



# Visia™ Dynamic Review

## Reference Guide

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# Overview

Visia Dynamic Review is a software package intended for use in viewing and analyzing magnetic resonance imaging (MRI) studies. Visia Dynamic Review supports evaluation of dynamic MR data.

Visia Dynamic Review automatically registers serial patient motion to minimize the impact of patient motion and visualizes different enhancement characteristics (parametric image maps). Furthermore, it performs other user-defined post-processing functions such as image subtractions; multi-planar reformats and maximum intensity projections. The resulting information can be displayed in a variety of formats, including a parametric image overlaid onto the source image. Visia Dynamic Review can also be used to provide measurements for diameters, areas and volumes. Furthermore, Visia Dynamic Review can evaluate the uptake characteristics of segmented tissues.

Visia Dynamic Review also displays images from a number of other imaging modalities; however, these images must not be used for primary diagnostic interpretation.

When interpreted by a skilled physician, Visia Dynamic Review provides information that may be useful in diagnosis. Patient management decisions should not be made based solely on the results of Visia Dynamic Review analysis.

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# Safety and Regulatory Considerations

PLEASE READ THE “ABOUT VITAL” SOFTWARE DOCUMENT OF VITAL MEDICAL IMAGING CAREFULLY BEFORE USING VISIA DYNAMIC REVIEW.

This document contains information essential for the safe and effective use of the Visia Dynamic Review application. You must understand this information before using the product.

# Manual Conventions

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## Use of Symbols

The following safety notices are used to emphasize certain safety instructions. This manual uses the international symbol along with the warning or caution message.



**WARNING:** Warning is used to identify procedures that you must precisely follow to avoid injury to yourself or others.



**CAUTION:** Caution is used to identify procedures that you must precisely follow to avoid damage to equipment, loss of data, or corruption of files or software applications.

The following notice symbols are used to emphasize information that is considered important or requires special notice.

**IMPORTANT:** Important indicates information where adherence to procedures is crucial to ensure correct results and achieve optimal performance.

**NOTE:** A Note provides additional information that is helpful to you. It may emphasize certain information or clarify a particular step or procedure.

## Format and Word Conventions

This guide uses special conventions for format and word expressions to make it easier for you to work with the information. Table 1 describes the conventions used with menus, buttons, text fields, and keyboard keys.

TABLE 1. **Format and Word Conventions**

Format	Description	Example
<b>Bold</b>	Used for emphasis.	<b>Do not</b> press down.
<i>Italic</i>	Used for emphasis.	Press <i>carefully</i> to engage.
<b>Bold</b>	A button label or interface button name that you actively click.	Click <b>Start</b> .
<b>Bold Italic</b>	A key on the computer keyboard that you actively press.	Press <b>Enter</b> .
>	The pathway of selecting options in a pull-down menu.	Click the <b>Zoom menu &gt; Pan</b> .
+	Press and hold a button on the keyboard and simultaneously press another keyboard button.	Press <b>Ctrl+W</b> .
Blue text	Text that is hyperlinked to another topic. Click the text to jump to the referenced section.	<a href="#">Start Dynamic Review</a>

## Mouse Controls

The three button mouse is used to make selections. It is a hand-operated device that you maneuver across the surface of a pad. As you move it, the on-screen cursor mimics the movement of the mouse, allowing you to move among windows and menus. For instance, moving the mouse to the right causes the on-screen cursor to move to the right. The mouse is used to make selections by clicking the left and right buttons or pressing the middle wheel.

TABLE 2. **Mouse Actions**

Mouse Action	Description
Click	Click the left mouse button to select a button or icon.
Right-click	Click the right mouse button.
Click and drag	Click and drag the left mouse button down while dragging the cursor to the desired location.
Right-click and drag	Click and drag the right mouse button down while dragging the cursor to the desired location.
Double-click	Click the left mouse button twice in rapid succession.

# General Warnings and Cautions

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**WARNING:** Processed, reformatted, and printed data should not be used as the sole source of diagnosis.



**CAUTION:** US Federal law restricts this device to sale by or on the order of a physician.

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# Dynamic Review Basics

This section contains steps for getting started with Dynamic Review.

## Start Dynamic Review

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Use this procedure to start Visia Dynamic Review through the Applications tab in VES.

1. From the Study Directory, select an appropriate MRI study.
2. From the Applications tab, select the **Dynamic MR** application.
3. Follow the recommended workflow, which supports various hanging protocols.
  - [Dynamic Review Workflow](#)

# User Interface Elements

This chapter describes Visia Graphic User Interface (GUI).

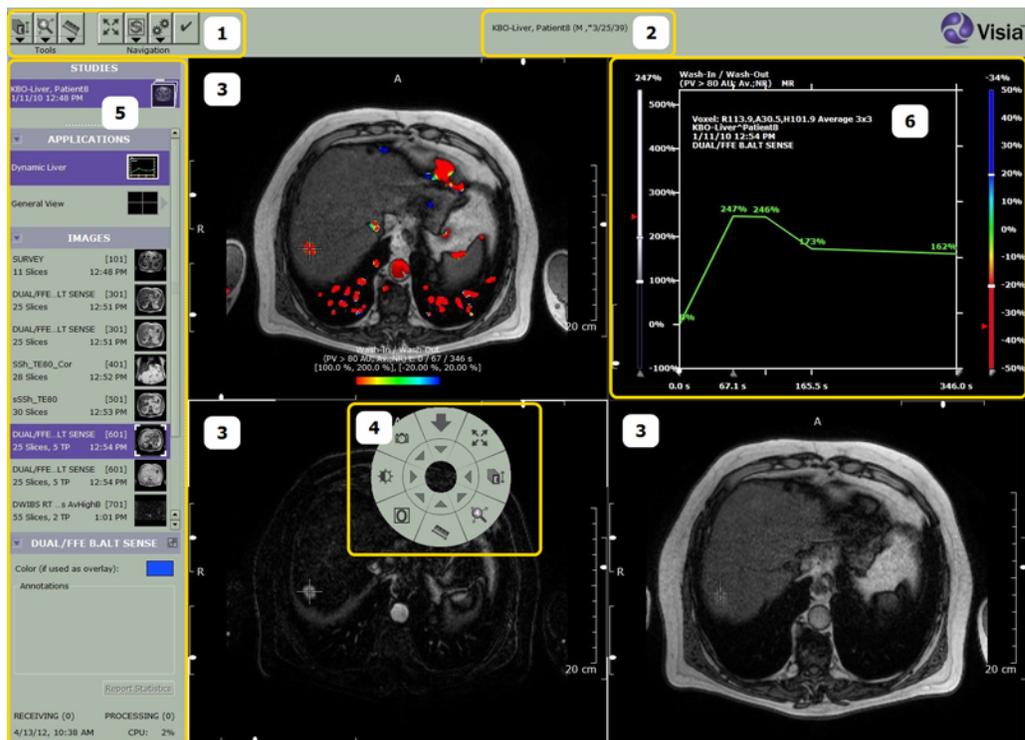
## Interface Basics

### Dynamic Review UI

Visia provides a series of hanging protocols (applications) specifically designed for Dynamic Review. Each application contains viewports that contain the source images and a Curve viewport, which displays the corresponding curves.

Due to customizations, the arrangement of the viewports at your site may be different from the Dynamic Review viewport arrangement in Figure 1. Table 3 describes the basic interface elements.

FIGURE 1. Dynamic Review UI



This manual shows the GUI in Standard mode, which is preferred by most users. When in the Expanded mode, the full compliment of buttons is visible.

**NOTE:** The Expanded mode is only available for Administrative users.

TABLE 3. **Dynamic Review UI features**

Number	Name	Description
1	Global toolbar	Contains tools required for selecting and reviewing studies, such as navigation, display, and patient browser functions.
2	Message area	Displays demographic patient information when studies are opened.
3	Work area viewports	Displays the image data in viewports (different types of viewports provide various tools for interacting with images).
4	Pie menu	Provides access to tools and context menus of the selected viewports.
5	Side panel	Provides an overview of the studies and allows you to select applications, studies, images series, and results.
6	Curve viewport	Displays the Dynamic Curve viewport. See <a href="#">Dynamic Curve Viewport</a> .

## Toolbars and Menus

Visia tools are available from the Global toolbar, Setup Toolbar, or from the Pie menu within a viewport. When you select a tool from the Global toolbar, it is active in all viewports. If you select a tool from the Pie menu, it is active only for the corresponding viewport.

### Global Toolbar

The Global toolbar provides the tools required for selecting and reviewing studies (navigation, patient browser, printing, closing studies, etc.). Some buttons in the toolbar are marked with an arrow. An additional menu displays when you click the arrow.

FIGURE 2. **Global Toolbar in Standard Mode**

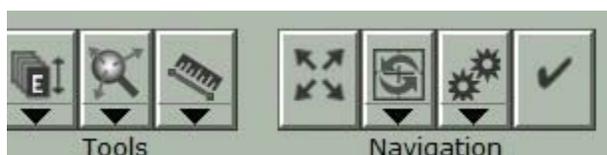


FIGURE 3. **Global Toolbar in Expanded Mode**



Table 4 provides an overview of the available tools and functions accessed through the Global toolbar or the Pie Menu. In addition to these tools and functions, other options are available via the Context menu.

TABLE 4. **Global Toolbar and Pie Menu Options**

Icon	Name	Global Toolbar	Pie Menu	Description
<b>Tools - Stacking menu</b>				
	Stack (ESM)	X	X	Selects the <b>Stack (ESM)</b> mode (ESM - Every Slice Mode) that allows you to stack through each individual slice of an image.
	Fast Stack	X	X	Selects the <b>Fast Stacking</b> mode that allows you to quickly stack through the slices.
	Automatic Stacking	X	X	Selects the <b>Automatic Stacking z</b> only mode for stacking through slices.
	Cine	X	X	Selects the <b>Cine</b> mode (Automatic stacking t, with change speed) for stacking through the time points.
	Register Currently Selected Point		X	Registers the <b>Currently Selected Point</b> (CSP) for synchronizing different frames of reference. This option exists only if it is applicable to the viewport.
<b>Tools - Zoom menu</b>				
	Zoom	X	X	Select the interactive <b>Zoom</b> tool, which allows you to zoom in or out of images.
	Magnifier	X	X	Selects the <b>Magnify</b> tool.
	Pan	X	X	Selects the <b>Pan</b> tool, which allows you to move images within a viewport.
	Rotate	X	X	Select the <b>Rotate</b> tool, which allows you to rotate the images.
	Crosshair	X	X	Shows the <b>Currently Selected Point</b> (CSP) as a small crosshair.
<b>NOTE:</b> Menu items marked with (E) are only available in the Expanded mode.				

Icon	Name	Global Toolbar	Pie Menu	Description
<b>Tools - Annotation menu</b>				
	Measure	X	X	Selects the <b>Measure</b> tool, which allows you to place lines and to measure distances.
	Freehand ROI	X	X	Selects the <b>Freehand ROI</b> tool.
	Oval ROI	X	X	Selects the <b>Oval ROI</b> tool.
	VOI	X	X	Selects the <b>VOI</b> tool.
	Arrow	X	X	Selects the <b>Arrow</b> tool.
	Text	X	X	Selects the <b>Text</b> tool.
	Point (E)	X	X	Selects the <b>Point</b> tool.
	Angle (E)	X	X	Selects the <b>Angle</b> tool.
	Finding Marker	X	X	Selects the <b>Finding Marker</b> tool.
<b>Navigation</b>				
	Patient Browser (E)	X		Opens the Patient Browser.
	Panels Off	X	X	Hides the side panel to display the viewports in full screen mode. When using the Full Screen option from the Pie menu, the viewport expands to the size of the work area.
	Panels On	X	X	Shows the side panel to display the viewports in non-full screen mode.
	Reset View	X		Resets the view of the currently selected hanging.
<b>NOTE:</b> Menu items marked with (E) are only available in the Expanded mode.				

Icon	Name	Global Toolbar	Pie Menu	Description
	Reapply Hangings	X		Reapplies the hanging protocols.
	Synchronization On/Off	X		Switches Synchronization on and off.
	Crosshair On/Off	X		Shows or hides the Currently Selected Point (CSP).
	Image Text On/Off	X		Switches the Image Information Overlay on and off.
	Show Synchronization Options (E)	X		Shows the list of Synchronization options.
	Defer/Complete	X		Completes or defers the current study.
<b>Image Orientation menu</b>				
	Original		X	Selects the <b>Original</b> orientation of the image.
	Axial		X	Selects an <b>Axial</b> (caudo-cranial) orientation.
	Coronal		X	Selects the <b>Coronal</b> (ventro-dorsal) orientation.
	Sagittal		X	Selects the <b>Sagittal</b> (right to left) orientation.
	Rotate Clockwise		X	Selects the <b>Rotate Clockwise</b> tool.
	Flip Image		X	Select the <b>Flip Image</b> tool.
<b>Window/Level menu</b>				
	Window/Level		X	Activates the <b>Window/Level</b> tool.
	Defined Window/Level Presets		X	Activates a defined Window/Level preset set by your site or system default.
<b>NOTE:</b> Menu items marked with (E) are only available in the Expanded mode.				

Icon	Name	Global Toolbar	Pie Menu	Description
<b>Snapshot menu</b>				
	Create Snapshot		X	Activates the <b>Snapshot</b> tool.
	Create Result Series		X	Creates a results image series. You can define a number of slices or a time series to be used to create the image series.
<b>NOTE:</b> Menu items marked with (E) are only available in the Expanded mode.				

**NOTE:** The toolbars and Pie menu can be customized by administrative users. If your system has been customized to support your personal workflow, then you may have other tools available in the toolbars or the Pie menu.

## Setup Toolbar

The Setup toolbar provides the tools required for configuring the work area (use of viewports, display of workareas, etc.) and for configuring Visia (language settings, time/clock format etc.).

**NOTE:** The Setup Toolbar is only available in the Expanded mode for Administrative users.

FIGURE 4. **Setup Toolbar**



TABLE 5. **Setup Toolbar**

Icon	Name	Description
	Inspectors	Opens a list of the available viewports from which you can select the viewport you want to use.
	Setup Tool	Opens a Setup tool from where you select your preferences.

## Context Menus

Many GUI objects, such as sections of the side panel, annotations, or elements in special viewports have context menus that provide additional options.

- Viewport context menu: Located in the Pie menu, the  Viewport context menu contains all the tools and options for that type of viewport.
- Work Area context menu: Right-click in the Global toolbar or work area to open the context menu. This context menu offers options for customizing the appearance of display/work areas and lists the common options including Help and Open Console.
- Side Panel context menus: The sections Applications, Images, and Results provide context menus with options that allow you to customize the content of the sections. There are also context menus for objects in a side panel. Right-click a section title or side panel object to open a context menu.

## Work Area

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The Work Area contains the viewports that are arranged according to the defined Application hangings. Application hangings not only define the layout of images on the screen, they also control the viewports and specify the default image display settings. Within the Work Area, you are able to control the display of the viewports, use sliders for navigating through an image series, access a Pie Menu specific to the viewport type, and manage image sets via the Images section.

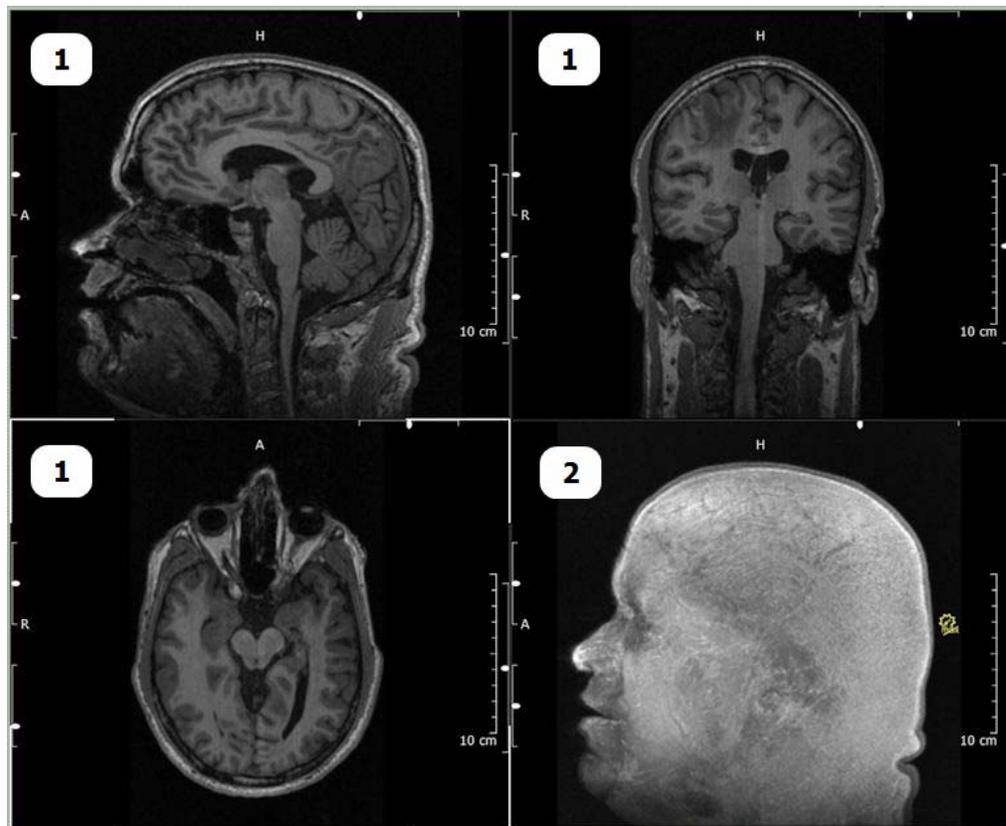
## Viewports

Viewports allow images to be displayed in various types of view and provide tools for annotation and display modification. Viewports may be used to visualize specific processing results, display image/ result comparisons, and view images reformatted in different orientations.

- Alternator: standard viewport for displaying images or image groups.
- MIP: displays the slab structures that have the highest intensity. The MIP (Maximum Intensity Projection) view is especially suited for displaying vessel structures (especially in conjunction with subtraction images).

Figure 5 displays an example Work Area with various viewport types.

FIGURE 5. **Work Area: Alternator Viewports (1) and MIP Viewport (2)**



## Dynamic Curve Viewport

The Dynamic Curve viewport (Figure 6) displays with a Dynamic Review application hanging protocol.

FIGURE 6. Dynamic Curve Viewport

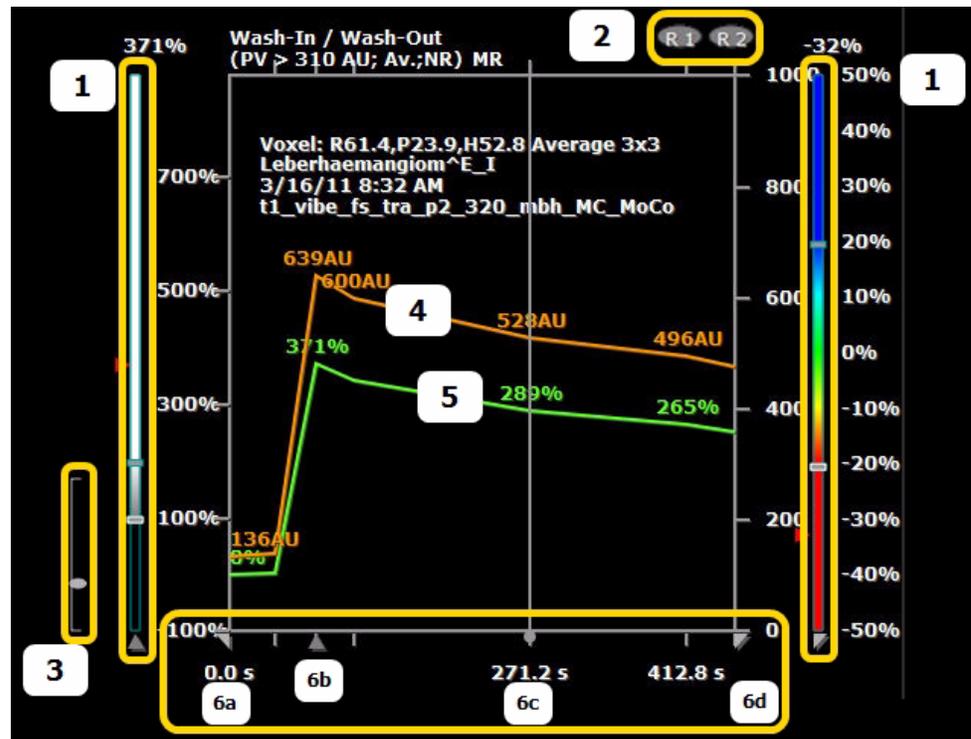


TABLE 6. Dynamic Curve Viewport Descriptions

Number	Name	Description
1	Color Bar	Represents the color shown in the overlay. Color Bars may contain a continuous color gradient or segments with discrete colors. See <a href="#">Color Overlay</a> .
2	Annotation icons	Defines the annotations placed on the source image. If an ROI or point annotation has been created in the source viewport, an annotation icon will be displayed. Click on an annotation icon to show/hide the corresponding curve.
3	Background Noise Threshold	Suppresses background noise by excluding pixels from the color overlays. See <a href="#">Background Noise</a> .
4	Absolute Value	Original signal value, displayed as an orange curve.
5	Enhancement Value	Signal enhancement of current time point relative to reference time point, displayed as a green curve.
6	Time Axis	<ul style="list-style-type: none"> <li>• 6a: <math>T_0</math> Baseline reference time point for subtraction and enhancement rate</li> <li>• 6b: Evaluation time point <math>T_1</math></li> <li>• 6c: The image of the time point marked by the vertical line is shown in the source viewport</li> <li>• 6d: Evaluation time point <math>T_2</math>. See <a href="#">Time Points</a>.</li> </ul>

## Sliders

When a viewport displays an image sequence, sliders (Figure 7) display for applicable image series.

FIGURE 7. **Viewport Sliders**

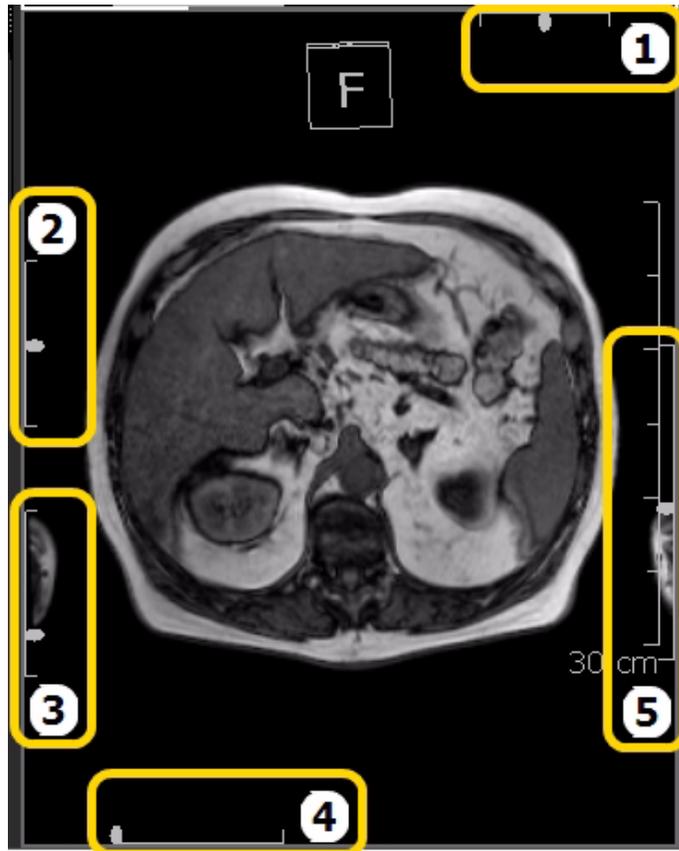


TABLE 7. **Viewport Sliders**

Reference Number	Name	Description
1	View Axis Slider	Rotates the viewing direction. Click and drag the slider or press <b>Alt</b> and click and drag the mouse.
2	Longitude Slider	Rotates the longitudinal axis (around the body of 3D display).
3	Latitude Slider	Rotates the latitudinal axis (around the horizontal of 3D display).
4	Time Point Slider	Indicates the time point. Click and drag the slider to move the time point of a timed series or press the <b>Left</b> and <b>Right</b> arrow keys.
5	Slice Position Slider	Indicates the position of the slice relative to the image volume (if the series contains multiple slices). Click and drag the slider or press the <b>Up</b> and <b>Down</b> arrow keys.

## Attention Icons

When you work with different viewports in Visia, you may come across attention icons that notify you of specific viewport information. Table 8 provides an overview of the attention icons that are used in the Visia software.

TABLE 8. **Attention Icons**

Icon	Name	Description
	Hidden Annotations	Annotations in the viewport are hidden. See <a href="#">Hide or Delete Annotation</a> .
	Manual Synchronization	Different frames of reference have been synchronized. See <a href="#">Synchronize Images</a> .
	Manual Synchronization Failed	Manual synchronization has been performed in a “non-valid” area or the currently selected point is located in an area that cannot be displayed. See <a href="#">Synchronize Images</a> .
	No Common Frame of Reference	Synchronized viewports do not use the same frame of reference. See <a href="#">Turn Off/Remove Synchronization</a> .
	CSP Coordinates do not Correspond to MIP Coordinates	In MIP projection mode, this warning icon indicates that the coordinates of the currently selected point do not correspond with the maximum-intensity coordinates (i.e., the point may not be on the slice with the maximum intensity).
	2D Image Swapped	When you use the Flip command in a 2D image, the right and left sides are swapped and this warning icon displays. See <a href="#">Mirror (2D) and Flip (3D)</a> .

## Data Orientation

The data orientation cube displays in the viewport Figure 8.

FIGURE 8. **Data Orientation Cube**



## Pie Menu

The Pie menu provides tools specific to the viewport where the Pie menu was opened as well as a Context menu with a complete list of the available tools. Most of the tools include submenus, which are marked by an arrow. See [Global Toolbar and Pie Menu Options](#) for a list of the available Pie menu tools.

FIGURE 9. Pie Menu



The  Context menu of the Pie menu contains additional menu items (Table 9).

TABLE 9. Pie Context Menu

Menu Item/Submenu	Description
Open DICOM Tag Information (E)	Opens an additional window with DICOM tag information.
Delete Inspector (E)	Removes the selected viewport from the work area.
<b>Tools</b>	
• Pan	Selects the Pan tool.
• Rotate	Selects the Rotate tool.
• Stacking	Allows you to select various stacking modes.
• Stack (ESM)	
– Fast Stack	
– Automatic Stacking	
– Cine	
– Combined Stacking	
<b>NOTE:</b> Menu items marked with (E) are only available in the Expanded mode.	

Menu Item/Submenu	Description
<ul style="list-style-type: none"> <li>• Magnification <ul style="list-style-type: none"> <li>– Zoom</li> <li>– Small</li> <li>– Magnifier</li> <li>– Large</li> </ul> </li> </ul>	Allows you to choose from a selection of different magnification levels and to activate interactive zooming.
<ul style="list-style-type: none"> <li>• Annotations <ul style="list-style-type: none"> <li>– Measure</li> <li>– Freehand ROI</li> <li>– Oval ROI</li> <li>– VOI</li> <li>– Arrow</li> <li>– Text</li> <li>– Angle (E)</li> <li>– Point (E)</li> <li>– Finding Marker</li> </ul> </li> </ul>	Allows you to choose from a selection of annotation tools to measure and annotate on your images.
<ul style="list-style-type: none"> <li>• Window/Level <ul style="list-style-type: none"> <li>– Window/Level</li> <li>– Sigmoid (E)</li> </ul> </li> </ul>	Allows you to change the window/level of the image display.
<ul style="list-style-type: none"> <li>• Currently Selected Point <ul style="list-style-type: none"> <li>– Crosshair</li> <li>– Hide Crosshair (E)</li> </ul> </li> </ul>	Allows you to set a CSP and select an option for showing/hiding the CSP.
<b>Image View</b>	
<ul style="list-style-type: none"> <li>• Rotate Clockwise</li> </ul>	Rotates the image display 90° clockwise.
<ul style="list-style-type: none"> <li>• Flip Image</li> </ul>	Mirrors the image around a vertical axis (2D image) or flips the entire data set (3D images).
<ul style="list-style-type: none"> <li>• Image Size <ul style="list-style-type: none"> <li>– Full Screen</li> <li>– Original Size</li> <li>– Fit to Inspector</li> </ul> </li> </ul>	Resizes the image area to the selected option.
<ul style="list-style-type: none"> <li>• Orientations</li> </ul>	Allows you to select the default image orientation (axial, coronal, sagittal, oblique, or original).
<b>Displayed Information</b>	
<ul style="list-style-type: none"> <li>• Parameter Overlay <ul style="list-style-type: none"> <li>– Hide</li> <li>– Show</li> </ul> </li> </ul>	Allows you to show/hide color overlays in the source viewports. This option displays if applicable to the data contained in the viewport.
<ul style="list-style-type: none"> <li>• Image Information Overlay <ul style="list-style-type: none"> <li>– All</li> <li>– Reduced</li> <li>– None</li> </ul> </li> </ul>	Allows you to specify the image information settings.
<b>NOTE:</b> Menu items marked with (E) are only available in the Expanded mode.	

Menu Item/Submenu	Description
<ul style="list-style-type: none"> <li>• Scanlines <ul style="list-style-type: none"> <li>– Hide</li> <li>– Show</li> <li>– Show in Localizer Only</li> </ul> </li> </ul>	Allows you to set the scanlines display setting.
<b>Subtraction Settings (E)</b>	
<ul style="list-style-type: none"> <li>• Modes <ul style="list-style-type: none"> <li>– None</li> <li>– Absolute Difference</li> <li>– Difference</li> </ul> </li> </ul>	Allows you to select the Subtraction mode. The Difference mode may result in negative values. Therefore, you may have to modify the window/level values accordingly. The subtraction mode can only be used for data with at least two time points.
<ul style="list-style-type: none"> <li>• Time Point</li> </ul>	Allows you to set the time point for image display.
<ul style="list-style-type: none"> <li>• Reference Time Point</li> </ul>	Allows you set the reference time point for the subtraction mode.
<b>MIP Mode Settings (E)</b>	
<ul style="list-style-type: none"> <li>• Modes <ul style="list-style-type: none"> <li>– None</li> <li>– MIP</li> <li>– MinIP</li> <li>– Average</li> <li>– Local MIP</li> <li>– Local MIP Threshold</li> </ul> </li> </ul>	Allows you to select the Rendering mode for slabs and volumes.
<ul style="list-style-type: none"> <li>• Slab Thickness <ul style="list-style-type: none"> <li>– Default</li> <li>– 2</li> <li>– 4</li> <li>– 8</li> <li>– 16</li> <li>– 32</li> <li>– 64</li> <li>– 128</li> </ul> </li> </ul>	Allows you to set the number of slices to be included in a slab.
<ul style="list-style-type: none"> <li>• Show Only VOI</li> </ul>	Displays only the selected volume.
<b>Window Level Settings (E)</b>	
<ul style="list-style-type: none"> <li>• Presets <ul style="list-style-type: none"> <li>– Original</li> <li>– Next Original</li> <li>– List of Presets</li> </ul> </li> </ul>	Allows you to select predefined window/level presets.
<ul style="list-style-type: none"> <li>• Invert</li> </ul>	Inverts the current window/level setting.
<ul style="list-style-type: none"> <li>• Optimize LUT</li> </ul>	Adapts the window/level setting (LUT) to the value range of the image.
<b>Inspector Setup (E)</b>	
<b>NOTE:</b> Menu items marked with (E) are only available in the Expanded mode.	

Menu Item/Submenu	Description
<ul style="list-style-type: none"> <li>• Combine Time/Slice Navigation</li> </ul>	Allows stacking (scrolling through slices) to be combined with different time points.
<ul style="list-style-type: none"> <li>• Show Synchronization Options</li> </ul>	Displays attributes available for synchronization in all viewports.
<ul style="list-style-type: none"> <li>• Initial Settings <ul style="list-style-type: none"> <li>– Keep Current Time Point</li> <li>– Slice Selection <ul style="list-style-type: none"> <li>&gt; First</li> <li>&gt; Center</li> <li>&gt; Last</li> </ul> </li> <li>– Orientation <ul style="list-style-type: none"> <li>&gt; Original</li> <li>&gt; Axial (Img)</li> <li>&gt; Coronal (Img)</li> <li>&gt; Sagittal (Img)</li> <li>&gt; Axial (Pat)</li> <li>&gt; Coronal (Pat)</li> <li>&gt; Sagittal (Pat)</li> <li>&gt; Flip Image</li> </ul> </li> <li>– Initial Windowing Selection <ul style="list-style-type: none"> <li>&gt; Optimize LUT</li> <li>&gt; List of Presets</li> </ul> </li> </ul> </li> </ul>	These settings define the default values for a hanging protocol. The settings should be configured for the viewport if the hanging set was created using the Add from Work area command in the ADS Editor.
<ul style="list-style-type: none"> <li>• Mosaic Mode <ul style="list-style-type: none"> <li>– Number of Columns (1-5)</li> <li>– Number of Rows (1-5)</li> <li>– Settings <ul style="list-style-type: none"> <li>&gt; Show Slices</li> <li>&gt; Show Time Points</li> <li>&gt; Ascending/Descending</li> </ul> </li> </ul> </li> </ul>	Allows you to define the number of columns and rows for the Mosaic viewport and to specify the settings for sorting images.
<ul style="list-style-type: none"> <li>• Move Inspector to Work Area</li> </ul>	Moves the specified viewport into the selected work area.
Results	
<ul style="list-style-type: none"> <li>• Create Snapshot</li> </ul>	Creates a snapshot of the currently selected viewport.
<ul style="list-style-type: none"> <li>• Create Result Series</li> </ul>	Creates a results image series. You can either define a number of slices or a time series to be used for creating the image series.
<b>NOTE:</b> Menu items marked with (E) are only available in the Expanded mode.	

## Dynamic Review Pie Menu

The Pie menu in the Dynamic Review Curve Viewport includes the options described in Table 10.

FIGURE 10. **Dynamic Review Viewport Pie Menu**



TABLE 10. **Dynamic Review Viewport Pie Menu Tool Descriptions**

Icon	Name	Description
	Context menu	Contains tools and options for the type of viewport selected.
	Full Screen	Toggles the viewport between original size and full work area size.
	Curves	<ul style="list-style-type: none"> <li>•Absolute Values: Displays the original signal value as an orange curve.</li> <li>•Enhancement Values: Displays the signal enhancement of current time point relative to reference time point as a green curve.</li> <li>•Both: Displays both the Absolute and Enhancement curves.</li> </ul>
	Volume Statistics	Displays a statistical evaluation of subvolumes. See Display Volume Statistics for Specific Regions.
	Curve Mode	Contains the Curve mode selections, which are useful for evaluating dynamic MR exams with relatively low temporal resolution (few time points). See Select the Curve Mode.
	Show/Hide Overlay	Toggles the overlay on or off.
	Cine Mode	Starts automatic stacking through the time points of the image series.
	Create Snapshot	Captures a snapshot of the Curve viewport. The image is stored in the currently selected result folder.

# Side Panel

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The Side Panel (Figure 11) contains different sections to organize studies, applications, images, and results.

FIGURE 11. **Side Panel**

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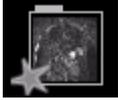
The Side Panel interface is organized into several sections:

- STUDIES**: Displays a study entry for "KBO-Liver, Patient8" with a timestamp of "11.01.2010 12:48 PM" and a small thumbnail image.
- APPLICATIONS**: Contains two entries: "Dynamic Liver" with a line graph icon, and "General View" with a four-quadrant icon.
- IMAGES**: Lists five image series:
  - SURVEY [101]: 11 Slices, 12:48 PM, with a thumbnail.
  - SSh\_TE80\_Cor [401]: 28 Slices, 12:52 PM, with a thumbnail.
  - DUAL/FFE B.ALT SENSE [601]: 25 Slices, 5 TP, 12:54 PM, with a thumbnail.
  - DUAL/FFE B.ALT SENSE [601]: 25 Slices, 5 TP, 12:54 PM, with a thumbnail.
  - DWIBS RT Res AvHighB [701]: 55 Slices, 2 TP, 1:01 PM, with a thumbnail.
- RESULTS**: Shows a dropdown for "DUAL/FFE B.ALT SENSE" with a color selection box set to green. Below it is an "Annotations" text area and a "Report Statistics" button.
- System Status**: At the bottom, it shows "RECEIVING (0)", "PROCESSING (0)", the date/time "4/11/12, 1:23 PM", and "CPU: 0%".

## Studies

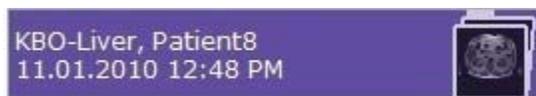
Studies provide specific text information and are marked by symbols (Table 11), which show the status of the study for the currently logged-on user.

TABLE 11. **Study Symbols**

Icon	Name	Description
	Dotted outline	The study is not prefetched. When you open studies that have not been prefetched, a dialog is displayed asking you if you want to open the studies. If a study is located on a remote workspace, the study can be preloaded (prefetched) on the local host to allow for faster image display.
	Highlighted	Selected study
	Star	Unread study
	Checkmark	Completed study
	Gears	Currently processing study

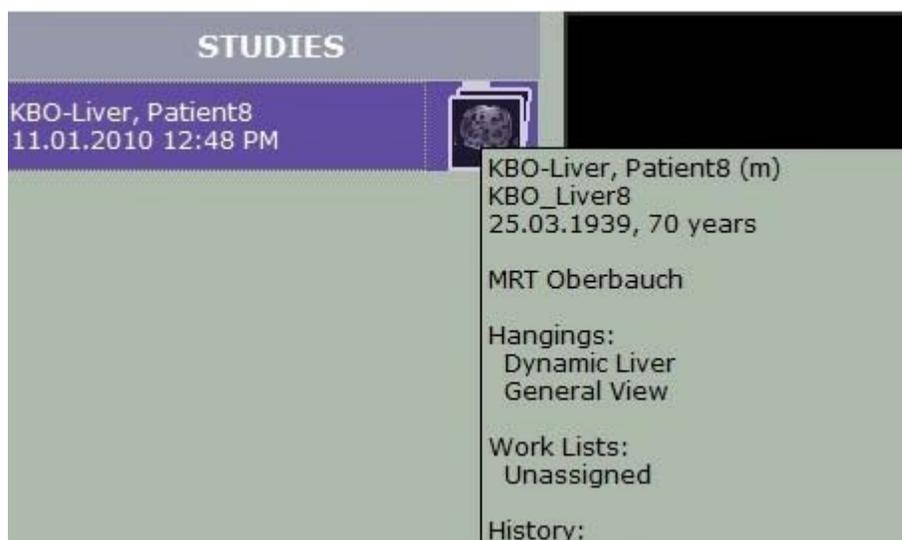
For each study, one of the above icons are displayed along with basic patient and study information (patient name, study date/time, study description). The information displayed can be configured by means of the Context menu in the Expanded mode.

FIGURE 12. **Study Information**



When you move the mouse pointer to the study icon, a gray frame with more detailed study information displays (Figure 13).

FIGURE 13. **Study Detailed Information**



A Context menu of the studies contain additional menu items (Table 12).

TABLE 12. **Study Context Menu**

Menu Item/ Submenu	Description
Open	Opens the selected study and one of its hangings. Alternately, double-click a study to open it.
Open Additionally	Opens additional studies. This option is only available when a study is already opened.
Reopen	Opens a completed study, allowing you to work with the study again.
Prefetch	If a study is located on a remote workspace, the study can be preloaded (prefetched) on the local host to allow for faster image display.
Process Study as New	Reprocesses a study according to the selected configuration.
<b>Administration</b>	
Reapply Hangings	Reapplies the hanging protocols.
Reapply Rules (E)	Applies the report creation rules again. Reapplying report creation rules may add a report form to the study
• Report Creation Rules	
• Advanced Processing Rules	All advanced processing rules are reapplied to the study. This may lead to different results if the advanced processing rules were changed since they were last used.
<b>NOTE:</b> Menu items marked with (E) are only available in the Expanded mode.	

Menu Item/ Submenu	Description
<ul style="list-style-type: none"> <li>Apply Advanced Processing Rules</li> </ul>	Is identical to the Re-apply Advanced Processing Rules command; you must, however, select the desired processing rule from a list. If there are no applicable processing rules, no list is provided.
<b>Show Text Information (E)</b>	
<ul style="list-style-type: none"> <li>Study Date</li> <li>Patient Age</li> <li>Patient ID</li> <li>Other Patient ID</li> </ul>	Allows you to select the type of information for each study in the worklist.
<ul style="list-style-type: none"> <li>Study Description</li> </ul>	Allows you to show/hide the study description in the last line.
<ul style="list-style-type: none"> <li>Anonymous</li> </ul>	Allows you to anonymize the studies, i.e., to hide all personal data.
<b>Sorting (E)</b>	
<ul style="list-style-type: none"> <li>By Patient Name</li> <li>By Patient ID</li> <li>By Study Date</li> <li>By Arrival Time</li> </ul>	Allows you to select the sorting criteria.
<ul style="list-style-type: none"> <li>Ascending (A to Z, old to new)</li> </ul>	Allows you to toggle the ascending order (based on the sorting option selected above) between "A" to "Z"/"Z" to "A" or "newest first"/"oldest first".
<ul style="list-style-type: none"> <li>Place Deferred Studies at End</li> </ul>	Allows you to define if deferred studies are to be placed at the end of the study list.
<ul style="list-style-type: none"> <li>Place Completed Studies at End</li> </ul>	Allows you to define if completed studies are to be placed at the end of the study list.
Show History	Displays the history of the study.
<b>NOTE:</b> Menu items marked with (E) are only available in the Expanded mode.	

# Studies, Applications, and Images

---

The Studies, Applications, and Images section displays an icons overview of the currently opened study (or studies). When multiple studies are opened, the details displayed belong to the currently selected study.

If there is more than one study for a patient, the studies are automatically listed along with the opened study.

The following information is displayed for the opened or currently selected study:

- The available hangings (in the Applications section)
- The images (or DICOM series) of the study
- Any additional images created during preprocessing
- Any result images (snapshots) created by the user

The hanging sets listed for the selected study provide various options for image display. For example, the General View hanging set is configured to display all of the images in a study. The number of viewports in a hanging can vary and will determine how many image sets are shown on the screen at one time.

The Applications section also includes additional hanging sets designed for studies with specific features and viewing needs. The availability of these hanging sets are restricted to the appropriate license and applicable study.

The icon overview of the Images section provides the following DICOM information:

- Single images are represented by a preview image, along with basic image data, including series description, number of slices, series number (given in square brackets next to the icon), and acquisition time.
- Series with multiple time points are represented by a single preview image along with basic image data, including series description, number of slices and time points, series numbers of the time points (given in square brackets next to the icon), and acquisition time.

The images are sorted in the order they were created (newest image at the end of the list). The images of a 3D scan are sorted geometrically when the sections are equidistant and parallel to each other (which allows for data reformatting). If the scan is geometrically inhomogeneous, the images are sorted according to image number.

# Results

---

The Results section organizes the results of a study by placing them in folders.

A Context menu of each result folder contain additional menu items (Table 13).

TABLE 13. **Results Folder Context Menu**

<b>Menu Item/ Submenu</b>	<b>Description</b>
Open in Editor	Opens an editor that shows a preview of the Results folder. The editor allows you to enter a comment and to change the name of the Results folder. To delete individual or all snapshots, right-click an image and select the corresponding command from the context menu.
Rename	Opens a dialog box, where you can enter a new folder name.
Delete	Deletes the selected results.

---

# Dynamic Review Workflow

This chapter describes the Dynamic Review workflow. The Dynamic Review tool enables physicians to analyze dynamic studies by visualizing and evaluating images acquired at different time points. It provides a means for visualizing changes in image intensity over time, using graphical representations and color maps overlaid on the source images.

## Select Hangings and Images

---

When you open a study, hangings are displayed in the Applications section. A hanging is an arrangement of viewports in the work area and the assignment of images to these viewports. Depending on your system configuration and the types of images in the study, several hangings may be available. The first hanging is automatically opened when you choose an application.

FIGURE 14. **Applications Hangings**



### Select Hangings

1. Click the desired hanging name to open it.
  - The selected hanging replaces any currently open hanging.
  - Studies and hangings that are being displayed are highlighted.
  - Modifications made to hangings persist when switching between hangings and/or studies.
    - If the study has already been opened, the most recently viewed hanging (in its last state) opens.
    - If the study is opened for the first time, then the hanging that is defined as the default hanging protocol is opened.

If expected hangings are not available in the list:

1. From the Applications section title context menu, select Force Hanging Set to Match and select the desired hanging from the list.
  - This hanging might not be suitable for the study, which is why it was not added automatically.

## Open a Different Layout

1. Click the arrow icon next to the hanging name.
  - The available supplementary hangings are displayed.
  - Not all hanging sets have multiple hangings available. If there is no arrow, then the hanging set consists of only the default hanging.
2. Click the hanging icon to open a supplemental hanging.

## Review/Replace Images

To review a series, drag it from the Images section into a viewport. If the viewport is already displaying an image set, it will be replaced by the new one.

## Page Through Images

If a study contains many image series, you may page through them. Use this procedure to page through the series in all viewports.

1. Select a standard hanging with several alternators.
  - The hanging populates with the first several series from the study.
2. Press the **Spacebar** to scroll forward through the image set.
  - The next image series, that match the same descriptors, displays in the viewports.
  - Press **Ctrl+Spacebar** to scroll through the series in the opposite order.
  - Press **Ctrl+Down /Up** arrow keys to display the next/previous image series in the active viewport.

# Manipulate Images

---

To manipulate images, use the tools and functions that are available in the Global toolbar or Pie menu. See [Toolbars and Menus](#). In addition to these tools and functions, other options are available via the [Pie Context Menu](#).

## Select a Pie Menu Tool

When you select a tool from the Pie menu, it is only active for the corresponding viewport.

1. Right-click in a viewport.
  - The Pie menu is opened at the position where you right-clicked in the viewport.
2. Click the icon of the desired tool.
3. To open a submenu, click the triangle icon of the desired tool.
4. To open the Context menu, click .
5. To close the Pie menu, click the open area in the middle of the Pie menu.
  - Alternatively, click anywhere in the viewport.
  - Alternatively, press **Esc**.
  - Selection of a tool will close the Pie menu.

## Select a Slice

For series that contain multiple slices, use one of the following methods to change the slice displayed.

- Click and drag the right **Slice Position** slider up/down.
- Press the **Up/Down** arrow keys.
- Press the right mouse button and move the mouse up/down.

## Select a Time Point

For 4D series and time-dependent 2D image series, use one of the following methods to select a point in time.

- Click and drag the lower **Time Point** slider to the left/right.
- Press the **Right/Left** arrow keys.
- Press the right mouse button and move the mouse left/right.

## Assess the Image Quality

---

### Check for Patient Motion

1. Use one of the following methods to check for patient motion between time points.
  - Manually scroll through the time points using one of the following methods.
    - Press the **Arrow** keys.
    - Click and drag the **Time Point** slider.
  - From the Curve viewport Pie menu, click  **Cine**.
  - View the data set in subtraction mode.
    - Bright signal intensity at the edge of an organ may indicate patient motion.

**NOTE:** Applying a registration algorithm to the data may reduce the effect of patient motion. See [Manually apply Motion Correction to a Subvolume \(VOI\)](#).

### Check for use of Contrast

1. Manually scroll through the time points using one of the following methods and check for changes in signal intensity due to the presence of contrast.
  - Press the **Arrow** keys.
  - Click and drag the **Time Point** slider.
  - From the Curve viewport Pie menu, click  **Cine**.
2. If signal intensity changes are not apparent, check the image acquisition and contrast protocol.

# Correct for Motion

---

Perform Motion Correction using one of the following methods:

- during advanced preprocessing on the original image data
- as a manually applied process on the complete image series
- as a manually applied process on a subvolume

Visia provides two methods for motion correction.

- **Liver Motion Correction:** minimizes motion for abdominal Liver 4D datasets. A rigid algorithm is used for faster computation time.
- **General Motion Correction:** minimizes motion for general 4D datasets. This algorithm requires more computation time. The resulting dataset is saved in the Other Images section.

## Recognize Motion Corrected Data

1. From the side panel, view the Images section.
  - Motion corrected images are saved in the Other Images section.
2. In the Viewport, view the text overlay information on an image.
  - The original series description of motion corrected series are prefixed by MC.
    - Both motion corrected series include the series description of the original series.
  - The last line of text indicates the type of processing performed to differentiate General and Liver (“MC” and “LiverMC”).

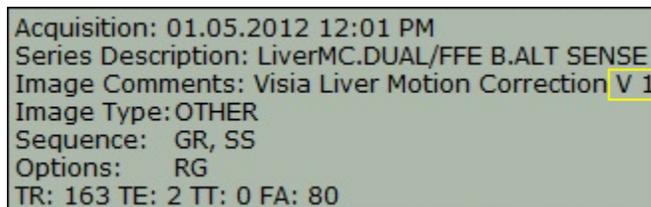
## Manually apply Motion Correction to a Subvolume (VOI)

Use this method to focus on a specific finding for each volume of interest. A new dataset is generated for each VOI.

1. Draw a volume.
  - The volume must be created in the source viewport of the Curve viewport around the region of interest, including a portion of adjacent tissue in all three planes.
  - Draw the annotation on the slice which intersects the region of interest.
  - Check the depth of the volume by viewing other image orientations.
2. Right-click the VOI, and then select **Apply Motion Correction** or **Apply Liver Motion Correction**.
  - The motion correction process will run in the background.
  - If the motion correction is performed for a VOI, the resulting data will only show the VOI.

**NOTE:** When creating multiple motion corrected data sets from volumes, the DICOM tag for the data set will include the volume label.

FIGURE 15. **Data Set DICOM Tag Volume Label**



```
Acquisition: 01.05.2012 12:01 PM
Series Description: LiverMC.DUAL/FFE B.ALT SENSE
Image Comments: Visia Liver Motion Correction V 1
Image Type: OTHER
Sequence: GR, SS
Options: RG
TR: 163 TE: 2 TT: 0 FA: 80
```

## Review Motion Corrected Data

From the Images side panel, select a motion-corrected image dataset and then, drag and drop it into the dynamic window of a diagnostic hanging protocol (e.g., Dynamic Review).

# Review Dynamic Data

---

**IMPORTANT:** The hanging protocols are saved for image series with a fixed number of time points. If you open a hanging protocol with an image series that has a different number of time points, a warning dialog is displayed. If this happens periodically, you can adjust the Time Point sliders. If this happens every time you open a hanging protocol, consult your technical support representative.

## Display Curves

1. From the Applications side panel, select the **Dynamic Review** hanging to see the Curve viewport.
2. From the Curve viewport Pie menu, select a curve to display.
  - **Absolute:** Displays the original signal value as an orange curve.
  - **Enhancement:** Displays the signal enhancement of current time point relative to reference time point as a green curve.
  - **Both:** Displays both the Absolute and Enhancement curves.
3. Place the Currently Selected Point (CSP) in the source viewport to view the associated curve in the Curve viewport.
  - If an ROI or point annotation has been created in the source viewport, an annotation icon will be displayed at the top of the Curve viewport. Click on an annotation icon to show/hide the corresponding curve.
  - From the Curve viewport Pie menu, select **Show** (or **Hide**) **Overlay** to toggle the overlay on or off.

## Select the Curve Mode

1. From the Curve viewport Pie menu, select the desired curve mode.
2. The Curve viewport displays a color overlay on the source image, which represents the characteristics of the corresponding curve for each pixel.
  - Figure 16 illustrates the information used by the available curve modes and Table 14 describes the modes.

FIGURE 16. **Dynamic Curve Modes**

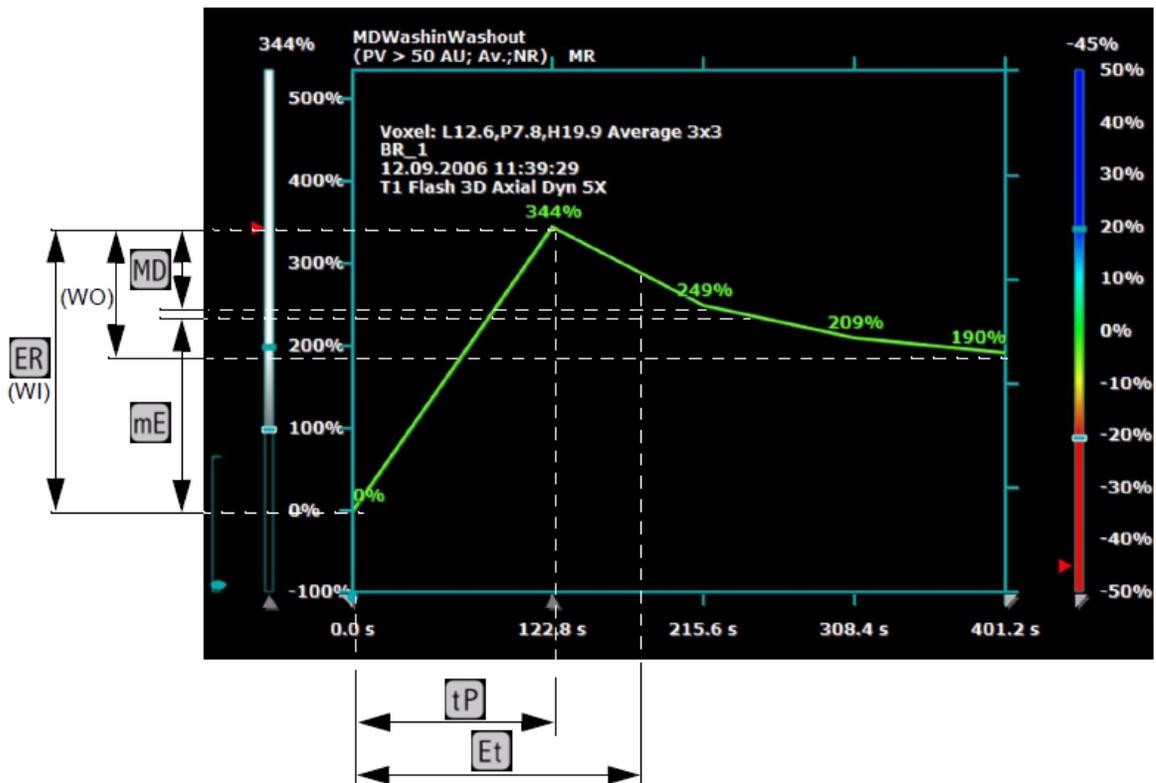


TABLE 14. **Curve Modes**

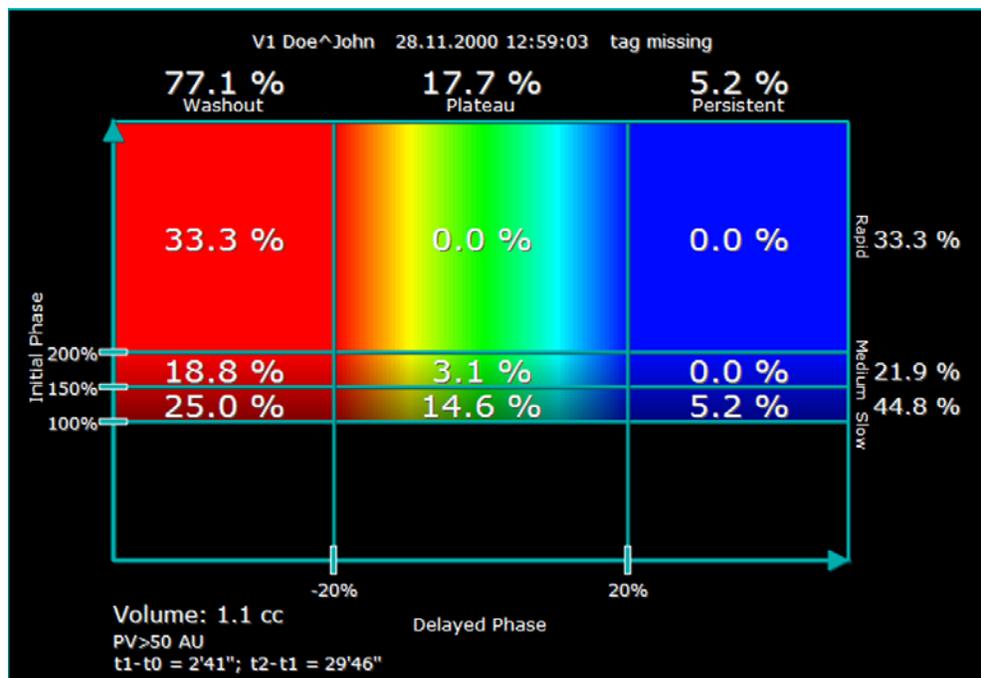
Icon	Name	Description
	Wash-In / Wash-out	Each pixel is color coded based on the shape of the curve. The brightness (left) color bar represents the enhancement (wash-in) between $T_0$ and $T_1$ (see WI in Figure 16). The hue (right) color bar represents the wash out between $T_1$ and $T_2$ (see WO in Figure 16).
	Curve Type	Each pixel is color coded based on the shape of the curve. The brightness color bar represents the enhancement (wash-in) between $T_0$ and $T_1$ . The hue color bar represents the wash out between $T_1$ and $T_2$ .
	Peak Value	The maximum value over all time points is displayed as a color overlay and is useful for thresholding noise in the image.
	Peak Enhancement	The maximum rate of enhancement for each pixel is displayed as a color overlay.
	Time to Peak (E)	Each pixel is color coded to reflect the time when the curve reaches its maximum value. Colors are assigned according to the lower (horizontal) color bar.
	Mean Enhancement Time (E)	Each pixel is color coded based on the time when half of the total integral value is reached.
	Mean Enhancement (E)	Each pixel is color coded based on the integral value between $T_1$ and $T_2$ , divided by the time range.
	Peak Enhancement over Time (E)	Maximum enhancement divided by time-to-peak is displayed as a color overlay.
	Value (E)	Value at $T_1$ is displayed as a color overlay.
	Enhancement Rate (E)	Enhancement (wash-in rate) at $T_1$ compared to $T_0$ is displayed as a color overlay.
	Enhancement Maximum Slope (E)	Maximum increasing slope between consecutive time points.
	Enhancement Maximum Descent (E)	Maximum decreasing slope between consecutive time points.
<b>NOTE:</b> Items marked with (E) are only available in the Expanded mode.		

## Display Volume Statistics for Specific Regions

Use this procedure to view the statistics of subvolumes in the Curve viewport.

- In the source viewport, draw a volume annotation that contains a region of interest.
  - Check the depth of the volume by viewing an alternate image orientation.
- From the Curve viewport Pie menu, select the **IO** **Wash-in/Wash-out** or the **TY** **Curve Type** method.
  - If you select another method only the geometrical data for the subvolume will be displayed.
- From the Curve viewport Pie menu, select the desired subvolume.
- To switch off the volume statistics display, from the context menu select **Show Curve** and select a curve.

FIGURE 17. Volume Statistics



## Search for a Suspect Finding Location

Use this procedure to perform an automated search for areas of maximum enhancement and washout within a specific subvolume and mark these areas as “suspect locations” within an image.

1. From the Curve viewport Pie menu, select the  **Wash-in/Wash-out** method.
2. In the source viewport, draw a volume around the suspect location on the slice that intersects the region of interest.
  - Alternatively, select an existing volume.
3. Check the depth of the volume by viewing other orientations.
4. Right-click the VOI and select **Search Suspect Location**.
5. Click **Yes** to the message prompt to add the finding to the Results folder.
  - The location in the VOI with the highest enhancement is detected, a finding marker is set and the finding is saved to the Results folder.
  - This result contains screenshots of the relevant viewports (including the Curve viewport) and statistical data for the volume.

# Create Results

---

Image snapshots are saved to the currently selected result folder of the study. Results can be opened in the same way as an image set (drag into the viewport) or can be opened by double-clicking on the result folder in the side panel.

## Take a SnapShot

Use this procedure to take a snapshot of the currently selected viewport.

1. From the Pie menu, select  **Create Snapshot**.
  - Alternatively, from the  **Pie Context menu > Results > Create Snapshot**.
2. Click a viewport to save the snapshot.
  - Alternatively, press **S**.
  - The snapshot is saved to the currently selected result folder.

Use this procedure to create a snapshot of all viewports of the Work Area.

1. From the Work Area context menu, select **Snapshot of Work Area**.
  - The snapshot is saved to the currently selected result folder.

## Add Selected Annotation

Use this procedure to add selected annotation to a result folder.

From the Context menu of the annotation, select **Add to Current Result Folder**.

- Alternatively, select **Add to New Result Folder** to create a new result folder with the screenshot.
- A screenshot with the annotation is added to the indicated or to a new result folder.

## Create a Result Series

Use this procedure to create a result series (time point or slice).

1. From the Viewport context menu, select **Results > Create Result Series**.
  - Alternatively, this option is available in the Create Snapshot menu.
2. Specify the parameters.
  - a. Type of series (slice or time point)
  - b. Series range (all slices or around current slice)
  - c. Number of images
  - d. Series description
  - e. PACS forward preference
3. The result series is saved in the currently selected result folder.

## View Results

1. From the Side panel, click the title or arrow to expand the Results section.
  - The available result folders are listed.
  - Click the arrow to expand the folder to display the list of result objects for that folder.
2. From the Results list, double-click the result object you want to view.
  - Alternatively, right-click the result object and select **Open in Editor**.
  - Results can be viewed for open studies only.

# Close a Study

---

## Defer or Complete a Study

On the Global toolbar, click the **Defer/Complete Study** icon.

- A dialog displays with options to defer or complete the study.
  - Deferring a study closes it while saving the current settings and modifications. The study remains in the system for further review.
  - Completing a study closes it and sends the results to the configured DICOM SCP.

---

# Display Tools

This chapter describes the Visia display tools for manipulating image display. To control operations such as navigating through slices, selecting time points, or changing parameters, move the mouse pointer (up/down or right/left) or use the sliders located on the viewport borders. Interaction results depend on the mouse pointer mode, which is determined by the selected tool. The shape of the mouse pointer indicates the active mouse pointer mode.

## Adjust the Window/Level

---

Window-leveling defines the range of pixel values which are displayed in grayscale colors. Pixels with values above or below the range are displayed in white or in black. To control the brightness and contrast of image display, use the Window/Level tool.

The window/level parameters (W:, L:) are displayed in the lower-right corner of the image information overlay. While window-leveling is performed, a window/level curve is displayed in the lower section of the viewport.

### Activate the Window/Level Mode

1. From the Pie menu, click  **Window/Level**.
  - Alternatively, press **W**.
2. With the activated tool, hold down the left mouse button and move the mouse up/down to modify the level or left/right to modify the width.
  - You can also hold down the left and right mouse buttons to activate the mode and move the mouse as described above.

**NOTE:** To invert the display, i.e., high values display as dark colors and low values display as light colors, press **i**.

# Select a Current Point

---

A Currently Selected Point (CSP) allows you to place a point in the series to view the point value and point coordinates. The point is marked by a crosshair and the point information is shown in the lower-right corner of the image information overlay.

## Deposit the Crosshair

1. From the Global toolbar or Pie menu, click the  **Zoom menu**  
>  **Crosshair**.
2. Click and drag the crosshair to reposition the point.

## Hide Crosshair

1. From the Global toolbar, click the  **Synchronization menu**  
>  **Crosshair On/Off**.
  - When the crosshair is hidden, the point may still be moved by means of the Currently Selected Point tool. The point coordinates shown in the lower-right corner of the image information overlay change as you move the currently selected point.
  - Alternatively, in Viewport context menu, select **Tools > Currently Selected Point (CSP) > Hide Crosshair**.

# Stack Through Slices or Time Points

---

## Select a Slice

Use one of the following methods to select a slice.

- On the right side of the viewport, click and drag the **Slice Position** slider.
  - The number of the current slice is shown next to the slider.
- From the Global toolbar or the Pie menu, click  **Stack**. Click and drag up and down in the viewport.
  - Every slice is shown while stacking so the stacking speed may be slow.
- From the Global toolbar or Pie menu, click the  **Stack menu**
  - >  **Fast Stack**. Click and drag up and down in the viewport.
    - Slices may be skipped while you stack, but the stacking speed is increased.
  - Rotate the **Wheel** button.
  - Press the **Up/Down** arrow keys.

## Select a Time Point

Use one of the following methods to select a time point.

- On the bottom of the viewport, click and drag the **Time Point** slider.
  - The current time point is shown next to the slider.
- Press the **Right/Left** arrow keys.

# Stack Automatically Through Time Points or Slices

---

To scroll automatically through time points (phases) or slices, you can use the Cine tool or one of the automatic stacking tools.

- Cine: scrolls automatically through time points (phases). The current series is shown as a movie.
- Stacking in z-direction: scrolls through a stack of slices, showing a spatial series of slices at one time point (phase).
- Stacking in t-direction: scrolls through a stack of slices, showing a slice of the same spatial position at different time points (phases).

**NOTE:** When automatic stacking is active, use the arrow keys to manually navigate to the previous/next time points or slices.

The stacking modes define the behavior when the first/last time point or slice is reached by automatic stacking. One of the following modes has been preselected during installation/configuration by an administrator:

- Cycle: loop mode, when the last slice is reached, the stacking starts with the first slice.
- Bounce: yo-yo mode, when the last slice is reached, the stacking direction is inverted.
- Stop: when the last slice has been reached, the stacking is stopped.

Contact your administrator to change the stacking mode or to activate Combined Timepoint/Slice Navigation.

## Automatic Stacking

Use this procedure to stack automatically through slices.

1. From the Global toolbar or Pie menu, click the  **Stack menu**  
>  **Automatic Stacking.**
  - The Automatic Stacking tool stacks through slices.
2. Click on the viewport to start stacking.
  - Click again to pause stacking.
3. Change the speed and direction: click and drag up/down or left/right.
  - The more you drag the cursor from its original position, the faster the stacking speed.
  - To reduce the stacking speed or change direction, drag the cursor in the opposite direction.

## Cine

Use this procedure to scroll automatically through time points (phases).

1. From the Global toolbar or Pie menu, click the  **Stack menu**  
>  **Cine**.
2. Click and drag left/right in the viewport to stack through time points.
3. Click again to stop the stacking.
4. Change the speed and direction: Click and drag up/down or left/right.
  - The more you drag the cursor from its original position, the faster the cine speed.
  - To reduce the speed or change direction, drag the cursor in the opposite direction.

## Combined Stacking z/t

Use this procedure to stack automatically through slices or time points.

1. From the Pie menu, click the  **Pie Context menu > Tools > Slice Stacking >**  **Combined Stacking**.
  - Alternatively, press **Ctrl+E** to allow automatic stacking through slices and time points.
2. Click on the viewport to start stacking.
  - Click again to pause stacking.
3. Change between time and point/slice stacking.
  - Click and drag up/down to select slice stacking.
  - Click and drag left/right to select time point stacking.
4. Change the stacking speed: click and drag up/down or left/right.
  - The more you drag the cursor from the initial position, the faster the stacking speed.
  - To reduce stacking speed, drag the cursor in the opposite direction.
5. Navigate directly to a slice or time point: click and slowly drag up/down or left/right.
  - If you move the mouse faster, the stacking speed increases.

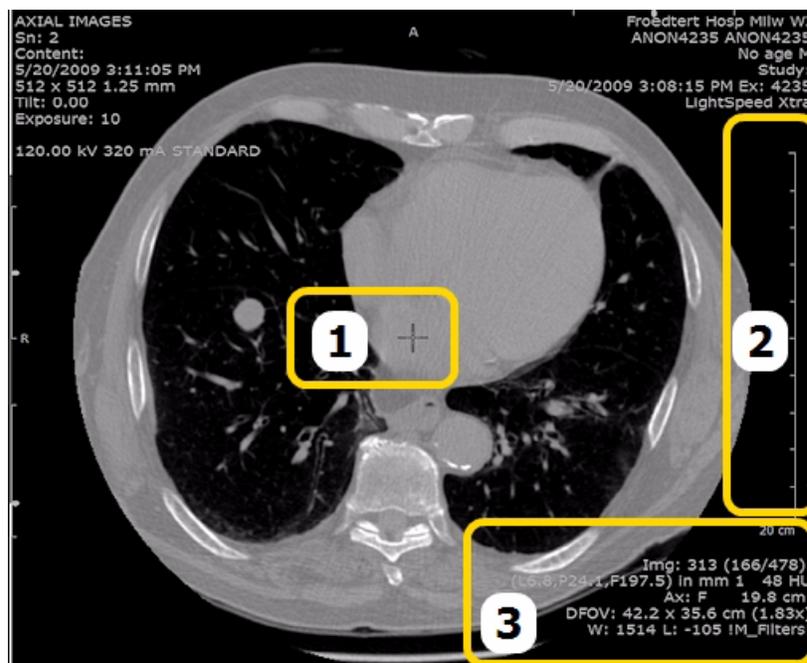
# Zoom

---

The interactive zoom tool zooms in on the entire image. Use this procedure to zoom an image.

1. From the Global toolbar or Pie menu, click  **Zoom**.
  - Alternatively, from the Context menu, select **Tools > Magnification > Zoom**.
2. Click and drag over the image.
  - Drag up to zoom in.
  - Drag down to zoom out.
  - The CSP (crosshair) is the focus point.
    - The crosshair may be moved to any position.
    - If zooming has moved part of the image outside the viewport, click and drag with the wheel button to drag the image back.
  - The magnification (zoom) factor is shown in the bottom-right corner of the image overlay information. The scale on the right side of the viewport updates according to the magnification.

FIGURE 18. **Zoomed image: CSP (1), Scale (2), and Magnification Factor (3)**



# Magnify

---

The magnifying tool works like a magnifying glass that is moved over the image.

## Select the Magnifier

1. From the Global toolbar or Pie menu, select the  **Zoom menu**  
>  **Magnifier**.
  - Alternatively, from the Context menu, select **Tools > Magnification >**
    - Small
    - Magnifier
    - Large
2. Click and drag over the image to enlarge an area below the pointer.
  - Magnifier windows of different sizes can be selected from the Context menu.

## Fix the Magnifier

1. Double-click in the magnifier area to fix the magnifier.
2. Click and drag to move the magnifier.
3. Double-click again to remove a fixed magnifier.

## Change the Zoom Factor

1. Click and hold the left mouse button and rotate the wheel or only rotate the wheel if the magnifier is fixed.
2. Alternatively, click and hold the left mouse button and press - or +.

# Pan

---

Use the following procedure to pan or scroll an image in a viewport.

1. From the Global toolbar or Pie menu, click the  **Zoom menu**  
>  **Pan**.
  - Alternatively, from the Context menu, select **Tools > Pan**.
2. Click and drag over the image to pan the image.
  - Alternatively, press the wheel button and hold while you drag the mouse.
  - The wheel button activates the pan function regardless of which tool is currently selected.

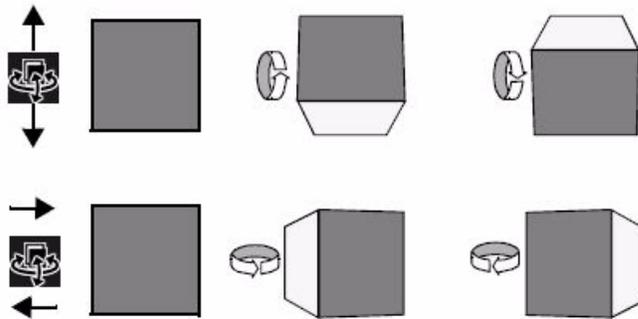
# Rotate

---

## Rotate Images

1. From the Global toolbar or Pie menu, click the  **Zoom menu** >  **Rotate**.
  - Alternatively, from the Context menu, select **Tools > Rotate**.
2. Click and drag over the image to rotate the image.
  - Alternatively, press **Alt** and hold while you drag the mouse.
    - A 2D image series will rotate.
    - A 3D image series will reformat.
  - **Alt** activates the rotation function regardless of which tool is currently selected.
3. Move the mouse to rotate the plane.
  - Drag up/down to rotate superior/inferior.
  - Drag left/right to rotate anterior/posterior.

FIGURE 19. **Rotate Tool**



## Rotate by 90°

1. From the Pie menu, click the  **Orientation menu** >  **Rotate Clockwise**.
  - Each time Rotate Clockwise is selected, the image rotates by 90°.

## Mirror (2D) and Flip (3D)

1. From the Pie menu, click the  **Orientation menu** >  **Flip Image**.
  - A 2D image series will be mirrored using the vertical axis as the mirror line. A 3D image series will be rotated by 180°.

# Annotate

---

## Activate Annotations

Use one of the following methods to activate an Annotation tool. Upon selection, the mouse pointer changes its shape according to the selected tool.

- From the Global toolbar or Pie menu, click the  **Measure menu** and select the desired tool.
- From the Pie menu, click the  **Context menu > Tools > Annotations** and select the desired tool.

## Edit Annotations

Use this procedure to edit an annotation. The measurement values update accordingly when an annotation is resized.

1. Point to an annotation.
  - The mouse pointer becomes a white arrow.
  - The annotation and its labels become white.
2. Edit the white elements.
  - Move starting and end points of lines.
  - Point to one of the end points of the major or minor axis and drag the point to resize the ROIs/VOI.
  - Move measurement labels.
    - When you click an annotation, the annotation labels resume their original position.

**NOTE:** Press **Page Up** and **Page Down** to go to the next annotated slice.

## Hide or Delete Annotation

- To delete an annotation, open the context menu of an annotation and select **Delete**.
- To delete all annotations, use multi-selection in the Annotation control panel.
- To hide/show an annotation, click the  **Eye** or from the context menu, select **Show**.

## Measure

Use the following procedure to measure a distance.

1. Select the  **Measure** tool.
2. Click to place the first point of the line (measurement).
3. Move the pointer to the desired end-point of the line.
4. Click again to connect the two points by a line.

A label shows the line number and the line length.

## Place a Finding Marker

A Finding Marker is an annotation in the form of an arrow. When this annotation is placed, a snapshot of the viewport is automatically created and saved in a new result folder.

1. Select the  **Finding Marker** tool.
  - Alternatively, press **F**.
2. Click the position (finding) to be marked.
  - To delete a Finding Marker, from the context menu of the finding marker entry in the results folder, select **Delete**. The result snapshot is automatically deleted with the finding marker.

## Place Angles

Each line of an angle is labeled with a line number. Another label (located between the lines) gives the angle between the two lines. When a line has been edited once, an additional label gives the length of the label.

1. Select the  **Angle** tool.
2. Click to place a pair of lines.
  - The left end of the upper line will be positioned where you click.
3. Click and drag the end handles of a line to adjust the length and position.

## Place Volumes

The depth of a volume is initially set to the average of the rectangle height and width. The volume is initially centered around the currently displayed slice. Use the following procedure to place and adjust a volume.

1. Select the  **VOI** tool.
2. Click to place a starting point.
3. Drag to the desired end point.
  - The starting point and the end point define the diagonal of a rectangle.
  - This rectangle is the projection of a volume.
  - The depth of the volume is initially set to the average of the rectangle height and width.
  - The volume is initially centered around the currently displayed slice.
4. View alternate image orientations to adjust the depth and positioning of the VOI.
  - To move a VOI, point inside the VOI near the border and drag the VOI to a new position.
  - To resize the VOI, drag one of the projected sides of the VOI or one of the corners.

**NOTE:** An ID number is shown above the upper left corner of the VOI. This ID number can be used in the MIP view to refer to different VOIs.

## Place an Oval ROI

1. Select the  **Oval ROI** tool.
2. Click to place the starting point.
3. Drag to the desired end point.
  - The starting point and the end point define the major axis (length) of the ellipse.
  - The minor axis (height) of the ellipse defaults to 3/4 of the major axis length.
  - To place a circle, press **Ctrl** while you move the mouse.
  - The ROI measurement values are shown in the Annotation control panel.

## Place a Freehand ROI

1. Select the  **Freehand ROI** tool.
2. Click to place the starting point.
3. Drag the pointer to draw the freehand line.
4. Release the mouse button to complete the line.
  - The starting point and the end point automatically connect by means of a straight line to create a closed area.
  - The size of the currently selected ROI and measurement values are shown in the Annotation control panel.

## Place Points

1. Select the  **Point** tool.
2. Click to place a point at the desired position.
  - The grayscale value (independent of the Window/Level value) and time point information are shown in the Annotation control panel.

## Place Text

1. Select the  **Text** tool.
2. Click to place the starting point.
3. Type the text.
4. Press **Enter** to complete the text or click to complete the current entry and to place the starting point of another text field.
  - Double-click the text in text annotation to change or add text.

## Place Arrows

1. Select the  **Arrow** tool.
2. Click to place an arrow.
  - The point you click is the end point of the tip of the arrow.
3. Click the handle of the arrow to change the size and direction.

## **Use Annotation as Shutters**

Ellipses and freehand ROIs can be used as shutters. If an annotation is used as a shutter, everything outside the shutter is hidden.

To switch a shutter on, from the Context menu of the annotation, select **Use As Shutter**. To turn off the shutter, select **Use As Shutter** again.

---

# Displayed Information

This chapter describes the information that can be displayed on images.

## Overlay Image Information

---

Image information can be displayed in the corners of the images as an overlay. The image information overlay primarily displays data from the DICOM tags.

The image overlay can be switched on/off or shown with reduced information.

### Select the Display Mode

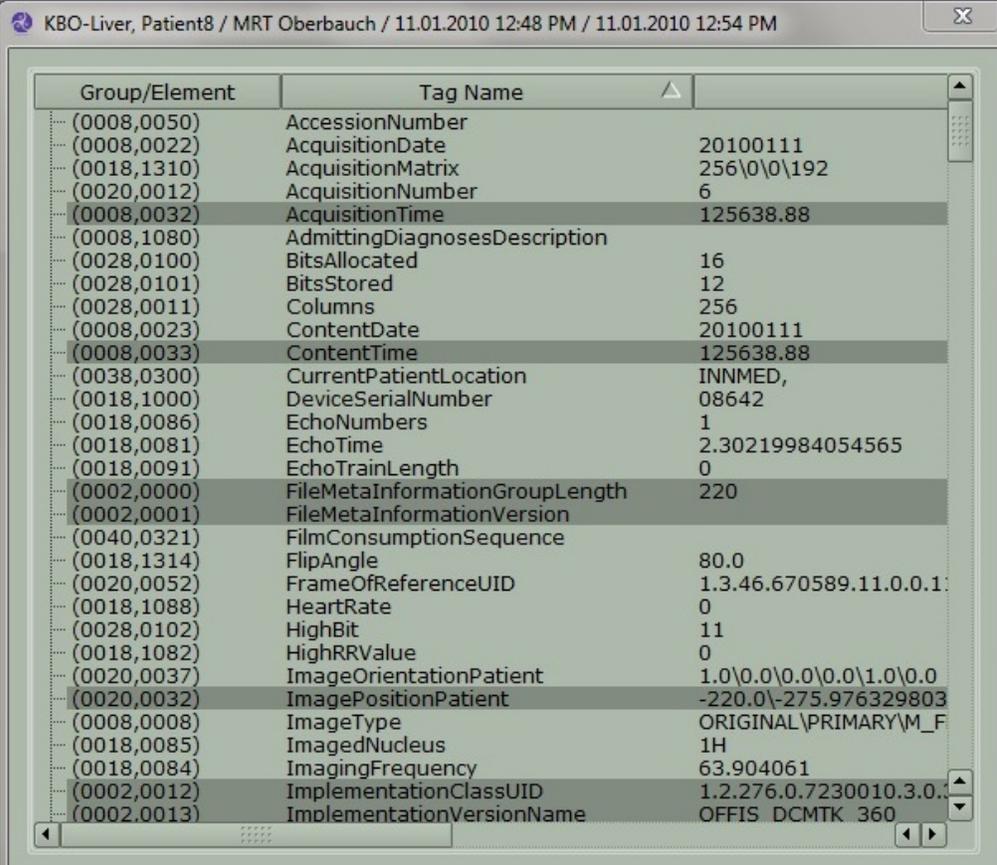
1. From the Pie menu, click the  **Context menu**.
2. Select **Displayed Information > Image Information Overlay**.
3. Select an image overlay mode: **All**, **Reduced**, or **None**.
  - Press **Ctrl+i** to toggle between the modes.
  - Alternatively, from the Global toolbar click the **Synchronization On/Off menu > Image Text on/off**.

# Display DICOM Tag Information

DICOM images may include bitplanes (black/white), which can be used as overlays. They may show information such as laterally, comments, or marks. The DICOM Tag Information option is only available in the Expanded mode.

1. From the Pie menu, select the  **Context menu**.
2. Select **Open DICOM Tag Information**.
  - Alternatively, press **Alt+D**.
  - DICOM information from the image displays fo the active viewport.
  - The highlighted entries indicate values that might change while you work on the series.

FIGURE 20. **DICOM Tag Information**



The screenshot shows a window titled "KBO-Liver, Patient8 / MRT Oberbauch / 11.01.2010 12:48 PM / 11.01.2010 12:54 PM". The window displays a table of DICOM tags with columns for Group/Element, Tag Name, and Value. The table is as follows:

Group/Element	Tag Name	
(0008,0050)	AccessionNumber	
(0008,0022)	AcquisitionDate	20100111
(0018,1310)	AcquisitionMatrix	256\0\0\192
(0020,0012)	AcquisitionNumber	6
(0008,0032)	AcquisitionTime	125638.88
(0008,1080)	AdmittingDiagnosesDescription	
(0028,0100)	BitsAllocated	16
(0028,0101)	BitsStored	12
(0028,0011)	Columns	256
(0008,0023)	ContentDate	20100111
(0008,0033)	ContentTime	125638.88
(0038,0300)	CurrentPatientLocation	INNMED,
(0018,1000)	DeviceSerialNumber	08642
(0018,0086)	EchoNumbers	1
(0018,0081)	EchoTime	2.30219984054565
(0018,0091)	EchoTrainLength	0
(0002,0000)	FileMetaInformationGroupLength	220
(0002,0001)	FileMetaInformationVersion	
(0040,0321)	FilmConsumptionSequence	
(0018,1314)	FlipAngle	80.0
(0020,0052)	FrameOfReferenceUID	1.3.46.670589.11.0.0.1
(0018,1088)	HeartRate	0
(0028,0102)	HighBit	11
(0018,1082)	HighRRValue	0
(0020,0037)	ImageOrientationPatient	1.0\0.0\0.0\0.0\1.0\0.0
(0020,0032)	ImagePositionPatient	-220.0\ -275.976329803
(0008,0008)	ImageType	ORIGINAL\PRIMARY\M_F
(0018,0085)	ImagedNucleus	1H
(0018,0084)	ImagingFrequency	63.904061
(0002,0012)	ImplementationClassUID	1.2.276.0.7230010.3.0.
(0002,0013)	ImplementationVersionName	OFFIS DCMTK 360

---

# Image View

This chapter describes the various ways to view your images.

## Manipulate the Image Orientation

---

The image orientation is indicated by the letters at the top and to the left of the image.

- H (Head) or F (Foot)
- L (Left) or R (Right)
- A (Anterior) or P (Posterior)

There are additional reformatting options for oblique images, e.g., images obtained by gantry tilt scanning. The series is reformatted (axial, coronal, or sagittal) with regard to the patient coordinate system.

### Select a Standard Orientation

1. From the Pie menu, click the  **Orientation menu** and select an orthogonal orientation.
  - For an axial (caudo-cranial) image, click the  **Axial** icon or press **Alt+A**.
  - For a coronal (ventro-dorsal) image, click the  **Coronal** icon or press **Alt+C**.
  - For a sagittal (right to left) image, click the  **Sagittal** icon or press **Alt+S**.
  - For a rotated axial image, click the  **Rotated Axial** icon.
    - This option is available for image series captured in a caudo-cranial orientation.

## Select an Oblique Orientation

1. From the Pie menu, click the  Orientation menu and select an oblique orientation.
  - For an axial oblique, click  **Axial Patient.**
  - For a coronal oblique, click  **Coronal Patient.**
  - For a sagittal oblique, click  **Sagittal Patient.**
2. To go back to the standard orientation, click  **Original.**

# Create Slabs and MIPs

---

A slab is a package of adjacent slices. It is defined by its middle slice and its slab thickness (number of slices to be rendered). Slabs are displayed in the Maximum Intensity Projection (MIP) mode. The slab thickness is shown on the lower-right corner of the image information overlay.

## Create Slabs

1. Press **Ctrl+Alt**.
2. Click and drag up/down to control the slab thickness or to create or delete a slab.
  - Without previous selection of the tool, you can also change the slab size.
    - Press **Ctrl+T** to increase the slab size.
    - Press **T** to decrease the slab size.
  - To directly define a slab size, from the Context menu, select **MIP Mode Settings > Slab Thickness**.
    - MIP Mode Settings are only available in the Expanded mode.

## Stack Through Slabs

Stacking through slabs is similar to stacking through slices. Use one of the following methods to stack through slabs.

- On the right side of the viewport, click and drag the **Slice Position** slider.
- From the Global toolbar or the Pie menu, click  **Stack**. Click and drag up and down in the viewport.
- Rotate the **Wheel** button.
- Press the **Up/Down** arrow keys.

# Subtract Images

---

The Subtraction mode displays the difference between the current image (time point  $t_c$ ) and the reference image (time point  $t_0$ ). You can choose if you want to show the actual difference or the absolute value of the difference.

1. Switch Subtraction mode on and off.
  - Press **Ctrl+D** to toggle between modes.
    - Difference
    - Absolute Difference
    - Original Data: switches Subtraction mode off.
  - Alternatively, from the Context menu, select **Subtraction Settings > Subtraction Modes**.
    - **Subtraction Settings** are only available in the Expanded mode.
2. Define a reference time point  $t_0$ : from the Context menu, select **Subtraction Settings > Reference Time Point**.
  - Only available in Expanded mode.
3. Define a time point  $t_c$  for subtraction: Click and drag the **Time Point** slider to select the desired image.
  - It is not possible to define  $t_c = t_0$ , as this would result in a black image.

# Synchronize

---

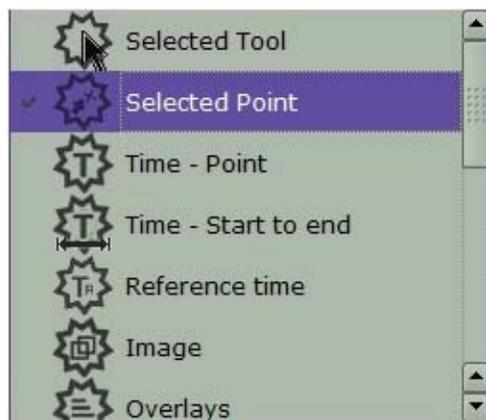
Different viewports in a hanging can be synchronized with regard to different attributes such as CSP position, window/level, view angle, time point, or selected tool. In many hangings, the CSP synchronization is preset.

If two viewports are synchronized and one of these viewports has already been synchronized with other viewports by means of the selected synchronization attribute, the changes are given to those viewports as well. You can synchronize by means of several attributes, e.g., you can select the LUT in addition to the CSP for synchronization.

## Synchronize Viewports

1. From the Global toolbar, click the  **Synchronization menu**
  - >  **Show Synchronization Options.**
    - Show Synchronization Options is only available in the Expanded mode.
    - A list of synchronization options opens.

FIGURE 21. **Synchronization Options**



2. Drag options from the Synchronization Options list to the list of another viewport.
  - When synchronized, the attribute is marked with a check in both viewport synchronization lists.
  - When you change a property in a viewport that cannot be changed in a viewport that it is synchronized with, a warning symbol is displayed (contains the symbol of the attribute). This usually happens when you synchronize two image series with different coordinate areas (e.g., MR scans with different orientations).

## Synchronize Images

Use this procedure to synchronize images with different frames of reference. This option exists only if it is applicable to the viewport.

1. From the Global toolbar or Pie menu, click the  **Zoom menu**  
>  **Crosshair**.
2. Click and drag the crosshair to reposition the point on a common structure that is visible in both viewports.
3. Select the appropriate slice in both viewports.
4. From the Pie menu, click the  **Stack menu** > **Register Currently Selected Point**.

## Turn Off/Remove Synchronization

To temporarily turn synchronization off:

- From the Global toolbar, click the  **Synchronization menu**  
>  **Synchronization On/Off**.

To remove synchronization:

- From the Synchronization Options list (Expanded mode), open the Context menu of the synchronization attribute and select **Remove from synchronization**.
  - The synchronization is removed for the attribute and the viewport you selected.
  - If more than two viewports were synchronized by the attribute, the synchronization between the other viewports is retained.

## Synchronize Current Studies with Priors

Be careful when you compare current studies with prior studies (i.e., when you compare data sets with different frames of reference). Studies that have different frames of reference cannot be compared by synchronizing them via the currently selected point. You must first identify a common point that is displayed in both data sets. A warning message informs you of the different frames of reference when you try to synchronize data by means of the currently selected point.

1. Identify a structure (reference point) that is visible in both viewports.
2. Select the appropriate slice in both viewports and place the currently selected point on this structure.

3. From the Pie menu, click the  **Stack menu > Register Currently Selected Point.**

- The mouse pointer changes in appearance.

4. Click the viewport to register.

- Alternatively, from the Global toolbar, click the 

- **Synchronization menu >  Show Synchronization Options > Selected Point.**

- A warning dialog displays.

5. Click **Yes** to confirm synchronization of the viewports.

- The images are registered.
- If the images have been manually registered before, the dialog offers the option to use previously stored patient transformation coordinates. If you select this option, the stored transformations are used. If not, transformation is performed again.

**NOTE:** This synchronization also works for data sets that have been created with different orientations or slice thickness values. If, however, the patient was positioned in different orientations, the registration may not suffice. If the orientation deviations are small enough, the data may be registered again; but if the orientations are completely different, registration will not work.

## Modify Synchronization with Prior Studies

1. Press **Shift+Ctrl** and simultaneously drag the currently selected point to the desired position.
2. Place a new currently selected point.
  - a. Temporarily switch off manual registration (by means of the **Use Original Patient Coordinates** command.)
  - b. Place a new currently selected point.
  - c. Select **Register Currently Selected Point**.
  - d. Start the registration process as described above.

## Switch Manual Registration On/Off

- Off: From the Context menu of the synchronization attributes, select **Use Original Patient Coordinates** to temporarily switch off manual synchronization without removing the registration information.
- On: From the Context menu of the synchronization attributes, select **Use Alternative Patient Coordinates** to switch manual registration on again.

## Automatically Interpolate Images

---

When you magnify images, the pixel structure of the data may become visible (i.e., pixels appear as rectangles) which may have a negative impact on the quality with which the image is perceived. To avoid this, you can interpolate adjacent pixels.

1. Right-click the Global toolbar or Work area.
2. Select **For All Inspectors > Interpolation**.
3. Choose an option to apply to all viewports.
  - **Always on** = Pixels are always interpolated (also during stacking and scrolling)
  - **Always off** = No interpolation; pixel structure may become visible

---

# Advanced Tools and Features

This chapter describes the advanced tools and features of Dynamic Review.

## Background Noise

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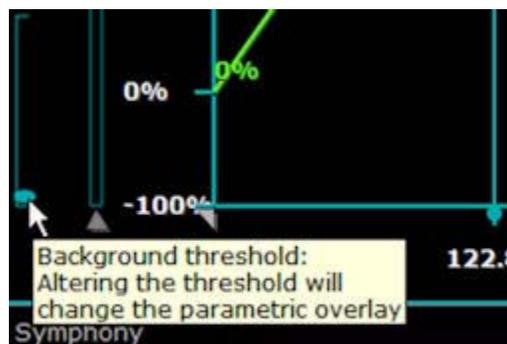
Color overlays displayed on noisy data might be susceptible to background noise artifacts. If necessary, the impact of the noise can be suppressed by adjusting the background threshold slider in the Curve viewport, or by filtering.

### Adjust the Background Noise Threshold

1. Move the **Threshold** slider up or down to suppress the background noise.
  - Adjusting the threshold will exclude background pixels from the color overlays.
  - Only pixels with values above the mask value are used for color overlay display.

FIGURE 22. **Background Threshold**

---



## Suppress the Background Noise with Filters

1. From the Curve viewport's context menu select **Parameter Overlay > Background Suppression Mode**.
2. From the list, select the desired filter mode.
  - **No Suppression:** Noise suppression is disabled.
  - **Background Noise Suppression:** The peak value threshold is used.
  - **Noise Reduction:** Applies both Noise Reduction and Background Suppression filters. Pixels that would appear as isolated points in the color overlay are removed.
  - **Averaging:** The signal is smoothed by means of a 3x3 averaging filter before the color overlay is created.

## Time Points

The different curve modes require the specification of particular time points. These time points are defined in the hanging protocol.

FIGURE 23. **Time Points**



FIGURE 24. **Time Point Descriptions**

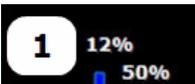
Number	Name	Description
1	$T_0$	Represents the $T_0$ baseline reference time point for subtraction and enhancement rate.
2	Image time point	The vertical line represents the time point of the display image in the source viewport.
3	$T_1$	Represents the evaluation time point $T_1$ .
4	$T_2$	Represents the evaluation time point $T_2$ .

If necessary, the reference time  $T_0$ , time point  $T_1$ , and time point  $T_2$  (when appropriate) can be changed. Click and drag the marks (triangles) to the desired locations on the time axis.

# Color Overlay

The Color Bars, located in Curve viewport parallel to the x or y axis, define the colors with which the curve values are displayed in the color overlay. Vertical Color Bars correspond to a specific time point (time point indicated by a triangle on the axis). The curve value for the Currently Selected Point (CSP) is shown at the top of the color bar. Color Bars may contain a continuous color gradient or segments with discrete colors.

FIGURE 25. Color Bar Descriptions

Number	Name	Description
1		Curve value of the CSP (according to the position of the mark). Slider for defining the color segment and end point.
2		
3		Curve value mark.
4		Slider for defining the color segment starting point.
5		Double-click the triangle to change the color segment starting point via a dialog window.

- Move the sliders on the color bar to define the starting and/or end point of the color segments or color gradients. Pixels with values outside of the range specified by the sliders are not color coded, instead the grayscale value is displayed.
- Use the Color Bar context menu to switch between color gradient display and color segment display.
- To define the color gradients, from the Color Bar context menu, select **Color LUTs**. A dialog is opened where you can select predefined color tables and define your own.
- To define the color segments, from the Color Bar context menu, select **Color Selection**.
  - A dialog is opened where you can define the number of segments as well as the color of the individual segments. The number of sliders changes according to the number of segments you specify.

# Curve Settings

---

The curve viewport allows you to easily configure curve settings for your scan protocols to customize them to your needs.

## Select a Curve Setting

Use this procedure to see the list of available curve settings.

1. From the Curve viewport Pie menu, select the **Hide** menu.
  - Alternatively, from the Curve viewport context menu, select **Parameter Sets**.
2. From the list of available curve settings, select the desired setting.

## Save Current Curve Settings

1. From the Curve viewport context menu, select **Parameter Sets > Save current Parameter Set**.
2. From the Save Parameter Set window, type a name for the new curve setting.
3. Optional: Select **Save in global config** if you want to provide the curve settings to all users (rather than to just the current user).
4. Click **Save**.

## Administer Curve Settings

1. From the context menu of the Curve viewport select **Parameter Sets > Manage**.
2. From the Manage Parameter Sets window, choose the desired curve setting and task.
  - It is recommended, not to delete or modify predefined curve settings.
3. Click **Exit** to close the window.

## Reset Curve Settings

4. From the Curve viewport pie menu, select **Reset** in the **Hide Color Overlay** menu.
  - This resets all values to their default settings.

# Keyboard Shortcuts

Table 15 shows the default settings for the keyboard shortcuts.

TABLE 15. **Keyboard Shortcuts**

Shortcut	Description
<b>Application</b>	
<i>F1</i>	Show software version/manual
<b>Studies/Side Panel</b>	
<i>F7</i>	Open previous hanging
<i>F8</i>	Open next hanging
<i>F9</i>	Open previous hanging set
<i>F10</i>	Open next hanging set
<i>Ctrl + S</i>	Close study
<b>Hangings</b>	
<i>Ctrl + Up Arrow</i>	To go to the previous series in the viewport
<i>Ctrl + Down Arrow</i>	To go to the next series in the viewport
<i>Ctrl + Shift + I</i>	Enable/disable interpolation type
<i>Ctrl + Shift + G</i>	Enable/disable Open GL
<b>Image Navigation</b>	
<i>Up/Down Arrow</i>	Next/previous slice
<i>Right/Left Arrow</i>	Next/previous time point
<i>Ctrl + G</i>	Go to slice number
<i>Ctrl + N</i>	Fast stacking mode
<i>Ctrl + E</i>	Combined Stacking
<i>Ctrl + Shift + E</i>	Stacking ESM
<i>P</i>	Switch selected point
<b>Image Orientation</b>	
<i>Alt + A</i>	Axial
<i>Alt + C</i>	Coronal
<i>Alt + S</i>	Sagittal
<b>Image Rendering</b>	
<i>Ctrl+Shift</i>	Zoom tool
<i>+/-</i>	Increase/decrease zoom factor
<i>*</i>	Fit to size
<i>Ctrl + i</i>	Text information overlay toggle
<i>Ctrl + D</i>	Toggle subtraction mode

<b>Shortcut</b>	<b>Description</b>
<i>T</i>	Decrease slab thickness
<i>Ctrl + T</i>	Increase slab thickness
<i>W</i>	Window-leveling
<i>I</i>	Invert window-leveling
<b>Annotation</b>	
<i>Delete</i>	Delete active annotation
<i>Shift</i>	Shows mouse cursor if any annotation tool is active
<i>F</i>	Place finding marker
<i>X</i>	Place point annotation at CSP
<i>PgUp</i>	Go to previous annotation
<i>PgDown</i>	Go to next annotation
<b>Results</b>	
<i>S</i>	Add to Result
<i>Ctrl + Shift + S</i>	Create Result series
<b>MIP Viewport</b>	
<i>Shift + A</i>	Set average rendering mode
<i>M</i>	Set MIP rendering mode
<i>Shift + M</i>	Set minIP rendering mode
<b>General Shortcuts</b>	
<i>Ctrl + C</i>	Copy to clipboard (e.g., annotations)
<i>Ctrl + A</i>	Select all items (in specific lists)
<i>Delete</i>	Delete selected items (e.g., annotations)