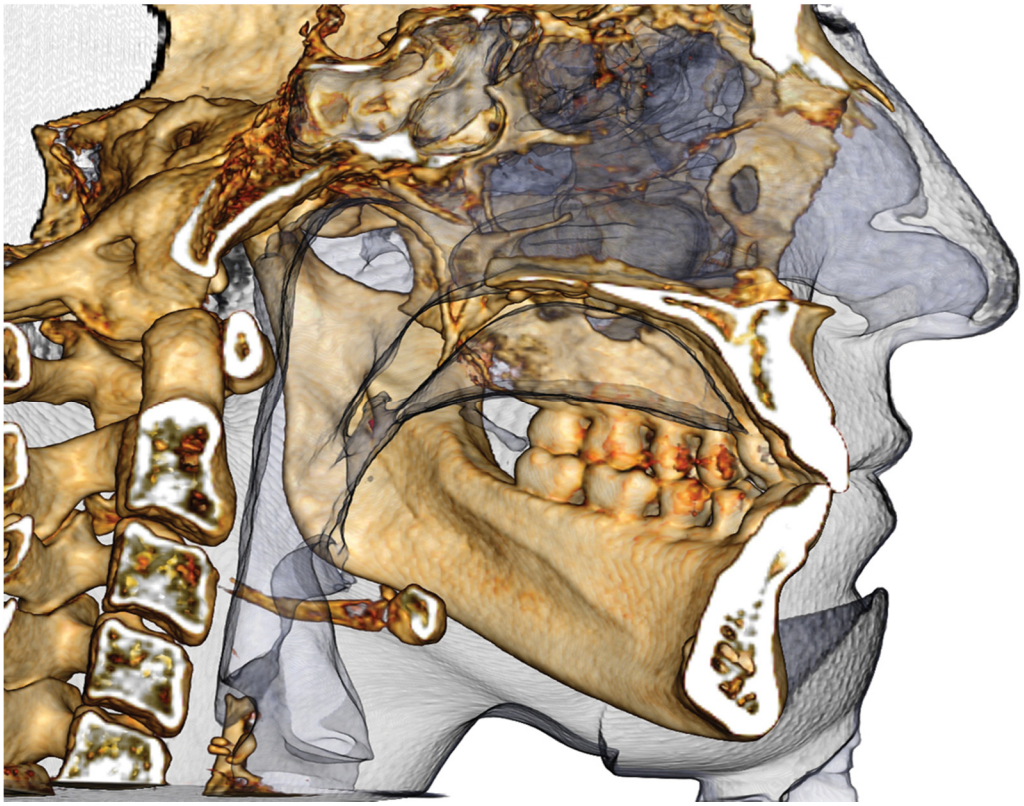
InvivoLight

InvivoLight 5.4 Reference Manual
English



Anatomage

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InvivoLight software is dependent on its hardware requirements. The life-cycle is limited only by the availability of the required hardware.

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Intended User

InvivoLight is designed to be used by medical and dental professionals who have been appropriately trained to use 3D CT imaging devices and read the image data generated by the devices.

Caution: Federal law restricts this device to sale by or on the order of medical and dental clinicians.

Indications for Use

InvivoLight is a software application used for the display and 3D visualization of medical image files from scanning devices, such as CT, MRI, or 3D Ultrasound. It is intended for use by radiologists, clinicians, referring physicians, and other qualified individuals to retrieve, process, render, review, store, print, assist in diagnosis and distribute images, utilizing standard PC hardware. Additionally, InvivoLight is a preoperative software application used for the simulation and evaluation of dental implants, orthodontic planning, and surgical treatments.

This device is not indicated for mammography use.

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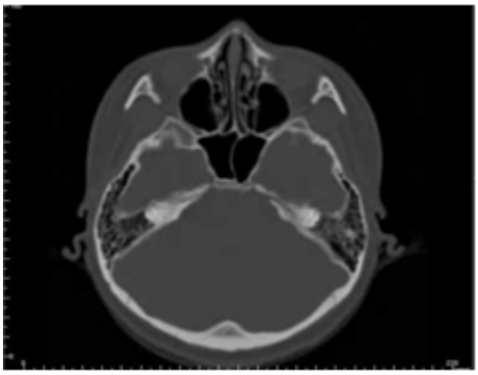
Introduction

InvivoLight Imaging Software



Anatomage, Inc. is a medical imaging company composed of a cross functional team consisting of the most elite researchers, mathematicians, engineers, software developers, business analysts, industry leaders, academic faculty, and dental specialists. We believe that InvivoLight software will enable the profession to initiate a revolution of unimaginable scope and magnitude. Ultimately, our mission is dedicated to developing software specially designed for dentists to be simple and refined, yet utilizing the most advanced cutting edge software and technology to better serve their patients. With InvivoLight software, doctors can create 3D volume renderings on their own computers, get cross-sections, trace nerves, place implants, print images, save images, and many more functions. The software is designed to reconstruct these 3D volume renderings from DICOM files generated by CBCT, Medical CT, and MRI radiography machines. InvivoLight is intended for use as a planning and simulation software in the placement of dental implants, orthodontics and surgical treatment.

This manual is intended to provide supplementary information to your direct training with the Anatomage support team. For correct and safe use, training is available to all InvivoLight users and is highly recommended. For more information, please contact the Anatomage customer support team at (408) 885-1474 or email info@anatomage.com

System Requirements

Below are the minimal and recommended system configurations.

Having an adequate computer system is essential to using InvivoLight efficiently and generating the highest quality images possible for enhanced analysis and presentation for your patients and colleagues. The most important element is the video card (3D graphics chip or GPU). If your system does not have an appropriate video card, you can purchase and install video cards for desktop computers.

InvivoLight has minimal system requirements; however, Anatomage recommends the following configurations to fully utilize all the features within the InvivoLight Software. The following recommendations have been updated in May 2015:

Summary

	Minimum	**Recommended**
CPU	Pentium 3	Intel Core i7 4000 series or comparable multi-core processor
RAM	3GB	4GB
GPU / Graphics Card	ATI Radeon HD 4650 *or* Nvidia GeForce 9800 GT	ATI Radeon HD 6800 or comparable
Hard Disk	100 GB	500 GB
OS	Windows 7 32-bit	Windows 7 64-bit or Windows 8 64-bit

Mac Users

	OS	**Hardware**
Not Compatible	Apple OS, Parallels	MacBook Air, Mac Mini
Fully Compatible	Apple Bootcamp (requires a full license of Windows)	iMac, MacBook Pro (15in), Mac Pro Note: Please check if a dedicated graphics card (Nvidia/Radeon) is included.

Graphics Cards / GPU Details

Brand	**Model Series**	**Low-End Options**	**Recommendation**	**High-End Options**
ATI	Radeon HD 4600 – R9 290X	Radeon HD 6450	Radeon HD 6800 series	Radeon HD 7970 Radeon R9 290X
Nvidia	GeForce GT 430 – GeForce GTX Titan	GeForce GT 635 GeForce GTX 645	GeForce GTX 650	GeForce GTX 760 GeForce GTX 660 Ti

Laptop Recommendations

IMPORTANT: Ensure the laptop has a dedicated video card. Integrated graphics cards alone, such as Intel HD Graphics, are insufficient for 3D rendering.

Note: Graphics processor options may vary. Please check with the laptop manufacturer for details on graphics processor options.

Dell

Sizes	Model Series	Graphics Processor Options	Weight
11", 14", 17", 18"	Alienware M	Nvidia GeForce 765M Note: Known issue with new GT 700M series drivers; will only work with "Nvidia driver 311.48.1.3.24.2" as of 1/29/2014	4.4 – 11.7 lbs
15", 17"	Inspiron R	ATI Radeon HD 8850M or Nvidia GeForce GT 750M	6.1 - 7.3 lbs
15", 17"	Studio XPS	Nvidia GeForce GT 730M or GT 740M or better	5.8 - 7.4 lbs

HP (Warning: HP brand laptops have a known issue with switchable graphics. A BIOS update from the HP website may be necessary to run Invivo5 with the intended graphics hardware.)

Sizes	Model Series	Graphics Processor Options	Weight
15", 17"	Envy	ATI Radeon HD 8750M or Nvidia GeForce GT 750M	5.6 – 7.5 lbs
15", 17"	Pavilion	ATI Radeon HD 8670M	5.5 - 6.6 lbs

For additional information, recommendations or assistance, please contact the Anatomage Tech Support Department at (408) 885-1474 or email info@anatomage.com

Installing InvivoLight

InvivoLight Setup Wizard

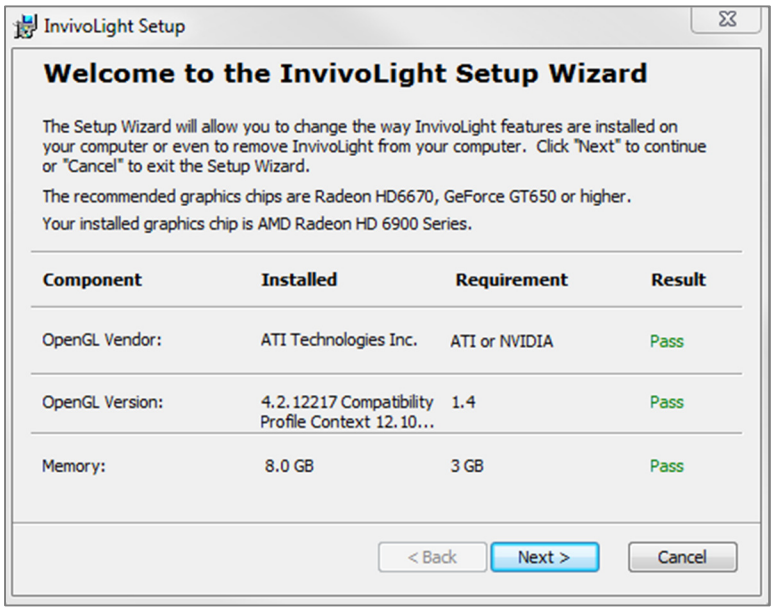
Before proceeding, please ensure the computer is connected to the Internet. InvivoLight Setup will check for certain components that are important to the performance of the software. A result of Pass or Fail will be provided as the components for that computer are compared to a list of the most compatible components. A Fail result will not prevent the installation from completing and is only intended as a warning of the possibility of suboptimal software performance as a result.

OpenGL Vendor: Associated with the manufacturer of the graphics processor

OpenGL Version: Associated with the driver version of the graphics hardware component

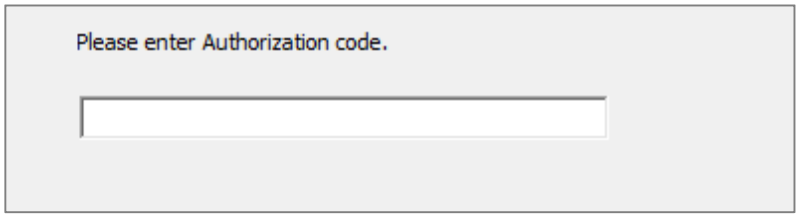
Memory: The quantity of RAM installed on the motherboard

Click **Next** to continue.



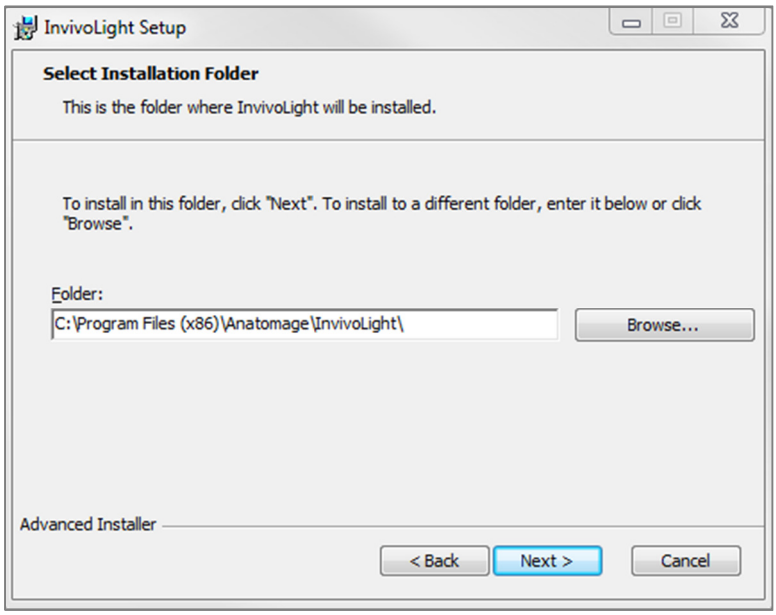
Enter the numerical authorization code. If you have an alphanumeric license key, click **Advance** and put in the key in the blank provided.

Click **Next** to continue.



This window allows you to change the default installation folder.

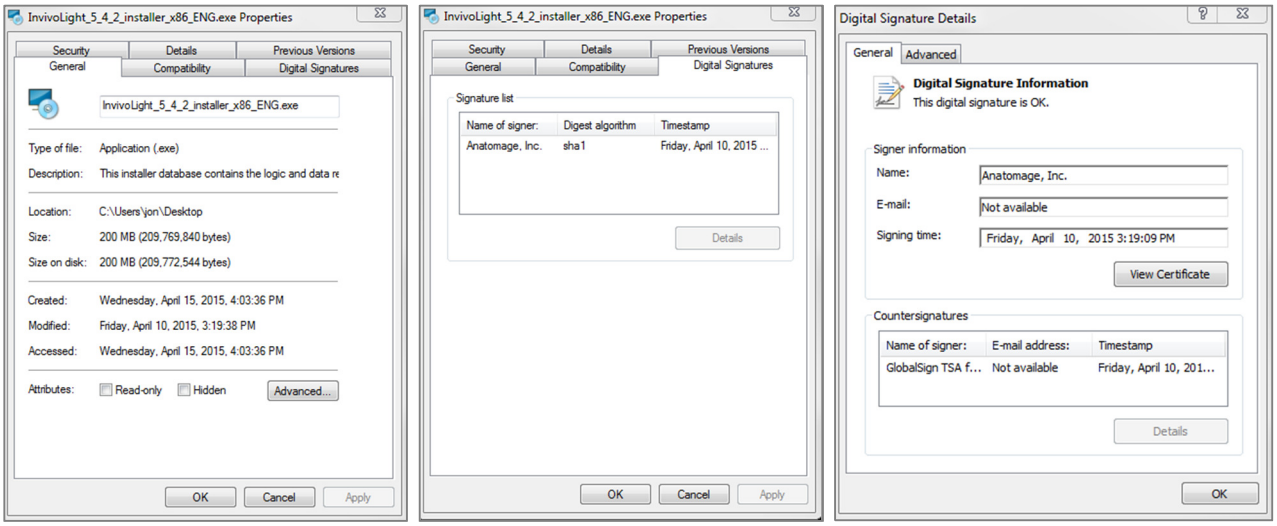
Click **Next** to continue. The program will proceed with installation until completed. Clicking **Finish** will close the wizard.



Validating the Installer File

1. Right-click the Installer file and select "Properties" to open the Properties window.
2. Open the "Digital Signatures" Tab.
3. Select "Anatomage, Inc." and press **Details**.
4. Verify that the Digital Signature Information is "OK."

The following pictures are for example purposes only. The name of the installer and Digital Signature Information is dependent on the release version and may change accordingly.



Feature List

An overview of the various features provided by InvivoLight.

- **Directly Opens DICOM Data from Any CT Machine**
- **Invivo File Compression**
- **Section and Multislice View Operations**
- **Volume Rendering of Scan Data**
- **Linear, Angular, Circumferential, and Area Measurements***
- **Image Capture and Export**
- **AVI (Movie) Capture and Export**
- **Implant Treatment Planning**
- **Restoration and Abutment Visualization**
- **Bone Density Evaluation**

* All measurements are performed with the metric system.

Software Layout

The following is a description of how InvivoLight is organized by Menu Bar, Tool Bar, View Tabs, View Controls, and Rendering Window.

Menu Bar

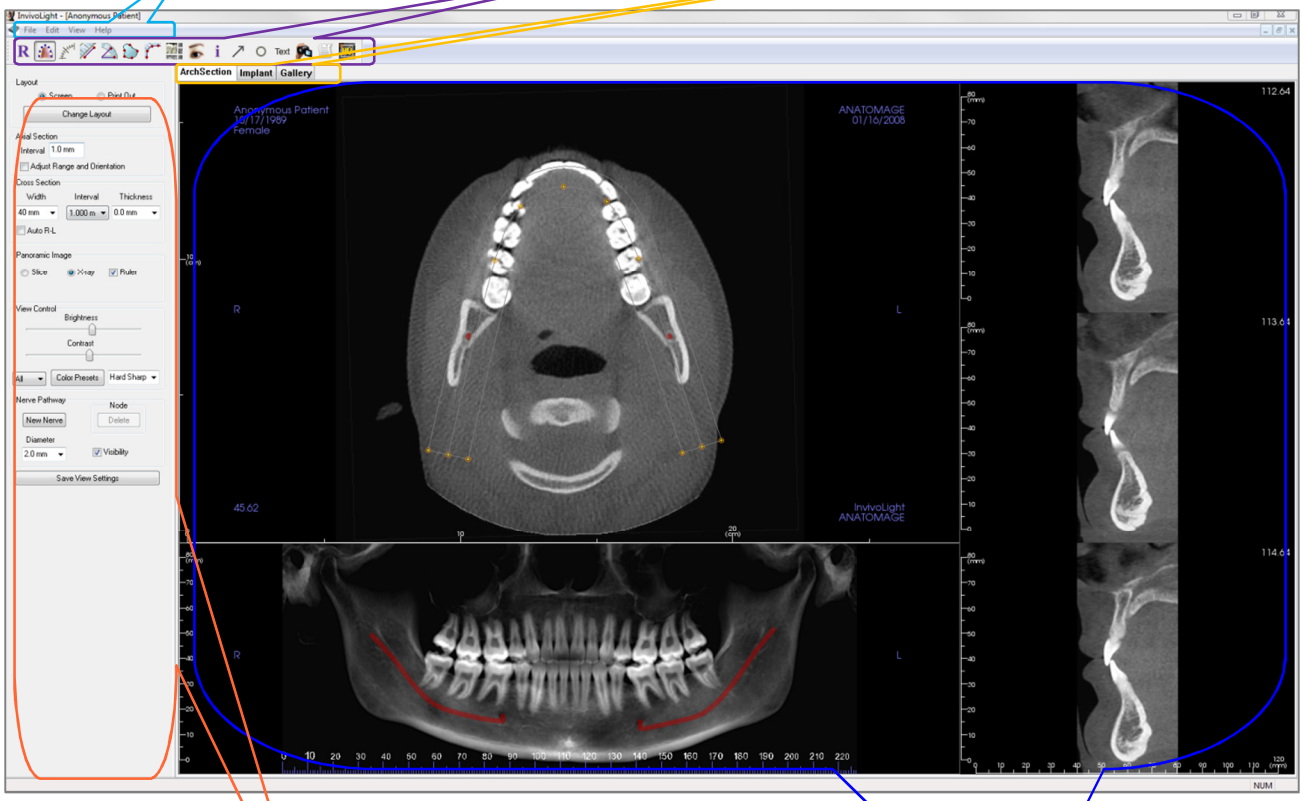
The **Menu Bar** allows you to perform application operations such as open, save, close, print, capture, etc.

Toolbar

Tools can be accessed to perform certain functions on patient images. Sets of tools are associated with a specific **View Tab**.

View Tabs

The **View Tabs** allow you to perform specific tasks or look at specific subjects of interest by adjusting the **Toolbar** and **View Controls**



View Control

View Control is the region where patient images can be manipulated and controlled. The **View Control** is associated with a specific **View Tab**.

Rendering Window

Rendering Window is the region where patient images are displayed. This window can be customized within many of the **View Tabs** by using the **Toolbar**.

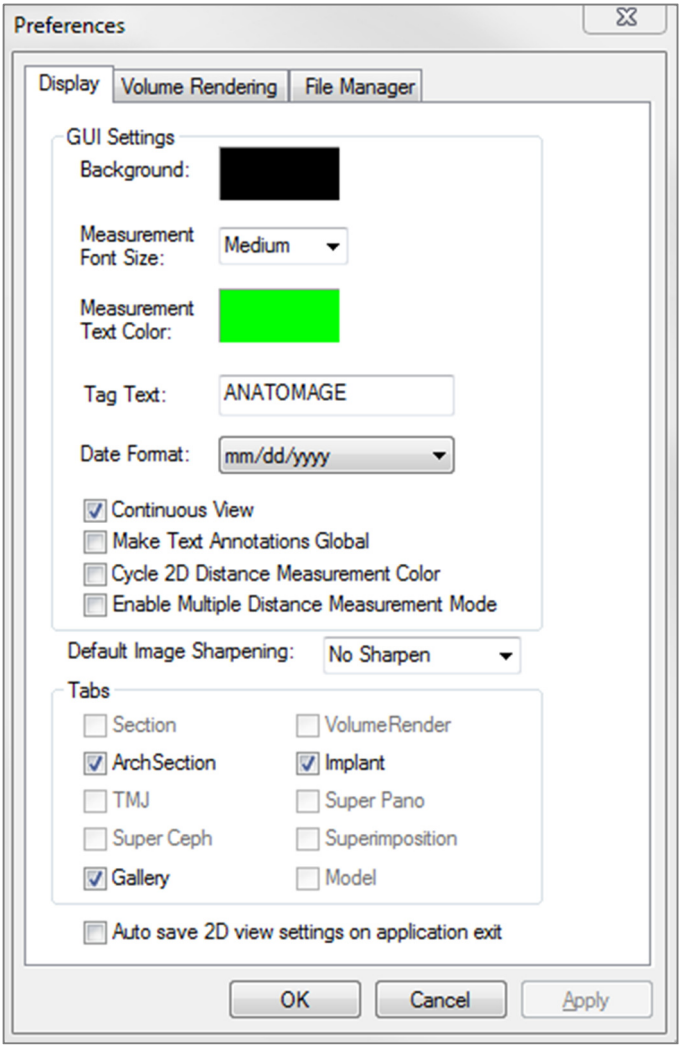
InvivoLight Preferences

This section will explain the different options within the Preference window of InvivoLight. The InvivoLight Preferences include options for Display settings, Volume Rendering settings, as well as File Manager settings.

Accessing the InvivoLight Preferences:

- In the Menu bar of the InvivoLight, select "File".
- Select "Preference…" from the "File" drop-down.

Display Preferences



GUI Settings

- Background: Sets the background color for the Rendering Window
- Measurement Font Size: Sets the measurement font size to a size preset: small, medium, or large
- Measurement Text Color: Sets the text color for measurement notations
- Tag Text: Provides an additional label to the right hand corner of the rendering window
- Date Format: Current date format for case information display
- Continuous View:
  - Checked – Switching between view presets for volume renderings will show intermediate volume positions
  - Unchecked – Switching between view presets will not show intermediate positions – the volume will "jump" to the final position
- Make Text Annotations Global: when checked, previously placed or new text annotations added to any 2D slice view except group slices (ArchSection) will be visible when scrolling past the slice the measurement was placed on
- Cycle 2D Distance Measurement Color: Measurement colors will cycle with every measurement that is added
- Enable Multiple Distance Measurement Mode: Distance Measurement will become a toggle on/off button for measurement mode. Toggling "on" this mode will continue to pick beginning and end points for linear measurements with each click after the first measurement has been created

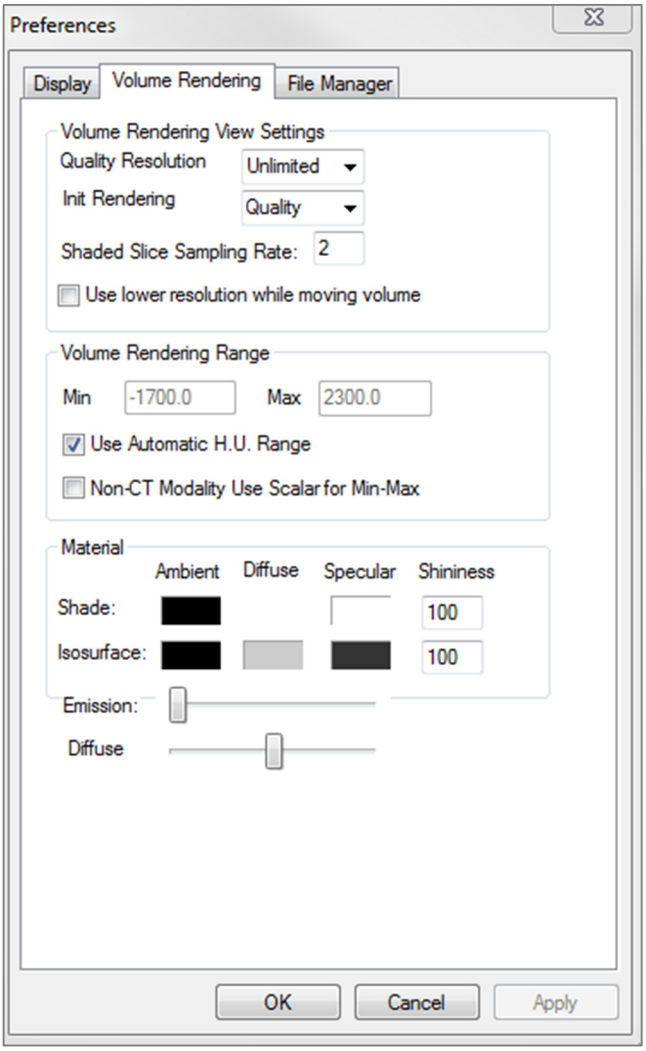
Default Image Sharpening
This drop-down menu features three settings: No Sharpening, Mild Sharpening, and Hard Sharpening. This setting determines the amount of sharpening applied to 2D grayscale and 2D X-ray (pano and ceph) images universally. Changes will occur immediately without restarting the program and the specific setting can still be changed manually in each individual tab.

Tabs
This section determines which View tabs are seen by the user when the program is running. Checked boxes will be available while unchecked boxes will hide those View tabs. Changes are made after restarting the program.

Auto save 2D view setting on application exit
This setting will determine if 2D view settings made in each of the applicable tabs will be saved automatically upon program closure and be reloaded with the next opened case. If left unselected, the user will have to manually save the configuration by clicking **Save View Settings** in the working tab. The specific 2D view settings that will be saved in each tab is given in the table below:

Implant	Layout, Restoration Lock, View Preset, Brightness/Contrast, Sharpen Filter, Volume Clipping, and Remove Crown
ArchSection	Slice Interval, Cross Section Width/Interval/Thickness, Auto R-L, Pano Image Type, Pano Ruler Enabled, Brightness/Contrast mode, Layout (including Axial vs. Cross Series and Print Layout), Sharpen Filter, Color Preset, Nerve Diameter, and Nerve Visibility

Volume Rendering Preferences



Volume Rendering View Settings

- Quality Resolution: Sets the limit for the resolution of the image. This can be set to either a user-defined number or set to Unlimited.
- Init (Initial) Rendering: Sets the rendering quality upon opening InvivoLight.
- Shaded Slice Sampling Rate: Accepts a numerical value that sets the sampling rate to improve image quality at the cost of performance.
- Use lower resolution while moving volume: positional changes of the volume will be rendered at a low quality resolution while maintaining the quality resolution setting in the final position.

Volume Rendering Range

- The user can define the range of Hounsfield Units that will be rendered. This cannot be set when "Use Automatic H.U. Range" is checked.
- Checking "Non-CT Modality Use Scalar for Min-Max" will allow the user to define the Min and Max Scalar units that will be rendered.

Material

- Various properties can be adjusted to change the appearance of a volume rendering. Ambient, Diffuse, and Specular effects can be rendered in different colors.
- The degree of Emission and Diffuse can be adjusted with the respective slide bars.
- Shininess is set to a number – higher numbers denote less shininess.

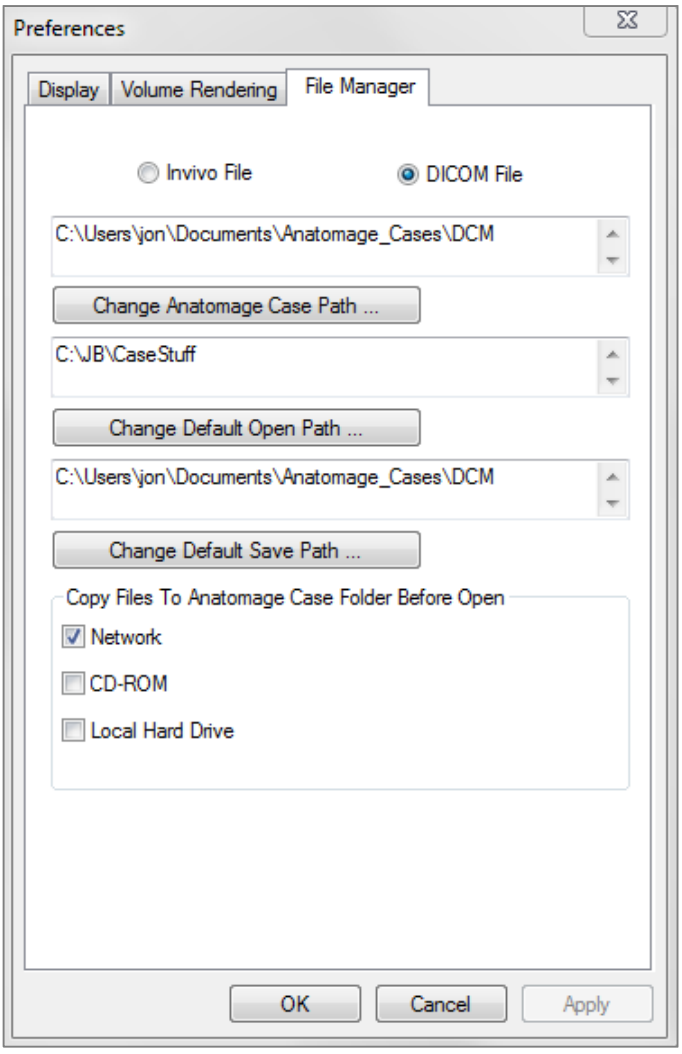
File Manager Settings

File Type-Associated Folder Paths

Folder paths can be set for each of the Invivo and DICOM file type options. When one mode is selected, the program will use the file paths associated with that file type mode, but the user may still save or open either file type at any time.

File Path Preferences for Different Users

In the situation that there are multiple users on a single computer with InvivoLight installed across multiple user accounts, the file paths for all new accounts will initially take on the preferences defined by the user administrator account. Non-admin accounts may redefine their file path settings but they will be overwritten the next time the settings are changed on a user administrator account.



File Paths

- Anatomage Case Path: Starting the program will open a window showing a list of cases within this location.
    - Can also serve as a backup folder for all opened cases.
- Default Open Path: This is the starting location for attempting to open a case through File → Open in the Menu bar.
- Default Save Path: This is the starting location for saving a case file in InvivoLight.

Copy Files to Anatomage Case Folder Before Open

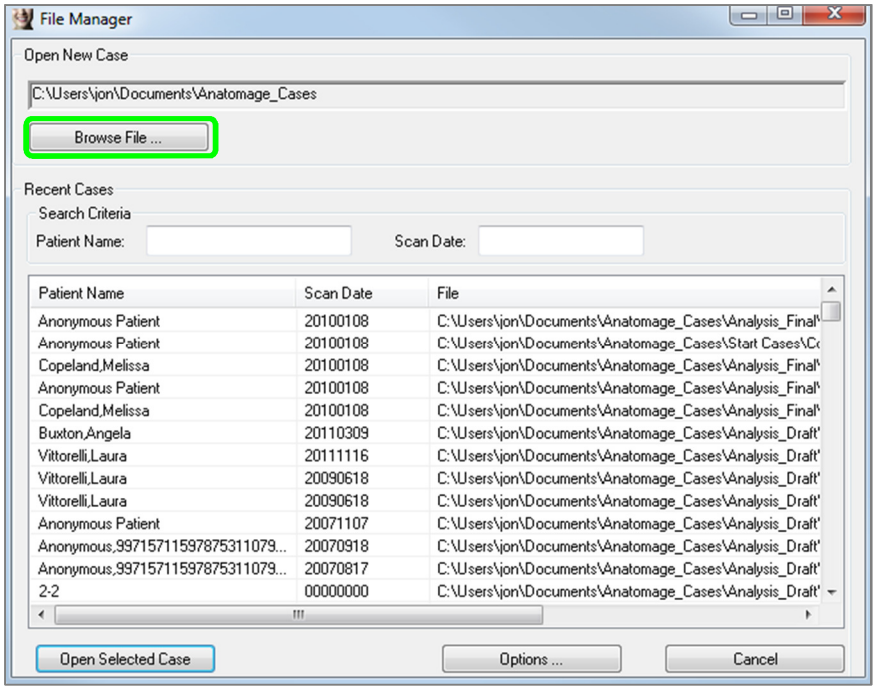
This section allows the user to save a copy of a case that is to be opened in the Anatomage Case Folder if it is in any location besides this folder, such as on a different location on a network, on a CD-ROM, or in a different folder on the local hard drive.

Basic Features

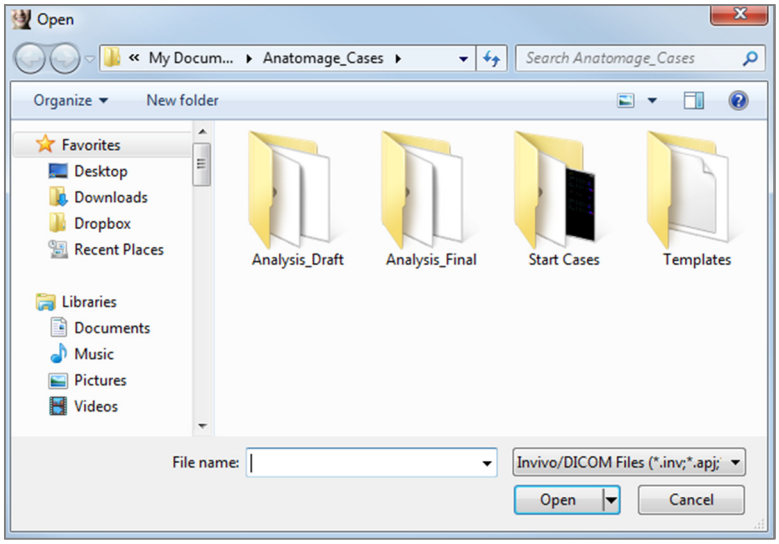
The following is a detailed explanation of the various features provided by InvivoLight.

DICOM & Invivo File Loading with the File Manager

To open a DICOM data set or Invivo-associated file type (.inv, .amg, apj), first launch the InvivoLight software. The File Manager will appear upon startup, allowing you to open the data.

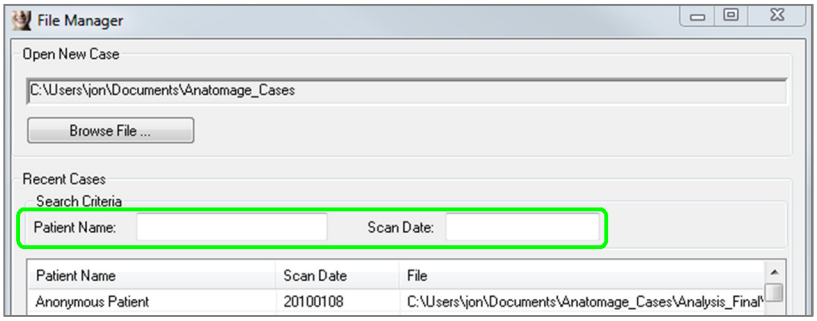


Click the **Browse File** button to manually search for the data you would like to open. If you are opening DICOM data, as shown to the right, simply highlight one of the .dcm files and click **Open**. **It does not matter which DICOM file you choose**, just click one and the software will open all the files within the data set present in that folder. If you are opening an Invivo file just click it and press **Open**. Invivo files can be compressed and opened.

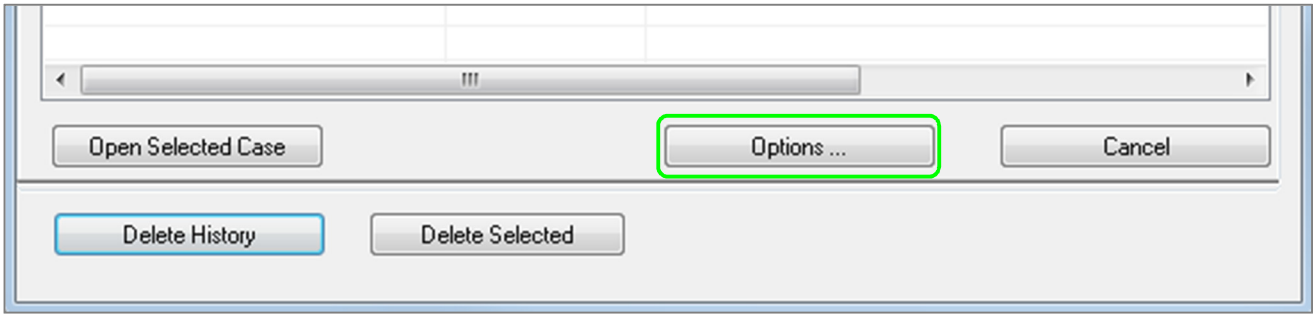


The File Manager allows you to automatically store and reopen recently viewed cases. This allows for quicker access to cases. By default, files will be saved in the "Anatomage Cases" folder, located in "My Documents." This location can be changed in the Menu Bar → File → Preferences → File Manager.

InvivoLight allows you to quickly search through your recent cases by typing in the Patient Name or Scan Date in the search fields (shown right). You can also remove the selected Recent Cases from your Recent Case List by selecting the **Options...** button and using the additional boxes (shown below). This will also allow you to completely clear your Recent Case List.

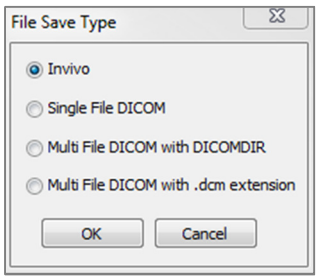


If you close a case and want to reopen another one, click on "File" → "Open" and the File Manager will appear again.



Invivo/DICOM File Saving

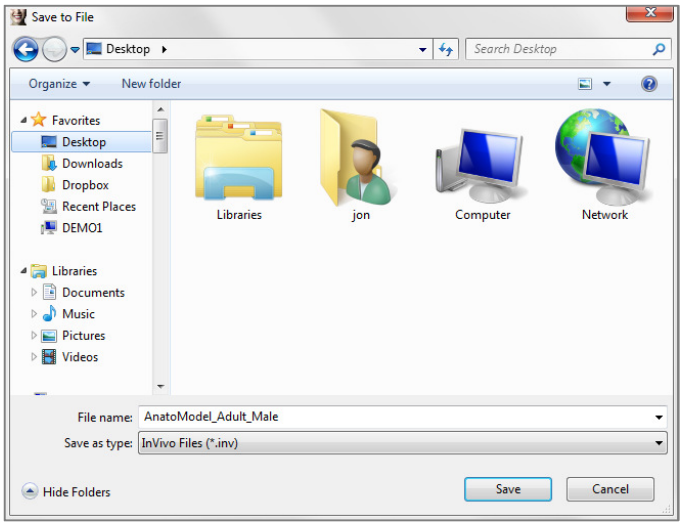
InvivoLight provides four options for saving and each type differs according to the size of the saved file and its compatibility with other software. Choosing "File" → "Save As..." for any file will present the dialog on the right. Choosing "File" → "Save" when a DCM file is open will save an INV in the specified location or simply overwrite the same file it is of the INV file type.



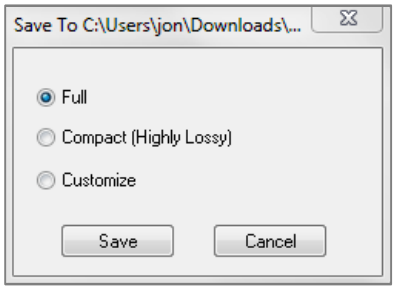
Invivo

The following work can be saved as an Invivo file (.inv).

- Case Information & Patient Orientation
- Traced Nerve Pathways
- Implants & Implant Measurements
- Landmarks and Annotations
- Images captured within the Gallery



Click "File" → "Save As...," browse to the folder you would like to save, name the file (default is the patient's name), then click **Save**.



The following save dialog box will show up. Select the default "Full" option for saving everything without losing any information.

DICOM

When the DICOM file type is chosen, the output options will be a either a single lossless DICOM or multi-file DICOM (with DICOMDIR) accompanied with an Invivo workup file containing workup data and a folder of exported Gallery images in DCM format.

For single-file DICOMs (Figure 1), the save dialog will ask for a location to save the files. For multi-file DICOMs (Figure 2), you will have to create or choose a folder to save the slices and DICOMDIR file. The DICOMDIR file presents the directory of slices to InvivoLight to accelerate the loading speed.

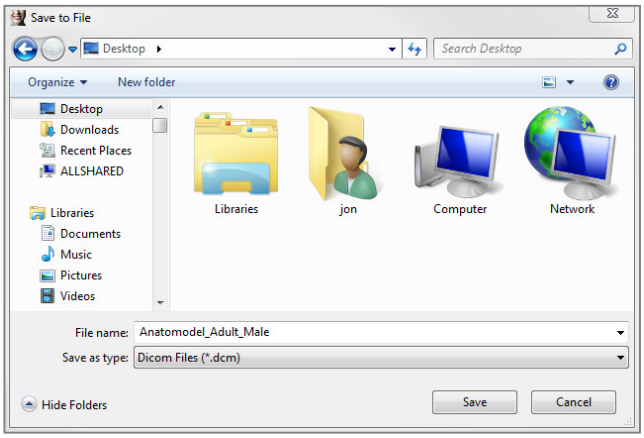


Figure 1: Single-file DICOM Save Dialog

The DICOM File Save Option dialog (Figure 3) will present numerous options for saving the file. Compression will reduce the size of the file (at the cost of increased saving and loading speed), Lossless or Lossy determines the quality (amount of data) of the file that is saved, and resampling will change the resolution by a factor in each orthogonal plane.

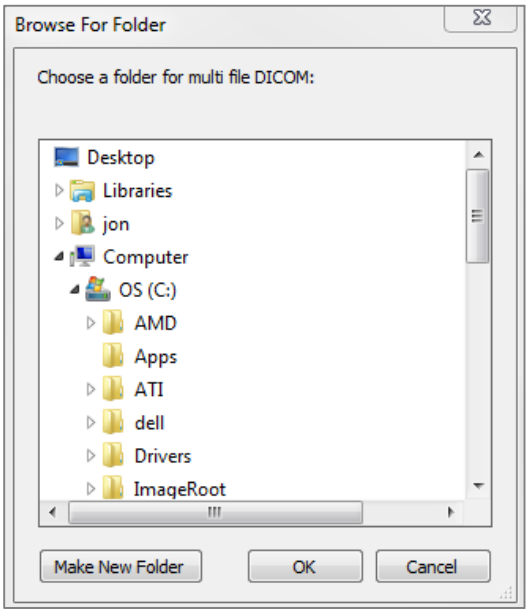


Figure 2: Multi-file DICOM Save Dialog

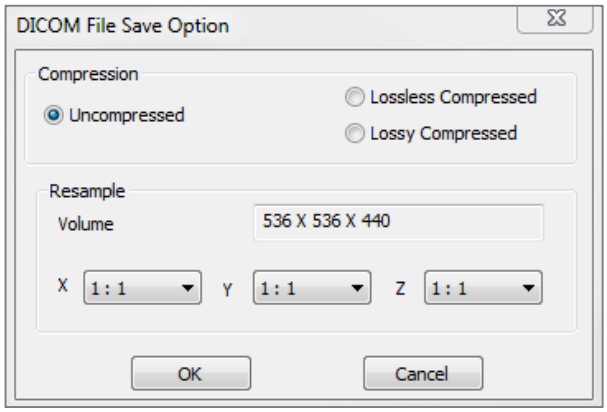
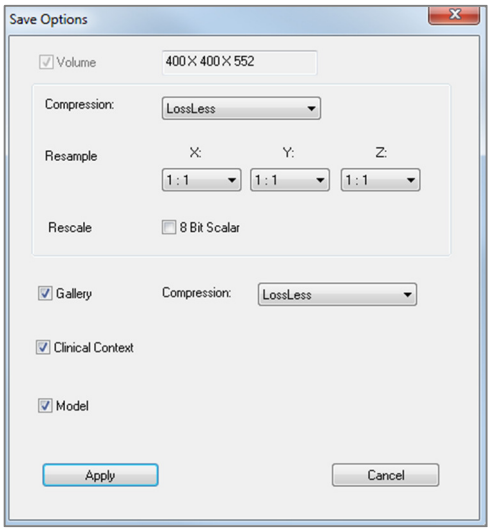


Figure 3: DICOM File Save Options

Custom Saving Dialog

Available for Invivo file saving: By selecting the "Customize" option, the custom saving dialog shows up. In the dialog box, one can compress the data. For the main volumetric image, you can select to save it as "LossLess" or "Lossy" compression. With LossLess compression, the volume is compressed to about 1/3rd – 1/4th of the original size. With the Lossy compression option, the file size can be dramatically reduced, but the image is altered. Resampling the data will reduce its size very dramatically by combining voxels to reduce the overall voxel count. Rescaling the image will reduce the number of shades of gray in the image. You can also choose to selectively compress images in the gallery, the clinical content (such as implants and nerve tracings), and the models.



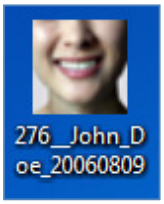
Saving As an Invivo Project File

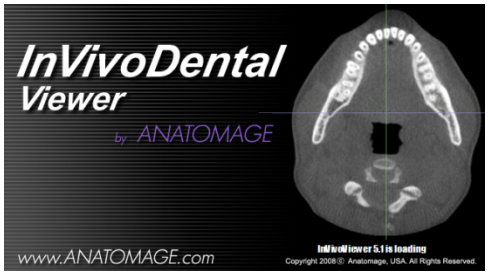
Click "File" → "Save As Project..." to save the case as an APJ, Invivo Project file. This file will **only** save changes made to the original scan data. It requires a reference data (.dcm scan data or .inv file) when opening. If InvivoLight cannot locate the reference data, it will ask you to locate the data again. Because it is saving only the changes to the original, APJ files save much faster than full INV files.

Lay Egg

This function will create an executable file containing the 3D volume data from the scan that is currently open as well as a 2D Invivo viewer program. This function is designed to allow the sharing of scan data from an InvivoLight user to a non-InvivoLight user on shareable media such as a CD, DVD, or flash drive. Note that some antivirus programs may detect the file as a virus due to its executable format.

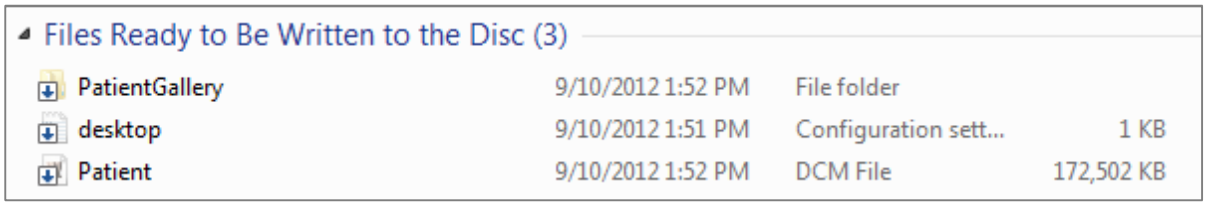
EggViewer: Running this file will initialize the viewer program and then load the embedded scan data. The EggViewer contains some Section, ArchSection, and Gallery functionality





Export to CD

This function will export the currently opened scan as a compressed or uncompressed DICOM or a full, compressed, or customized setting Invivo file. The exported image file will be placed in the temporary burn location in the computer.



Case Information Display

To display or hide the Case Information for a specific patient, go to the "File" → "Case Info." Click **Anonymize** then click **OK** to save the changes. For safety, only the patient's name or "Anonymous Patient" can be displayed and cannot be manually edited.

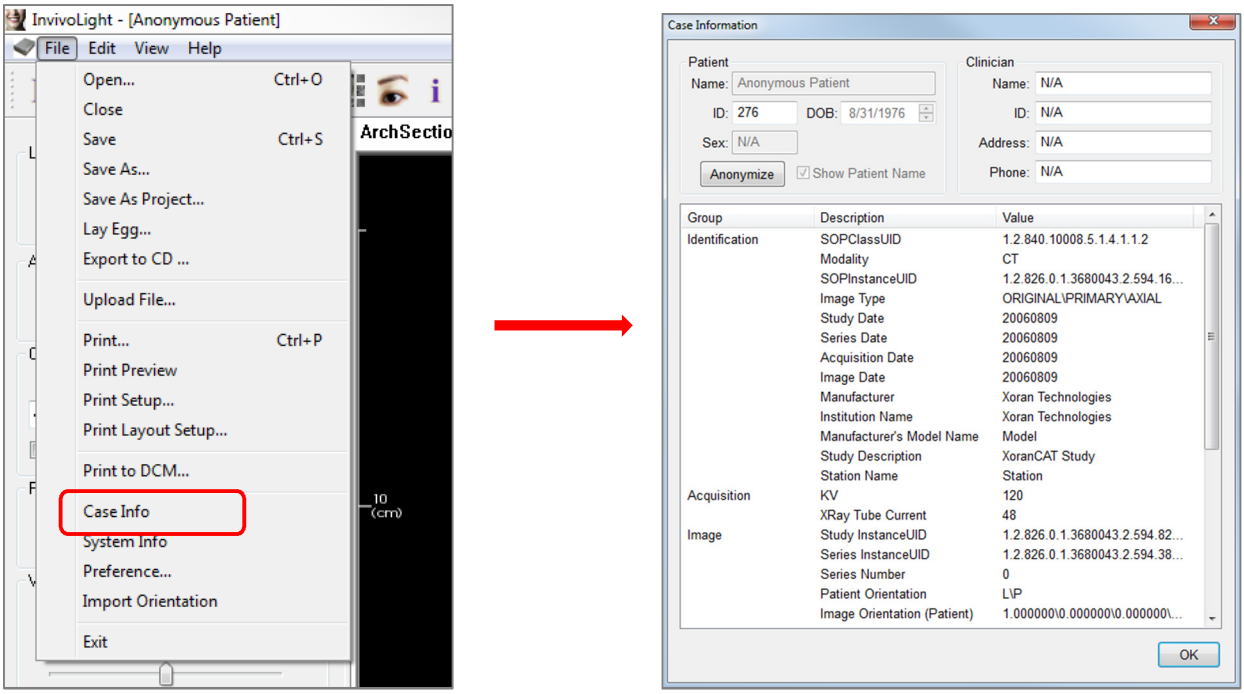


Image Capture to File

To capture an image of the active display click "View" → "Capture to File." Browse to the location where you want to save the image, type the name of the file, choose the file type on the "Save as type" drop-down, and click **Save**. The file can be saved as bmp, jpg, or png format. Jpg is the most popular file format for images, but there is a small amount of color degradation. Bmp preserves the image, but the file size is big. Png is an effective lossless format that does not degrade the color.

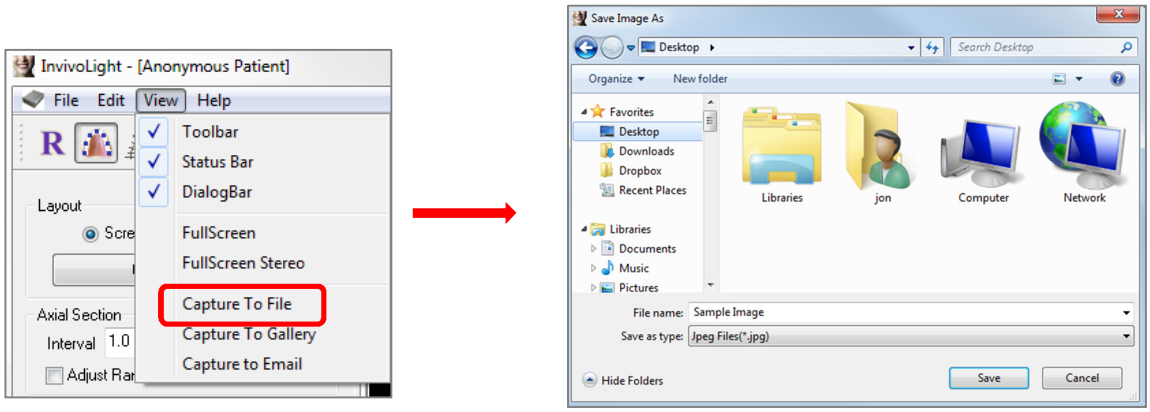


Image Capture to Gallery

Selecting "Capture To Gallery" will capture an image of the rendering window and save it to the Image List (see Gallery Tab features for additional information).

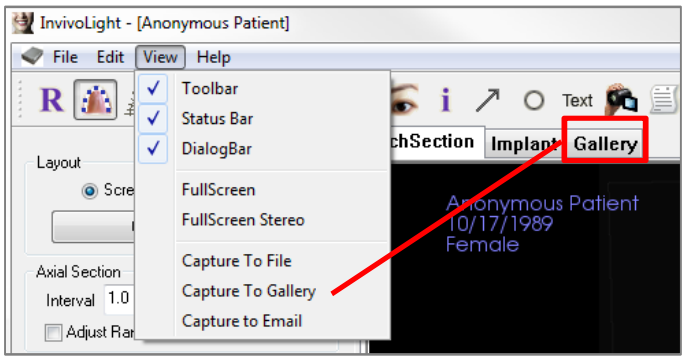


Image Capture to an Email

Selecting "Capture To Email" will capture an image of the rendering window and attach it to an email ready to send. This tool requires e-mail client setup before use (ex: Microsoft Outlook, Mozilla Thunderbird).

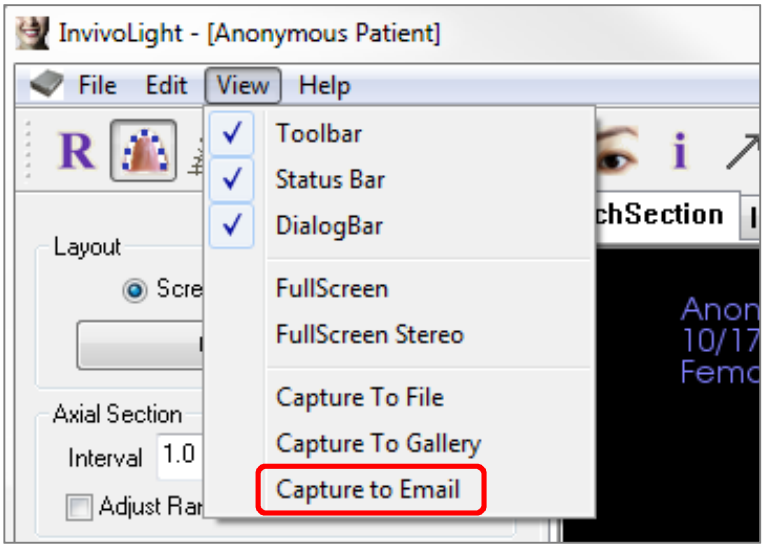


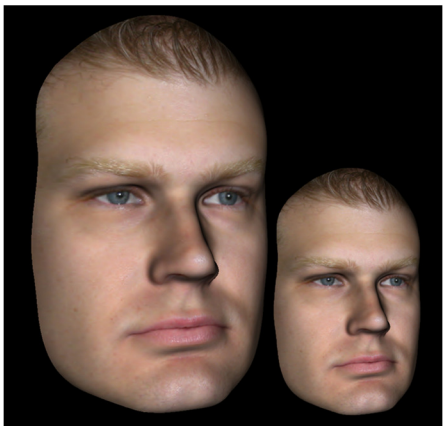
Image Navigation

Below is an explanation showing how to manipulate images in the rendering window with the keyboard and mouse.

Slider Bar Scroll

- Click the mouse cursor over any slider bar (e.g. axial slice, brightness, etc.) and move it to adjust the image.
- Click the slider and keep the mouse cursor in the Control Panel before scrolling the mouse wheel forward or backward to achieve the image adjustment you like.

Zoom In/Out



- Place the mouse cursor in the center of the image you want to zoom.
- Hold down the "Control" key + left-button on the mouse.
- While holding down the buttons indicated above, move the mouse up and down on the screen.
- This shrinks/enlarges the image: Down vertically zooms out. Up vertically zooms in.

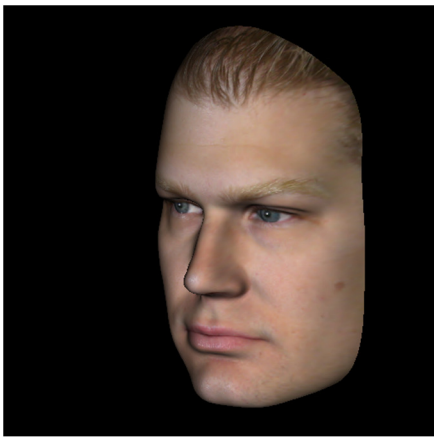
Pan (Shift)

- Place the mouse cursor in the center of the image you want to shift.
- Hold down the "Shift" key + left-button on the mouse.
- While holding down the buttons indicated above, move the mouse any direction to achieve the desired image displacement.

Free Rotate

Applicable only for 3D images.

- Place the mouse cursor in the center of the image you want to shift. Hold down the left-button on the mouse.
- While holding down the left-button, move the mouse in any direction to achieve the desired rotational position.



Free Rolling

- Hold down the "Space" key + left-button on the mouse.
- While holding down the buttons indicated above, move the mouse **up and down** to rotate the image about a central axis.

Increment Rotate

Applicable only for 3D images.

- Use the keyboard arrows ← ↑ ↓ → to rotate the 3D Model 1 degree up, down, right, or left., perpendicular to the computer screen.

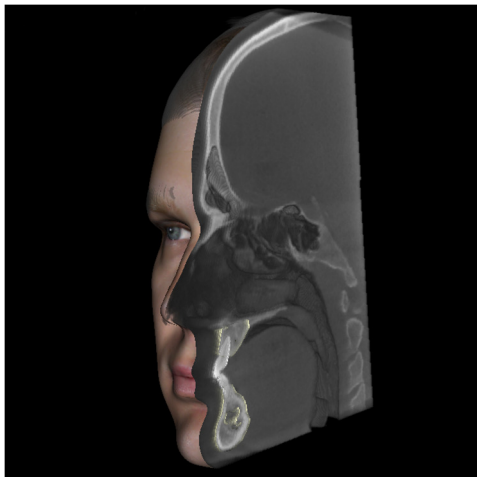
Increment Roll

Applicable only for 3D images.

- Hold down "**Control**" and use the keyboard arrows ← → to rotate the 3D Model 1 degree rolling left or right about a central axis. Pressing ← → without the Ctrl key pressed will roll the image left or right. Use ↑ ↓ to roll the image up or down.

Anatomical Plane Clipping

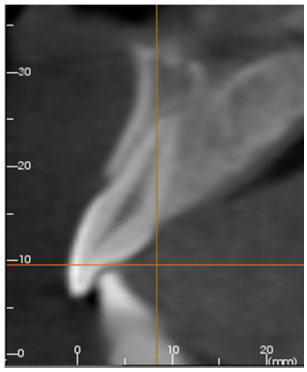
Applicable only for 3D images.



- Place the mouse cursor over the center of the image, then scroll the mouse wheel forward or backward to clip the anatomic plane as you like (after enabling clipping in the Control Panel).

Scroll Slice

Use when you would like to move through the series of sections when in either the Section, ArchSection, or Pano views.



- Place the mouse cursor in the center of the image then scroll the mouse wheel forward or backward to move one section at a time as you advance through the data slices.

*Note: In the **ArchSection Tab**, you must first create an arch spline to activate this feature.*

Full Screen Mode and Keyboard Shortcuts

Below is an explanation pertaining to running the software in full screen mode without toolbars and controls.

Switching to Full Screen Mode

From the software menu, select "View" → "Full Screen." "Full screen stereo" is only applicable for the stereo display system. To return back to the normal screen mode, press the "Esc" key on the keyboard. Full screen is not applicable to the ArchSection Tab and Implant Tab.

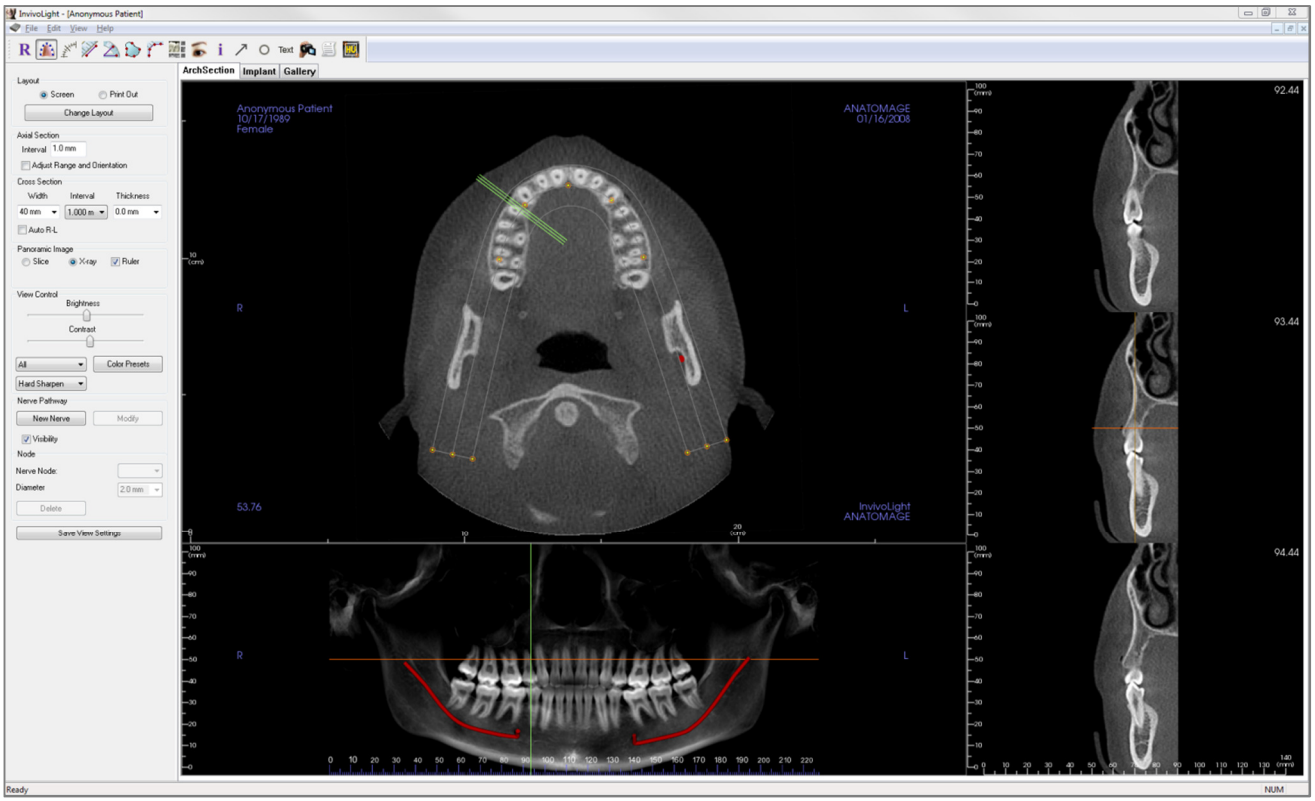
Keyboard Shortcuts at Volume Rendering View

The following keyboard short cuts are available in Volume Render view:

Category	Keyboard Shortcut	Description
View Preset	*1*	Inverse Volume Rendering
	2	Soft-Tissue 1
	3	Soft-Tissue 2
	4	Soft-Tissue + Bone 1
	5	Soft-Tissue + Bone 2
	6	Teeth
	7	Bone
	8	(unassigned)
	9	(unassigned)
	0	Gray Scale
Clipping Control	*P*	Toggles clipping plane on/off
	A	Axial clipping set
	S	Sagittal clipping set
	C	Coronal clipping set
	F	Flip the clipping direction
	Page Up / Page Down	Move the clipping plane
Copy/Paste	*Ctrl+C/Ctrl+V*	Text/Circle/Arrow notations can be copy and pasted
Delete	*Del*	Pressing this key will delete the selected measurement, comment marker, notation, airway volume, or nerve

The View Tabs:
ArchSection View Features

ArchSection View Tab *is a sectional image exploration view. Instead of conventional X-Y-Z sections, this view allows the user to review the image in dentally meaningful perspectives using multiple cross sections, traversing the lengths of the dental arches.*



ArchSection: Toolbar

Shown below is the Toolbar and tools that are loaded with the ArchSection Tab:

Reset View: Resets the window to the original view.

Create Arch Spline (Focal Trough): After selecting this tool, you can create a new arch spline or edit an existing arch spline. First, left-click on the point you would like to start and continue adding points by left-clicking. After you have marked your final point, right-click or double-click to finalize the arch spline. When modifying an existing arch spline, drag the control points to the desired positions.

Arch Spline (Focal Trough) Ruler: Places ruler along the arch spline for easy reference.

Distance Measurement: After selecting this tool, click two points to mark the desired distance. A number in millimeters will automatically display.

Angle Measurement: Select this option and mark three points on the volume and the angle between them will appear. Clicking on their control points and moving the cursor can modify measurements. Click on the measurement and press the "delete" key to delete it.

Area Measurement: After selecting this tool, click multiple points along the boundary of the desired area. Double-click or right-click to end the measurement. A number in millimeters squared will be automatically display. Click on the measurement and press the "delete" key to delete it.

Polygonal Measurement: When selected you may mark an unlimited number of points on the volume and the total between the first point and the last point will appear. Right-click your mouse to indicate that you have marked your last point. Clicking on the point and moving the cursor can modify points. Click on the measurement and press the "delete" key to delete it.

Layout: Creates a different layout to your preference. After clicking on the layout icon, a list a various layout options will appear. Click on the layout of your preference to apply it. These options allow for different case workup images.

Show/Hide Implant/Cursor/Nerve: Conceals or displays cursors.

Information Display: Displays or hides case information embedded in the data.

Arrow Notation: Allows an arrow to be drawn on the image.

Circle Notation: Allows a circle to be drawn on the image.

Text Notation: Allows text to be written and edited on the image.

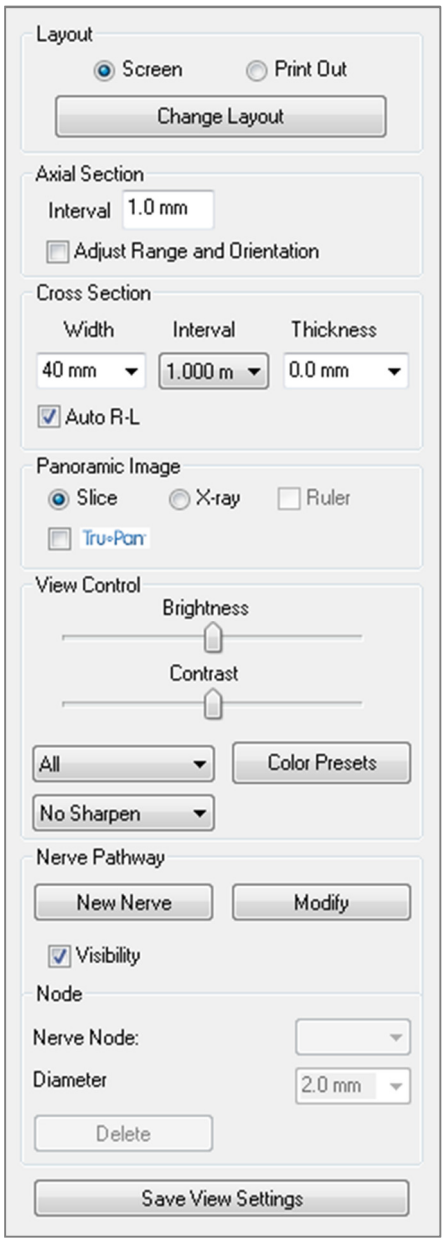
View Sequence: Allows for the creation of custom camera sequences and AVI file movie capturing.

Slice Capture Mode: Disabled; this feature is available with the add-on Report module for the full Invivo5 software.

Select Region: Calculates the HU value of an area within a bounding box. The measurement values will display alongside the rectangle and can also be by dragging.

Warning: Any measurement that is incorrect can lead to surgical complications if diagnosis, treatment plans and/or actual treatment is based on the incorrect measurements. It is critical for the end user to learn how to perform measurements correctly and employ proper usage of all measurement tools. Measurement accuracy depends on the image data and the hardware scanner that generated the image data. The measurement cannot be more precise than the resolution of the image. Software reports the value based on user-picked points. Due to the nature of the medical imaging, the boundary is not always well defined. The apparent boundary depends on the current brightness and contrast setting. The boundary may shift as the user makes adjustments to brightness and contrast. The user must understand the limitation of the measurement value before applying to the patient. If you notice any inconsistencies or software problems with measurements, or have further questions or concerns about using measurement tools correctly, please contact us at (408) 885-1474 or email us at info@anatomage.com

ArchSection: Control Panel



Layout:

- "Screen" layout is optimized for viewing the image on the computer screen. "Print Out" layout is optimized for printing the image on paper. With Print Out layout, what you see on screen will be printed on the paper in life-size. First, capture to Gallery, then print from Gallery to ensure the image is life size.
- Change Layout allows you to adjust the layout with different amounts of slices and orientations.

Vertical Range and Orientation:

- "Adjust Range and Orientation" will switch to a mode allowing for the adjustment of the upper and lower limit of pano and cross sections. You can also reorient the image in this view.

Cross Section:

- Width: Cross-section width.
- Interval: Distance between the subsequent cross sections.
- Thickness: Allows for the cumulative thickness of the slices to be viewed in the cross sections.
- Auto R-L: This will allow the cross section to be oriented to a consistent R-L orientation on screen. If turned off, the cross-section orientation will be consistent to arch spline.

Panoramic Image:

- Slice mode will show you a single cross section along the panoramic curve (yellow).
- X-ray will show you the ray sum (reconstructed x-ray) in the focal trough. Slice mode is used for drawing the nerve.

- Tru-Pan™: This option enables the one-click volumetric pan that can be created from scans taken by a i-CAT© Cone Beam 3D system. (This setting is only displayed in the Control Panel when a Tru-Pan™ case is currently loaded.)

View Control:

- Brightness and Contrast allow you to adjust the image.
- The All drop-down allows you to adjust brightness/contrast in different areas independently.
- Different Color Presets can be used to view the images in color.
- Sharpening Filter applies the selected sharpening filter from the drop-down menu to the 2D slice renderers.

Nerve Pathway:

- New Nerve: Starts a new nerve tracing
- Modify: Allows editing of the selected nerve tracing.
- Visibility: Controls the visibility of the nerve in the section and X-ray renderers.
- Nerve Node: Select a specific node for modification.
- Diameter: Selects the diameter of the nerve that has been traced or a specifically selected node.
- Delete: Deletes the last placed node during the tracing or the entire nerve if Modify is active.

Save View Settings

Saves the current 2D View settings to be reloaded upon opening any case. See the Display Preferences section in **Preferences** (pg. 12) for more information on which settings are saved for this specific tab.

ArchSection: Creating a Nerve Pathway

Creating a Nerve Pathway (e.g. Inferior Alveolar by following the mandibular canal to its exit).

- Click **New Nerve**.
- Left-click the mouse where you want the nerve to start.
- Move the mouse to the next point along the nerve path and left-click again.
- Click **Delete** to remove the last-placed node if it is mispositioned.
- Repeat this procedure for the entire length of the nerve.
- **2.0mm** is the default diameter of the nerve pathway, but you may adjust it for your preference.
- Press **Done** to finish.

Editing a Nerve Pathway

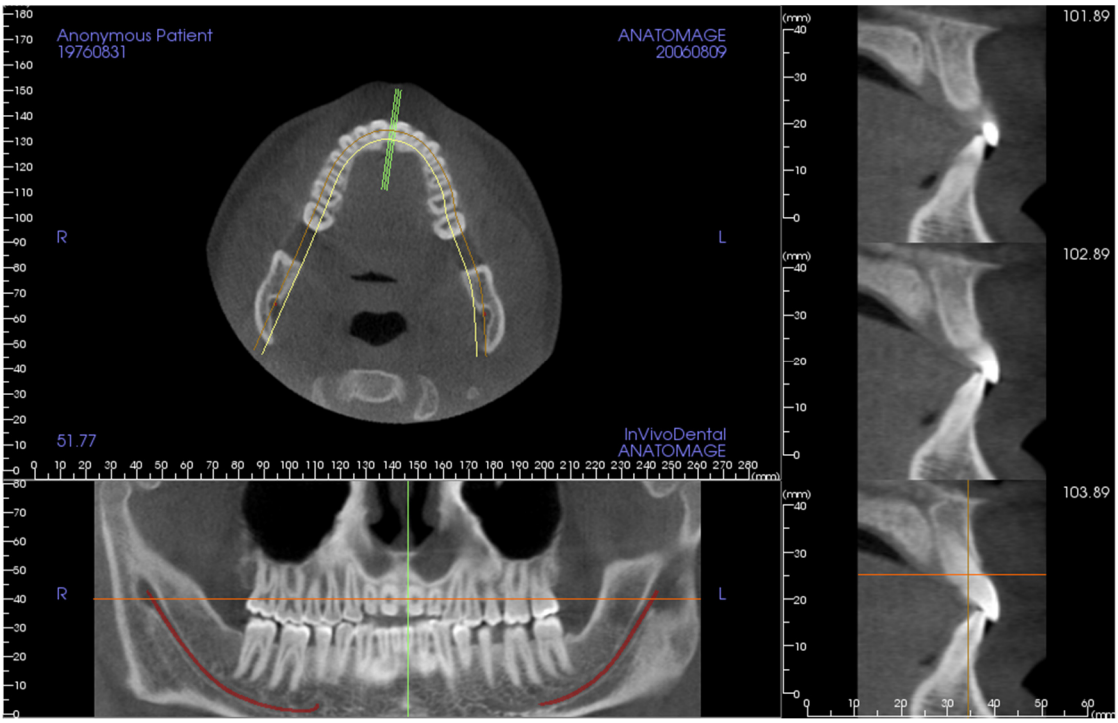
- Click on a nerve tracing to select it. This highlights it in a brighter red color.
- Set the Nerve Node drop-down menu to "All" or a specific node.
- If "All" is selected, the entire nerve tracing's diameter can be adjusted.
- If a single node is selected, it will be highlighted in the scan, and its diameter and position may be adjusted independently. The nerve node diameter is adjusted in the Diameter drop-down menu. The highlighted node can be moved by clicking and dragging it across the scan.

Deleting a Nerve Pathway

- The **Delete** button can be used if a point was plotted in the wrong spot; it will delete the last point added.
- Once a nerve has been completed and **Done** has been clicked, the nerve can be deleted by clicking on it and pressing the "delete" key on the keyboard or the **Delete** button.
- Visibility will turn the nerve on or off from view.

Warning: Any nerve that is traced in a way that does not conform to the actual pathway of the nerve can lead to surgical complications if diagnosis, treatment plans and/or actual treatment is based off of the incorrect tracing. It is critical for the end user to learn how to properly perform nerve tracings correctly. If you notice any inconsistencies or software problem with nerve tracing or have further questions or concerns about nerve tracing, please contact Anatomage support at (408) 885-1474 or email us at info@anatomage.com

ArchSection: Rendering Window

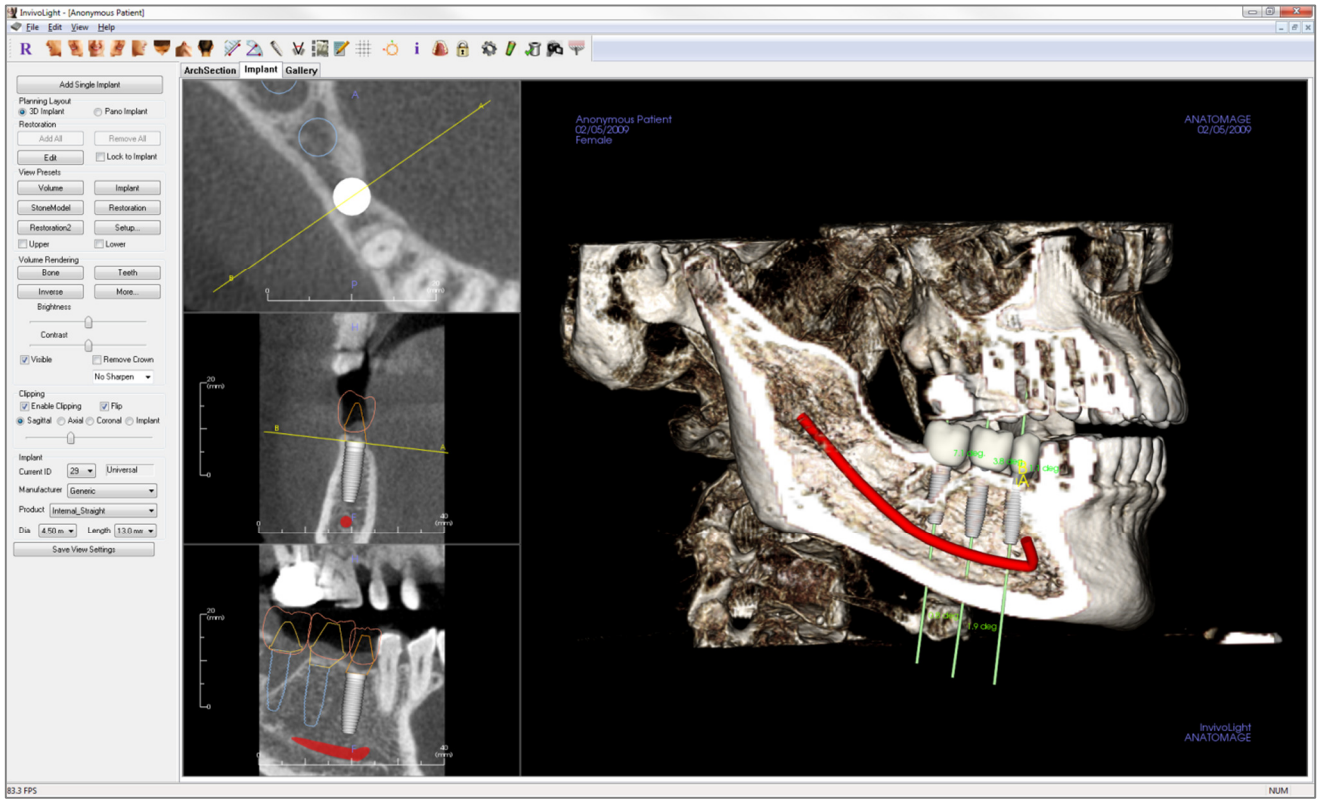


Arch Cursor: Notice the green, orange, and brown coordinate indicators. These ArchSection coordinate indicators show where you are spatially located within the ArchSection modeling window.

- **Cross Section Indicator:** The green lines give the location of the cross sections along the arch spline.
- **Axial Slice Indicator:** The orange line shows the axial coordinate position within the section.
- **Arch Spline:** The brown spline in the center of the arch spline represents the current position where the arch section has moved.
- **Cross Section:** Mouse scrolling within any one of the three sagittal frames advances the slices to the patient's right or left and causes the green coordinate indicator to move anteriorly or posteriorly in the axial and pano sections simultaneously.
- **Axial Section:** Mouse scrolling within the axial section advances the sections superiorly or inferiorly and causes the red coordinate indicator to move superiorly or inferiorly in the cross or pano sections simultaneously.
- **Pano Section:** Mouse scrolling within the coronal frame advances the slices buccally or lingually and causes the brown coordinate indicator to move buccally or lingually in the axial and cross sections simultaneously.

Implant View Features

*The **Implant View Tab** allows you to access the full-featured implant planning module.*



Implant: Toolbar

Shown below are the Toolbar and tools that are loaded with the Implant View Tab:

Reset Views: Resets the Rendering Window to the original view.

Left View: Automatically orients the volume so the patient is facing left sagittal.

Left ¾ View: Automatically orients the volume so the patient is facing 45° left sagittal.

Front View: Automatically orients the volume so the patient is facing the front.

Right ¾ View: Automatically orients the volume so the patient is facing 45° right sagittal.

Right View: Automatically orients the volume so the patient is facing right sagittal.

Top View: Automatically orients the volume so you are oriented above the patient

Bottom View: Automatically orients the volume so you are oriented below the patient.

Back View: Automatically orients the volume to the posterior view.

Distance Measurement: Select this option and mark two points on the volume and distance will appear. Clicking on the point and moving the cursor can modify points. Click on the measurement and press the "delete" key to delete it.

Angle Measurement: Select this option and mark three points on the volume and the angle between them will appear. Clicking on their control points and moving the cursor can modify measurements. Click on the measurement and press the "delete" key to delete it.

Insert Implant: To place an implant, first click the **Add Implant** icon, select the Tooth ID for the implant, then left-click the mouse on the spot that you want the implant to be placed. Note: specific manufacturers measure the implant from different points, so a measurement in the software might not be the same as the actual measurement of the specific implant design.

Show Implant Angle Dialog: Opens a window displaying all the angles between placed implants.

Change Layout: Toggles the rendering window layout.

Create Summary: Creates an Implant summary of images that is added to the Gallery. Images contain ID (FDI), implant product, diameter, and length information in the lower right hand corner of the screenshot. The user will also be given an option to print a reference chart which lists the implants placed (including implant site, manufacturer, product name, diameter and radius) for each arch.

Toggle Grid: Toggles between two different grid layouts for use in the upper two section frames allowing quick assessment of measurements and spatial location.

Toggle Move Widget: Toggles the implant orientation widget on and off.

Information Display: Displays or hides case information embedded in the data.

Change Model Visibility: Allows various models to be turned on or off from view.

Treatment Lock: Locks the implants in place so that they are not accidentally moved when viewing the 3D images.

Preferences: Allows you to adjust the different rendering, color and visibility preferences.

Density Profile Control: Adjust the settings for the displayed density profile around planned implants.

Check Sleeves: The program will search for collisions between the sleeves, instruments, and stone models.

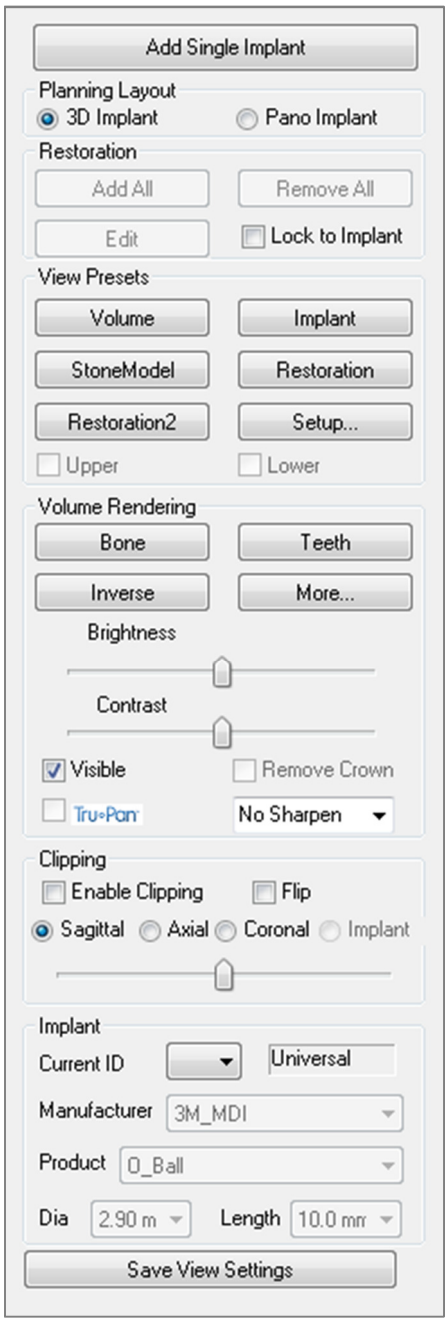
Generate View Sequence: Disabled; this feature is available in the full Invivo5 software.

Visualize Bone Graft Volume: Simulates a bone graft near the apex of an implant and displays its volume.

Warning: Any measurement that is incorrect can lead to surgical complications if diagnosis, treatment plans and/or actual treatment is based on the incorrect measurements. It is critical for the end user to learn how to perform measurements correctly and employ proper usage of all measurement tools. Measurement accuracy depends on the image data and the hardware scanner that generated the image data. The measurement cannot be more precise than the resolution of the image. Software reports the value based on user-picked points. Due to the nature of the medical imaging, the boundary is not always well defined. The apparent boundary depends on the current brightness and contrast setting. The boundary may shift as the user makes adjustments to brightness and contrast. The user must understand the limitation of the measurement value before applying to the patient. If you notice any inconsistencies or software problems with measurements, or have further questions or concerns about using measurement tools correctly, please contact us at (408) 885-1474 or email us at info@anatomage.com

Warning: Any implant planning that is performed incorrectly in any aspect including but not limited to implant location, orientation, angle, diameter, length, and/or manufacture can lead to surgical complications if diagnosis, treatment plans and/or actual treatment is based off of the implant planning error(s) in question. It is critical for the end user to learn how to use the implant treatment planning tools correctly. If you notice any inconsistencies or software problem with implant planning or have further questions or concerns about correct utilization of implant planning, please contact Anatomage support at (408) 885-1474 or email us at info@anatomage.com

Implant: Control Panel



Add Single Implant:

- Click to add single implant to the 3D volume.
- Adjust the implant orientation and placement using the move widget that appears on the selected implant.

Planning Layout:

- 3D Implant: Place and adjust individual implants on 3D volume.
- Pano Implant: Add multiple implants using the Pano view; select "3D Implant" to exit Pano view and re-adjust individual implants.
- Restoration: Disabled; this feature available in the full Invivo5 software.

Restoration:

- Lock to Implant: When selected, the implant and restoration will move as a single unit.
- **Add All:** Disabled; this feature is available in the full Invivo5 software.
- **Remove All:** Disabled; this feature is available in the full Invivo5 software.
- **Edit:** Disabled; this feature is available in the full Invivo5 software.

View Presets:

- **Setup:** Opens a dialog where the view presets can be configured.
- **Presets:** Preset toggles that display the selected features as configured in the **Setup**.
- Upper/Lower: Toggles the visibility of the stone models if present.

Volume Rendering:

- Rendering Types: Different settings allow for better visualization of certain anatomic structures, soft tissue profiles, hard tissue, etc. This is achieved by displaying specific densities with specific colors.
- Brightness & Contrast: Can be adjusted for each of the presets to enhance your image.
- Visible: Allows the 3D Volume Rendering to be turned on or off from view.
- Remove Crown: Only applicable with surgical guide related modeling service options.
- Tru-Pan™: This option enables the one-click volumetric pan that can be created from scans taken by a i-CAT© Cone Beam 3D system. (This setting is only displayed in the Control Panel when a Tru-Pan™ case is currently loaded.)
- Sharpening Filter: Applies the selected sharpening filter from the drop-down menu to the 2D slice renderers.

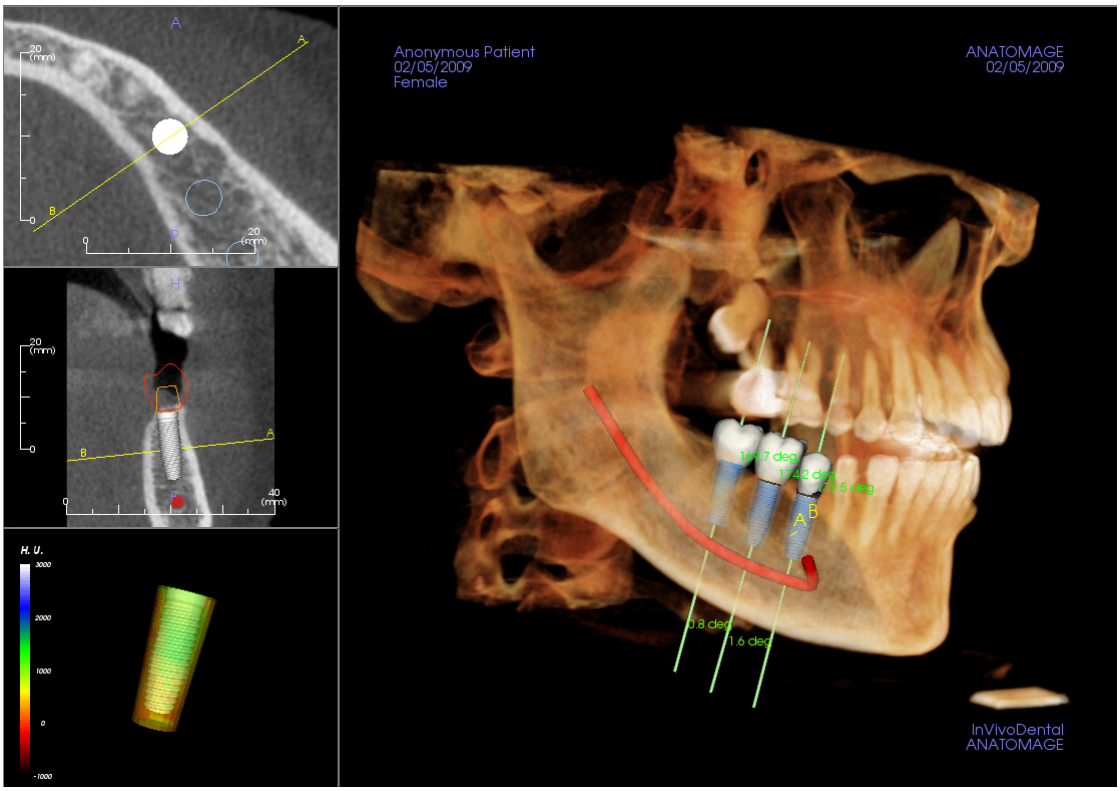
Clipping:
Click the "Enable Clipping" box to slice the image along the predefined Anatomical Planes (sagittal, axial, coronal, and arch). Scrolling the mouse wheel or moving the slider bar will move the clipping plane. To switch a view to the opposite side, click "Flip."

Implant:
The implant section can be configured to only show specific implants as defined by the user. For more information, look at the Preferred Implant settings further in this section.

- ID: Use the drop-down menu to select an implant to manipulate. The active implant will appear lighter in color than the others.
- Manufacturer, Product Name, Diameter, and length: The default is generic, but you may select a specific implant manufacture, diameter and length.

Save View Settings
Saves the current 2D View settings to be reloaded upon opening any case. See the Display Preferences section in **Preferences** (pg. 12) for more information on which settings are saved for this specific tab.

Implant: Rendering Window



Used for more precise control and final detailed touches to implant treatment planning. Using the navigation discussed below, you can visualize all aspects of the implant in the 3D volume. For further information on implant position and sizing using the implant widgets, please refer to the next section of the manual. **Once an implant is added, it will also appear in the Volume Render View.**

Axial Section: Top left window. This section is the view from the top of the implant. The yellow line passing through the axis creates the view seen in the sagittal view. Scrolling the mouse wheel after clicking inside the axial window, or clicking and dragging the line will change the cross section seen in the sagittal view as the line rotates about the axis of the implant. Asymmetrical (STL) implants can be rotated about the long axis in this view (see the next section).

Sagittal Section: Middle left window. This section is the view from the side of the implant. The A-B line passing through the implant creates the cross-section view that appears in the axial view and is set by default to be positioned at the level of the implant emergence point. Scrolling the mouse wheel after clicking inside the sagittal window, or clicking and dragging the line will change the cross section seen in the axial view. The implant widget in this view allows for quick resizing of implant length and diameter (see the next section).

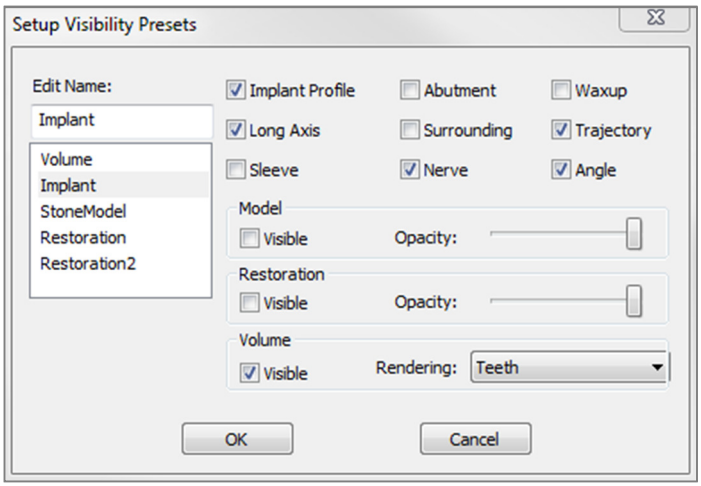
Density Profile: Lower left window. Displays a real-time visualization of the volume density immediately surrounding the implant.

Volume Rendering: Right window. This frame allows user to change the implant position and orientation with the orientation widget within the 3D volume rendering.

Warning: Any implant planning that is performed incorrectly in any aspect including but not limited to implant location, orientation, angle, diameter, length, and/or manufacture can lead to surgical complications if diagnosis, treatment plans and/or actual treatment is based off of the implant planning error(s) in question. It is critical for the end user to learn how to use the implant treatment planning tools correctly. If you notice any inconsistencies or software problem with implant planning or have further questions or concerns about correct utilization of implant planning, please contact Anatomage support at (408) 885-1474 or email us at info@anatomage.com

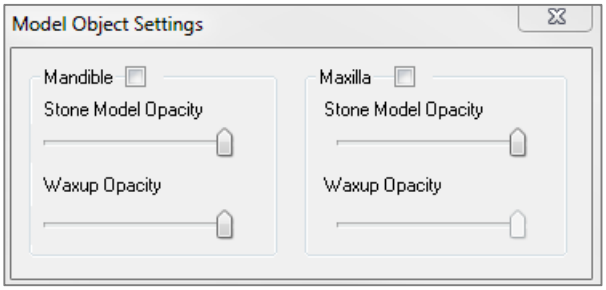
Implant: View Preset Setup

Visibility presets allow for easy switching between set views during implant planning. To configure these settings, click on **Setup**. These presets may also be modified in the Restoration Tab.



- **Edit Name:** Click on any preset to select it. Type the new name into the field.
- Visibility checkboxes hide or show features in the rendering window.
- **Implant Profile:** Controls the visibility of the solid implant cross section in the 2D renderers. When activated, the currently selected implant will have a red profile and the unselected implants will have blue profiles. When not activated, the selected implant will show an opaque cross section of the implant and the unselected implants will show as blue profiles.
- **Abutment:** Controls the visibility of the abutment 3D model in the volume renderer or the colored profile in the 2D slice renderers.
- **Waxup:** Controls the visibility of the profiles in the 2D renderers and 3D models on the volume. Option is only available after they have been added by an Anatomage technician as part of a surgical guide case workup.
- **Long Axis:** Displays a colored rod running through the long axis of the implant in the volume render.
- **Surrounding:** Displays the surrounding volume around an implant. The collision zone is determined by the allowance defined in the preferences.
- **Trajectory:** Displays the simulated trajectory of the implant during surgical placement.
- **Sleeve:** Controls the visibility of the profiles in the 2D renderers and 3D models on the volume. Option is only available if the mandibular and maxillary models are available as well as after the Check Sleeve action has been performed.
- **Nerve:** Displays a 3D nerve in the volume render or a cross section of the nerve in the 2D section renderers.
- **Angle:** Controls the visibility of the angle between the long axes of adjacent implants as well as the angles of the abutment for each implant.
- **Model:** Controls the visibility of the stone models. Varying degrees of transparency can be obtained with the Opacity slider bar.
- **Restoration:** Controls the visibility of the 3D waxup models in the volume renderer and the colored profile in the 2D section renderer. The colored profile of the selected restoration or restoration associated with the selected implant will be red while the unselected restorations will be pink. Varying degrees of transparency can be obtained with the Opacity slider bar.
- **Volume:** Controls the visibility of the volume render as well as the rendering type.

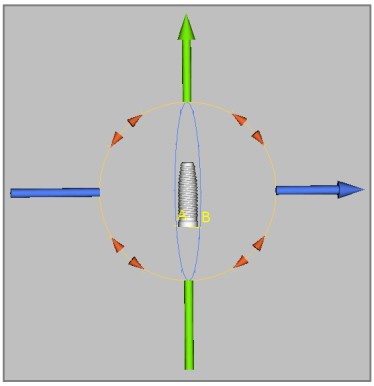
Implant: Model Visibility



The Model Visibility function will open the Model Object Settings dialog.

- The "Mandible" and "Maxilla" checkboxes control all of the model visibility options (except Profile Only and Density) and allow the user to turn off the set of models for each jaw independently. *Note: The visibility checkboxes in Model Object Settings will not always match the checked/unchecked status of the visibility checkboxes in the Control Panel.*)
- The Stone Model and Waxups Opacity can be adjusted for both jaws.

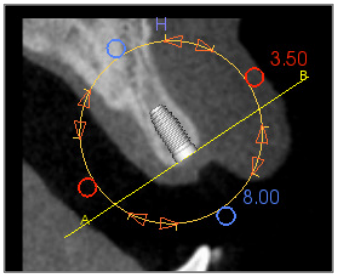
Implant: 3D Implant Widget

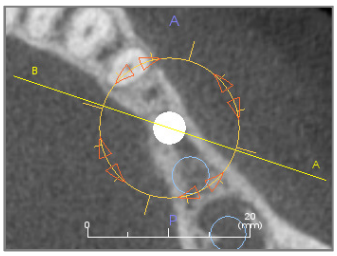


The 3D implant widget is designed to optimize visibility in the renderer and provide a high level of versatility in implant positioning. The linear, colored arrows can be dragged to reposition the implant transversely. The colored arrows only appear when the camera perspective is close to orthogonal. The implant may also be moved along these directions using the keyboard arrow keys.

- The yellow arrow (not shown) is parallel to the A-B line.
- The blue arrow is orthogonal to the green and yellow arrows.
- The green arrow runs through the long axis of the implant.
- The rotation circle appears on the same plane as the two arrows that are close to orthogonal to each other and to the camera perspective and features eight handles for rotation.

Implant: 2D Implant Widget





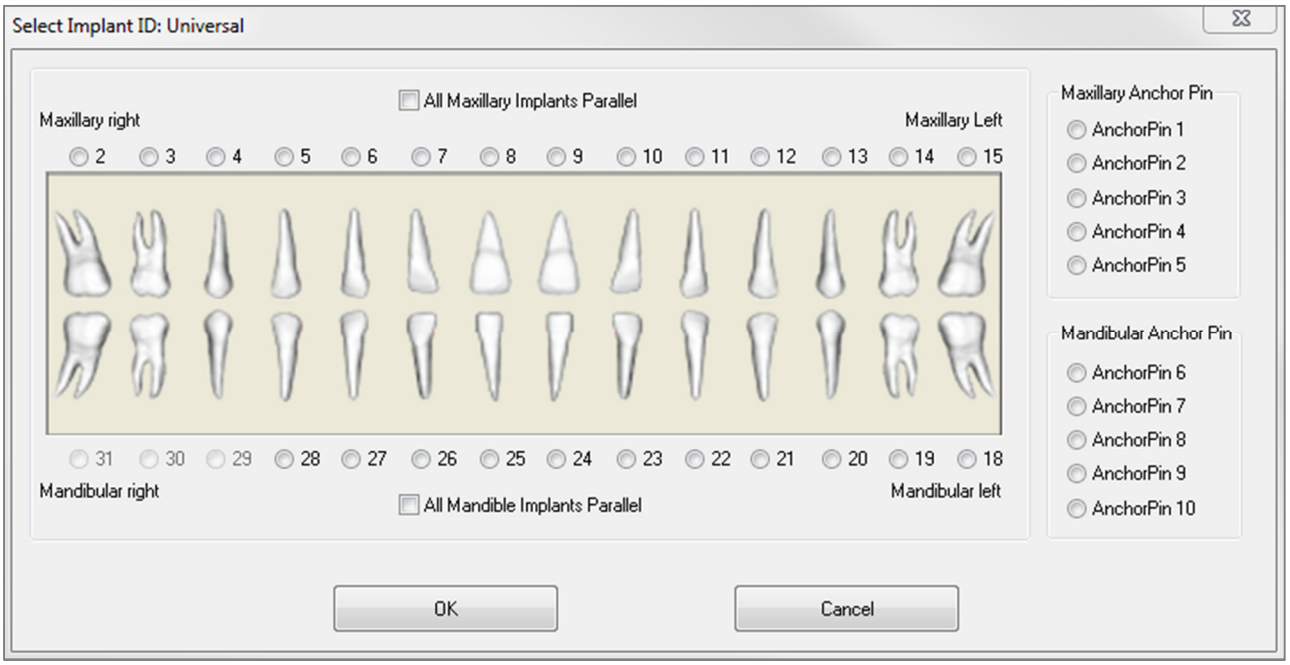
The 2D implant widget is designed to optimize visibility in the slice renderer and still provide a high level of versatility in implant positioning as well as sizing. The implant may also be moved along its long axis or orthogonally with the keyboard arrow keys.

- The rotation circle has eight handles for implant rotation along the same plane as the currently displayed slice.
- The two red handles can be selected and dragged toward/away the implant to reduce/expand the diameter of the implant sequentially through any available options for that implant model.
- The two blue handles can be selected and dragged toward/away the implant to reduce/expand the length of the implant sequentially through any available options for that implant model.
- The implant model itself can be selected and dragged in any direction along the same plane as the currently displayed slice.
- A rotation circle appears when the product cross section is selected that allows for implant rotation about the long axis of asymmetrical (STL) implants in the top left section renderer. Please contact Anatomage for an updated list of asymmetrical (STL) implants.

Implant: 3D Implant Planning

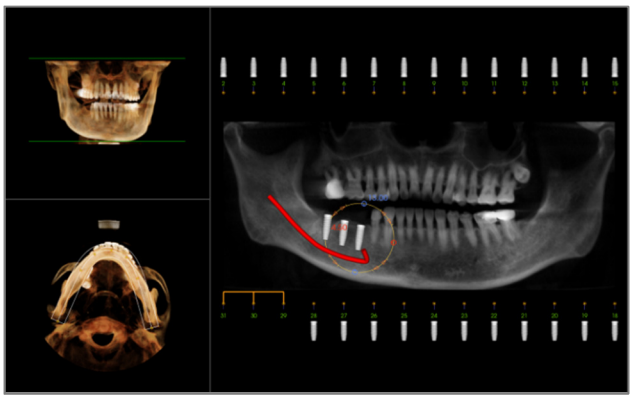
- In the View Control, click the **Add Single Implant** button. 

- The implant ID dialog will show up (image below).
- Select implant ID to be inserted. Press **OK**, and a new implant will appear on the mouse pointer.
- Drag and drop the implant in 3D view onto the surgical site. (It helps to have the volume rotated so that the surgical site is centered).
- In axial view, align the yellow line such that the below cross-section view becomes the view along mesiodistal direction.
- In cross-section view, re-orient and position the implant so that its angle is as desired.
- In axial view, align the yellow line such that the cross-section view becomes the view along buccolingual direction.
- In cross-section view, re-orient and position the implant so that its angle is as desired.
- Review the final implant position in 3D view.
    - To delete an implant, select the desired implant in the 3D view and press the "delete" key on the keyboard. The implant will be removed.



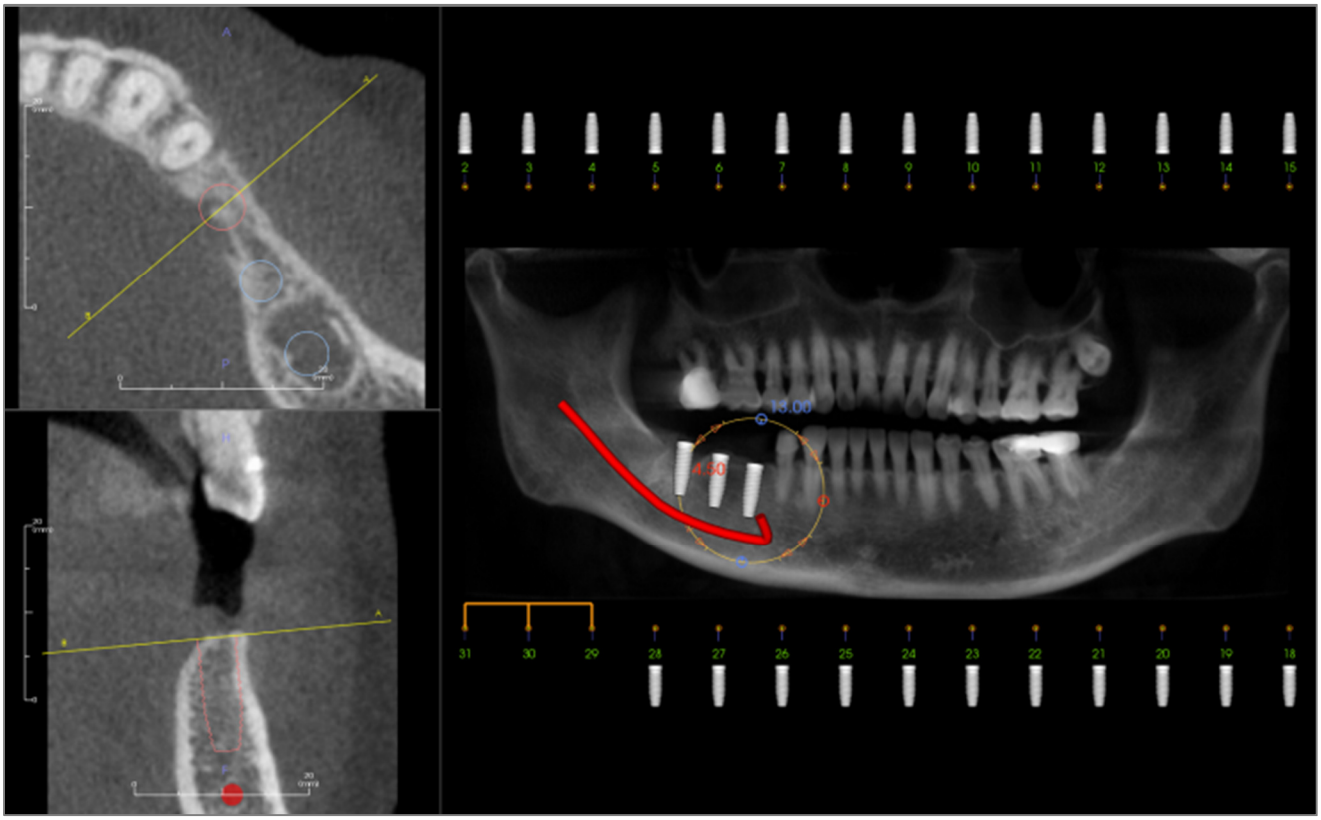
A similar procedure can be done to add anchor pins to your 3D volume. Select which anchor pin you would like to add and follow similar steps for adjusting its position.

Implant: Pano Implant Planning



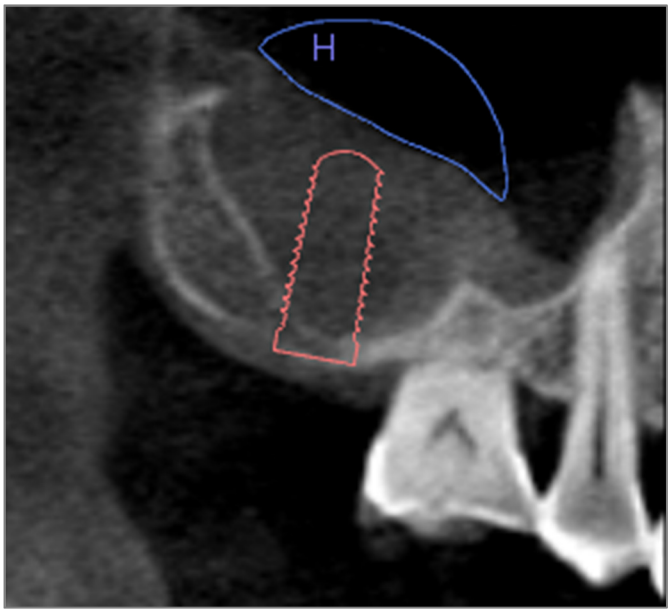
- Select Planning Layout: Pano Implant under the View Controls in the Implant Tab.
- Rendering window updates to pano view (left)
- Adjust the ArchSection focal trough such that the middle profile passes through the dentition.
- Drag implant to its desired location and adjust the angle of the implant.
- Click to select implants and manipulate them in the cross sections.

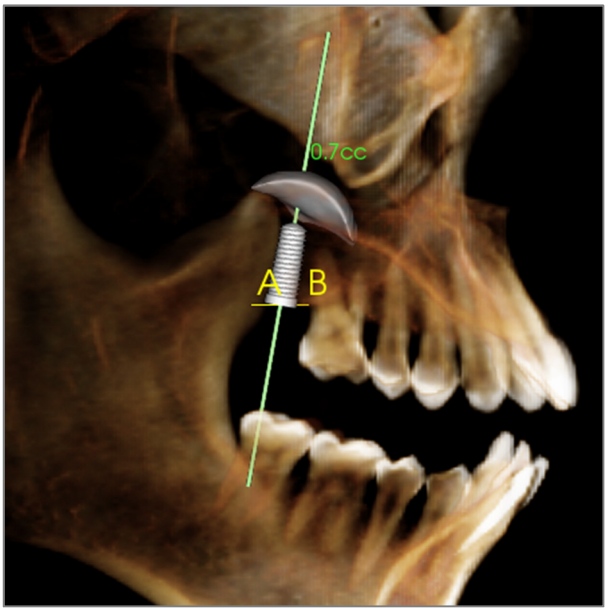
- Click the nodes above the implant identification numbers and connect them with other implants to create parallel implant groups. Remove the implants from these groups by clicking on the nodes again.
- Repeat for all desired implants.
- Select Planning Layout: 3D Implant to exit Pano-Mode and further adjust individual implants.



Implant: Bone Graft Simulation

- Select the implant that requires a bone graft and click the **Visualize bone graft volume** tool  .
- The graft simulation tool will appear as an arc that moves along the central axis of the implant in the cross section.
- Click to place the graft in the desired position.
- The resulting graft will appear in the 2D sections in blue and in the volume rendering in off-white.
- The volume of the graft will be displayed in the volume rendering.
- The graft can be deleted by clicking on it to select it and pressing the "delete" key on the keyboard.





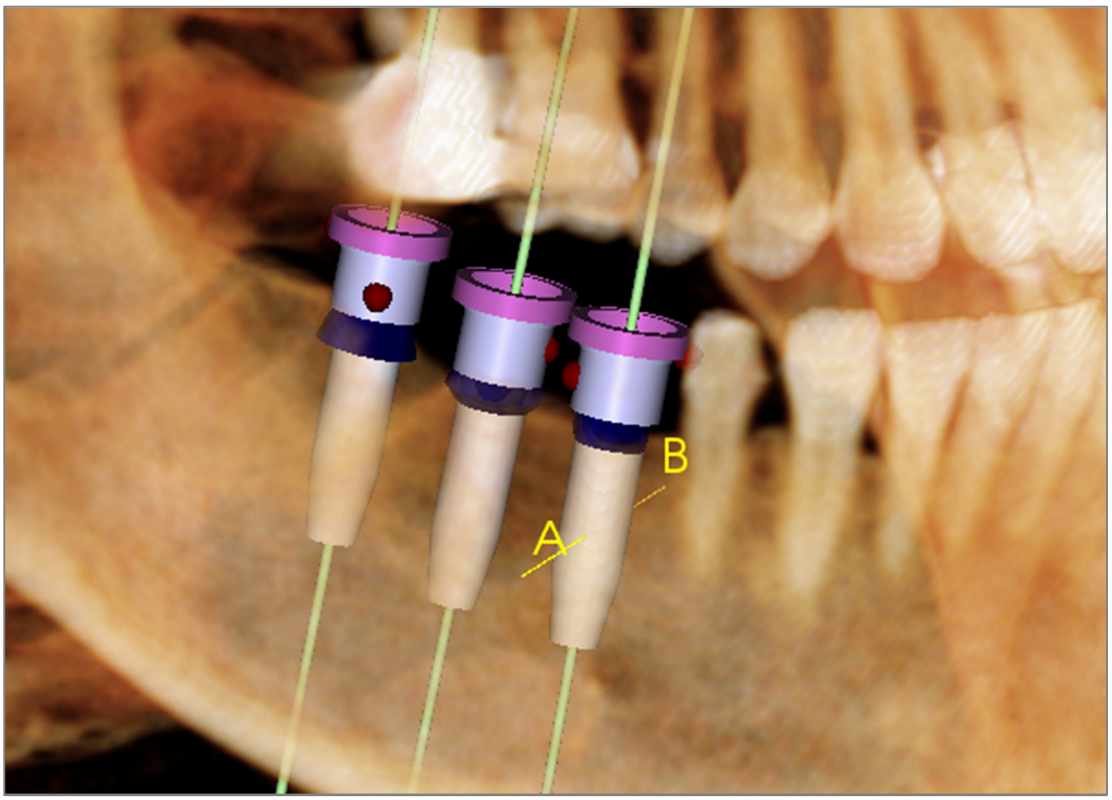
Important: The measurement values may not be true anatomical volumetric measurements. Due to the nature of the imaging, there are imaging artifacts such as white noise, scattering, beam hardening, ring noise or off scale H.U. The software measurement tool cannot distinguish the imaging artifact from the true anatomy. Furthermore, the measurement value depends on threshold values; thus, user must set proper thresholds to get the best estimate of the desired structure. The measurements must not be used as the sole metric for any treatment.

Warning: Any measurement that is incorrect can lead to surgical complications if diagnosis, treatment plans and/or actual treatment is based on the incorrect measurements. It is critical for the end user to learn how to perform measurements correctly and employ proper usage of all measurement tools. Measurement accuracy depends on the image data and the hardware scanner that generated the image data. The measurement cannot be more precise than the resolution of the image. Software reports the value based on user-picked points. Due to the nature of medical imaging, the boundary is not always well defined. The apparent boundary depends on the current brightness and contrast setting. The boundary may shift as the user makes adjustments to brightness and contrast. The user must understand the limitation of the measurement value before applying to the patient. If you notice any inconsistencies or software problems with measurements, or have further questions or concerns about using measurement tools correctly, please contact us at (408) 885-1474 or email us at info@anatomage.com

Implant: Restoration Design

While InvivoLight does not offer the advanced restoration capabilities of the full Invivo5 software, a case with restorations already placed can be opened. The restorations will be visible, but manipulating them is limited to locking the restoration to the implant and moving the implant with the restoration.

Implant: Check Sleeve

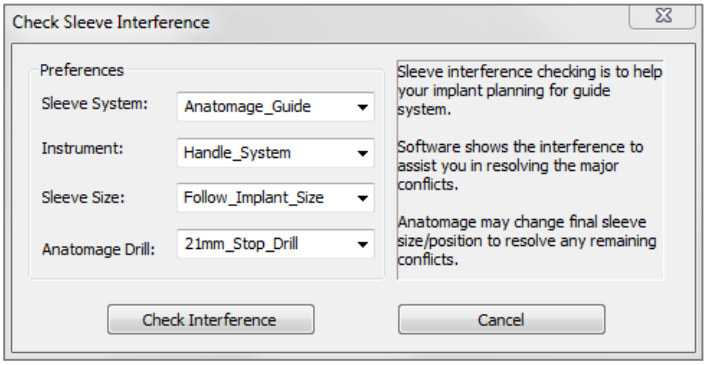


The **Check Sleeves** function can be performed to determine the position of where sleeves would be if a surgical guide was produced for implant placement. This function will simulate possible collisions that may occur between:

- Sleeves and other sleeves
- Sleeves and the instrument
- Sleeves and the stone model
- Instrument and the stone model

Interference: Demonstrated visually by a dark red colored sphere. **These interference indicators are not updated in real-time and will only be rechecked after each instance that Check Sleeve is performed.**

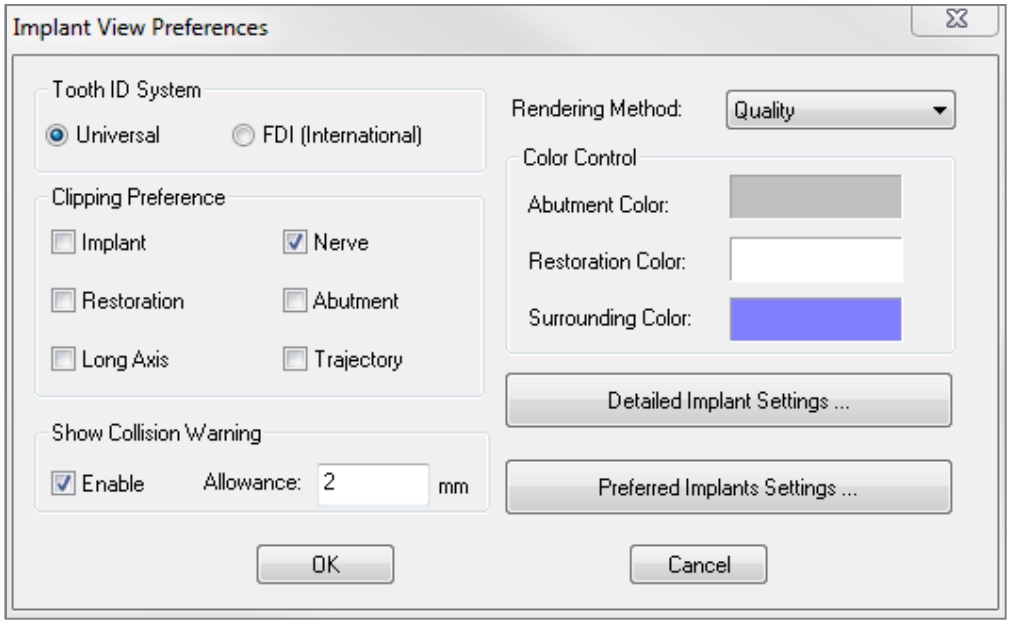
Check Sleeve Interference: The user can change certain preferences to better simulate the actual procedure that will be performed, such as sleeve system, instrument, sleeve size, and drill. Solution options are to change implant planning, change sleeve preferences, or to allow a technician to try to resolve the interference.



The option to check sleeves will automatically appear when attempting to save Anatomage Surgical Guide planning files.

Implant: Settings and Preferences

Selecting the **Preferences** tool  opens up a customization window within the Implant Tab:



Tooth ID System:

You can set the ID to either the Universal or FDI(International) standard.

Clipping Preference:

Options for which models to include in volume clipping.

Show Collision Warning:

You can define whether or not to display a proximity warning between implants at an allowed tolerance.

Rendering Method:

Choose which rendering method (Default, Performance, and Quality) you would like to use in the Implant View Tab.

Color Control:

Set the various colors for the abutment, restoration, and collision colors.

Detailed Implant Settings:

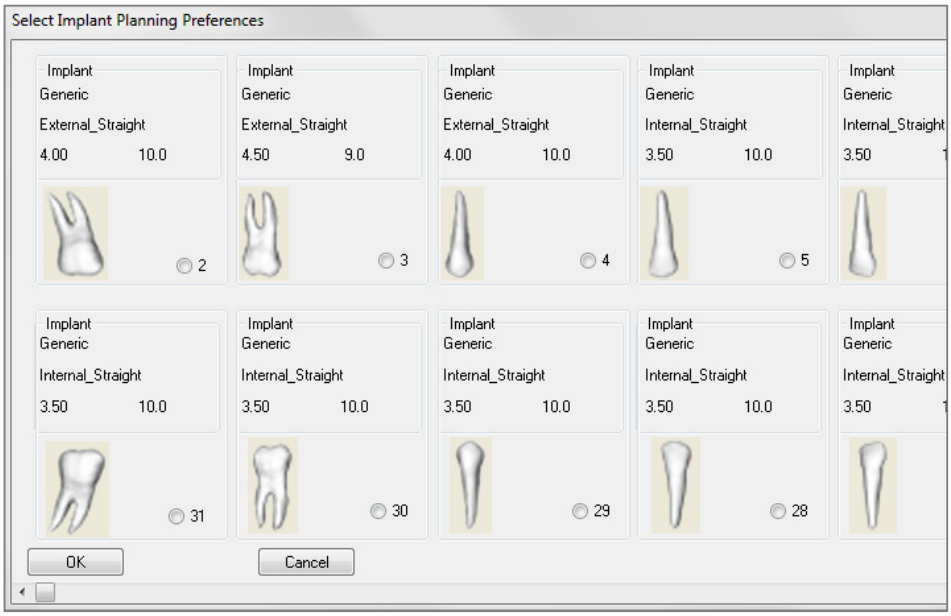
Adjust default settings for individual implants. See more information below.

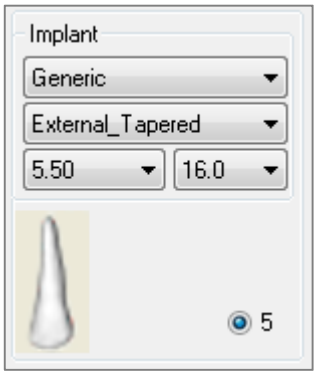
Preferred Implants Settings:

Used to modify which implants will be displayed in the drop-down menus in the Control Panel. See more information in the Preferred Implant Settings section on page 48.

Detailed Implant Settings

When you select **Detailed Implant Settings**, you are able to adjust the default settings for individual implants in the Implant Planning Preference Window.



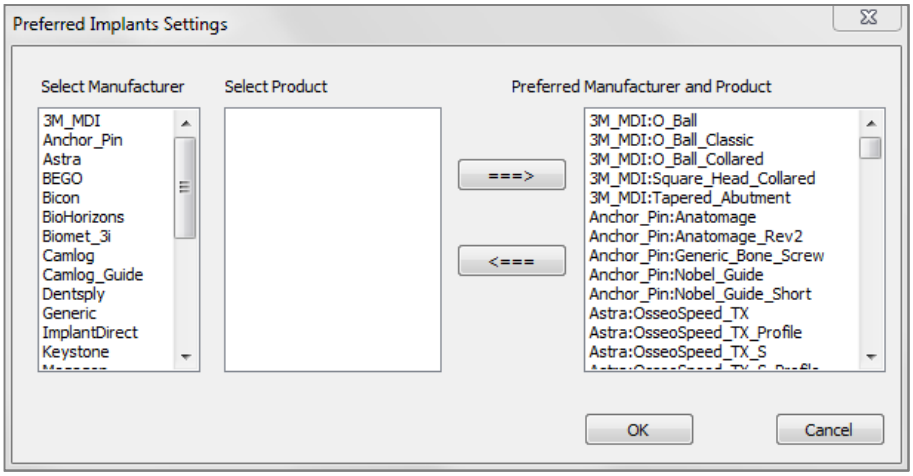


Clicking once anywhere in the region above will activate drop-down menus for the various implant characteristics. *Options will not appear for implants not in the preferred list (see below).*

Click **OK** to save these preferences and the designated implant will be selected automatically when choosing a tooth in the Add Single Implant menu.

Preferred Implants Settings

The user can hide certain implants from populating the lists to simplify the drop-down menus. By default, all implant manufacturers and types are selected as "preferred." **To remove an implant, select it in the list on the right-hand side and use the left arrow button to remove it from the list.**

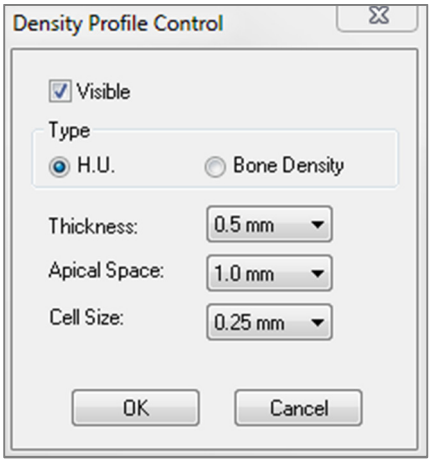


Settings will take effect in the drop-down menu options for Detailed Implant Settings as well as in the Implant section of the Control Panel. If there is a case open with implants that are not in the preferred list, the implant will still show up correctly in the renderers and the Control Panel. However, the specific settings for this implant cannot be changed and implants of the same type cannot be added.

Adding implants to the preferred list can be accomplished by selecting the implant manufacturer on the list on the left-hand side, selecting the specific product in the middle column, and pushing the right arrow button to add.

Density Profile Control

By selecting the **Density Profile Control** icon  you can adjust the settings for the Density Profile.



Visible: Toggles the visibility between the Density Profile and the third cross section.

H.U.: Shows the bone density in Hounsfield units.

Bone Density: Shows the density in Misch's bone density units.

Thickness: Changes the sampled volume located around the implant.

Apical Space: Changes the sampled volume located at the apex of the implant.

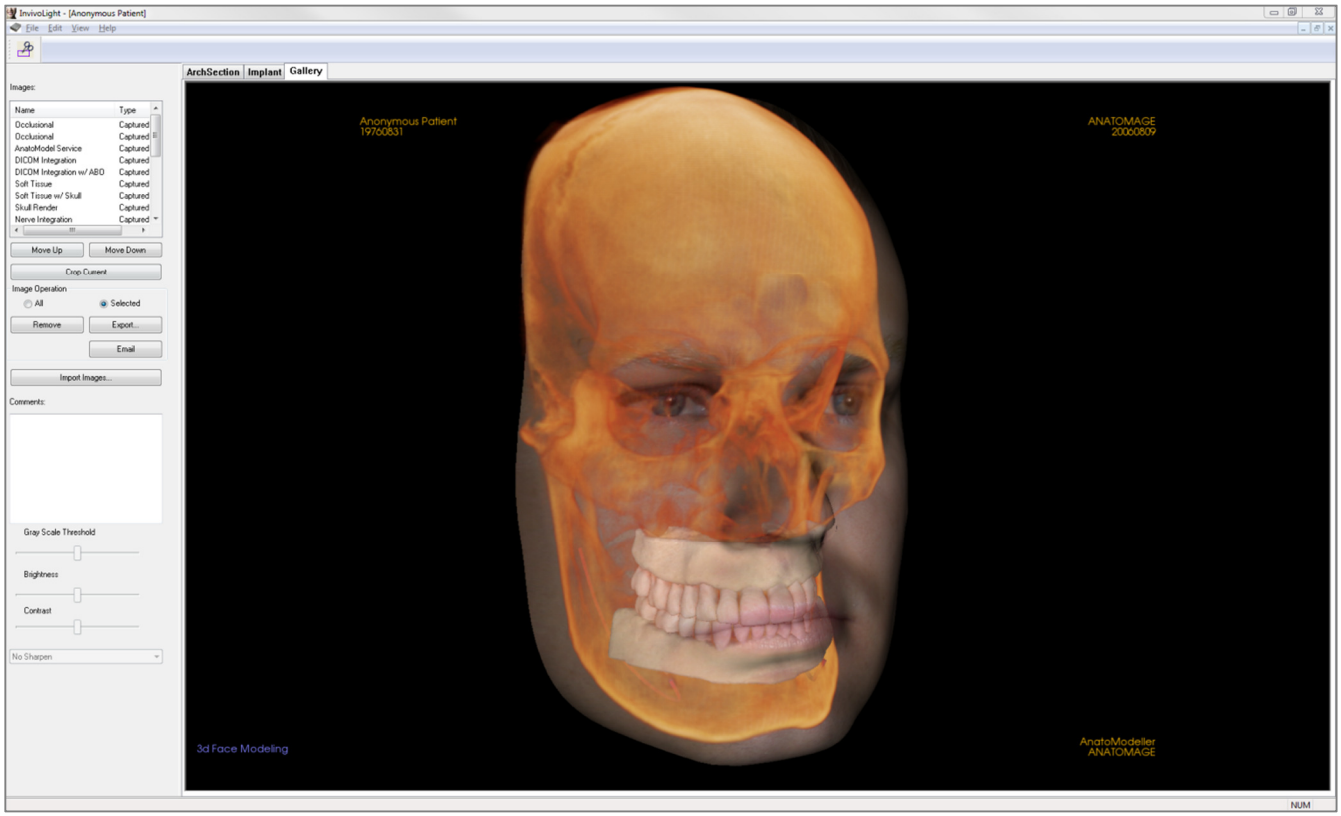
Cell Size: Changes how finely the voxels will be sampled and displayed in the volume around the implant.

Warning: Any measurement that is incorrect can lead to surgical complications if diagnosis, treatment plans and/or actual treatment is based on the incorrect measurements. It is critical for the end user to learn how to perform measurements correctly and employ proper usage of all measurement tools. Measurement accuracy depends on the image data and the hardware scanner that generated the image data. The measurement cannot be more precise than the resolution of the image. Software reports the value based on user-picked points. Due to the nature of the medical imaging, the boundary is not always well defined. The appeared boundary depends on the current brightness and contrast setting. The boundary may shift as the user makes adjustments to brightness and contrast. The user must understand the limitation of the measurement value before applying to the patient. If you notice any inconsistencies or software problems with measurements, or have further questions or concerns about using measurement tools correctly, please contact us at (408) 885-1474 or email us at info@anatomage.com

Warning: Any implant planning that is performed incorrectly in any aspect including but not limited to implant location, orientation, angle, diameter, length, and/or manufacture can lead to surgical complications if diagnosis, treatment plans and/or actual treatment is based off of the implant planning error(s) in question. It is critical for the end user to learn how to use the implant treatment planning tools correctly. If you notice any inconsistencies or software problem with implant planning or have further questions or concerns about correct utilization of implant planning, please contact Anatomage support at (408) 885-1474 or email us at info@anatomage.com

Gallery View Features

*In the **Gallery View Tab** you can retrieve images that have been captured. Additionally, images can be imported into InvivoLight or exported to the location of your choice. Comments or notes can be added to describe images that have been captured.*

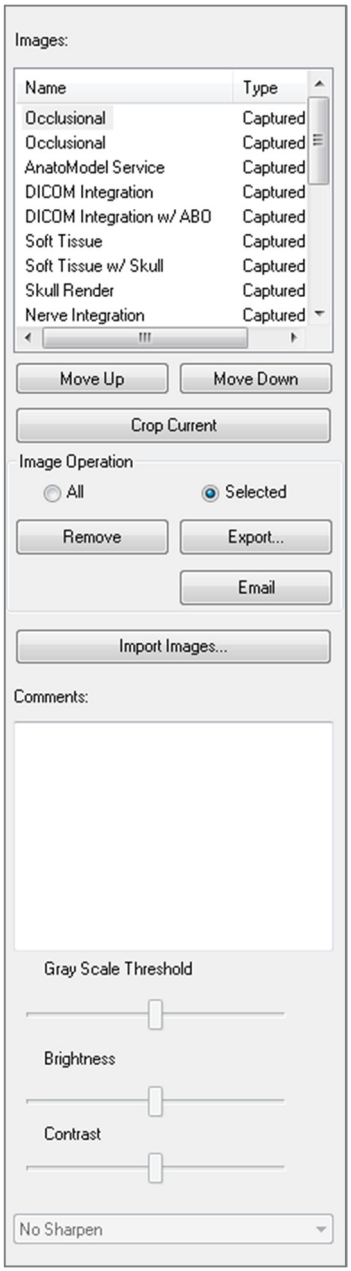


Gallery: Toolbar

Shown below is the Toolbar and tools that are loaded with the Gallery View Tab:

Crop Image: Allows you to crop and save the image that was captured.

Gallery: Control Panel



Images: Gives a list of all captured images.

- Each of these images has a "Name" and "Type" which can be renamed by double-clicking on the text.
- **Move Up/Down:** Moves the selected image up or down on the list.
- **Crop Current:** Allows you to crop the currently selected image within InvivoLight.

Image Operation

- All/Selected: Applies operation to all or a subset of the images from the list.
- **Remove:** Removes images from the Gallery.
- **Export:** Allows you to export the images in the Image List to a path specified in the dialog box that opens. Files can be saved as one of the following formats: .jpg, .bmp, or .png.
- **Email:** Captures all images to your email ready to send. This requires having a mailer client set up.

Import Images:

- Select to import images (.jpg, .bmp, .png) from an external source into the Gallery Tab.
- Using this, you can import patient photographs into the InvivoLight software for storage within the Invivo file once saved.

Comments:

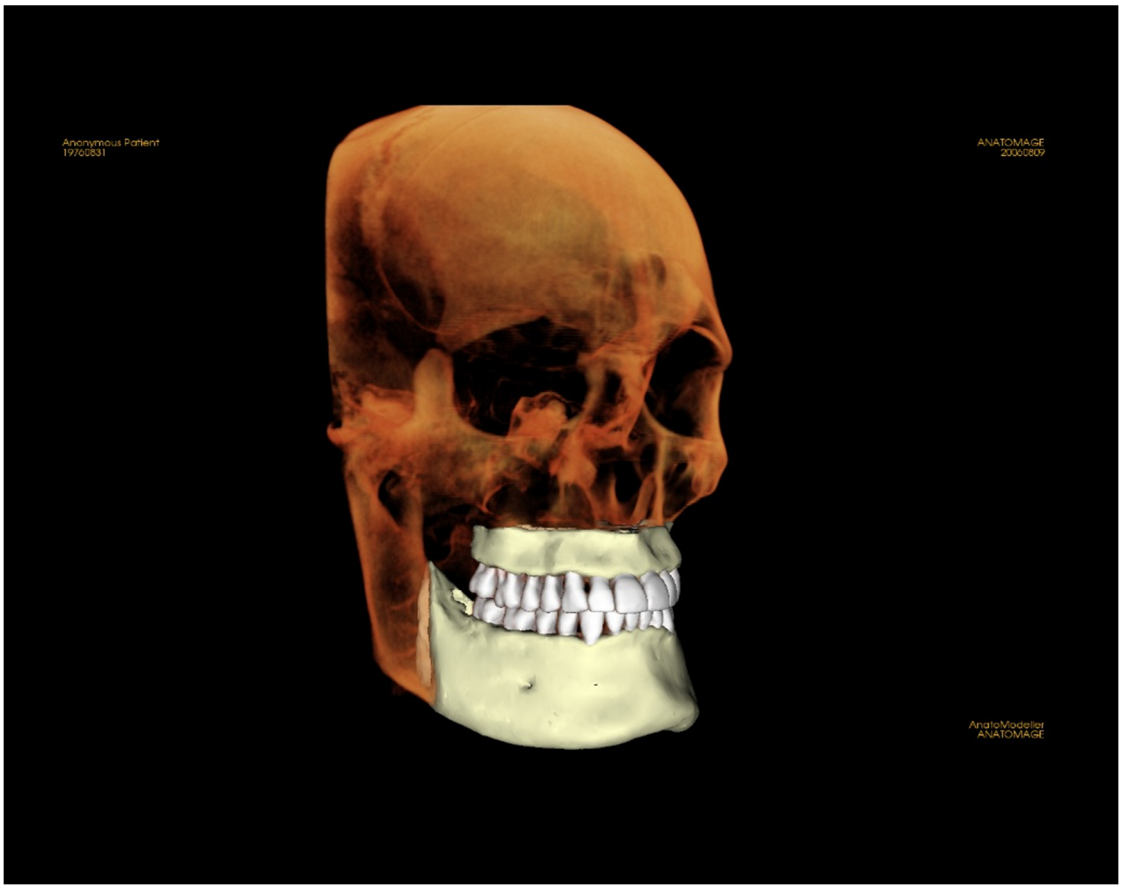
- Text box displays comments about the image displayed in the Rendering Window.
- Add or change comments by clicking Edit at the bottom of the Comment Box.

2D Image Options:

- Controls settings for 2D images. See more information in Gallery: 2D Image Options.

Gallery: Rendering Window

This window allows the viewing of captured and imported images. The Gallery is particularly useful for creating a workup of a particular case. Remember that the Gallery's images will only be saved if you re-save the whole file, otherwise any images captured will be lost.

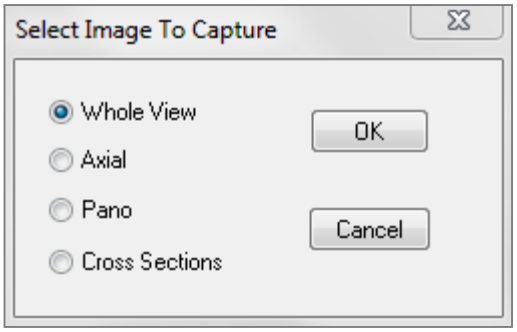


Please refer to **Image Navigation (pg. 23)** for information about controlling and adjusting these images.

Gallery: Adding Images to the Gallery

Capture any single image to the Gallery. A single image within any view can be captured without including the other parts of the rendering window. When the Capture to Gallery function is used, a dialog will appear on the screen providing the user with options regarding which parts of the rendering window to capture.

The options provided by each dialog will vary according to which InvivoLight view is currently displayed; the following example is the dialog that appears within the ArchSection Tab:



Ex. ArchSection Capture to Gallery

Capture to Gallery Dialog:

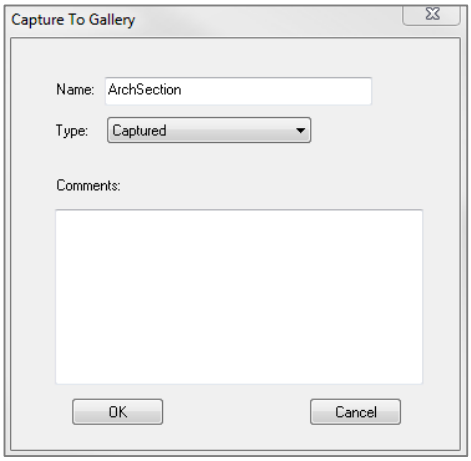
- Whole View – Captures a screenshot of the rendering window
- Axial – Captures the axial slice view and no other parts of the rendering window
- Pano – Captures the pano view and no other parts of the rendering window
- Cross Sections – Captures a series of slices that are within the rendering window

Options within each Select Image to Capture Dialog:

Note: Some options will appear gray (disabled) in the Select Image to Capture dialog. The choices available are determined by the specific layout as well as the view tab.

ArchSection	Whole View	Pano
	Axial	Cross Sections
Implant	Whole View	Para Arch
	Main Volume	Pano
	Axial	Arch Volume
	Cross	Front Volume
	Density	

Capture to Gallery Dialog:



Name: Image label

Note: Image name must be unique from any other captured image in the Gallery and must not contain any special characters.

Type: Image type – can be set from the drop-down to "Captured" or "Photo."

Comments: Additional comments about the image can be added in this section.

Gallery: 2D Image Options

The Gallery Tab is compatible with 2D DICOM images and has several features that allow it to handle this image format better.

Opening 2D DICOM

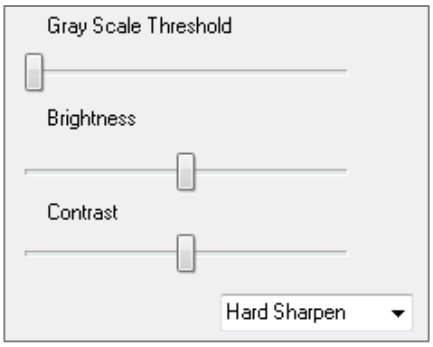
When instructed to open a 2D DICOM image, InvivoLight will automatically enter a mode that disables 3D functionality. Only the Gallery Tab will be available within the software and the DICOM will appear as a Gallery image.

If a 2D DICOM is associated with a 3D volume as a scout image, opening the volume will automatically import that scout image into the Gallery Tab.

Grayscale Image Options

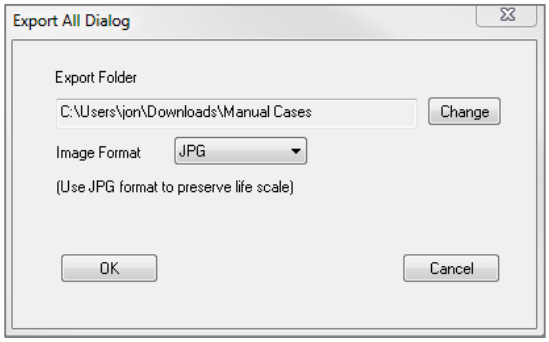
For grayscale images in the Gallery, the user has the option to adjust several settings such as Gray Scale Threshold, Brightness, Contrast, and Sharpening.

The updates to these images are saved and always reflect the updated settings when the image is selected in the Gallery and also after it has been saved/exported and then opened/imported back into InvivoLight.



Export to DCM/JPG/PNG/TIF/BMP

An image in the Gallery can be exported into any of the above formats when using the **Export…** button. When saving individual Gallery images to file, the following image formats will be available (JPG, PNG, BMP).



Common How To Tasks

How to Trace a Nerve

- Go to the ArchSection Tab.
- Make sure the pano is in Slice Mode (not X-ray mode).
- Adjust focal trough such that the nerve pathway is visible in pano image.
- Move cursor to the pano image.
- Review the nerve pathway while using the scroll wheel.
- If the nerve is not clearly visible, scroll the mouse wheel.
- If the nerve is not clearly visible, adjust the focal trough.
- When the nerve pathway is identified through the pano image, press **New Nerve** in the Control Panel.
- Starting from the mandibular foramen, click point by point.
- If nerve is not clearly visible, use the scroll wheel to find the nerve and continue picking points.
- Near mental foramen, move the mouse to cross-section view.
- Use the scroll wheel to find the exit of the nerve.
- Pick points connecting the nerve exit.
- Press **Done** in the Control Panel to finish the nerve.

Warning: Any nerve that is traced in a way that does not conform to the actual pathway of the nerve can lead to surgical complications if diagnosis, treatment plans and/or actual treatment is based off of the incorrect tracing. It is critical for the end user to learn how to properly perform nerve tracings correctly. If you notice any inconsistencies or software problem with nerve tracing or have further questions or concerns about nerve tracing, please contact Anatomage support at (408) 885-1474 or email us at info@anatomage.com

InvivoLight Software Troubleshooting

Category	Error	Solution
General	Error Message: *InvivoLight Application has encountered a problem and needs to close. We are sorry for the inconvenience.*	Click the "Don't Send" Button. Launch InvivoLight application again. Warning: Treatment information can only be manually saved. All information added after last saving will be lost.
	Cannot launch InvivoLight	Open Task Manager and check if multiple instances of InvivoLight is already running. Close other InvivoLight processes. Launch InvivoLight application again.
	Computer failure	Launch InvivoLight application again. Warning: Treatment information can only be manually saved. All information added after last saving will be lost.
Installation	Error Message: *Server is not Responding*	Check Internet connection. If Internet is connected, try again later.
	Error Message: *Please run as administrator to activate software*	Run the installer/application as administrator.
	Error Message: *Failed to verify the license code!*	Check the license code and try again. Check internet connection and try again.
	Error Message: *Wrong License Code!*	Check the license code and try again.
	Error Message: *Invalid Authorization code*	Check the license code and try again.
	Error Message: *Actual size of the image can't fit to the paper size!*	Change printer setting or create an image with smaller size.
File Operations	Error Message: *Failed to create process. Please close other applications and try again.*	Close all the other applications. Launch InvivoLight application again.
	Error Message: *Error: Cannot read this file*	Check if this file is supported by InvivoLight.
	Message: *Not enough memory*	Close all the other applications. Launch InvivoLight application again.
	Error Message: *Can't create temporary save file!*	Check if the remaining disk capacity for the temporary folder is big enough.
	Error Message: *Failed to read DICOM file!*	Check if this file is supported by InvivoLight.
	Error Message: *Can't read Dicom's Image Data!*	Check if this file is supported by InvivoLight.
	Try to open a file but nothing showing up	Check if this file is supported by InvivoLight.
	Error Message: *Cannot save file!*	Check if the file is the correct type. Check if the file path is correct and folder is writable.

Image Rendering	Error Message: *Can't detect hardware acceleration for OpenGL support!*	Check if the graphics card meets system requirements. Check if the latest driver is installed for the graphics card.
	Image is distorted	Switch to another view and switch back.
	Grayscale image shows up for all rendering presets	Check if the graphics card meets system requirements. Check if the latest driver is installed for the graphics card.
	Warning Message: *3D reconstruction may not work!*	Check if the DICOM files are exported correctly.

For all other issues, please contact Anatomage Inc. Customer Support at (408) 885-1474.

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This comprehensive list provides a quick and easy way to find the relevant information that you would like to examine.

CE 0086

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