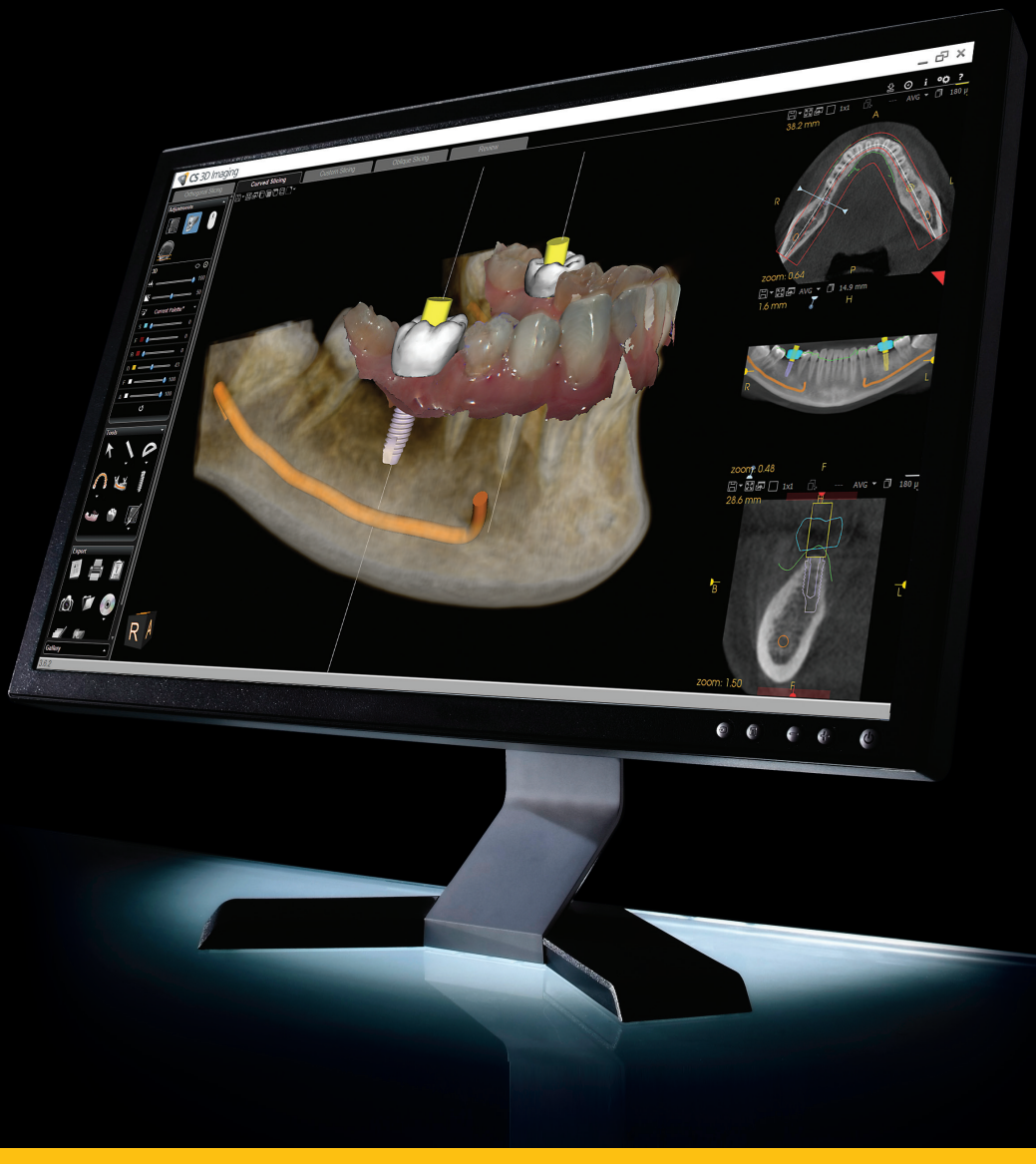
Carestream DENTAL

CS 3D Imaging



User Guide

Notice

All trademarks and registered trademarks are the property of their respective holders.

U.S. Federal law restricts the CS 3D Imaging software and extraoral imaging systems to sale by or on the order of a dentist or physician.

CS 3D Imaging is digital imaging software intended to be used with Carestream Dental's 3D extra-oral X-ray equipment by health care professionals to display, make measurement, print, export and store 2D and 3D views of digital images of the dento-maxillofacial and ENT (Ear, Nose and Throat) region of the human anatomy as diagnostic support.

It is also a software application used for the management of the implant library and the virtual placement of dental implants.

It can be used as stand-alone software in a standard computer and does not perform any radiographic image acquisition.

The names of persons and the data reflected in this user guide are fictitious and are not intended to represent any real individual, event, or condition. Any resemblance or similarity of the names of persons or data reflected in this user guide to any actual person's name or any event or condition is purely coincidental and unintended.

Important: CS Dental software may contain data or content portraying dental implant products provided by third parties. The products portrayed by such data or content may not have regulatory approvals in all countries

No part of this guide may be reproduced without the express permission of Carestream Dental, LLC.

Manual Name: CS 3D Imaging User Guide
Part Number: SMA22
Edition Number: 07
Print Date: 2022-06

CS Imaging software complies with Medical Device Directive 93/42/EEC until September 14th, 2022. After this date, the software will be certified according to Medical Device Regulation (EU) 2017/745 and UK Medical Devices Regulations 2002 (SI 618) as subsequently amended by the EU Exit Regulations of 2019 (SI 791) and 2020 (SI 1478).

CE 2797 UK CA 0086

Contents

Chapter 1 About This Guide

Conventions in this Guide . . . 1
Safety Information . . . 3
Clinical Benefits and Performance Characteristics . . . 3

Chapter 2 Overview

CS 3D Imaging Features . . . 5
Getting Started . . . 5
Getting to Know Your Software . . . 6
Parts of the Screen . . . 6
Keyboard Shortcuts . . . 8
2D MPR View Screen Shortcuts . . . 8
Implant Shortcuts . . . 8
Using the Patient Information Window . . . 8

Chapter 3 Using the Interface

Using the Workspace Tabs . . . 9
Using the Orthogonal Slicing Tab . . . 9
Using the Curved Slicing Tab . . . 10
Prosthetic-Driven Implant Planning in the Curved Slicing Tab . . . 11
View Screens in the Curved Slicing Tab . . . 11
Using the Oblique Slicing Tab . . . 14
Tilting the Slice Planes in the Oblique Slicing Tab . . . 14
Using the Custom Slicing Tab . . . 16
Using the Review Tab . . . 18
Using the Slice Series View Screen in the Review Tab . 19
Using the Toolbox . . . 22
The Adjustments Pane . . . 22
Expanding the Adjustments Pane Tools . . . 23
Overview of the Adjustments Pane Features . . . 25
Using Pan and Zoom . . . 27
Resetting the Slice Planes . . . 27
Using the 2D MPR Sliders to Modify View Screen Brightness and Contrast . . . 27
Creating a 2D MPR Windowing Preset . . . 28
Applying an MPR Windowing Preset . . . 29
Editing or Deleting a 2D MPR Windowing Preset . . . 29
Setting a 2D MPR Windowing Preset as a Favorite . . . 30
Using the MAR/FDK Adjustment Tool . . . 30
Using the Basic Region of Interest Tool . . . 33
The Tools Pane . . . 34
Overview of Tools Pane Features . . . 36
Using the Object List in the Tools Pane . . . 37

Using the Cropping Tool in the Oblique Slicing Tab . . 38
Editing Drawing Objects in a View Screen 38
Adjusting a Trace in the Axial Slice View Screen 39
Making Measurements 40
Drawing a Straight Line 40
Drawing a Polyline 40
Drawing an Angle 41
Moving Measurement Labels in Images 42
Adding Annotations (Pointers) to Images 43
Adding Pointers 43
Adding Pointers With Text Captions 43
Using the Custom Region of Interest Tool (2D). 45
Drawing a 2D Region of Interest Shape. 46
Inverting the Selection in a 2D Region of Interest . . . 47
Using the Custom Region of Interest Tool (3D). 48
Drawing a 3D Region of Interest Shape. 49
Combining Region of Interest Shapes. 51
Editing a Region of Interest 51
Deleting a Region of Interest. 52
The Export Pane 52
Using Icon Groups 54
Working With View Screens in the Workspace Tabs 55
The 3D View Screen 55
The 2D MPR View Screens 56
View Screen Toolbars 57
Additional Buttons Available in the 3D View Screen . . 59
Creating a DICOM Snapshot 59
Understanding the Numerical Information on 2D MPR View Screens 60
Understanding Slices in 2D MPR View Screens 61
Changing Slice Thickness 62
Moving and Tilting Slice Planes in 2D MPR View Screens . 64
Moving a 2D MPR Plane Using a Handle 64
Moving a 2D MPR Plane by Scrolling (“Sliding”) in the Orthogonal Slicing Tab 65
Moving and Tilting the Oblique Coronal Slice Plane in the Oblique Slicing Tab 65
Adjusting the Width of Lateral View Screens 66
Using Split Views in 2D MPR Views 67
Changing the Slice Spacing in 2D MPR View Screens 68
Using the Gallery 69
Displaying and Hiding Image Objects in the Gallery 70
Copying Images to Other Software Applications 70
Deleting Images from the Gallery. 70

Chapter 4 Creating Views

Drawing a Trace along a Dental Arch. 71
Drawing a Trace Along a Dental Arch. 71
Adjusting a Trace 73
Positioning the Cross-Section Plane 73
Adjusting the Position of the Cross-Section Plane 74
Creating a Reconstructed Panoramic Image. 75
Tracing a Nerve Canal. 76
Method 1 - Scrolling Through the Jaw and Tracing as You Go 76
Method 2 - Displaying the Whole Nerve Canal and Then Tracing 77
Fine-Tuning a Nerve Canal Trace 78
Creating a Segmented Airway 79
Creating an Airway View. 80
Using the Airway Object List 81
Creating TMJ Views 83
Creating Ear Views 84
Creating a Temporal Bones View. 85
Synchronizing Views 86
Disabling View Synchronization 87
Synchronizing Four Views 87
Synchronizing Two Views (Side) 88
Synchronizing Two Views (Type) 88
Creating a View Screen Screenshot 89

Chapter 5 Using the 3D View Screen

The 3D View Screen 91
Using the Orientation Indicator 92
Displaying MPR Planes 93
Repositioning MPR Planes in the 3D View Screen 94
Using the Reformatting Tool 94
Using 3D Color Palettes 95
Creating a 3D Color Palette. 96
Editing or Deleting a 3D Color Palette 96
Adding 3D Color Palettes to Your Favorites 97
Using the 3D Sliders 97
Using 3D Color Sliders 98
Changing 3D Palette Colors 100
Using Presets (Image Rendering). 100

Chapter 6 Aligning a Patient Face Scan Image with a Volume

Aligning a Patient Face Scan Image with a Volume 101
Adjusting a Face Scan Alignment 103
Accessing the Alignment Adjustment Window 103
Visualizing Adjustments in the 3D View Screen 104
Semi-Automatically Adjusting a Face Scan Alignment . . . 104

Modifying Opacity Settings in the 3D View Screen 106
Manually Adjusting a Face Scan Alignment 106
Undoing Manual Face Scan Adjustments 108
Redoing Manual Face Scan Adjustments 108
Resetting a Semi-Automatic Face Scan Alignment 108
Exporting a Face Scan Alignment 108
Managing Face Scans Using the Object List 109
Showing and Hiding Face Scans 109
Configuring Color Preferences for a Face Scan (2D Display) . 109
Deleting a Face Scan 110

Chapter 7 Aligning a Model with a Volume

Before You Start 111
Using the Prosthetic-Driven Implant Planning Workflow . 111
Aligning a Model with a Patient Image Volume 112
Aligning a Model Manually 114
Accessing the Semi-Automatic Alignment Adjustment Window 115
Aligning a Patient Waxup 116
Visualizing Adjustments in the 3D View Screen. 117
Modifying Opacity Settings in the 3D View Screen 118
Adjusting a Model Alignment 118
Undoing Model Adjustments 120
Redoing Model Adjustments 120
Resetting an Automatic Model Alignment 120
Exporting a Model Alignment 120
Managing Models Using Model Object List 121
Showing and Hiding Models 121
Configuring Color Preferences for a Model (2D Display) . 121
Deleting a Model 122
Deleting All Models for a patient image volume 122

Chapter 8 Working with Crowns

Using the Prosthetic-Driven Implant Planning Workflow 125
Prosthetic-Driven Implant Planning Workflow 125
Using a Prosthetic-Driven Implant Planning Workflow . . 125
Using the Crown Library 126
Before You Start 126
Placing a Crown 127
Repositioning a Crown. 128
Managing Crown Objects 130
Displaying Crown Information 131
Showing and Hiding Crowns. 131
Replacing a Crown 132
Editing Crown Color Preferences 132

Deleting Crowns 132

Chapter 9 Working with Implants

Using the Prosthetic-Driven Implant Planning Workflow. 135
Placing an Implant 135
Using the Implant Object List to Edit Implants and Display Information 137
Implant Security Box 139
Security Zones and Warning 139
Repositioning an Implant 140
Moving Implants in 2D MPR View Screens 140
Moving Implants in 3D View Screens 140
Generating an Implant Planning Report 140
Creating Your Own Implant 141
Using the Implant Library 141
Updating the Implant Library. 142
Using the Implant Database Update Window 143

Chapter 10 Using Export Functions

Using Patient Analyses 145
Creating an Analysis 146
Editing or Deleting Analyses. 146
Generating a Cross-Section 147
Method 1: Flexible Region Of Interest 147
Method 2: Fixed Region Of Interest. 150
Saving Slicing Presets. 152
Generating an Implant Planning Report 152
Creating a Workspace Screenshot. 154
Opening the Screenshot Folder 155
Printing with Film Composer 155
Exporting a Volume 156
Exporting to a Compact Disc 159
Exporting to a USB Key 160
Generating and Exporting Virtual Cephalometric Images 161

Chapter 11 Setting CS 3D Imaging Preferences

Application Preferences 164
3D View Preferences 165
Color Preferences 167
Measurement Units Preferences 168
Template Preferences 169
MPR Preferences 170
View Orientation Preferences. 171
View Order in Split Views Preferences (Imaging Center Software Only) 172
Export Preferences 173

Implant Preferences 174
Annotations Preferences 175
Implant Planning Report Preferences 176
Virtual Cephalometric Preferences 177
Airway Preferences 178

Chapter 12
Managing Backups

Types of Backup Media 179
Storing Backup Media 179
Data Backups 179
Testing Your Backup System 179
Maintaining Backup Devices 179
Replacing Backup Media 180

Chapter 13
Contact Information

Manufacturer's Address 181
Authorized Representatives 181

1 About This Guide

The CS 3D Imaging User Guide describes all of the functions available in the **CS 3D Imaging** software application. The CS 3D Imaging User Guide is displayed in the same language as the installation language of the application.

You can launch the user guide at any time in **CS 3D Imaging** by pressing **F1** or by clicking ? in the System Icons bar.

Conventions in this Guide

The following special messages emphasize information or indicate potential risk to personnel or equipment:

WARNING: Warns you to avoid injury to yourself or others by following the safety instructions precisely.

CAUTION: Alerts you to a condition that might cause serious damage.

Important: Alerts you to a condition that might cause problems.

Note: Emphasizes important information.

Tip: Provides extra information and hints.

Marking and Labeling Symbols

	Manufactured Date
	Manufacturer's address
MD	Medical Device
EC REP	Name of the European Authorized Representative and address of the registered place of business
UK REP	Name of the Responsible Person in the United Kingdom and address of the registered place of business

Safety Information

WARNING:

- **This software is for use only by dentists, ENT specialists, radiologists and other medical professionals who have training and skills adapted to the interpretation of 3D radiological images. Their respective assistants may use the software if they have been trained on 3D imaging. If you are not a trained dental professional, you should not be using this software.**
- **Drawings and measurements made in this software are under your own responsibility. A radiographic image is a two dimensional image of a three dimensional object, and measurements may be subject to errors. Measurements are only informative and operations requiring precise positioning of the patient are under your own responsibility**
- **Radiographic images are not intended for diagnostic use when viewed on displays or monitors that do not meet system specifications. For more information, check the 3D Imaging system requirements.**
- **This software cannot manage your device acquisition settings. It is the role of the acquisition driver to provide calibrated data.**
- **3D rendering must not be used for diagnosis. Confirmation must be performed using one or more of the two-dimensional slices used for MPR.**
- **2D image edge enhancement must not be used for diagnosis. Confirmation must be performed using the two-dimensional slices (MPR) without filters applied.**
- **An exported 3D volume will be subsampled which may lead to diagnosis errors. It is your own responsibility to decide to use subsampled data.**
- **When the** PREVIEW **label appears in an image in a view screen, it indicates that the image is still being loaded by 3D Imaging. This preview of the image should not be used to support the diagnosis.**

Clinical Benefits and Performance Characteristics

CS Imaging software benefits healthcare professionals by providing them support for image diagnosis when using Carestream Dental's digital imaging devices to acquire digital X-ray images. CS Imaging essential performance concerns image processing functions to display, adjust, make measurement, print and export digital images.

Important: All known residual risks, contra-indications or undesirable side-effects are listed in this guide. If any serious incident occurs in relation to the device, you must report it to Carestream Dental and to the competent authority in your country.

2 Overview

CS 3D Imaging is a software system intended to be used with **Carestream Dental** systems equipment that are equipped with 3D features.

The intended users are dentomaxillofacial health care professionals, ENT specialists or radiologists who have access to functions of the 3D Viewer, depending on their profile.

Note: Some features are only available in specific versions of the software (DENTAL or ENT).

CS 3D Imaging Features

CS 3D Imaging allows qualified professionals to:

- Visualize volumes in 2D or 3D views.
- Create a series of slices for viewing and printing.
- Draw curved traces to create reconstructed panoramic and temporal bone views.
- Draw custom orthogonal slice planes to focus on TMJ and ear anatomy.
- Trace nerve canals.
- Place virtual implants for implant planning.

Note: **CS 3D Imaging** is not designed to support touch screen or touch pad usage.

Getting Started

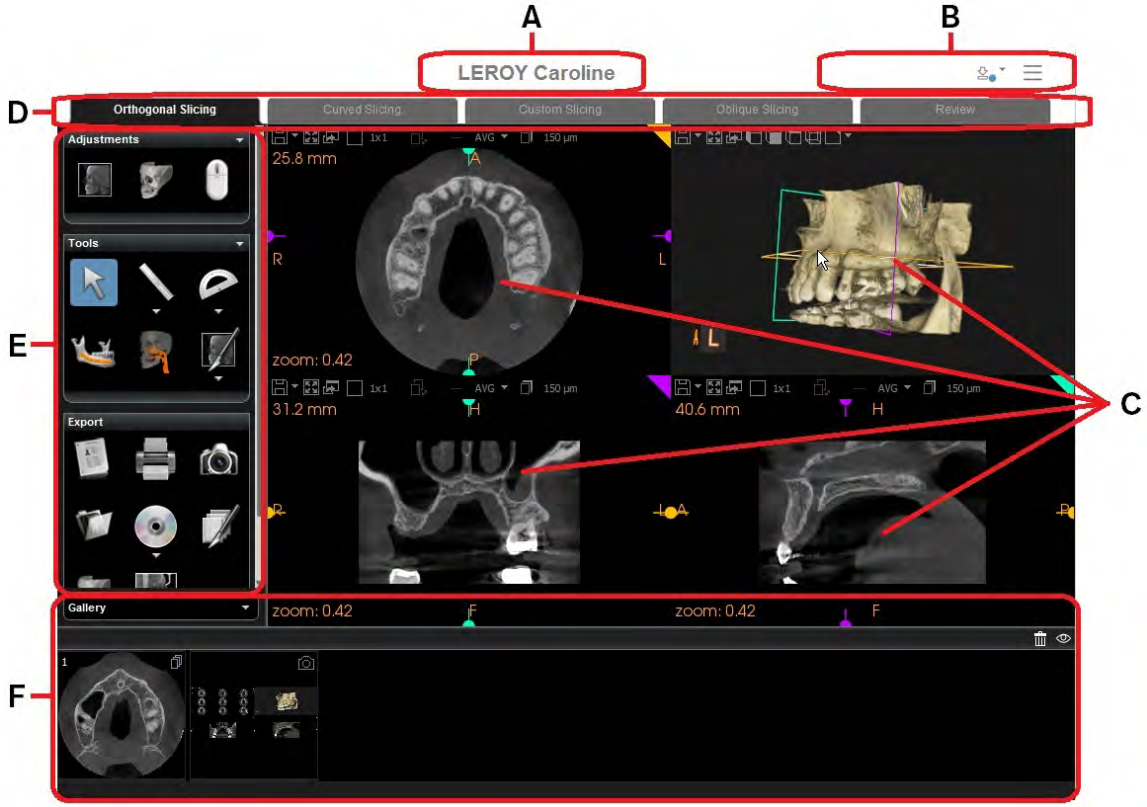
To start using the **CS 3D Imaging** software, follow these steps:

1. Either acquire a 3D volume from your 3D acquisition device or open a volume from the **CS Imaging** software.
2. Configure your preferences. See "Setting CS 3D Imaging Preferences".
3. Familiarize yourself with the basic functions of the software.

Getting to Know Your Software

Parts of the Screen

The **CS 3D Imaging** interface is comprised of the following parts:



A	**Patient name**	
B	**Main Toolbar Icons**	
		Click the **update** icon to install updates to the **Implant Library**. When there are updates available, a blue dot appears in this icon. For more information, see "Updating the Implant Library". Click the arrow next to the icon to toggle to the **Implant Library** icon.
		Click the **Implant library** icon to display the **Implant Library**, in which you can view available implants and create your own implants. See "Using the Implant Library". Click the arrow next to the icon to toggle to the **update** icon.
		Click the **Patient information** icon to display the **Patient information** window, which includes examination information. See "Using the Patient Information Window".
		Click the **About box** icon to display application and registration information. You can also access the **Licensing** software via this window.
		Click the **Preferences** icon to set application preferences. See "Setting CS 3D Imaging Preferences".
		Click the **Help** icon to open the user guide for your application.
C	**View Screens** Each of the workspace tabs contain multiple view screens. The example above shows three 2D Multi-Planar Reconstruction (MPR) view screens and a **3D View Screen**.	
D	**Workspace tabs** The following workspace tabs provide access to view screens: • **Orthogonal Slicing** • **Curved Slicing** • **Custom Slicing** • **Oblique Slicing** • **Review**	
E	**Toolbox** The toolbox provides the following panes: • Adjustments • Tools • Export See "Using the Toolbox".	
F	**Gallery** Displays thumbnail images of the screenshots, snapshot images and cross-section slice series.	

Keyboard Shortcuts

2D MPR View Screen Shortcuts

Shortcut	Action
Ctrl + A	Changes the mouse wheel action in 2D MPR views (zoom or slide).
Ctrl + W	Changes the mouse left button action in 2D MPR views (brightness/contrast or none).

Implant Shortcuts

Note: These shortcuts only work on numbers in the keyboard keypad.

Keypad number	Action
8	Increases the length of the implant.
2	Decreases the length of the implant.
6	Increases the diameter of the implant.
4	Decreases the diameter implant object.

Using the Patient Information Window

To display the **CS 3D Imaging** Patient Information window, click in the **Main Toolbar Icons**.

The Patient information window displays the patient, doctor and acquisition information. The information displayed depends on your Practice Management System.

3 Using the Interface

Using the Workspace Tabs

CS 3D Imaging contains the following workspace tabs that provide a wide range of functions for viewing and enhancing images, carrying out implant planning and generating reports.

Tab	Description
Orthogonal Slicing	This workspace tab provides a **3D View Screen** and three 2D Multi-Planar Reconstruction (MPR) view screens. This is a classic radiologist's method of examining a 3D volume.
Curved Slicing	Depending which software mode you have installed (**Dentist**, **ENT** or **Imaging Center**), this workspace tab allows you to trace the jaw arch or temporal bone to display trace and cross-section. See "Using the Curved Slicing Tab". The **Curved Slicing** workspace tab can be used as part of your **Prosthetic-Driven Implant Planning** workflow to match 3D digital impression and CBCT scan views, and to import crowns and implants. See "Prosthetic-Driven Implant Planning Workflow".
Custom Slicing	Enables you to trace custom TMJ or ear planes. See "Using the Custom Slicing Tab".
Oblique Slicing	Enables you to view slice planes at any angle. See "Using the Oblique Slicing Tab".
Review	In the **Review** workspace tab, you can review **Gallery** images and slices generated in the **Cross Section Tool** before printing them using **Film Composer**. See "Using the Review Tab".

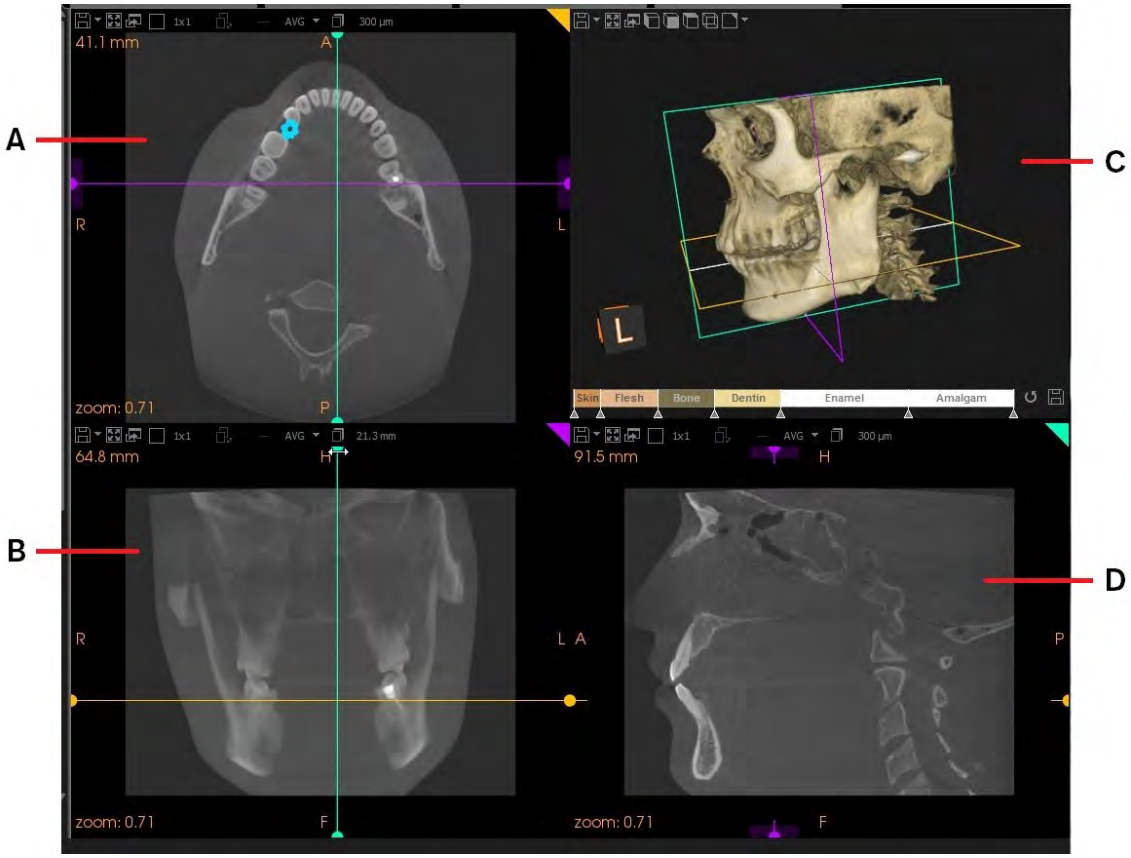
For more information on the view screens, see "Working With View Screens in the Workspace Tabs".

Using the Orthogonal Slicing Tab

The **Orthogonal Slicing** workspace tab contains a **3D View Screen** and three 2D MPR slice views. This workspace tab is a classic radiologist's method of examining a 3D volume.

WARNING: 3D views must not be used for diagnosis. Confirmation must be performed using one or more of the two-dimensional slices used for MPR.

The **Orthogonal Slicing** workspace tab contains the following view screens:



- **2D MPR view screens:**
  - **Axial Slice View Screen**, which displays horizontal slices (**A**).
  - **Coronal Slice View Screen**, which displays vertical slices from front to back (**B**).
  - **Sagittal Slice View Screen**, which displays vertical slices from side to side (**D**).
- **3D View Screen**, a rotatable, three-dimensional view of the 3D volume (**C**).

> **Note:** You can set the default position of the **3D View Screen** in the "Template Preferences".

Using the Curved Slicing Tab

In the **Curved Slicing** workspace tab, you can do the following:

- Dynamically generate a reconstructed-panoramic view, and a movable cross-section while drawing the trace.
- Align a 3D Model (digital impression) with a patient image volume
- Add virtual objects, for example measurements, crowns, and implants.
- Create 2D and 3D views to the **Gallery**.
- Generate implant reports via **Film Composer**.

- Automatically or manually trace the jaw arch or temporal bone along the axial slice plane.

Prosthetic-Driven Implant Planning in the Curved Slicing Tab

CS 3D Imaging supports **Prosthetic-Driven Implant Planning** (**PDIP**). See "Prosthetic-Driven Implant Planning Workflow".

In the **Curved Slicing** workspace tab, you can carry out the following tasks as part of your **PDIP** process:

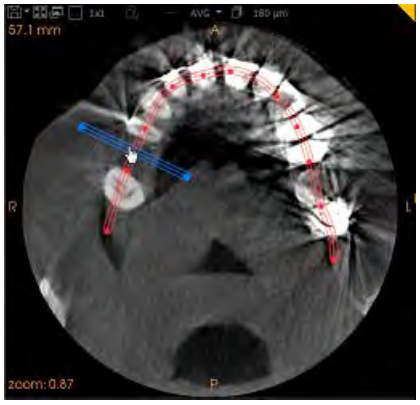
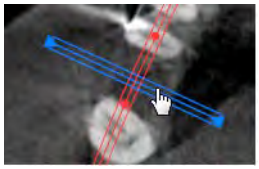
- "Drawing a Trace Along a Dental Arch"
- "Aligning a Model with a Volume"
- "Placing a Crown"
- "Placing an Implant"
- "Generating an Implant Planning Report"

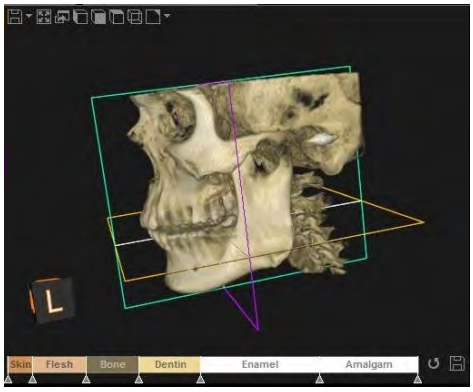
View Screens in the Curved Slicing Tab

The **Curved Slicing** tool contains the following view screens:

- 2D MPR view screens:
  - **Axial Slice View Screen**, displays the horizontal plane as it is moved vertically through the image.
  - **Trace View Screen**, or Reconstructed Panoramic View Screen, displays dynamically the dental arch as it is drawn in the **Axial Slice View Screen**.
  - **Oblique Coronal View Screen**, appears when you start drawing a trace on the **Axial Slice View Screen**, and displays a 90° view through the trace drawn on the **Axial Slice View Screen**.
- **3D View Screen**, a rotatable, three-dimensional view of the 3D volume.

> **Note:** You can set the default position of the **3D View Screen** in the "Template Preferences".

View Screens		Description
A	**Axial Slice View Screen** 	This view screen displays horizontal slices. It is displayed by default even when there are no traces present. Before drawing a trace, use the slider at the base of the **Axial Slice View Screen** to move the axial slice plane. The imaging software will display in real time the corresponding **Trace View Screen** and **Oblique Coronal View Screen**. You can use this view screen to trace the jaw arch or temporal bone, depending on which software mode you have installed. 
B	**Trace View Screen**	Also known as Reconstructed Panoramic View Screen, this view screen displays the jaw arch or temporal bone, depending on which software mode you have installed. This screen appears when you start drawing a trace on the **Axial Slice View Screen**. Once a trace is present, you can use the slice plane handle to adjust the position of the axial slice plane.

C	**Oblique Coronal View Screen**	This view screen is displayed dynamically when you start drawing a trace on the **Axial Slice View Screen**, displaying a 90° view through the trace drawn on the **Axial Slice View Screen**. You can fine-adjust the position of the axial slice plane displayed in the **Axial Slice View Screen**. by using the blue handle in the **Oblique Coronal View Screen** (also known as the cross-section view screen).
D	**3D View Screen** 	This screen shows the 3D representation of a volume.

Note: You can configure the color of view indicator tags shown in the workspace tabs in the "Color Preferences". The colors in the images in the user guide may differ from those shown on your computer monitor.

Using the Oblique Slicing Tab

The **Oblique Slicing** workspace tab provides the same 2D MPR views as the **Orthogonal Slicing** workspace tab, however you can also tilt slice planes to any angle to align with anatomic planes (for example a tooth root, a bone ridge or an implant) and reset to pure orthogonal angles.

> **Note:** Slice planes can be reset to pure orthogonal angles.

In this tab, you can also crop the 3D view by using the **Cropping** tool. See "Using the Cropping Tool in the Oblique Slicing Tab".

> **Note:** You can configure the color of view indicator tags shown in the workspace tabs in the "Color Preferences". The colors in the images in the user guide may differ from those shown on your computer monitor.

The **Oblique Slicing** workspace tab contains the following view screens:

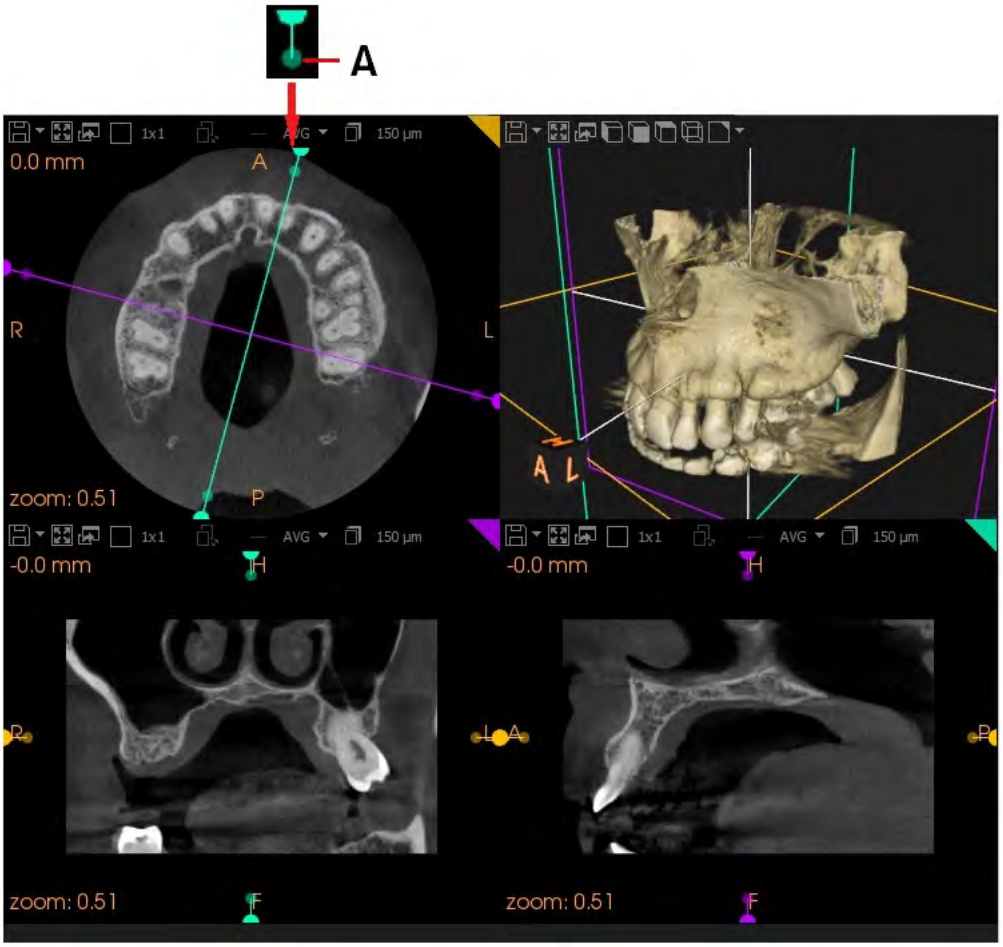
- 2D MPR view screens:
  - **Axial Slice View Screen**, which displays horizontal slices.
  - **Coronal Slice View Screen**, which displays vertical slices from front to back.
  - **Sagittal Slice View Screen**, which displays vertical slices from side to side.
- **3D View Screen**, a rotatable, three-dimensional view of the 3D volume (**C**).

> **Note:** You can set the default position of the **3D View Screen** in the "Template Preferences".

Tilting the Slice Planes in the Oblique Slicing Tab

> **Note:** You can also move and tilt slice planes in the oblique coronal slice planes in the **Curved Slicing** workspace tab. See "Moving and Tilting the Oblique Coronal Slice Plane in the Oblique Slicing Tab".

You can tilt the angle of a slice plane on the **Oblique Slicing** workspace tab using the round handles (**A**).



To tilt the slice planes, follow these steps:

1 In a 2D MPR view screen, click the round tilt handle (**A**) on the slice plane.

The mouse pointer changes to ✥.

2 Drag the round handle.

The selected plane is tilted as you move your mouse pointer.

In this example, as the coronal plane is tilted in the **Sagittal Slice View Screen** (**B**), it is also tilted in the **3D View Screen** (**C**).

You can do the following actions in the 2D MPR view screens in this workspace tab:

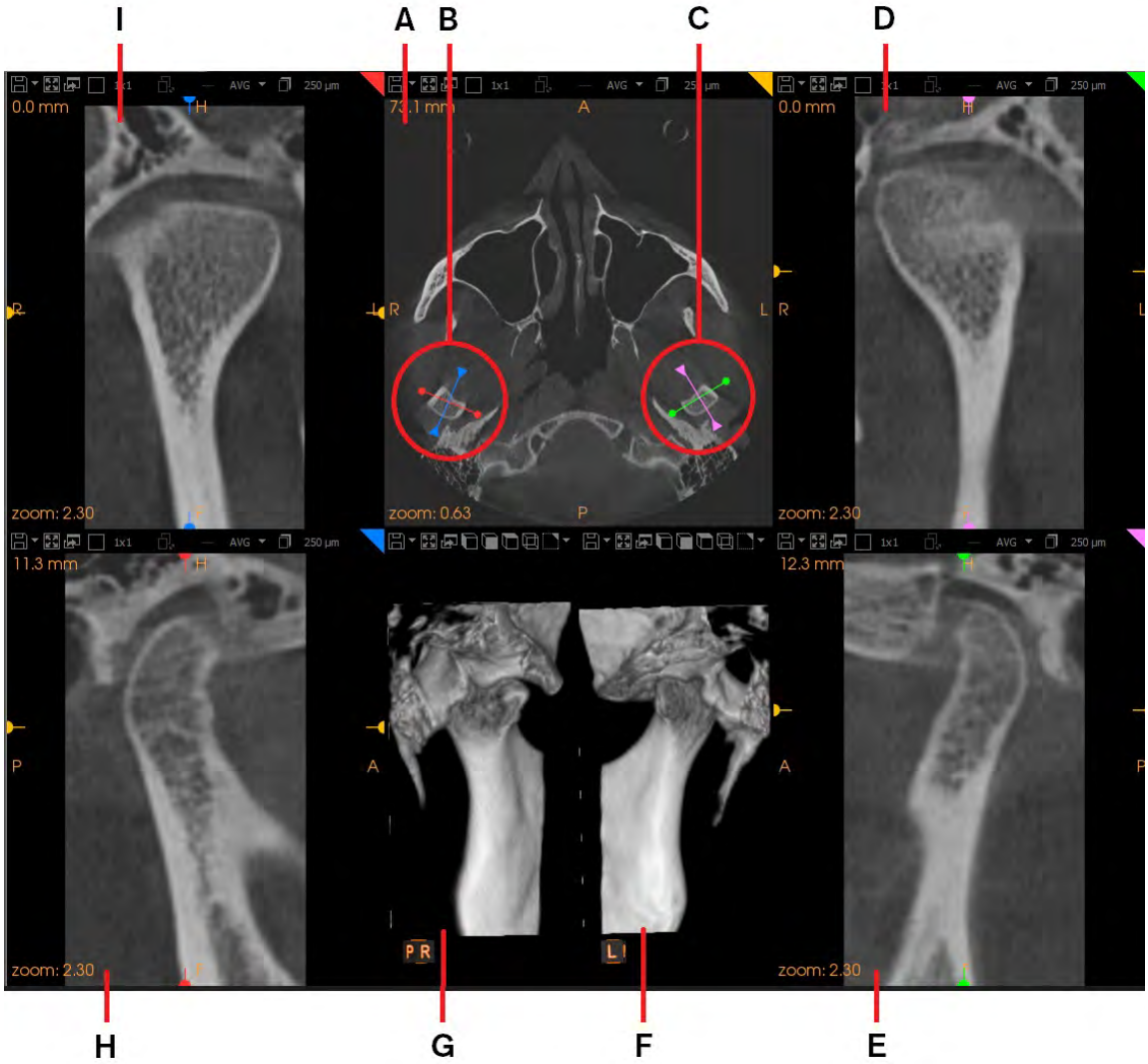
- Reset the slice planes. See "Resetting the Slice Planes".
- Crop the image in the 2D views to customize the 3D view in the **3D View Screen**. See "Using the Cropping Tool in the Oblique Slicing Tab".

Using the Custom Slicing Tab

In the **Custom Slicing** workspace tab, you can examine specific regions of interest in depth, specifically the temporomandibular joint (TMJ) or ear. The view screens that appear on this workspace tab will depend on the type of acquisition you use. If you acquire only one side of the volume, then only the view screens relevant to that side are displayed.

By default, the **TMJ/Ear View Screen**, **TMJ/Ear Cross-Section View Screen** and **3D View Screen** are displayed. If the field of view is large enough, a second set of these view screens is displayed for the other side of the head.

The **Custom Slicing** workspace tab can therefore display either four or seven view screens. The following example shows all seven view screens.



The **Custom Slicing** workspace tab displays the following view screens.

A	**Axial Slice View Screen**	This view screen shows a horizontal slice through the volume. In this view screen, you can draw a TMJ/ear trace over a region of interest on one side of the volume. If the acquired volume is large enough, the software automatically draws a mirror image trace on the opposite side of the volume. The colors in the handles in this view screen (**B**, **C**) match with the traces in the corresponding cross-section view screens. Once these traces have been drawn, the **TMJ/Ear View Screen** and **TMJ/Ear Cross-Section View Screen** appear, displaying slice views through the volume at the location of the traces. A **3D View Screen** displays cropped TMJ or ear images.
D	**LEFT TMJ/Ear View Screen**	This view screen appears when you draw a trace on the **Axial Slice View Screen**. In the **Axial Slice View Screen**, the trace is shown as a colored line. To move this slice plane, click and drag in the **LEFT TMJ/Ear Cross-Section View Screen**.
E	**LEFT TMJ/Ear Cross-Section View Screen**	This view screen appears when you draw a trace on the **Axial Slice View Screen**. A view at 90° to the RIGHT TMJ/ear trace drawn on the axial slice is displayed. In the **Axial Slice View Screen**, the trace is shown as a colored line. To move this slice plane, click and drag in the **LEFT TMJ/Ear View Screen**.
F	**LEFT 3D View Screen** (**E**).	Before any traces are drawn, this view screen and the **RIGHT 3D View Screen** (**E**) display identical views of the full volume. When you draw traces on the **Axial Slice View Screen** (**A**), the **3D View Screen** displays the 3D view regions defined by the TMJ/ear cross-section and TMJ/ear cross-section traces.
G	**RIGHT 3D View Screen** (**F**).	Before any traces are drawn, this view screen and **LEFT 3D View Screen** (**D**) display identical views of the full volume. When you draw traces on the **Axial Slice View Screen** (**A**), then the **3D View Screen** displays 3D views of the regions defined by the TMJ/ear and TMJ/ear cross-section traces.
H	**RIGHT TMJ/Ear Cross-Section View Screen**	This view screen appears when you draw a trace on the **Axial Slice View Screen**. A view at 90° to the LEFT TMJ/ear trace drawn on the axial slice is displayed. In the **Axial Slice View Screen**, the trace is shown as a colored line. To move this slice plane, click and drag in the **RIGHT TMJ/Ear View Screen**.
I	**RIGHT TMJ/Ear View Screen**	This view screen appears when you draw a trace on the **Axial Slice View Screen**. In the **Axial Slice View Screen**, the trace is shown as a colored line. To move this slice plane, click and drag in the **RIGHT TMJ/Ear Cross-Section View Screen**.

Note:

- You can configure the color of view indicator tags shown in the workspace tabs in the "Color Preferences". The colors in the images in the user guide may differ from those shown on your computer monitor.
- LEFT/RIGHT display conventions will depend on the "View Orientation Preferences".

Using the Review Tab

In the **Review** workspace tab, you can review TIFF, JPG, PNG, and DICOM snapshots and slices generated in the **Cross Section Tool** before printing them using **Film Composer**.

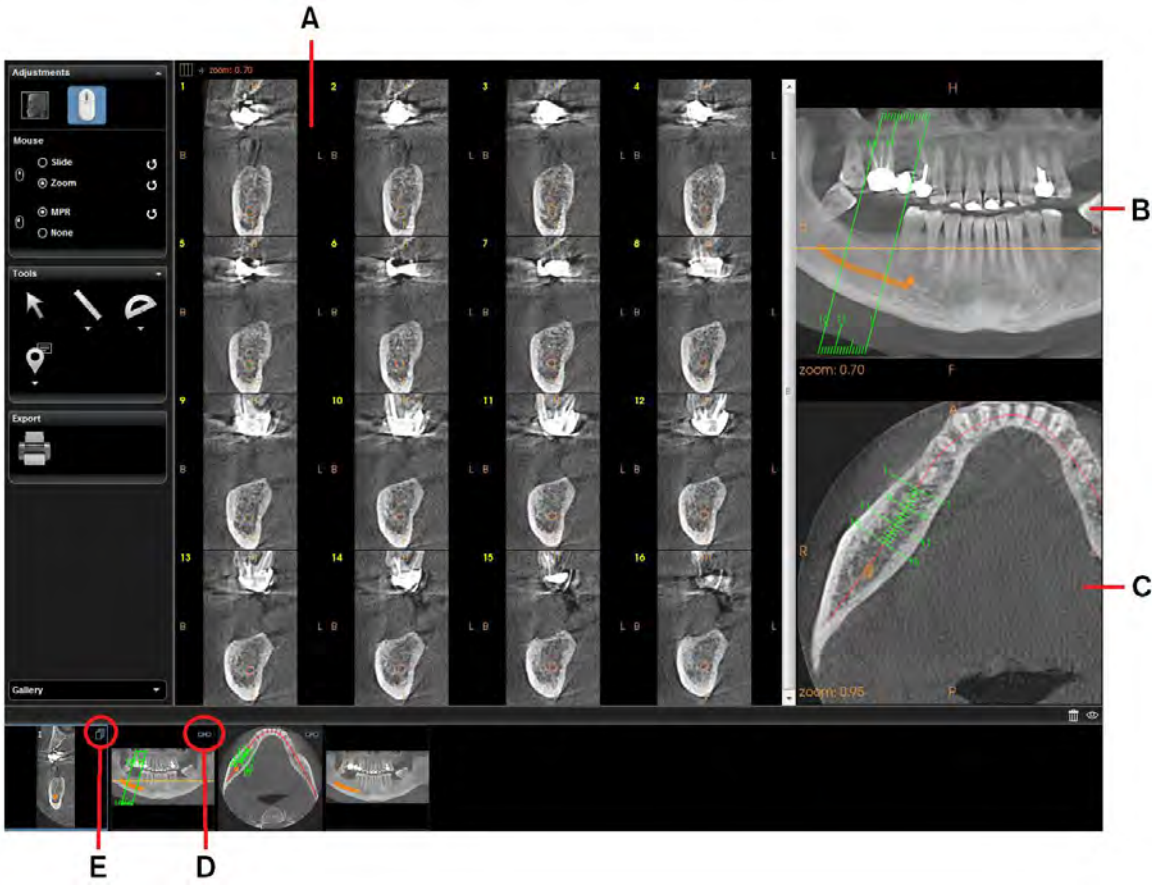
> **Note:** Only slice series created using the **Cross Section Tool** are displayed with locator images. If you create a slice series by creating a DICOM snapshot of a split view, the resulting slice series displayed on the **Review** workspace tab has no locator

You can also add objects to images. When you draw an object onto an image, the behavior of the object depends on the view:

- In the 2D MPR view screens on the **Orthogonal Slicing** workspace tab, the object floats above the image, so when you slide through the slice series, the object remains visible at all times.
- In the **Review** workspace tab, in slice images, an object is attached to a specific slice, so that when you slide through the slice series, the object disappears as different slices are displayed.

> **WARNING: A radiography image is a two-dimensional image of a three dimensional object, and measurement may be subject to errors. You are responsible for all drawings and measurements.**

The views on the **Review** workspace tab depend on the type of images displayed. In the following example, a slice series has been generated using the **Cross Section Tool** on the **Curved Slicing** workspace tab.



A	**Slice Series View Screen**	Displays all slices in the series in one or more columns. You can set the number of columns displayed. See "Using the Slice Series View Screen in the Review Tab". The slice series is accessible from the **Gallery** by double-clicking on the slice series thumbnail. The slice series thumbnail in the **Gallery** is identified by the icon (**E**).
B **C**	Slice series locator images (**Cross Section Tool** slice series only)	These two images contain locators that display the location and numbering of the slice series in the volume. These images are also displayed as thumbnails in the **Gallery**. When you select a slice series thumbnail in the **Gallery**, the two slice locator thumbnails that belong to it are identified with icons (**D**).

When the **Review** workspace tab is selected, the **Annotations** tool appears in the **Tools** pane. See "Adding Annotations (Pointers) to Images".

To use the **Review** workspace tab, do one of the following:

- Use the **Cross Section Tool** to generate a series of slice images. See "Generating a Cross-Section".
- Create views in the workspace tabs.

  If you want to create a series of slice images, create a split view. You can also save snapshots of your views to the **Gallery** and then double-click on the **Gallery** thumbnail to open the slice series on the **Review** workspace tab.

Once you have reviewed the images on the **Review** workspace tab, click in the **Export** pane of the tool box to print your images using **Film Composer**.

Note:
- If you already have several items in the **Gallery**, double-click on the **Gallery** thumbnails (slice series or locator images) to display the images on the **Review** workspace tab.
- To cancel a drawing operation, press the **ESC** key.

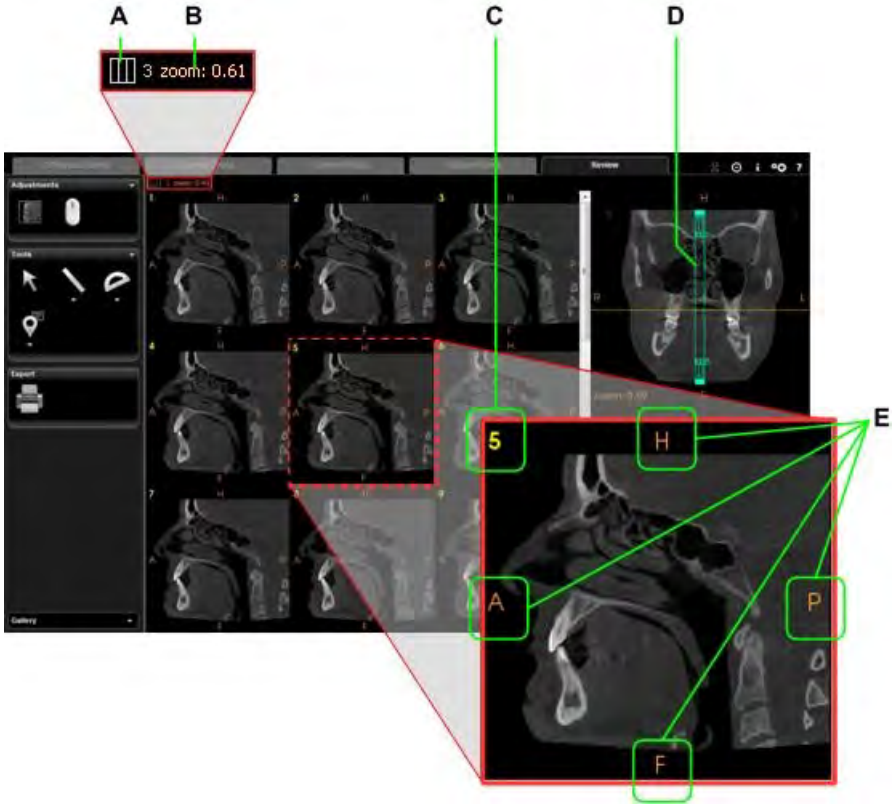
You can use predefined captions to quickly create captioned annotations on the **Review** workspace tab. See "Annotations Preferences".

Using the Slice Series View Screen in the Review Tab

In the **Review** workspace tab, the **Slice Series View Screen** displays numbered slice images in columns.

In the following example, the **Slice Series View Screen** is split into three columns.

Each column displays slice images in separate frames.



A	**Column Setting**	Click to change the number of columns displayed. The number displayed alongside the icon displays the current number of columns displayed. **Note:** • The fewer columns you use, the greater the magnification that you can use for slice images. • The default number of columns displayed can be set in the “Template Preferences”.
B	**Zoom Level**	To change the zoom level, see "Using Pan and Zoom".

C	**Slice Number**	This is the number of the slice in the series (in this case, slice #5 in a series of 10 slices).
D	**Slice Series Locator**	An overlay that identifies where in the volume the slice series was taken. As each slice in the series is numbered, by noting the slice number and looking at the slice series locator (**D**), you can determine where in the volume a particular slice image was taken from. **Note:** Only slice series created using the **Cross Section Tool** are displayed with locator images. If you create a slice series by creating a DICOM snapshot of a split view, the resulting slice series is not displayed on the **Review** workspace tab with locator images. See "Generating a Cross-Section".
E	**Orientation Indicator**	These letters identify the orientation of the image in the 3D volume. **Note:** The orientation convention/indicator depends on type of images or tab you are viewing.

Using the Toolbox

The **Toolbox** pane is displayed to the side of the tab and is composed of three panes that enable you to adjust display parameters, carry out tasks, and export the results:

- The Adjustments Pane
- The Tools Pane
- The Export Pane

Note:
- The contents of the panes change depending on which tab you have selected. For information, see "Using the Workspace Tabs".
- You can specify which workspace tab opens by default in "Application Preferences".

The Adjustments Pane

The **Adjustments** pane in the toolbox contains a range of display adjustment tools. The tools that are available depend on which workspace tab you are in and the **Application Preferences** you have configured.

The **Adjustments** pane contains the following tools, depending on the workspace tab used:

Tool	
MPR Adjustments	The **MPR Adjustments** tool, available in all workspace tabs, enables you to: • Use MPR sliders to control the appearance of the 2D MPR views. • Configure or select from MPR windowing presets.
3D Adjustments	**CS 3D Imaging** provides a library of different color palettes that define how different tissue types are displayed in the **3D View Screen**. You can either select a predefined palette or, if necessary, activate color sliders to fine tune the appearance of the **3D View Screen**. This tool is available in the **Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, and **Oblique Slicing** workspace tabs.

Tool	
Mouse Settings	The **Mouse Settings** tool, available in all workspace tabs, allows you to: • Adjust Slide, Zoom and MPR options to control how your mouse wheel functions in 2D MPR view screens. • Adjust Synchronization settings for view screens.
Basic Region of Interest	The **Basic Region of Interest** tool allows you to set an upper and a lower limit on the region of interest, when tracing a jaw arch, temporal bone, TMJ or ear slices. You can find this tool in the **Curved Slicing** and **Custom Slicing** workspace tabs. See "Using the Basic Region of Interest Tool".
MAR/FDK Adjustments	The **MAR/FDK Adjustments tool** enables you to toggle between the MAR (Metal Artifact Reduction) reconstruction and the FDK (Feldkamp, Davis, and Kress) reconstruction of an image, and to use an adjustment tool to display all information inside a limited area of interest without the need to toggle.

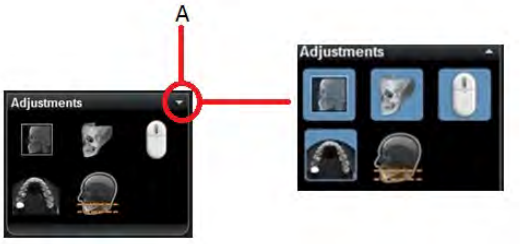
Note: In the **Easy** mode, some tools are not available. If you have installed the **Imaging Center** version of the software, the option to switch between **Easy** and **Advanced** modes is not available; the **Imaging Center** version, like the **Advanced** mode, allows access to all of the tools.

Expanding the Adjustments Pane Tools

Click on an icon in the **Adjustments** pane to expand the features available for that icon. You may then need to scroll to access all of the available **Adjustment** features.

To expand all **Adjustments** tool features, click the **Expand** icon (A):

Note: To activate the , , , and buttons simultaneously and see their settings, click the **Expand** icon (**A**).



To deactivate all four buttons and hide their settings, click .

If you cannot see or access the icon you are looking for, it may not be available in your software configuration or on the selected tab, or it may be hidden inside an **Icon Group**, (See "Using Icon Groups").

In this example, the **MPR Adjustments** and **Mouse Settings** have been activated (blue icons).

The **Adjustments** pane expands and a vertical scroll bar (**A**) appears.

Overview of the Adjustments Pane Features

- **MPR Adjustments**

Icon Descriptions	
	Windowing Presets See “Applying an MPR Windowing Preset”.
	Sliders for brightness, contrast, and filter enhancements. See “Using the 2D MPR Sliders to Modify View Screen Brightness and Contrast”.
	Reset Resets the **MPR Adjustments** sliders to the selected preset.

- **3D Adjustments**

Icon Descriptions	
	Gradient threshold Cleans up a 3D view by reducing artefacts around metal or bone caused by scattered radiation.
	Opacity Adjusts the global opacity of the 3D view.
	Color Palette selector The colors used in a 3D view to display different tissue types can be controlled by preset color palettes. See “Using 3D Color Palettes”.
	Tissue Limit Palette control Activates a bar that allows you to adjust tissue limit with respect to voxel intensity in the **3D View Screen**. See “Using 3D Color Sliders”.
	Reset Resets all 3D adjustments sliders to default values.

- **Mouse Settings**

Icon Descriptions	
	Mouse wheel You can use the **Slide** and **Zoom** options to control how your mouse wheel functions in 2D MPR view screens. See "Moving a 2D MPR Plane by Scrolling ("Sliding") in the Orthogonal Slicing Tab".
	Mouse wheel reset • For **Slide**, resets the 2D MPR slice planes to default positions, and, in the **Oblique Slicing** tab, resets the crop box. See "Using the Cropping Tool in the Oblique Slicing Tab". • For **Zoom**, resets the default zoom for all 2D MPR view screens. • For MPR, resets all 2D MPR views to the default brightness and contrast values.

	Left button
	The following settings control how the left mouse button functions in the 2D MPR view screens.
	• Click MPR to adjust brightness and contrast in the 2D MPR view screens:
	  • Click and drag up/down on an MPR view to adjust contrast.
	  • Click and drag left/right on an MPR view to adjust brightness.
	• Click **None** to deactivate this function.

	Disable Synchronization (**Custom Slicing** tab only) Click to deactivate zoom synchronization of the anteroposterior and lateral view screens.
	Synchronize Four Views (**Custom Slicing** tab only) Click to activate zoom synchronization of the anteroposterior and lateral view screens
	Synchronize Two Views (side) (**Custom Slicing** tab only) Click to activate zoom synchronization of view screen pairs by side.
	Synchronize Two Views (type) (**Custom Slicing** tab only) Click to activate zoom synchronization of view screen pairs by type.

- **Basic Region of Interest**

  You can use this tool to adjust the upper and lower limits of the jaw arch, temporal bone, TMJ or ear slices. You can find this tool in the **Curved Slicing** and **Custom Slicing** workspace tabs.

- **MAR/FDK Adjustments**

  The classical way to view images that include a MAR data reconstruction as well as FDK data is to toggle between them inside the 3D Viewer. You can also use the MAR adjustment tool to display all information within a limited area of interest without the need to toggle. See "Using the MAR/FDK Adjustment Tool".

Using Pan and Zoom

You can use the zoom to magnify an image, and when you have zoomed in, you can then pan to view different parts of the magnified image.

To use the zoom function, follow these steps:

1 In the **Adjustments** pane in the tool box, click .

2 In the **Mouse** settings, click **Zoom**.

3 Click in a view screen and scroll your mouse wheel.

The image is magnified as you scroll the mouse wheel.

4 To pan, **right**-click and drag in the view screen to different parts of the image.

Resetting the Slice Planes

To reset the slice planes to orthogonal angles, follow these steps:

1 In the **Adjustments** pane in the tool box, click to activate the **Mouse** settings.

2 Click next to **Slide**.

The tilted 2D MPR planes are reset to orthogonal angles.

Using the 2D MPR Sliders to Modify View Screen Brightness and Contrast

To access the MPR slider settings, click in the **Adjustments** pane in the tool box, to display sliders and windowing presets.

You use the following MPR sliders to control the appearance of the 2D MPR views.

	Brightness Use this slider to adjust the brightness of all 2D MPR views.
	Contrast Use this slider to adjust the contrast of all 2D MPR views.
	Enhancement Filter Use this slider to adjust the level of enhancement applied to all 2D MPR views. **Note:** While the **Enhancement Filter** sharpens the edges of 2D MPR views, it can also make the images grainy.

Windowing presets offer preset slider settings that enhance certain aspects of an image. You can select from the following 2D MPR windowing presets.

Preset from File	Displays the native settings in the original image file. This is the default preset.
Sinus Normal	Displays an optimized view of sinus areas.
Sinus Contrast	Displays the sinus area in high contrast relief.
Temporal Bone	Displays an optimized view of the temporal bone.

You can also create customized 2D MPR windowing presets, and mark them as **Favorites** so that they appear in the drop-down list of available presets.

Note: You can also save 2D MPR slider settings as a part of a patient analysis. See "Using Patient Analyses".

Click to reset the sliders to the original 2D MPR preset values.

Creating a 2D MPR Windowing Preset

To create a 2D MPR windowing preset, follow these steps:

1 In the **Adjustments** pane in the tool box, click .

The MPR settings appear in the tool box.The text displays the name of the preset that is currently active.

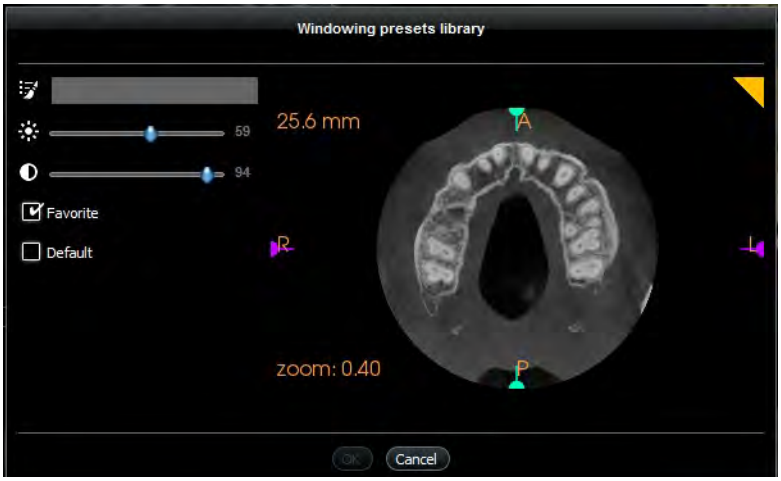
2 Next to the icon, click or the current preset name and select a different preset from the drop-down list.

3 Click .

The **Windowing presets library** window appears.

4 In the **Windowing presets library** window, click the **Save current windowing presets** button.

The selected preset options are shown.



> **Note:** You can edit the brightness and contrast sliders in this window before you save the preset.

5 Adjust the MPR sliders as necessary.

6 Enter a name for your new preset in the text box next to .

7 To add the preset to the list of favorite presets, click **Favorite**.

8 To have the preset applied by default to 2D MPR views, click **Default**.

9 Click **OK** to save the preset.

Applying an MPR Windowing Preset

To select an MPR windowing preset, follow these steps:

1 In the **Adjustments** pane in the tool box, click to activate the **MPR Adjustments** settings.

The MPR settings appear in the tool box. The text next to the icon displays the name of the preset that is currently active.

2 To change the preset, click or the current preset name and select a different preset from the drop-down list.

The settings of the selected preset are applied to all 2D MPR views.

Editing or Deleting a 2D MPR Windowing Preset

To edit or delete an MPR preset, follow these steps:

1 In the **Adjustments** pane in the tool box, click .

The MPR settings appear in the tool box.

2 In the MPR settings, click .

The **Windowing presets library** window appears.

3 In the **Windowing presets library** window, do one of the following:

- Click to edit preset settings.
- Click to delete a preset.

> **Note:** Default presets cannot be edited or deleted.

4 Click **OK**.

Setting a 2D MPR Windowing Preset as a Favorite

When you set a windowing preset as a **Favorite**, it is available in the windowing preset drop-down list in the MPR settings.

To select an 2D MPR windowing preset for inclusion in your favorites list, follow these steps:

1 In the **Adjustments** pane in the tool box, click .

The MPR settings appear in the tool box.

2 In the MPR settings, click .

The **Windowing presets library** window appears.

The **Favorite** status is displayed as follows.

	All windowing presets with this icon appear in the favorites list when you select a 3D color palette. See "Using 3D Color Palettes".
	All windowing presets with this icon do not appear in the **Favorites** list.

3 For any windowing preset that is not currently in your favorites list, click .

When you move your mouse pointer away, the icon changes to to show that the selected windowing preset is now a favorite. To unselect it, click . When you move your mouse pointer away, the icon changes to to show that the windowing preset no longer a favorite.

Note: Default windowing presets are set as **Favorites** and cannot be unselected.

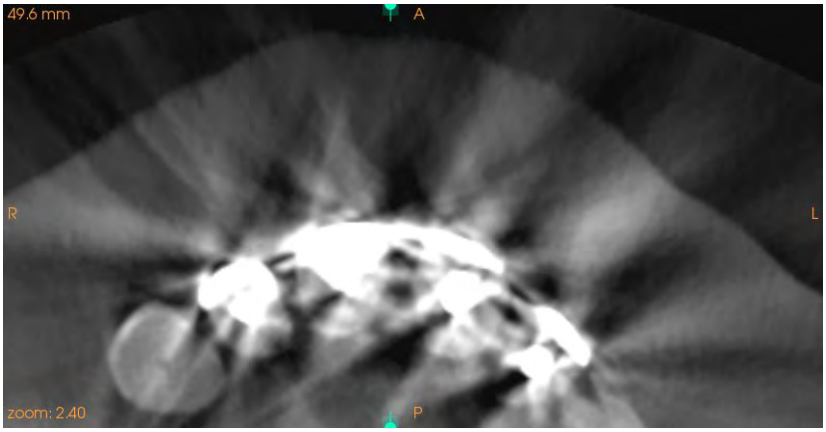
4 Click **OK**.

Tip: You can also set the windowing preset as a favorite while creating the preset. See "Creating a 2D MPR Windowing Preset".

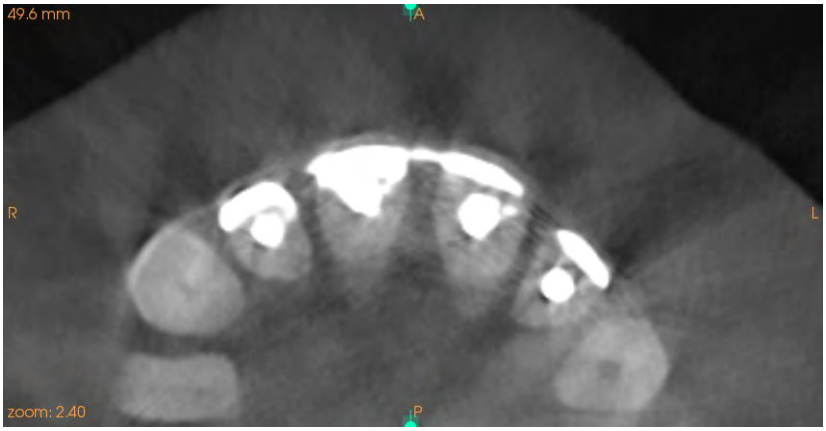
Using the MAR/FDK Adjustment Tool

The MAR/FDK Adjustment tool enables you to view both FDK and MAR image reconstructions inside the 3D viewer without the need to toggle between them. The tool cuts a circular hole in the image in front so that you can see through to the image behind. You use the mouse to move the adjustment tool to the correct position. You use a slider to adjust the size of the circle. You can find this tool in each slicing workspace tab.

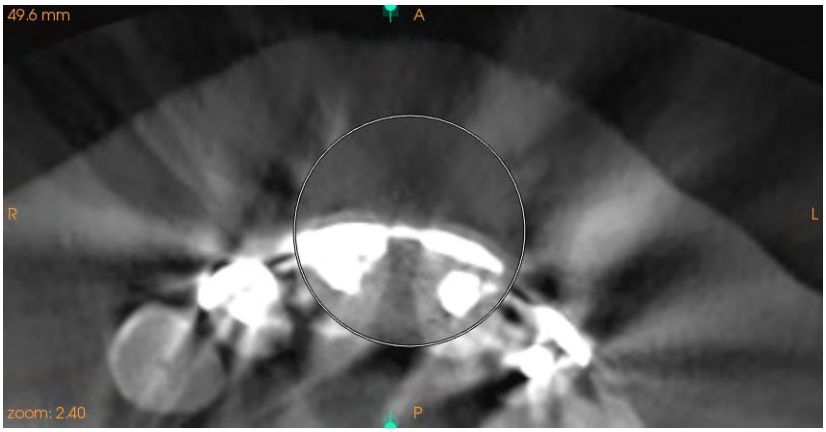
Consider the following FDK image of an axial MPR view, which shows streaks caused by the presence of metal artifacts:



By toggling, you can display the corresponding MAR image that shows a reduction in streaks:



When you activate the MAR adjustment tool, the mouse pointer is replaced by a circle that you can move around the image. The circle marks the outer edge of the adjustment tool. The following axial slice view screen shows an example of what you see when you activate the adjustment tool with the FDK image in front of the MAR image. The MAR image is displayed inside the circle, and the FDK image is displayed outside the circle:

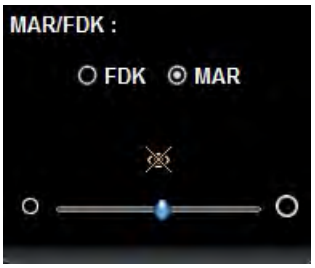


To use the MAR/FDK Adjustment tool:

1 In the **Adjustments** pane in the tool box, click .

2 If necessary, change the display of the MAR and FDK images:

- To place the MAR image in front of the FDK image, click MAR.
- To place the FDK image in front of the MAR image, click FDK.



3 Click to enable the adjustment tool.

You can now use the mouse to move the adjustment tool around the image.

4 To change the size of the adjustment circle, use the slider: . To increase the size, drag the slider to the right. To reduce the size, drag the slider to the left.

Using the Basic Region of Interest Tool

The **Basic Region of Interest** tool allows you to set an upper and a lower limit on the region of interest displayed in a reconstructed-panoramic image on the **Curved Slicing** tab. See "Creating a Reconstructed Panoramic Image".

To set the upper and lower limits of the **Basic Region of Interest** tool, follow these steps:

1. In the **Curved Slicing** tab, if there is not a trace already present, draw a curved trace along the jaw arch.

   A reconstructed-panoramic image is displayed.

2. In the **Adjustments** pane in the tool box, click .

   The **Region of Interest** window appears.

3. In the **Region of Interest** window, use the white horizontal lines to define the upper and lower limits of the region of interest.

4. Click **OK**.

The reconstructed-panoramic and oblique coronal images are cropped to the limits set in the **Basic Region of Interest** tool.

> **Note:** In some cases, if you trace a path on an image with a large field of view, **CS 3D Imaging** may have to crop the image. If this happens, you can reposition the region of interest limits once the arch has been drawn.

The Tools Pane

In the **Tools** pane, depending on the tab you have selected and your **Application** preference settings, shows the following tools that you can click to access their settings.

Tool	Tab Availability
Select	Available in all workspace tabs.
Line **MultiLine** **Polyline** **MultiPolyline**	Available in all workspace tabs. **Note:** These tools belong to an icon group. See "Overview of Tools Pane Features".
Angle **Multiple angles**	Available in all workspace tabs. **Note:** These tools belong to an icon group. See "Overview of Tools Pane Features".
Arch **Automatic Arch** **Temporal Bone**	**Curved Slicing** **Note:** These tools belong to an icon group. See "Overview of Tools Pane Features".
TMJ **Ear**	**Custom Slicing** **Note:** These tools belong to an icon group. See "Overview of Tools Pane Features".
Airways	**Orthogonal Slicing**, **Oblique Slicing**
Nerve Canal	**Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing**
Model	**Curved Slicing**
Implant	**Curved Slicing**
Crown	**Curved Slicing**

Tool	Tab Availability
2D region of interest **3D region of interest**	**Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** **Note:** These tools belong to an icon group. See "Overview of Tools Pane Features".
Cropping box	**Oblique Slicing**
Arrow + Caption **Arrow** **Multi Arrows** **Multi Annotation**	**Review** **Note:** These tools belong to an icon group. See "Overview of Tools Pane Features".

Note: In the **Easy** mode, some tools are not available. If you have installed the **Imaging Center** version of the software, the option to switch between **Easy** and **Advanced** modes is not available; the **Imaging Center** version, like the **Advanced** mode, allows access to all of the tools.

You may not see or access a button for one of the following reasons:

- It may not be available in your software configuration or on the selected tab.
- It may be hidden inside an icon group.

Overview of Tools Pane Features

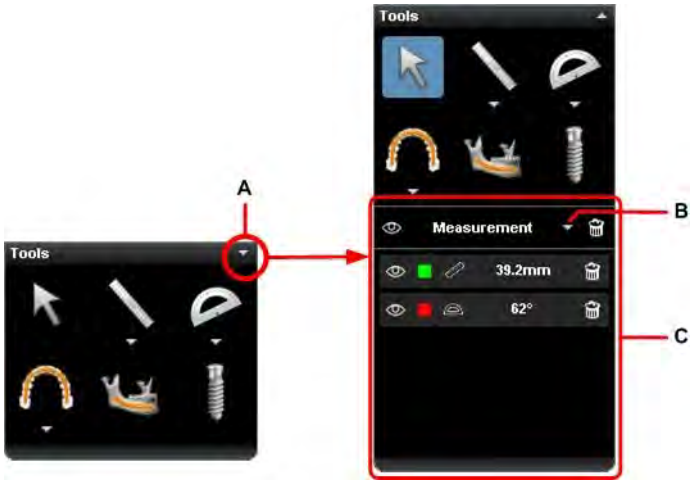
The following table provides a description of the **Tools** pane features.

Tool	Descriptions
2D region of interest	Use this tool to draw region of interest shapes on 2D MPR images. See "Using the Custom Region of Interest Tool (2D)".
3D region of interest	Use this tool to draw region of interest shapes onto the **3D View Screen**. See "Using the Custom Region of Interest Tool (3D)".
Airways	Use this tool to create a segmented view of an airway. See "Creating a Segmented Airway".
Angle	Use this tool to draw an angle. The size of the angle is displayed alongside the vertex. See "Drawing an Angle".
Arch	Use this tool to draw a curved trace along the jaw arch and create a reconstructed panoramic image with a cross-section perpendicular to the curve. See "Creating a Reconstructed Panoramic Image".
Arrow	Use this tool to draw arrow pointers on an image. See "Adding Pointers".
Arrow + Caption	Use this tool to draw arrow pointers with text captions onto an image. See "Adding Pointers With Text Captions".
Automatic Arch	Use this tool to automatically draw a curved trace along the jaw arch and create a reconstructed panoramic image with cross-section perpendicular to the curve. **Note:** This feature can be deactivated in the "MPR Preferences".
Cropping box	Use this tool to crop 2D MPR views. See "Using the Cropping Tool in the Oblique Slicing Tab".
Crown	Use this tool to place a virtual crown as part of your **Prosthetic-Driven Implant Planning** workflow. See "Working with Crowns".
Ear	Use this tool to draw ear traces and create trace views, with lateral views perpendicular to each trace. Depending on the type of volume, this tool creates right and left TMJ views symmetrically. See "Creating Ear Views".
Implant	Use this tool to place a virtual implant and access the implant library. See "Placing an Implant".
Line	Use this tool to draw a straight line. See "Drawing a Straight Line".
Model	Use this tool to match a 3D model (digital impression) to an x-ray volume. See "Aligning a Model with a Volume".
Multi Annotations	Use this tool to draw multiple arrow pointers onto an image. See "Adding Pointers With Text Captions".
Multi Arrows	Use this tool to draw multiple arrow pointers onto an image. See "Adding Pointers".
Multiple angles	Use this tool to draw multiple angles. See "Drawing an Angle".
Multiple Measurements	Use this tool to draw multiple lines. See "Drawing a Straight Line".

Tool	Descriptions
MultiPolyline	Use this tool to draw multiple polylines. See "Drawing a Polyline".
Nerve Canal	Use this tool to trace mandibular nerve canals. **Note:** Although it is technically possible to use this tool on the **Orthogonal Slicing** tab, you may find it easier to trace a nerve using the **Curved Slicing** tab. See "Using the Curved Slicing Tab".
Polyline	Use this tool to draw a multi-point line (polyline). See "Drawing a Polyline".
Select	Use this tool to select an object (line, polyline, angle, or trace) for editing.
Temporal Bone	Use this tool to draw a curved trace along the temporal bones. See "Creating a Temporal Bones View".
TMJ	Use this tool to draw temporomandibular joint (TMJ) traces and create trace views, with lateral views perpendicular to each trace. Depending on the type of volume, this tool creates right and left TMJ views symmetrically. See "Creating TMJ Views".

Using the Object List in the Tools Pane

All tools in the **Tools** pane, with the exception of the **Cropping box**, has a list (**C**) that shows any objects that you have created. In the following example, the list shows entries for two existing **Measurement** objects.



To show this list you do one of the following:

- Click the tool in the **Tools** pane, and the related list appears. To deactivate the list you can click the tool again.
- Click (**A**) in the **Tools** pane.

To toggle between the object lists, click the arrow (**B**) next to the list and select a tool from the drop-down list. The lists you can choose from are the following:

- Measurement
- Implant

- Nerve Canal
- Model
- Crown
- Airway
- Region of interest
- Arch/temporal bone

The list offers settings for each list object (**C**). For example, for **Measurements**, you can do the following.

	Indicates that the object is hidden. Click to show the object in the image.
	Indicates that the object appears in the image. Click to hide the object in the image.
	Click to edit the object color.
	Click to delete an object.

Using the Cropping Tool in the Oblique Slicing Tab

To crop the 3D view in the **Oblique Slicing** workspace tab, follow these steps:

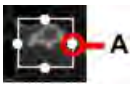
1 Adjust the axial, coronal, and sagittal slice planes.

> **Note:** If you change the axis angulation, the cropping box angulation is adjusted accordingly.

2 In the **Tools** pane in the tool box, click .

White crop boxes are displayed on the 2D MPR view screens.

3 In a 2D MPR view screen, click and drag a white handle (**A**).



All other views are updated as you crop the image.

4 To deactivate the cropping box, click .

Editing Drawing Objects in a View Screen

This section describes how to edit or delete drawing objects on 2D images. Overlays also include traces drawn on the **Curved Slicing** and **Custom Slicing** workspace tabs, and implants placed on reconstructed panoramic images.

> **Note:** To cancel a drawing operation, press the **ESC** key.

To edit or delete a drawing overlay, follow these steps:

1 In the **Tools** pane in the tool box, click .

The icon is displayed in blue to show that the tool has been activated and all drawing objects in the tab are displayed with handles.

2 Do one of the following:

- Apply options in the **Tools** pane list.
- To move an object, click anywhere on the object and drag to move it to a new position.
- To move a point, click and drag an object's handle.

Note: When you select a measurement tool in the **Tools** pane, a list of existing measurement objects is displayed in a list in the **Tools** pane. See "Using the Object List in the Tools Pane".

Adjusting a Trace in the Axial Slice View Screen

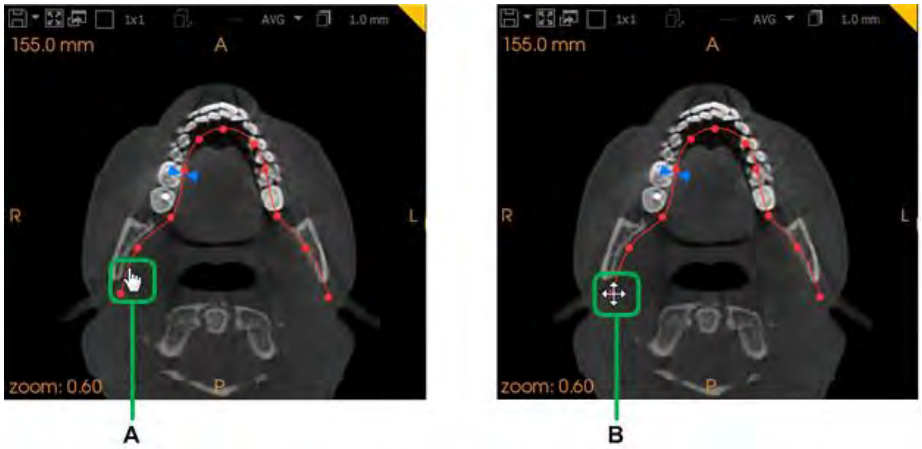
This section describes how to adjust a trace in the **Axial Slice View Screen** in the **Curved Slicing** or **Custom Slicing** tab.

To adjust the position of a trace, follow these steps:

1 In the **Tools** pane in the tool box, click .

2 In the **Axial Slice View Screen**, do one of the following:

- Click and drag directly on the red trace to move the entire trace (**A**).
- Click and drag an individual control point to adjust part of the trace (**B**).



Note: You can also adjust the position of the trace either using the red handles in the **TMJ/Ear Cross-Section View Screen** or the mouse **Slide** function. See "Moving a 2D MPR Plane by Scrolling ("Sliding") in the Orthogonal Slicing Tab".

Making Measurements

You can take measurements on 2D MPR images by using the tools described in this section.

WARNING:

- **The CS 3D Imaging Software cannot manage your device's acquisition settings. It is the role of the acquisition device to provide calibrated data.**
- **Drawings and measurements made in the software are done under the responsibility of the user.**

Note:

- When you draw an object on an image, the behavior of the object depends on the view:
  - When you draw an object on a 2D MPR image in the **Orthogonal Slicing** tab, it "floats" above the image, so that when you slide the view through different slices the object remains visible at all times.
  - When you draw an object on a slice on the **Review** tab, the drawing object is attached to that specific slice, so if you view a different slice the object disappears.
- To cancel a drawing operation, press the **ESC** key.
- Units of measurement are Standard International (SI) units: millimeters (mm) for length, cubic centimeters (cm^3) for volumes, and degrees (°) for angles.

Drawing a Straight Line

To draw a single straight line, follow these steps:

1 In the **Tools** pane in the tool box, click .

The icon is displayed in blue. If this icon is not visible, it may have been replaced by another measurement icon in the same icon group. Click the white arrow below the icon group button to expand it and display all the buttons in the group. See "Overview of Tools Pane Features".

The **Measurement** object list appears in the **Tools** pane. See "Using the Object List in the Tools Pane".

2 On a 2D MPR view screen in the tab, click to set the start point of the line.

3 The length of the new line is displayed alongside the start point.

4 Drag your mouse pointer and click again to set the end point.

The line length appears alongside the start point. You can move this label. See "Moving Measurement Labels in Images".

A line entry is added to the **Measurement** object list and the button is deactivated in the tool box.

To draw multiple straight lines, in the **Tools** pane in the tool box, click .

This tool works in the same way as the single line tool but remains activated so that you can keep drawing more lines on an image.

Drawing a Polyline

To draw a single line made up of connected segments, follow these steps:

1 In the **Tools** pane in the tool box, click .

The icon is displayed in blue. If this icon is not visible, it may have been replaced by another measurement icon in the same icon group. Click the white arrow below the icon group button to expand it and display all the buttons in the group. See "Overview of Tools Pane Features".

The **Measurement** object list appears in the **Tools** pane. See "Using the Object List in the Tools Pane".

2 On a 2D MPR view screen in the tab, click to set the start point of the polyline.

3 Drag your mouse pointer and click again to set a segment end point.

The length of the segment is displayed alongside the segment end point.

4 Keep dragging and clicking to set additional segment end points.

The total length of the polyline increases as each new segment is added.

5 Double-click to set the end point of the polyline.

A calculation label containing the total length appears on the image. You can move length labels. See "Moving Measurement Labels in Images".

A new polyline entry is added to the **Measurement** object list and the button is deactivated in the tool box.

To draw multiple polylines, in the **Tools** pane in the tool box, click .

This tool works in the same way as the single polyline tool but remains activated so that you can keep drawing polylines on an image.

Drawing an Angle

To draw a single angle, follow these steps:

1 In the **Tools** pane in the tool box, click .

The icon is displayed in blue. If this icon is not visible, it may have been replaced by another measurement icon in the same icon group. Click the white arrow below the icon group button to expand it and display all the buttons in the group. See "Overview of Tools Pane Features".

The **Measurement** object list appears in the **Tools** pane. See "Using the Object List in the Tools Pane".

2 On a 2D MPR view screen in the tab, click to set the start point of the first side of your angle.

3 Drag your mouse pointer and click again to set the vertex of the angle.

A line is drawn from the start point to the vertex.

4 Move your mouse pointer and click to set the end point of the second side of the angle.

A second line is drawn from the vertex to the end point and the angle (in degrees) between the two lines is displayed at the vertex.
You can move length labels. See "Moving Measurement Labels in Images".

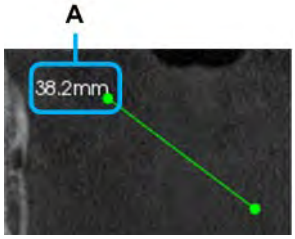
A new angle entry is added to the **Measurement** object list and the button is deactivated in the **Tools** pane.

To draw multiple angles, in the **Tools** pane in the tool box, click .

This tool works in the same way as the single angle tool, but remains activated so that you can keep drawing angles on the image.

Moving Measurement Labels in Images

When you draw a measurement object on a 2D image, the dimension length or angle of the object is displayed alongside the object(**A**).

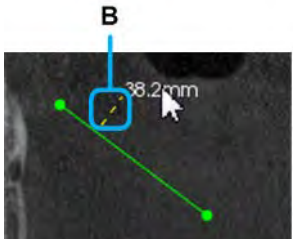


After you have set the end point of a line or angle, the label appears alongside the object.

To reposition a measurement annotation, follow these steps:

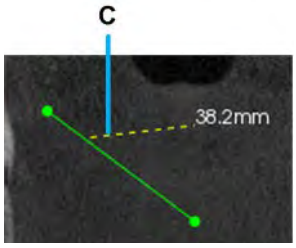
1 Click on the measurement label, and drag it to a new position.

A dotted leader line linking the label to its shape appears (**B**).



2 Release the mouse button.

The label is repositioned with a dotted leader line (**C**) linking it to its measurement shape.



Note:
- If you drag the measurement annotation back to its original start point, it will snap back into position.
- You can change the color of the leader line in the "Color Preferences".

Adding Annotations (Pointers) to Images

In the **Review** tab, you can use annotations in an image to draw attention to anatomical details.

Note:
- To cancel a drawing operation, press the **ESC** key.
- You can include up to 10 annotations in an image.

Adding Pointers

To add an arrow pointer to an image in the **Review** tab, follow these steps:

1 In the **Tools** pane in the tool bar, click .

The button is displayed in blue. If this icon is not visible, it may have been replaced by another measurement icon in the same icon group. Click the white arrow below the icon group button to expand it and display all the buttons in the group. See "Overview of Tools Pane Features".

2 Click on the image to place the pointer arrow head.

3 Drag your mouse pointer and click again to set the end point.

The pointer is added to the image and an annotation entry is added to the **Annotations** pane in the object list in the **Tools** pane. See "Using the Object List in the Tools Pane".

To add multiple pointers to an image in the **Review** tab, click .

This tool works in the same way as the single arrow pointer tool, but remains activated so that you can add more pointers without having to reselect the tool each time.

Adding Pointers With Text Captions

To add a pointer with a text caption to an image in the **Review** tab, follow these steps:

1 In the **Tools** pane in the tool bar, click .

The button is displayed in blue. If this icon is not visible, it may have been replaced by another measurement icon in the same icon group. Click the white arrow below the icon group button to expand it and display all the buttons in the group. See "Overview of Tools Pane Features".

2 Click on the image to place the pointer arrow head.

3 Drag your mouse pointer and click again to set the end point.

The pointer is added to the image with a numbered caption and the **Annotations properties** window appears.

4 In the **Annotations properties** window, do one of the following:

- Enter the caption text for the new arrow (up to 160 characters).
- If you have created predefined captions, the **Predefined text** drop-down list and **Fill** button are enabled.
  Click the drop-down to select a predefined caption name, then click **Fill** to insert the full caption text into the **Annotation properties** window.

5 Click **OK** to save the annotation caption.

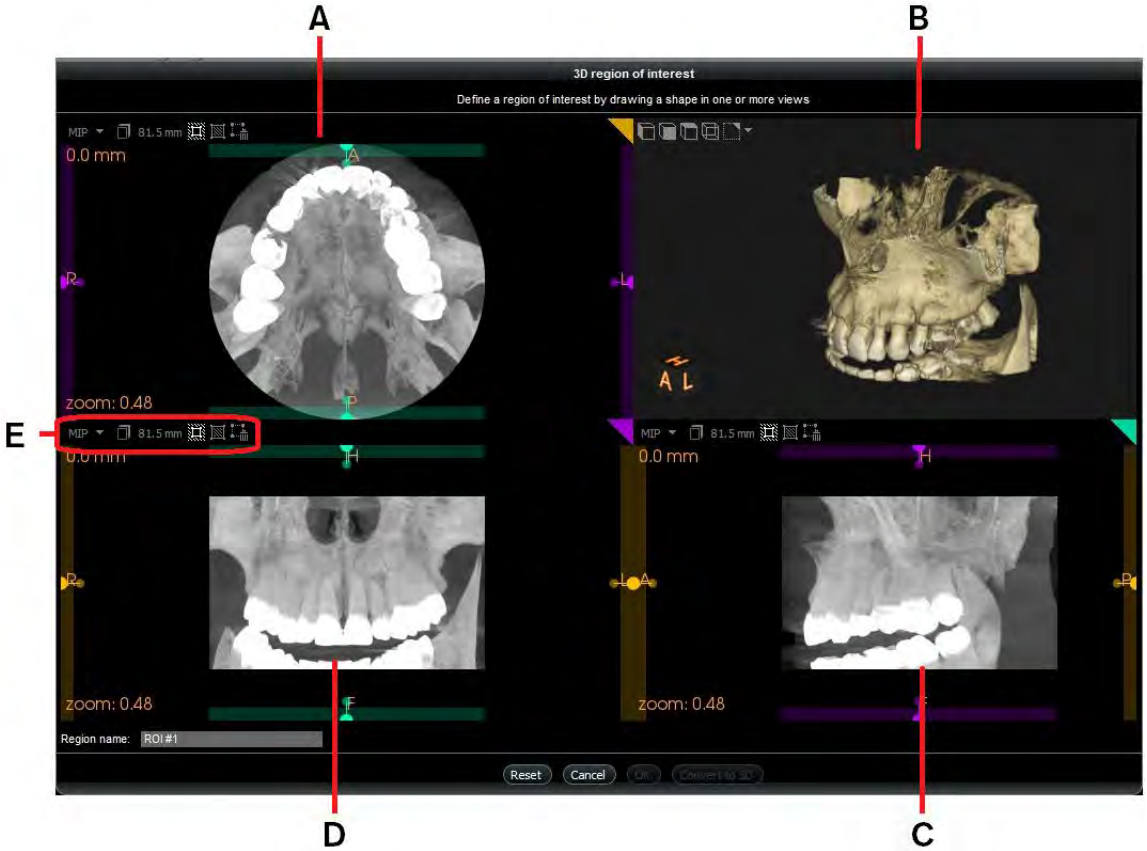
> **Note:** To avoid obscuring image detail, the text caption is not displayed on the image. It is displayed under the image when printed in **Film Composer**, using a numbered footnote that links the pointer with the caption.

To add multiple pointers with captions, click .

This works in the same way as the single arrow pointer tool, but stays activated so that you can add more pointers without having to reselect the tool each time.

Using the Custom Region of Interest Tool (2D)

The **2D region of interest** tool allows you to customize region of interest (ROI) shapes in 2D MPR images. These shapes combine together to build up a region of interest that customizes your 3D view.



A C D	**2D MPR views** Each 2D MPR view is set to the maximum slice integration (slice thickness is same as the dimension of the volume). Use these views to draw ROI shapes. The 2D MPR views have individual toolbars (**E**) that allow you to manage slice settings and manage ROI shapes drawn in the view. **Note:** You can zoom these views using your mouse scroll wheel.
B	**3D View** This is displayed in parallel projection, not perspective projection, so near-field objects appear the same size as distant objects. Use this view to examine the results of the combined ROI shapes drawn in **A**, **C** and **D**. **Note:** You can zoom, pan and rotate in the 3D view.
E	**View screen toolbar** Use this to manage slice settings and ROI shapes for the selected view.

Once a shape has been drawn, if required you can click the **Convert to 3D** button to continue editing in the **3D region of interest** tool. See "Using the Custom Region of Interest Tool (3D)".

Important: Each 2D MPR view screen is set to the maximum slice integration (slice thickness is same as the dimension of the volume).

Drawing a 2D Region of Interest Shape

To draw a region of interest shape using the **2D region of interest** tool, follow these steps:

1 In the **Tools** pane in the tool box, click .

If this icon is not visible, it may have been replaced by another icon in the same icon group. Click the white arrow below the icon group button to expand it and display all the buttons in the group. See "Overview of Tools Pane Features".
The **3D region of interest** window appears.

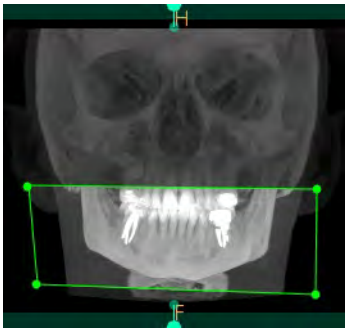
2 In the **3D region of interest** window, move your mouse pointer over a 2D MPR view and click on the image to set the start point of the region of interest shape.

3 Move your mouse pointer and click again to set a vertex.

A white line appears as you move your mouse pointer, and when you click to set a vertex, the completed line segment is displayed in color (green for preserve inside, red for remove inside).

4 When you have completed the shape, double-click to complete the shape.

The completed region of interest shape is displayed.



The 3D view is updated, so that only the region of interest shape is displayed in the 3D view.

5 If you want to remove the entire region of interest and start again, click the **Reset** button.

6 If you want to name the region of interest, in the lower corner of the **3D region of interest** window, click in the **Region name** field and enter a name for the new region of interest.

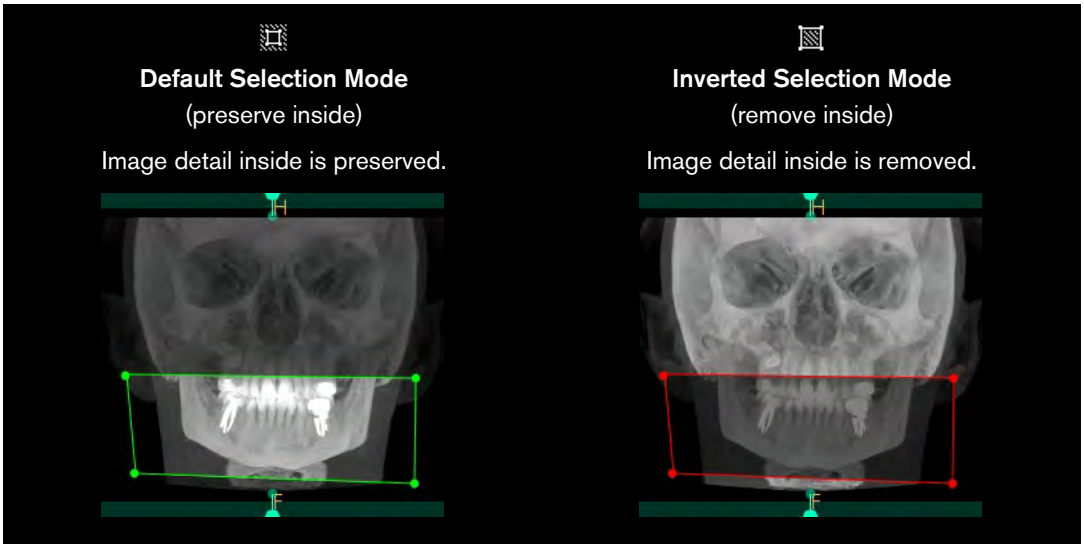
This name will appear in the **Region of interest** object list in the **Tools** pane when you save the region of interest. For more information on the object list, see "Using the Object List in the Tools Pane".

7 Click **OK** to save and close the **3D region of interest** window.

The new region of interest is added to the **Region of interest** object list in the **Tools** pane.

Inverting the Selection in a 2D Region of Interest

When you draw a shape, there are two selection modes available, the preserve inside or remove inside.



By default, the **2D region of interest** shapes preserve image detail inside the shape and exclude image detail outside. This function can be inverted to remove image detail inside the shape.

To invert the selection mode, follow these steps:

1 In the **3D region of interest** window, draw a region of interest shape.

The shape is displayed in green (default selection mode), and image detail inside the shape is preserved.

2 Click in the 2D MPR view toolbar to activate inverted selection mode.

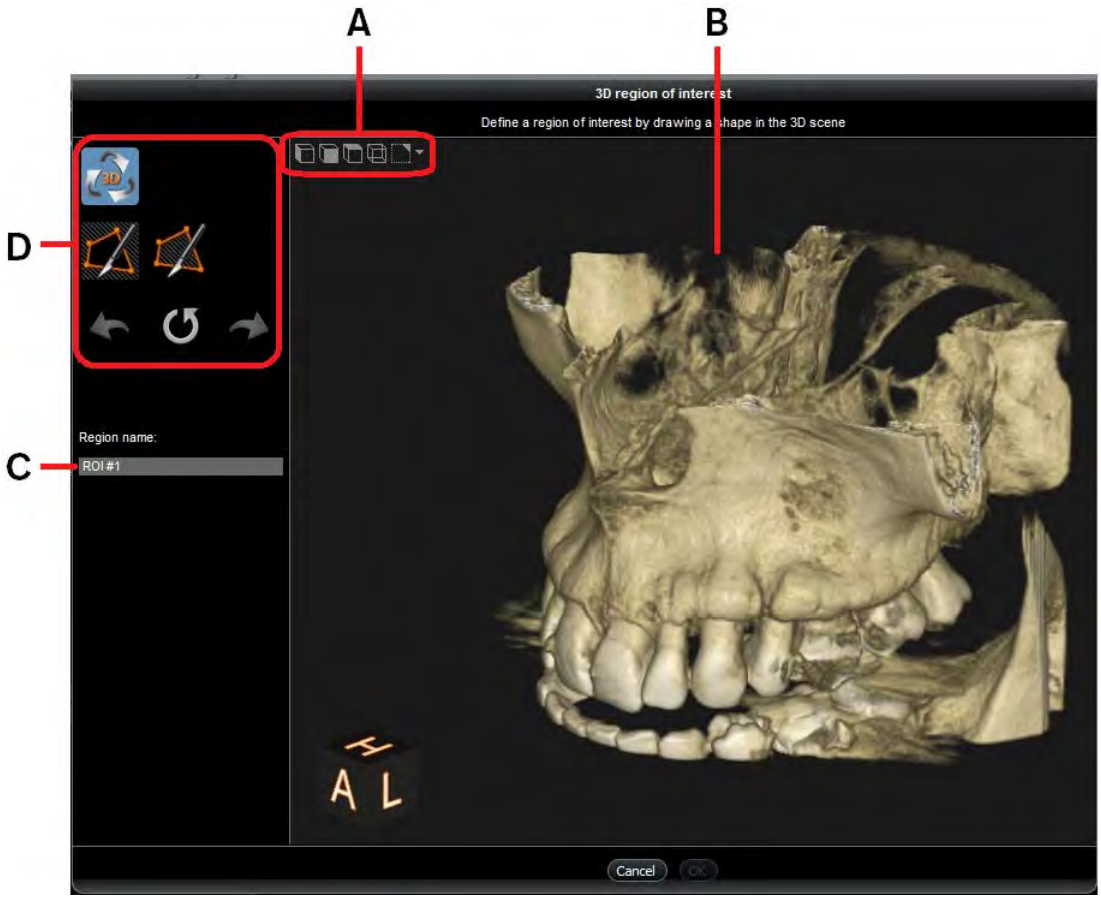
The icon is activated to show that inverted selection mode has been selected. The region of interest shape is displayed in red, and image detail inside the shape is removed.

3 To go back to default selection mode, click .

The inverted selection mode is deactivated, and the shape is displayed in green.

Using the Custom Region of Interest Tool (3D)

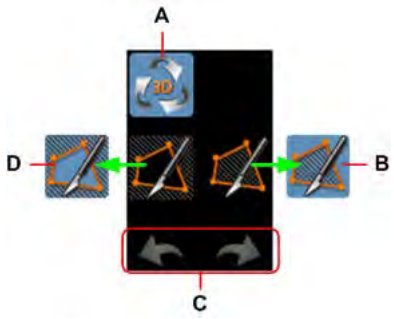
In the **3D region of interest** tool, you can draw region of interest shapes directly on the 3D view.



A	**3D View Screen** toolbar
B	**3D view** This is displayed in parallel projection, not perspective projection, so near-field objects appear the same size as distant objects. Use this view to examine the results of the combined ROI shapes. **Note:** You can zoom, pan and rotate this 3D view. See "Using the 3D View Screen".
C	**Region of interest** name field Use this to save your ROI with a name for future use.
D	**3D region of interest** tools pane See "Drawing a 2D Region of Interest Shape".

Drawing a 3D Region of Interest Shape

The **3D region of interest** window contains a **Tools** pane.



A	**Rotate 3D** view mode. Displayed in blue when active. When this is inactive, and a **Shape** mode is activated, you cannot rotate the 3D view.
B	**Shape** button (preserve inside). Displayed in blue when active.
C	**Redo** and **Undo**. These are activated once you have started drawing a shape.
D	**Shape** button (remove inside). Displayed in blue when active.

To draw a region of interest shape with the **3D region of interest** tool, follow these steps:

1 In the **Adjustments** pane in the tool box, click .

If this icon is not visible, it may have been replaced by another icon in the same icon group. Click the white arrow below the icon group button to expand it and display all the buttons in the group.

The **3D region of interest** window appears.

2 In the **3D region of interest** window, click on the relevant shape button (**B** or **D** above). The selected shape mode is activated, and the selected button is displayed in blue.

3 Move your mouse pointer over the 3D view and click on the image to set the start point of the region of interest shape.

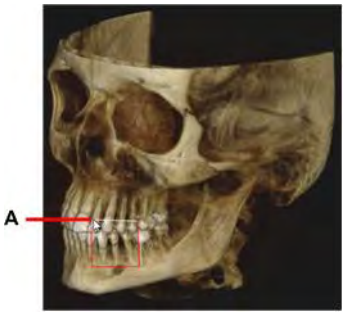
The following example uses button **D** (**Shape**) to remove the inside.

4 Move your mouse pointer and click again to set a vertex.

A white line appears as you move your mouse pointer.

When you click to set a vertex, the completed line segment is displayed in red.

Keep going until you have completed your shape, then double-click to complete the shape (**A**).



The completed shape cuts a hole in the volume (**B**). By rotating the 3D view, you can see that the new shape has created an extruded hole into the volume (**C**).

5 To remove the entire region of interest and start again, click the **Reset** button.

6 To name the region of interest, click in the **Region name** field (**A**) and enter a name for the new region of interest.

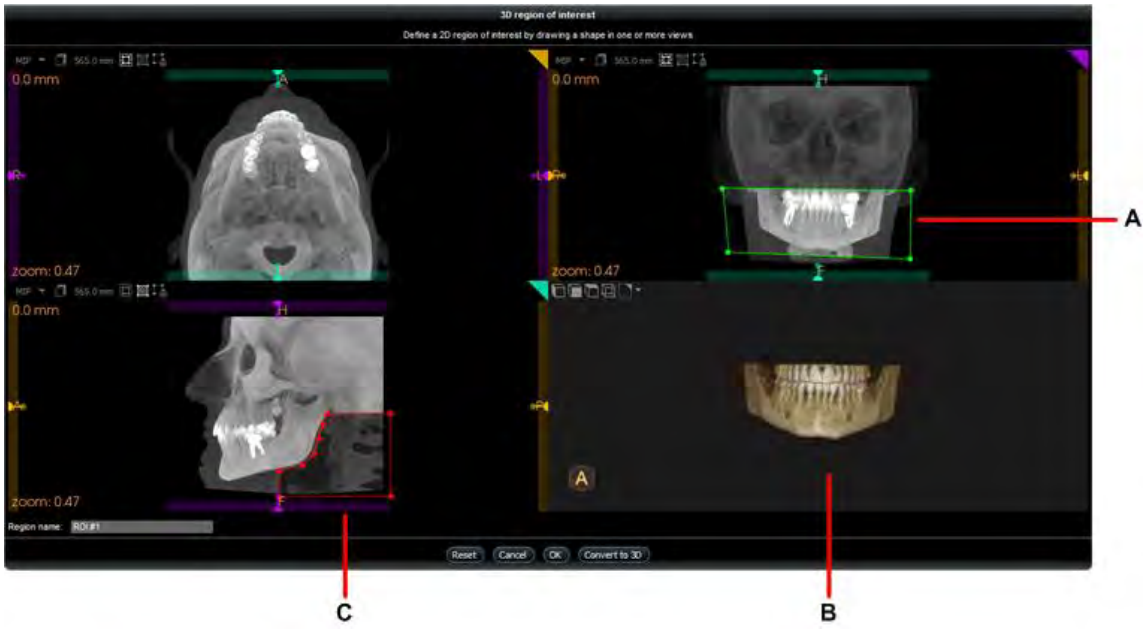
This name will appear in the **Region of interest** object list when you save the region of interest.

7 Click **OK** to close the **3D region of interest** window and return to the tab.

Your new region of interest is added to the **Region of interest** object list in the **Tools** pane.

Combining Region of Interest Shapes

By drawing multiple region of interest shapes, you can combine them to create the effect you want on the 3D view.



In this example, an inverted region of interest (**C**) has been added to conceal the spinal column.

This works in conjunction with the original region of interest shape (**A**) to create a cleaner 3D view (**B**).

Note: You can also combine saved regions of interest using the show/hide icons (**A**) in the object list.

means the region of interest has been activated in the 3D view.

means the region of interest has been deactivated in the 3D view.

Tip: To delete a region of interest shape, in the **3D region of interest** window, click for the 2D MPR view.

Editing a Region of Interest

To edit a saved region of interest, follow these steps:

1 In the **Tools** pane in the tool box, click .

The **Tools** pane expands to display the object list.

2 In the object list, select **Region of interest** from the drop-down list.

All existing regions of interest in the volume are listed.

3 Click alongside the region of interest you want to edit.

The selected region of interest is displayed in the **3D region of interest** window.

Note: The type of ROI is shown by the 2D or 3D label (**A**) next to the show/hide icon.

Deleting a Region of Interest

To delete a saved region of interest, follow these steps:

1 In the **Tools** pane in the tool box, click .

The **Tools** pane expands to display the object list.

2 In the object list, select **Region of interest** from the drop-down list. All existing virtual scalpel regions of interest in the volume are listed.

3 Click alongside the region of interest you want to delete. The selected region of interest is deleted, and the 3D view is updated.

Tip: To delete a region of interest shape, in the **3D region of interest** window, click for the 2D MPR view.

The Export Pane

In the **Export** section, you can find tools that you can use to export images and tab configurations.

The table below gives a brief description of the tools available in the **Export** section. These tools are described in greater detail in "Using Export Functions".

Tool	Tab
Patient Analyses	**Patient Analyses** allows you to save views and settings for a patient, including drawings, measurements and other objects. Available in the following workspace tabs: **Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** See "Using Patient Analyses".
Cross-Sections	The **Cross-Sections** export tool creates a series of slices in the 3D volume of a selected region of interest that can be reviewed on the **Review** workspace tab or printed using **Film Composer**. Available in the following workspace tabs: **Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** See "Generating a Cross-Section".
Implant Planning Reports	Generate a patient **Implant Planning Report** using the dedicated report generation tool located in **Export** tools. Available in the following workspace tab: **Curved Slicing** See "Generating an Implant Planning Report".
Printing	Launches the dedicated print application **Film Composer**. Available in all workspace tabs. See "Printing with Film Composer".
Volume Converter	You can use the **Volume Converter** to export the current 3D volume for use in third party DICOM software. Available in the following workspace tabs: **Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** See "Exporting a Volume".
Virtual Ceph	You can use the **Virtual Ceph** export tool to generate integrated lateral, facial and axial views. Available in the following workspace tab: **Orthogonal Slicing**

Tool	Tab
Workspace Screenshots	You can use the **Workspace Screenshot** tool to create a workspace tab screenshot to add the **Gallery**. **Note**: You cannot use this tool to create a DICOM image. Available in the following workspace tabs: **Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** See “Creating a Workspace Screenshot”.
Screenshot Folders	You can use this tool to access the folder (directory) on your computer containing images in current view screens, or that you have created using the DICOM Snapshot or **Workspace Screenshots** tools. Image files are saved to folder as specified in the **Export** preferences. Available in the following workspace tabs: **Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** See “Opening the Screenshot Folder”.
CD Export **USB Export**	You can use **CD Export** to burn a copy of the 3D volume to a CD. Available in the following workspace tabs: **Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** See: "Exporting to a Compact Disc". "When all data has been copied to the disc, it is automatically ejected from the computer. When you give the disc to someone else, make sure that the recipient is aware that they need to launch ViewData.exe.". **Note:** These tools belong to an icon group. See “Using Icon Groups”.

Using Icon Groups

In the toolbox, related tools are grouped together. For example, the line drawing functions are grouped together.

You can recognize an icon group by the white arrow (**A**) below the icon.

The white arrow beneath the icon indicates that this icon can be expanded to display other icons in the group.

To expand an icon group and select a different icon in the group, follow these steps:

1 Click the white arrow (**A**). The icon group expands to show all member icons in the group.

2 While the icon group is expanded, click the icon you want to use.

The selected icon becomes the active icon (displayed in blue) for the icon group, replacing the previous icon in the toolbar.

Working With View Screens in the Workspace Tabs

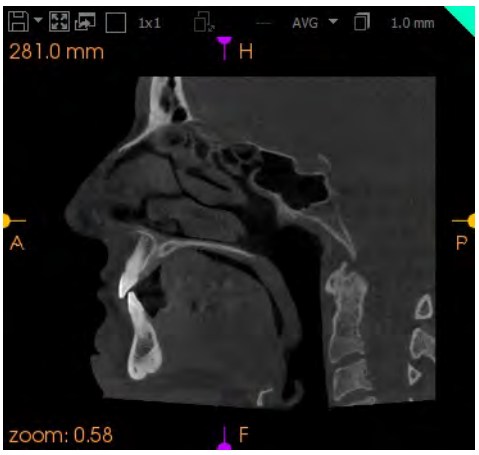
This section describes the general functions of the main view screens that you can view in the workspace tabs.

The 3D View Screen

The **3D View Screen** displays a rotatable, three-dimensional view of the acquired volume.

See “Using the 3D View Screen”.

The 2D MPR View Screens

Axial Plane	The axial plane shows the horizontal plane and can be moved up and down.	
Coronal Plane	The coronal plane shows the vertical plane and can be moved front to back.	
Sagittal Plane	The sagittal plane shows the vertical plane and can be moved side to side.	

Each 2D MPR view screen has a colored triangular tag in the top right corner. These colors are important because they identify 2D MPR slice planes throughout the system.

For example the **Sagittal Slice View Screen** is identified by a green tag ( ). Therefore, on both the **Axial Slice View Screen** and **Coronal Slice View Screen**, the position of the sagittal plane is shown by green handles at the edges of the view screen.

View Screen Toolbars

Each view screen has a toolbar at the top (**A**).

The following buttons are available in a view screen toolbars, depending on the view screen you are viewing.

DICOM Snapshot	Click this button to create a snapshot of the selected view screen in the **Gallery**. Click the drop-down arrow alongside this button to toggle to the **View Snapshot** button. **Note:** These are saved as DICOM files in the screen captures folder. See "Opening the Screenshot Folder".
View Snapshot	Click this button to create an image of the selected view screen in the **Gallery**. Click the drop-down arrow alongside this button to toggle to the **DICOM Snapshot** button. **Note:** These are saved as image files in the screen captures folder in the format specified in the "Export Preferences". See "Creating a Workspace Screenshot".
Maximize	Click this button to maximize the view screen. All other view screens will be reduced and displayed on the right side of the tab.
Minimize	Click this button to restore the maximized view screen to normal size. **Note:** This button is only visible in a view screen that has been maximized.
Dual Screen	Click this button to open the view screen in a separate window which you can then drag to another monitor (if you are using two or more monitors).
Split View	Click this button to change the arrangement of slices displayed in the view screen to **1x1**, **3x3**, **5x5**, **1x3**, **3x1**, **1x5**, or **5x1**. See "Using Split Views in 2D MPR Views". **Note:** This setting is not available in the **3D View Screen**.
Split Spacing	Click this button to adjust the spacing between slices when the **Split View** option is set to **3x3**, **5x5**, **1x3**, **3x1**, **1x5**, or **5x1**. See "Changing the Slice Spacing in 2D MPR View Screens". **Note:** This is inactive when the **Split View** option is set to **1x1**.
Set Integration	Click this button to increase or decrease the slice thickness. **Note:** This is only active when the **Split View** option is set to **1x1**. See "Changing Slice Thickness".
Set Integration Mode	Click this button to set the integration mode between slices. You can choose from Averaging [**AVG**] and Maximum Intensity Pixel/Projection [**MIP**]. You can use this tool to artificially enhance contrast to increase the visibility of denser structures in the anatomy (for example cortical bone, enamel metal), which is useful for visualizing impacted or supernumerary teeth or for use in orthodontic pseudo-cephalometry. **Note:** This tool is only active when the **Split View** option is set to **1x1**. If you select the **MIP** integration mode, then you need to set the **Set Integration** value to greater than **300µm**.

Additional Buttons Available in the 3D View Screen

Sagittal Orientation	Click this button to display the 3D image from the sagittal orientation. The image is displayed as if the patient is looking to the left or right, depending on the "View Orientation Preferences".
Coronal Orientation	Click this button to display the 3D image from the coronal orientation. The image is displayed as if the patient is looking towards you or away from you, depending on the "View Orientation Preferences".
Axial Orientation	Click this button to display the 3D image from the axial orientation. The image is displayed from underneath, looking up or from above, looking down, depending on the "View Orientation Preferences".
Perspective Orientation	Click to reset the **3D View Screen** to the default perspective orientation. The image is displayed so that the front, top, and left sides are visible.
Planes	Click to display the current planes setting or select another planes setting from the drop-down list. None WireFrame MPR Color See "Displaying MPR Planes".

Creating a DICOM Snapshot

To create a DICOM snapshot of a view screen, click in the view screen toolbar. A thumbnail of your snapshot is added to the **Gallery**.

Note: You toggle between this button and the view screen snapshot button ( ). See "Creating a View Screen Screenshot" for information about this button.

In the "Export Preferences", you can define the location in which you want a copy of DICOM files to be saved.

Tip: CS 3D Imaging also provides the following methods for creating snapshot images:

- To create a screenshot of a view screen, click in the view screen toolbar.
- To create a slice series, see "Using Split Views in 2D MPR Views".
- To create a slice series with locator images, see "Generating a Cross-Section".

Understanding the Numerical Information on 2D MPR View Screens

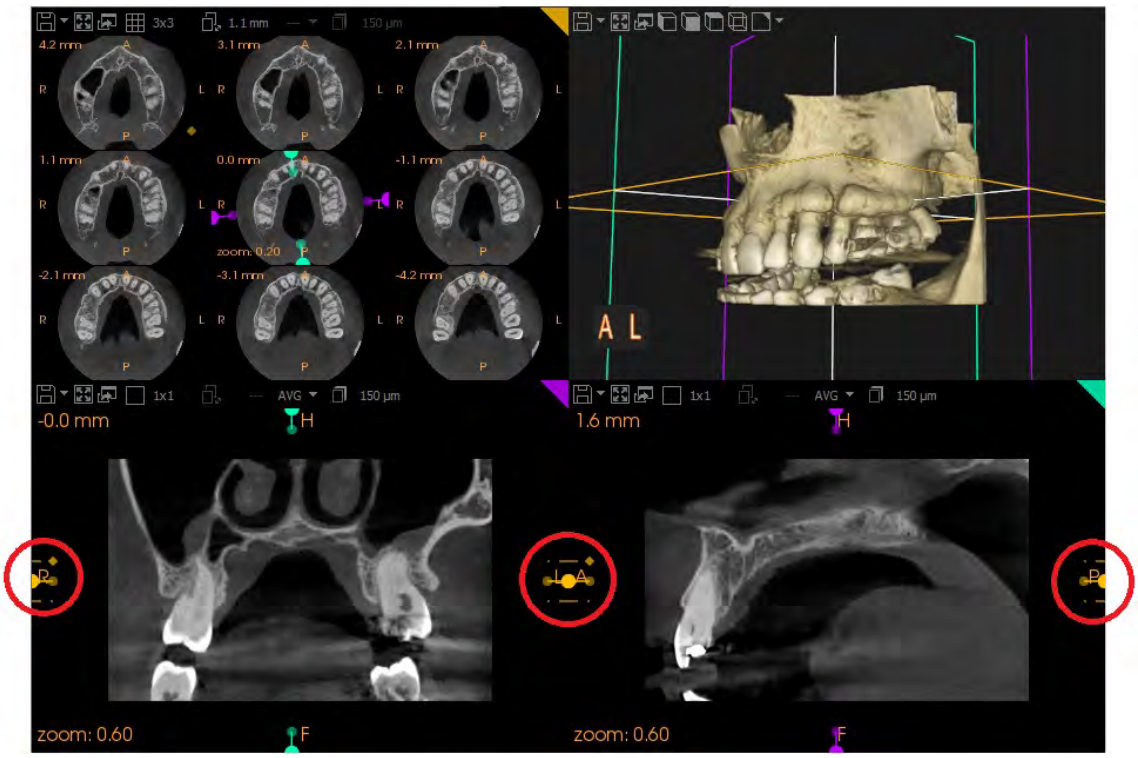
Each of the 2D MPR view screens displays numerical information.

A	**Slice Plane Position**	The absolute position of the slice within a 3D volume. **Note:** • If you have set your mouse wheel to **Slide** in the **Mouse** tool in the tool box, then when you scroll your mouse wheel, this number will increase or decrease as you scroll through different slices in the 2D MPR view screen. • When you set the position to **0mm** the extreme right of the patient for the **Sagittal Slice View Screen**, the very bottom for the **Axial Slice View Screen** and the very front for **Coronal Slice View Screen** are displayed.
B	**Slice Thickness**	The thickness of the current slice. You can change the slice thickness by clicking on this icon. See "Changing Slice Thickness".
C	**Zoom Number**	The amount of the original image represented in the viewing frame. The same zoom number is applied to all of the 2D MPR view screens. A zoom number of 1.0 means each pixel is displayed. A zoom number of 2.0 means that each original pixel has been replaced by two pixels in the zoomed image. **IMPORTANT**: A zoom number of 1.0 does not mean the image has been zoomed to 100%.

Understanding Slices in 2D MPR View Screens

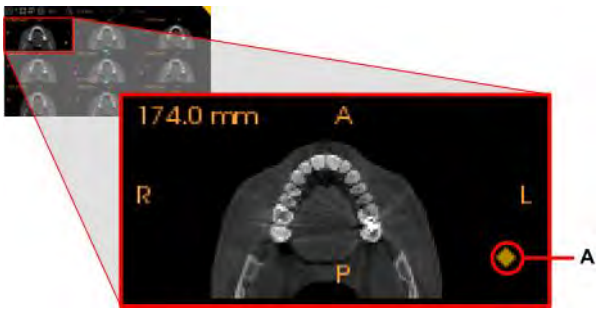
When a 2D MPR view screen contains multiple slices (split view), its slice plane is displayed differently in other 2D MPR view screens.

For example, if the **Axial Slice View Screen** has been split to a 3x3 display, the axial plane handles change in the other 2D MPR view screens (circled in red in the image below).

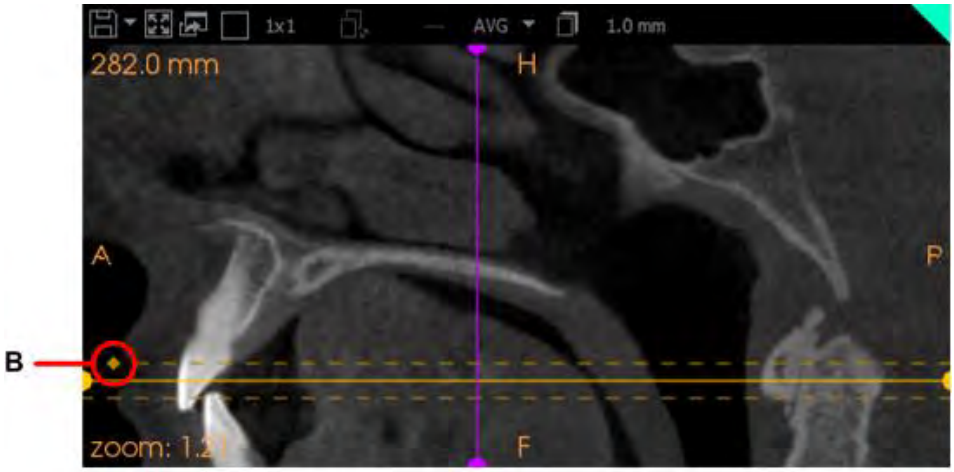


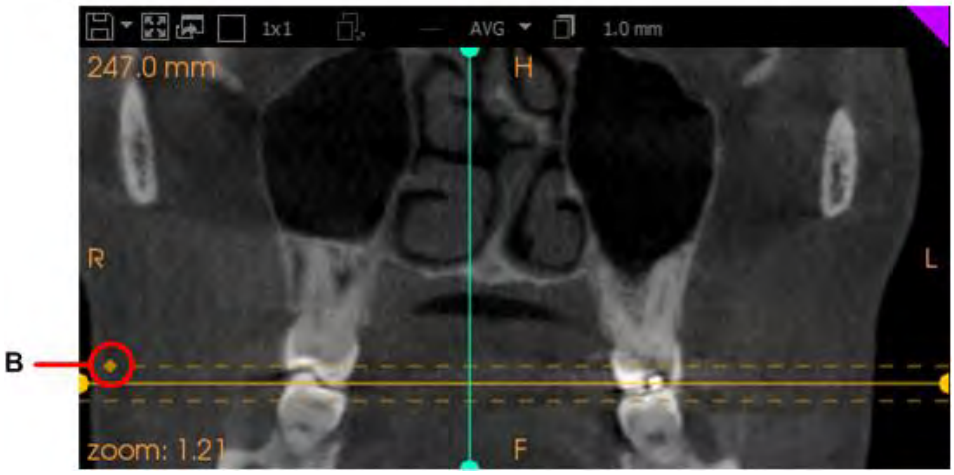
The yellow handles now have yellow lines above and below to indicate that the **Axial Slice View Screen** is displaying a series of slices.

Also the handle in the middle circle in the image above has ◆ added to it. This is the first slice identifier, which identifies the position of the first slice in the series. This identifier is also displayed on the first slice of the split view (see **A** below).



When you click on one of the axial slice handles in the other 2D MPR view screens, dotted lines are displayed to show the location of the axial slice series.





The first slice identifier (**B**) is displayed alongside the first slice in the series.

For information on configuring the order of the slices in the split view, see "View Order in Split Views Preferences (Imaging Center Software Only)".

Changing Slice Thickness

Each 2D MPR view screen displays images of slices in the volume. When the **Split View** option is set to **1x1**, you can change the thickness of the slice displayed.

To change slice thickness, follow these steps:

1 In a 2D MPR view screen, make sure the split view is set to **1x1**.

2 In the view screen toolbar, click 1.0 mm.

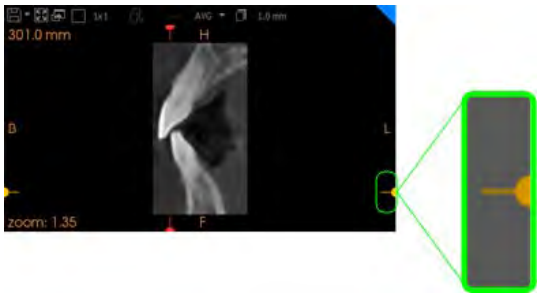
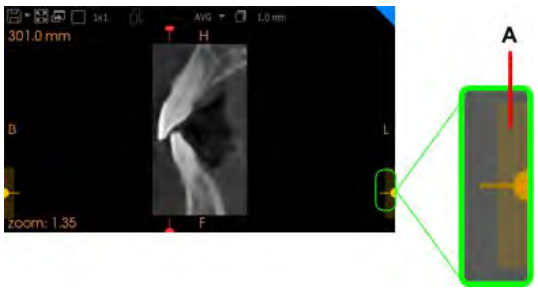
A drop-down list of different slice thicknesses appears.

3 Select a slice thickness.

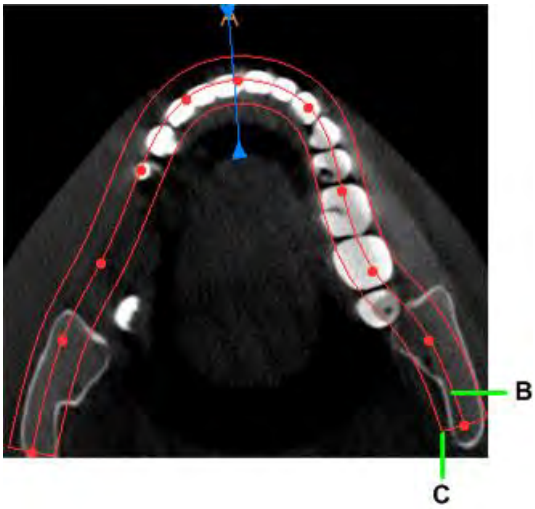
For example, if the axial slice thickness changes from **1.0 mm** to **45.0 mm**, the image changes to shoe the new slice thickness.

Axial slice at 1.0 mm thickness	Axial slice at 45.0 mm thickness

The axial slice handles are changed in the other views. The color-coded shading (**A**) shows that the slice thickness has changed.

Axial slice thickness = 1.0 mm	Axial slice thickness = 45.0 mm
	

The shaded block above (**A**) is used to represent thicker slices in the 2D MPR view screen. In other non-orthogonal, specialized view screens (for example, the jaw arch/temporal bone view screen on the **Curved Slicing** tab) slice thickness is represented as a solid line (**C**) drawn around the curve plane (**B**).



Moving and Tilting Slice Planes in 2D MPR View Screens

The slice plane indicators in 2D MPR view screens can be used as handles to move the slice planes through the volume.

You can move 2D MPR slice planes in the following ways:

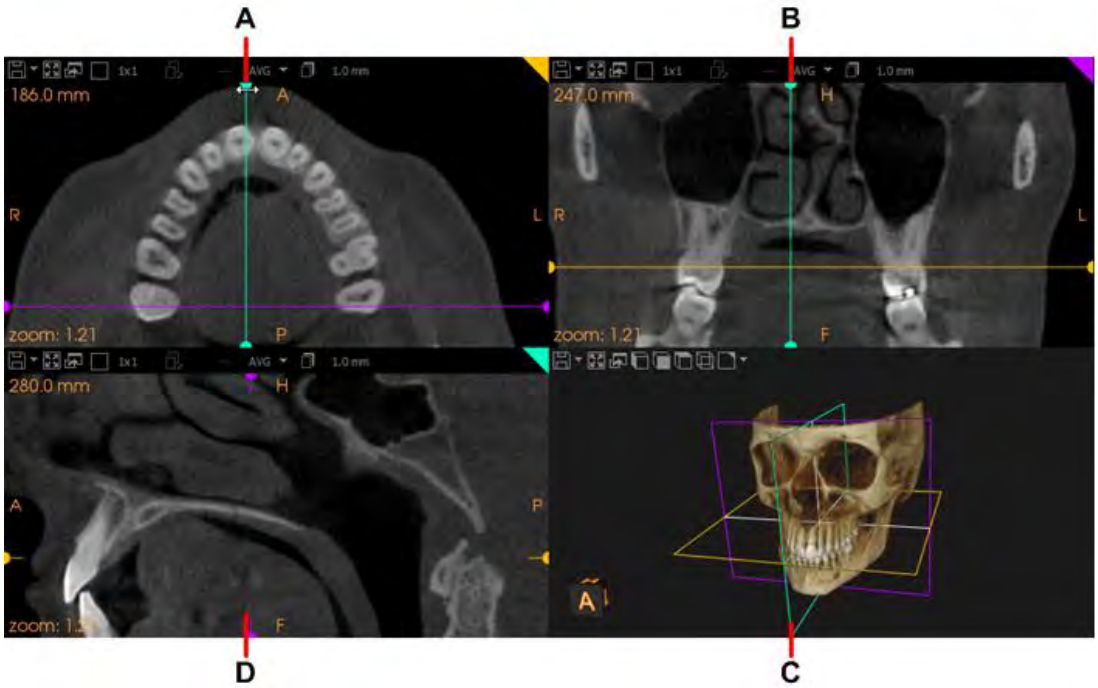
- To quickly move a slice plane through the volume, click and drag on a handle. See "Moving a 2D MPR Plane Using a Handle".
- To fine-tune the slice plane position by scrolling through the volume one slice at a time, set the Mouse wheel preference to Slide in the tool box, and the scroll your mouse wheel over a 2D image. See "Moving a 2D MPR Plane by Scrolling ("Sliding") in the Orthogonal Slicing Tab".
- To triangulate all three 2D MPR slice planes on a point, click and hold your mouse pointer and use the scroll wheel.
- In the **3D View Screen**, right-click and drag on a slice plane. See "Repositioning MPR Planes in the 3D View Screen".

Moving a 2D MPR Plane Using a Handle

You can use this method to quickly move a slice plane to the approximate position you want.

For example, to quickly move the sagittal slice plane, follow these steps:

1 On the **Orthogonal Slicing** tab, click the sagittal slice plane handle in the **Axial Slice View Screen** (**A**).



The mouse pointer changes to and full length slice planes are displayed in the **Axial Slice View Screen** and **Coronal Slice View Screen** (**A** and **B**).

2 Keep pressing the mouse button and drag the sagittal slice plane handle to move the plane to a new position.

The sagittal slice plane moves in the **Axial Slice View Screen**, **Coronal Slice View Screen** (**A** and **B**), and **3D View Screen** (**C**).

The image displayed in the **Sagittal Slice View Screen** (**D**) changes as you move the view screen plane.

3 When the **Sagittal Slice View Screen** displays what you are looking for, let go of the mouse button.

The slice planes in the **Axial Slice View Screen** and **Coronal Slice View Screen** revert to normal handles.

You can also use the **Slide** method to accurately move the plane to the exact location.

Moving a 2D MPR Plane by Scrolling ("Sliding") in the Orthogonal Slicing Tab

To move the slice plane through a volume one slice at a time using the scroll wheel on your mouse, follow these steps:

1 Make sure your **Mouse** wheel settings are set to **Slide** and not **Zoom** in the **Adjustments** pane in the tool box.

> **Note:** To control slide direction, see "View Order in Split Views Preferences (Imaging Center Software Only)".

2 On the **Orthogonal Slicing** tab, click in a view screen and scroll your mouse wheel.

As you scroll your mouse wheel, the view screen view shifts through the volume and the view screen indicators move in the other view screens.

Moving and Tilting the Oblique Coronal Slice Plane in the Oblique Slicing Tab

In the **Trace View Screen**, the oblique coronal slice plane has two handles, (**A**) and (**B**) at each end that allow you to move and tilt the slice plane in the **Trace View Screen** and **3D View Screen**.

In the **Oblique Slicing** tab, you can tilt the plane of the **Coronal Slice View Screen** (also referred to as the cross-section or trans-axial view screen).

This allows you to align the plane with anatomical features in the 3D volume.

In the **Trace View Screen**, do any of the following:

- To move the plane of the oblique coronal slice along the trace, click and drag a blue handle (**A**).
- To tilt the plane of the oblique coronal slice, click and drag the round handle (**B**).

> **Note:**
> - You can also move the plane of the oblique coronal slice along the trace by clicking in the **Coronal Slice View Screen** and moving your mouse scroll wheel. See "Tilting the Slice Planes in the Oblique Slicing Tab".
> - You can track the position of the oblique coronal slice by watching the blue line moving along the curve in the other view screens as you move the mouse scroll wheel.

Adjusting the Width of Lateral View Screens

Lateral (or cross-section) view screens are displayed on the **Axial Slice View Screen** in both the **Curved Slicing** and **Custom Slicing** workspace tabs.

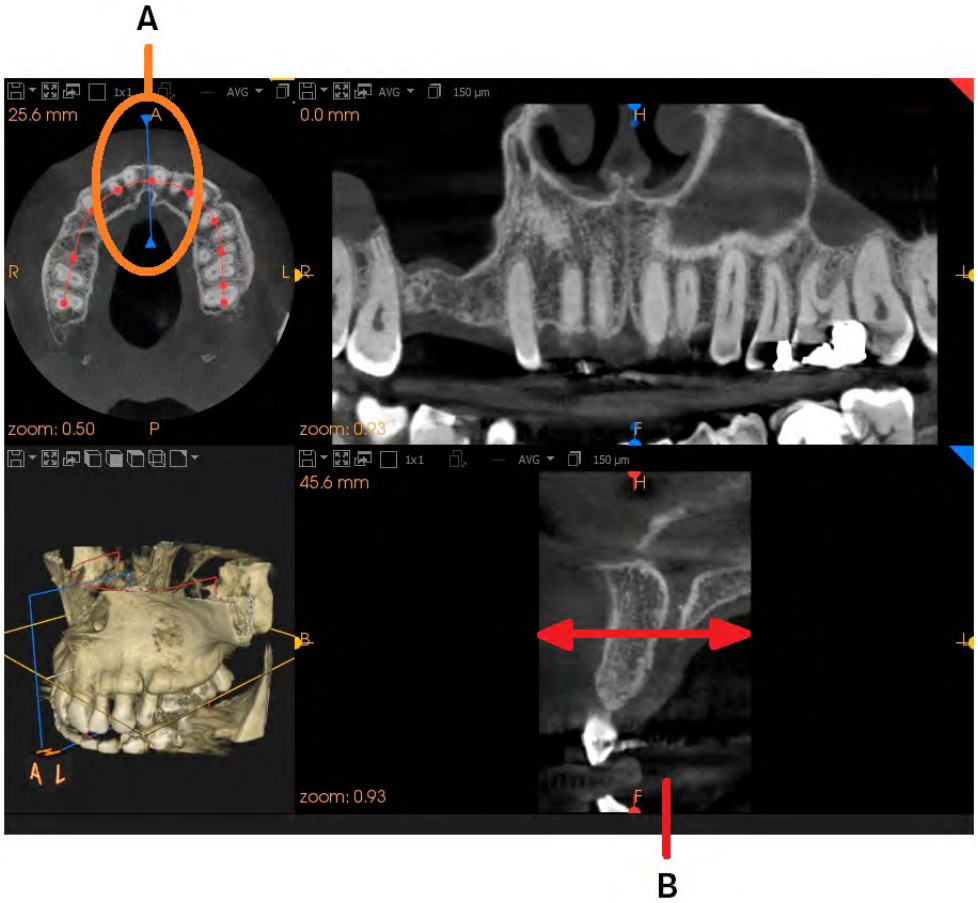
Lateral view screens can be identified by triangular handles (**A**).

To adjust the width of a lateral view screen, follow these steps:

1 In the **Tools** pane in the tool box, click .

The icon is displayed in blue to show that the tool has been activated.

2 In the **Axial Slice View Screen** in the **Curved Slicing** or **Custom Slicing** tab, click on a triangular handle on the blue line (**A**) and drag to adjust the width of the lateral slice.



The width of the corresponding view screen (**B**) is adjusted.

Using Split Views in 2D MPR Views

Each 2D MPR view screen displays images of slices in the volume. In a 2D MPR view screen, you can also view an array of multiple slices in a split view.

When a 2D MPR view screen has been split, the view screen toolbar displays an icon that allows you to set the slice spacing. See "Changing the Slice Spacing in 2D MPR View Screens".

To display a **Split View** in a view screen, follow these steps:

1 In the view screen toolbar, click

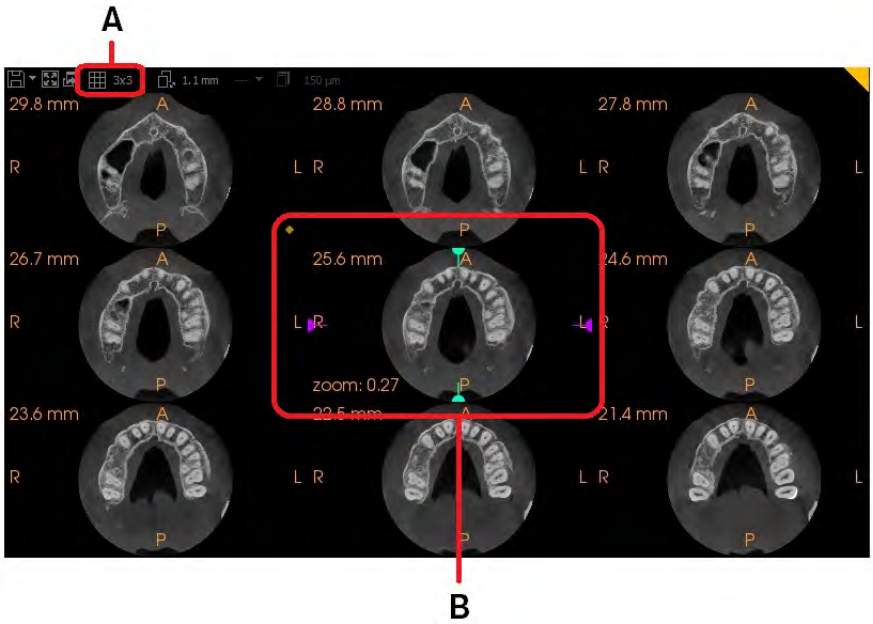
(see **A** below).

A drop-down list of different **Split View** options is displayed.
This icon displays the current **Split View** setting, for example if the current split view is **1x1**, the icon is displayed like this:

.

2 Select the **Split View** you want to use.

The view screen display changes to the selected **Split View**.



The MPR slice plane handles (green or purple) are now displayed on the central slice (**B**). When you use split views, the slice order becomes significant. For more information, see "Understanding Slices in 2D MPR View Screens".

> **Note:** In split views, the default slice thickness set at the time the image was acquired is used.

Changing the Slice Spacing in 2D MPR View Screens

When a 2D MPR view screen has been split, a new icon appears in the view screen toolbar which allows you to change the slice spacing. See "View Screen Toolbars".

To change the slice spacing, follow these steps:

1. In the view screen toolbar, click 1.0 mm.

   A drop-down list of different slice spacing options appears, displaying the current slice spacing setting, for example if the current slice spacing is **4.0 mm**, the icon is displayed like this: 4.0 mm

2. Select the **Split View** you want to use.

   The view screen display changes to the selected **Split View**.

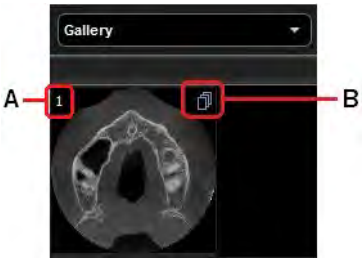
Using the Gallery

The **Gallery** at the bottom of the **CS 3D Imaging** tab displays thumbnails of captured images or slices.

Do any of the following:

- To display the **Gallery**, click ▲ beside the **Gallery** tab at the bottom of the tool box.
- To open an image in the **Gallery**, double-click on the thumbnail. The image is displayed on the **Review** tab.
- To hide the **Gallery**, click ▼ beside the **Gallery** tab at the bottom of the tool box.

You can add images to the **Gallery** in the following ways.

Function		Gallery result
	DICOM Snapshot	Located in the view screen toolbar, click this icon to add a DICOM image of the selected view screen to the **Gallery**. This icon is in an icon group with the **Screenshot** icon. To toggle between these icons, use the little arrow next to the icon. **Note:** If the view screen has been split (for example into a **5x5** split view), when you click the **DICOM Snapshot** icon, a slice series is added to the **Gallery**. The slice series thumbnail is identified in the **Gallery** with in the top right corner of the thumbnail (**B**).  The first slice in the series is displayed by default. The slice number is displayed in the top left corner of the thumbnail (**A**).
	Screenshot	Located in the view screen toolbar, click this icon to add an image of the selected view screen to the **Gallery**. This icon is in an icon group with the **DICOM Snapshot** icon. To toggle between these icons, use the little arrow next to the icon. The **Gallery** thumbnail shows the icon.
	Workspace Screenshot	Located in the **Export** pane in the tool box of a tab, click this tool to add a TIFF image of the tab to the **Gallery**. See "Creating a Workspace Screenshot". The **Gallery** thumbnail is labelled with .
	Generating a Cross-Section	When you create a cross-section in a 3D volume, a thumbnail of the slice series and two linked locator thumbnails are added to the **Gallery**. The slice series thumbnail shows a icon in the top right corner of the thumbnail. The two associated locator thumbnails show a icon in the top right corner when you click on the slice series thumbnail. The first slice in the series is displayed by default. The slice number is displayed in the top left corner of the thumbnail. See "Generating a Cross-Section".

Displaying and Hiding Image Objects in the Gallery

The thumbnails in the **Gallery** show any objects present in the original image, for example annotations, measurements or locator images for a cross-section slice series.

- To hide image objects, click on the right of the **Gallery** title bar.
- To redisplay image objects, click on the right of the **Gallery** title bar.

Copying Images to Other Software Applications

To copy a screenshot image to another application, click on the **Gallery** thumbnail and drag it onto another open application window.

Note: This does not work for DICOM images.

Deleting Images from the Gallery

To delete images from the **Gallery**, follow these steps:

1 In the **Gallery**, click on a thumbnail.

Tip: Use **Ctrl**+Click to select multiple thumbnails.

Selected thumbnails are displayed with a blue border.

2 On the right of the **Gallery** title bar, click .

A confirmation message appears.

3 Click **Yes**.

The selected images are deleted.

Important:
- Make sure you really want to delete the images you have selected because there is no 'undo' feature available.
- If you delete a slice series, the two locator images are deleted too.

4 Creating Views

Drawing a Trace along a Dental Arch

The **Curved Slicing** tab enables you to draw a trace along the jaw arch or temporal bone, and to display a reconstructed-panoramic view and movable **Coronal Slice View Screen** through the trace.

This section describes the procedure for drawing a trace along the dental arch.

To draw a trace along the temporal bone, see "Creating a Temporal Bones View".

Before you start

- In **CS 3D Imaging**, open the patient image volume on which you wish to trace a dental arch.

Drawing a Trace Along a Dental Arch

To draw a trace along the dental arch of a patient image volume, follow these steps:

1 In the **Curved Slicing** tab, adjust the position of the **axial slice plane** in the **Axial Slice View Screen** to the relevant position in the volume.

To do so, click and drag the slider at the base of the **Axial Slice View Screen** to display the anatomical region you are interested in.

> **Note:** Once the trace has been drawn and you double-click to validate it, the slider will disappear.

If you need to reposition the axial slice once the trace has been drawn, click and drag in the Reconstructed Panoramic/**Trace View Screen** or **Coronal Slice View Screen**.

2 In the **Tools** pane, do one of the following:

- Click to activate the manual tracing tool.

> **Note:** If the **Automatically create an arch** function is enabled in the "MPR Preferences", when you click the **Curved Slicing** tab for the first time, a jaw arch is automatically created for you.

- In the extended scroll list, click to automatically trace a dental arch. When the automatic trace has been drawn, you can fine-adjust the trace manually as required. See "Adjusting a Trace".

The icon is highlighted in blue to show that the tracing tool is activated.
You can disable this function in the “MPR Preferences”.

3 In the **Axial Slice View Screen**, click points along the jaw arch to place the red control points of the trace.

Note: Do not use too many control points to draw your trace. We recommend seven control points for the whole arch.

You can adjust the control points manually after the trace has been drawn. The trace is drawn in red, and the **Reconstructed Panoramic View Screen** and **Oblique Coronal Slice View Screen** are activated and dynamically updated as the trace is drawn.

4 As you finish tracing the dental arch, **double-click** to set the last control point of the trace. The trace is drawn, and an entry is created in the object list in the expanded **Tools** pane.

5 Click to turn off the tool.

Tip: In some cases, if you draw a trace on an image with a large field of view, the software will automatically crop the image vertically during processing. If this happens, you can reposition the region of Interest limits once the trace has been drawn. For more information, see "Using the Basic Region of Interest Tool".

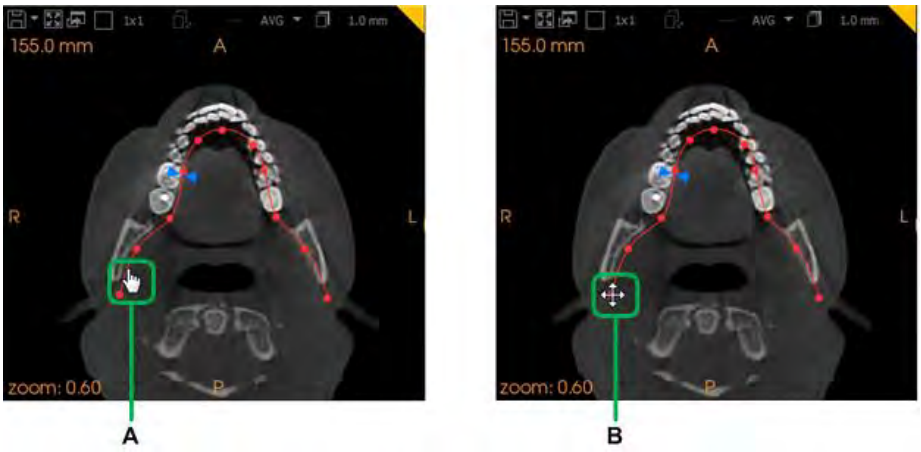
Adjusting a Trace

This section describes how to manually adjust a trace drawn along the dental arch.

To adjust the position of a trace, on the **Axial Slice View Screen**, follow these steps:

1 In the **Tools** pane in the tool box, click to activate the **Select** mode.

2 In the **Axial Slice View Screen**, either click and drag directly on the red trace to move the entire trace (**A**), or click and drag an individual control point to adjust part of the trace (**B**).



3 Click to turn off the **Select** mode.

> **Note:** You can also adjust the position of the trace either by using the red handles in the cross-section view screen or by using the mouse slide function as described in "Moving a 2D MPR Plane by Scrolling ("Sliding") in the Orthogonal Slicing Tab".

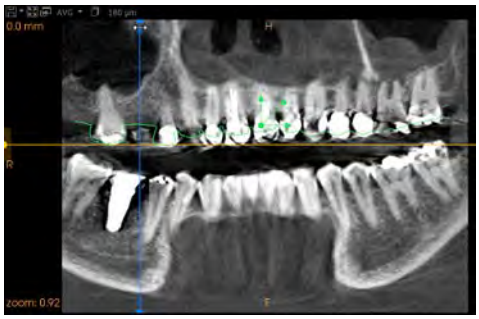
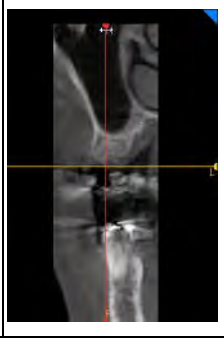
Positioning the Cross-Section Plane

When you trace a dental arch, the following view screens are displayed:

- **Axial Slice View Screen** (**A**)
- Reconstructed-Panoramic View (also known as the '**Trace View Screen**') (**B**)
- **Coronal Slice View Screen** (for cross-sections) (**C**)

The full **Reconstructed Panoramic Image** is displayed in the **Trace View Screen** (**B**) to the right of the **Axial Slice View Screen**, and the **Coronal Slice View Screen** (**C**) is displayed below the **Trace View Screen**.

> **Note:** The cross-section plane (the default color is blue) will appear automatically in the **Axial Slice View Screen** (**A**) once the trace has been drawn.

A Axial Slice View Screen	B Reconstructed Panoramic/Trace View Screen	C Coronal Slice View Screen
		

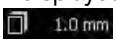
Adjusting the Position of the Cross-Section Plane

To adjust the position of the cross-section plane, follow these steps:

1 In the **Tools** pane in the tool box, click to activate **Select** mode.

2 Use the handles and in the corresponding Reconstructed-Panoramic View and oblique **Coronal Slice View Screen**. The position of the axial slice cross-section plane is updated dynamically in all view screens.

3 Click to turn off the **Select** mode.

> **Tip:**
> - To present the reconstructed-panoramic view displayed in the **Trace View Screen** screen as a traditional panoramic x-ray, click  in the view screen toolbar and select a value of approximately 10 to 15 mm.
> - To cancel a drawing operation, press the **ESC** key.

> **Note:** During manipulation, a view may disappear from other view screens. If this happens, click in the tool box to automatically center all views.

Creating a Reconstructed Panoramic Image

On the **Curved Slicing** tab, you can create a reconstructed panoramic image by drawing a trace along the jaw arch. See "Using the Curved Slicing Tab".

By default, only the **Axial Slice View Screen** and **3D View Screen** are displayed until a trace is drawn.

As each point on the trace is added, the trace image is dynamically updated.

If the **Automatically create an arch** function is enabled in the **CS 3D Imaging Preferences**, when you click the **Curved Slicing** tab for the first time, a jaw arch is automatically created for you. You can disable this function via the **Setting Preferences** window.

> **Note:** In some cases, if you draw a trace on an image with a large field of view, the software will automatically crop the image vertically during processing. If this happens, you can reposition the region of Interest limits once the trace has been drawn. For more information, see "Using the Basic Region of Interest Tool".

To create a reconstructed panoramic image, follow these steps:

1. On the **Curved Slicing** tab, adjust the position of the axial slice plane in the **Axial Slice View Screen** to the relevant position in the volume.

   To move the axial slice plane, click and drag the slider at the bottom of the **Axial Slice View Screen**.

   > **Note:** Once the trace has been drawn in step 3, this slider will disappear. If you need to reposition the axial slice once the trace has been drawn, click and drag in the **Trace View Screen** or Oblique **Coronal Slice View Screen**.

2. In the **Tools** pane in the tool box, click to switch on the **Manual Arch** tool (see also the **Tip** below).

   The button is displayed in blue to show that the tool has been activated.

   > **Note:** If this button is not visible, look for it in an icon group with other tools. See "Using Icon Groups".

3. In the **Axial Slice View Screen**, click points along the jaw arch to place the red control points of the trace.

   > **Tip:** Do not use too many control points to draw your trace. We suggest seven control points for the whole arch.

   The trace is drawn in red, and the **Trace View Screen** and Oblique **Coronal Slice View Screen** are activated as the trace is drawn.
   As each new control point is added, the **Trace View Screen** is dynamically updated. When you reach the end of the jaw arch, double-click to set the last control point of the trace.
   The full Reconstructed Panoramic Image is displayed in the **Trace View Screen** to the right of the **Axial Slice View Screen**.
   You can adjust the control points manually after the trace has been drawn.

The Oblique **Coronal Slice View Screen** is displayed below the **Trace View Screen**, with orientation indicators to show the orientation of the image in the jaw. For more information, see "Using the Orientation Indicator".

Once the trace is drawn, an entry is created in the object list in the tool box.

4 To present the reconstructed-panoramic view as a traditional panoramic x-ray, click 1.0 mm and select a value of approximately 10 to 15 mm.

Tip:

- Use from the same icon group to automatically generate a curved path along the dental arch. You can adjust the control points manually after the curved path has been generated.
- To cancel a drawing operation, press the ESC key.

Tracing a Nerve Canal

To analyze the 3D volume for an extraction or an implant placement, you sometimes need to locate the mandibular nerve. Once you have traced the jaw arch and created a reconstructed-panoramic image, you can use the **Nerve Canal** tool to trace the path of the nerve canal.

There are two methods for tracing a nerve canal:

- "Method 1 - Scrolling Through the Jaw and Tracing as You Go".
- "Method 2 - Displaying the Whole Nerve Canal and Then Tracing".

Method 1 - Scrolling Through the Jaw and Tracing as You Go

This method involves creating a reconstructed panoramic view, and shifting the curve plane through the jaw and adding trace points along the nerve canal as you move through the jaw.

To trace a nerve canal using method 1, follow these steps:

1 On the **Curved Slicing** tab, create a reconstructed panoramic image.

2 In the **Trace View Screen**, click 1.0 mm and select the thinnest value possible.

This is to make sure you trace the nerve canal accurately.

3 In the **Tools** pane in the tool box, set your mouse setting to **Slide**.

4 Click in the **Trace View Screen** and use the mouse wheel to scroll through the jaw until you can see the entry point of the nerve canal inside the upper branch of the jaw.

When you scroll the mouse wheel, the image in the **Trace View Screen** changes as the curve plane moves through the depth of the jaw. You can monitor the position of the plane as it moves by watching the red trace line moving relative to the original trace line (white) in the **Axial Slice View Screen**.

5 Once you have a clear view of the nerve canal entry point, in the **Tools** pane in the tool box, click .

The button is displayed in blue to show that the **Nerve Canal Tool** has been activated.

6 In the **Trace View Screen**, click on the image to mark the nerve canal entry point.

An orange dot appears on the image.
This is a trace control point which you can adjust later if required.

7 Now continue to scroll through the jaw, until you can see more of the nerve path and click on the image to add additional control points as you go.

New orange dots are added each time you click.

8 When you reach the nerve foramen (exit point), add the final control point by double-clicking on the image.

The final point is added to the trace on the image and a new nerve canal entry appears in the object list in the expanded **Tools** pane in the tool box.

9 To trace the nerve on the other side of the jaw, repeat the above process on the other side of the image.

10 Once you have drawn both nerve canal traces, click in the **Trace View Screen** and click 1.0 mm to select a slice thickness of around 15mm.
This simulates the thickness of a real panoramic image and allows you to see both nerve canal traces on the image.

Method 2 - Displaying the Whole Nerve Canal and Then Tracing

This method involves creating a Reconstructed Panoramic view, and then adjusting the jaw trace the shifting the curve plane through the jaw and adding trace points along the nerve canal as you move through the jaw.

To trace a nerve canal using method 2, follow these steps:

1 On the **Curved Slicing** tab, create a Reconstructed Panoramic image.

2 In the **Trace View Screen**, click and select the thinnest value possible. This is to make sure you trace the nerve canal accurately.

3 Make sure your mouse setting is set to **Slide** in the **Tools** pane in the tool box.

4 In the **Tools** pane in the tool box, click .

The button is displayed in blue to show that the tool has been activated. Red control points are displayed on the jaw trace in the **Axial Slice View Screen**.

5 In the **Axial Slice View Screen**, adjust the position of the jaw trace by clicking and dragging individual control points until you can see the whole nerve canal in the **Trace View Screen**.

6 Once you have a clear view of the whole nerve canal, in the **Tools** pane in the tool box, click .

The button is displayed in blue to show that the **Nerve Canal Tool** has been activated.

7 In the **Trace View Screen**, click on the image to mark points along the visible nerve canal.

Orange dots appear at each point.

These are trace control points which you can adjust later if required.

8 To add the last control point, double-click on the image. The final point is added to the trace on the image and a new **Nerve Canal** entry appears in the object list in the expanded **Tools** pane in the tool box.

9 To trace the nerve on the other side of the jaw, repeat the above process on the other side of the image.

10 Once you have drawn both nerve canal traces, click in the **Trace View Screen** and click 1.0 mm to select a slice thickness of around 15mm.

This simulates the thickness of a real panoramic image and allows you to see both nerve canal traces on the image.

Tip: To cancel a drawing operation, press the ESC key.

Fine-Tuning a Nerve Canal Trace

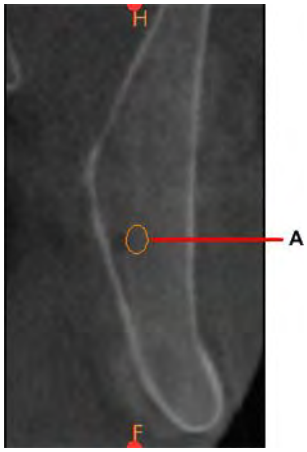
Once you have drawn a nerve canal trace on the reconstructed-panoramic image, you can fine-tune the position of the trace by moving control points in the **Coronal Slice View Screen**.

To fine-tune a nerve canal trace, follow these steps:

1 In the **Tools** pane in the tool box, click .

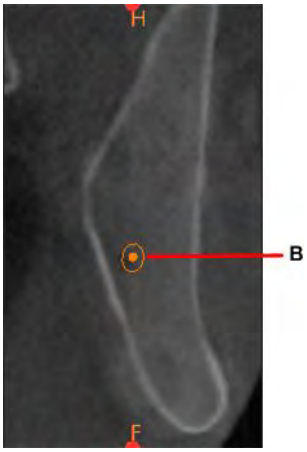
The button is displayed in blue to show that the tool has been activated. Red control points are displayed on the jaw trace in the **Axial Slice View Screen**.

2 In the **Axial Slice View Screen**, move the cross-section slice plane to a section of the jaw curve where a nerve canal trace has been drawn, then watch what happens in the **Coronal Slice View Screen**.



An orange circle (**A**) appears in the **Coronal Slice View Screen** as the cross-section slice plane cuts through the nerve canal trace.

3 In the **Trace View Screen**, use the mouse scroll wheel in **Slide** mode to keep moving the cross-section slice plane until a control point on the nerve canal trace is displayed.

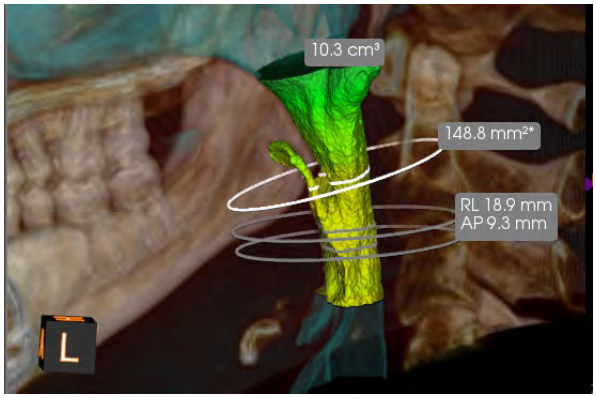


When a control point (**B**) is reached on the nerve canal trace, the orange circle contains an orange dot.

4 In the **Coronal Slice View Screen**, click and drag the control point (**B**) to move the position of the nerve canal trace.

Note: You can change the diameter of the nerve canal trace in the Nerve Canal object list in the expanded **Tools** pane in of the tool box. See "Using the Object List in the Tools Pane".

Creating a Segmented Airway



WARNING: Drawings and measurements made in the software are done under the responsibility of the user.

In the **Orthogonal Slicing** and **Oblique Slicing** workspace tabs, you can use the **Airway** tool in the **Tools** pane to do the following in the **Sagittal Slice View Screen**:

- Using at least two seed points to set segments according to upper and lower points, create a segmented airway that shows total volume, minimum cross-sectional area, anterior/posterior, and left/right measurements.
- Display and update measurement values in realtime.

Measurements are calculated automatically and the locations at which the slices were calculated are displayed in the **3D View Screen** using circular rings and in the 2D MPR views as a series of lines.

You can configure **Airway** tool settings in the "Airway Preferences".

Creating an Airway View

To use the **Airway** tool, follow these steps:

1 In the **Orthogonal Slicing** or **Oblique Slicing** tab, in the **Tools** pane, click to activate the **Airway** tool.

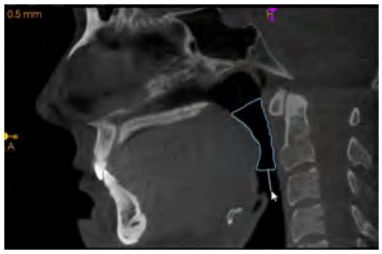
The **Airway analysis** icon changes to blue.

2 In the **Sagittal Slice View Screen** , click in the upper region of the airway to set the first point.

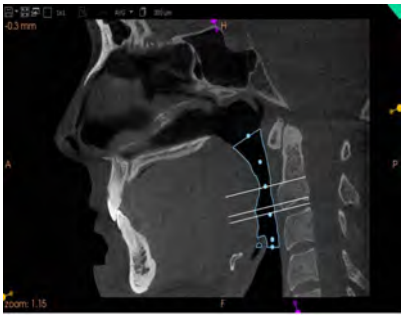
3 Click at another point in the airway to set at least one more seed point.

4 Double-click to set the final seed point.

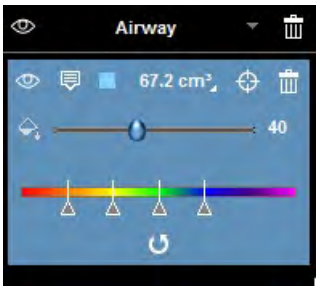
5 Optionally, you can click and drag the existing outline of the airway view in the 2D MPR views to modify the region covered. In this case, the revised airway is computed automatically.



The angles at which seed points are added will determine the angles at which the cross-sectional areas are calculated. The following example shows several seed points.



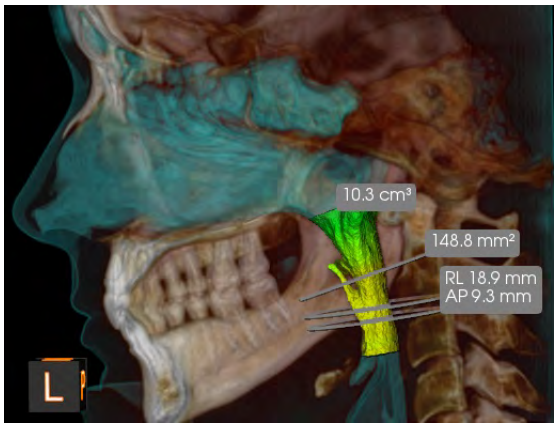
The computed airway is added to the **Airway** object list in the **Tools** pane, where the name of the airway object is represented by the volume size in cubic centimeter.



When computed, the airway is automatically displayed in the **3D View Screen**, and the following measurements are indicated by a series of rings:

- Minimum Cross-Sectional Area (MCA)
- Minimum AP Distance

- Minimum RL Distance
- Total volume of the segmented region.

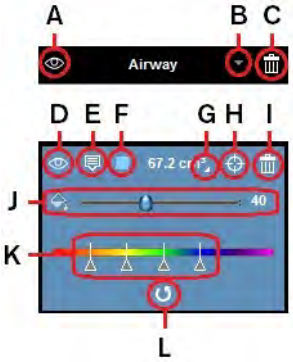


Using the Airway Object List

For more information on object lists, see "Using the Object List in the Tools Pane".

To use the **Airway** object list, follow these steps:

1 In the **Tools** pane, click (**B**) in the object list toolbar to select the **Airway** object list.



2 Do any of the following:

To show or hide airway objects in an image...	In the object list: • To hide all of the airway objects in the image, click (**A**) in the object list toolbar. To show all hidden airway objects, click . • To hide one airway object in the image, click (**D**) in the airway object toolbar. To show the hidden object in the image, click .
To delete airway objects in an image...	• To delete all airway objects in an image, click (**C**) in the object list toolbar. • To delete one airway object in an image, click (**I**) in the airway object toolbar.
To hide or display the measurements for an airway object in the **3D View Screen**...	Click (**E**).

To change the color of the airway object in the 2D MPR view screens...	Click the color box (**F**) in the airway object toolbar, and select a different color for the airway object.
To view the measurements for an airway object in the list...	Hover the mouse pointer over the arrow next to the airway name (**G**) in the object list.
To move between the different measurements in the airway object...	Click (**H**) to cycle between the different measurements: • Center on the Minimum area measurement. • Center on the AP measurement. • Center on the RL measurement.
To modify the intensity threshold that 3D should use when setting the segmentation threshold...	To modify move the **Segmentation threshold** (**J**) slider as necessary.
To change the color matching the predefined section area value in an **Airway** view...	Move the color indicators (**K**) for the selected image. By default there are four color scale entries that represent sections of the segmented airway, and their area values are set in the "Airway Preferences".
To reset to the settings for an airway object...	Click (**L**).

Creating TMJ Views

By default, only the **Axial Slice View Screen** and **3D View Screen** are activated on the **Custom Slicing** tab until traces have been drawn on the **Axial Slice View Screen**.

To create TMJ views, follow these steps:

1 On the **Custom Slicing** tab, adjust the position of the axial slice plane until the condyles are visible in the **Axial Slice View Screen**.

To move the axial slice plane, click and drag the slider at the bottom of the **Axial Slice View Screen**.

2 In the **Tools** pane in the tool box, click .

The button is displayed in blue to show that the TMJ tool has been activated.

If there are existing traces on the **Axial Slice View Screen**, a warning is displayed to inform you that the previous traces (and views) will be deleted. Do one of the following:

- Click **Yes** to continue - the existing traces and view screens are removed.
- Click **No** to keep the previous traces.

3 In the **Axial Slice View Screen**, choose either the left or the right condyle, click to set the trace start point then draw a line through the condyle and click again on the other side to set the trace end point.

The TMJ/ear and TMJ/ear views in the **Coronal Slice View Screen** are activated, a symmetrical trace is automatically drawn over the opposite condyle and the **3D View Screen** displays cropped images of the regions defined by the TMJ/ear and TMJ/ear/cross-section traces.

> **Note:** Once the traces have been drawn, the axial slice plane slider will disappear to be replaced by axial slice plane handles.
> When trace lines are present, click and drag in the TMJ/ear and TMJ/ear/cross-section view screens to move the axial slice.

Creating Ear Views

By default, only the **Axial Slice View Screen** and **3D View Screen** are activated on the **Custom Slicing** tab until traces have been drawn on the **Axial Slice View Screen**.

To create Ear views, follow these steps:

1 On the **Custom Slicing** tab, adjust the position of the axial slice plane until the ear regions are visible in the **Axial Slice View Screen**.

To move the axial slice plane, click and drag the slider at the bottom of the **Axial Slice View Screen**.

2 In the **Tools** pane in the tool box, click .

The button is displayed in blue to show that the **Ears** tool has been activated.

If there are existing traces on the **Axial Slice View Screen**, a warning is displayed to inform you that the previous traces (and views) will be deleted. Do one of the following:

- Click **Yes** to continue - the existing traces and view screens are removed.
- Click **No** to keep the previous traces.

3 In the **Axial Slice View Screen**, choose either the left or the right ear, click to set the trace start point then draw a line through the ear region and click again on the other side to set the trace end point.

The TMJ/ear and TMJ/ear/cross-section view screens are activated, a symmetrical trace is automatically drawn over the opposite ear and the **3D View Screen** display cropped images of the regions defined by the TMJ/ear and TMJ/ear/cross-section traces.

> **Note:** Once the traces have been drawn, the axial slice plane slider will disappear to be replaced by axial slice plane handles.
> When trace lines are present, click and drag in the TMJ/ear and TMJ/ear/cross-section view screens to move the axial slice.

Creating a Temporal Bones View

To create a temporal bones view, follow these steps:

1 On the **Curved Slicing** tab, adjust the position of the axial slice plane in the **Axial Slice View Screen** to the relevant position in the volume.

To move the axial slice plane, click and drag the slider at the bottom of the **Axial Slice View Screen**.

> **Note:** Once the traces have been drawn, the axial slice plane slider will disappear to be replaced by axial slice plane handles.
> If you need to reposition the axial slice once the trace has been drawn, click and drag in the **Trace View Screen** or oblique **Coronal Slice View Screen**.

2 In the **Tools** pane in the tool box, click .

The button is displayed in blue to show that the tool is switched on.

> **Note:** If this button is not visible, look for it in an icon group with other tools.

3 In the **Axial Slice View Screen**, click points on the axial slice to place the red control points of the trace.

The trace is drawn in red, and the trace and cross-section slice view screens are activated as the trace is drawn.
As each new control point is added, the **Trace View Screen** is dynamically updated. When you reach the end of the trace, double-click to set the last control point.
The temporal bones view is displayed in the **Trace View Screen** to the right of the **Axial Slice View Screen**. You can adjust the control points manually after the trace has been drawn.

The oblique **Coronal Slice View Screen** is displayed below the **Trace View Screen**, with orientation indicators to show the orientation of the image in the jaw (For more information, see "Using the Orientation Indicator".).

Once the trace is drawn, an entry is created in the object list in the tool box. See "Using the Object List in the Tools Pane".

Note: In some cases if you draw a trace on an image with a large field of view, the software will automatically crop the image vertically. If this happens, you can reposition the region of interest limits once the trace has been drawn. For more information, see "Using the Basic Region of Interest Tool".

Synchronizing Views

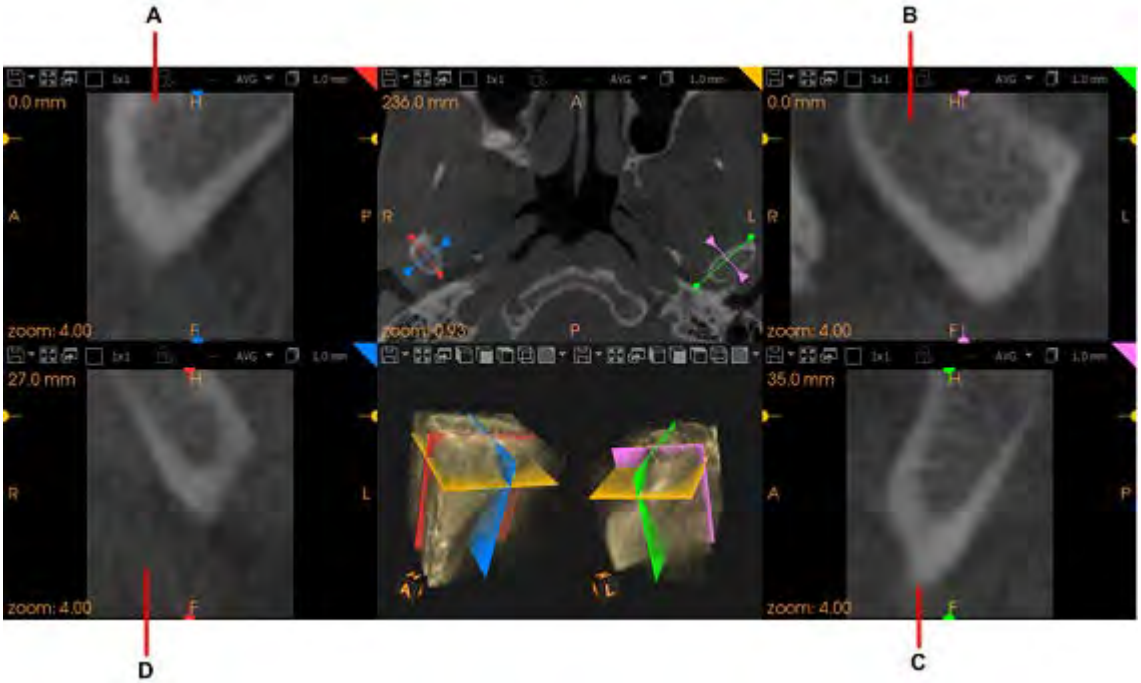
On the **Custom Slicing** tab, when you set the **Mouse Wheel** settings to zoom, the following options allow you to control the zoom behavior of the TMJ/ear and associated cross-section view screens on the **Custom Slicing** tab:

	Disable Synchronization	Click to deactivate zoom synchronization of TMJ/ear and TMJ/ear cross-section view screens (**A** to **D** below).
	Synchronize Four Views	Click to activate zoom synchronization of TMJ/ear and TMJ/ear cross-section view screens (**A** to **D** below). See "Synchronizing Four Views".
	Synchronize Two Views (side)	Click to activate zoom synchronization of view screen pairs **A+D** and **B+C**. See "Synchronizing Two Views (Side)".
	Synchronize Two Views (type)	Click to activate zoom synchronization of view screen pairs **A+B** and **C+D**. See "Synchronizing Two Views (Type)".

Note: If the acquired volume has a small field of view, only 2 of these icons will be displayed:

1. to disable synchronization.
2. OR to synchronize views by side OR by type, depending on the field of view.

The TMJ/ear and TMJ/ear cross-section view screens on the **Custom Slicing** tab are shown below.



Disabling View Synchronization

To disable the view synchronization, follow these steps:

1 Go to the **Custom Slicing** tab.

2 In the **Adjustments** section of the tool box, click .

Mouse settings are displayed.

3 In the mouse wheel settings, select **Zoom**.

4 In the mouse wheel settings, click .

While this option is activated, you can zoom each view screen independently of the others.

Synchronizing Four Views

To synchronize the views, follow these steps:

1 Go to the **Custom Slicing** tab.

2 In the **Adjustments** section of the tool box, click .

Mouse settings are displayed.

3 In the mouse wheel settings, select **Zoom**.

4 In the mouse wheel settings, click .

While this option is activated, zooming in any view screen **A** to **D** (See "Synchronizing Views".) will also zoom all other view screens simultaneously.

Synchronizing Two Views (Side)

To synchronize two side views, follow these steps:

1 Go to the **Custom Slicing** tab.

2 In the **Adjustments** section of the tool box, click .

Mouse settings are displayed.

3 In the mouse wheel settings, select **Zoom**.

4 In the mouse wheel settings, click .

While this option is activated, zooming is synchronised as follows (See "Synchronizing Views".):

- View screens **A** and **D** are synchronized.
- View screens **B** and **C** are synchronized.

Synchronizing Two Views (Type)

To synchronize two views by type, follow these steps:

1 Go to the **Custom Slicing** tab.

2 In the Adjustments section of the tool box, click .

Mouse settings are displayed.

3 In the mouse wheel settings, select **Zoom**.

4 In the mouse wheel settings, click .

While this option is activated, zooming is synchronised as follows (See "Synchronizing Views".):

- View screens **A** and **B** are synchronized.
- View screens **C** and **D** are synchronized.

Creating a View Screen Screenshot

To create a screenshot of a view screen, click in the view screen toolbar.

> **Note:** You toggle between this button and the DICOM snapshot button ( ). See "Creating a DICOM Snapshot" for information about this button.

A thumbnail of your screenshot is added to the **Gallery**.

When you create a view screen screenshot:

- An image file is created of the selected view screen.
- The image file is created in the format specified in the "Export Preferences".
- The location of copies of screenshot files is specified in the "Export Preferences"

5 Using the 3D View Screen

WARNING: 3D rendering must not be used for diagnosis. Confirmation must be performed using one or more of the two-dimensional slices used for Multi-Planar Reconstruction (MPR).

The 3D View Screen

The **3D View Screen** provides a fully rotatable view of the acquired 3D volume.

- To rotate the 3D view, click and drag in the **3D View Screen**. The **Orientation Indicator** rotates in synch with the rotation of the 3D view.
- To reset the orientation of the 3D view, use one of the following 3D orientation buttons.

Sagittal	Re-orients the 3D image to display it from the sagittal. The image is displayed as if the patient is looking to the left or right (depending on the settings in the "View Orientation Preferences").
Coronal	Re-orients the 3D image to display it from the coronal. The image is displayed as if the patient is looking towards you or away from you (depending on the settings in the"View Orientation Preferences").
Axial	Re-orients the 3D image to display it from the axial. The image is displayed from underneath, looking up or from above, looking down (depending on the settings in the "View Orientation Preferences").
Perspective	Resets the 3D view to display it from the default perspective. The image is displayed so that the front, top, and left sides are visible.

- To zoom in and out, move your mouse pointer over the **3D View Screen** and scroll the mouse wheel.
- To pan the 3D view, right-click and drag in the **3D View Screen**.
- Use view screen toolbar buttons to take a snapshot, maximise the view screen, or open the 3D view in a separate window.
- To move the slice planes using the **3D View Screen**, right-click on a slice plane and drag to a new position. See "Moving and Tilting Slice Planes in 2D MPR View Screens".
- Use the 3D sliders to control the overall display of the 3D view and the different tissue types displayed. See "Using 3D Color Sliders".
- To crop the 3D view, either use the Clipping Box on the **Oblique Slicing** tab, or use the Custom **Region of interest** tools (See "Using the Custom Region of Interest Tool (2D)" or "Using the Custom Region of Interest Tool (3D)".).

Note: If your 3D View is not displayed, check to see if it has been deactivated in the "3D View Preferences".

Using the Orientation Indicator

The **Orientation Indicator** is displayed in the bottom left corner of the **3D View Screen**.

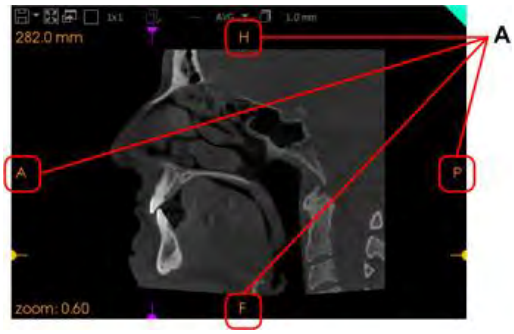
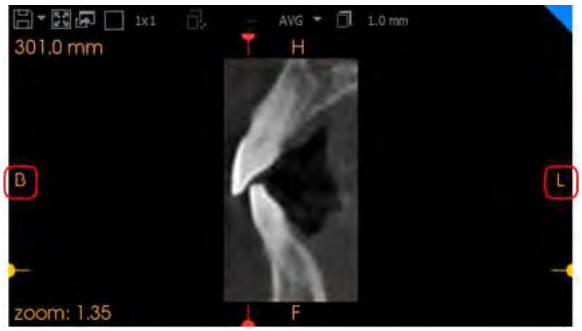
As you rotate the 3D view, the **Orientation Indicator** rotates at the same time to help you understand which perspective of the 3D view is being displayed.

The letters displayed on the **Orientation Indicator** are described below. If reviewing Wrist, use L & R.

H	Head, view from above
F	Foot, view from below
L	Left, view from the patient's left
R	Right, view from the patient's right
A	Anterior, view from in front of the patient
P	Posterior, view from behind the patient

These letters are also used

throughout **CS 3D Imaging** to show the orientation of 2D images within the volume.

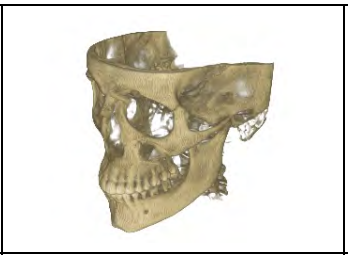
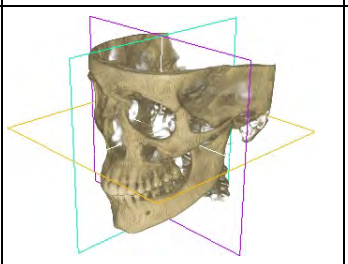
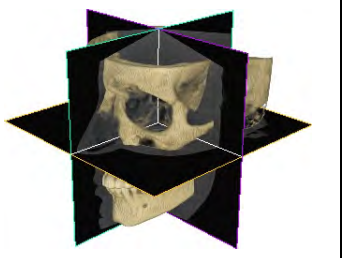
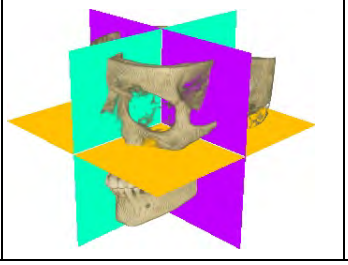
View Screen	Letters
2D MPR view screens 	A typical 2D MPR view screen displays four orientation indicators (**A**) that use the same letters as the 3D orientation Indicator shown above.
Coronal Slice View Screen 	In this case, different letters (**B** and **L**) are used to show specific orientation: **B** - Buccal **L** - Lingual

Note: Custom Slicing will be disabled when Wrist is in use.

Displaying MPR Planes

The **3D View Screen** displays the three orthogonal MPR planes in different colors. You can use the **Planes** button in the **3D View Screen** to choose different planes display options.

In the **3D View Screen**, click the **Planes** button in the View Screen toolbar to select one of the 3D Planes settings as follows.

Planes: No plane		No slice planes displayed.
Planes: Wireframe		Displays the positions of slice planes in the 3D view as transparent planes with colored edges.
Planes: MPR		Displays the positions of slice planes in the 3D view as MPR planes with colored edges. See "Repositioning MPR Planes in the 3D View Screen". **Note:** In order to see MPR detail on the slice planes more clearly, slide the 3D opacity slider towards 0. See "Using the 3D Sliders".
Planes: Color		Displays the position of the slice planes in the 3D view as colored, opaque planes.

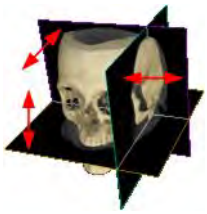
Repositioning MPR Planes in the 3D View Screen

To quickly reposition your MPR planes using the **3D View Screen**, follow these steps:

1 Click the **Planes** button in the view screen toolbar and select either ◘ or ▩.

This will make it easier to click on an MPR plane.

2 Right-click on an MPR plane and drag it to a new position.



> **Note:** You must click carefully on a plane in the **3D View Screen** for this function to work. If you do not right-click on a plane, you will pan the 3D view instead.

Using the Reformatting Tool

The **Reformatting Tool** opens automatically when you open a 3D volume acquired from a specified device type and allows you to derive a new volume from the existing 3D volume.

In the **Reformatting Tool** dialog box, you can do the following to derive this new volume:

- Adjust the angulation of the 2D MPR planes to set the patient position.
- Change the voxel size to create a lighter volume (and lower resolution), which is useful for example for compatibility with other software applications.
- Use the **Cropping** box to focus on a specific region of interest.

> **Important:** When you use the **Reformatting Tool**, a duplicate volume is created in the same patient folder. Make sure you have sufficient disk space available before using this tool.

To use the **Reformatting Tool**, follow these steps:

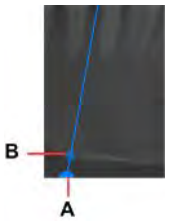
1 From an imaging software application, open the 3D volume you want to reformat.

The **Reformatting Tool** window appears.

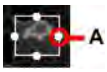
2 On the **Axial Slice View Screen**, **Coronal Slice View Screen**, and **Sagittal Slice View Screen**, you can do the following:

- To select a slice thickness, click 1.0 mm in the top right corner of a view screen and select a thickness.
- To select a thickness mode, click AVG and select a mode.

- Use the end handles (**A**) to move the slice planes, and the tilt handles (**B**) to adjust angles.



3 To crop a 3D volume and display only part of the volume, select the **Cropping box** option, and adjust the white handles (**A**) around the three 2D MPR slices.



4 To change the voxel size, select a higher voxel size from the **Voxel Size** drop-down list.

5 Enter a name in the **Volume Name** field and click **OK**.

You must enter a name to be able to save the reformatted volume.

Note: If you decide you do not want to use the **Reformatting Tool** for a volume:
- Click **Skip** so that **CS 3D Imaging** opens to show the 3D volume without any reformatting.
- Click **Quit**. The **CS 3D Imaging** software application closes.

Using 3D Color Palettes

CS 3D Imaging provides a library of different color palettes that define how different tissue types are displayed in the 3D view.

To use these palettes, you can either select a predefined palette or, if necessary, activate color sliders to fine tune the appearance of the 3D view. See "Using 3D Color Sliders".

To select a 3D color palette, follow these steps:

1 In the **Display** section of the tool box, click to activate the 3D adjustment tools.

The tool box expands to display the 3D adjustment tools. The text alongside the icon displays the name of the 3D color palette that is currently active.

2 In the 3D adjustment tools, click the current palette name (for example Bone).

A drop-down list of all available palettes is displayed.

3 Click on a different palette name to select it.

The new palette is applied to the 3D view.

By default, the following 3D color palettes are available:

Bone	Displays a realistic 3D view by highlighting bone rendering.
Transparent Bone	Displays bone tissue at lower opacity to highlight dental structures.
Grayscale	Displays the 3D View as a grayscale image.

Realist	Displays the 3D view with a wider range of colors.
Shiny Bone	Displays the 3D view similar to the **Bone** palette but with a shiny rendering.
Shiny Realist	Displays the 3D view similar to the **Realist** palette but with a shiny rendering.

Creating a 3D Color Palette

To create a 3D color palette, follow these steps:

1 Select an existing 3D color palette.

2 Use the 3D color sliders to adjust your 3D view.

An asterisk (*) appears alongside the palette name to show that you have changed the 3D color palette.

3 In the **3D** section of the **Display** panel in the tool box, click .

The **Palette library** window is displayed.

4 In the **Palette library** window, click the **Create palette** button.

Save palettes options are displayed.

5 Enter a name for the palette.

Click to select **Favorite** if you want the palette to appear on the drop-down list of palettes or click to select **Default** if you want it to be applied by default to the 3D view.

> **Note:** The color sliders are provided here so that you can make any final adjustments to your preset before you save it.

6 Click **OK** to save the palette.

Editing or Deleting a 3D Color Palette

To edit or delete a 3D palette, follow these steps:

1 In the **Display** section of the tool box, click to activate the 3D adjustment tools.

The tool box expands to display the 3D adjustment tools.

2 In the **3D** section of the **Display** panel in the tool box, click .

The **Palette library** window is displayed.

3 In the **Palette library** window, do one of the following:

- Click to edit a palette.

- Click to delete a palette.

> **Note:** You cannot delete default palettes.

4 Click **OK**.

Adding 3D Color Palettes to Your Favorites

When the **Palette library** window is displayed, **Favorite** status is displayed as follows.

	All presets with this icon alongside are displayed in the favorites list when you select an existing 3D color palette.
	All presets with this icon alongside are not displayed in the favorites list.

To select a 3D color palette for inclusion in your favorites list, follow these steps:

1 In the **Display** section of the tool box, click to activate the 3D adjustment tools.

The tool box expands to display the 3D adjustment tools.

2 In the **3D** section of the **Display** panel in the tool box, click .

The **Palette library** window is displayed.

3 In the **Palette library** window, for any palette that is not currently in your favorites list, click .

- When you move your mouse pointer away, the icon changes to to show that the selected preset is now a favorite. To unselect it, click .
- When you move your mouse pointer away, the icon changes to to show that the selected preset is not a favorite.

4 Click **OK**.

Using the 3D Sliders

To activate the **3D Adjustments** panel, click in the tool box.

The **3D Adjustments** panel contains sliders that you can use to control the appearance of the 3D view.

Gradient		Use this slider to remove unwanted “noise” around dense regions such as metal objects.
Opacity		Use this slider to adjust the overall opacity of the 3D view.

Click to reset both sliders.

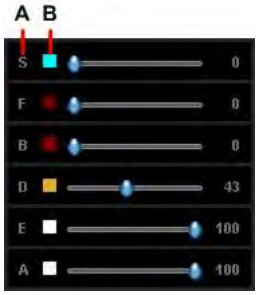
The other sliders in the **3D Adjustments** panel are color sliders that you can use to control the display of different tissue types in the 3D view.

Using 3D Color Sliders

You can define which voxels in a 3D volume are considered based on the voxel intensity. You can decide how much tissue, and even which tissues appear in the 3D volume. For example, you can set all skin at 20% opacity to appear in light blue.

You define the intensity based on voxels using color sliders or using the color palette. See "Changing 3D Palette Colors".

Each slider is identified by a letter (**A**) that represents a different tissue type.



S	Skin
F	Flesh
B	Bone
D	Dentin
E	Enamel
A	Amalgam

Click to reset the sliders to current preset values.

To use the 3D color sliders, follow these steps:

1 In the **Display** section of the tool box, click .

The tool box expands to display the **3D Adjustment** tools.

2 Do one of the following:

- Use the color sliders to adjust the opacity of different tissue types in the **3D View Screen**.
- Click (see **A** below).

The icon changes to and a 3D Color Bar (**C**) is activated beneath the **3D View Screen**.

3 On the 3D color bar, click and drag the adjusters (**D**) to adjust the opacity levels of different tissue types.

4 Click the reset icon (**E**) to reset to current preset values.

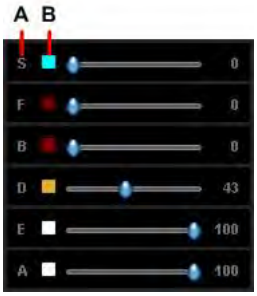
Changing 3D Palette Colors

To change the colors used in a 3D palette, follow these steps:

1 In the **Display** section of the tool box, click .

The tool box expands to display the **3D Adjustment** tools.

2 In the **3D Adjustments** tools, click on a color block (**B**).



A color picker window appears.

3 In the color picker window, click to select a new color and click **OK**.

The new color is applied in the 3D color palette and in the **3D View Screen**.

Using Presets (Image Rendering)

CS 3D Imaging provides two libraries of image rendering presets:

- MPR presets for setting brightness, contrast and sharpness in all MPR views. Brightness and Contrast are referred to as “Windowing” presets. This is a radiological term that relates to the brightness and contrast levels in radiological images.
- 3D color palette presets for setting color levels. These allow you to control the appearance of different tissue types in the 3D view.

6 Aligning a Patient Face Scan Image with a Volume

CS 3D Imaging Automatic Face Scan Alignment provides:

- Automatic alignment of a patient Face Scan image with a patient image volume
- Easy-to-use tools to semi-automatically or manually adjust the alignment

Aligning a Patient Face Scan Image with a Volume

To align a patient face scan with a patient image volume, follow these steps:

1 In any workspace tab apart from the **Review** tab, in the **Tools** pane in the tool box, click to select a face to align with your patient image volume.

The **Patient Face Scan** window opens and available faces are displayed in the window's side pane, sorted by date.

You can hover the mouse over a face to display the following Acquisition type (Face) information:

> **Note:** Only supported patient face scan formats are available for alignment.

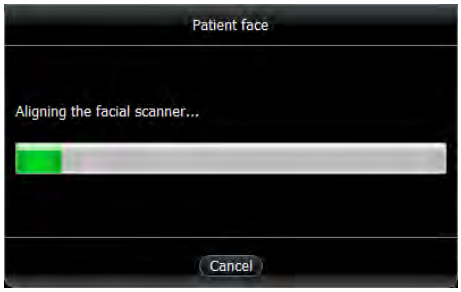
2 In the list of faces displayed in the Patient Face Scan side pane, select the face to be aligned to the patient image volume.

> **Note:** Only one patient face can be aligned to a patient image volume at a time.

3 Click **Align** to launch the automated face alignment process.

If a discrepancy is found between the data associated with the selected face scan and the patient image volume data, a dialog box appears displaying details of the patient image volume and the face. After you have reviewed the information, click **Confirm** to continue with the alignment, or **Cancel** to select a different face.

CS 3D Imaging launches the automatic alignment of the face with the patient image volume.

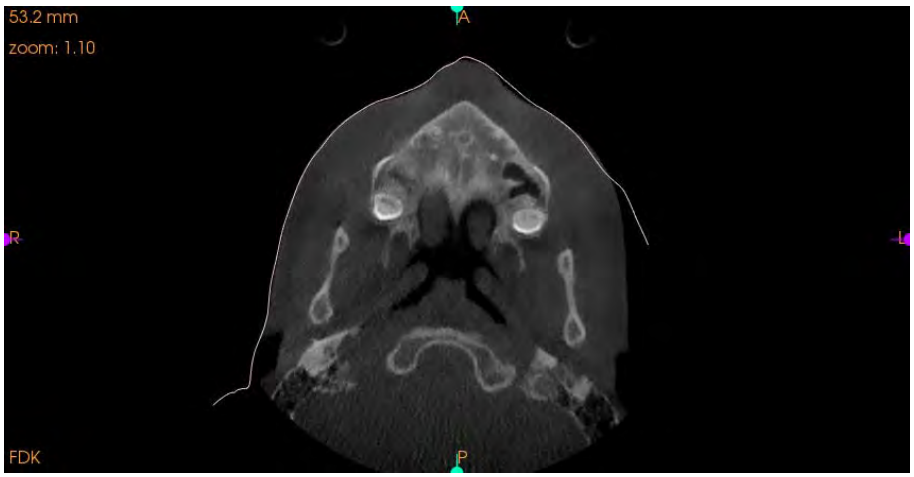


If the automatic registration is not successful, you are sent directly to the "Accessing the Alignment Adjustment Window".

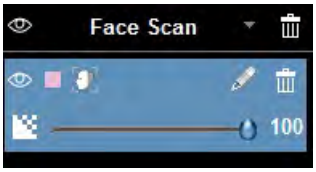
When the face is aligned with the patient image volume:

- The aligned face scan and patient image volume are displayed in the **3D View Screen**.

- The outline of the face is displayed as a line (the default color is pink) in each 2D view screen.



- The face appears in the **Face Scan** object list.



4 Check that the alignment has been performed correctly by comparing the patient's face with the patient image volume. "Manually Adjusting a Face Scan Alignment".

Adjusting a Face Scan Alignment

You can adjust the automatic alignment of a patient face scan with a patient image volume, in order to refine the result based on a careful analysis of anatomical details.

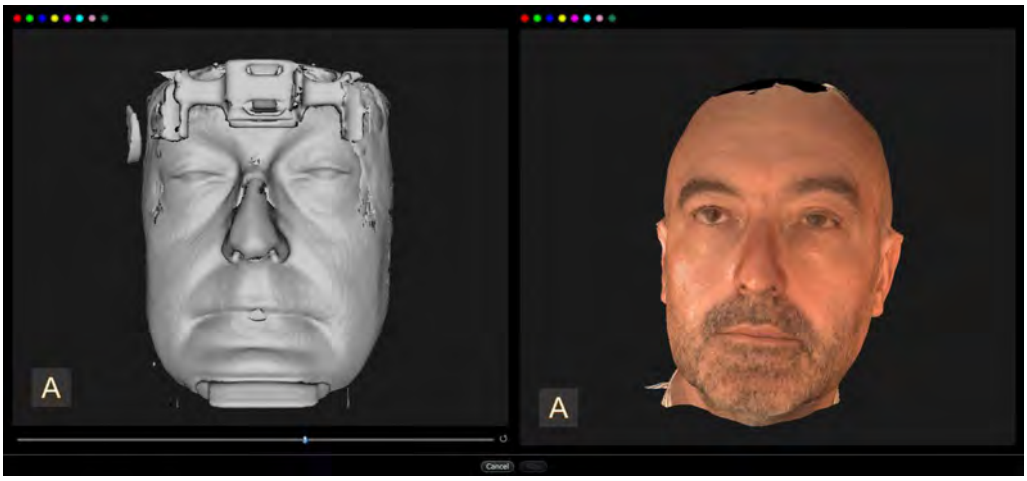
Accessing the Alignment Adjustment Window

To adjust the automatic alignment of a patient face with a patient image volume, follow these steps:

1 In any workspace tab apart from the **Review** tab, in the **Tools** pane in the tool box, click ▼ and select **Face Scan** in the object drop-down list.

2 In the object list, for the selected face, click to edit the automatic alignment of the face.

The **Adjust a Face Scan alignment** window opens automatically.



Visualizing Adjustments in the 3D View Screen

When you open the **Adjust a Face Scan alignment** window, the following tab pages are available:

- Semi automatic: enables you to semi-automatically adjust the alignment of a patient face by clicking matching facial features on the Face Scan image and a facial image based on the patient image volume. "Semi-Automatically Adjusting a Face Scan Alignment".
- Manual: enables you to make manual adjustments by dragging or rotating the patient face in 2D view screens. "Manually Adjusting a Face Scan Alignment".

Semi-Automatically Adjusting a Face Scan Alignment

To semi-automatically adjust the alignment of a Face Scan with a patient image volume, follow these steps:

1 In any workspace tab apart from the **Review** tab, in the **Tools** pane in the tool box, click ▼ and select **Face Scan** in the object drop-down list.

2 In the **Face Scan** object list, select the **Face Scan** object and click .

3 In the **Adjust a Face Scan alignment** window, click the **Semi automatic** tab.

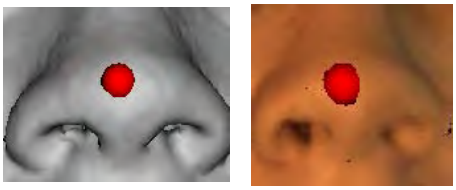
Editing objects are displayed in the following view screens:

- Left side: A monochrome representation of the patient face based on the patient image volume.
- Right side: The Face Scan object.

4 To determine the threshold of the skin, adjust the density by moving the threshold slider. Then add a minimum of 3 common points on the face.

5 Then click an identical feature in each view screen to indicate that they should be matched.

The points that you click are marked with identically colored spheres. For example, first click the tip of the nose in the Face Scan view screen, and then click the tip of the nose in the view screen based on the patient image volume:



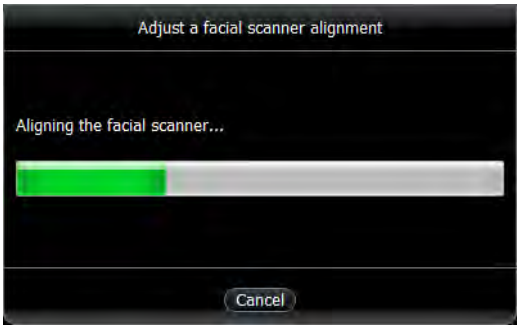
6 Continue marking identical points.

You must mark a minimum of three and a maximum of eight points.

Note: Misplaced marks can be left-clicked and moved to the proper location.

7 Click **Align**.

CS 3D Imaging launches the semi-automatic adjustment of the Face Scan:



When re-alignment is complete, the face and patient image volume are displayed in the **3D View Screen**.

Modifying Opacity Settings in the 3D View Screen

> **Tip:** On the **Manual** tab in the **Adjust a Face Scan alignment** window, the opacity of the patient face and the patient image volume in the **3D View Screen** are set to 50% by default. You can modify these settings to better highlight the relative position of the patient face and patient image volume.

To modify the opacity of a patient image volume to which a Face Scan has been matched, in the left-hand pane of the **Adjust a Face Scan alignment** window, click and drag the upper of the two slide adjusters.

The opacity setting of the patient image volume is displayed dynamically in the **3D View Screen**.

You can adjust the opacity of the patient face in the same way by dragging the lower of the two slide adjusters.

Manually Adjusting a Face Scan Alignment

To manually adjust the alignment of a **Face Scan** with a patient image volume, follow these steps:

1. In any workspace tab apart from the **Review** tab, in the **Tools** pane in the tool box, click and select **Face Scan** in the object drop-down list.

2. In the **Face Scan** object list, select the **Face Scan** object and click .
3. In the **Adjust a Face Scan alignment** window, click the **Manual** tab.

   Editing objects are displayed in the following view screens:

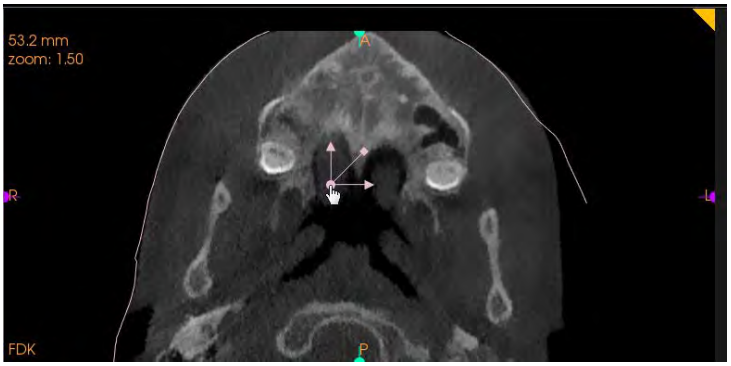
   - **Axial Slice View Screen**
   - **Coronal Slice View Screen**
   - **Sagittal Slice View Screen**

   > **Note:** You cannot adjust an automatic alignment directly in the **3D View Screen**.
   > The **3D View Screen** is intended as a visual aid while carrying out adjustments to the Face Scan alignment.

4. To move the **Face Scan**, in a view screen select the Face Scan's **object outline**, or one of the **left-and-right** or **up-and-down handles,** and drag to move it to a new position.

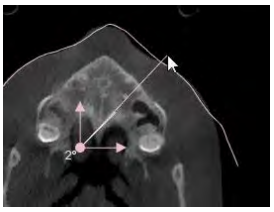
   These handles enable constrained movement (**left-and-right** or **up-and-down**), to ensure greater precision when repositioning a Face Scan object.

5 To move an object without any directional constraint, click on the omnidirectional handle.



Note: Use of this adjustment feature requires particular care. To undo manual adjustments see "Undoing Manual Face Scan Adjustments".

6 **To rotate an object**, select the rotation handle and drag the axis to a new position.



You can drag the rotation handle outwards, in order to increase the precision of the adjustment.
As you rotate the Face Scan, the angle of rotation is displayed in real-time.

7 To complete repositioning of the **Face Scan**, release the object.

8 When you have finished carrying out **Matching Refinements**:

- Click **OK** to validate modifications and close the **Adjust a Face Scan alignment** window.
- Click **Cancel** to cancel modifications carried out and not saved in the **Adjust a Face Scan alignment** window.

Undoing Manual Face Scan Adjustments

You can undo manual adjustments made to an automatic face alignment on the **Manual** tab of the **Adjust a Face Scan alignment** window.

To undo a Face Scan alignment adjustment, in the configuration side-panel on the **Manual** tab of the **Adjust a Face Scan alignment** window, click . The last adjustment carried out in the **Adjust a Face Scan alignment** window is undone.

You can undo prior modifications by clicking again on .

Each prior modification is undone with each click.

> **Note:** The **Undo** feature is persistent; if you leave the **Adjust a Face Scan alignment** window and return, you can still undo modifications that have been validated and saved during a prior session.

Redoing Manual Face Scan Adjustments

You can redo manual adjustments made to an automatic face alignment on the **Manual** tab of the **Adjust a Face Scan alignment** window.

To redo a **Face Scan** alignment adjustment, in the configuration side-panel on the **Manual** tab of the **Adjust a Face Scan alignment** window, click . The last adjustment undone in the **Adjust a Face Scan alignment** window is redone.

You can redo each prior undone adjustment by clicking again on the required number of times. Each undone adjustment is redone with each click.

Resetting a Semi-Automatic Face Scan Alignment

You can reset an automatic face alignment to which manual adjustments have been applied in the **Adjust a Face Scan alignment** window. This removes all manual adjustments applied and returns the automatic face alignment to its original position.

In the configuration panel on the **Manual** tab of the **Adjust a Face Scan alignment** window, click .

All manual adjustments applied in the **Adjust a Face Scan alignment** window are removed, and the automatic face alignment returns to its original position.

Exporting a Face Scan Alignment

You can export the alignment of a **Face Scan** with a patient image volume to a third-party guided surgery software application. See "Exporting a PDIP Analysis to a Third-Party Application".

Managing Face Scans Using the Object List

Face Scans that are aligned with patient image volumes are displayed in the object list in the **Tools** pane on every workspace tab other than the **Review** tab.

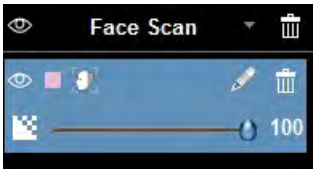
You can manage and configure preferences for existing Face Scans.

Showing and Hiding Face Scans

To show/hide a **Face Scan**, follow these steps:

1 In any workspace tab other than the **Review** tab, in the object list in the **Tools** pane, click to open the drop-down list and select **Face Scan**.

The object list displays the information bar of the Face Scan aligned with the patient image volume:



2 In the list of **Face Scans**, click on the desired icon as follows.

- Click to hide a Face Scan.
- Click to show a hidden Face Scan. The selected Face Scan is hidden or displayed in the volume.

Configuring Color Preferences for a Face Scan (2D Display)

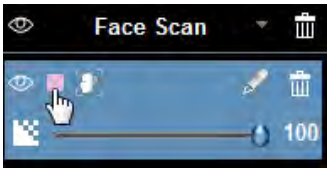
The color of Face Scan object outlines is displayed by default in pink in the 2D MPR view screens. This color can be customized to suit your requirements.

To change the color of 2D Face Scan object outlines, follow these steps:

1 On any workspace tab apart from the **Review** tab, in the objects list in the **Tools** pane, click to open the drop-down list and select **Face Scan**.

The **Face Scan** configuration panel containing the information bar of each Face Scan object is displayed.

2 Click on the square icon in a Face Scan information bar as shown.



This will open the **Color selector** dialog box.

3 Select the color of your choice and click **OK**.

> **Tip:** General color preferences for **CS 3D Imaging** can be customized in the "Color Preferences".

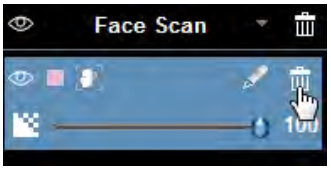
Deleting a Face Scan

To delete a Face Scan that has been aligned with a patient image volume, follow these steps:

1 On any workspace tab apart from the **Review** tab, in the object list in the **Tools** pane, click to open the drop-down list and select **Face Scan**.

The object list displays a list of existing Face Scans.

2 In the **Face Scan** list, click in the information bar of the Face Scan you wish to delete.



The Face Scan is deleted and disappears from all workspace tab view screens.

> **Note:** Deleting a Face Scan will only delete it from the patient image volume and corresponding workspace tab view screens. The Face Scan itself is not erased.

7 Aligning a Model with a Volume

The **CS 3D Imaging** software's **Automatic Model Alignment** module integrates easily into your **Prosthetic-Driven Implant Planning** (**PDIP**) workflow, to enhance the planning of virtual crowns and implants.

CS 3D Imaging Automatic Model Alignment provides:

- Automatic alignment of a model with a patient image volume
- Easy-to-use tools to manually adjust the automatic model alignment

Before You Start

Before aligning a model with a patient image volume, follow these steps:

1 Take a 3D x-ray scan of the Field of View using a **Carestream Dental** systems CBCT unit (CS 8200 3D & CS 9600 Families). For recommended Fields of View, see "Using the Prosthetic-Driven Implant Planning Workflow".

2 Take a 3D digital impression of the patient's dental arch using a **Carestream Dental** CBCT unit (CS 8200 3D & CS 9600 Families) or CS Intraoral scanner, or use a previously imported 3D digital impression from CS Imaging 8 software.

3 Open the patient image volume in **CS 3D Imaging**, and in the **Curved Slicing** tab draw a trace along the dental arch.

Using the Prosthetic-Driven Implant Planning Workflow

Before matching a Model to a patient image volume, make sure you have carried out the following:

1 Take a 3D x-ray scan of the region of interest using a Carestream Dental CBCT unit (CS 8200 3D & CS 9600 Families). The following Carestream Dental CBCT units and Fields of View (FoV) are specifically adapted for this use:

Carestream Dental CBCT unit	CS 9600	CS 8200 3D
Field of View (Jaw)	jaw 8x8, 12x10, 10x10 16*10 - mandibula and maxilla 8x5, 12x5, 10x5	jaw 8x9 (or 8x8), 12x10, 10x10 - mandibula and maxilla 8x5, 12x5, 10x5
Field of View (Head)	16*12, 16*17, 16*10, 12*10	NA
Acquisition mode	LD STD HR	LD STD HR

Important: During the scanning process, make sure that the patient is not in occlusion. Follow the guidelines for using your CBCT device.
To facilitate data registration, ask the patient to use the appropriate 3D bite block during the X-ray acquisition process.

Carry out a classic evaluation of the region of interest and take necessary measurements.

2 To take a 3D digital impression of the patient's dental arch, do one of the following:

- Generate the 3D model from a conventional impression (silicon or alginate) obtained using a Carestream Dental CBCT Unit's 3D object acquisition module.

- Take an intraoral digital impression using the CS 3700 or CS 3800 IO scanner.

> **Important:** HD color rendering is available only with 3D models acquired using intraoral scanning.

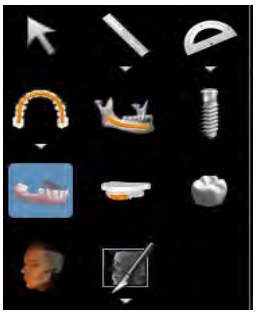
> **Note:** The following acquisition modes can be used to perform a digital impression adapted to the **PDIP** workflow:
> - Orthodontic
> - Restoration
> - Implant

3 Open the patient image volume in **CS 3D Imaging**.

4 In the **Curved Slicing** tab draw a trace along the dental arch. See "Drawing a Trace Along a Dental Arch".

Aligning a Model with a Patient Image Volume

> **Note:** It is recommended you draw a trace along the dental arch before aligning a model with a patient image volume.
> To do so, open a patient image volume in the **Curved Slicing** tab and draw a trace along the dental arch.
> The **Reconstructed Panoramic View Screen** and the **Oblique Coronal Slice View Screen** become visible when you start to draw a trace along the dental arch.



To align a model with a patient image volume, follow these steps:

1 In the **Curved Slicing** tab, in the **Tools** pane in the tool box, click to select a model to align with your patient image volume.

The **Patient Models** window opens and available models are displayed in the **Patient Models** window's side pane, sorted by date.

You can hover the mouse over a model to display the following information:

- Acquisition type (Orthodontic, Restoration, Implant)
- Equipment (CS 3500, CS 3600, CS 9300/9300 Select, CS 3700, CS 3800, CS 8100 3D, CS 9600, CS 8200 3D, including Intraoral scanner competitors...)

- Scan area information if available.

2 Select your model alignment preference to the volume, either **Open mouth** (if the volume of the patient has been captured with an open mouth) or **Occlusion** (if you want to merge the model to a patient volume performed in occlusion).

3 Select the model to be aligned to the patient image volume by Maxilla or Mandible.

4 To align both Mandible and Maxilla models in Occlusion on a Patient Volume performed in an **Open mouth**, choose the option in the bottom left-hand corner:

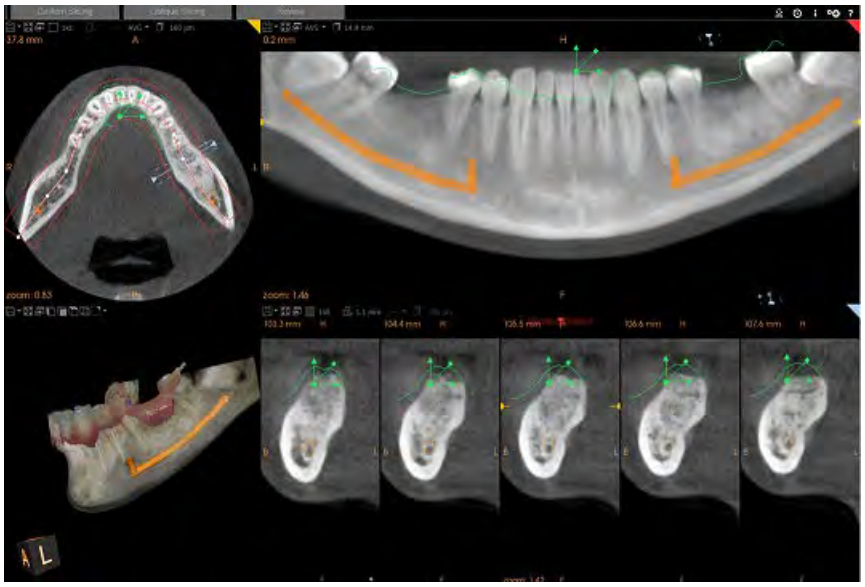
5 Click **Align** to launch the automated model alignment process.

CS 3D Imaging launches the automatic alignment of the model with the patient image volume.

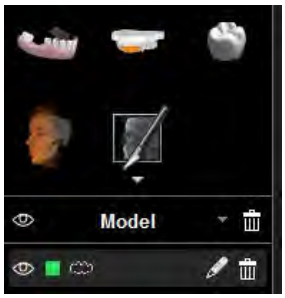
When the model is aligned with the patient image volume:

- The aligned model and patient image volume are displayed in the **3D View Screen**.
- The outline of where the Model's soft tissue meets the slice planes is displayed as a line (the default color is green) in the following view screens:
  - **Axial Slice View Screen**
  - **Reconstructed Panoramic View Screen**

- **Oblique Coronal Slice View Screen (Cross-section)**



- The model appears in the **Model** object list.



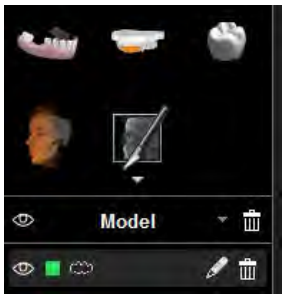
6 Check that the alignment has been performed correctly by comparing the patient's teeth with the model. See “Adjusting a Model Alignment”.

Aligning a Model Manually

You can adjust the model alignment with landmarks to a patient image volume, in order to refine the result based on a careful analysis of anatomical details.

The virtual tools proposed by **CS 3D Imaging** are intended to enhance and simplify implant supported restoration. No algorithm, however fine, can replace the dental practitioner's experience and skill.

Accessing the Semi-Automatic Alignment Adjustment Window

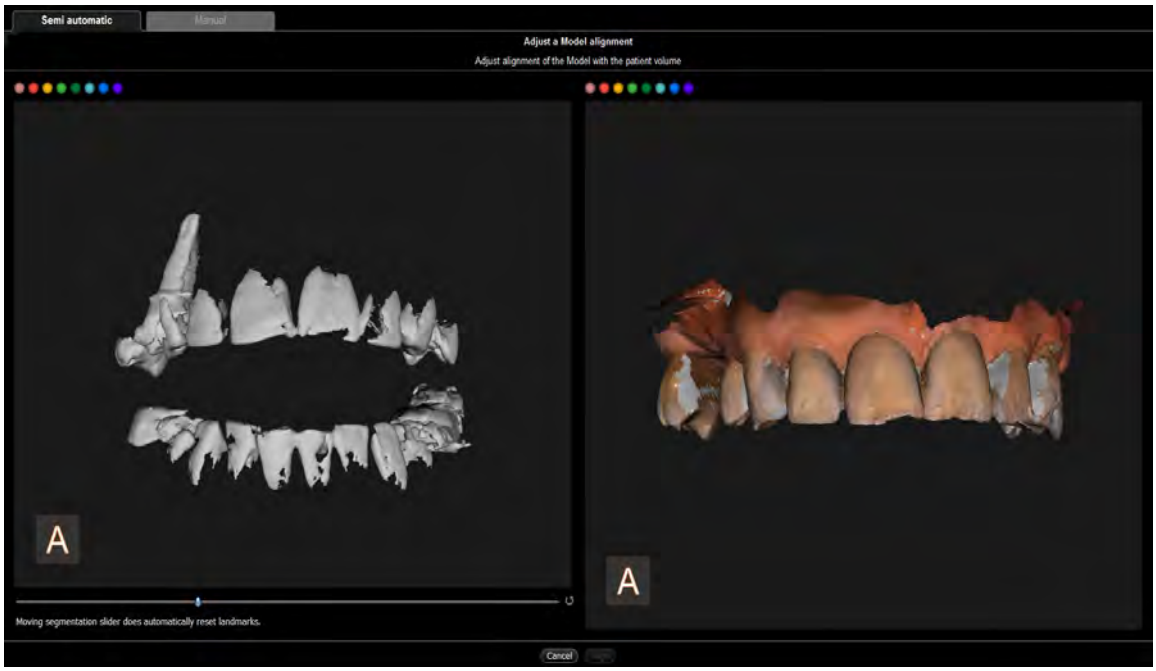


To manually adjust the alignment of a model with a patient image volume, follow these steps:

1 In the **Curved Slicing** tab **Tools** pane in the tool box, click ▼ and select **Model** in the object drop-down list.

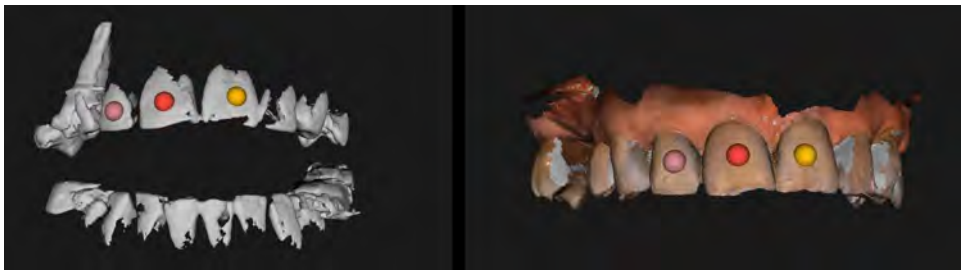
2 In the object list, for the selected model, click to edit the semi automatic or manual alignment of the model.

The **Adjust a Model Alignment** window opens automatically.



3 Adjust the segmentation slider to modify the model threshold, and know that any landmarks placed previously to moving the slider will be cancelled.

4 To align correctly a model, place a minimum of 3 landmarks (max. of 8) required for re-alignment and click, **Align**.



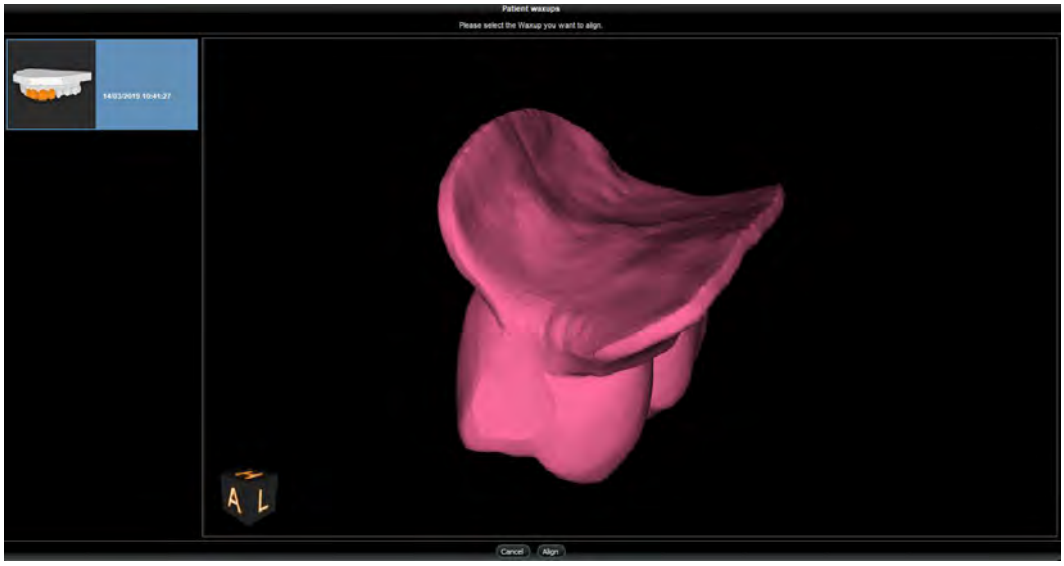
Aligning a Patient Waxup

To align a waxup design with a patient image volume, follow these steps:

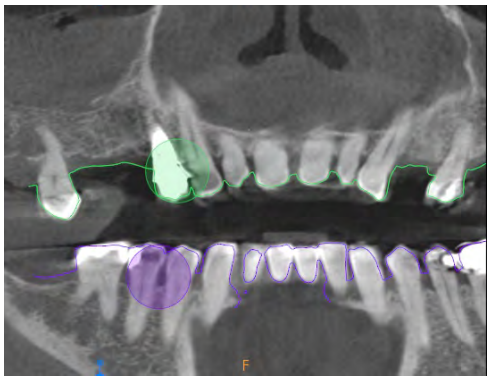
1 In the **Curved Slicing** tab, in the **Tools** pane in the tool box, click to select a waxup design to align with your patient image volume.

The **Waxup** window opens and available waxup designs are displayed in the window's side pane, sorted by date.

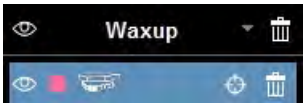
2 In the list of waxup designs displayed in the **Waxup** side pane, select the design to be aligned to the patient image volume and click **Align**.

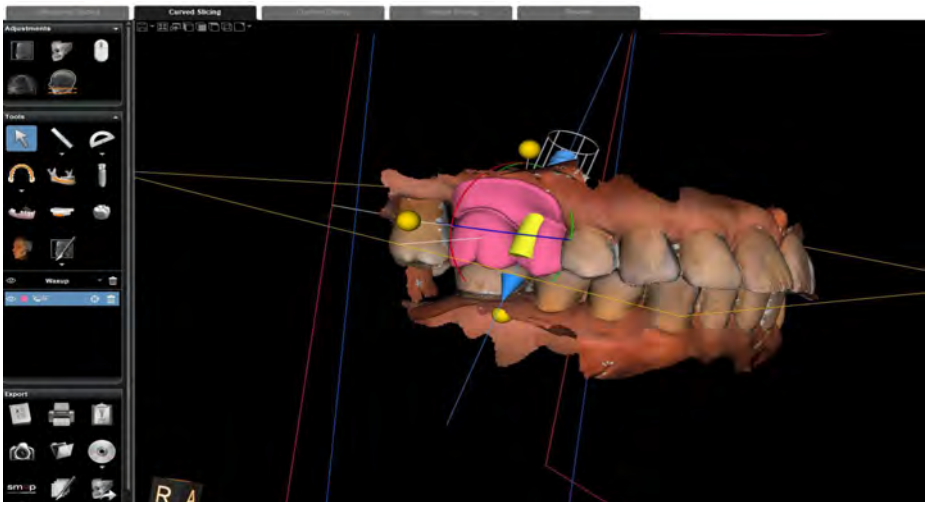


3 Choose the waxup design to associate to by clicking on one of the specified colored regions designated by the circular zone shown below. In order to distinguish the design properly, select different colors for each design.



4 After clicking in the green zone, corrections may need to be made, so click on the in the toolbar.





After proper adjustments have been made, click **Ok**.

Visualizing Adjustments in the 3D View Screen

When you open the **Adjust a Model Alignment** window:

- The aligned model and patient image volume are displayed in the **3D View Screen**
- The outline of where the model's soft tissue meets the slice planes is displayed as a line (the default color is green) in the following view screens:
  - **Axial Slice View Screen**
  - **Reconstructed Panoramic View Screen**
  - **Oblique Coronal Slice View Screen (Cross-section)**

> **Note:** You cannot adjust an automatic alignment directly in the **3D View Screen**.
> The **3D View Screen** enables you to visualize adjustments you make to the automatic alignment.

> **Tip:** If you move the model it may disappear from view in other View Screens. If this happens click in the side pane to reset the model to its initial position.

Modifying Opacity Settings in the 3D View Screen

> **Tip:** In the **Adjust a Model Alignment** window, the opacity of the **3D View Screen** is set to 50% by default. You can modify this setting to better highlight the relative position of the model and patient image volume.

To modify the opacity of a patient image volume to which a Model has been matched, in the left-hand pane of the **Adjust a Model Alignment** window, click and drag the slide adjuster.

The opacity setting of the patient image volume is displayed dynamically in the **3D View Screen**.

Adjusting a Model Alignment

To manually adjust the automatic alignment of a model with a patient image volume, follow these steps:

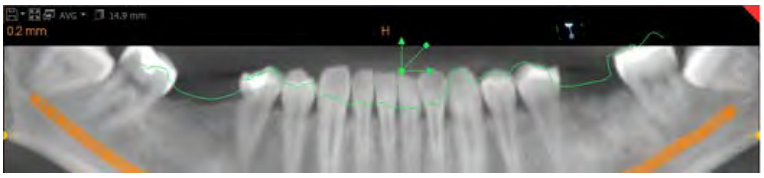
1 In the **Curved Slicing** tab **Tools** pane in the tool box, click ▼ and select **Model** in the object drop-down list.

2 In the **Model** object list, select a model and click .

The **Adjust a Model Alignment** window opens with the **Select** mode activated automatically, and editing objects are displayed in the following view screens:

- **Axial Slice View Screen**
- **Reconstructed Panoramic View Screen**
- **Oblique Coronal Slice View Screen (Cross-section)**

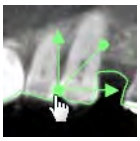
> **Note:** You cannot adjust an automatic alignment directly in the **3D View Screen**.
> The **3D View Screen** is intended as a visual aid while carrying out adjustments to the model alignment.



3 To move an object, in a view screen select the model's **object outline**, or one of the **left-and-right** or **up-and-down handles,** and drag to move it to a new position.

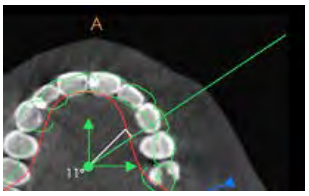
These handles enable constrained movement (**left-and-right** or **up-and-down**), to ensure greater precision when repositioning a model.

4 To move an object without any directional constraint, click on the omnidirectional handle.



> **Note:** Use of this adjustment feature requires particular care. To undo manual adjustments see "Undoing Model Adjustments".

5 **To rotate an object**, select the rotation handle and drag the axis to a new position.



Tip: You can drag the rotation handle outwards, in order to increase the precision of the adjustment.
As you rotate the model, the angle of rotation is displayed in real-time.

6 To complete repositioning of the model, release the object.

7 When you have finished carrying out **Matching Refinements**:

- Click **OK** to validate modifications and close the **Adjust a Model Alignment** window.
- Click **Cancel** to cancel modifications carried out and not saved in the **Adjust a Model Alignment** window.

Undoing Model Adjustments

You can undo adjustments made to an automatic model alignment in the **Adjust a Model Alignment** window.

To undo a model alignment adjustment, in the configuration side-panel of the **Adjust a Model Alignment** window, click . The last adjustment carried out in the **Adjust a Model Alignment** window is undone.

You can undo prior modifications by clicking again on .

Each prior modification is undone with each click.

> **Note:** The **Undo** feature is persistent; if you leave the **Adjust a Model Alignment** window and return, you can still undo modifications that have been validated and saved during a prior session.

Redoing Model Adjustments

You can redo adjustments made to an automatic model alignment in the **Adjust a Model Alignment** window.

To redo a model alignment adjustment, in the configuration side-panel of the **Adjust a Model Alignment** window, click . The last adjustment undone in the **Adjust a Model Alignment** window is redone.

You can redo each prior undone adjustment by clicking again on the required number of times. Each undone adjustment is redone with each click.

Resetting an Automatic Model Alignment

You can reset an automatic model alignment to which manual adjustments have been applied in the **Adjust a Model Alignment** window. This removes all manual adjustments applied and returns the automatic model alignment to its original position.

In the configuration panel of the **Adjust a Model Alignment** window, click .

All manual adjustments applied in the **Adjust a Model Alignment** window are removed, and the automatic model alignment returns to its original position.

Exporting a Model Alignment

You can export the alignment of a model with a patient image volume to a third-party guided surgery software application. See "Exporting a PDIP Analysis to a Third-Party Application".

Managing Models Using Model Object List

Models that are aligned with patient image volumes are displayed in the object list in the **Curved Slicing** tool box.

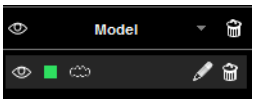
You can manage and configure preferences for existing models.

Showing and Hiding Models

To show/hide a Model, follow these steps:

1 In the object list in the **Curved Slicing** tab **Tools** pane, click to open the drop-down list and select **Model**.

The object list displays the information bar of the models aligned with the patient image volume (maxilla and/or mandibula).



2 In the list of **Models**, click on the desired icon as follows.

Click to hide a model.

Click to show a hidden model. The selected model is hidden or displayed in the volume.

To hide/display **all** models in the volume, follow these steps:

1 In the object list, click the drop-down list and select **Model**.

The object list displays a list of all models in the volume.

2 In the **Model** section of the object list, click the show/hide toggle icon at the top of the panel.

All models are hidden or displayed in the **Curved Slicing** tab view screens for the volume.

Configuring Color Preferences for a Model (2D Display)

The color of model object outlines is displayed by default in green in the 2D MPR view screens. This color can be customized to suit your requirements.

To change the color of 2D model object outlines, follow these steps:

1 In the list of the **Curved Slicing** tab **Tools** pane, click to open the drop-down list and select **Model**.

The **Model** configuration panel containing the information bar of each model is displayed.

2 Click on the square icon in a model information bar as shown.

This will open the **Color selector** dialog box.

3 Select the color of your choice and click **OK**.

- **Axial Slice View Screen**
- **Reconstructed Panoramic View Screen**
- **Oblique Coronal Slice View Screen (Cross-section)**

> **Tip:** General color preferences for **CS 3D Imaging** can be customized in the "Color Preferences".

> **Note:** Modifying 2D color preferences for models acquired using a CBCT scan will modify the color of the model in the **3D View Screen**.

Deleting a Model

To delete a model that has been aligned with a patient image volume, follow these steps:

1 In the object list of the **Curved Slicing** tab **Tools** pane, click to open the drop-down list and select **Model**.

The object list displays a list of existing models.

2 In the **Model** list, click in the information bar of the model you wish to delete.

The model is deleted and disappears from the **Curved Slicing** tab view screens.

> **Note:** Deleting a model will only delete it from the patient image volume and corresponding **Curved Slicing** tab view screens. The model itself is not erased.

Deleting All Models for a patient image volume

To delete all models listed for a patient image volume, click at the top of the **Model** list.

All Models aligned with the patient image volume are deleted (maxilla and mandibula) and disappear from the **Curved Slicing** Tab view screens.

Important: Make sure you want to proceed before you click . There is no confirmation message and no undo feature.

Integrated in your **Prosthetic-Driven Implant Planning** workflow, the soft tissue data of the digital model can be used to enhance your implant supported restoration.

For more information see "Prosthetic-Driven Implant Planning Workflow".

8 Working with Crowns

Using the Prosthetic-Driven Implant Planning Workflow

CS 3D Imaging supports **Prosthetic-Driven Implant Planning** (**PDIP**).

By combining visible soft tissue data of a digitized model with the patient x-ray volume, via the automatic Model Alignment Module, and by taking into account the final positioning of the crown (Prosthetic-Driven) at the beginning of the Implant planning process, **CS 3D Imaging** greatly improves the positioning of implants and simplifies implant supported restoration.

Prosthetic-Driven Implant Planning Workflow

	Align a Digital Model to a patient x-ray volume (Recommended) See “Aligning a Model with a Volume”.
	Place a crown See “Placing a Crown”.
	Place an Implant See: "Working with Implants". "Placing an Implant".
	Generate an Implant Planning Report See “Generating an Implant Planning Report”. or Export datasets to 3rd party software as part of your guided surgery workflow

Using a Prosthetic-Driven Implant Planning Workflow

The **Prosthetic-Driven Implant Planning** workflow involves the following steps:

1 Take a 3D x-ray scan of the Field of View using a Carestream Dental CBCT unit (CS 8200 3D & CS 9600 Families).

The following Carestream Dental CBCT units and Fields of View (FoV) are specifically adapted for this use.

Carestream Dental CBCT unit	CS 9600	CS 8200 3D
Field of View (Jaw)	jaw 8x8, 12x10, 10x10 16*10 - mandibula and maxilla 8x5, 12x5, 10x5	jaw 8x9 (or 8x8), 12x10, 10x10 - mandibula and maxilla 8x5, 12x5, 10x5
Field of View (Head)	16*12, 16*17, 16*10, 12*10	NA
Acquisition mode	LD STD HR	LD STD HR

Important: During the scanning process, make sure that the patient is not in occlusion. Follow the guidelines for using your CBCT device. To facilitate data registration, ask the patient to use the appropriate 3D bite block during the X-ray acquisition process.

Carry out a classic evaluation of the region of interest and take necessary measurements.

2 We recommend that you generate a digital impression of the patient's dental arch to create the 3D model in one of the following ways:

- From a conventional impression (silicon or alginate) obtained using a **Carestream Dental Systems** CBCT Unit's 3D Object acquisition module. **CBCT Impression Scanning**

- By taking an intraoral digital impression using the CS 3700 or CS 3800 IO scanner.

Note: Color rendering of 3D Digital impressions in **CS 3D Imaging** is only available using IOS acquisition (Intra-Oral Scanner).

3 Open the patient image volume in **CS 3D Imaging**, and in the **Curved Slicing** tab draw a trace along the dental arch. See "Drawing a Trace Along a Dental Arch".

4 Align a model with the patient image volume. See "Aligning a Model with a Volume".

Using the Crown Library

CS 3D Imaging allows **Prosthetic-Driven Implant Planning** (**PDIP**). This is carried out via the **Curved Slicing** tab.

Before You Start

Before using the **CS 3D Imaging** Crown Library, follow these steps:

1 Take a 3D x-ray scan of the region of interest using a Carestream Dental CBCT unit (CS 8200 3D & CS 9600 Families).

2 Take a digital impression (referred to as a model) of the patient's dental arch.

3 Open the patient image volume in **CS 3D Imaging**, and in the **Curved Slicing** tab draw a trace along the dental arch. See "Using the Curved Slicing Tab".

4 Align the Model to the patient image volume. See "Aligning a Model with a Volume".

Placing a Crown

To place a crown in a patient image volume, follow these steps:

1 Draw a trace along the dental arch. See "Drawing a Trace Along a Dental Arch".

2 Align a model with the patient image volume (recommended). See "Aligning a Model with a Volume".

3 In the **Curved Slicing** tab, draw a trace along the dental arch of the patient image volume, and align a model with the volume (optional).

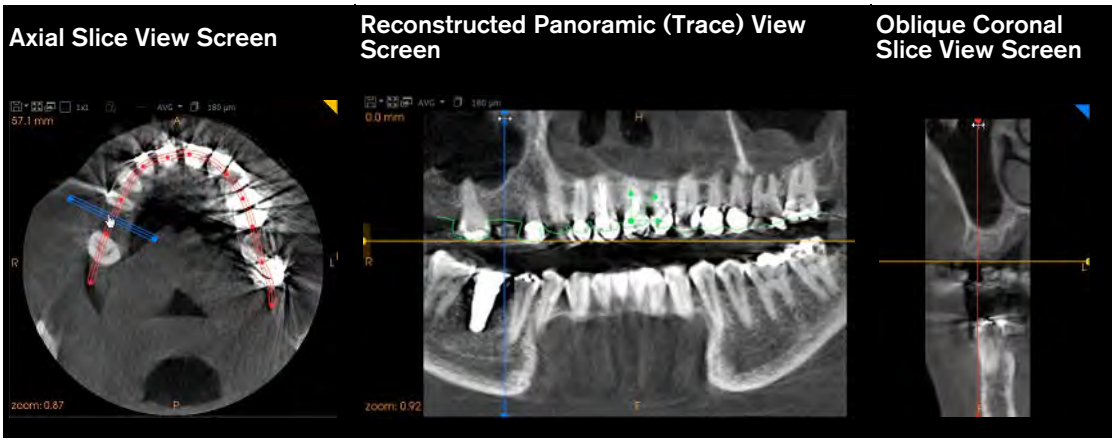
> **Note:** The **Crown** icon is only available on the **Curved Slicing** tab, and is deactivated (grayed out) until a trace has been drawn along the jaw arch.

4 Based on your analysis of anatomical details, **carefully select the initial crown position**, taking into account:

- The soft tissue data of the digital model
- The position and height of adjacent crowns

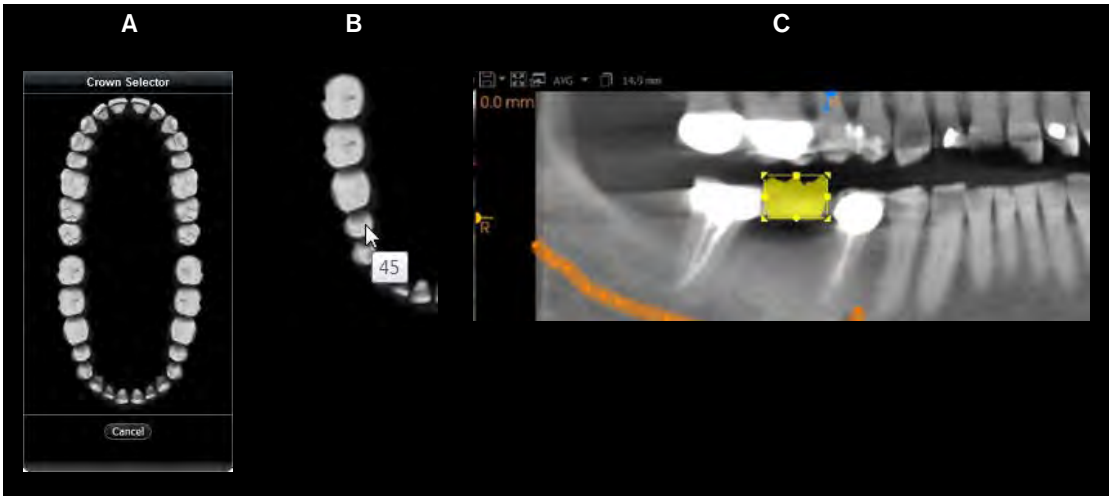
To select the initial crown position, use the slice plane handles and to adjust the position of the axial slice plane in the **Reconstructed Panoramic View Screen** and **Oblique Coronal Slice View Screen**.

> **Tip:** To optimize crown placement, it is recommended you set the vertical handle of the axial plane at a right angle in the **Reconstructed Panoramic View Screen**, and set the horizontal handle with reference to the occlusal plane and the position of the adjacent crowns.



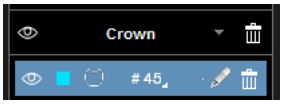
5 After careful analysis of anatomical details, and when you are satisfied that you have chosen the optimal position for your crown placement, in the **Curved Slicing** tab tool box, click to **select a crown from the crown library**.

The **Crown Selector** window (**A**) is displayed.



6 In the **Crown Selector** window, choose the appropriate crown number by clicking on the corresponding image (**B**).

- The crown is placed automatically in the position predefined by you in the patient image volume (**C**).
- The crown appears in the **Crown** list of the object list.



Note: **CS 3D Imaging** can support up to 8 crown placements in the same volume.

Repositioning a Crown

The position of an imported crown can be adjusted manually in the **Curved Slicing** tab, using the object editing tools displayed in the following view screens:

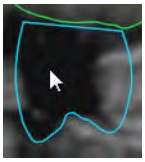
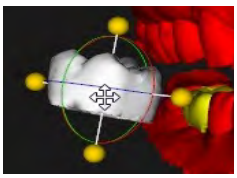
- **Axial Slice View Screen**
- **Reconstructed Panoramic View Screen**

- **Oblique Coronal Slice View Screen (Cross-section)**

To reposition a crown in a patient image volume, follow these steps:

1 In the **Tools** pane in the tool box, click .

2 To **move** a crown in the 2D or 3D view screen of your choice, click on the object using and drag to move it to a new position.

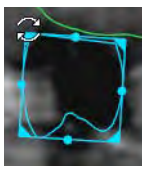
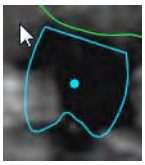
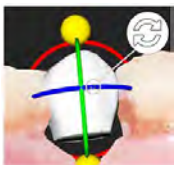
A - 2D	**B** - 2D	3D
		

3 To **rotate** a crown in 2D view:

- select a rotation point by hovering the mouse outside one of the corners (A) and;
- click, drag and release to move the object to a new position (B).

In 3D view:

- select the proper circle to rotate the crown either in a buccal / lingual or mesio / distal direction, then;
- drag & release to rotate the object to the expected position.

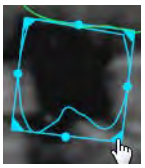
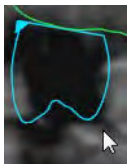
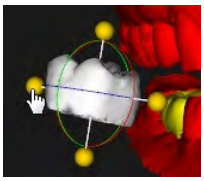
A - 2D	**B** - 2D	3D
		

4 To **resize** a crown in 2D view:

- click to select one of the corner handles (A) and;
- drag the object (B) outward (+) or inward (-).
- Release when the crown is in the desired size.

In 3D view:

- click and select one of the 4 corner handles and;
- drag the object outward or inward, then release.

A - 2D	**B** - 2D	3D
		

5 To **stretch** or **squeeze** a crown in order to adapt its shape to anatomical conditions, click one of the grab points located at the center of the sides (**A**), and drag the object inward or outward. Release when the crown is the desired shape; **this option is not available in 3D.**

A	**B**

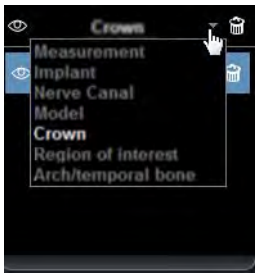
When you place a crown in a patient image volume, it automatically appears in the object list of the **Curved Slicing** tab tool box. See "Using the Curved Slicing Tab".

Integrated in your **Prosthetic-Driven Implant Planning** workflow, the placed crown can be used to guide implant supported restoration. See "Prosthetic-Driven Implant Planning Workflow".

Managing Crown Objects

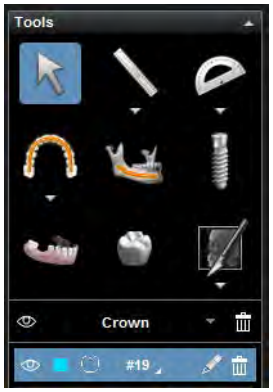
When you import a crown, it is added to the object list in the extended **Tools** pane in the **Curved Slicing** tab tool box.

This panel enables you to manage the full range of objects added using features in the **Tools** pane.



Displaying Crown Information

To display information about a crown, follow these steps:



1 In the object list in the **Tools** pane, click the drop-down list and select **Crowns**.

The object list displays a list of crowns that have already been placed in the volume.

2 Click to automatically center all view screens on a selected crown.

The **Oblique-Coronal Slice View Screen**, **Axial Slice View Screen** and **Reconstructed Panoramic View Screen** are all repositioned so that they center on the selected crown.

Showing and Hiding Crowns

To show/hide an individual crown, follow these steps:

1 In the object list in the **Tools** pane, click the drop-down list and select **Crowns**.

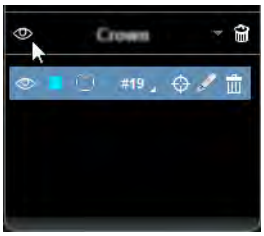
The object list displays a list of all crowns in the volume.

2 Click an individual crown icon as follows:

- Click to hide a visible crown.
- Click to show a hidden crown.

The selected crown is hidden or re-displayed in the volume.

To hide/display **all** crowns in the volume, follow these steps:



1 In the object list in the **Tools** pane, click the drop-down list and select **Crowns**.

The object list displays a list of all crowns in the volume.

2 Click the show/hide icon at the top of the panel.

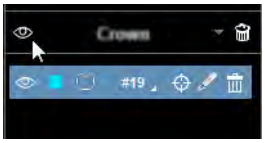
- Click to hide all visible crowns.
- Click to show all hidden crowns.

The crowns are hidden or re-displayed in the volume.

Replacing a Crown

1 To replace an existing crown, follow these steps:In the object list in the **Tools** pane, click the drop-down list and select **Crown**.

The object list shows the existing crowns



2 In the **Crowns** section of the object list, click the pencil icon for the crown you want to replace.

The **Crown Selector** window appears, and the crown you wish to replace is highlighted.

3 Select the new crown you want to use to replace the selected crown.

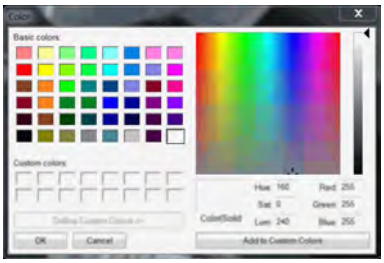
> **Important:** A replacement crown can only be selected from the same quadrant as the original crown.

4 Click **OK**.

The crown is replaced in the **Curved Slicing** tab view screens. It is likely you will have to reposition the newly replaced crown.

Editing Crown Color Preferences

To change the color of an individual crown, follow these steps:



1 In the object list in the **Tools** pane, click the drop-down list and select **Crown**.

The object list displays a list existing crowns.

2 Select a crown and click (existing crown color). The **Color** selection window appears.

3 Select a **Color** and click **OK**.

The placed crown is displayed in the color option selected.

Deleting Crowns

To delete crowns, follow these steps:

> **Note:** Make sure you want to proceed before you click . There is no confirmation message and no undo feature.

1 In the object list in the **Tools** pane, click the drop-down list and select **Crown**.

The object list displays a list of existing crowns in the volume.

2 Do one of the following:

- Click alongside the individual crown you want to delete.
- Click at the top of the **Crown** section to remove all crowns.

9 Working with Implants

Note: The implant functionality is not available in the ENT version of **CS 3D Imaging**.

Using the Prosthetic-Driven Implant Planning Workflow

CS 3D Imaging enables placing implants as part of the **Prosthetic-Driven Implant Planning** (**PDIP**) workflow.

By taking into account the final positioning of the crown (Prosthetic-Driven) at the beginning of the implant procedure, **CS 3D Imaging** enables you to greatly improve the reliability and precision of Implant planning. See "Prosthetic-Driven Implant Planning Workflow".

Important: Carestream Dental software may contain data or content portraying dental implant products provided by third parties. The products portrayed by such data or content may not have regulatory approvals in all countries.

Placing an Implant

Before You Start

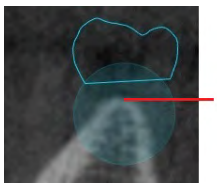
- Before you place implants, we recommend that you do the following:
  - Set the implant preferences in the "Implant Preferences".
  - Select your favorite implant systems in the implant library. See "Using the Implant Library".
- In the **Curved Slicing** tab, draw a trace along a dental arch (See "Drawing a Trace Along a Dental Arch".), create a reconstructed panoramic image (See "Creating a Reconstructed Panoramic Image".) and position the cross-section plane of the oblique-coronal slice using the blue handles . See "Moving and Tilting Slice Planes in 2D MPR View Screens".
- To make it easier to place your implant, we suggest you use the object list to hide all of the other existing measurement objects on your images. See "Using the Object List in the Tools Pane".

To place an implant, follow these steps:

1 On the **Curved Slicing** tab, in the **Tools** pane in the tool box, click .

> **Tip:** An **Implant creation tutorial** window appears, indicating the process to place an implant. To deactivate this tutorial, click **Do not show this tutorial again**. This tutorial can be activated and deactivated in the **"Implant Preferences"**.

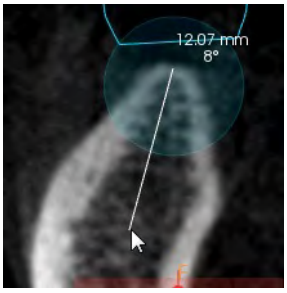
2 In the cross-section view, click to set the implant neck.

> **Note:** If you are placing an implant based on a crown, the first point must be within the transparent blue circle.
>
> 
>

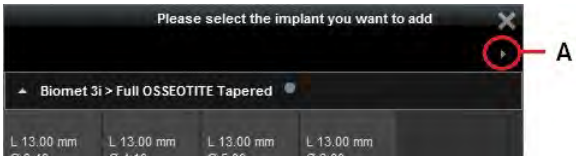
3 Click again to set the apex position.

A line displaying the measured length between the defined implant neck and apex appears.

If the implant has been placed according to a crown axis, the angle calculation between the implant position and the restoration appears.

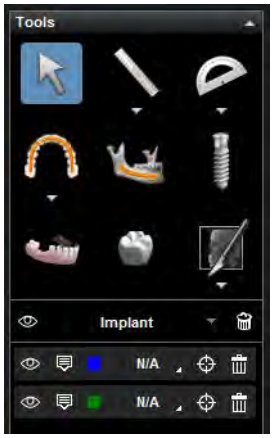


An implant selection window appears, with a recommended implant selected.

> **Tip:** In the implant selection window, you can click the arrow to the side (**A**) to select the favorite implant types that you want to appear in the implant selection window.
>
> 
>

4 In the window, select a different implant if necessary, and then click **OK**.

The implant appears in the **Implant** object list.

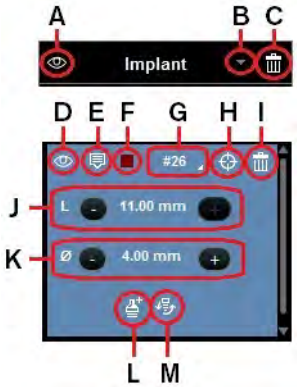


Using the Implant Object List to Edit Implants and Display Information

To display information about an implant that has already been placed, follow these steps:

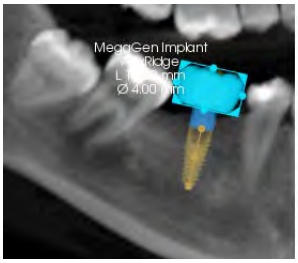
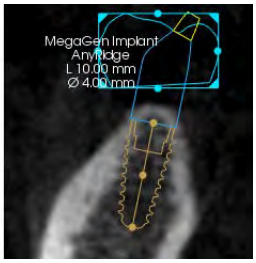
1 In the object list in the **Tools** pane, click the drop-down list (**B**) and select **Implant**.

The object list displays a list of existing implants.



2 Do any of the following:

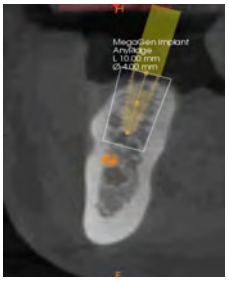
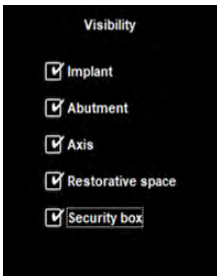
To show or hide implant objects in an image...	In the object list: • To hide all of the implant objects in the image, click (**A**) in the object list toolbar. To show all hidden objects, click . • To hide one implant object in the image, click (**D**) in the implant object toolbar. To show the hidden object in the image, click .
To delete implant objects in an image...	• To delete all implant objects in an image, click (**C**) in the object list toolbar. • To delete one implant object in an image, click (**I**) in the implant object toolbar. **Note:** Make sure you want to proceed before you click - there is no confirmation message and no undo feature.
To have the information for an implant object displayed in the image...	Click (**E**). To hide the implant information displayed in an image, click .

To change the color of the implant object in the 2D MPR view screens...	Click the color box (**F**) in the implant object toolbar, and select a different color for the object.
To view the information for an implant...	In the object list, next to the implant name (and the number for the tooth on which the implant is placed) #26 (**G**), click the arrow.
To have the view screens positioned with the implant in the center...	Click the (**H**). The view screens are repositioned so that they center on the selected implant.
To modify the length of the implant...	Use the plus and minus buttons (**J**).
To modify the diameter of the shoulder platform of the implant...	Use the plus and minus buttons (**K**).
To add an abutment to the implant...	1. Click (**L**). 2. Enter the desired **Abutment** parameters. The implant and customized abutment are displayed in 3D when selected/created, and relevant implant reference information is displayed. 3. Click **OK**.  
To replace the implant...	1. Click (**M**). An implant selection window appears. 2. Select a different implant and click **OK.**

Implant Security Box

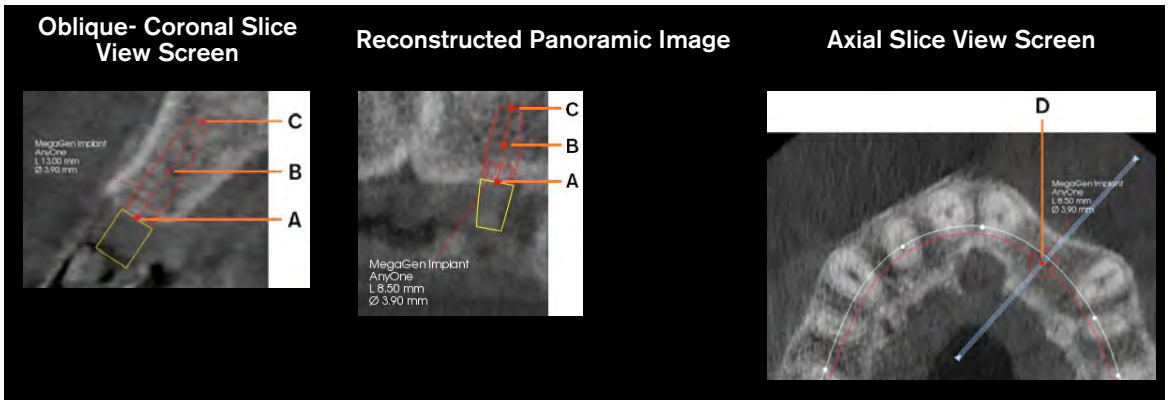
Security Zones and Warning

To activate the implant security box go to **Implant Preferences**.

In normal behavior, there is a white box of 1.5mm on each implant body side and 2mm at the implant Apex. Check that the implant is well seated in the bone.	
When the box is too close to anatomical obstacles, it becomes red.	
The same behavior occurs when 2 Implants are too close to each other.	
Activate or deactivate the warning box in **Implant Preferences**.	

Repositioning an Implant

Moving Implants in 2D MPR View Screens



To rotate an implant, in either the **Oblique-Coronal Slice View Screen** or on the reconstructed panoramic image, click and drag the end handles (**A**) or (**C**).

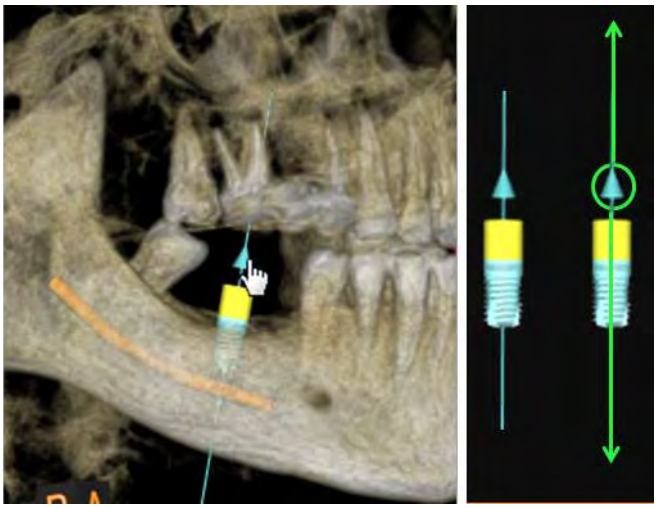
To move an implant, do one of the following:

- In the **Oblique-Coronal Slice View Screen** or on the reconstructed panoramic image, click and drag the center handle (**B**).
- In the **Axial Slice View Screen**, click and drag the Implant handle (**D**).

> **Note:** If you move an implant in the volume, it may disappear from view in other View Screens. If this happens click in the **Implant** object list to automatically center all views on an implant. See "Using the Implant Object List to Edit Implants and Display Information".

Moving Implants in 3D View Screens

You can move an implant along its axis by dragging the tip of the implant as shown below.



Generating an Implant Planning Report

When you have carried out your implant placement, you can generate an **Implant Planning Report**. See "Generating an Implant Planning Report".

Creating Your Own Implant

To create an implant, follow these steps:

1 In the **Main Toolbar Icons**, to display the **Implant Library**, click .

The **Implant Library** window appears, showing the list of available implants and their details.

2 In the **Implant Library** window, click **Create your own implant**.

The **Implant Library** window displays fields for configuring an implant.

> **Note:** Fields displayed in red are mandatory.

3 Specify the manufacturer, brand, reference, length, apical diameter, and diameter.

You can select the body style, connection type, and default color of the implant. New implant dimensions must comply with the following ranges.

Head Length	0.4 - 20.0 mm	Values are displayed in red if they are outside of these ranges.
Head Diameter	1.0 - 10.0 mm	
Body Length	2.0 - 100.0 mm	
Body Apical diameter	1.0 - 10.0 mm	
Body diameter	1.0 - 10.0 mm	

> **Note:** Once you have saved the new implant, the manufacturer and brand fields cannot be edited.

4 In the **Implant Library** window, use the **Head**, **Body** and **Color** pickers to configure the shape and color of the new implant.

5 In the **Implant Library** window, click **OK**.

The new implant is added to the **Implant Library**.

6 Click **Close** to close the window.

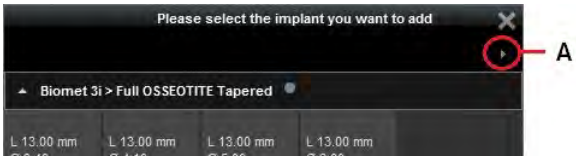
Using the Implant Library

In the **Implant Library** window, you can do the following:

- View information on the available implants.

- Create an implant. See “Creating Your Own Implant”.

Tip: You can select “favorite” implants in the implant selection window. In that window you click the arrow to the side (**A**) to show an additional pane, in which you select the favorite implant types that you want to appear in the implant selection window.



See “Placing an Implant”.

To access the **Implant Library** window, follow these steps:

1 In the **Main Toolbar Icons**, to display the **Implant Library**, click .

The **Implant Library** window appears, showing the list of available implants and their details.

2 If necessary, create implants. See “Creating Your Own Implant”.

3 Click **OK**.

Updating the Implant Library

CS 3D Imaging provides a library of virtual implants for use on the **Curved Slicing** tab.

You can add and remove manufacturers, and import and export custom implant libraries.

Note:
- The number of implant manufacturers increases frequently. Check periodically for updated information.
- You can only export implants that you have created yourself (you cannot export manufacturers implants).

When updates are available, the icon appears in the **CS 3D Imaging Main Toolbar Icons**.

To update the **Implant Library**, follow these steps:

1 Verify that the computer is connected to the Internet.

2 Click in the **Main Toolbar Icons**.

The **Implant Library Update** window appears.

3 In the **Implant Library Update** window, click one of the following:

Option	Further Steps
Add Implant Manufacturer	1. If you select this option, click **Next**. A list of available implant libraries not currently installed on your computer is displayed, with all manufacturers are selected by default. 2. Deselect the manufacturers you do not want to download, and click **Next**. Click **Hide** if you want to perform the implant update in the background while you carry on working. 3. When the update is complete, click **Close** to close the window or **Previous** to return to the window option menu.
Remove Implant Manufacturer	1. If you select this option, click **Next**. A list of the installed implant libraries is displayed. 2. Select the manufacturers you want to remove from the computer, and click **Next**. 3. When the action is complete, click **OK** to close the window or **Previous** to return to the window option menu.
Update Implant Manufacturers	**Note:** Only available when there are updates available. 1. If you select this option, click **Next**. A list of implant libraries available to install. 2. Deselect the manufacturers you do not want to download, and click **Next**. Click **Hide** if you want to perform the implant update in the background while you carry on working. 3. When the update is complete, click **Close** to close the window or **Previous** to return to the window option menu.
Import Custom Library	**Note:** The implants that you want to import need to be in ZIP file.s 1. If you select this option, click **Next**. 2. Click **Browse** and select the folder that contains the ZIP files containing the implants that you want to import. 3. Click **Next**. The file import is executed. 4. When the action is complete, click **OK** to close the window or **Previous** to return to the window option menu.
Export Custom Library	**Note:** You can only export implants that you have created; you cannot export manufacturers' implants. See "Creating Your Own Implant". The exported library will be saved in ZIP file format. 1. If you select this option, click **Next**. 2. Click **Browse** and select the folder in which you want to export the ZIP file and enter a name for the ZIP file. **Tip**: Make note of this folder name so that you can easily locate the ZIP file in the future. 3. Click **Next**. The file export is executed. 4. When the action is complete, click **OK** to close the window or **Previous** to return to the window option menu.

Using the Implant Database Update Window

In some circumstances, the **Implant Database Update** window may appear following a software update.

This is because your implants library contains custom implants that need to be recalibrated.

To do this you must decide how the “catalog length” for these implants is calculated in one of the following ways:

- catalog length = head length + body length
- catalog length = body length only.

To use the **Implant Database Update** window, follow these steps:

1 Do one of the following:

For any implants where **catalog length = head length + body length**...	1. Select the affected implants in the list (either use individual check boxes or click the **Select All** button to select them all). 2. Click the **Head+Body** button to assign the **catalog length = head length + body length** calculation.
For any implants where **catalog length = body length**...	1. Select the affected implants in the list (either use individual check boxes or click the **Select All** button to select them all. 2. Click the **Body** button to assign the **catalog length = body length** calculation.

2 Click **OK** to close the **Implant Database Update** window.

Once you have completed this process the **Implant Database Update** window will not be displayed again.

10 Using Export Functions

Depending on the tab you have selected, the **Export** section of the **CS 3D Imaging** tool box shows the following tools that you can click to access their settings.

Tool	Workspace Tab
Patient Analyses	**Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** See “Using Patient Analyses”.
Cross-Sections	**Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** See “Generating a Cross-Section”.
Implant Planning Reports	**Curved Slicing** See “Generating an Implant Planning Report”.
Printing	Available in all workspace tabs. See “Printing with Film Composer”.
Volume export **Export Scanned Object**	**Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** See “Exporting a Volume”.
Virtual Ceph	**Orthogonal Slicing** See “Generating and Exporting Virtual Cephalometric Images”.
Workspace Screenshots	**Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** See “Creating a Workspace Screenshot”.
Screenshot Directory	**Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** See “Opening the Screenshot Folder”.
CD Export **USB Export**	**Orthogonal Slicing**, **Curved Slicing**, **Custom Slicing**, **Oblique Slicing** See: "Exporting to a Compact Disc". "When all data has been copied to the disc, it is automatically ejected from the computer. When you give the disc to someone else, make sure that the recipient is aware that they need to launch ViewData.exe.". **Note:** These tools belong to an icon group. See “Using the Toolbox”.

Using Patient Analyses

When you open a volume for the first time in **CS 3D Imaging**, a default patient analysis is created. When you exit the software or switch to a different patient analysis, your settings are stored in the current analysis.

This allows you to retain views and settings for future use. For example, you can then compare two different implant placements for the same patient, or for two clinicians can work on the same patient record using their individual analyses.

When you exit the software or switch to a different analysis, the following settings are retained:

- Drawings, measurements or other objects on the **Curved Slicing**, **Orthogonal Slicing**, and **Oblique Slicing**.
- 2D and 3D view adjustments, including palettes
- View screen settings (for cut plane positions, integration, split views and others)
- **Gallery** images

Note: The following are not saved:
- **Review** tab views
- **Cross Section Tool** (**Slicing**) settings

You can maintain several analyses, but only one analysis can be open at a time.

Creating an Analysis

To create an analysis, follow these steps:

1 In the **Export** pane in the tool box, click .

The **Patient Analyses** window appears. Any previously saved analyses are listed in date order. The current analysis is listed without an icon next to it.

2 Click **Create**, and enter a name for the analysis. You can also add a comment.

3 Click **OK**.

The new analysis is displayed in the list with the date, time, and any comment you entered.

4 Select the new analysis in the list by clicking on it.

The selected analysis is highlighted in blue.

5 Click **OK**.

The **Patient Analyses** window closes and the volume reloads in its original state.

When you exit **CS 3D Imaging**, your changes are saved automatically to the new analysis.

Editing or Deleting Analyses

To edit or delete an existing analysis, follow these steps:

1 In the **Export** pane in the tool box, click .

The **Patient Analyses** window appears.

2 In the **Patient Analyses** window, do one of the following:

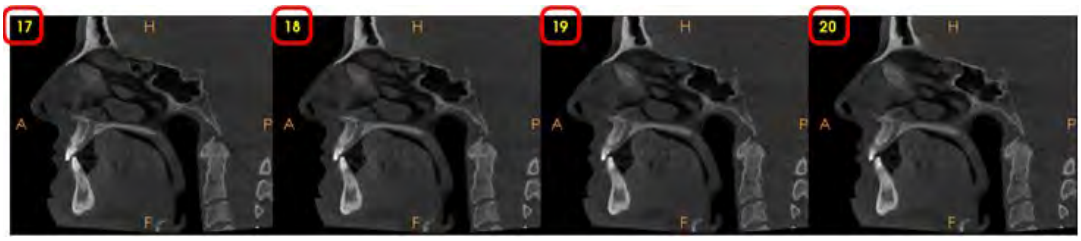
- Select the analysis you want to edit. The selected analysis is highlighted in blue. Edit the item as necessary and click **OK**, and then **OK** a second time to close the **Patient Analyses** window.

- To delete an analysis, click next to the analysis you want to delete, and then click **OK** to close the **Patient Analyses** window.

Generating a Cross-Section

A cross-section is a series of slices through a selected region of interest in the 3D volume which you can view in the **Review** tab or print using **Film Composer**.

Each slice in the series is displayed on the **Review** tab with a slice number.



There are two methods for using this tool:

- To select a mode and spacing requirements and then adjust region of interest lines as required, use "Method 1: Flexible Region Of Interest".

- To specify the slice count and then adjust the entire region of interest as required, use "Method 2: Fixed Region Of Interest".

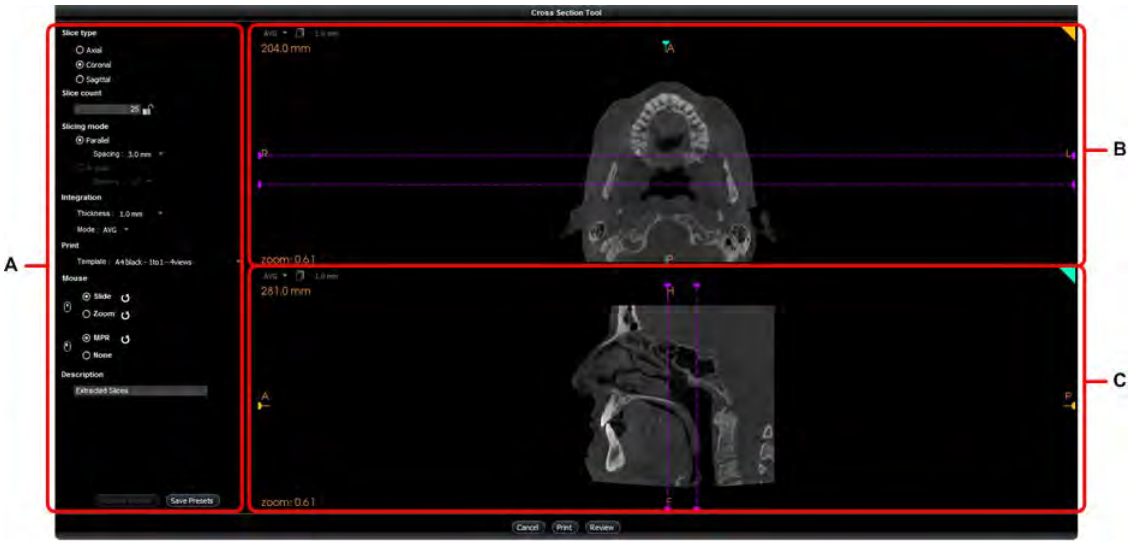
Method 1: Flexible Region Of Interest

In this method, you select the mode and spacing requirements, while leaving the slice count unlocked, so that you can manually adjust the boundaries of the region of interest.

To generate a cross-section, follow these steps:

1 In the **Export** pane in the tool box, click .

The **Cross Section Tool** appears, showing a configuration pane (**A**) and two region of interest views (**B** and **C**).



2 In the **Cross Section Tool** pane, select a **Slice type**.

The type of slices available depends on the tab you are working on when you generate the cross-section.

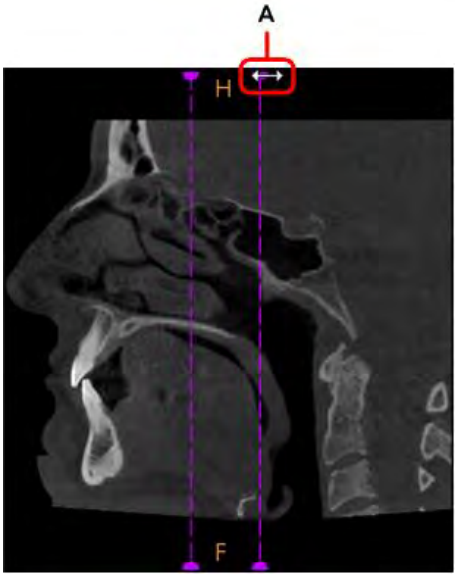
Tab	Slice types available in the Slicing Tool
Orthogonal Slicing	**Axial**, **Coronal**, **Sagittal**
Curved Slicing	**Panoramic**, **Arch/temporal bone cross-section**, **Implants** (grayed out if there are no implants in the volume)
Custom Slicing	**Lateral**, **Anteroposterior**
Oblique Slicing	**Oblique axial**, **Oblique coronal**, **Oblique sagittal**

The two region of interest views change to reflect your **Slice type** selection.

3 To select the **Slice count**, do one of the following:

- Manually enter the slice number.

- In one of the region of interest views, click and drag one of the region of interest handles (**A**).



The region of interest boundaries (dotted lines) can move independently because the **Slice count** in the configuration panel is not locked. By moving the region of interest boundaries, the **Slice count** is recalculated automatically.

4 In the configuration panel, where appropriate, select a **Slicing mode**.

Slicing mode	Spacing
Parallel Use this mode to generate parallel slices between your region of interest boundaries. This is the default setting for all workspace tabs except in the **Curved Slicing** tab.	Measured in mm, this is the distance between each parallel slice.
Angular (**Curved Slicing** tab only) Use this mode to generate slices in a circle around the point where the oblique-coronal slice (blue line) crosses the plane of the axial slice (yellow line).	Measured in degrees (°), this is the angle between slices. A spacing of 30° will generate 12 slices (360/30=12).

The region of interest views change to reflect your **Slicing mode** selection.

5 Select an **Integration** parameter: **Thickness** or **Mode**.

6 Click the name of the selected **Print** template to activate a drop-down list and select a different template name. This template will be applied in **Film Composer** when you print your slices.

7 Select a **Mouse** scroll wheel mode:

- **Slide** enables you to scroll through the visible slices using the scroll wheel of the mouse.
- **Zoom** enables you to zoom in and out on the visible slices using the scroll wheel of the mouse.

8 To add a description, enter text in the **Description** field. This text will appear as a part of the DICOM tag “Series description”.

9 To print the slices, click the **Print** button to launch **Film Composer**. The print template selected above is used to layout pages containing the generated slices.

10 To display your slices on the **Review** tab, click the **Review** button.

The generated slice series is displayed on the **Review** tab with two locator images on the right.

Thumbnails of the slice series and associated locator images are also added to the **Gallery**.

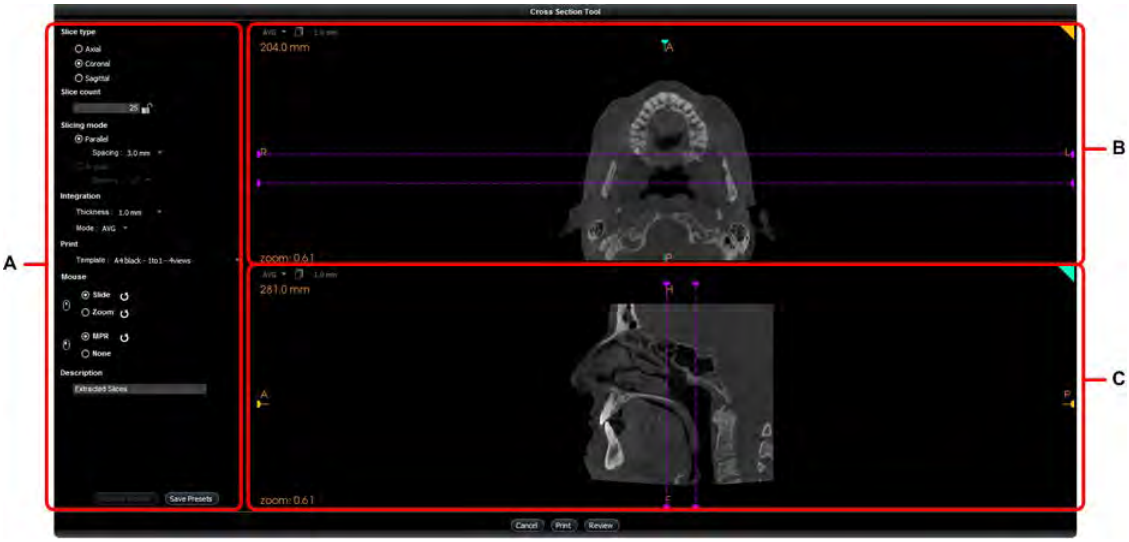
Method 2: Fixed Region Of Interest

You can use this method to specify and lock the slice count so that you can manually adjust the entire region of interest.

To generate a cross-section, follow these steps:

1 In the **Export** pane in the tool box, click .

The **Cross Section Tool** appears, showing a configuration panel (**A**) and two region of interest views (**B** and **C**).



2 In the **Cross Section Tool** pane, select a **Slice type**.

The type of slices available depends on the tab you are working on when you generate the cross-section.

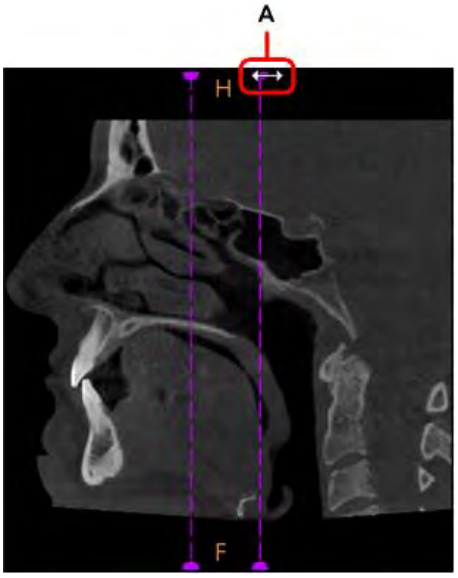
Tab	Slice types available in the Slicing Tool
Orthogonal Slicing	**Axial**, **Coronal**, **Sagittal**
Curved Slicing	**Panoramic**, **Arch/temporal bone cross-section**, **Implants** (grayed out if there are no implants in the volume)
Custom Slicing	**Lateral**, **Anteroposterior**
Oblique Slicing	**Oblique axial**, **Oblique coronal**, **Oblique sagittal**

The two region of interest views change to reflect your **Slice type** selection.

3 To select the **Slice count**, do one of the following:

- Manually enter the slice number.

- In one of the region of interest views, click and drag one of the region of interest handles (**A**).



The region of interest boundaries (dotted lines) can move independently because the **Slice count** in the configuration panel is not locked. By moving the region of interest boundaries, the **Slice count** is recalculated automatically.

4 Click to lock slice spacing.

Slice count and **Spacing** are locked and grayed out. The lock icon changes to .

Click if you need to unlock slice spacing.

5 In the configuration panel, where appropriate, select a **Slicing mode**.

Slicing mode	Spacing
Parallel Use this mode to generate parallel slices between your region of interest boundaries. This is the default setting for all workspace tabs except in the **Curved Slicing** tab.	Measured in mm, this is the distance between each parallel slice.
Angular (**Curved Slicing** tab only) Use this mode to generate slices in a circle around the point where the oblique-coronal slice (blue line) crosses the plane of the axial slice (yellow line).	Measured in degrees (°), this is the angle between slices. A spacing of 30° will generate 12 slices (360/30=12).

The region of interest views change to reflect your **Slicing mode** selection.

6 Select an **Integration** parameter: **Thickness** or **Mode**.

7 Click the name of the selected **Print** template to activate a drop-down list and select a different template name. This template will be applied in **Film Composer** when you print your slices.

8 Select a **Mouse** scroll wheel mode:

- **Slide** enables you to scroll through the visible slices using the scroll wheel of the mouse.
- **Zoom** enables you to zoom in and out on the visible slices using the scroll wheel of the mouse.

9 To add a description, enter text in the **Description** field. This text will appear as a part of the DICOM tag “Series description”.

10 To print the slices, click the **Print** button to launch **Film Composer**. The printer template selected above is used to layout pages containing the generated slices.

11 To display your slices on the **Review** tab, click the **Review** button.

The generated slice series is displayed on the **Review** tab with two locator images on the right.

Thumbnails of the slice series and associated locator images are also added to the **Gallery**.

Saving Slicing Presets

If you make any changes to the slicing settings in the **Cross Section Tool**, these changes are retained during the current software session but not saved when you exit the software.

To save slicing presets for future use, follow these steps:

1 In the **Export** pane in the tool box, click .

The **Cross Section Tool** appears.

2 In the **Cross Section Tool**, set the preferred slicing presets.

3 Click the **Save Presets** button. The new presets are saved and available for future use.

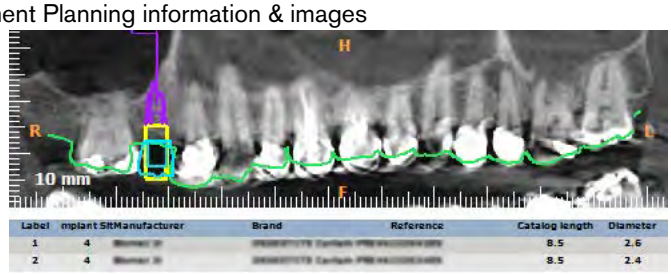
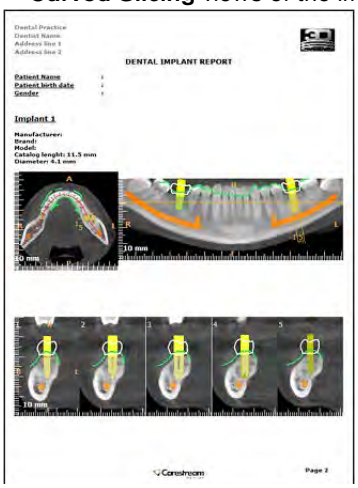
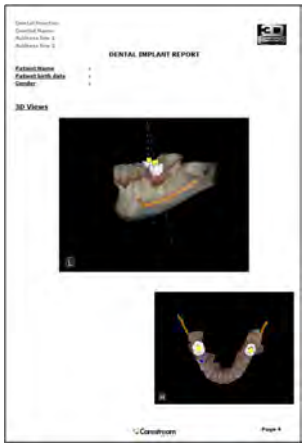
Note: Once you have saved your presets, the **Restore Presets** button is enabled to allow you to reload the saved presets.

Generating an Implant Planning Report

The contents and format of a **Implant Planning Report** depend on the settings in the "Implant Planning Report Preferences".

WARNING: Indications of use described here are meant only as a quick guide to specific features.

A **Implant Planning Report** can contain the following information.

Digest page	The digest page contains the following: • Administrative information including dental practice, referring physician, and patient details. • Treatment Planning information & images  • The reconstructed panoramic image shows virtual implants and crowns placed in the volume. • Relevant implant information, like the label, implant site, manufacturer, brand, reference, catalog length, and diameter.
Implant information	The Implant information includes the following: • Implant details including the label, implant site, manufacturer, brand, reference, catalog length, and diameter. • **Curved Slicing** views of the implant. 
3D view page	You can activate and deactivate a 3D view page in the "Implant Planning Report Preferences". 

To generate an **Implant Planning Report** for printing or export, follow these steps:

1 Open the **Curved Slicing** tab.

2 In the **Export** pane in the tool box, click .

The **Implant Planning Report** is opened in **Film Composer**.

Note: **Film Composer** is a separate software application that handles all print requirements for **CS Imaging** products. For information see the **Film Composer** online help.

Creating a Workspace Screenshot

To create a screenshot of the workspace in the tab, click in the **Export** pane in the tool box. A thumbnail of your screenshot is added to the **Gallery**.

Tip: **CS 3D Imaging** also provides the following methods for creating snapshot images:

- To create a screenshot of a view screen, click in the view screen toolbar. See "Creating a View Screen Screenshot".
- To create a slice series, see "Using Split Views in 2D MPR Views".
- To create a slice series with locator images, see "Generating a Cross-Section".

When you create a tab screenshot, an image file is created of the entire workspace in the screenshots folder.

Note: Screenshot and snapshot image files and the file location are created in the format specified in the "Export Preferences".

Opening the Screenshot Folder

When you create a workspace screenshot, copies of these files are saved in the folder you define in the "Export Preferences".

To open the screenshot folder, click in the **Export** pane of the tool box.

WARNING: This feature is provided to allow access to screenshot image files only. Accessing any other files with this feature can seriously damage your system.

Printing with Film Composer

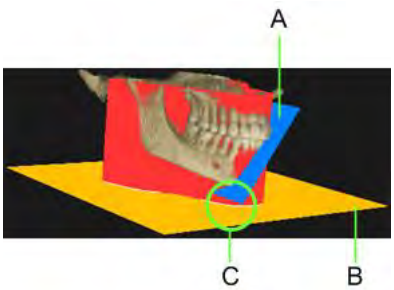
All printing is carried out using **Film Composer**, a separate software application that handles all print requirements for all **CS Imaging** products. For information on using this software application, see the **Film Composer** online help.

To open **Film Composer**, in the **Export** pane in the tool box, click .

Any images or views currently in the **Gallery** and all 2D MPR and 3D views are made available in the **Film Composer** gallery.

These images and views are arranged into compositions using pre-defined templates. You can modify these compositions if required before printing them to a printer or PDF file. You can also define which **Film Composer** templates should be applied to each mode tab.

Important: A print error can occur if certain slice planes do not intersect, because several functions in **CS 3D Imaging** depend on the intersection of these slice planes. For example if the oblique-coronal slice is angled such that it no longer intersects the axial slice, then an error message will appear when you export the image to **Film Composer**.



A Oblique-coronal slice

B Axial slice

C Gap between the oblique-coronal and axial slices

The same error can also occur if an implant plane does not intersect the axial slice.

Exporting a Volume

You can use the **Volume export** function in the **Export** pane to export a 3D volume for use in third-party DICOM software.

WARNING: An exported 3D volume may be subsampled, which may lead to diagnosis errors. Use subsampled data at your own risk.

Note:
- Only axial slices are exported. Other details such as implants and annotations are not exported.
- If you use increased slice thickness or a smaller axial matrix size, the exported volume will use up less storage space than the original volume.
- You can use the **Volume export**:
  - If the third party software does not support JPEG lossless compressed images.
  - If you need to export your volume with a DICOMDIR.
  - To anonymize a volume.

To export a 3D volume, follow these steps:

1 In the **Export** pane in the tool box, click .

The **Volume export** appears.

2 Configure the export settings as required.

1: Select file and directory	Click the **Browse** button and select the output directory (folder) in which you want the 3D volume to be exported. You can add a text description in the **Description** field if required. The text is added to the DICOM tag “Series description”.
2: Select resolution	**Select axial matrix size (pixels)**: Set the resolution of the axial slices for the exported 3D volume. **Select slice thickness**: Use the drop-down list to select one of the following slice thickness options: • **Isotropic**: If selected, the **Volume export** automatically calculates slice thickness when you adjust the axial matrix (voxel size remains cubic or uniform). • **Anisotropic** If selected, you can modify the slice thickness settings to give a volume with non-cubic (nonuniform) voxel dimensions. **Note:** Changing slice resolution and/or thickness will decrease image quality. Use these options at your own risk.

3: Select output file format	**Select file format**: Select an axial slice format that matches the third-party software's requirement: • Click **Anonymize** to remove all Patient Health Information (PHI) from the exported volume. • Click **Create DICOMDir** to add a DICOMDir data file to the exported volume. **Select compression**: Select compressed or uncompressed DICOM output. **Note:** DICOM images are usually exchanged as compressed JPEG images in order to conserve file space and bandwidth. However it is not mandatory to do so. An uncompressed DICOM volume can require up to 350 Mb of disk space.

3 Click the **Export** button.

The current 3D volume is exported to the folder you selected in section 1.

A window will open allowing you to choose the type of volume selections.

4 Choose the selection and **Click** OK.

To export a scanned object, follow these steps:

1 After having opened a scanned object appliance, format STL, in **CS Imaging**, proceed to the Export toolbox.

> **Note:** Appliance volume acquired with CS 8100, CS 8200 or CS 9600 only

2 In the **Export** pane tool box, click .

The scan object export dialog window appears.

3 Select the Output folder, file name.

The mesh contour can be adjusted with the dedicated slider.

4 Click the **Export** button when finished.

Exporting to a Compact Disc

You can copy a 3D volume to a blank compact disc.

Important: Data review is available with CS 3D Imaging Lite on a CD or USB Key for users who do not have access to the complete version of CS 3D Imaging.

The export disc allows you to do the following:

- Copy 3D volume and data to a computer.
- Install CS 3D Imaging lite on the computer, if needed.
- Launch CS 3D Imaging.

To export the current 3D volume to a disc, follow these steps:

1 Insert a blank, writable disc in the computer disc drive.

2 In the **Export** pane in the tool box, click .

The disc burning wizard starts up automatically.

3 Enter a title for your disc (maximum 16 characters) or accept the default (the current date).

Note: This name will be displayed in the operating system's file-browser when the disc is inserted into a computer disc drive.

4 Select a recording speed.

Consult your computer documentation for assistance with this step.

5 Click **Next** to continue.

The disc burning wizard starts copying data to the blank disc.

When all data has been copied to the disc, it is automatically ejected from the computer. When you give the disc to someone else, make sure that the recipient is aware that they need to launch ViewData.exe.

Exporting to a USB Key

To export the current patient file to a USB key, follow these steps:

1 Insert into the computer USB port a USB key with sufficient free space to hold your file.

> **Note:**
>
> - You must insert the USB key before clicking .
> - The quality of the USB key used will have a direct impact on how quickly your data is saved.

2 In the **Export** pane in the tool box, click .

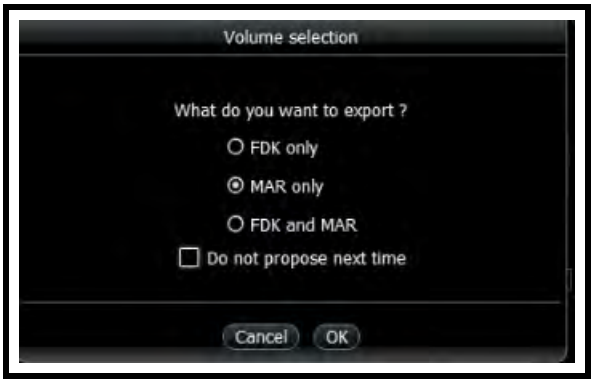
The **Select a folder** window appears.

3 In the **Select a folder** window, select or create a folder on the USB key.

4 Click **OK**.

A **Please Wait** message is displayed while your data is written to the USB key. The data transfer may take several minutes.

When exporting Volumes only, select one of three choices: FDK, MAR or both, as shown below:

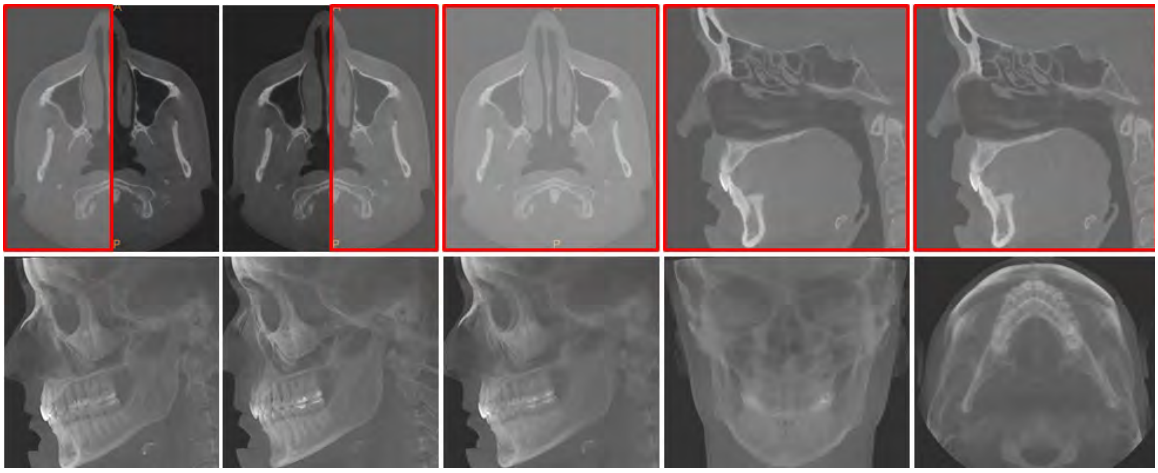


Once the export has completed, the folder you selected will contain:

- **Data**: This folder contains the exported data from your 3D volume.
- **ViewData.exe**: When all data has been copied to the disc, it is automatically ejected from the computer. When you give the disc to someone else, make sure that the recipient is aware that they need to launch ViewData.exe.

Generating and Exporting Virtual Cephalometric Images

In **CS 3D Imaging**, you can use the **Virtual Ceph** tool to generate images of integrated lateral, facial and axial views. These images are exported to the patient's record in **CS Imaging**, from which you can export the images that a third-party cephalometric tracing software can open.

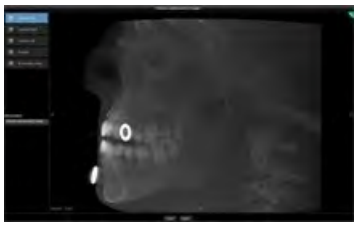


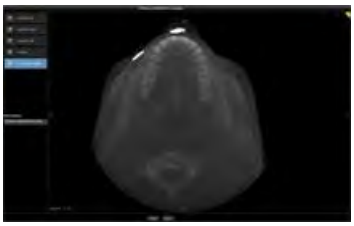
To use the **Virtual Ceph** tool to generate a virtual cephalometric image, follow these steps:

1 In the **Export** pane in the tool box, click .

The **Virtual cephalometric images** window appears.

2 Select any of the following view options.

Lateral	This view shows the fully integrated skull.	
Lateral Left	This view shows the half integrated left side of the skull.	
Lateral Right	This view shows the half integrated right side of the skull.	

Frontal	This view shows the fully integrated skull.	
Submento-vertex	This view shows the fully integrated skull from below or above.	

3 Enter a description.

4 Adjust 2D MPR sliders to set the brightness, contrast and enhancement in the virtual cephalometric images.

5 Click **Create**.

Thumbnails of your screenshot are added to the **Gallery** and the image files are saved in the screenshots folder.

11 Setting CS 3D Imaging Preferences

The **Preferences** window allows you to customize **CS 3D Imaging** tools, functions and performance, which are grouped together into functional categories.

	“Application Preferences”
	“3D View Preferences”
	“Color Preferences”
	“Measurement Units Preferences”
	“Template Preferences”
	“MPR Preferences”
	“View Orientation Preferences”
	“View Order in Split Views Preferences (Imaging Center Software Only)”
	“Export Preferences”
	“Implant Preferences”
	“Annotations Preferences”
	“Implant Planning Report Preferences”
	“Virtual Cephalometric Preferences”
	“Airway Preferences”

Application Preferences

In the **Application** preferences, you can do the following:

- Choose whether MAR volume should be displayed by default or not.
- Switch between the **Easy** and **Advanced** modes (Dental and ENT only).
- Select the workspace tab you want to see every time you open the software.
- Activate/deactivate previews of images being loaded by **CS 3D Imaging**.

To set the **Application** preferences, follow these steps:

1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

The **Application** preferences appear.

3 Do any of the following.

To switch between the **Easy** and **Advanced** modes...	To display fewer tools in the tool box, click **Easy**. To display all available tools in the tool box, click **Advanced**. **Note:** This setting only applies to **Dental** and **ENT** versions of the software because the **Imaging Center** version can only be run in **Advanced** Mode.
To display available MAR data by default...	Next to **When available, display MAR volume by default**, click **Yes**. Click **No, always display FDK** to display FDK reconstructions by default.
To select the default workspace tab that should appear when you launch **CS 3D Imaging**...	Click one of the following: • **Orthogonal Slicing** • **Curved Slicing** • **Custom Slicing** • **Oblique Slicing**
To configure the preview of a volume while the complete volume is being loaded...	To deactiveate this feature and have no preview volume, deselect **View preview version of a volume while the complete volume is loading**. To activate this feature and have a preview volume, indicated by the PREVIEW label in the upper corner of the image, select **Show a preview version of the volume while it is loading**.
To reset the preferences to the installation defaults...	Click .

4 Click **Apply**.

3D View Preferences

Important: 3D rendering is not intended for diagnostic use.

In the **3D View** preferences, you can optimize performance by configuring the following settings:

- Activate and deactivate the **3D View Screen**.
- Set 3D rendering prioritization.
- Allow shading.
- Select a rendering technique.
- Set the tissue limit adjustment mode.

To set the **3D View** preferences, follow these steps:

1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

The **3D View** preferences appear.

3 Do any of the following.

To activate or deactivate the **3D View Screen**...	Click **3D View**. **Note:** You must restart **CS 3D Imaging** for this setting to take effect.
To set the prioritization of the software's performance...	Select a **Rendering prioritization**: • **Rendering Speed** for high speed. • **Speed/Quality balance** for medium speed. • **Rendering Quality** for low speed, but better images.
To activate or deactivate shading in the **3D View Screen**...	Click **Shading**. **Note:** To get the best image results, make sure **Shading** is selected when you take screenshots.

To select a 3D rendering option that matches your computer performance...	Select one of the following from the **Desired rendering technique** drop-down list: • **Enhanced hardware-accelerated rendering** • **Standard hardware-accelerated rendering** • **Software rendering**
To set the tissue limit adjustment mode...	Select one of the following: • To have the tissue limit automatically set, click **Automatic**. • To be able to manually set the tissue limits in the **3D View Screen**, click **Custom**. **Note:** When you select **Custom** it is applied to every new volume loaded, regardless the machine's settings for the **Program** field of view. The following tissue limit adjustment bar appears under the setting and in the **3D View Screen** in the applicable workspace tabs: **Note:** For changes to this setting to take effect, you need to close and restart **CS 3D Imaging**.
To reset the preferences to the installation defaults...	Click ↺.

4 Click **Apply**.

Color Preferences

In the **Color** preferences, you can modify the default colors for the **View** and **Annotation** color elements used in **CS 3D Imaging**.

To customize the color settings, follow these steps:

1 In the **Main Toolbar Icons**, click .

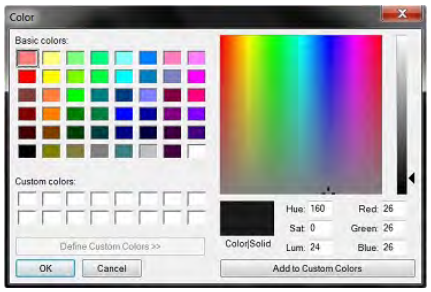
The **Preferences** window appears.

2 In the **Preferences** window, click .

The **Color** preferences appear.

3 For either **View colors** or **Annotation colors**, select the color you want to change.

The **Color** window appears.



4 Choose a color and click **OK**.

5 To reset the preferences to the installation defaults, click .

6 Click **Apply**.

Measurement Units Preferences

In the **Measurement Units** preferences, you can select measurement units and font size.

To change the **Measurement Units** preferences, follow these steps:

1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

The measurement unit preferences appear.

3 Do any of the following.

To set the measurement unit...	Select **millimeter** or **inch**. **Note:** You can only use inches for measurement units. They cannot be used for other objects, for example, implant diameters or segmented airways.
To select the font size for the measurement labels displayed on your images...	Manually enter or use the arrow boxes to specify a **Measurement font size**.
To reset the preferences to the installation defaults...	Click .

4 Click **Apply**.

Template Preferences

In the **Template** preferences, you can do the following:

- Select print templates to use with **Film Composer**.

> **Note:** You need **Film Composer** installed on your computer for this action.

- Select a view screen layout for the **Orthogonal Slicing** tab. See "Using the Orthogonal Slicing Tab".
- Select the number of columns used to display slice series on the **Review** tab. See "Using the Review Tab".

To set the **Template** options, follow these steps:

1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

The **Template** preferences appear.

3 Do any of the following.

To select the print template you want to use for each workspace tab and maximized view screen...	In the **Print templates** section, select from the relevant drop-down list the templates that will be used when you print images using **Film Composer**. **Note:** • You must restart **CS 3D Imaging** for this setting to take effect. • This section only appears if **Film Composer** is installed on your computer.
To select a default layout for the **Orthogonal Slicing** tab...	In the **Layout for orthogonal slicing** section, click one of the **Template for orthogonal slicing** icons. The position of the blue square determines the position of the **3D View Screen** on the **Orthogonal Slicing** tab.
To select the default number of columns displayed on the **Review** tab...	In the **Review default column count** section, select a number from the drop-down list.
To reset the preferences to the installation defaults...	Click .

> **WARNING: Film Composer templates fit images within placement frames as either "Best Fit" or 1:1. Therefore the dimensions of a printed image can vary depending on the template used.**

4 Click **Apply**.

MPR Preferences

In the **MPR** preferences, you can do the following:

- Select **Reformatting Tool** options. See "Using the Reformatting Tool".
- Select the default slice spacing for 2D MPR view screens.
- Set the thickness for views.
- Activate automatic arch creation.
- Select the automatic **Region of interest** setting.

> **Note:** Updates to these preferences are only applied to 3D volumes acquired after these changes are applied to the **CS 3D Imaging** software.

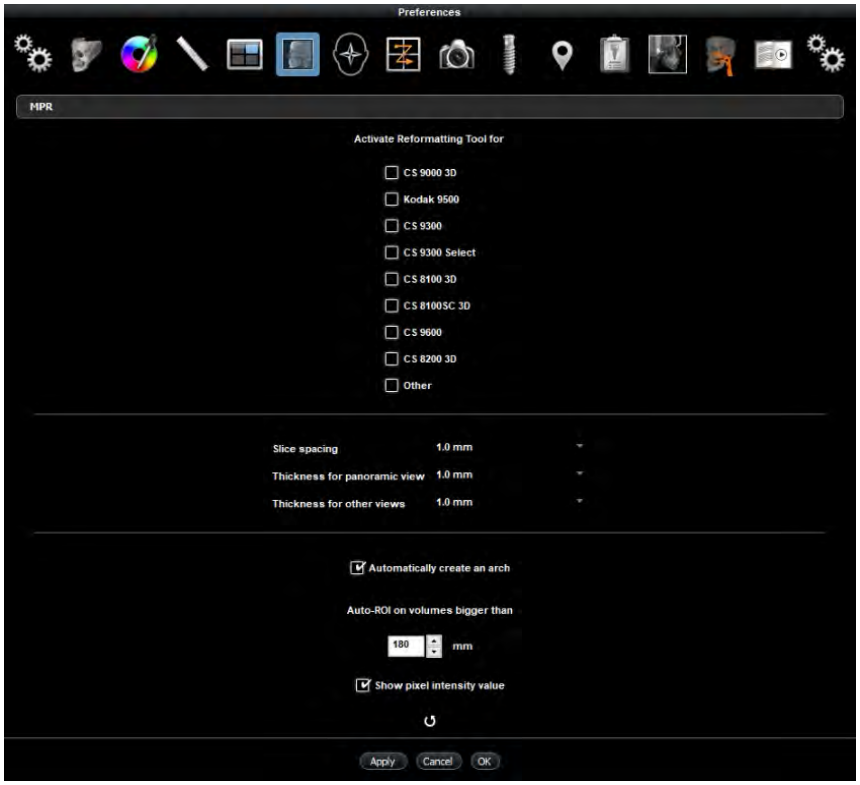
To set the MPR preferences, follow these steps:

1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

The MPR preferences are displayed.



3 Do any of the following.

To specify which image acquisitions should activate the **Reformatting Tool**....	Select an acquisition device type. The **Reformatting Tool** will be applied to images acquired from the selected device types the next time you open the images.
To set the default slice spacing for split views in 2D slice views...	Select a slice spacing value from the drop-down list. **Important**: If **Split Views** are already displayed in the 2D MPR view screens when you change this setting, you must restart the software for the spacing changes to take affect.
To set the thickness for panoramic views...	Select a thickness from the **Thickness for panoramic view** drop-down list.
To set the thickness for views that are not panoramic...	Select a thickness from the **Thickness for other views** drop-down list.
To activate automatic arch creation...	Click **Automatically create an arch**. To deactivate the automatic arch creation function, click the activated option.
To set the default volume size applied by the **Basic Region of Interest** tool...	Use the **Auto-ROI on volumes bigger than** picker to specify the size of the volume that you want to automatically crop. **Note:** This setting must be between 30 to 180 mm. See "Using the Basic Region of Interest Tool".
To reset the preferences to the installation defaults...	Click .

4 Click **Apply**.

View Orientation Preferences

In the **View orientation** preferences, you can control how 2D MPR slice views appear in **CS 3D Imaging**.

To control the orientation of the 2D slice views, follow these steps:

1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

Three sets of view orientation options are displayed.

3 Use the options on the left to configure the orientation of the **Axial Slice View Screen**.

View screen	Setting	Effect on view
Axial Slice View Screen	**View from top**	When used with **Dorsal view**, the dental arch faces upwards.
		When used with **Frontal view**, the dental arch faces downwards.
	View from bottom	When used with **Dorsal view**, the dental arch faces downwards.
		When used with **Frontal view**, the dental arch faces upwards.
Coronal Slice View Screen and reconstructed panoramic images	**Dorsal view**	Patient image is facing away from you.
	Frontal view	Patient image is facing towards you.
Sagittal Slice View Screen	**Left to right**	This is the view from the patient's left side.
	Right to left	This is the view from the patient's right side.

4 To reset the preferences to the installation defaults, click .

5 Click **Apply**.

View Order in Split Views Preferences (Imaging Center Software Only)

In the **View Order in Split View** preferences, you can control the slide direction through the volume.

If you have set your **Mouse Wheel** settings to “slide”, you can use the mouse wheel to scroll through slices in 2D MPR view screens.

To set the **View Order in Split View** preferences, follow these steps:

1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

The **Split view sort order** preferences are displayed.

3 Use the following options to set the scrolling direction for each slice plane.

Slice plane	Slide order setting	Result	Applies to	
			View screen	Tab
Axial	**top to bottom**	forward scroll moves the slice plane downwards	Axial slice	**Orthogonal Slicing, Oblique Slicing**
	bottom to top	forward scroll moves the slice plane upwards		
Coronal	**anterior to posterior**	forward scroll moves the slice plane front to back	Coronal slice	
	posterior to anterior	forward scroll moves the slice plane back to front		
Sagittal	**right to left**	forward scroll moves the slice plane right to left	Sagittal slice	
	left to right	forward scroll moves the slice plane left to right		
Panoramic	**external to internal**	forward scroll moves the curve plane inwards	Arch/temporal bone	**Curved Slicing**
	internal to external	forward scroll moves the curve plane outwards		
Oblique	**right to left**	forward scroll moves the slice plane right to left	Arch/temporal bone lateral	
	left to right	forward scroll moves the slice plane left to right		
Anteroposterior	**posterior to anterior**	forward scroll moves the slice plane back to front	TMJ/Ear	**Custom Slicing**
	anterior to posterior	forward scroll moves the slice plane front to back		
Lateral	**internal to external**	forward scroll moves the curve plane inwards	TMJ/Ear cross-section	
	external to internal	forward scroll moves the curve plane outwards		

4 To reset the preferences to the installation defaults, click .

5 Click **Apply**.

Note: Slice order also determines the order in which slices are generated in multi-slice views.

Export Preferences

In the **Export** preferences, you can do the following:

- Select the folder in which copies of screenshots and snapshots are saved.
- Select a screenshot file format.
- Activate the DICOM description prompt.

To set the **Export** preferences, follow these steps:

1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

The **Export** preferences are displayed.

3 Do any of the following.

To select a screenshot folder...	Select the **Save a copy in the specified folder** option and click **Browse** to navigate to the folder you want to use. **Note:** This is the screenshot folder that you can open from the **Export** pane in the tool box. If you do not select this option, screenshots are saved in the same folder as the original volume. See "Opening the Screenshot Folder".
To select a file format to use for view screen and workspace screenshots...	Select the file format you want to use (**TIFF**, **JPEG** or **PNG**).
To activate the DICOM description prompt each time you create a DICOM snapshot...	Select **Prompt for description**.
Volume(s) to Export	Select either FDK only; MAR only or both FDK and MAR Select or unselect, the option to **Ask volume type to export**
To reset the preferences to the installation defaults...	Click .

4 Click **Apply**.

Implant Preferences

In the **Implant** preferences, you can do the following:

- Edit implant color preferences.
- Configure the restorative length setting.
- Select implant visibility settings.

- Activate and deactivate the implant tutorial for the implant placement tool in the **Curved Slicing** workspace tab.

To set the **Implant** preferences, follow these steps:

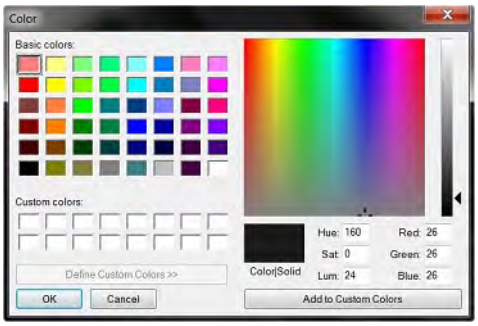
1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

The **Implant** preferences are displayed.

3 Do any of the following.

To select implant colors...	1. Click a color box (for **Abutment** or **Restorative**). 2. In the **Color** window, select a color and click **OK**. 
To specify the length of the restorative space used for implant placement...	Click in the **Length of Restorative Space** field to set the length of restorative space automatically applied when you place a virtual implant.
To select implant visibility options...	In the **Visibility** section, click to select which parts of your virtual implants you want to display in the volume.
To activate the Implant tutorial for the implant placement tool...	Activate **Show Implant Tutorial**. To deativate the tutorial, deactivate this option.
To reset the preferences to the installation defaults...	Click .

3 Click **Apply**.

Annotations Preferences

In the **Annotations** preferences, you can manage predefined captions for annotations on the **Review** tab.

To set the **Annotations** preferences, follow these steps:

1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

Any existing annotations are listed in the **Preferences** window.

3 Do one of the following:

- Click to create a caption and enter a caption name and text.
- Select and edit an existing caption.
- Click to delete an existing caption.

4 Click **Apply**.

> **Note:** Each caption is comprised of a caption name and caption text. When you use these captions to create annotations, the drop-down list in the annotations editor displays only the caption names.

Implant Planning Report Preferences

To configure **Implant Planning Report** preferences, follow these steps:

1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

The **Implant Planning Report** preferences are displayed.

3 Configure the following settings.

Template	Select an A4 or US Letter format and page orientation for reports.
Slice count	Select the number of slices (1 - 10) to be included in a report per implant.
Slice thickness	From the drop-down list, select the desired slice resolution for a report.
Slice spacing	Select the default spacing for slice images.
Mode	From the drop-down list, select the output mode for images: AVG (Average Intensity Projection) or MIP (Maximum Intensity Projection).
Prompt for description	Select to have a prompt window automatically request a description for a report.
Include 3D views	Select to include 3D views in reports.

4 To reset the preferences to the installation defaults, click .

5 Click **Apply**.

Virtual Cephalometric Preferences

To configure the **Virtual cephalometric** preferences, follow these steps:

1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

The **Virtual cephalometric** preferences are displayed.

3 Select the image types that you want to use by default when creating a **Virtual cephalometric** image.

Lateral	This view shows the fully integrated skull.	
Lateral Left	This view shows the half integrated left side of the skull.	
Lateral Right	This view shows the half integrated right side of the skull.	
Frontal	This view shows the fully integrated skull.	
Submento-vertex	This view shows the fully integrated skull from below or above.	

4 To reset the preferences to the installation defaults, click .

5 Click **Apply**.

Airway Preferences

To configure **Airway** preferences, follow these steps:

1 In the **Main Toolbar Icons**, click .

The **Preferences** window appears.

2 In the **Preferences** window, click .

The **Airway** preferences are displayed, showing the cross-sectional area entries.

By default there are four entries that represent cross-sectional areas of a segmented airway.

3 Do any of the following.

To create and change the cross-sectional area value...	1. Delete the thresholds that you do not want to use (see “To delete an entry” below. 2. Enter the cross-section area in square millimeters and click the + button. The color setting is added in the list. You can drag the pointer to refine the placement of the setting on the color scale.. The color setting changes in the entry list. **Note:** You cannot assign the same area to more than one entry.
To delete an entry...	In the entry list, click for the entry you want to delete.
To reset the preferences to the installation defaults...	Click .

3 Click **Apply**.

12 Managing Backups

Types of Backup Media

Depending on your system, there are many types of backup media available, including tapes, CD-ROMs, and Internet-based services.

It is recommended that you work with your hardware vendor to determine the best media type for your practice.

Storing Backup Media

Make sure you store your backups in a safe place. For all types of media, you should avoid excessive heat or moisture. Avoid magnets of any type; they can erase data. Always follow the manufacturer's backup, storage, and replacement guidelines.

Note: We recommend that you keep one or more backups off site. This should be your most recent backup and should be rotated on a daily basis.

Data Backups

Data backups are a vital part of any computer-based system.

This is a process of regularly copying important data and storing it in a safe place to help minimize the disruption caused by an unexpected computer failure.

As **CS 3D Imaging** is a component of the CS Imaging Suite of software applications, **CS 3D Imaging** data will be backed up as part of the CS Imaging backup process.

Contact your representative for technical assistance with this.

Testing Your Backup System

The installer of the backup system should test the system to confirm that it operates properly and saves all the necessary data. Make sure you understand the methods for verifying your backup system.

Consult your hardware technician to provide specific steps for your office.

Maintaining Backup Devices

Your backup device may need periodic maintenance.

The manufacturer of your backup equipment should provide you with the service requirements for the system.

To ensure the most reliable performance of your backup system, follow the recommended service schedule.

Note: Always follow the manufacturer's maintenance instructions.

Replacing Backup Media

Regular use of backup media eventually degrades the quality of the media. The more often backups are used, the quicker they degrade.

The only way to know if media is no longer functional is to attempt to restore data from it. By periodically replacing the media, you can avoid deterioration problems.

Follow the replacement schedule recommended by the media manufacturer.

To keep track of the replacement dates, mark them on the disk or tape label for easy reference.

13 Contact Information

Manufacturer's Address

Carestream Dental LLC
3625 Cumberland Boulevard, Suite 700,
Atlanta, GA USA 30339

Authorized Representatives

Authorized Representative in the European Union

EC REP

TROPHY
4, Rue F. Pelloutier, Croissy-Beaubourg
77435 Marne-la-Vallée Cedex 2, France

Responsible Person in the United Kingdom

CARESTREAM DENTAL LTD
Samantha Bush
Wiltron House, Rutherford Cl., Stevenage
SG1 2EF, United Kingdom

Authorized Representative in Brazil

CARESTREAM DENTAL BRASIL EIRELI
Rua Romualdo Davoli, 65
1° Andar, Sala 01 - São José dos Campos
São Paulo - Brazil
CEP (Zip code): 12238-577

List of Importers for European Union according MDR 2017/745

CARESTREAM DENTAL FRANCE SAS

4, Rue F. Pelloutier, Croissy-Beaubourg
77435 Marne-la-Vallée Cedex 2, France

CARESTEAM DENTAL GERMANY GmbH

Hedelfinger Str. 60, 70327 Stuttgart, Germany

CARESTEAM DENTAL SPAIN

S.L.U. Paseo de la Castellana, 79 Madrid 28046, España

CARESTEAM DENTAL Italy S.r.l.

Via Mario Idiojmi 3/3, Assago 20090 (MI), Italia

List of Swiss Importers

CURADEN AG
Riedstrasse 12
CH-8953 Dietikon
Switzerland

Dema dent AG
Furtbachstrasse 16
CH-8107 Buchs
Switzerland

Jordi Röntgentechnik AG
Dammstrasse 70
CH-4142 Münchenstein
Switzerland

E. Schweizer AG
Bernerstrasse Nord 182
CH-8064 Zürich
Switzerland