PatientLastName>>



Braces Removed <<Date Braces off>>

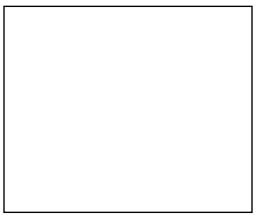
Patient – First Appointment Welcome

Thanks the patient for coming in for an examination and then summarizes the patient's chief concerns, diagnostic findings, and treatment recommendations.

Tokens

GuardianCity	GuardianTitle	UserPhone
GuardianFirstName	GuardianZip	Chief Concerns
GuardianLastName	PatientFirstName	Next appointment
GuardianState	her_him	Orthodontic Diagnosis
GuardianStreet	UserName	Treatment Recommendations

6/16/22



<<GuardianTitle>> <<GuardianFirstName>> <<GuardianLastName>>

<<GuardianStreet>>

<<GuardianCity>>, <<GuardianState>> <<GuardianZip>>

Dear <<GuardianTitle>> <<GuardianLastName>>,

It was a pleasure meeting you and <<PatientFirstName>> during your first appointment. Our staff eagerly welcomes <<PatientFirstName>> to our practice and looks forward to seeing <<her_him>> again for <<her_him>> next appointment on <<Next appointment>>. Following is a recap of your initial examination:

Your Chief Concerns
• <<Chief Concerns|Layman>>

Our Diagnostic Findings
• <<Orthodontic Diagnosis|Layman>>

Treatment Recommendations
• <<Treatment Recommendations|Layman>>

If you have any questions or require any further information prior to your next appointment, please feel free to call us at <<UserPhone>>.

Sincerely,

<<UserName>>

Patient – Payment Past Due

Letter to patient, informing them that they have past due payments.

Tokens

PatientCity	PatientStreet
PatientFirstName	PatientTitle
PatientLastName	PatientZip
PatientNickName	UserName
PatientState	UserPhone
	$ Amount due

6/16/22

<<PatientTitle>> <<PatientFirstName>> <<PatientLastName>>

<<PatientStreet>>

<<PatientCity>>, <<PatientState>> <<PatientZip>>

Dear <<PatientNickName>>,

Our records show that you are past due on your payments for orthodontic care. We need to receive <<$ Amount due>> to bring this account up to date. For your convenience, overdue accounts can be charged on Visa, Mastercard, or American Express.

Please remit this amount immediately or call us at <<UserPhone>> to have the <<$ Amount due>> charged to your credit card.

We appreciate your cooperation and expect to hear from you soon.

Sincerely,

Financial Coordinator

<<UserName>>

Patient – Thanks for Referring Another Patient

This letter is to thank one patient for referring another. When using this letter, select the patient that was referred on the image list so that the person that referred them can see their photo.

Tokens

City, State Zip	Ref. patient full name
PatientFirstName	Referral Address
PatientLastName	Referral Name
He_She	she_he
	UserName

6/16/22

<<Ref. patient full name>>

<<Referral Address>>

<<City, State Zip>>

Dear <<Referral Name>>,

Recently, <<PatientFirstName>> <<PatientLastName>> visited our office regarding orthodontic treatment. <<He_She>> mentioned that <<she_he>> had heard of us from you. On behalf of our entire staff, I would like to thank you for thinking of us. We really appreciate the recommendation.

Sincerely,

<<UserName>>

Patient – Treatment not Required

Thanks the patient for coming in and then informs them that treatment is not required at this time.

Tokens

PatientCity	PatientStreet
PatientFirstName	PatientTitle
PatientLastName	PatientZip
PatientNickName	UserName
PatientState	

6/16/22

<<PatientTitle>> <<PatientFirstName>> <<PatientLastName>>

<<PatientStreet>>

<<PatientCity>>, <<PatientState>> <<PatientZip>>

Dear <<PatientNickName>>,

It was a pleasure to meet you and discuss possible orthodontic treatment. As I mentioned during our visit, you are not required to have orthodontic treatment at this time.

We are pleased that you chose our office. Please let us know if there is any way in which we can be of help in the future.

Sincerely,

<<UserName>>

Patient – Treatment Outline

Outlines the treatment plan for the patient.

Tokens

UserName	Add'l Charges	Payment in Full
UserAddress1	Cost of Rec & Init exam	Signed Insur. Form
UserAddress2	Date of Last Dental Exam	Treatment Fee
PatientFirstName	Est. Treat time (mo.)	Treatment Recommendations
PatientLastName	Insurance Company	

<<UserName>>
<<UserAddress1>>
<<UserAddress2>>

6/16/22

Treatment outline for <<PatientFirstName>> <<PatientLastName>>

Date of Last Dental Exam

<<Date of Last Dental Exam>>

Estimated Treatment Time

<<Est. Treat time (mo.)>> months

Recommended Treatment Plan

<<Treatment Recommendations>>

Insurance Coverage

<<Insurance Company>>

Patient Responsibility

Excellent Brushing

Avoid hard or sticky foods. Loose appliances can

extend treatment time.

Wear elastics full time.

Keep appointments faithfully.

Wear retainers as instructed.

Signed Insurance Form

<<Signed Insur. Form>>

Orthodontic Charges

Records and Initial Exam: <<Cost of Rec & Init exam>>

Treatment Fee: <<Treatment Fee>>

Payment in Full: <<Payment in Full>>

Additional Charges: <<Add'tl Charges>>

Financial Arrangements

Patient – Treatment Outline with Fee Schedule

Outlines the treatment plan for the patient.

Tokens

UserName	Add'l Charges	Payment in Full
UserAddress1	Cost of Rec & Init exam	Signed Insur. Form
UserAddress2	Date of Last Dental Exam	Treatment Fee
PatientFirstName	Est. Treat time (mo.)	Treatment Recommendations
PatientLastName	Insurance Company	

<<UserName>>
<<UserAddress1>>
<<UserAddress2>>

6/16/22

Treatment outline for <<PatientFirstName>> <<PatientLastName>>

Date of Last Dental Exam	**Estimated Treatment Time**
<<Date of Last Dental Exam>>	<<Est. Treat time (mo.)>> months
Recommended Treatment Plan	**Insurance Coverage**
<<Treatment Recommendations>>	<<Insurance Company>>
Patient Responsibility	**Signed Insurance Form**
Excellent Brushing	<<Signed Insur. Form>>
Avoid hard or sticky foods. Loose appliances can	
extend treatment time.	**Orthodontic Charges**
Wear elastics full time.	Records and Initial Exam: <<Cost of Rec & Init exam>>
Keep appointments faithfully.	Treatment Fee: <<Treatment Fee>>
Wear retainers as instructed.	Payment in Full: <<Payment in Full>>
	Additional Charges: <<Add'tl Charges>>

Fees and Financial Arrangements

Fee Schedule	
Records & Initial Exam	250
Additional Charges	100
Treatment Fee	3,500
Total	3,850

	Plan A	Plan B	Plan C
Down Payment	1,000	2,000	3,000
Net	2,850	1,850	850
Months	20	20	20
Monthly Pmt	142.50	92.50	42.50

Letter Set Templates

Letter Set - First Appointment Evaluation #1

Creates two letters, one to the referring doctor and one to the patient's guardian, reviewing the diagnosis and treatment plan.

Tokens

DoctorCity	GuardianStreet	Chief Concerns
DoctorFirstName	GuardianTitle	Crowding
DoctorLastName	GuardianZip	Crossbite
DoctorState	He_She	Dental Class (2)
DoctorStreet	her_his	Dentition developmental stage (2)
DoctorTitle	Name	Overbite
DoctorZip	PatientFirstName	Overjet (2)
GuardianCity	PatientLastName	Patient's Next Step
GuardianFirstName	Status at Appointment	Skeletal Evaluation|
GuardianLastName	Add'l Notes for Patient	Treatment Plan
GuardianState	Add'l Tx Notes	Tx length (mos)

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

Dear <<DoctorNickName>>,

Thank you for referring <<PatientFirstName>> <<PatientLastName>>. I recently saw <<PatientFirstName>> for <<Status at Appointment>> appointment. <<He_She>> presents with the following findings.

Chief concerns:
• <<Chief Concerns>>

Dental evaluation
• <<Dental Class (2)|Dentist>>
• <<Dentition developmental stage (2)|Dentist>>
• <<Overbite|Dentist >>
• <<Overjet (2)|Dentist >>
• <<Crowding|Dentist >>
• <<Crossbite|Dentist >>

Skeletal evaluation
• <<Skeletal Evaluation|Dentist >>

I recommended the following treatment plan for <<PatientFirstName>>:
<<Treatment Plan>>:
• <<Add'l Tx Notes>>

<<PatientFirstName>>'s next step:
• <<Patient's Next Step>>

I estimate <<PatientFirstName>>'s treatment time at approximately <<Tx length (mos)>> months. I have reminded <<PatientFirstName>> to maintain <<her_his>> 6-month recalls with you throughout the course of <<her_his>> orthodontic treatment. Please feel free to call if you have any additional questions or suggestions regarding <<PatientFirstName>>.

Sincerely,

<<Name>>

6/16/22

<<GuardianTitle>> <<GuardianFirstName>> <<GuardianLastName>>

<<GuardianStreet>>

<<GuardianCity>>, <<GuardianState>> <<GuardianZip>>

Dear <<GuardianTitle>> <<GuardianLastName>>,

This letter is a review of the diagnosis and treatment plan we discussed at

<<PatientFirstName>>’s recent orthodontic consultation.

My evaluation of <<her_his>> teeth reveals:
• <<Dental Class (2)|Layman>>
• <<Dentition developmental stage (2)|Layman>>
• <<Overbite|Layman>>
• <<Overjet (2)|Layman>>
• <<Crowding|Layman>>
• <<Crossbite|Layman>>

My evaluation of <<her_his>> jaw relationships reveals:
• <<Skeletal Evaluation|Layman>>

I recommend the following treatment plan:

<<Treatment Plan|Layman>>:
• <<Add’l Notes for Patient>>

I estimate that <<PatientFirstName>>’s orthodontic treatment to be approximately <<Tx length (mos)>> months. The actual treatment time will be largely dependent upon <<her_his>> cooperation, such as keeping teeth and appliances clean, avoiding hard or chewy foods, and keeping all appointments. Many appointments can be arranged in the "after-school" hours; however, we will require longer appointments to be scheduled during “school hours” on occasion. It is important for <<PatientFirstName>> to see <<her_his>> family dentist prior to orthodontic treatment, and to continue regular visits for cavity checks and cleanings.

I hope this letter answers any questions you may have regarding <<PatientFirstName>>’s proposed orthodontic treatment. Please feel free to call if you have any additional questions. We look forward to working with <<PatientFirstName>> in the future.

Sincerely,

<<Name>>

Letter Set - First Appointment Evaluation #2

Creates two letters, one to the referring doctor and one to the patient's guardian, reviewing the diagnosis and treatment plan.

Tokens

DoctorCity	GuardianTitle	Fixed Appliances
DoctorFirstName	GuardianZip	Functional Appliance
DoctorLastName	her_him	Maxillary Arch Length II
DoctorNickName	her_his	Mandibular Arch Length II
DoctorState	Name	Overbite II
DoctorStreet	PFirstName	Overjet II
DoctorTitle	PLastName	Removable Appliance
DoctorZip	PatientNickname	Skeletal Profile
GuardianCity	she_he	Skeletal Vertical
GuardianFirstName	Abnormalities or Special Problems	TMJ Clicking
GuardianLastName	Crossbite	TMJ Pain II
GuardianState	Dental Class (2)	Treatment Duration
GuardianStreet	Extractions	

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

RE: <<PFirstName>> <<PLastName>>'s orthodontic consultation

Dear <<DoctorNickName>>,

Your patient, <<PFirstName>> <<PLastName>>, recently visited our office and will be undergoing orthodontic treatment.

We completed a Full Phase orthodontic consultation for <<PFirstName>> that presented the following findings:

Classification:	<<Dental Class (2)>>
Arch Discrepancy:	<<Maxillary Arch Length II>>
	<<Mandibular Arch Length II>>
Overbite:	<<Overbite II>>
Overjet:	<<Overjet II>>

Crossbite:	<<Crossbite>>
Skeletal Problems:	<<Skeletal Profile>>
	<<Skeletal Vertical>>
TMD Signs/Symptoms:	<<TMJ Clicking>>
	<<TMJ Pain II>>
Special Problems:	<<Abnormalities or Special Problems>>

After completing and evaluating <<PFirstName>>'s diagnosis, I developed the plan for <<her_him>>, outlined below:

Extractions:	<<Extractions>>
Removable Appliances:	<<Removable Appliance>>
Functional Appliance:	<<Functional Appliance>>
Fixed Appliances:	<<Fixed Appliances>>

<<PFirstName>> has been told the importance of keeping regular visits with you. If <<she_he>> fails to come in for an appointment, please call our office and we'll be glad to reinforce the importance of periodic checkups. If you should have any questions or comments about <<PFirstName>>'s orthodontic treatment, please don't hesitate to call.

Sincerely,

<<Name>>

6/16/22

<<GuardianTitle>> <<GuardianFirstName>> <<GuardianLastName>>

<<GuardianStreet>>

<<GuardianCity>>, <<GuardianState>> <<GuardianZip>>

RE: <<PFirstName>> <<PLastName>>'s orthodontic consultation

Dear <<GuardianFirstName>>,

We are very happy to welcome you and <<PFirstName>> to our practice. We are excited to have your company for the next few years.l

This letter is a review of a diagnosis and treatment plan we discussed at our recent orthodontic consultation appointment. As you are aware, the diagnosis included the following:

Classification:	<<Dental Class (2)|Layman>>
Arch Discrepancy:	<<Maxillary Arch Length II|Layman>>
	<<Mandibular Arch Length II|Layman>>

Classification:	<<Dental Class (2)|Layman>>
Arch Discrepancy:	<<Maxillary Arch Length II|Layman>>
	<<Mandibular Arch Length II|Layman>>
Overbite:	<<Overbite II|Layman>>
Overjet:	<<Overjet II|Layman>>
Crossbite:	<<Crossbite|Layman>>
Skeletal Problems:	<<Skeletal Profile|Layman>>
	<<Skeletal Vertical|Layman>>
TMD Signs/Symptoms:	<<TMJ Clicking|Layman >>
	<<TMJ Pain II|Layman >>
Special Problems:	<<Abnormalities or Special Problems|Layman >>

After completing and evaluating <<PatientNickname>>'s diagnosis, I developed the plan for <<her_him>>, outlined below:

Extractions:	<<Extractions|Layman >>
Removable Appliances:	<<Removable Appliance|Layman >>
Functional Appliance:	<<Functional Appliance|Layman >>
Fixed Appliances:	<<Fixed Appliances|Layman >>

I anticipate active treatment time at approximately <<Treatment Duration>> months with up to a 2 year retention treatment after the braces have been removed. However, the actual treatment time will be largely dependent upon <<PFirstName>>'s cooperation, such as keeping teeth and appliances clean, avoiding hard or chewy food, and keeping all <<her_his>> orthodontic appointments.

Many appointments can be arranged for after-school hours; however, we will require appointments to be scheduled during school on occasion. Understanding that your time is valuable, we will do everything possible to start and complete all of your appointments on time. Please advise of any loose or broken braces. A longer (or separate) appointment can then be scheduled for your convenience and to help us stay on schedule. Please keep in mind that broken or missed appointments, regardless of the reason, usually result in a longer active treatment.

As we mentioned, it is important to see your family dentist prior to orthodontic treatment, and to continue regular 3-6 month visits for cavity checks and cleanings.

I hope this letter answer any questions you may have regarding orthodontic treatment. If you any questions in the future, please do not hesitate to call on me any time. It has been a pleasure meeting with you and I look forward to a pleasant relationship in the future, as well as an excellent result!

Sincerely,

<<Name>>

Letter Set - First Appointment Evaluation #3

Creates two letters, one to the referring doctor and one to the patient's guardian, reviewing the diagnosis and treatment plan.

Tokens

DoctorCity	GuardianTitle	Fixed Appliances
DoctorFirstName	Abnormalities or Special Problems	Functional Appliance
DoctorLastName	Crossbite	Maxillary Arch Length II
DoctorNickName	Dental Class (2)	Mandibular Arch Length II
DoctorState	Extractions	Overbite
DoctorStreet	GuardianZip	Overjet (2)
DoctorTitle	her_him	Removable Appliance
DoctorZip	her_his	Skeletal Profile
GuardianCity	PatientFirstName	Skeletal Vertical
GuardianFirstName	PatientLastName	TMJ Clicking
GuardianLastName	PatientNickname	TMJ Pain
GuardianState	she_he	Treatment Duration
GuardianStreet	UserName	

6/16/22

<<DoctorTitle>> <<DoctorFirstName>> <<DoctorLastName>>

<<DoctorStreet>>

<<DoctorCity>>, <<DoctorState>> <<DoctorZip>>

RE: <<PatientFirstName>> <<PatientLastName>>'s

orthodontic consultation

Dear <<DoctorNickName>>,

Your patient, <<PatientFirstName>> <<PatientLastName>>, recently visited our office and will be undergoing orthodontic treatment.

We completed a Full Phase orthodontic consultation for <<PFirstName>> that presented the following findings:

Classification	<<Dental Class (2)>>
Arch Discrepancy	<<Maxillary arch length>>
	<<Mandibular arch length>>
Overbite	<<Overbite>>

Overjet	<<Overjet (2)>>
Crossbite	<<Crossbite>>
Skeletal Problems	<<Skeletal Profile>>
	<<Skeletal Vertical>>
TMD Signs/Symptoms	<<TMJ Clicking>>
	<<TMJ Pain II>>
Special Problems	<<Abnormalities or Special Problems>>

After completing and evaluating <<PatientFirstName>>'s diagnosis, I developed the plan for <<her_him>>, outlined below:

Extractions	<<Extractions>>
Removable Appliances	<<Removable Appliance>>
Functional Appliance	<<Functional Appliance>>
Fixed Appliances	<<Fixed Appliances>>

<<PatientFirstName>> has been told the importance of keeping regular visits with you. If <<she_he>> fails to come in for an appointment, please contact our office and we'll glad to reinforce the importance of periodic checkups. If you should have any questions or comments, please don't hesitate to call.

Sincerely,

<<UserName>>

6/16/22

<<GuardianTitle>> <<GuardianFirstName>> <<GuardianLastName>>

<<GuardianStreet>>

<<GuardianCity>>, <<GuardianState>> <<GuardianZip>>

RE: <<PatientFirstName>> <<PatientLastName>>'s orthodontic consultation

Dear <<GuardianFirstName>>,

We are very happy to welcome you and <<PatientFirstName>> to our practice. We are excited to have your company for the next few years.

This letter is a review of a diagnosis and treatment plan we discussed at our recent orthodontic consultation appointment. As you are aware, the diagnosis included the following:

Classification	<<Dental Class (2)|Layman>>
Arch Discrepancy	<<Maxillary Arch Length II|Layman>>
	<<Mandibular Arch Length II|Layman>>

Overbite	<<Overbite|Layman>>
Overjet	<<Overjet (2)|Layman>>
Crossbite	<<Crossbite|Layman>>
Skeletal Problems	<<Skeletal Profile|Layman>>
	<<Skeletal Vertical|Layman>>
TMD Signs/Symptoms	<<TMJ Clicking|Layman >>
	<<TMJ Pain|Layman >>
Special Problems	<<Abnormalities or Special Problems|Layman >>

After completing and evaluating <<PatientNickname>>'s diagnosis, I developed the plan for <<her_him>>, outlined below:

Extractions	<<Extractions|Layman >>
Removable Appliances	<<Removable Appliance|Layman >>
Functional Appliance	<<Functional Appliance|Layman >>
Fixed Appliances	<<Fixed Appliances|Layman >>

I anticipate active treatment time at approximately <<Treatment Duration>> months with up to a 2-year retention treatment after the braces have been removed. However, the actual treatment time will be largely dependent upon <<PatientFirstName>>'s cooperation, such as keeping teeth and appliances clean, avoiding hard or chewy food, and keeping all <<her_his>> orthodontic appointments.

Many appointments can be arranged for after-school hours; however, we will require appointments to be scheduled during school on occasion. Understanding that your time is valuable, we will do everything possible to start and complete all of your appointments on time. Please advise of any loose or broken braces. A longer (or separate) appointment can then be scheduled for your convenience and to help us stay on schedule. Please keep in mind that broken or missed appointments, regardless of the reason, usually result in a longer active treatment.

As we mentioned, it is important to see your family dentist prior to orthodontic treatment, and to continue regular 3-6 month visits for cavity checks and cleanings.

I hope this letter answer any questions you may have regarding orthodontic treatment. If you any questions in the future, please do not hesitate to call on me any time. It has been a pleasure meeting with you and I look forward to a pleasant relationship in the future, as well as an excellent result!

Sincerely,

<<UserName>>

Part VII: Appendices

This part of the *Dolphin Imaging User's Guide* includes the following supplementary information:

- Appendix A, Cephalometric Analyses lists the standard and Dolphin-proprietary analyses and provides tables of the cephalometric landmarks and their definitions.
- Appendix B, Tokens and Codes includes tables of page setup tokens and their definitions, Dolphin Letter System (DLS) reserved tokens and their definitions, and DLS diagnostic lists and codes.
- Appendix C, DOLPHIN.INI File describes the **DOLPHIN.INI** file, which stores configuration options for the Dolphin Imaging program.
- Appendix D, Digital Radiographic System Integration provided information about the digital radiographic systems with which the Dolphin Imaging System has been integrated.
- Appendix E, Practice Management System Integration provides information about the practice management systems with which the Dolphin Imaging System has been integrated.
- Appendix F, Recommended Readings contains a list of recommended readings.

Appendix A: Cephalometric Analyses

This appendix includes the following information for your reference:

- lists of the standard and Dolphin-proprietary analyses
- tables of the cephalometric landmarks and their definitions along with diagrams of their locations
- notes on frequently-used analyses

Standard and Dolphin-proprietary Analyses

The following lists the standard and Dolphin-proprietary analyses available on the Digitize dialog box. In the Digitize dialog box, an at-sign (@) indicates a Dolphin-proprietary analysis. Square brackets ([ ]) indicate a custom analysis created for a specific doctor, practice, or institution. All other analyses are standard analyses. For more information on the Digitize dialog box, see Chapter 7, Digitize (Medical Device).

The following analyses are Dolphin-proprietary:

- Profilogram
- Superimpose
- Treatment Plan

The following standard lateral analyses are supported:

ABO	ABO 2012	Alabama
Alexander	Bjork	Bjork II
Bjork III	COGS	CVM
Delaire	Downs	Downs-Northwestern
Gerety	Holdaway	Iowa
Jarabak	Jarabak (Revised)	Legan
McLaughlin	McNamara	Moshiri Surgical
Quadrilateral	Ricketts	Ricketts Advanced
Ricketts, Comprehensive	Ricketts-Roth-Jarabak	Roth-Jarabak
Roth-Williams AEO	Sassouni	Sassouni+
Steiner	Tweed	

The following standard frontal analyses are supported:

Grummons	Grummons Simplified Frontal	Ricketts
Simplified	Slick/Good	Standard

The following standard arch analyses are supported:

Arch Calibration	Bolton - Anterior	Bolton - Full Arch
Both Arches	Lower Arch	Upper Arch

Cephalometric Landmarks

The following sections define lateral and frontal cephalometric landmarks. These sections include a table defining the landmarks and illustrations of the landmarks.

Lateral Landmarks

The following table lists static lateral cephalometric landmarks. This table only applies if you are digitizing a lateral x-ray. For an illustration of these landmarks, see the two figures below the table.

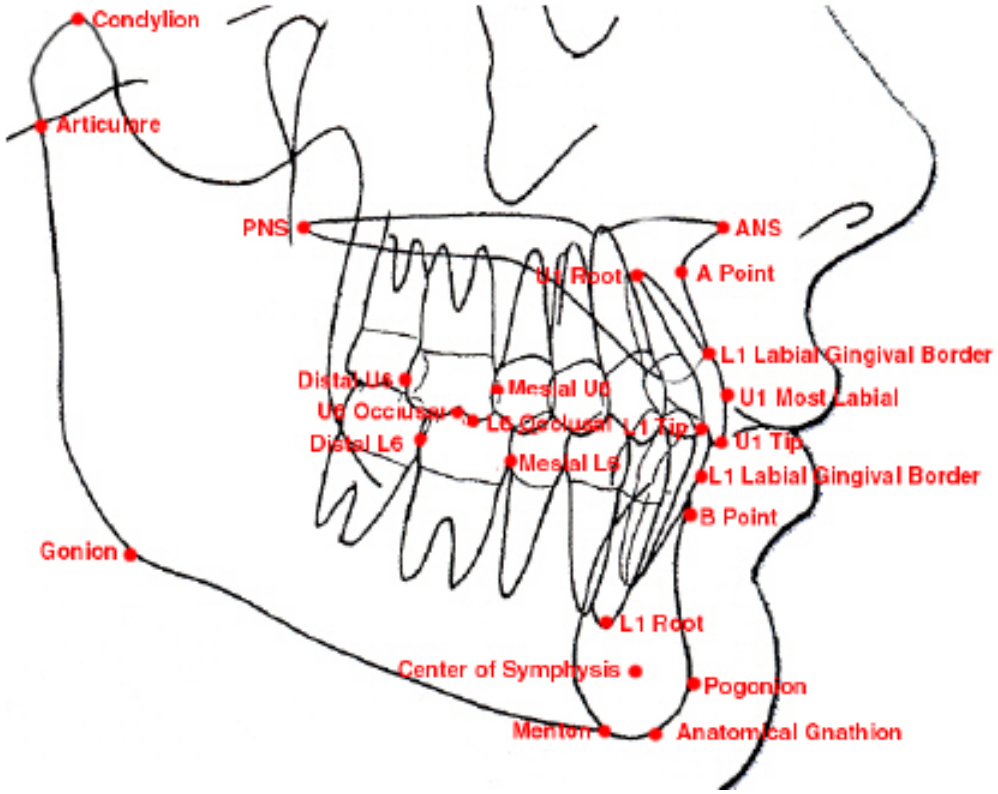
Landmark	Description
A point	Deepest point of the curve of the maxilla, between the anterior nasal spine (ANS) and the dental alveolus.
Anatomical Gnathion	Midpoint between the most anterior and inferior point on the bony chin. (Brodie, 1941)
ANS	The tip of the anterior nasal spine.
Antegonial Notch	Point at the lateral interior margin of the antegonial protuberance.
Articulare	Posterior border of the neck of the condyle.
B Point	Most posterior point in the concavity along the anterior border of the symphysis.
Basion	Most inferior posterior point of the occipital bone at the anterior margin of the occipital foramen.
Bridge of Nose	Mid-point from the soft tissue Nasion to the Tip of Nose; first contour encountered along the length of the profile on the nose.
Center of Symphysis (D)	The center of the symphysis structure.
Clinoidale	Posterior point of the roof of the orbit, where it meets anterior of the sella turcica.
Columella Point	Nasal Base.
Condylion	Most posterior superior point of the condyle.
Cribiform Point	Point of intersection of the planum with greater wing of the sphenoid.

DC Point	Center of the neck of the condyle on the Nasion-Basion line.
Distal L6	Distal surface of the lower first molar, perpendicular to the occlusal plane.
Distal U6	Distal surface of the upper first molar, perpendicular to the occlusal plane.
Dorsum Sella	Most posterior superior point of the pituitary fossa.
Floor of Sella	Most inferior point of the pituitary fossa.
Gonion	Location depends on the analysis: 1) most convex point along the inferior border of the Ramus; or, 2) most convex point where the posterior inferior curve of the ramus meet.
L1 Labial Gingival Border	Labial cemento-enamel junction (CEJ) of the lower central incisor.
L1 Lingual Gingival Border	Lingual cemento-enamel junction (CEJ) of the lower central incisor.
L1 Root	Root apex of the lower central incisor.
L1 Tip	Tip of the lower central incisor.
L6 Occlusal	Point on the occlusal surface crown of the lower first molar. (Same as U6 Occlusal if the molars occlude.)
Lower Lip	Most anterior point on the curve of the lower lip.
Mechanical Porion	Highest point of the ear canal; most superior point of the external auditory meatus.
Menton	Most inferior point of the symphysis.
Mesial L6	Mesial surface of the lower first molar, perpendicular to the occlusal plane.
Mesial U6	Mesial surface of the upper first molar, perpendicular to the occlusal plane.
Nasion	Intersection of the internasal suture with the nasofrontal suture in the midsagittal plane.
Occlusal Plane Distal	Point where the upper and lower first molars occlude. If molars do not occlude, point is the bisection of the occlusal crown surface of the upper and lower first molars.
Orbitale	Lowest point of the roof of the orbit; most inferior point of the external border of the orbital cavity.
PM	Point on the symphysis between B point and Pogonion, where the bone curves from convex to concave.
PNS	Tip of the posterior nasal spine.
Pogonion	Most anterior point on the mid-sagittal symphysis.
Porion	Highest point of the ear canal; most superior point of the external auditory meatus.
PT Point	Intersection of the inferior border of the formen rotundum with the posterior wall of the pterygomaxillary fissure.
R1	Most concave point on the interior of the ramus. Used to locate Xi point.
R2	Most convex point on the exterior border of the ramus along the vertical. Used to locate Xi point.
R3	Most inferior border along the top of the ramus. Used to locate Xi point.
R4	Most superior border along the bottom of the ramus. Used to locate Xi point.

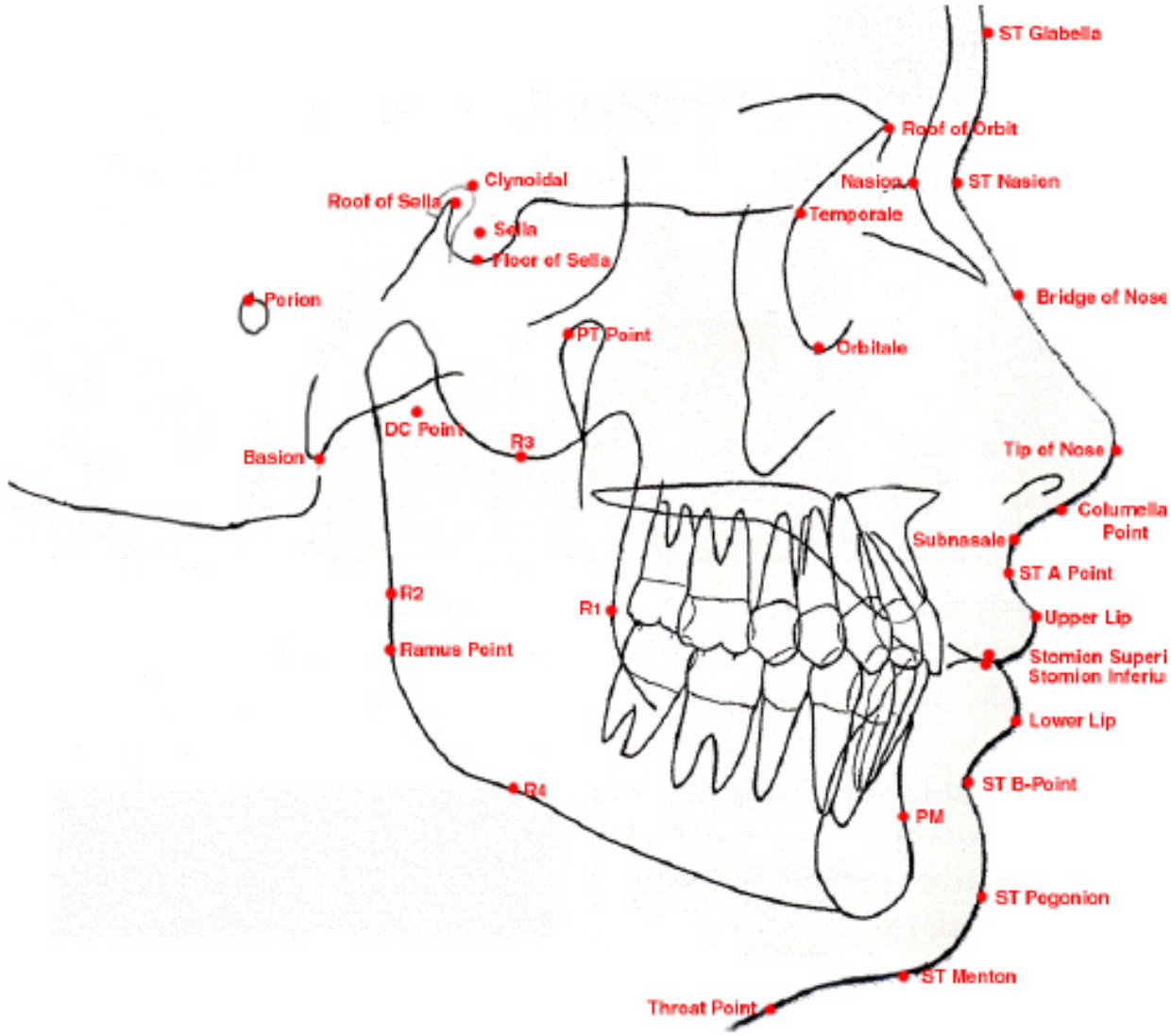
Ramus Point	Most posterior point up the border of the ramus.
Roof of Orbit	Most superior point of the roof of the orbit.
S.T. Glabella	Most anterior point on the frontal bone. (Krogman & Sassouni, 1957)
Sella	Center of the pituitary fossa of the sphenoid bone.
Sella Est-1	Midline of the patient's head, located at the occipital level of the head.
Sella Est-2	Midline located 45 degrees to the Frankfort plane at the posterior crown of the head.
Sella Est-3	Midline straight up from the orbitale.
Sella Est-4	Midline back of the head, along the Frankfort plane.
Soft Tissue Menton	The most inferior point of the soft tissue chin.
Sphenoid	Point of the greatest convexity between the anterior contour of sella turcica and planum sphenoidale.
ST A-Point	Soft tissue point A; most concave point between the subnasale and the anterior point of the upper lip.
ST B-Point	Most concave point between the lower lip and the soft tissue chin.
ST Nasion	Soft tissue profile's most concave point at the bridge of the nose.
ST Pogonion	Point on the anterior curve of the soft tissue chin.
Stomion	Midpoint between stomion superius (lowest point of the upper lip) and stomion inferius (highest point of the lower lip).
Stomion Inferius	Most superior point on the curve of the lower lip.
Stomion Superius	Most inferior point on the curve of the upper lip.
Subnasale	Point where the nose connects to the center of the upper lip.
Temporale	Point where the anterior wall of the temporale meets the anterior extension of the sphenoid bone.
Throat Point	Intersection of lines tangent to the neck and the throat.
Tip of Nose	Pronasale. Point of the anterior curve of the nose.
Trichion	Frontal hairline at the midline.
U1 Labial Gingival Border	Labial cemento-enamel junction (CEJ) of the upper central incisor.
U1 Lingual Gingival Border	Lingual cemento-enamel junction (CEJ) of the upper central incisor.
U1 Most Labial	Most labial surface of the upper central incisor.
U1 Root	Root apex of the upper central incisor.
U1 Tip	Incisal tip of the upper central incisor.
U6 Occlusal	Point on the occlusal surface crown of the upper first molar. (Same as L6 Occlusal if the molars occlude.)
Upper Lip	Most anterior point on the curve of the upper lip.
Vertex	Most superior point on the head, along the midline.

Vertical Lower	“Lower” point that establishes “Vertical,” the natural head position line. (Harvard analysis)
Vertical Upper	“Upper” point that establishes “Vertical,” the natural head position line. (Harvard analysis)

Lateral teeth (base) diagram



Lateral tracing (base) diagram



Frontal Landmarks

The following table lists static frontal cephalometric landmarks. This table only applies if you are digitizing a frontal x-ray.

Landmark	Description
A Point	Deepest point of the curve of the maxilla between the anterior nasal spine and the dental alveolus.
Antegonial notch R (AG)	Highest point in the antegonial notch on the patient's right side.
Antegonial notch R (GA)	Highest point in the antegonial notch on the patient's left side.
Condylion, Left	Most superior point of the condylar head of the patient's left side.
Condylion, Right	Most superior point of the condylar head on the patient's right side.
Crista Galli	Most superior point on the Crista Galli.
Jugal Process, L	Intersection of the zygonmatic buttress and outline of the tuberosity on the patient's left side.
Jugal Process, R	Intersection of the zygonmatic buttress and outline of the tuberosity on the patient's right side.
L1 Labial Gingival, L	Cemento-enamel junction (CEJ) of the mandibular incisor on the patient's left side.
L1 Labial Gingival, R	Cemento-enamel junction (CEJ) of the mandibular incisor on the patient's right side.
L1 Labial Gingival, R (open)	With the patient's mouth properly opened by a bite block, digitize the cemento-enamel junction (CEJ) of the mandibular incisor on the patient's left side.
L1 Mesial, L	Mesial tooth surface of the mandicular incisor on the patient's left side.
L1 Mesial, L (open)	With the patient's mouth properly opened by a bite block, digitize the mandibular cuspid tip on the patient's left side.
L1 Mesial, R	Mesial tooth surface of the mandicular incisor on the patient's right side.
L1 Mesial, R (open)	With the patient's mouth properly opened by a bite block, digitize the mandibular cuspid tip on the patient's right side.
L1 Tip, L	Maxillary incisal tip on the patient's left side.
L1 Tip, L (open)	With the patient's mouth properly opened by a bite block, digitize the mandibular cuspid tip on the patient's left side.
L1 Tip, R	Maxillary incisal tip on the patient's right side.
L1 Tip, R (open)	With the patient's mouth properly opened by a bite block, digitize the mandibular cuspid tip on the patient's right side.
L3 Tip, L	Tip of the mandicular cuspid on the patient's left side.
L3 Tip, L (open)	With the patient's mouth properly opened by a bite block, digitize the mandibular cuspid tip on the patient's left side.

L3 Tip, R	Tip of the mandicular cuspid on the patient's left side.
L3 Tip, R (open)	With the patient's mouth properly opened by a bite block, digitize the mandibular cuspid tip on the patient's right side.
L6 Buccal, L	Most buccal point of the mandibular first molar on the patient's left side.
L6 Buccal, R	Most buccal point of the mandibular first molar on the patient's right side.
L6 Buccal, R (open)	With the patient's mouth properly opened by a bite block, digitize the most buccal point of the maxillary first molar on the patient's right side.
Menton	Most inferior point on the border of the mandible, directly inferior to the mental protuberance.
Nasal cavity, L	Most lateral and widest aspect of the bottom of the nose on patient's left side.
Nasal cavity, R	Most lateral and widest aspect of the bottom of the nose on patient's right side.
Occlusal Plane Distal, L	Intersection or midpoint of the maxillary and mandibular first molar crown.
Occlusal Plane Distal, R	Intersection or midpoint of the maxillary and mandibular first molar crown.
Orbitale, Right	Most inferior point on the outline of the right orbital margin.
Pogonion	Most anterior point on the mid-sagittal symphysis.
Porion, L	Most superior point of the patient's left external auditory meatus.
Porion, R	Most superior point of the patient's right external auditory meatus.
ST Pogonion	Point on the anterior curve of the soft tissue chin.
U1 Labial Gingival, L	Cemento-enamel junction (CEJ) of the maxillary incisor on the patient's left side.
U1 Labial Gingival, R	Cemento-enamel junction (CEJ) of the maxillary incisor on the patient's right side.
U1 Mesial, L	Mesial tooth surface of the maxillary incisor on the patient's left side.
U1 Mesial, R	Mesial tooth surface of the maxillary incisor on the patient's right side.
U1 Tip, L	Maxillary incisal tip on the patient's left side.
U1 Tip, R	Maxillary incisal tip on the patient's right side.
U3 Tip, L	Tip of the maxillary cuspid on the patient's left side.
U3 Tip, R	Tip of the maxillary cuspid on the patient's right side.
U6 Buccal, L	Most buccal point of the maxillary first molar on the patient's left side.
U6 Buccal, R	Most buccal point of the maxillary first molar on the patient's right side.
Zygomatic Suture L (ZL, ZA)	Zygomatic-frontal suture, intersecting the orbit on the patient's right side.
Zygomatic Suture R (ZR, AZ)	Zygomatic-frontal suture, intersecting the orbit on the patient's right side.

Notes on Frequently Used Analyses

This section provides notes on digitizing landmarks and simulating treatment with some frequently used analyses.

Digitizing the [Diez & Bonilla] Analysis

This analysis is based on the Subnasale Vertical (TVL).

To digitize this analysis:

1 In the Ceph Analyses group box of the Digitize Setup dialog box, select the analysis type icon if it isn't already selected.

2 Select **[Diez & Bonilla]** from the **Ceph Analysis** list.

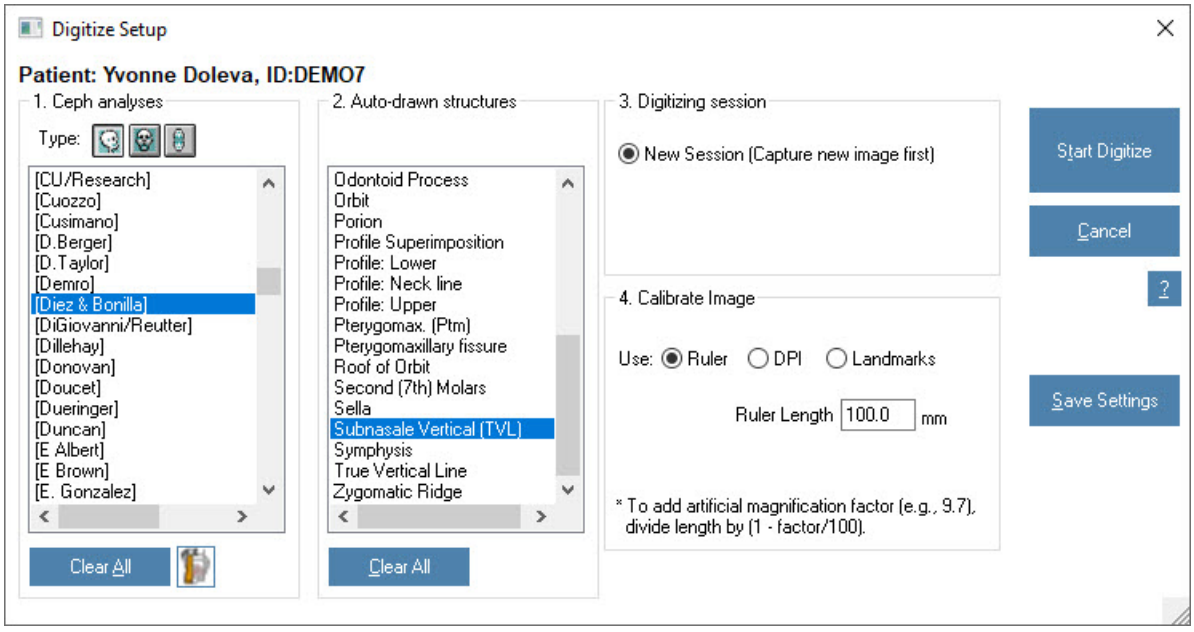
3 Select **Subnasale Vertical (TVL)** from the **Auto Drawn Structures** list.

Make sure that the **Subnasale Vertical (TVL)** is the only vertical line selected in the **Auto Drawn Structures** list, so that you don't have extraneous vertical lines appearing on the tracing.

4 Set any other options on this dialog box.

For more information, see "Digitize Setup" on page 7-3.

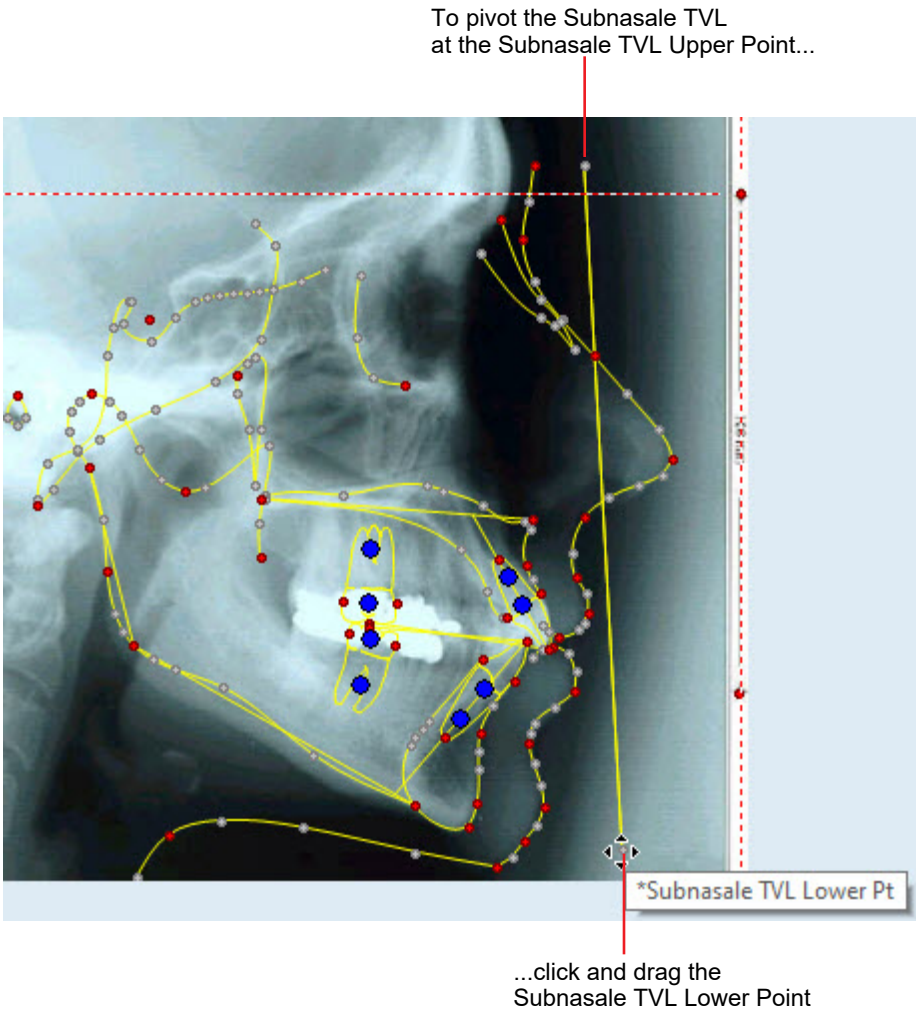
5 Click **Start Digitize**.



To rotate the Subnasale Vertical (TVL) while digitizing:

1 Click and drag the Subnasale TVL Lower Point.

The Subnasale Vertical (TVL) pivots on the Subnasale TVL Upper Point.



If you want to position the true vertical line at 10 mm from S.T. Glabella, you can use the symmetry ruler to help you place it.

To use the symmetry ruler tool to place the true vertical line:

1 Click on the Digitize tool bar.

2 Select **Show Symmetry Ruler** from the menu that appears.

3 Select **Horizontal** to display a horizontal symmetry ruler.

The symmetry ruler appears on the image.

4 Click on the Digitize tool bar.

5 Select **Ruler Length** from the menu that appears.

6 Select **10 mm** as the length of the symmetry ruler.

7 Click on the Digitize tool bar.

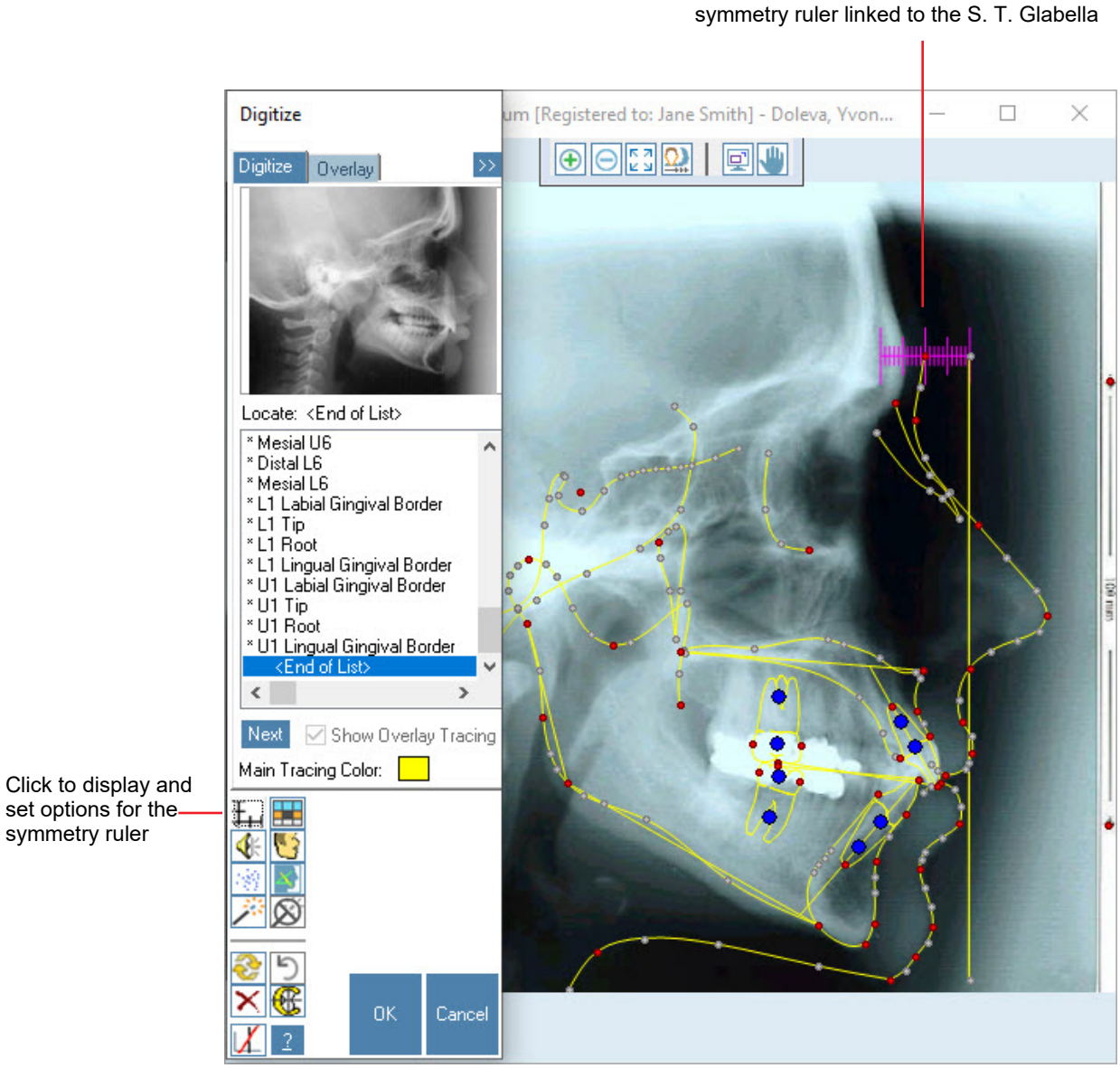
8 Select **Link Ruler To** from the menu that appears

9 Select **S.T. Glabella** as the landmark that you want at the center of the ruler.

10 Click and drag the Subnasale TVL Upper Point to the right end of the symmetry ruler.

11 Click and drag the Subnasale TVL Lower Point as necessary to make the Subnasale Vertical (TVL) vertical.

For more information, see “Using the Symmetry Ruler” on page 7-16.



In Treatment Simulation, when the maxilla is moved in the anterior or posterior direction, the true vertical line moves 30% of that distance. For example, if the maxilla is moved 3 mm in the anterior direction, the true vertical line moves 1 mm in the anterior direction.

Digitizing the [FACE] and [FACE Aesthetic] Analyses

The [FACE] and [FACE Aesthetic] analyses are modernizations of the [Ayala] and [Ayala ST] analyses. Both the [FACE] and [FACE Aesthetic] analyses are based on the Subnasale Vertical (TVL), but [FACE Aesthetic] uses only soft tissue measurements (like the [Ayala ST] analysis).

These analyses were created by Osteoplac S.L. (FORMEDIKA by Osteoplac). For more information, see http://www.formedika.com/en/.

To digitize the [FACE] and [FACE Aesthetic] analyses:

1 In the Ceph Analyses group box of the Digitize Setup dialog box, select the analysis type icon if it isn't already selected.

2 Select **[FACE]**, **[FACE Aesthetic]**, or both from the **Ceph Analysis** list.

You can select both **[FACE]** and **[FACE Aesthetic]** on the Digitize Setup dialog box to digitize both analyses at the same time.

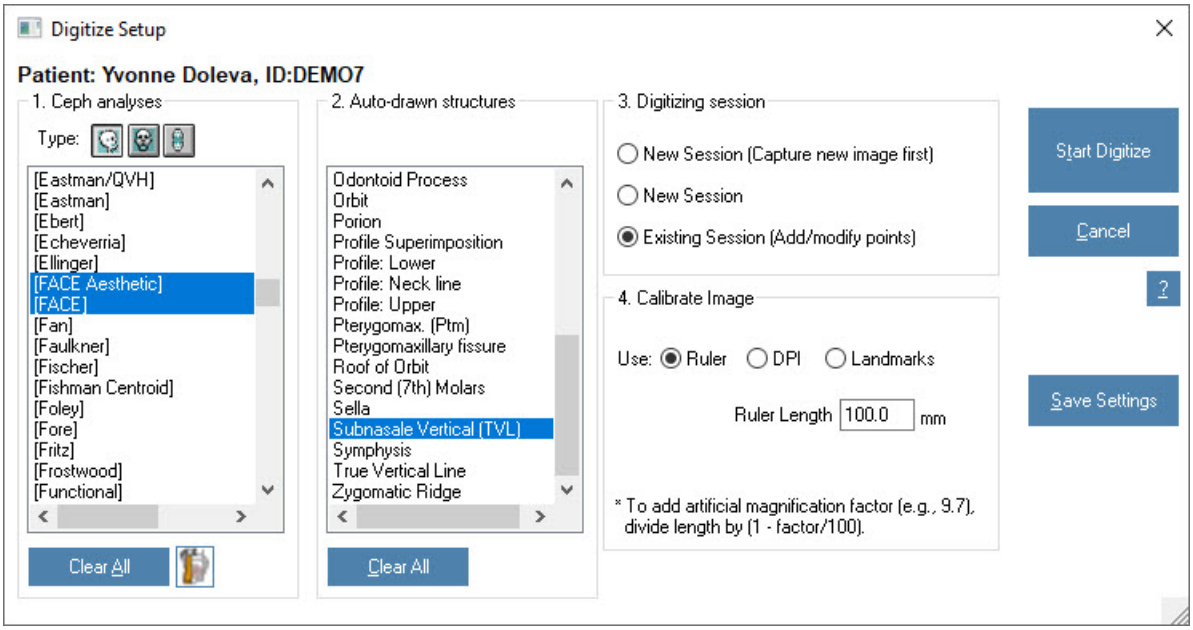
3 Select **Subnasale Vertical (TVL)** from the **Auto Drawn Structures** list.

Make sure that the **Subnasale Vertical (TVL)** is the only vertical line selected in the **Auto Drawn Structures** list, so that you don't have extraneous vertical lines appearing on the tracing.

4 Set any other options on this dialog box.

For more information, see "Digitize Setup" on page 7-3.

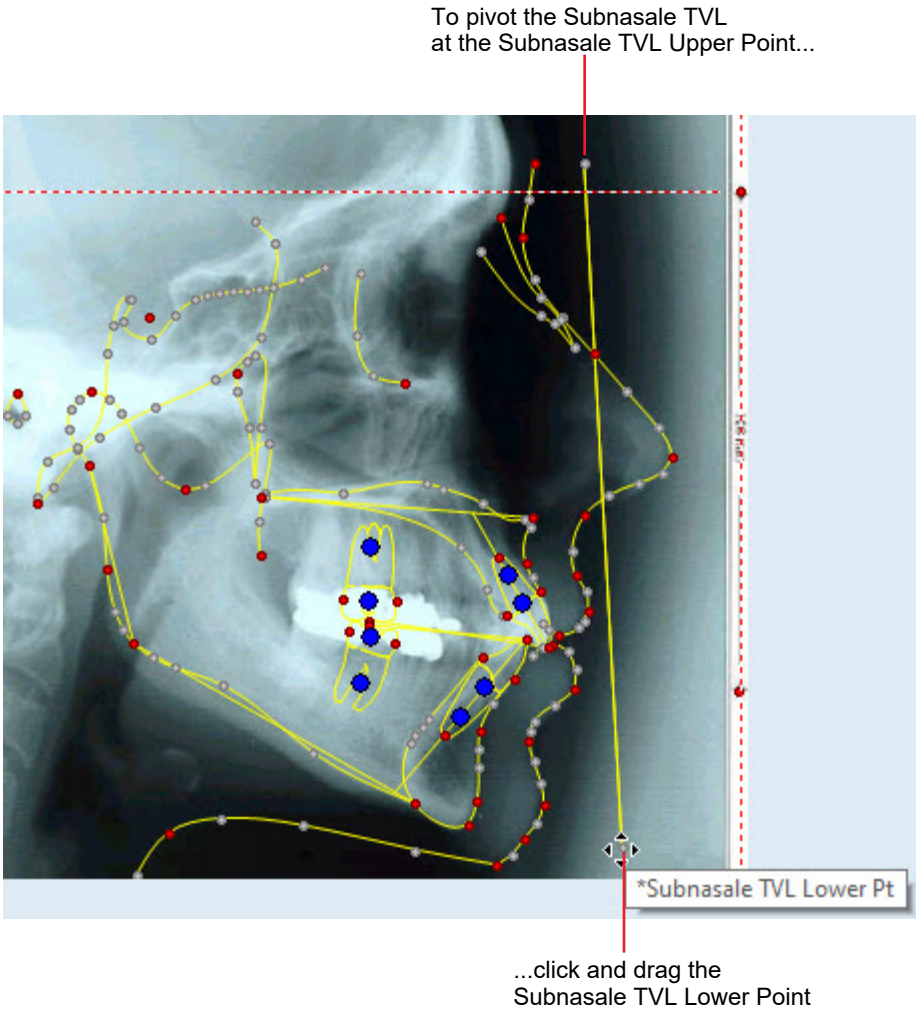
5 Click **Start Digitize**.



To rotate the Subnasale Vertical (TVL) while digitizing:

1 Click and drag the Subnasale TVL Lower Point.

The Subnasale Vertical (TVL) pivots on the Subnasale TVL Upper Point.



In Treatment Simulation, when the maxilla is moved in the anterior or posterior direction, the true vertical line moves 30% of that distance. For example, if the maxilla is moved 3 mm in the anterior direction, the true vertical line moves 1 mm in the anterior direction.

Digitizing the [Ortomax] Analysis

This analysis is based on Andrew's Vertical, which is a vertical line on the soft-tissue Glabella. On the Digitize Setup dialog box, this vertical line is listed as **Glabella Vertical (TVL)** in the **Auto Drawn Structures** list.

The distance from the Andrew's Vertical/Glabella Vertical (TVL) to the U1 Most Labial landmark should ideally be 0 mm, with ±1 mm being the norm.

To digitize this analysis:

1 In the Ceph Analyses group box of the Digitize Setup dialog box, select the analysis type icon if it isn't already selected.

2 Select **[Ortomax]** from the **Ceph Analysis** list.

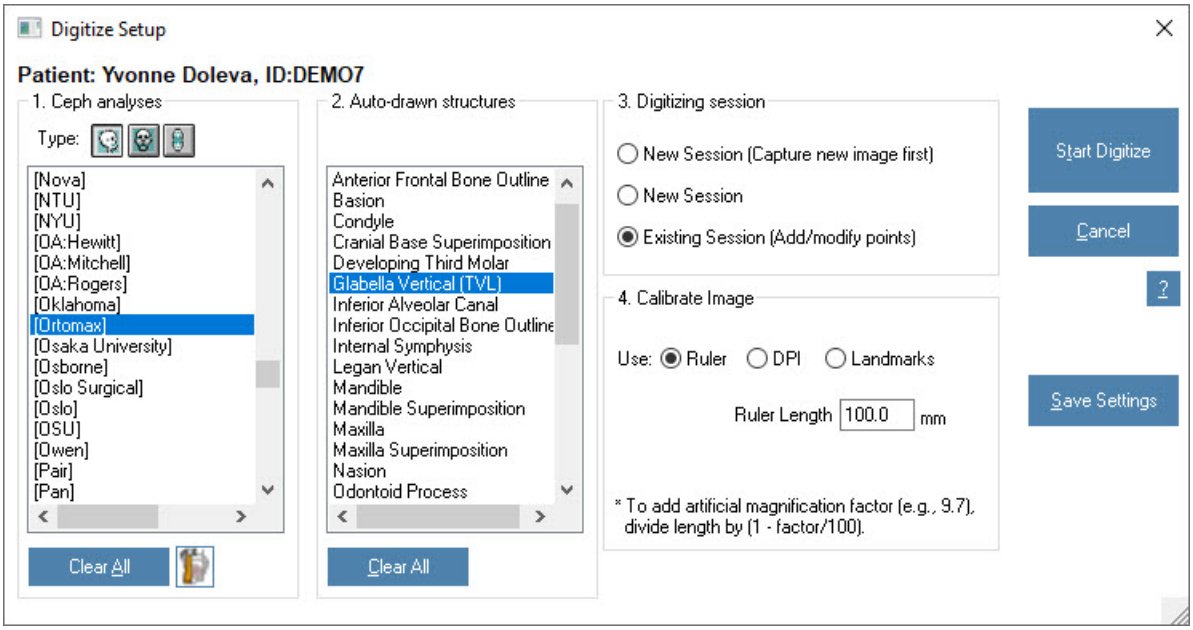
3 Select **Glabella Vertical (TVL)** from the **Auto Drawn Structures** list.

Make sure that the **Glabella Vertical (TVL)** is the only vertical line selected in the **Auto Drawn Structures** list, so that you don't have extraneous vertical lines appearing on the tracing.

4 Set any other options on this dialog box.

For more information, see "Digitize Setup" on page 7-3.

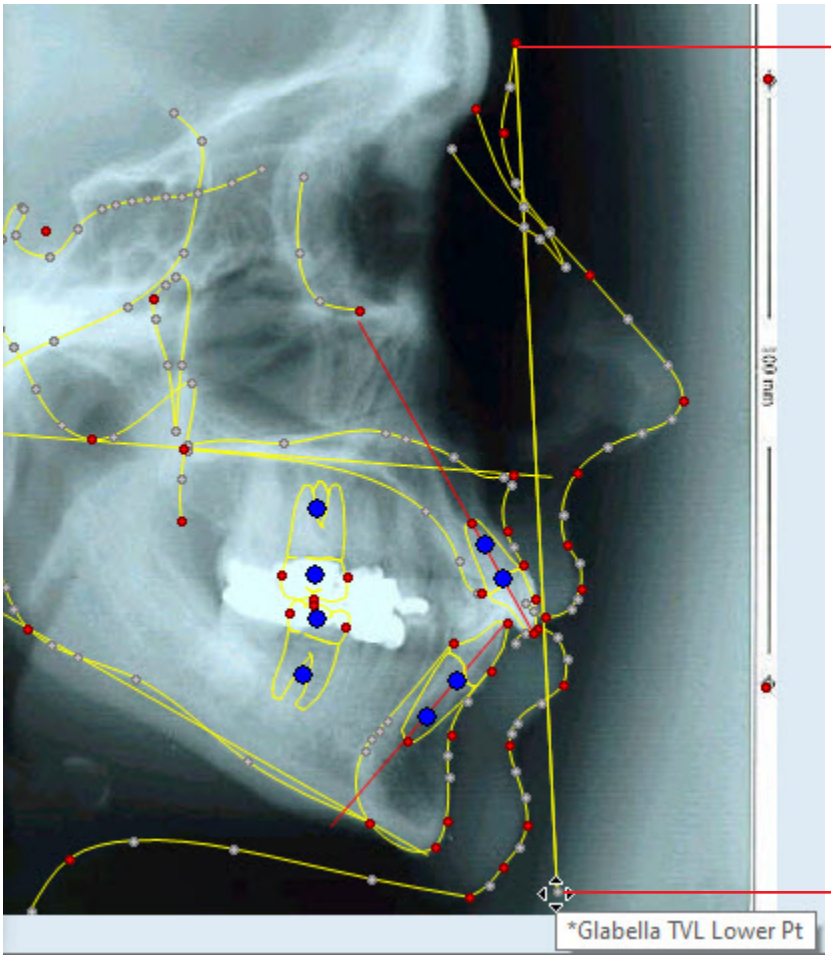
5 Click **Start Digitize**.



To rotate the Glabella Vertical (TVL) while digitizing:

1 Click and drag the Glabella TVL Lower Point.

The Glabella Vertical (TVL) pivots on the Glabella TVL Upper Point.



In Treatment Simulation, the true vertical line does not move when the maxilla is moved in the anterior or posterior direction.

Appendix B: Tokens and Codes

This appendix includes the following information for your reference:

- A list of tokens and their definitions
- A list of the Dolphin Letter System (DLS) diagnostic lists and codes

Tokens

The following table lists the tokens that Dolphin Imaging uses in place variable information (such as patient name or page number) in image layouts, page layouts, Dolphin Letter System (DLS) letters, image captions, and a custom title bar caption for the Dolphin Imaging window. Some of these tokens are for use in specific circumstances (such as in side-by-side layouts), so they may not always be available.

Note: *Some of the tokens listed below are available only if you have the Dolphin Imaging Security Utilities or Dolphin Management installed. For more information, see "Installing the Security Utilities" on page 1-11 and the Dolphin Management online help.*

Token	Description
AccountBalance	The total amount of money owed on a particular treatment by a billing party or insurance company.
AddresseeAddress1	The street address for the person to whom this letter is addressed.
AddresseeCity	The city for the person to whom this letter is addressed.
AddresseeCountry	The country for the person to whom this letter is addressed.
AddresseeEmail	The email address of the person to whom this letter is addressed.
AddresseeFirstName	The first name of the person to whom this letter is addressed.
AddresseeGreeting	The salutation and last name for the person to whom this letter is addressed.
AddresseeLastName	The last name of the person to whom this letter is addressed.
AddresseeName	The first and last names of the person to whom this letter is addressed.
AddresseeNickname	The nickname of the person to whom this letter is addressed.
AddresseeSalutation	The salutation to use for the person to whom this letter is addressed.
AddresseeState	The state for the person to whom this letter is addressed.
AddresseeTitle	The title of the person to whom this letter is addressed.

AddresseeZip	The zip or postal for the person to whom this letter is addressed.
AgeInMonths	The patient's current age in months.
AgeInMonthsAtCurrTimepoint	The patient's age at the current timepoint expressed in months. For example, if the patient is 10 years 4 months old, this token evaluates to 124.
AgeInYears	The patient's current age in years.
AgeInYearsAtCurrTimepoint	The patient's age at the current timepoint. The patient's age is rounded down to the year. For example, if the patient is 10 years 4 months old, this token evaluates to 10.
AgeModMonths	The number of months since the patient's last birthdate expressed in months.
AgeMODMonthsAtCurrTimepoint	The number of months since the patient's last birthdate at the current timepoint expressed in months. For example, if the patient is 10 years 4 months old, this token evaluates to 4.
AnnualPercentageRate	The annual interest rate for charged to a billing party when they have not paid a minimum dollar amount after a certain period of time.
BillingPartyBirthday	The billing party's birthday.
BillingPartyCell	The billing party's mobile phone number.
BillingPartyCity	The city for the billing party's address.
BillingPartyCompany	The name of the company where the billing party works.
BillingPartyCountry	The country for the billing party's address.
BillingPartyEmail	The billing party's email address.
BillingPartyFax	The billing party's fax number.
BillingPartyFirstName	The billing party's first name.
BillingPartyGender	The billing party's gender. An "F" for female or "M" for male.
BillingPartyGreeting	The billing party's salutation and last name.
BillingPartyHomePhone	The billing party's home phone number.
BillingPartyLastName	The billing party's last name.
BillingPartyNickName	The billing party's nickname.
BillingPartyNextStatementDate	Date of the this billing party's next statement
BillingPartyOfficePhone	The billing party's office phone number
BillingPartyPager	The billing party's pager number.
BillingPartyRelationshipToPatient	The billing party's relationship to the patient.
BillingPartySalutation	The salutation to use for this billing party.
BillingPartySocial	The billing party's social security number.
BillingPartySpouse	The name of the billing party's spouse.
BillingPartyState	The state for the billing party's address.

BillingPartyStreet	The billing party’s street address.
BillingPartyTitle	The billing party’s title.
BillingPartyZip	The zip or postal code for the billing party’s address.
ChangeableImageTimepoint	
ChangedImageName	
ChangedImageNotes	
ChangedImageTitle	
ChargesToDate	Charges posted to date for patient.
CompletionDate	
ContractBalance	Current balance for a contract for treatment.
ContractChargeDay	Day of the month on which charges for a particular contract for treatment will be charged. Same as a billing party's Due Day.
ContractChargeFrequency	The time period in which charges for a particular contract for treatment will be charged, such as monthly, quarterly, and so on.
ContractDownPaymentAmount	Amount of a down payment on a contract.
ContractDownPaymentCharge-Date	The date a contract down payment was charged out to the ledger.
ContractDownPaymentDate	Date of a down payment on a started contract.
ContractDownPaymen-tHasCharged	Flag which indicates if a regular contract payment has been charged out to the ledger. 0 = no, 1 = yes
ContractFirstPaymentAmount	The date of the first regular payment on a contract.
ContractFirstPaymentDate	The date of the first regular payment on a contract.
ContractLastPaymentAmount	The amount of the last regular payment on a contract.
ContractLastPaymentDate	The date of the last regular payment on a contract.
ContractOtherID	Contract ID
ContractPaymentAmount	Amount of a regular payment on a contract.
ContractPaymentChargeDate	The date a regular contract payment was charged out to the ledger.
ContractPaymentDate	Date of a regular payment on a started contract.
ContractPaymentHasCharged	Flag which indicates if a regular contract payment has been charged out to the ledger. 0 = no, 1 = yes
ContractProposalChargeAmount	Contract proposal's itemized charge amount
ContractProposalChargeDesc	Contract proposal's itemized charge description
ContractProposalDownPayment	The down payment amount on the contract proposal.
ContractProposalDuration	The number regular payments on the contract proposal.
ContractProposalFinancedA-mount	The financed amount (net fee minus down payment) on the contract proposal.

ContractProposalFinancedA-mountBP	The bililng party financed amount (net fee minus down payment and expected insurance benefit) on the contract proposal.
ContractProposalFrequency	The frequency of the payments on the contract proposal.
ContractProposalFrequency-Amount	The contract proposal's regular frequency amount
ContractProposalLastPaymentA-mount	The amount of the final payment for the contract proposal.
ContractProposalNonCon-tractCharges	The sum of non-contract charges on the contract proposal.
ContractProposalPaymentA-mount	Amount of payment on the contract proposal.
ContractProposalPaymentCount	The number of payments for the contract proposal.
ContractProposalRetentionFee	The sum of retention fees on the contract proposal.
ContractProposalRunningPay-mentTotal	Running total of payments on the the contract proposal.
ContractProposalSumOfP-mtsAndNonContractChgs	The sum of all payments and non-contract charges for the contract proposal.
CurrentAnalysisName	Name of the current analysis. Available for cephalometric images only.
CurrentDue	Money that has been charged to a patient and billing party and is due now.
CurrentEmployerName	The billing party’s employer.
DoctorAddr1	The first line of the doctor’s address entered when the Dolphin Imaging software was installed.
DoctorAddr2	The second line of the doctor’s address entered when the Dolphin Imaging software was installed.
DoctorAddr3	The third line of the doctor’s address entered when the Dolphin Imaging software was installed.
DoctorAddr4	The fourth line of the doctor’s address entered when the Dolphin Imaging software was installed.
DoctorBirthday	The doctor’s birthday.
DoctorCell	The doctor’s mobile phone number.
DoctorCity	The city for the doctor’s address.
DoctorCompany	The name of the doctor’s practice.
DoctorCountry	The country for the doctor’s address.
DoctorEmail	The doctor’s email address.
DoctorFax	The doctor’s fax number.
DoctorFirstName	The doctor’s first name.
DoctorGender	The doctor’s gender.
DoctorGreeting	The doctor’s salutation and last name.

DoctorHomePhone	The doctor's home phone number.
DoctorLastName	The doctor’s last name.
DoctorName	The doctor’s first and last names.
DoctorNickName	The doctor’s nickname.
DoctorOfficePhone	The doctor’s office phone number
DoctorPager	The doctor’s pager number.
DoctorPhone1	The first telephone number for the doctor.
DoctorPhone2	The second telephone number for the doctor.
DoctorSalutation	The salutation to use for this doctor.
DoctorSpeciality	The doctor’s specialty.
DoctorState	The state for the doctor’s address.
DoctorStreet	The doctor’s street address.
DoctorTitle	The doctor’s title.
DoctorZip	The zip or postal code for the doctor’s address.
DueDay	Day of the month on which charges for a particular contract for treatment will be charged. Same as a billing party's Contract Charge Day.
ExpectedInsuranceBenefit	The total amount of money you expect to receive from an insurance policy for a particular treatment.
FinancedAmount	The starting amount for a contract for treatment minus the down payment amount.
GuardianBirthday	The guardian’s birthday.
GuardianCell	The guardian’s mobile phone number.
GuardianCity	The city for the guardian’s address.
GuardianCompany	The name of the company where the guardian works.
GuardianCountry	The country for the guardian’s address.
GuardianEmail	The guardian’s email address.
GuardianFax	The guardian’s fax number.
GuardianFirstName	The guardian’s first name.
GuardianGender	The guardian’s gender. An “F” for female or “M” for male.
GuardianGreeting	The guardian’s salutation and last name.
GuardianHomePhone	The guardian's home phone number.
GuardianLastName	The guardian’s last name.
GuardianNickName	The guardian’s nickname.
GuardianOfficePhone	The guardian’s office phone number
GuardianPager	The guardian’s pager number.
GuardianSalutation	The salutation to use for this guardian.

GuardianSocial	The guardian's social security number.
GuardianSpouse	The name of the guardian's spouse.
GuardianState	The state for the guardian's address.
GuardianStreet	The guardian's street address.
GuardianTitle	The guardian's title.
GuardianZip	The zip or postal code for the guardian's address.
He_She	Capitalized "He" or "She" depending on the patient's gender.
her_him	Lowercase "him" or "her" depending on the patient's gender.
her_his	Lowercase "his" or "her" depending on the patient's gender.
Him_Her	Capitalized "Him" or "Her" depending on the patient's gender.
His_Her	Capitalized "His" or "Her" depending on the patient's gender.
ImageName	A single picture name, or the name for the "before" picture. This token is only available for layouts with only one picture, side-by-side layouts, or in the cut/paste mode.
ImageNotes	Notes for a single picture, or the notes for the "before" picture. This token is only available for layouts with only one picture, side-by-side layouts, or in the cut/paste mode.
ImageTitle	A single picture title, or the title for the "before" picture. This token is only available for layouts with only one picture, side-by-side layouts, or in the cut/paste mode.
InitialChargeAmount	The initial charge amount or down payment for a contract for treatment.
InsuranceContact	The contact person at the insurance billing center.
InsuranceCompany	The name of the insurance company billing center.
InsuranceCompanyName	The name of the insurance carrier.
InsuranceCity	The city for the insurance billing center's address.
InsuranceCountry	The country for the insurance billing center's address.
InsuranceFax	The insurance billing center's fax number.
InsuranceGroupNumber	The employer plan group number for the insurance policy providing coverage for a patient.
InsuranceOfficePhone	The insurance billing center's office phone number
InsurancePolicyNumber	The policy number for the insurance policy providing coverage for a patient.
InsuranceState	The state for the insurance billing center's address.
InsuranceStreet	The insurance billing center's street address.
InsuranceZip	The zip or postal code for the insurance billing center's address.
InterestAmount	
LastAppointment	Long format for the date of the patient's last appointment.
LastAppointmentDate	Short format for the date of the patient's last appointment.

LastAppointmentLocation	The location of the patient's last appointment.
LastAppointmentProcedure	The description of the appointment type for the patient's last appointment.
LastAppointmentTime	The start time of the patient's last appointment.
LastAppointmentWeekday	The day of the week for the patient's last appointment.
LastMissedAppointmentDate	The date of the patient's last missed appointment.
LastPaymentDate	The date of the last billing party or insurance payment for the patient.
LastRecurringPaymentDate	The scheduled date of the last recurring payment (on or before today)
LastRecurringPaymentAmount	The amount of the last recurring payment (on or before today)
LayoutName	Name of the image layout.
LayoutNotes	Notes about the image layout as entered using the Layout editor.
McLaughlin	
MonthlyPercentageRate	The percentage of the amount owed that is charged to a billing party when they have not paid a minimum dollar amount after a certain period of time.
NextAppointment	Long format for the date of the patient's next appointment.
NextAppointmentDate	Short format for the date of the patient's next appointment.
NextAppointmentLocation	The location of the patient's next appointment.
NextAppointmentProcedure	The description for the appointment type of the patient's next appointment.
NextAppointmentTime	The start time of the patient's next appointment.
NextAppointmentWeekday	The day of the week for the patient's next appointment.
NextRecurringPaymentDate	The scheduled date of the next recurring payment (after today)
NextRecurringPaymentAmount	The amount of the next recurring payment (after today)
NoShows	The number of "no-show" appointments for a patient.
NumberOfInitialChargePayments	The number of initial (down payment) charges for a contract for treatment.
NumberOfMissedAppointments	The number of appointments that this patient has missed.
NumberOfPayments	
OriginalContractAmount	The starting balance amount of a contract for treatment.
Over30Due	Money charged to a patient and billing party that is between 31 and 60 days past the original charge date.
Over60Due	Money charged to a patient and billing party that is between 61 and 90 days past the original charge date.
Over90Due	Money charged to a patient and billing party that is over 90 days past the original charge date.
Page	The page number.

PatientAge	The patient’s age in years and months.
PatientBirthday	The patient’s birth date.
PatientBirthdayWords	The patient’s birth date in long format.
PatientCell	The patient’s mobile phone number.
PatientCity	The city for the patient’s address.
PatientCompany	The company where the patient works.
PatientCountry	The country for the patient’s address.
PatientEmail	The patient’s email address.
PatientFax	The patient’s fax number.
PatientFirstName	The patient's first name.
PatientFirstNamePossessive	The possessive form of the patient’s first name.
PatientGender	The patient’s gender. An “F” for female or “M” for male.
PatientGreeting	The patient’s salutation and last name.
PatientGUID	The patient’s globally unique identifier used to identify the patient in the Dolphin database.
PatientHomePhone	The patient's home phone number.
PatientID	The patient's ID.
PatientLastName	The patient’s last name.
PatientMedicalAlert	The patient’s medical alert information.
PatientModel	The number of the patient’s study model.
PatientNickname	The patient’s nickname.
PatientNorm	The most appropriate category for this patient. Used only if you use comparisons to racial and gender norms in your practice.
PatientNotes	All the notes entered for this patient.
PatientOrthodontist	The orthodontist treating the patient.
PatientOfficePhone	The patient’s office phone number
PatientPager	The patient’s pager number.
PatientPhone1	The first telephone number on file for the patient.
PatientPhone2	The second telephone number on file for the patient.
PatientRace	The most appropriate category for this patient. Used only if you use comparisons to racial and gender norms in your practice.
PatientSalutation	The salutation to use for this patient.
PatientSocial	The patient’s social security number.
PatientState	The state for the patient’s address.
PatientStatus	The description of the patient’s status.
PatientStreet	The street for the patient’s address.
PatientTitle	The patient’s title.

PatientUsualLocation	The location where the patient can usually be reached.
PatientZip	The zip or postal code for the patient's address.
PaymentsToDate	
PerVisitFee	Fee charged when a patient keeps any appointment.
PracticeAddress	The street address for your practice as entered on the Dolphin Management Practice Information dialog box.
PracticeCity	The city for your practice's address as entered on the Dolphin Management Practice Information dialog box.
PracticeFax	Your practice's fax number as entered on the Dolphin Management Practice Information dialog box.
PracticeName	The name of your practice as entered on the Dolphin Management Practice Information dialog box.
PracticePhone	Your practice's phone number as entered on the Dolphin Management Practice Information dialog box.
PracticeState	The state for your practice's address as entered on the Dolphin Management Practice Information dialog box.
PracticeZip	The zip or postal code for your practice's address as entered on the Dolphin Management Practice Information dialog box.
PrintDate	The date that the layout was printed when used to define a layout. Today's date when used in a custom window title bar.
PrintTime	The time that the layout was printed.
RecallDate	The date of a reminder to contact a patient to schedule an appointment of a specific type.
RecallType	The description of the appointment type for which a patient should be scheduled when returning for their recall appointment.
RecallOrthodontist	The orthodontist who will be seeing the patient when they return for their recall appointment.
ReferralBirthday	The referring doctor's birthday.
ReferralCell	The referring doctor's mobile phone number.
ReferralCity	The city for the referring doctor's address.
ReferralCompany	The name of the referring doctor's practice.
ReferralCountry	The country for the referring doctor's address.
ReferralDoctor	The first and last names of the doctor who referred this patient.
ReferralEmail	The referring doctor's email address.
ReferralFax	The referring doctor's fax number.
ReferralFirstName	The referring doctor's first name.
ReferralGender	The referring doctor's gender.
ReferralGreeting	The referring doctor's salutation and last name.
ReferralHomePhone	The referring doctor's home phone number.

ReferralLastName	The referring doctor's last name.
ReferralNickName	The referring doctor's nickname.
ReferralOfficePhone	The referring doctor's office phone number
ReferralPager	The referring doctor's pager number.
ReferralPhone1	The first phone number entered for the referring doctor.
ReferralPhone2	The second phone number entered for the referring doctor.
ReferralSalutation	The salutation to use for this referring doctor.
ReferralState	The state for the referring doctor's address.
ReferralStreet	The referring doctor's street address.
ReferralTitle	The referring doctor's title.
ReferralZip	The zip or postal code for the referring doctor's address.
ReferralZipCode	The zip or postal code for the referring doctor's address.
RegularChargePayments	
RetainerFee	Fee charged to the patient at the conclusion of treatment.
she_he	Lowercase "he" or "she" depending on the patient's gender.
son_daughter	Lowercase "son" or "daughter" depending on the patient's gender.
SubscriberName	The name of the person whose insurance is providing coverage for a patient.
TimepointDate	The date of the timepoint.
TimePointFile	The name of the timepoint file in the Dolphin working directory, usually the patient ID plus two numbers that identify the timepoint.
TimepointName	The name of the timepoint.
Total	Total due, which is the sum of the current, over 30, over 60, and over 90 amounts for a contract for treatment.
TotalObligation	Net treatment fee, which is calculated as the total fee for a treatment minus any discount.
TotalPastDue	The sum of over 30, over 60, and over 90 amounts for a contract for treatment.
TreatingAddress	The street for the address of the doctor treating the patient.
TreatingCity	The city for the address of the doctor treating the patient.
TreatingDoctor	First and last names of the doctor treating the patient.
TreatingFirstName	First name of the doctor treating the patient.
TreatingLastName	Last name of the doctor treating the patient.
TreatingNickname	Nickname of the doctor treating the patient.
TreatingPhone1	The first phone number entered for the doctor treating the patient.
TreatingPhone2	The second phone number entered for the doctor treating the patient.
TreatingTitle	The title of the doctor treating the patient.

TreatingZipCode	The zip or postal code for the address of the doctor treating the patient.
TreatmentDiscount	A financial discount, represented in dollars, allowed for a treatment.
TreatmentEndDate	The date that the patient was debanded.
TreatmentEstimatedCompletion	The date that you expect the patient to complete the current status, as entered in the **Est. Completion Date** field of the Edit a Patient window's **Status** tab.
TreatmentEstimatedMonths	An estimate of the number of months that this patient will be in the current status, as entered in the **Est. Months in Status** field of the Edit a Patient window's **Status** tab.
TreatmentGrossAmount	The total fee for a treatment.
TreatmentRemainingMonths	
TreatmentStartDate	The date that the patient entered the current status, as entered in the **Status Start Date** field of the Edit a Patient window's **Status** tab.
UserAddress1	Your address, line 1
UserAddress2	Your address, line 2
UserAddress3	Your address, line 3
UserAddress4	Your address, line 4
UserCellPhone	Cell phone number of employee printing the letter
UserCity	City of the employee printing the letter
UserEmail	Email of the employee printing the letter
UserFirstName	First name of employee printing the letter
UserFullName	Salutation, first, and last name of employee printing the letter
UserGreeting	Greeting for employee printing the letter
UserLastName	Last name of employee printing the letter
UserLoginName	Login name of employee printing the letter
UserName	Name of the employee printing the letter
UserOfficePhone	Office phone number of the employee printing the letter
UserPostalCode	Postal code of employee printing the letter
UserSalutation	Salutation of employee printing the letter
UserState	State of employee printing the letter
UserStreet	Street of the employee printing the letter
WalkIns	
YTDInterestPaid	

DLS Diagnostic Lists and Codes

This section contains the diagnostic lists and codes that were included with the Dolphin Letter System (DLS). You can remove or modify any of the lists and their codes You can also create your own lists by using codes from your current system or by borrowing from the codes listed on the following pages.

Airway Evaluation

Code	Clinical Term
00	Nasal
02	Mouth
06	Allergies, chronic nasal congestion

Anterior Bite Depth

Code	Clinical Term	Code	Clinical Term
1	Anterior bite depth: Normal 10-20%	**5**	Anterior bite depth: Very deep >100%
2	Anterior bite depth: Slight 20-40%	**6**	Anterior bite depth: Shallow 0-10%
3	Anterior bite depth: Moderate 40-60%	**7**	Anterior bite depth: Functional openbite
4	Anterior bite depth: Deep 60-100%	**8**	Anterior bite depth: Anatomic openbite

Archform

Code	Clinical Term	Code	Clinical Term
32	Normal maxillary arch width	**38**	Wide maxillary arch
34	Constricted maxillary arch	**40**	Normal mandibular arch width
35	Constricted mandibular arch	**42**	Wide mandibular arch

Canine Classification

Code	Clinical Term	Code	Clinical Term
00	Class II	**03**	Class I
02	End to end	**04**	Class III

Caries Prone

Code	Clinical Term
1	High
2	Average
3	Low

Chief Concerns

Code	Clinical Term	Layman Term
1	None indicated by patient	
2	Second opinion desired	
3	Continuation of care	
4	Overjet	
5	Crowding	The teeth appear crowded due to insufficient space in the dental arch
6	Underbite	
10	Spacing	There are spaces between the teeth
11	Diastema	Space between upper front teeth
12	Irregularly shaped teeth: {}	Some teeth have irregular shapes
13	Irregular tooth positions	Some teeth are in irregular positions
15	Overbite or deep bite	
16	Early loss of baby teeth	Baby teeth have been lost too early
20	Open bite	Even when the mouth is closed, the upper and lower front teeth still do not properly touch
25	Flared incisors	
30	Cross bite	The teeth are in crossbite
35	Smile esthetics	
40	Incisor rotations	
45	Delayed eruptions	
46	Impacted teeth	
50	Missing permanent teeth: {}	There are missing teeth
54	Gingival recession	There is recession of the gum tissue
55	Tooth motion	

56	Gingival disease or gingival health related problems	The gums are unhealthy and inflamed (gum disease)
57	Periodontal support	
58	Excessive gingival display	Too much gum showing when smiling (gummy smile)
60	Excessive wear of dentition	
70	Lack of lip support	The upper and lower lips are thin, and appear to be not sufficiently covering the teeth properly
100	Deficient chin	The lower jaw appears to be too small
104	Prominent lower jaw	The lower jaw appears to be too far forward
105	Excessive lower jaw development	
110	Procumbent lower facial profile	
111	Facial asymmetry	
115	Lack of upper jaw development	The upper jaw is too narrow
200	Tooth sensitivity	
205	Jaw pain	There is pain in the jaw area
210	Ear pain	
211	Ear ringing or stuffiness	There is continual ringing or stuffiness in the ears and in the head
215	Neck pain	
220	Headache, facial or neck pain	There are frequent headaches, facial pain or neck ache
300	Chewing difficulties	
301	Change in bite (occlusion)	
305	Bruxing	
400	Jaw dysfunction or clicking	The jaw does not function properly, or clicks when opening or closing
405	Jaw locking open	
410	Jaw locking closed	
415	Diminished mouth opening	
420	Thumb habit	
425	Tongue thrusting habit	
430	Speech difficulty	

Crossbite

Code	Clinical Term	Layman Term

10	No crossbite	None of the teeth are in crossbite relationship
18	Partial anterior crossbite (tooth #s:{})	The upper front teeth bite behind the lower front teeth (underbite)
20	Complete anterior crossbite	The upper back teeth bite on the inside on the right side (crossbite)
21	Posterior right crossbite	The upper back teeth bite on the inside on the left side (crossbite)
22	Posterior left crossbite	The upper back teeth bite on the inside on both sides (crossbite)
23	Bilateral posterior crossbite	The upper back teeth bite completely outside the lower back teeth (buccal crossbite)
25	Buccal crossbite	Some of the upper back teeth bite completely outside of the lower teeth
27	Partial buccal crossbite (tooth#: {})	The upper front teeth bite behind the lower front teeth (underbite)

Crowding

Code	Clinical Term	Layman Term
24	No crowding	There is sufficient space for the teeth in both dental arches.
30	Mild crowding in the maxillary arch	The upper teeth are crowded due to insufficient space
32	Mild crowding in the mandibular arch	The lower teeth are crowded due to insufficient space
34	Moderate crowding in the maxillary arch	The upper teeth are crowded due to insufficient space
36	Moderate crowding in the mandibular arch	The lower teeth are crowded due to insufficient space
38	Severe crowding in the maxillary arch	The upper teeth are crowded due to insufficient space
40	Severe crowding in the mandibular arch	The lower teeth are crowded due to insufficient space
42	Excessive spacing in the maxillary arch	There is excessive space between the upper teeth
44	Excessive spacing in the mandibular arch	There is excessive space between the lower teeth

Code	Dentist Term	Code	Dentist Term

1	Severe overjet	**20**	Minimal overbite (edge to edge incisor relationship)
2	Normal overjet	**30**	Mild crowding in the maxillary arch
3	Minimal overjet (end to end incisors)	**32**	Mild crowding in the mandibular arch
5	Moderate overjet	**34**	Moderate crowding in the maxillary arch
14	Mild overbite (15-45%)	**38**	Severe crowding in the maxillary arch
16	Normal overbite (0-10%)	**36**	Moderate crowding in the mandibular arch
17	Moderate overbite (50-80%)	**40**	Severe crowding in the mandibular arch
18	Severe overbite (100%, deep impinging overbite)		

Curve of Spee

Code	Clinical Term	Code	Clinical Term
00	Flat mandibular	**12**	Deep Curve of Spee in the maxillary arch
02	Deep Curve of Spee in the mandibular arch	**14**	Reverse Curve of Spee in the maxillary arch
04	Reverse Curve of Spee in the mandibular arch	**20**	Normal Curve of Spee in the maxillary arch
10	Flat Curve of Spee in the maxillary arch	**22**	Normal Curve of Spee in the mandibular arch

Dental Class

Code	Clinical Term
5	Class I
6	Class II
7	Class III

Dental Class (2)

Code	Clinical Term	Layman Term
5	Class I	The upper and lower back teeth fit together normally

6	Class II	The lower back teeth bite too far behind the upper back teeth
8	Class II, division 1	The lower back teeth bite too far behind the upper back teeth
9	Class II, division 2	The lower back teeth bite too far behind the upper and upper incisors tip inwards
7	Class III	The lower back teeth bite significantly forward of the upper back teeth
13	Class III tendency	The lower back teeth bite too far forward of the upper back teeth
12	Mild Class II tendency (end-to-end)	The lower back teeth bite slightly behind the upper back teeth
10	Class II, division {}, subdivision {}	The lower back teeth on the right side bite too far behind the upper back teeth
11	Class III, subdivision {}	The lower back teeth on the left side bite too far behind the upper back teeth

Dental Profile

Code	Clinical Term	Layman Term
1	Upper Protrusive	Upper teeth are too forward
2	Upper Retrusive	Upper teeth are too far back
3	Lower Protrusive	Lower teeth are too forward
4	Lower Retrusive	Lower teeth are too far back
5	Bidental Protrusion	Upper and lower teeth are too forward
6	Bidental Retrusion	Upper and lower teeth are too far back

Dentition Developmental Stage

Code	Clinical Term	Layman Term
1	Developmental stage: Primary	Only baby teeth are present
2	Developmental stage: Early mixed	There is a mixture of mostly baby teeth and some permanent teeth
3	Developmental stage: Middle mixed	There is a mixture of baby teeth and permanent teeth
4	Developmental stage: Late mixed	Mostly permanent teeth, with some baby teeth still present

5	Developmental stage: Permanent (adult)	Only permanent teeth are present

Dentition Developmental Stage (2)

Code	Clinical Term	Code	Clinical Term
1	Primary dentition	**4**	Late mixed dentition
2	Early mixed dentition	**5**	Permanent dentition
3	Mixed dentition		

Disposition

Code	Clinical Term	Code	Clinical Term
1	Treatment recommendations have been accepted.	**6**	Emergency treatment has been rendered.
2	Treatment recommendations are being considered.	**7**	Patient will be seen in near future; extraction of teeth has been prescribed.
3	Delay extraction of teeth until diagnostic records have been reviewed.	**8**	The patient's concerns were discussed thoroughly, and future care was suggested.
4	A second opinion has been requested by the patient.	**9**	We will look forward to seeing you.
5	Postpone treatment due to financial concerns.		

Enamel Defects

Code	Clinical Term	Code	Clinical Term
00	Hypocalification	**04**	Vertical cracks
02	Intinsic staining	**10**	None

Extracted & Congenitally Absent Teeth

Code	Clinical Term
1	Extracted & Congenitally absent teeth: {}

Extractions

Code	Clinical Term	Layman Term
00	Extract upper first permolars: 5, 12	Removal of the (2) first bicuspids on the upper arch
02	Extract upper second permolars: 4, 13	Removal of the (2) second bicuspids in the upper arch
06	Extract lower first premolars: 21, 28	Removal of the (2) first bicuspids in the lower arch
08	Extract lower second premolars: 20, 29	Removal of the (2)second bicuspids in the lower arch
10	Extract upper third molars	Removal of the wisdom teeth in the upper arch
12	Extract lower third molars	Removal of the wisdom teeth in the lower arch
14	Early extraction of primary teeth: {}	Early removal of baby teeth to allow space for erupting adult teeth
16	Extract upper second molars: 2, 15	Removal of the (2) second molars in the upper arch
18	Extract one incisor: {}	Removal of one lower incisor
19	Serial extraction procedures	Early removal of baby teeth and later permanent teeth to gain space for alignment and to aid normal eruption
20	Try non-extraction therapy	No removal of teeth are planned at this time, but a re-evaluation will be needed later
22	Non-extraction therapy	The treatment simulation does not require removal of teeth

Facial Balance

Code	Clinical Term	Code	Clinical Term
38	Prognathic maxilla	**46**	Inadequate maxillary width on full smile
39	Vertical maxillary deficiency	**47**	Insufficient upper lip length
41	Vertical growth pattern	**48**	Maxillary deficiency
42	Bialveolar protrusive	**49**	Mandibular deficiency
43	Flat facial profile	**50**	Prognathic mandible
44	Convex (full) facial profile	**51**	Short lower face height
45	Vertical maxillary excess	**52**	Excessive lower facial height

Fixed Appliances

Code	Clinical Term	Layman Term
1	Rapid palatal expansion	Upper jaw expander
2	Headgear	Headgear “Night gear”
3	Partial upper orthodontic bonding	Partial upper braces
4	Partial lower orthodontic bonding	Partial lower braces
5	Full upper and lower orthodontic bonding	Full upper and lower braces
6	Full upper orthodontic bonding	Full upper braces
7	Full lower orthodontic bonding	Full lower braces
8	Lip bumper	
9	{ }	{ }

Frenum

Code	Clinical Term
1	Maxillary Labial - Heavy
2	High Lingual
3	High Mandibular Labial

Functional Analysis

Code	Clinical Term
1	Able to chew
5	Debilitated chewing apparatus
10	Unable to incise food

Functional Appliance

Code	Clinical Term	Layman Term
1	Fixed Herbst Bite - Jumping Appliance	Herbst Bite - Jumping Appliance
2	Jasper Jumper	Jasper Bite Jumper
3	{ }	

Functional Shift

Code	Clinical Term	Code	Clinical Term
00	Anterior {}mm	**06**	Vertical {}mm
02	Right lateral {}mm	**10**	None
04	Left lateral {}mm		

Gingival Attachment

Code	Clinical Term	Layman Term
1	Thin Attached Gingiva	Thin gum tissues
2	Lack of Attached Gingiva	Gum tissues very thin in some areas
3	Gingival Recession	

Habits

Code	Clinical Term	Code	Clinical Term
57	Ant tongue	**61**	Fingersucking
58	Lat Tongue	**62**	Lip Biting
59	Thumbsucking	**63**	Occi Grind
60	Night Thumb	**64**	Mentalls Hb

Habits II

Code	Clinical Term	Layman Term
1	Thumb / Finger	
2	Tongue Thrust	Tongue thrust swallow
3	Bruxing - Slight	Some night grinding
4	Bruxing - Moderate	Moderate night grinding
5	Bruxing - Severe	Severe night grinding
6	Mouth Breather	Breathes through mouth

Headgear

Code	Clinical Term	Code	Clinical Term
172	Cervical Headgear	**174**	Vertical Headgear
173	Combl Headgear	**175**	Watch Headgear

History

Code	Clinical Term	Code	Clinical Term
1	Non-contributory	**216**	Significant stress experience
5	Medical involvements	**220**	Orthodontic treatment in past
6	Previously diagnosed migraine headaches	**225**	Previous bicuspid extractions
10	Facial trauma	**230**	Third molar extractions
11	Whiplash injury	**235**	Gradual crowding of teeth
15	Congenital syndrome	**240**	Congenital absence tooth #{}
20	Increasing awareness of pain	**245**	Primary tooth extraction/loss
30	Tonsilar enlargement	**300**	Orthognathic jaw surgery-jaw locking
35	Familial trait expressed	**400**	Occlusal splint treatments-jaw locking
36	Sinus involvements	**401**	Jaw locking
100	Increasing jaw movement limitation	**405**	Intracapsular TM joint surgery
105	Mouth breathing habit	**410**	Arthoscopic TM joint surgery
106	Tongue thrust habit	**415**	Increasing awareness of joint sounds
110	Thumb/finger habit	**416**	Jaw dysfunction related to pregnancy

115	Behavior control problems	**417**	Jaw dysfunction related to yawning
125	Bruxing, clenching	**418**	Jaw dysfunction related to dental procedure
200	Early primary tooth loss	**419**	Jaw dysfunction related to general anesthesia application
205	Late primary tooth loss	**420**	Jaw dysfunction related to one episode of chewing
215	Orthodontic treatment ongoing		

Hygiene/Periodontic Health

Code	Clinical Term	Code	Clinical Term
00	Excellent	**04**	Fair
02	Good	**06**	Poor

Impacted Teeth

Code	Clinical Term
1	{}

Impacted Teeth Evident Clinically

Code	Clinical Term
1	Impacted teeth evident clinically: {}

Included Radiographs

Code	Clinical Term	Code	Clinical Term
1	None	**4**	Ceph Lateral - Date ({date})
2	Full Mouth Series - Date ({date})	**5**	{X-ray type} ({date})
3	Panorex - Date ({date})		

Lip Posture

Code	Clinical Term	Layman Term
1	Normal	
2	Apart	
3	Upper incisors on lower lip	
4	Short upper lip	
5	Hypertonic	Tight muscles
6	Hypotonic	Loose muscles
7	Thin	Thin lips
8	Full	Full lips

Lips at Rest

Code	Clinical Term
65	Apart
66	Together
80	Lower lip behind upper incisor

Lips Evaluation

Code	Clinical Term
00	Balanced
02	Full
04	Recessive

Mandibular Arch Length

Code	Clinical Term
1	Mandibular arch length: Deficient {}mm
2	Mandibular arch length: Excessive {}mm
3	Mandibular arch length: Adequate

Mandibular Arch Length II

Code	Clinical Term	Layman Term
1	Mandible: Adequate	No crowding in lower jaw
2	Mandible: Crowded - Slight 1-2mm	Slight crowding in lower jaw
3	Mandible: Crowded - Moderate 3-5mm	Moderate crowding in lower jaw
4	Mandible: Crowded - Severe 6+mm	Severe crowding in lower jaw
5	Mandible: Spaced - Slight 1-2mm	Slight spacing in lower jaw
6	Mandible: Spaced - Moderate 3-5mm	Moderate spacing in lower jaw
7	Mandible: Spaced - Severe 6+mm	Severe spacing in lower jaw

Mandibular Position

Code	Clinical Term
00	Orthognathic
02	Retrognathic
04	Prognathic

Mandibular Width

Code	Clinical Term	Layman Term
1	Constricted	Narrow lower jaw
2	Broad	Wide lower jaw

Maxilla Position

Code	Clinical Term
00	Orthognathic
02	Retrognathic
04	Prognathic

Maxillary Arch Length

Code	Clinical Term
1	Maxillary arch length: Deficient {}mm
3	Maxillary arch length: Adequate
2	Maxillary arch length: Excessive {}mm

Maxillary Arch Length II

Code	Clinical Term	Layman Term
1	Maxilla: Adequate	No crowding in upper jaw
2	Maxilla: Crowded - Slight 1-2mm	Slight crowding in upper jaw
3	Maxilla: Crowded - Moderate 3-5mm	Moderate crowding in upper jaw
4	Maxilla: Crowded - Severe 6+mm	Severe crowding in upper jaw
5	Maxilla: Spaced - Slight 1-2mm	Slight crowding in upper jaw
6	Maxilla: Spaced - Moderate 3-5mm	Moderate crowding in upper jaw
7	Maxilla: Spaced - Severe 6+ mm	Severe spacing in upper jaw

Maxillary Width

Code	Clinical Term	Layman Term
1	Constricted	Narrow upper jaw
2	Broad	Wide upper jaw

Maximum Opening

Code	Clinical Term
1	{ } mm

Midline - Mandibular

Code	Clinical Term	Layman Term
1	Right { } mm	Lower midline to the right
2	Left { } mm	Lower midline to the left

Midline - Maxillary

Code	Clinical Term	Layman Term
1	Right { } mm	Upper midline to the right
2	Left { } mm	Upper midline to the left

Midlines

Code	Clinical Term	Code	Clinical Term
27	Max to Rt.	**39**	Mn to Rt.
38	Max to Lft.	**40**	Mn to Lft.

Missing Teeth

Code	Clinical Term	Layman Term
1	{ }	Missing

Opening Deviation

Code	Clinical Term	Layman Term
1	Left	Jaw opens deviating to left
2	Right	Jaw opens deviating to right

Oral Hygiene

Code	Clinical Term
84	Good
85	Fair
86	Poor

Oral Hygiene II

Code	Clinical Term
1	Good
2	Fair
3	Poor

Orthodontic Diagnosis

Code	Clinical Term	Code	Clinical Term
1	Anterior open bite	**205**	Maxillary central diastema
5	Anterior deep bite	**206**	Enamel mottling
10	Posterior open bite	**210**	Lack of posterior vertical support
15	Lingually inclined upper incisors	**215**	Excessive tooth mobility
16	Lingually inclined lower incisors	**216**	Defective restorations # {}
20	Gummy smile appearance	**300**	Facial asymmetry
25	Class I molar relationship	**305**	Retrognathic facial profile
30	Class I cuspid relationship	**310**	Prognathic facial profile
35	Class II molar relationship	**311**	Flat facial profile
40	Class II cuspid relationship	**315**	Long vertical facial pattern
45	Class III molar relationship	**320**	Short vertical facial pattern
50	Class III cuspid relationship	**325**	Short upper lip posture
55	Maxillary dental crowding	**340**	Skeletal maxillary protrusion
60	Mandibular dental crowding	**345**	Skeletal maxillary retrusion
65	Maxillary and mandibular dental crowding	**350**	Skeletal mandibular protrusion
70	Maxillary dental spacing	**355**	Skeletal mandibular retrusion

75	Mandibular dental spacing	**360**	Skeletal bimaxillary protrusion
80	Generalized dental spacing	**365**	Skeletal maxiallary and mandibular retrusion
81	Short upper lip	**370**	Maxillary vertical excess
82	Constricted circumoral musculature	**375**	Maxillary vertical deficiency
85	Maxillary incisor protrusion	**380**	Mandibular vertical excess
90	Mandibular dental spacing	**385**	Mandibular vertical deficiency
100	Dental bimaxillary protrusion	**386**	Excessive curve of spee
105	Maxillary incisor retrusion	**390**	Maxillary transverse discrepancy
106	Traumatic maxillary intrusion	**395**	Mandibular transverse discrepancy
110	Mandibular incisor retrusion	**400**	Constricted palatal formation
120	Dental bimaxillary retrusion	**401**	Enlarged tonsilar tissues
125	Maxillary midline discrepancy {} mm	**405**	Constricted mandibular arch formation
130	Mandibular midline discrepancy {} mm	**410**	Enlarged maxillary torus
131	Maxillary central incisor diastema {} mm	**415**	Enlarged mandibular torus
132	Centric relation/centric occlusal discrepancy	**420**	Cleft lip
135	Anterior crossbite	**425**	Cleft palate
140	Right posterior crossbite	**430**	Cleft lip and palate
145	Left posterior crossbite	**431**	Generalized periodontal bone loss
146	Right crossbite tendency	**432**	Periodontal bone loss tooth # {}
147	Left crossbite tendency	**500**	Gingival stripping # {}
150	Supernumerary tooth present # {}	**505**	Gingival inflammation
155	Congenital tooth absence # {}	**510**	Gingival hyperplasia
156	Crossbite # {}	**515**	Maxillary labial frenum hypertrophy
160	Impacted tooth # {}	**520**	Mandibular labial frenum hypertrophy
165	Blocked out tooth # {}	**525**	Lingual frenum hypertrophy
166	Severely rotated # {}	**600**	Lack of cuspid guidance
170	Tooth pain and sensitivity	**605**	Lack of incisal guidance
175	Apparent tooth/arch size discrepancy	**610**	Posterior balancing interferences
180	Root resorption # {}	**615**	Posterior working interferences
185	Missing tooth # {}	**620**	Dual-bite habit
186	Edentulous condition both arches	**625**	Prognathic mandibular posturing habit
187	Edentulous upper arch	**630**	Mouth breathing habit
188	Edentulous lower arch	**635**	Enlarged tosilar tissues
189	Retained primary tooth # {}	**640**	Tongue/finger habit

190	Possible ankylosis # {}	**645**	Anterior tongue thrust
200	Peg lateral incisor # {}	**650**	Posterior tongue thrust
201	Abnormal tooth development		

Overbite

Code	Clinical Term	Layman Term
16	Normal (0-10%)	The front teeth overlap normally in the vertical dimension
14	Mild (15-45%)	The vertical overlap of the front teeth is excessive (overbite)
17	Moderate (50-80%)	The vertical overlap of the front teeth is excessive (overbite)
18	Severe (100%, deep impinging overbite)	The incisor overbite is so excessive that the lower incisors hit the palate
19	Openbite	The front teeth do not touch when biting down (open bite)
20	Edge to edge	The front teeth are biting edge to edge (minimal overbite)

Overbite II

Code	Clinical Term	Layman Term
1	Normal	Vertical overlap of front teeth overlap normally
2	Deep Bite Slight (30%)	Upper and lower teeth overlap excessively
3	Deep Bite Moderate (40%)	Upper and lower teeth overlap excessively
4	Deep Bite Moderate (60%)	Upper and lower teeth overlap excessively
5	Deep Bite Severe (80%)	Upper and lower teeth overlap severely
8	Open Bite Moderate (2 - 3 mm)	Upper and lower front teeth are moderately open
9	Open Bite Severe (4+ mm)	Upper and lower front teeth are severely open
10	Posterior Open Bite - Right	Right back teeth don't meet
11	Posterior Open Bite - Left	Left back teeth don't meet
6	Deep Bite Very Severe (100%)	Upper and lower teeth overlap very severely
7	Open Bite Slight (0 - 1mm)	Upper and lower front teeth don't meet

Overjet

Code	Clinical Term	Layman Term
1	Overjet: Excessive {} mm	The upper incisors are too far in front of the lower incisors (overjet)
2	Overjet: Normal	The upper front teeth bite slightly ahead of the lower, which is normal
3	Overjet: Edge to Edge	The front teeth are biting edge to edge (minimal overjet)
4	Overjet: Pseudo Class III	The lower front teeth bite in the front of the upper front teeth (underbite)

Overjet (2)

Code	Clinical Term	Code	Clinical Term
1	Severe	**4**	Underbite (negative overjet)
2	Normal	**5**	Moderate
3	Edge to edge		

Overjet II

Code	Clinical Term	Layman Term
1	Normal	Horizontal overlap of front teeth is normal
2	Slight 1-3 mm	Horizontal overlap of front teeth is slightly excessive
3	Moderate 4-6 mm	Horizontal overlap of front teeth is moderately excessive
4	Severe 7 + mm	Horizontal overlap of front teeth is severely excessive
5	Edge to Edge	Front teeth bite edge to edge, with no overbite
6	Negative	Upper teeth bite behind lower teeth

Patient's Next Step

Code	Clinical Term	Layman Term
00	Observation	No treatment is needed now; we will send a reminder for your next check-up
02	Full diagnostic records	Please schedule an appointment for full diagnostic records to aid in development of a treatment plan
04	Partial diagnostic records	Please schedule an appointment for partial diagnostic records to aid in development of a treatment plan
06	Consultation	Please schedule a consultation to discuss the diagnosis and treatment plan
08	Periodontal evaluation	A more thorough evaluation of the gums by a periodontist is necessary
10	Schedule to start treatment	You may schedule your first appointment to start orthodontic treatment

Periodental Health

Code	Clinical Term	Layman Term
1	Localized Gingivitis	Localized inflammation of gums
2	Mild Gingivitis	Mild inflammation of gums
3	Moderate Gingivitis	Moderate inflammation of gums
4	Severe Gingivitis	Severe inflammation of gums
5	Mild periodontal disease	Mild periodontal disease
6	Moderate periodontal disease	
7	Severe periodontal disease	

Post Treatment Concerns

Code	Clinical Term	Code	Clinical Term
00	Root resorption on incisors	**08**	Maintenance of space closure
02	Third molars may need to be extracted in the future	**10**	Cervical decalcification due to poor oral hygiene during treatment
04	Maintenance of deepbite correction	**12**	Treatment goals not reached due to patient's non-compliance
06	Late Class III type growth	**14**	Waiting for full eruption of the second molars

Posterior Crossbites

Code	Clinical Term
1	Posterior crossbites are absent
2	Posterior crossbites are present

Radiographic Interpretations

Code	Clinical Term	Code	Clinical Term
1	No radiographs were taken at the time of this report	**205**	Degenerative osteoarthristis of left articular eminence
2	Radiographs available indicate morphology within normal limits	**210**	Steroid necrosis--right temporomandibular joint
5	Anterior displacement of right mandibular condyle	**215**	Steroid necrosis--left temporomandibular joint
6	Anterior displacement of left mandibular condyle	**220**	Ankylosis, fibrous--right temporomandibular joint
10	Posterior displacement of right mandibular condyle	**225**	Ankylosis, fibrous--left temporomandibular joint
15	Posterior displacement of left mandibular condyle	**230**	Ankylosis, osseous--right temporomandibular joint
20	Degenerative osteoarthritis of right mandibular condyle	**235**	Ankylosis, osseous--left temporomandibular joint
25	Degenerative osteoarthritis of left mandibular condyle	**240**	Chondroma--right temporomandibular joint

30	Flattening of superior surface of right condylar head	**245**	Chondroma--left temporomandibular joint
35	Flattening of superior surface of left condylar head	**250**	Rheumatoid arthritis--right temporomandibular joint
40	Osteophyte formation--anterior surface of right condyle	**255**	Rheumatoid arthritis--left temporomandibular joint
45	Osteophyte formation--anterior surface of left condyle	**300**	Elongated and calcified right stylohyoid ligament (Eagle's syndrome)
50	Agenesis of right mandibular condyle	**305**	Elongated and calcified left stylohyoid ligament (Eagle's syndrome)
55	Agenesis of left mandibular condyle	**310**	Fractured odontoid process
60	Hypoplasia of right mandibular condyle	**315**	Lateral displacement of second cervical vertebra
65	Hypoplasia of left mandibular condyle	**320**	Rotational displacement of second cervical vertebra
70	Hyperplasia of mandibular right condyle	**325**	Degenerative osteoarthritis of cervical vertebra
75	Hyperplasis of mandibular left condyle	**330**	Compression of cervical intervertebral spaces
76	Bone cyst formation right condyle	**335**	Fractured cervical vertebra--spinous process
77	Bone cyst formation left condyle	**340**	Fractured cervical vertebra--left transverse process
80	Lack of translation of right condyle upon joint extension	**345**	Fractured cervical vertebra--right transverse process
85	Partial translation of right condyle upon joint extension	**350**	Osseous fusion of first cervical vertebra to occipital bone
90	Lack of translation of left condyle upon joint extension	**355**	Osseous fusion of first and second cervical vertebra
95	Partial translation of left condyle upon joint extension	**360**	Osseous fusion of second and third cervical vertebra
100	Right horizontal condylar angle beyond normal limits on submental-vertex view	**365**	Osseous fusion of third and fourth cervical vertebra
105	Left horizontal condylar angle beyond normal limits on submental-vertex view	**370**	Osseous fusion of fourth and fifth cervical vertebra
200	Degenerative osteoarthristis of right articular eminence	**375**	Radiographs appear to be within normal limits

Refer To

Code	Clinical Term	Code	Clinical Term
235	Refer for ENT Evaluation	**239**	Refer for DDS Prophy & Exam
236	Refer for TMJ Evaluation	**240**	Refer for 3rd Molar Removal, post ortho
237	Refer for Freegingival Graft	**241**	Frenectomy may be needed post ortho
238	Refer for Complete Perio Eval.		

Removable Appliance

Code	Clinical Term	Layman Term
1	Upper Bite plane	Upper plastic bite opener
2	Lower Bite plane	Lower plastic bite opener
3	Upper Hawley	Upper plastic retainer
4	Lower Hawley	Lower plastic retainer
5	Splint	Plastic bite repositioner
6	Splint Therapy	Plastic bite repositioner
7	Inclined Plane	Plastic bite jumper
00	Removable lower expander	
02	Quad helix appliance	
04	Bite plane	
06	Lip bumper	
08	Facebow	
10	High pull headgear	
12	Occlusal splint	
14	Facemask	
16	Bionator	
18	Twin Block Appliance	
20	Frankel	
22	Herbst	
24	Removable upper expander	
26	Intraoral elastics	
28	Habit appliance	
30	Bite splint	

32	Upper spring retainer	
34	Lower spring retainer	
36	Removable upper retrainer	
38	Removable lower retainer	

Retention

Code	Clinical Term	Code	Clinical Term
228	Mx Hw Mn 3-3	**232**	Mn Hw only
229	Mx Hw LLA	**233**	Mn Ling Arch
230	Mx Hw Mn Hw	**234**	Positioner
231	Mx Hw only		

Skeletal Class

Code	Clinical Term	Code	Clinical Term
1	Class I	**3**	Class II Div. II
2	Class II Div. I	**4**	Class III

Skeletal Evaluation

Code	Clinical Term	Layman Term
00	No skeletal imbalance	The examination revealed no skeletal imbalance
02	Prognathic maxilla	The upper jaw is too far forward of the other facial structures
04	Retrognathic maxilla	The upper jaw is underdeveloped and is behind its ideal position
06	Prognathic mandible	The lower jaw is too far forward of the other facial structures
08	Retrognathic mandible	The lower jaw is underdeveloped, and is too far behind the upper jaw
10	Skeletal openbite	The jaw growth pattern has lead to insufficient overlap of the upper and lower teeth (open bite)
12	Skeletal deepbite	The jaw growth pattern has lead to excessive overlap of the upper and lower teeth

14	Mandibular asymmetry to the right	Uneven lower jaw growth has caused the chin to deviate to the right
16	Mandibular asymmetry to the left	Uneven lower jaw growth has caused the chin to deviate to the left
18	Excessive vertical development	There is excessive vertical development of the upper jaw
20	Deficient vertical development	Deficient vertical development of the jaws has caused short facial height
30	Narrow maxilla	The upper jaw is narrow

Skeletal Profile

Code	Clinical Term	Layman Term
1	Class I	Normal skeletal profile
2	Class II	The lower jaw has not grown forward sufficiently
3	Class III	The lower jaw has grown ahead of the upper jaw

Skeletal Vertical

Code	Clinical Term	Layman Term
1	Open Bite	Long narrow facial pattern
2	Deep Bite	Short square facial pattern
3	Normal Bite	Normal vertical facial pattern

Spacing

Code	Clinical Term	Code	Clinical Term
40	Mild maxillary spacing	**46**	Moderate mandibular spacing
42	Mild mandibular spacing	**48**	Excessive maxillary spacing
44	Moderate maxillary space	**50**	Excessive mandibular spacing

Status at Appointment

Code	Clinical Term	Layman Term
00	an initial examination	initial examination appointment
02	an observation	observation appointment

Surgery

Code	Clinical Term	Code	Clinical Term
177	Mx Frenectomy	**180**	Prob Mn Adv. Surg.
178	Mn Frenectomy	**181**	Prob Mn Setback Surg.
179	Prob Mx Impac surg.		

Third Molars

Code	Clinical Term	Code	Clinical Term
87	No 3rd Molars	**90**	Max 3rds Only
88	3rds pre & impac	**91**	Mn 3rds Only
89	3rds pre & erupt		

Timing

Code	Clinical Term	Code	Clinical Term
127	9 Months	**130**	18 Months
128	12 Months	**131**	24 Months
129	12-18 months	**132**	30 Months

TM Joint Diagnosis

Code	Clinical Term	Code	Clinical Term
1	Asymptomatic, functioning within normal limits	**202**	Functional subluxation of the left TM joint
5	Myofacial pain dysfunction syndrome	**205**	Left TM joint hyperextension
6	Psychological stress implications	**206**	Right TM joint hyperextension
7	Potential Migraine headache involvement	**210**	Dysfunctional right TM joint subluxation
100	Right TM joint capsulitis	**215**	Dysfunctional left TM joint subluxation
105	Left TM joint capsulitis	**220**	Right TM joint closed lock tissue derangement
110	Right TM joint soft tissue derangement/ non-pathologic	**225**	Left TM joint closed lock tissue derangement
115	Left TM joint soft tissue derangement/ non-pathologic	**300**	Right condylar osteoarthrosis
120	Right TM joint anterior disk displacement with reduction	**305**	Left condylar osteoarthrosis
125	Right TM joint anterior disk displacement without reduction	**310**	Right fractured condyle
130	Left TM joint anterior disk displacement with reduction	**315**	Left fractured condyle
135	Left TM joint anterior disk displacement without reduction	**320**	Right condylar agenesis
140	Medial component to disk displacement	**325**	Left condylar agenesis
145	Lateral component to disk displacement	**330**	Right condylar ankylosis
201	Functional subluxation of the right TM joint	**335**	Left condylar ankylosis

TMJ

Code	Clinical Term	Code	Clinical Term
79	No TMJ	**82**	Bilateral
80	Clicking on the right side	**83**	Crepitus
81	Clicking on the left side		

TMJ Clicking

Code	Clinical Term	Layman Term
1	Right Clicking	Right joint click
2	Left Clicking	Left joint click
3	Bilateral Clicking	Right and left joint click
4	Right Crepitus	Grating noise in right joint
5	Left Crepitus	Grating noise in left joint

TMJ Clinically Evident or Reported

Code	Clinical Term	Code	Clinical Term
1	TMJ clicks clinically evident or reported: Not evident	**6**	TMJ clicks clinically evident or reported: Lt “Pt Hx only”
2	TMJ clicks clinically evident or reported: Rt palpable	**7**	TMJ clicks clinically evident or reported: Rt & Lt “Pt Hx only”
3	TMJ clicks clinically evident or reported: Lt palpable	**8**	TMJ clicks clinically evident or reported: Rt & Lt, esp. Rt
4	TMJ clicks clinically evident or reported: Rt & Lt palpable	**9**	TMJ clicks clinically evident or reported: Rt & Lt, esp. Lt
5	TMJ clicks clinically evident or reported: Rt “Pt Hx only”		

TMJ Pain

Code	Clinical Term	Code	Clinical Term
1	TMJ Pain: Not reported	**4**	TMJ Pain: Right and Left temporal areas
2	TMJ Pain: Right temporal area	**5**	TMJ Pain: Right & left, especially right
3	TMJ Pain: Left temporal area	**6**	TMJ Pain: Right & left, especially left

TMJ Pain II

Code	Clinical Term	Layman Term
1	Right Pain	Pain in right TMJ
2	Left Pain	Pain in left TMJ
3	Bilateral Pain	Pain in both joints
4	Closed Lock	Jaw won't completely open
5	Open Lock	Jaw won't completely close

TMJ Symptoms

Code	Clinical Term	Code	Clinical Term
1	No signs of symptoms of dysfunction noted	**230**	Stiff neck--left side
5	Cephalgia--right frontal area	**235**	Cervical crepitus upon movement of neck
10	Cephalgia--left frontal area	**240**	Right shoulder pain
15	Cephalgia--right temporal area	**245**	Left shoulder pain
20	Cephalgia--left temporal area	**250**	Numb sensation in left upper arm
25	Cephalgia--right parietal area	**255**	Numb sensation in right upper arm
30	Cephalgia--left parietal area	**300**	Ear pain--right ear
35	Cephalgia--right occipital area	**305**	Ear pain-left ear
40	Cephalgia--left occipital area	**310**	Fullness/stuffiness--right ear
45	Cephalgia--at vertex of cranium	**315**	Fullness/stuffiness--left ear
50	Right greater occipital nerve neuralgia	**320**	Itchiness--right ear
55	Left greater occipital nerve neuralgia	**325**	Itchiness--right ear
60	Right temporal arteritis	**330**	Dizziness/lightheadedness
65	Left temporal arteritis	**335**	Loss equilibrium
70	Right maxillary sinus pain	**340**	Hearing loss
75	Left maxillary sinus pain	**345**	Tinnitis--right ear
80	Sinus drainage/chronic postnasal drip	**350**	Tinnitis--left ear
85	Pain on right side of face	**400**	Right retroorbital pain or pressure
90	Pain on left side of face	**405**	Left retroorbital pain or pressure
95	Pain in right cheek or cheekbone	**410**	Photophobia
100	Pain in left cheek or cheekbone	**415**	Occasional blurring or vision/tearing

105	Right hemifacial paraxysmal neuralgia	**500**	Right preauricular pain or pressure
110	Left hemifacial paraxysmal neuralgia	**510**	Left preauricular pain or pressure
115	Neuralgia--right supraorbital nerve	**515**	Right temporomandibular joint pain or pressure
120	Neuralgia--left supraorbital nerve	**520**	Left temporomandibular joint pain or pressure
125	Neuralgia--right infraorbital nerve	**525**	Pain in right lower jaw
130	Neuralgia--left infraorbital nerve	**530**	Pain in left lower jaw
135	Maxillary odontalgia (tooth sensitivity)	**535**	Popping/clicking in right TMJ upon opening only
140	Mandibular odontalgia (tooth sensitivity)	**540**	Popping/clicking in left TMJ upon opening only
145	Right suboccipital pain	**545**	Reciprocal (opening and closing) clicks right TMJ
150	Left suboccipital pain	**550**	Reciprocal (opening and closing) clicks left TMJ
155	Facial numbness	**555**	Crepitus--right temporomandibular joint
160	Trigeminal Neuralgia--right opthalmic division	**560**	Crepitus--left temporomandibular joint
165	Trigeminal Neuralgia--left opthalmic division	**600**	Restricted opening of mouth
170	Trigeminal Neuralgia--right maxillary division	**605**	Right mandibular deviation upon opening
175	Trigeminal Neuralgia--left maxillary division	**610**	Left mandibular upon opening
180	Trigeminal Neuralgia--right mandibular division	**615**	Deviation of the mandible upon protrusion
185	Trigeminal Neuralgia--left mandibular division	**620**	Limited ability to move mandible to the right
190	Bell's Palsey--right side of face	**625**	Limited ability to move mandible to the left
195	Bell's Palsey--left side of face	**630**	Mouth “locks shut”
200	Constant sore throat	**635**	Mouth “locks open”
205	Feeling of foreign object in throat	**640**	Pain when chewing food
210	Pain on right side of neck	**645**	Difficulty chewing food
215	Pain of left side of neck	**650**	Difficulty swallowing food
220	Pain in back of neck	**655**	Constant clearing of the throat
225	Stiff neck--right side		

Tongue

Code	Clinical Term
1	Large

Treatment

Code	Clinical Term	Code	Clinical Term
120	Phase I treatment	**124**	Lower arch only
121	Phase II treatment	**125**	Upper arch only
122	Full band treatment	**126**	Phase I into Phase II
123	Retainers only		

Treatment Duration

Code	Clinical Term	Code	Clinical Term
0	{}	**24**	24
18	18	**28**	28
20	20	**32**	32
22	22		

Treatment Objectives

Code	Clinical Term	Code	Clinical Term
182	Reduce Overjet	**202**	Elim tongue thrust
183	Resolve Crowding	**203**	Elim thumb habit
184	Open Bite	**204**	Elim finger habit
185	Close Open Bite	**205**	Advance Mandible
186	Cls let open bite	**206**	Hold max growth
187	Close Ext spaces	**207**	Bring max forward
188	Close Max Dias	**208**	Advance incisors
189	Close Mn Dias	**209**	More Inc Torque
190	Close Dias 8 & 9	**210**	Upright meso molars

191	Corr Rotations	**211**	Bring ectopic in
192	Corr Crossbite	**212**	Bond Remain Tth
193	Corr Midlines	**213**	Ph I into Ph II
194	Retract Incisors	**214**	Hold vertical growth
195	Bring impacted teeth in	**215**	Create Lip Comp
196	Expand max arch	**216**	Watch Cl III grow
197	Expand mand arch	**217**	Watch root resorp
198	Expand both arches	**218**	Assymetrical mandible growth
199	Distal Mx Rt side	**219**	Reduce gummy smile
200	Distal Mx Lft side	**220**	Level & align
201	Distal Max Arch	**221**	Detail the occlusion

Treatment Simulation

Code	Clinical Term	Layman Term
00	Comprehensive orthodontic treatment	Comprehensive orthodontic treatment to address all the noted problems
02	Partial orthodontic treatment	Limited orthodontic treatment to address the chief complaints only
04	TMJ therapy	TMJ therapy to diagnose and address the joint problems
06	Phase I orthodontic treatment	Early interceptive orthodontic treatment to minimize the developing problems
08	Re-evaluate	Future evaluation to determine the necessity and timing of orthodontic treatment
10	Re-treatment	Re-treatment of the orthodontic problem is necessary
12	No treatment indicated	No orthodontic treatment is indicated at this time
14	Orthognathic surgery	Surgical correction of the underlying jaw abnormality

Treatment Recommendations

Code	Layman Term
1	Diagnostic records - comprehensive orthodontic evaluation

Code	Clinical Term	Code	Clinical Term
1	Diagnostic records--comprehensive orthodontic/TM joint evaluation	**280**	RX supracrestal gingival fibrotomy
5	Occlusal analysis--articulated models	**281**	RX maxillary labial frenectomy
6	Postional analysis--hand held models	**285**	Repair fixed appliance
10	Radiographic survey of skeletal morphology	**290**	Repair removable appliance
15	Radiographic survey of dentition	**295**	Tooth positioner
20	Radiographic survey of TM joints	**300**	Gnathological tooth positioner
25	Magnetic resonance image of TM joints	**305**	Occlusal equilibration
30	Arthrographic survey of TM joints	**310**	Upper spring retainer
35	Evaluate for surgery to widen the palate	**315**	Lower spring retainer
40	Evaluate for surgery to advance the maxilla	**320**	Upper adapter retainer
45	Evaluate for surgery to retract the maxilla	**325**	Lower adapter retainer
50	Evaluate for surgery to advance the mandible	**330**	Upper Hawley retainer
55	Evaluate for surgery to retract the mandible	**335**	Lower Hawley retainer
60	Evaluate for surgery to correct vertical discrepancy	**340**	Upper Circumferential retainer
65	Evaluate for prosthetic/restorative treatment	**345**	Lower circumfrential retainer
70	Evaluate for periodontic treatment	**350**	Thumb/finger restraining appliances
71	Free gingival graft	**351**	Psychological support to discontinue thumb habit
75	Evaluate for airway obstruction	**400**	Functional appliance growth modification treatment
80	Evaluate for TM joint surgical intervention	**405**	Frankel Regulator FR-1 appliance for muscular adaptation
100	Comprehensive orthodontic treatment	**410**	Frankel Regulator FR-2 appliance
105	Orthodontic/surgical treatment	**415**	Frankel Regulator FR-3 appliance
110	Two stage removable and fixed orthodontic appliance treatment	**420**	Bionator functional appliance
125	Continuation of current orthodontic treatment	**425**	Herbst functional appliance
130	Dental alignment and arch coordination	**430**	Ligated anterior repositioning splint (LARS)

135	Full fixed orthodontic appliances	**435**	Orthopedic corrector functional appliance (OPC)
140	Upper full arch fixed appliance	**440**	Biofinisher appliance (verticalizer)
145	Lower full arch fixed appliance	**500**	Pretreatment guidance
150	Upper 2x4 fixed appliance	**501**	Interceptive treatment
155	Upper 2x4 fixed appliance with headgear	**502**	Placed on recall; to be seen in {}
160	Lower 2x4 fixed appliance	**505**	Phase 1 interceptive/corrective treatment
165	Upper anterior fixed appliance	**510**	Extraction # {}
170	Lower anterior fixed appliance	**515**	Surgical exposure # {}
171	Open/maintain space for bridgework	**516**	Surgical exposure and ligation of # {}
175	Mandibular holding arch	**520**	Myofunctional evaluation and treatment as indicated
180	Maxillary Nance holding arch	**525**	Eliminate gum chewing habit
185	Cervical headgear	**526**	Reduce caffeine consumption
190	Esthetic ceramic brackets	**527**	Reduce nicotine consumption
195	Oblique headgear	**530**	Muscular deprogramming treatment and reevaluation
200	Vertical pull headgear	**535**	RX anti-inflammatory medication
205	Face-mask reverse traction to the maxilla	**540**	RX muscle relaxant medication
206	J-hook headgear	**545**	RX physical therapy evaluation and treatment
210	Chin-cup traction to the mandible	**550**	RX psychological evaluation and treatment as indicated
215	Upper bite plane retainer	**555**	Ear evaluation
220	Upper bite plane expander	**560**	Maxillary 2nd molar extraction regimen
225	Upper sagittal appliance	**561**	Molar distalization followed by individual tooth retraction
230	Lower sagittal appliance	**562**	Nance holding arch
235	Rapid palatal expansion appliance	**600**	TM joint repositioning splint therapy
245	Lower removable expansion appliance	**605**	TM joint stabilizing splint therapy
250	Lower fixed expansion appliance	**610**	Postpone treatment awaiting further growth development
255	Jasper Jumper anchorage	**611**	Postpone treatment due to behavioral problems
260	Magnet molar distalization	**612**	Re-evaluate after muscular relaxation therapy

265	Upper arch treatment only	**613**	Re-evaluate after anti-inflammation treatment
270	Lower arch treatment only	**614**	Re-evaluate after symptom observation period
271	Partial appliance correction	**615**	Re-evaluate after Phase 1 orthodontic treatment
275	Enamel reproximation (ERP)	**616**	Re-evaluate after completion of splint therapy

Treatment Status

Code	Clinical Term	Layman Term
00	Consultation	The next step is a consultation to review the treatment plan
01	New patient exam	The initial examination has not been completed
02	Observation	The patient has been placed on recall for future observation
03	Start	The patient is ready to start treatment
04	Will Call	We are waiting for a decision regarding whether to start treatment
05	Phase I	The patient is in Phase I treatment
06	Interim	The patient is currently between Phase I and Phase II of treatment
07	Full Active	The patient is currently in comprehensive orthodontic treatment
08	Partial treatment	The patient is currently in partial orthodontic treatment
09	Retention	The patient is currently in supervised orthodontic retention
10	Phase II	The patient is ready to start Phase II of the orthodontic treatment
11	Transfer patient	The patient transferred to our office from another office with orthodontic treatment in progress
12	Re-treatment	The patient is undergoing re-treatment for the original orthodontic problem
13	Surgery	The patient will have orthognathic surgery
14	TMJ patient (TMJ)	The patient has temporomandibular joint (TMJ) concerns
15	Inactive	
16	delete chart	

18	New patient NO SHOW	The patient missed the first scheduled appointment and needs to be contacted to reschedule

Appendix C: DOLPHIN.INI File

The **DOLPHIN.INI** file contains system settings for the Dolphin Imaging software. The Dolphin Imaging software automatically maintains almost all of the settings in this file.

CAUTION: *Settings in this file determine how the Dolphin Imaging software behaves, and setting these options improperly can cause problems in the software's functioning. For this reason, it is recommended that you do not modify the settings in this file unless specifically instructed to do so.*

This file is installed in both your **C:\Dolphin** and **C:\Windows** folders, but settings are maintained in the **DOLPHIN.INI** file in your **C:\Dolphin** folder, and those settings override any settings made in the file in your **C:\Windows** folder

A practice with several Dolphin Imaging workstations can have several **DOLPHIN.INI** files, so that the operation of the Dolphin Imaging program is configured individually on each workstation.

The following sections provide a brief overview of the contents of the **DOLPHIN.INI** file and describe how to use the **DOLPHIN.INI** file manager to coordinate multiple **DOLPHIN.INI** files on networked workstations in your practice.

Contents of a DOLPHIN.INI File

The **DOLPHIN.INI** file is divided into sections, each of which is identified by a tag that looks similar to the following example.

```
[Licensee]
```

These tags identify the purpose of that section of the **DOLPHIN.INI** file. For example, the tag above identifies the section of the **DOLPHIN.INI** file that identifies the software licensee.

Within each section, the individual configuration settings each appears as a single, separate line in the file. A semi-colon (;) is used to begin a comment. When the Dolphin Imaging program encounters a semi-colon in evaluating the **DOLPHIN.INI** file, it skips the rest of that line. For example:

```
[Licensee]
Name=John Smith ;Dolphin Imaging license owner
Address1=123 Main St.
Address2=El Segundo, CA 90000
DoctorPhone1=(310) 555-1212
DoctorPhone2=
```

In some cases, several instances of a particular tag may appear in the **DOLPHIN.INI** file. For example, your **DOLPHIN.INI** file may contain more than one section identified as a page setup. In this case, a modifier identifies the type of page setup to which the options apply. For instance, your **DOLPHIN.INI** file may contain the following tags:

```
[Page Setup Defaults]
  .
  .
  .
[Page Setup Composite Layout]
  .
  .
  .
```

In this example, the **DOLPHIN.INI** file defines page setup options to use as defaults for page types for which specific options are not set. Then, it defines page setup options that apply only to the Composite Layout.

Editing the DOLPHIN.INI File

The Dolphin Imaging software automatically maintains almost all of the settings in the **DOLPHIN.INI** file, so there are only a few occasions when you need to edit it to make changes manually.

CAUTION: *Since setting configuration options in the DOLPHIN.INI file improperly can cause problems in the software's functioning, it is recommended that you do not modify the settings in this file unless specifically instructed to do so.*

If the need arises to make changes to the **DOLPHIN.INI** file manually, you can edit it using Microsoft Notepad.

Managing Multiple DOLPHIN.INI Files

A practice with several Dolphin Imaging workstations can have several **DOLPHIN.INI** files, so that the operation of the Dolphin Imaging program on each workstation can be customized. Typically, you set up these **DOLPHIN.INI** files as follows:

- You create a global **DOLPHIN.INI** file that contains the default settings for all workstations in your practice. This file contains the settings for the Dolphin Imaging program except for preferences and presentations.
- You create a local **DOLPHIN.INI** file for each workstation in your practice. This file contains the settings that are customized for this particular workstation such as preferences and presentations. Any settings in this file override the settings in the global **DOLPHIN.INI** file. The **[Environment]** section of the local **DOLPHIN.INI** file indicates the location for the global **DOLPHIN.INI** file.

Note: *The Dolphin Update Service (DUS) does not support global* **DOLPHIN.INI** *configurations. For more information on setting up* **DOLPHIN.INI** *files for use with DUS, see "Getting Software Updates" on page 1-16.*

Two common reasons to use a global **DOLPHIN.INI** file are:

- Your want to use the same **DOLPHIN.INI** settings for all the workstations in your office. The benefits of using a global **DOLPHIN.INI** file on all workstations include:
  - Consistency within your practice: Changes to settings made in the global **DOLPHIN.INI** file (except for preferences and presentations) are reflected on all workstations.
  - Ease of making changes: You only need to make changes to **DOLPHIN.INI** settings once. For example, if you change your server, you can change this setting in the global **DOLPHIN.INI** file instead of changing the **DOLPHIN.INI** file settings on each workstation.
- You want to configure a notebook computer for both office and home use.

When setting up a global **DOLPHIN.INI** file, keep the following points in mind:

- Settings in a local **DOLPHIN.INI** file *always* override settings in a global **DOLPHIN.INI** file.
- Settings in the **[Environment]** section of a global **DOLPHIN.INI** file *must* use universal naming convention (UNC) path names, such as **\\server\c\dolphin\working**. These settings cannot use the usual Microsoft path names, such as **c:\dolphin\working**.
- The **[Environment]** section of each local **DOLPHIN.INI** file *must* identify the location of the global **DOLPHIN.INI** file. You use the **DOLPHIN.INI** file manager to set this location for each workstation.
- Each workstation's local **DOLPHIN.INI** file will contain entries created by the **DOLPHIN.INI** file manager (such as **common=**, **commontemp=**, **alternate1=**, **alternate2=**, and so on) as well as any customized settings for that workstation (such as preferences and presentations).

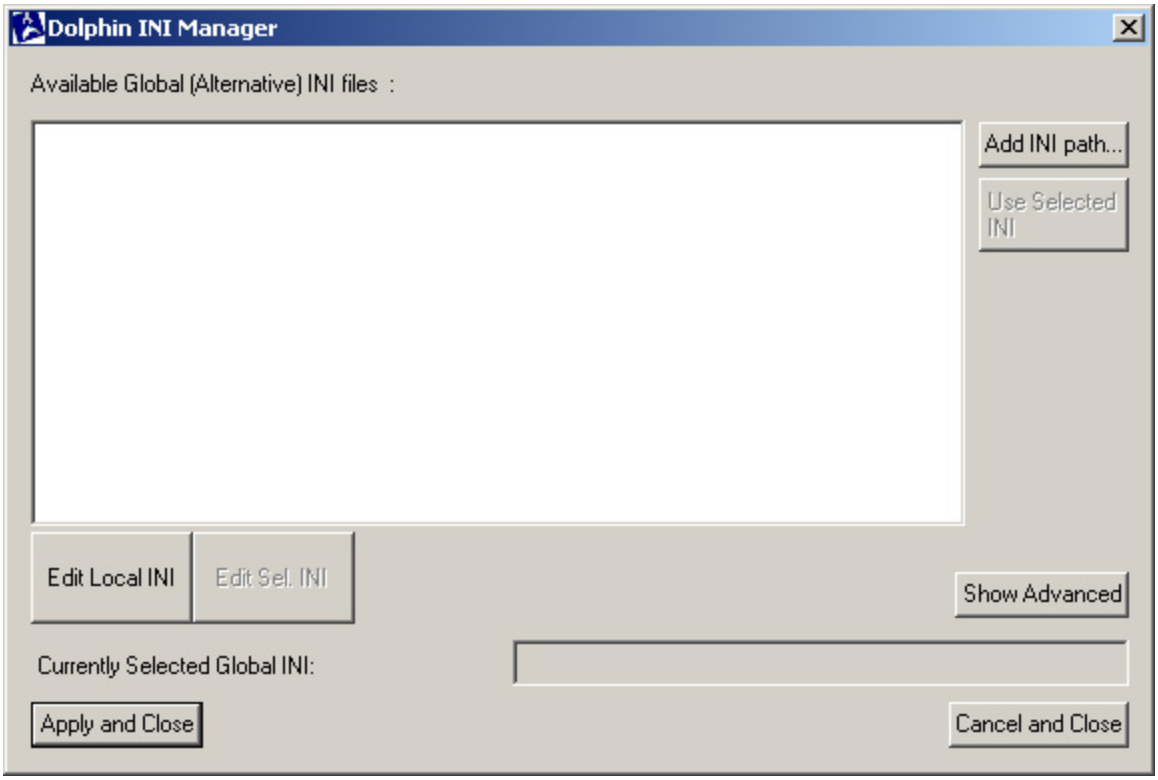
The Dolphin imaging program provides a **DOLPHIN.INI** file manager that you can use to coordinate your global and local **DOLPHIN.INI** files.

To start the DOLPHIN.INI file manager:

1 In the Microsoft Windows Explorer, open the folder in which the Dolphin Imaging program is installed (typically **c:\Dolphin**).

2 Double-click **DolIniManager.exe** to start the **DOLPHIN.INI** file manager.

The Dolphin INI Manager dialog box opens.



Available Global (Alternative) INI Files	Lists the global **DOLPHIN.INI** files available on your network.
Add INI path	Adds a **DOLPHIN.INI** file to the list of available global INI files.
Use Selected INI	Uses the file selected in the list of available global INI files as the global **DOLPHIN.INI** file for this workstation.
Edit Local INI	Edits the local **DOLPHIN.INI** file for this workstation.
Edit Sel. INI	Edits the file selected in the list of available global INI files.
Show	Accesses the **DOLPHIN.INI** file manager's advanced options.
Currently Selected Global INI	Global **DOLPHIN.INI** file that this workstation is currently set to use.
Apply and Close	Applies your changes and exits the **DOLPHIN.INI** file manager.
Cancel and Close	Cancels your changes and exits the **DOLPHIN.INI** file manager.

Setting up Global and Local DOLPHIN.INI Files

To set up global and local DOLPHIN.INI files:

1 Decide which of your existing **DOLPHIN.INI** files you want to use as the global **DOLPHIN.INI** file.

2 Start the **DOLPHIN.INI** file manager, if you haven't already done so.

3 Using the **DOLPHIN.INI** file manager, copy the **DOLPHIN.INI** file that you want to use as your global **DOLPHIN.INI** file to your server.

Typically, you should store the global **DOLPHIN.INI** file in the following directory: **\\server\c\dolphin\working\global**. You should store it in a location that is regularly backed up.

Note: *Do not store your global* **DOLPHIN.INI** *file in* **C:\DOLPHIN** *or* **C:\WINDOWS** *on any computer.*

4 For each workstation, use the **DOLPHIN.INI** file manager to add this **DOLPHIN.INI** file to the list of available global **DOLPHIN.INI** files.

5 In the Dolphin INI Manager dialog box, select the new global **DOLPHIN.INI** file from the **Available Global (Alternative) INI Files** list. Then, click **Edit Sel. INI**.

6 In the **[Environment]** section of the new global **DOLPHIN.INI** file, change all path names to universal naming convention (UNC) path names. Save the file, and exit from Notepad.

Settings in the **[Environment]** section of a global **DOLPHIN.INI** file *must* use universal naming convention (UNC) path names, such as **\\server\c\dolphin\working**. These settings cannot use the usual Microsoft path names, such as **c:\dolphin\working**.

Note: *You need to perform this step only once. You do not need to perform it on each workstation.*

7 For each workstation, use the **DOLPHIN.INI** file manager to select this **DOLPHIN.INI** file as the global **DOLPHIN.INI** file.

8 For each workstation, use the **DOLPHIN.INI** file manager to empty the workstation's local **DOLPHIN.INI** file.

Emptying a workstation's local **DOLPHIN.INI** file removes all entries except those created by the **DOLPHIN.INI** file manager (such as **common=**, **commontemp=**, **alternate1=**, **alternate2=**, and so on).

Note: *If you are using a global* **DOLPHIN.INI** *file, you must empty the workstation's local* **DOLPHIN.INI** *file. Otherwise, Dolphin reads the local settings, but it still save settings in the global* **DOLPHIN.INI** *file. This can result in unexpected behavior. For example, if you edit a layout on your computer and save it, you will not see those changes, but everyone else using the global* **DOLPHIN.INI** *file will see them.*

9 For each workstation, click **Apply and Close** to apply your changes and close the Dolphin INI File Manager.

Configuring a Notebook Computer

To configure a notebook computer for both office and home use:

1 Start the **DOLPHIN.INI** file manager, if you haven't already done so.

The **Currently Selected Global INI** field should be blank. If it is not, then this computer is already using a global **DOLPHIN.INI** file. In this case, follow the procedure to configure a notebook computer that is already using a global **DOLPHIN.INI** file.

2 Copy the computer's local **DOLPHIN.INI** file to **c:\bin\network**.

You may need to create a new sub-folder called **network** in the **c:\bin** folder.

3 Copy the computer's local **DOLPHIN.INI** file to **c:\bin\local.**

You may need to create a new sub-folder called **local** in the **c:\bin** folder.

4 Add the **c:\bin\network\dolphin.ini** file to the list of available global **DOLPHIN.INI** files.

You can use the comment **Network** to identify this **DOLPHIN.INI** file.

To begin configuring a notebook computer that is already using a global DOLPHIN.INI file for both home and office use:

1 Use Microsoft Windows Explorer to copy the file **c:\dolphin\dolphin backup.ini** to **c:\bin\local**.

Or,

Use Microsoft Windows Explorer to copy the global **DOLPHIN.INI** file to **c:\bin\local**.

2 If you copied **c:\dolphin\dolphin backup.ini**, rename **dolphin backup.ini** in **c:\bin\local** to **dolphin.ini**.

To complete the configuration:

1 Add the **c:\bin\local\dolphin.ini** file to the list of available global **DOLPHIN.INI** file.

You can use the comment **Local** to identify this **DOLPHIN.INI** file.

At this point, the **Available Global (Alternative) INI Files** list includes two paths:

- **[Network] c:\bin\network\dolphin.ini**
- **[Local] c:\bin\local\dolphin.ini**

2 Select the local path from the **Available Global (Alternative) INI Files** list. Then, click **Edit Sel. INI**.

3 In the **[Environment]** section of this **DOLPHIN.INI** file, change all path names to use Microsoft path names (such as **c:\dolphin\working**). Save the file, and exit from Notepad.

4 Select the network path from the **Available Global (Alternative) INI Files** list. Then, click **Edit Sel. INI**.

5 In the **[Environment]** section of this **DOLPHIN.INI** file, change all path names to use universal naming convention (UNC) path names, such as **\\server\c\dolphin\working**). Save the file, and exit from Notepad.

6 Empty the workstation's local **DOLPHIN.INI** file.

7 Select the **DOLPHIN.INI** file to use depending on the computer's current location.

Select the local path if the notebook is currently being used at home. Select the network path if the notebook is currently being used at the office.

8 Click **Apply and Close** to apply your changes and close the **DOLPHIN.INI** file manager.

Note: *Since you will need to use the* **DOLPHIN.INI** *file manager to select the appropriate* **DOLPHIN.INI** *file each time you change location, you may want to create a shortcut to the* **DOLPHIN.INI** *file manager on the notebook computer's desktop. For more information, refer to your Microsoft Windows documentation.*

To change locations (either work or home):

1 Start the **DOLPHIN.INI** file manager, if you haven't already done so.

2 Select the **DOLPHIN.INI** file to use depending on the computer's current location.

Select the local path if the notebook is currently being used at home. Select the network path if the notebook is currently being used at the office.

3 Click **Apply and Close** to apply your changes and close the **DOLPHIN.INI** file manager.

4 Start Dolphin Imaging.

Note: *To make patients available for use off-line (not connected to the office network), you must archive those patients to a location on the notebook's C: drive, and then retrieve them from that location to use them locally. To make all patients available off-line, you can copy the entire archive and working folders from the server to the notebook's C: drive.*

You must also copy the database files and have a local Microsoft SQL Server running. For more information, contact your Dolphin representative.

Adding a New Global DOLPHIN.INI File

To add a new global DOLPHIN.INI file to the list of available global INI files:

1 Click **Add INI Path...**.

The Ini entry information dialog box opens, as shown below.

2 Enter a comment that describes the global **DOLPHIN.INI** file you want to add.

The comment you enter will appear in the **Available Global (Alternative) INI Files** list on the Dolphin INI Manager dialog box.

3 Type the full directory and file name for the global **DOLPHIN.INI** file you want to add in the **Full Path** field. Then, click **OK**.

Or,

Click **Browse...** to browse for the global **DOLPHIN.INI** file you want to add.

Typically, the global **DOLPHIN.INI** file is stored in the following directory on your server: **\\server\c\dolphin\working\global\dolphin.ini**.

4 Click **OK** to close this dialog box and add the global **DOLPHIN.INI** file.

The global **DOLPHIN.INI** file you specified appear in the **Available Global (Alternative) INI Files** list on the Dolphin INI Manager dialog box.

Comment	Description of the global **DOLPHIN.INI** file you want to add. This comment appears in the **Available Global (Alternative) INI Files** list on the Dolphin INI Manager dialog box
Full Path	Full directory and file name for the global **DOLPHIN.INI** file you want to add (typically, **\\server\c\dolphin\working\global\dolphin.ini**).
Browse...	Browse for the global **DOLPHIN.INI** file you want to add.

Selecting a Global DOLPHIN.INI File

To select a global DOLPHIN.INI file to use for this workstation:

1 Select a **DOLPHIN.INI** file from the **Available Global (Alternative) INI Files** list.

2 Click **Use Selected INI**.

The file you selected appears in the **Currently Selected Global INI** field.

3 Click **Apply and Close** to apply your change and exit the Dolphin INI Manager.

Editing a DOLPHIN.INI File

To edit a local or global DOLPHIN.INI file:

1 Click **Edit Local INI** to edit the local **DOLPHIN.INI** file for this workstation.

Or,

Select a global **DOLPHIN.INI** file from the **Available Global (Alternative) INI Files** list. Then, click **Edit Sel. INI**.

A Notepad window opens containing the appropriate **DOLPHIN.INI** file.

2 Use Notepad to any changes to the **DOLPHIN.INI** file.

Refer to your Microsoft Windows documentation for information on how to use Notepad.

3 Save the file, and exit Notepad.

Using Advanced Features

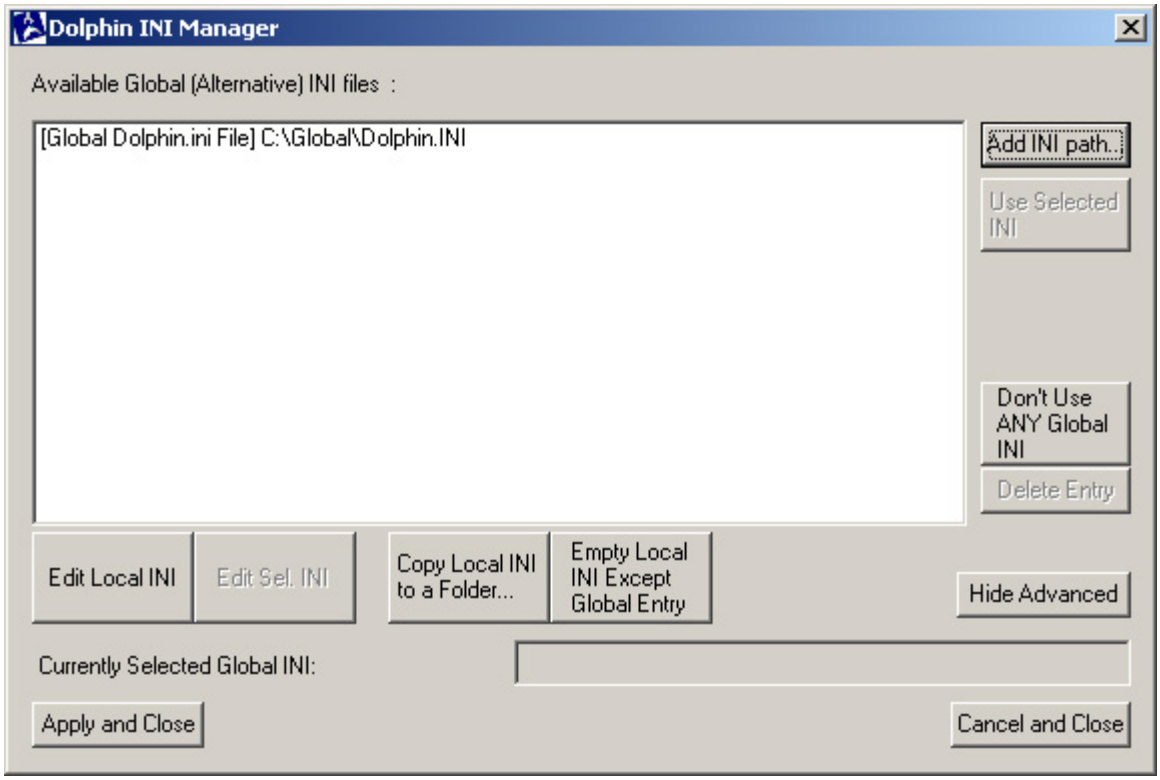
The **DOLPHIN.INI** file manager provides the following advanced features:

- You can specify that you do not want to use any global **DOLPHIN.INI** file.
- You can delete a global **DOLPHIN.INI** file from the **Available Global (Alternative) INI Files** list.
- You can copy the local **DOLPHIN.INI** file for this workstation to a particular folder.
- You can remove all the contents of local **DOLPHIN.INI** file for this workstation except for the entry in the **[Environment]** section that identifies the location of the global **DOLPHIN.INI** file. You would use this feature if you do not want to customize the Dolphin Imaging program's operation for this workstation.

To access the advanced features of the `DOLPHIN.INI` file manager:

1 Click **Show Advanced**.

Additional buttons appear on the Dolphin INI Manager dialog box, as shown below.



Don't Use ANY Global INI	Sets this workstation to not use any global **`DOLPHIN.INI`** file. The workstation only uses a local **`DOLPHIN.INI`** file.
Delete Entry	Deletes the selected global **`DOLPHIN.INI`** file from the **Available Global (Alternative) INI Files** list.
Copy Local INI to a Folder...	Copies the local **`DOLPHIN.INI`** file for this workstation to another folder.
Empty Local INI Except Global Entry	Removes all entries from this workstation's local **`DOLPHIN.INI`** file except for the entry in the **`[Environment]`** section that identifies the location of the global **`DOLPHIN.INI`** file.

To specify that this workstation should not use any global DOLPHIN.INI file:

1 Click **Don't Use ANY Global INI**.

A dialog box appears asking you to confirm that you want this workstation to use only its local **DOLPHIN.INI** file.

2 Click **Yes** to set this workstation to use only its local **DOLPHIN.INI** file.

Or,

Click **No** to cancel this operation and continue to use the selected global **DOLPHIN.INI** file for this workstation in addition to its local **DOLPHIN.INI** file.

To delete a global DOLPHIN.INI file from the Available Global (Alternative) INI Files

1 Select the global **DOLPHIN.INI** file that you want to delete from the list.

2 Click **Delete Entry**.

A dialog box appears asking you to confirm that you want remove this global **DOLPHIN.INI** file from the **Available Global (Alternative) INI Files** list.

3 Click **Yes** to set this workstation to remove this global **DOLPHIN.INI** file from the **Available Global (Alternative) INI Files** list.

Or,

Click **No** to cancel this operation.

If you clicked **Yes**, the entry for the selected global **DOLPHIN.INI** file is removed from the **Available Global (Alternative) INI Files** list. However, the file itself is not deleted from the computer's hard disk.

To copy this workstation's local DOLPHIN.INI file to another folder:

1 Click **Copy Local INI to a Folder...**.

The Save As dialog box opens so that you can select the folder in which to save a copy of the local **DOLPHIN.INI** file.

2 Select the folder in which you want to save the file.

3 Optionally, enter the file name that you want to use for this file in the **File Name** field.

Typically, **DOLPHIN.INI** files use the file name extension **.ini**. It is recommended that you do not change this extension.

4 Click **Save**.

To remove all entries from this workstation's local DOLPHIN.INI file except for the global DOLPHIN.INI file's location:

Note: *You must install DLS before completing this procedure.*

1 Click **Empty Local INI Except Global Entry**.

2 Click **Yes** in the confirmation dialog box that appears to empty this workstation's local **DOLPHIN.INI** file.

Or,

Click **No** to cancel this operation.

Emptying a workstation's local **DOLPHIN.INI** file removes all entries except those created by the **DOLPHIN.INI** file manager (such as **common=**, **commontemp=**, **alternate1=**, **alternate2=**, and so on).

When you empty a workstation's local **DOLPHIN.INI** file, a backup copy of the original local **DOLPHIN.INI** file is created and called **dolphin.ini.erased**. If needed, you can revert to this file.

Note: *The contents of the local* **DOLPHIN.INI** *file are copied to the* **DOLPHIN.INI.*erased*** *file each time you empty the workstation's local* **DOLPHIN.INI** *file. If the* **DOLPHIN.INI.*erased*** *file already exists, it is overwritten. If, for any reason, you empty the local* **DOLPHIN.INI** *file more than once, you should manually save the existing* **DOLPHIN.INI.erased** *file with another name so that your original file settings will still be available if you need to revert to them.*

Exiting from the DOLPHIN.INI File Manager

To exit from the DOLPHIN.INI file manager:

1 Click **Apply and Close** to apply your changes and exit the Dolphin INI File Manager.

Or,

Click **Cancel and Close** to cancel your changes and exit the Dolphin INI File Manager.

Appendix D: Digital Radiographic System Integration

Dolphin Imaging supports direct TWAIN integration with many digital x-ray systems, alleviating the need to develop, support, and maintain custom x-ray integration

In addition, Dolphin Imaging has custom integrations with several popular digital radiographic systems. If you have one of these systems, you can capture images from it into the Dolphin Imaging System. Before you begin capturing pictures from a digital radiographic system into Dolphin, you need to have the digital radiographic equipment and software correctly installed and integrated with Dolphin.

The following digital radiographic system integrations are available. Dolphin Imaging provides complete documentation for these systems.

Product	Company	Web Site
CD-DENT™	OREX Computed Radiography Inc.	www.orex-cr.com
COMBI-X™	OREX Computed Radiography Inc.	www.orex-cr.com
ComCAT	Imaging Sciences International	www.imagingsciences.com
DenOptix™	Gendix	www.gendexxray.com
DIGORA®	SOREDEX	www.soredex.com
Dimax2	Planmeca Group	www.planmeca.com
Dixi^{Æ}2	Planmeca Group	www.planmeca.com
Kodak 8000C (**Orthodontic**)	Kodak	www.kodak.com
Orthoceph® OC100 D	GE Healthcare	www.gehealthcare.com/usen/dental/
Orthopantomograph® OP100 D	GE Healthcare	www.gehealthcare.com/usen/dental/
ORTHOPHOS/SIDEXIS	Sirona	www.sirona.com
Paxorama Xi™	OREX Computed Radiography Inc.	www.orex-cr.com
Scan-X	Air Techniques	www.airtechniques.com
Trophy (both orthodontic and dental)	Kodak	www.kodak.com

Appendix E: Practice Management System Integration

Integrating your practice management system with Dolphin Imaging enables you to easily share information between the two programs. Information from your practice management system is seamlessly imported into Dolphin, and Dolphin patient images are available from the practice management system.

The following practice management system integrations are provided by Dolphin. You can contact your Dolphin representative to purchase these integration packages, which include complete documentation:

Product	Company
Dentrix	Dentrix
EagleSoft	Patterson Technology
OPMS	KODAK
Orthosoft	KODAK
Orthotrac Classic	KODAK
Orthotrac Classic Connect	KODAK
Orthotrac Office (OMS)	KODAK
OrthoWare	KODAK
Practiceworks Dental	KODAK
SoftDent	KODAK
WinOMS CS	KODAK

The following practice management system integrations are provided by the practice management system provider. You can contact your practice management system representative to purchase these integration packages or find out more information from the company web site listed below:

Product	Company	Web Site or Email
axiUm Academic Practice Management System	Exan Academic	www.exanacademic.com
Arakis	Arakis	www.arakis.fr
ClinicView	ClinicView	clinicview@earthlink.net
CPS Clinical Product Suite	Quality Systems, Inc. (QSI)	www.qsii.com

Dental-Exec	DSN Software (Data Systems Northwest)	www.dsnsoft.com
DentalVision Enterprise	Discus Dental	www.discusdental.com
DentalVision Professional	Discus Dental	www.discusdental.com
DENTECH for Windows	Softech, Inc.	www.dentech.com
DOX (Dental Office Xpress)	KSB Dental	www.ksbdental.com
EndoVision	Discus Dental	www.discusdental.com
IMS for Orthodontics	IMS Specialty Services, Inc.	www.ims-tech.com
MEDIMS	Nectech, Inc.	www.medims.com
OASiS	OASiS Software Pty Ltd	www.oasis-software.com.au
OAsys	OAsys, Inc.	www.oasys-practice.com
OMS Navigator	OMS COMP (now Kodak)	www.kodak.com
OMSVision	Discus Dental	www.discusdental.com
OneTouch™	Ortho Computer Systems, Inc. (Ortho II)	www.orthoii.com
Oral Surgery-Exec	DSN Software (Data Systems Northwest)	www.dsnsoft.com
Orthalis 4.0	Orthalis	www.orthalis.fr
OrthoChart	OrthoChart, LLC	www.orthochart.com
OrthoExec	New Horizons Software, Inc.	www.nhsoftware.com
OrthoExec Advanced Series	New Horizons Software, Inc.	www.nhsoftware.com
OrthoManager™	DrRx (formerly Centaur Management Systems, Inc.)	www.orthomanager.com
Perio-Exec	DSN Software (Data Systems Northwest)	www.dsnsoft.com
PerioVision	Discus Dental	www.discusdental.com
Power Practice	Exan Mercedes Software	www.exansoftware.com
Robadent	Robadent Softwarehouse.	www.robadent.com
Tracker	Bridge Network	www.bridge-network.com
ViewPoint™	Ortho Computer Systems, Inc. (Ortho II)	www.orthoii.com
Windent 2000	Windent	www.windent.com
Windent EE	Windent	www.windent.com
Windent OMS	Windent	www.windent.com
Windent SQL	Windent	www.windent.com
WOW Office Suite	Orthodontic Software Solutions, LLC (OSS)	www.osstoday.com

Appendix F: Recommended Readings

The following readings are recommended:

- Alexander, R. G. (1986) The Alexander Discipline
- Athanasiou, A. E. (1995) Orthodontic Cephalometry
- Jacobson, A. (1995) Radiographic Cephalometry
- Ricketts, Roth, et. al. (1982) Orthodontic Diagnosis and Planning, Volumes 1 and 2
- ABO Guideline

Glossary

3GP

A multimedia file format used on 3G mobile phones and on some 2G and 4G phones.

AnywhereDolphin

A Dolphin product that enables you to share Dolphin records with referrals and patients over the Internet. Shared records can include x-rays, cephalometric tracings, 3D datasets, photos, treatment simulations, treatment request forms, and notes.

archive

A process that saves patient records in compressed format in your Dolphin archive directory (typically **`C:\Dolphin\Archive`**).

Audio Video Interleave (AVI)

A multimedia file format introduced by Microsoft that can contain both audio and video data.

BMP

A file format used to store bitmaps, which are images made up of pixels.

caliper

A line or angle that appears on the patient's image so that you can measure distances and angles.

capture sequence

A sequence of images, individual images, or movies that you can capture into Dolphin Imaging.

client workstation

A computer that communicates over a network with a server (a central repository for software and data) to request data or services.

client/server communication

Communication over a network between a client workstation, which request data or services, and a server, which is a central repository for data and software.

codec

A mechanism for encoding and/or decoding a digital data stream or signal. Codec is a portmanteau of coder-decoder. The coder function encodes a data stream or a signal for transmission or storage, possibly in compressed or encrypted form, and the decoder function reverses the encoding for playback or editing. Codecs are used in videoconferencing, streaming media, and video editing applications

Digital Imaging and Communications in Medicine (DICOM)

The international standard for transmitting, storing, retrieving, printing, processing, and displaying medical imaging information.

digitize

The process of identifying landmarks for cephalometric analyses on a patient's x-ray, 3D volume, or photograph.

DivX

A brand of video codecs known for compressing lengthy video segments into small sizes while maintaining relatively high visual quality.

DOLI licensing

A mechanism that delivers and updates licenses for Dolphin products electronically via the Dolphin Update Service.

Dolphin 3D

An optional Dolphin Imaging module for visualizing and analyzing craniofacial anatomy from data produced by cone beam computed tomography (CBCT), MRI, medical CT and 3D facial camera systems.

Dolphin Aquarium

Dolphin's interactive patient education and case presentation product, which utilizes high-quality 3D graphics to help you demonstrate common and complex topics such as diagnostic findings, oral surgery and orthodontic procedures, appliance use, hygiene, and more.

Dolphin database server

The computer where the Dolphin database, which contains your patient data, resides. All Dolphin workstations communicate with the database on this computer when they need to store or retrieve patient information.

Dolphin Imaging Security Utilities

Optional utilities designed to help you comply with national privacy acts such as HIPAA. These utilities require users to log in to Dolphin Imaging and enable you to limit access to some Dolphin Imaging features based on employee login IDs.

Dolphin Imaging Viewer

A free, and freely-distributable, stand-alone Dolphin patient viewing program.

Dolphin Letter System (DLS)

A correspondence system that simplifies and automates generation of referral and patient letters using information and images from your Dolphin database. Letters can be based on predefined correspondence templates or on your custom templates.

Dolphin Management

Dolphin's full-featured orthodontic practice management system, which enables you to efficiently manage and organize your practice flow, especially if you have high-volume, multiple locations and multiple practitioners.

Dolphin Update Service (DUS)

A service that automatically updates the Dolphin products and licenses on your computer when a new version that you are eligible to receive becomes available.

encryption

The process of encoding information so that only authorized parties can access it.

feature line

A line or curve drawn on the patient's image that Dolphin uses as a guide to match up the patient's anatomy when morphing between images.

floating license

A software licensing approach in which a limited number of licenses are shared among a larger number of users on an as-needed basis.

Image Library

A collection of images that you can use to replace the patient's smile to show after treatment results or show the patient's appearance with a variety of appliances.

JPEG Network Graphics (JNG)

An file format closely related to JPEG and PNG.

JPEG

A commonly used compression method for digital images, particularly digital photographs. The degree of compression can be adjusted, resulting in a trade-off between storage size and image quality. JPEG typically achieves 10:1 compression with little perceptible loss in image quality. JPEG files have a filename extension of .JPG or .JPEG

JPEG 2000 (JP2)

A compression method for digital images, particularly digital photographs, created as an improvement to JPEG.

local path

Describes the location of a resource (such as a file, directory, or printer) on the computer you're using. For example, a local path to a file on computer you're using might be **`C:\folder\file.txt`**.

marker

A shape drawn on the patient's image to represent a specific anatomical structure, to indicate a treatment operation, or to emphasize an area.

M4V

A video file format developed by Apple that is very similar to the MP4 format. The primary difference is that M4V files may optionally be protected by digital rights management (DRM) copy protection.

Messaging Application Programming Interface (MAPI)

An application programming interface that enables programs to become email-aware. MAPI is usually used to communicate with Microsoft Exchange Server.

Microsoft SQL Server

A database management system that Dolphin Imaging uses to store and retrieve patient information.

MP4

A digital multimedia format most commonly used to store video and audio, but it can also be used to store other data such as subtitles and still images.

MPEG-1

A standard for compressing VHS-quality digital video and CD audio to reduce the file size without excessive quality loss. MPEG-1 computer files use the file extension .MPG.

MPEG-2

A standard for compressing video and audio data to reduce file size while maintaining quality. While MPEG-2 is not as efficient as newer standards, backwards compatibility with existing hardware and software means it is still widely used. MPEG-2 files use an .M2V file extension.

multi-byte character

A character that computers store as a sequence of two or more bytes, such as Russian, Chinese, or Japanese characters.

network path

Describes the location of a network resource, such as a shared file, directory, or printer. A network path has the form *ComputerName**SharedFolder**Resource*.

networked workstation

A workstation connected to other workstations via a computer network.

norm

A measurement value considered normal or average based on a patient's age, gender, and ethnic/racial classifications.

PCX

One of the first widely accepted image file formats developed for the PC, which has largely been superseded by more sophisticated image formats, such as BMP, JPEG, and PNG.

Picture Archiving and Communication System (PACS)

A medical imaging technology that provides economical storage and convenient access to images from multiple sources.

PNG

A file format used to compress and store images made up of pixels. PNG was designed for transferring images on the Internet, not for professional-quality print graphics.

polygon/wiggle-gram

A display option for measurements tables that depicts deviations from the norm graphically using a red line. By default, the red line wiggles left for measurements below the norm and right for measurements above the norm.

PSD

The proprietary image file format used by Adobe Photoshop.

QuickTime File Format (QTFF)

A computer file format used by QuickTime. QuickTime files have a .MOV file extension.

rendering filter

A method for interpreting 3D volume data to create an x-ray view. Using different rendering filters helps emphasize different structures of interest.

server

A computer used as the central repository for software and data shared by users on a computer network.

soft tissue rules

The rules that the Dolphin Treatment Simulation module uses to translate changes in the cephalometric data to soft tissue movement.

stand-alone workstation

A workstation that is not connected to a network.

standard deviation

The expected variation of data from the norm.

TGA

An early image file format developed for the PC that offers acceptable compression for simple images (such as icons, cartoons and line drawings), but is not suitable for photographs. This format is often referred to as TARGA.

TIFF

An image file format popular among graphic artists, the publishing industry, and photographers. TIFF is widely supported by scanning, faxing, word processing, optical character recognition, image manipulation, desktop publishing, and page-layout applications.

TWAIN

A communication protocol used between software and digital imaging devices, such as image scanners and digital cameras.

volume

A 3D representation of a patient's anatomy created from a cone-beam computed tomography (CBCT), MRI, or medical CT system.

polygon/wiggle-gram

A display option for measurements tables that depicts deviations from the norm graphically using a red line. By default, the red line wiggles left for measurements below the norm and right for measurements above the norm.

Windows Media Video (WMV)

A series of video codecs and their corresponding video coding formats developed by Microsoft. It is part of the Windows Media framework.

wizard

A user interface type that presents a user with a sequence of dialog boxes that lead the user through a series of well-defined steps.

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