DynaSuite Neuro
User Guide

Customer Support

For support, contact:

Toll free: 1-877-INVIVO1 or 1-877-468-4861

Available 8AM to 8PM, Eastern Time

Email: dynasupport@invivocorp.com

Website: www.invivocorp.com

$C\epsilon$ 0482

Manufacturer:

MeVis Medical Solutions AG
Caroline-Herschel-Str. 1
28359 Bremen
Germany

Manufactured for:

Invivo Corporation
3545 SW 47th Avenue
Gainsville, FL 32608
United States

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Glossary

Chapter 1

About This Guide

Introduction

This chapter explains the purpose and design of this user guide. It is an introduction to the guide, providing information on the purpose, format, and graphic conventions that identify the visual symbols used throughout the guide.

You should be familiar with the following topics before using this guide:

- Guide Conventions
  - Use of Symbols
  - Format and Word Conventions
  - Mouse Controls
- General Warnings and Cautions

Guide Conventions

Use of Symbols

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

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

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

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 1-1 describes the conventions used with menus, buttons, text fields, and keyboard keys.

Table 1-1 Format and Word Conventions

Format	Description	Example
Bold	Used for emphasis.	**Do not** press down.
Italic	Used for emphasis.	Press *carefully* to engage.
Bold	A button label or interface button name that you actively click.	Click **Start**.
Bold Italic	A key on the computer keyboard that you actively press.	Press ***Enter***.
>	The pathway of selecting options in a pull-down menu.	Click the **Zoom** menu **> Pan**.
+	Press and hold a button on the keyboard and simultaneously press another keyboard button.	Press ***Ctrl+W***.
Blue text	Text that is hyperlinked to another topic. Click the text to jump to the referenced section.	For Technical Support and Service: See Customer Support.

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 1-2 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

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

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

If exported data is needed for further treatment or diagnosis, check to make sure the data arrived at the destination device.

Changes in scanning protocols may affect processing parameters and the advanced processed images. If changes are needed, consult your technical support representative.

When generating results, make sure they are accompanied by all necessary information for the intended recipient.

Chapter 2

DynaSuite Neuro Basics

Introduction

This chapter describes the purpose and general information of the DynaSuite Neuro system. This chapter also contains steps for getting started with DynaSuite Neuro. The general information and instructions should be read carefully and thoroughly before attempting to use the DynaSuite Neuro software.

You should be familiar with the following topics before using the DynaSuite Neuro system:

- Intended Use
  - BOLD fMRI Review
  - Diffusion Review
  - Fiber Tracking Review
  - Dynamic Review
  - Vessel Visualization
  - 3D Visualization
- General Information
  - Available Resources

The following procedure will help you get started with your DynaSuite Neuro system:

- Login
- Open the User Guide

Intended Use

DynaSuite Neuro is a medical image processing software application intended for the visualization of images from various sources such as Magnetic Resonance Imaging systems or from image archives. The system provides viewing, quantification, manipulation, communication, and printing of medical images. DynaSuite Neuro provides both analysis and viewing capabilities for anatomical and physiologic/functional imaging datasets, including Blood Oxygen Level Dependent (BOLD) fMRI, diffusion, fiber tracking, dynamic review, and vessel visualization. Data can be visualized in both 2D and 3D views.

BOLD fMRI Review

The BOLD fMRI feature is useful in identifying small susceptibility changes arising from neuronal activity during performance of a specific task.

Diffusion Review

The Diffusion Review feature is intended for visualization and analysis of local diffusion properties within the brain.

Fiber Tracking Review

The fiber tracking feature uses the directional portion of the diffusion vector to track and visualize white matter structures within the brain.

Dynamic Review

The Dynamic Review feature is intended for visualization and analysis of MR dynamic studies, showing changes in contrast over time, where such techniques are useful or necessary.

Vessel Visualization

The vessel feature is used to identify and visualize the vascular structures of the brain.

3D Visualization

The 3D visualization feature allows image data to be reconstructed as 3D objects that are visualized and manipulated on a 2D screen.

General Information

Available Resources

The following resources are available when you are working with DynaSuite Neuro:

- Onscreen Messages: The DynaSuite Neuro system is designed to guide you through any interaction you have with the system. Informational onscreen messages display when appropriate.

- Tool Tips: For most user interface elements, when you hover the mouse pointer over the item, a brief informational message is displayed.

- Technical Support and Service: See Customer Support.

- User Manuals: Instructions for using the system are provided in this guide. To order additional copies of the manuals, contact Customer Support.

- Scanning Protocol: For questions regarding protocols, contact Customer Support.

- DICOM Conformance Statements: The MeVis Medical Solutions website provides the DICOM Conformance Statement, which describes the DynaSuite Neuro implementation of the DICOM protocol.

- Customer Bulletins: We are committed to making our products safe and easy to use. If an issue arises or new features become available, we will send you a Customer Bulletin.

- Training: Contact Customer Support to arrange personalized instruction.

Login

Use this procedure to start the DynaSuite software and login to the program.

1. Double-click the **DynaSuite** desktop icon .

   - Alternatively, click **Start > DynaSuite**.

   - When DynaSuite opens, the Welcome screen (Figure 2-1) displays.

   Figure 2-1 Welcome screen

2. From the **Workspace** list, select the desired workspace.

3. Type your **User Name**.

4. Type your **Password**.

5. Click **Login**.

   - Quit closes the dialog box.

   User passwords can be changed in the Setup Tool in the **Preferences > Personal Settings tab**. You must be logged in to DynaSuite to change the password.

   If you do not know your user name or password, please contact Customer Support.

Open the User Guide

The user guide is available as a PDF file and can be displayed using the Adobe Acrobat Reader.

1. Press *F1*.

2. Use the bookmarks of the user guide to go to specific chapters or sections.

3. Use the blue hypertext in the document to jump to specific content.

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Chapter 3

User Interface Elements

Introduction

This chapter describes DynaSuite Graphic User Interface (GUI).

You should be familiar with the following user interface elements before using DynaSuite:

- Interface Basics

- Smart Fusion Review UI

- Diffusion Review UI

- fMRI Review UI

- Dynamic Review UI

- Toolbars and Menus

  - Global Toolbar

  - Setup Toolbar

  - Context Menus

- Work Area

  - Viewports

  - Sliders

  - Attention Icons

  - Data Orientation

  - Pie Menu

  - Image List

  - Image Panel

- Side Panel
  - Level 1: Worklists
  - Level 2: Studies
  - Level 3: Studies, Applications, and Images
- Patient Browser
- Results and Reports

Interface Basics

The typical DynaSuite GUI is shown in Figure 3-1. Table 3-2 describes the basic interface elements.

Figure 3-1 DynaSuite GUI
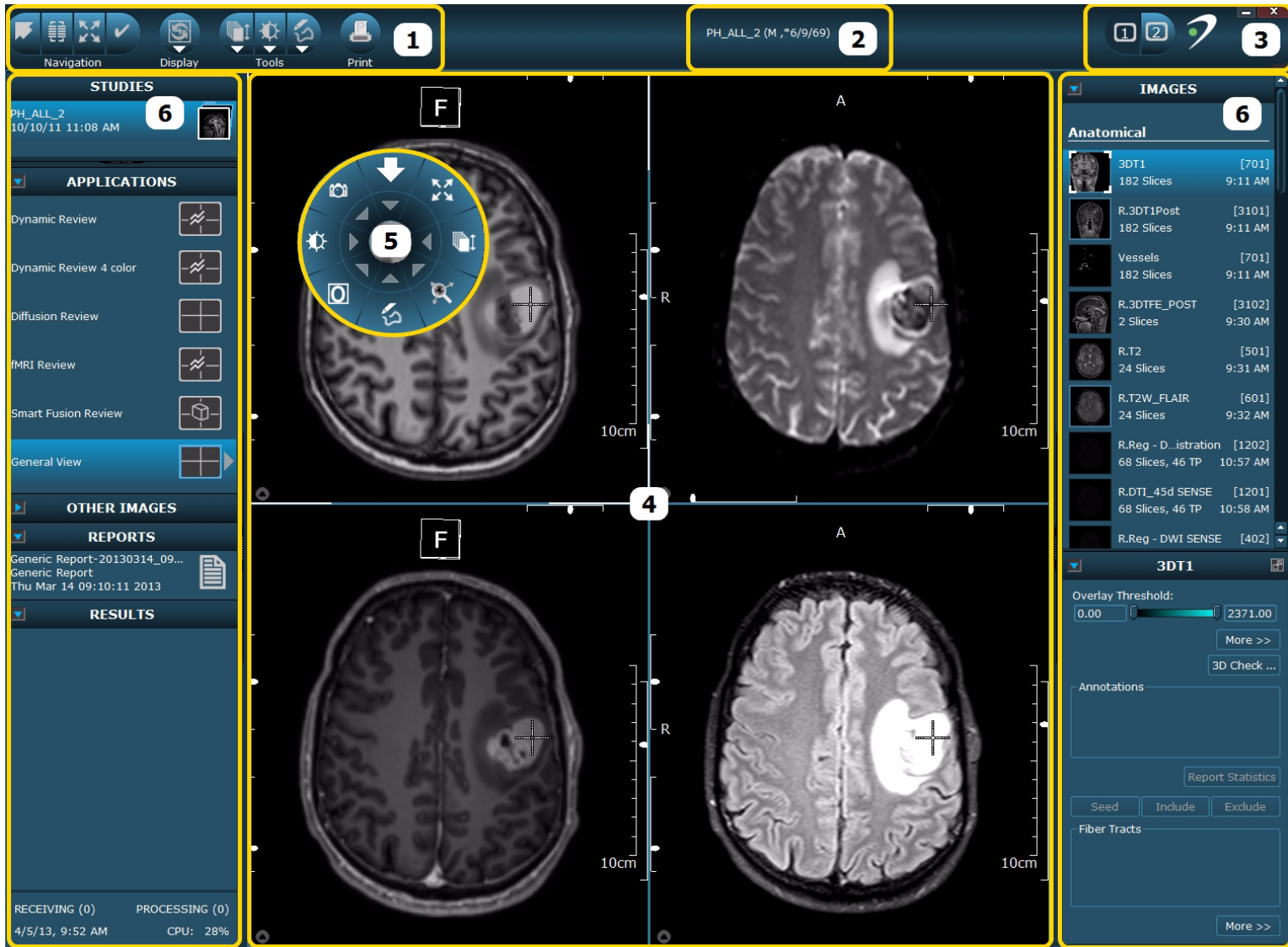
This guide shows the GUI in Standard mode, which is preferred by most users. When in the Expanded mode, the full compliment of buttons is visible. From the Work area Context menu, select **Switch to Expanded Mode** or ***Shift+Ctrl+X*** to display additional toolbar buttons.

When you logon for the first time, the Standard mode is active. When you switch to the Expanded mode, this setting is saved when you log off.

Table 3-2 User Interface Features

Reference 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	**Setup toolbar**	Contains tools for organizing the Work area and for configuring DynaSuite.
4	**Work area viewports** (Inspectors)	Displays the image data in viewports (different types of viewports provide various tools for interacting with images).
5	**Pie menu**	Provides access to tools and context menus of the selected viewports.
6	**Side panel**	Provides an overview of the studies and allows you to select and work with applications, studies, images series, results, and reports. The side panel also hosts the control panel, which provides display options and features for the selected image.

Smart Fusion Review UI

The Smart Fusion Review application provides a preset layout format that consists of three 2D viewports showing the same image with different initial orientations (axial, sagittal, coronal) and a 3D volume rendered viewport.

Figure 3-3 Smart Fusion Review Work Area
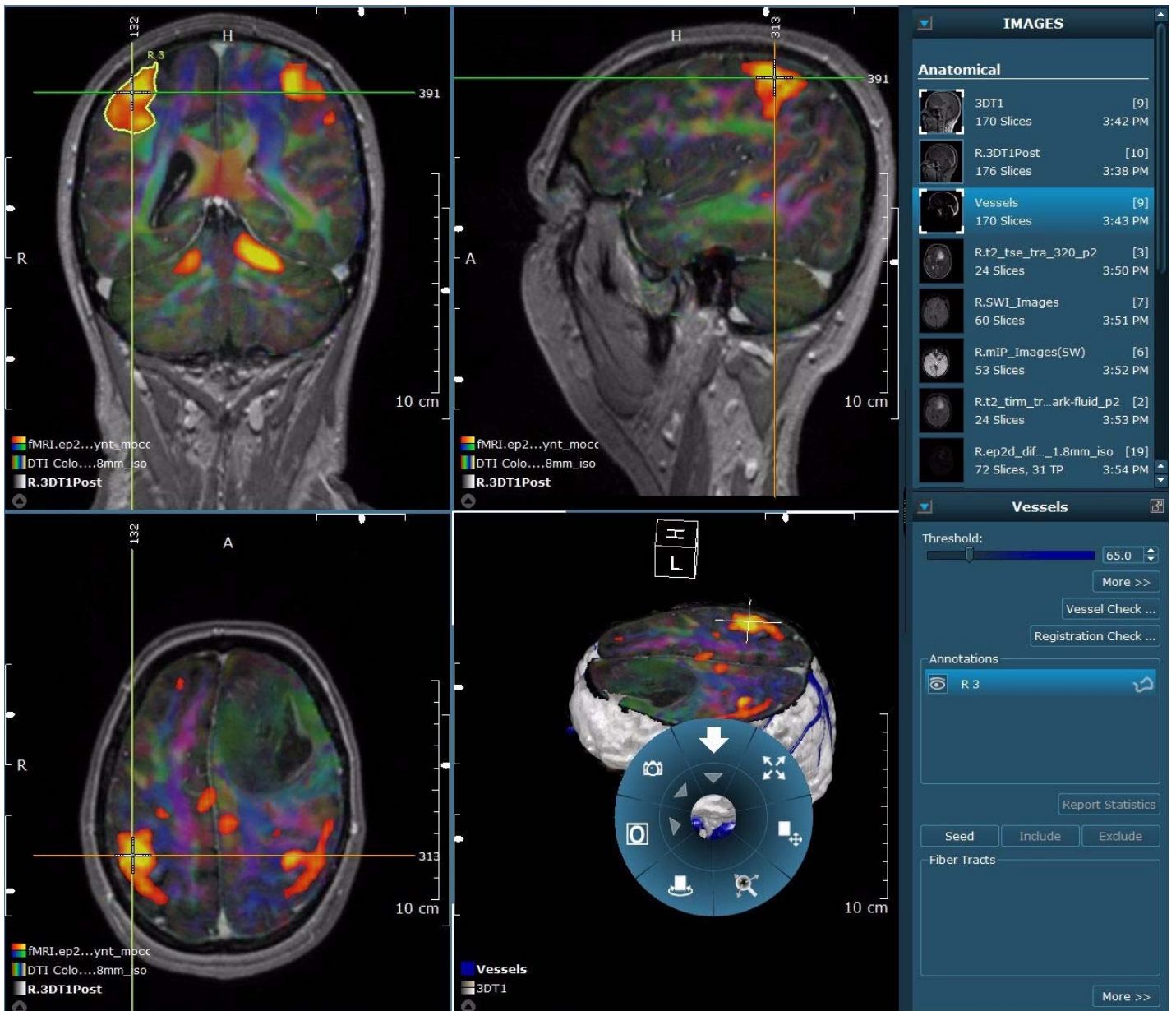
Diffusion Review UI

Figure 3-4 shows a diffusion study opened in the Diffusion Review application. The Work area includes 2D image viewports displaying the diffusion images and a diffusion specific Control panel.

Figure 3-4 Diffusion Review UI

Control Panel

Control panel options that are specific to diffusion data are described in Table 3-5.

Table 3-5 Control Panel - Diffusion Data Options

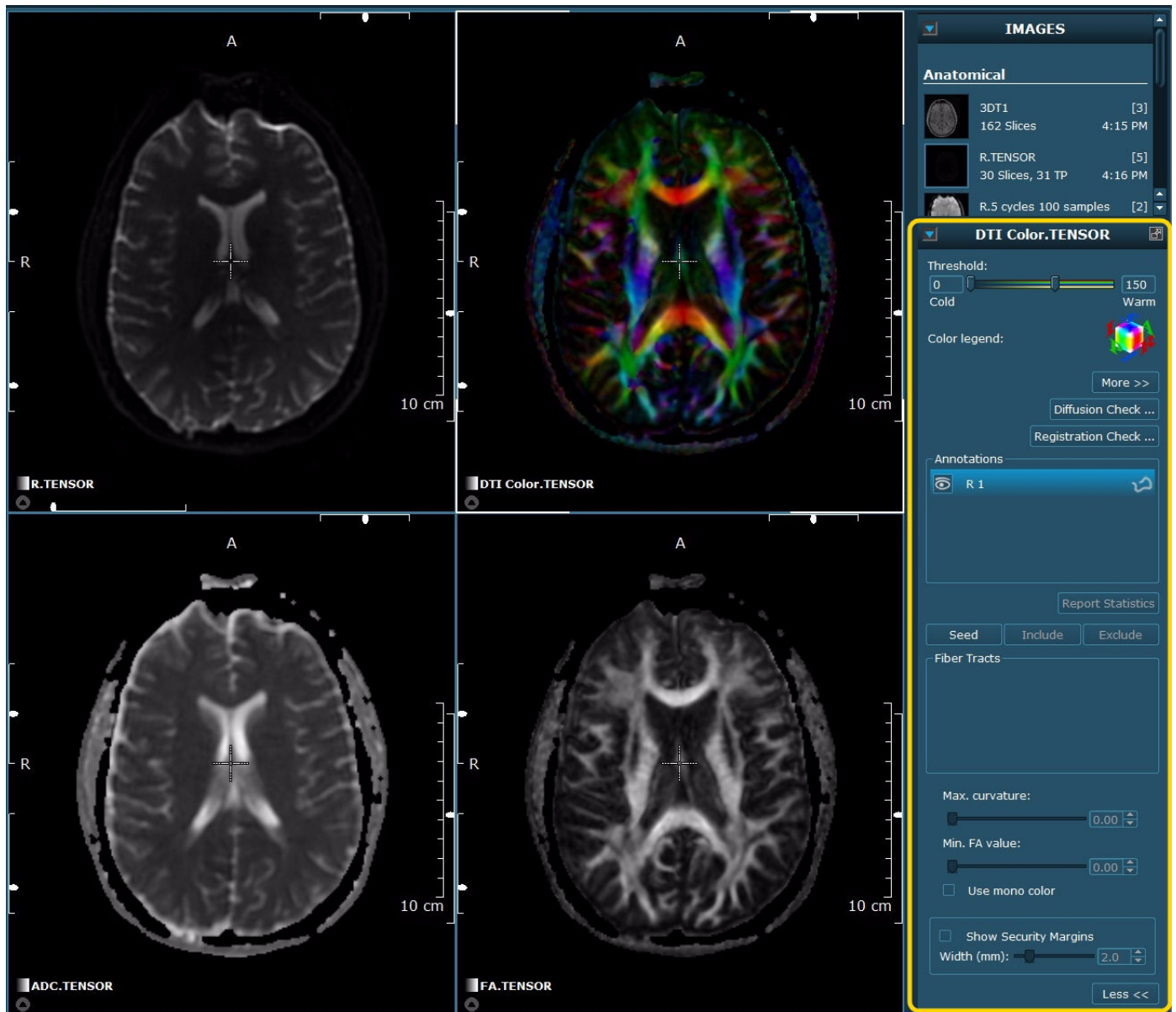| Name	Description
Threshold	Allows you to set the upper and lower thresholds. For ADC and FA maps, values below the lower threshold are not displayed. Values above the upper threshold are displayed in the color for the highest value (the highest value depends on the chosen color table).
Colors	Allows you the change the colors assigned to the map.
Seed	Initiates the fiber tracking algorithm for a defined region of interest.
Include	Includes fibers intersecting both the seed and included ROI for a selected fiber tract.
Exclude	Excludes fibers within an isolated defined region from a selected fiber tract.
Fiber Tracts	Lists the ROIs that have been seeded and tracked. Right-click to display a Fiber Tract Context menu to show/hide, rename, delete, and sort fiber tracts.
Max. Curvature	Allows you to limit the fibers to a certain direction.
Min. FA Value	Allows you to limit the length of the fibers.
Use mono color	Changes the color of the fiber tract from directional color coding to one color.
Show Security Margins	Displays the boundaries around fibers to aid in visualization.
Diffusion Check	Allows you to remove the noise outside the brain.

fMRI Review UI

Figure 3-6 shows a study opened in the fMRI Review application. The Work area includes the orthogonal image viewports, a curve viewport with an activation timeline, and an fMRI specific Control panel.

Figure 3-6 fMRI Review UI
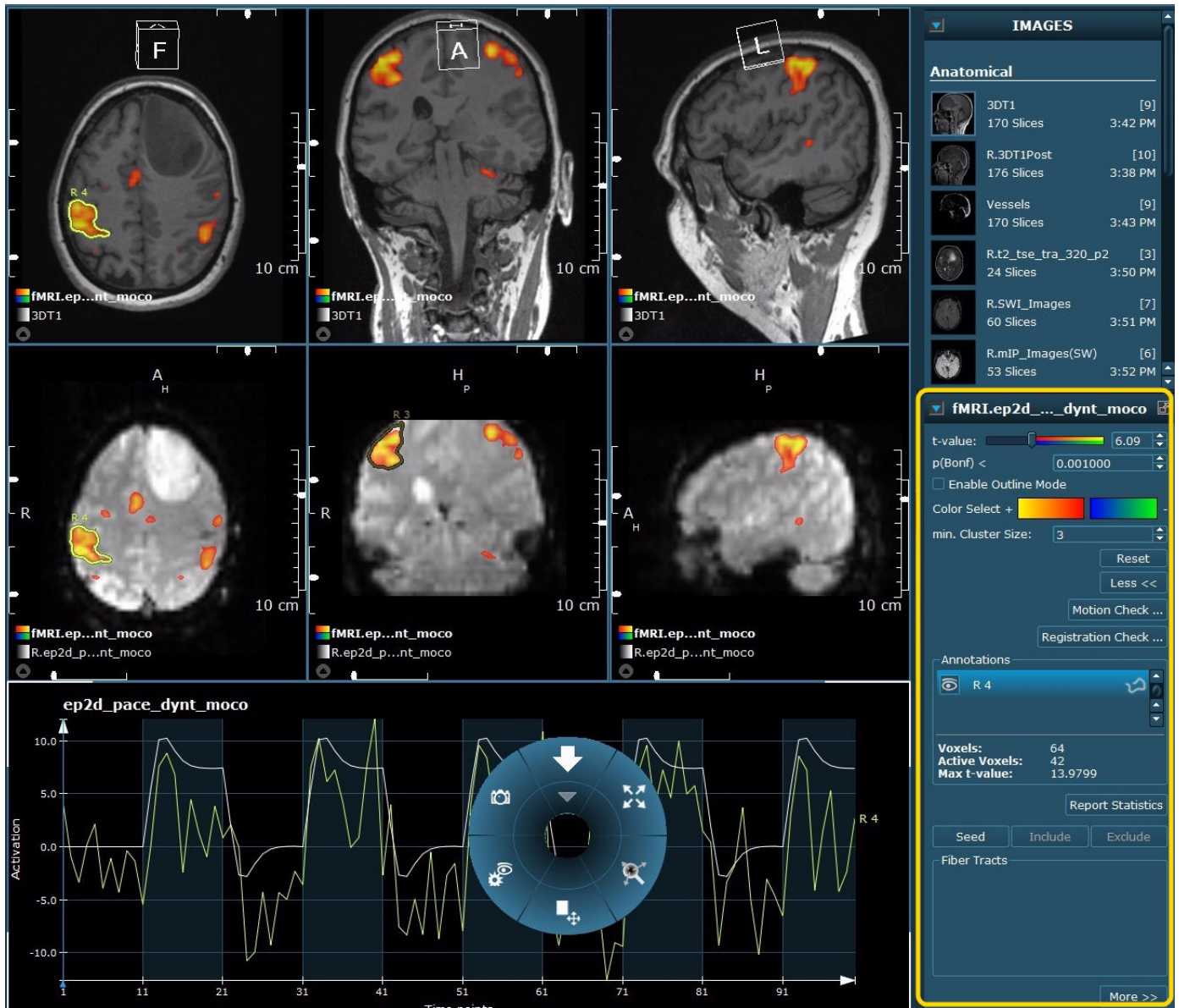
Control Panel

Table 3-7 describes the Control panel options specific to fMRI images.

Table 3-7 Control Panel - fMRI Data Options

Name	Description
t-value	Allows you to change the threshold of the t-value statistical significance.
p(Bonf) <	Allows you to change the threshold value of p(Bonf) or q(FDR) statistical significance.
Enable Outline Mode	Displays only an outline of the fMRI activation.
Color Selection	Allows you to change the colors assigned to positive and negative activation.
min. Cluster Size	Determines the number of voxels that are required to be next to each other in order to show the activation area.
Motion Check	Opens the Motion Check window, which displays the motion correction curve.
Annotations	Displays any ROIs applied to the images along with their statistical information of the number of voxels, number of active voxels, and the maximum t-value.

Dynamic Review UI

Figure 3-8 shows a dynamic study opened in the Dynamic Review application. The Work area includes 2D image viewports displaying the dynamic images, a curve viewport, and a dynamic specific Control panel.
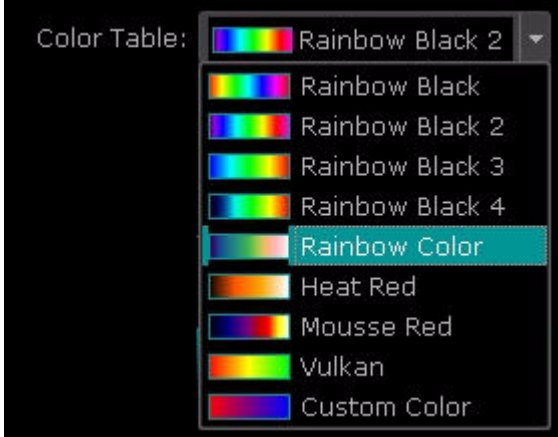
Figure 3-8 Dynamic Review UI

Control Panel

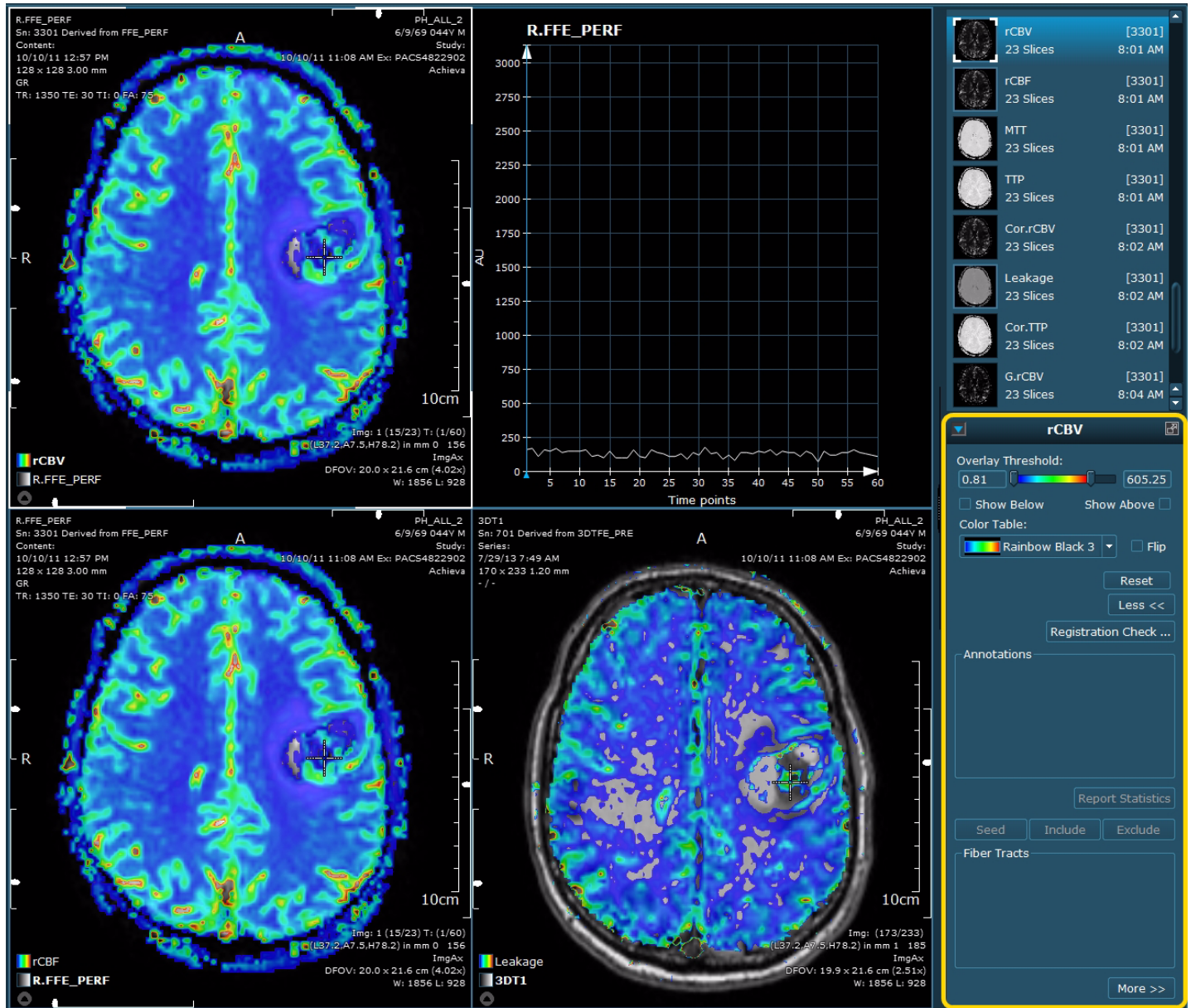Table 3-9 describes the Control panel options specific to dynamic images.

Table 3-9 Control Panel - Dynamic Data Options

Name	Description
Threshold	Allows you to change the minimum and maximum threshold values of the dynamic maps.
Show Below	Allows you to show/hide values below the lower threshold.
Show Above	Allows you to show/hide values above the upper threshold.
Color Table	Allows you the change the colors assigned to the map.
Flip	Flips the color scale. For example, if blue was assigned for low values, it will now be used for high values.

Toolbars and Menus

DynaSuite 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 3-10 Global Toolbar in Standard Mode

Figure 3-11 Global Toolbar in Expanded Mode

Table 3-12 provides and 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 3-12 Global Toolbar and 2D Viewport Pie Menu Options

Icon	Name	Global Toolbar	Pie Menu	Description
	Side Panel Navigation			
	Level Up (side panel)	X		Goes one level up in the hierarchy of the study overview list.
	Patient Browser	X		Opens the Patient Browser.
	Transfer Study (E)	X		Transfers the current study to the selected worklist.
(N)	Menu items marked with (E) are only available in the Expanded mode.			

Icon	Name	Global Toolbar	Pie Menu	Description
	Full Screen	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.
	Non-Full Screen	X	X	Shows the Side panel to display the viewports in non-Full Screen mode.
	Defer/Complete study	X		Completes or defers the current study.
Display - Reset View Menu				
	Reset View	X		Resets the view of the currently selected hanging.
	Reapply Hanging Protocols	X		Reapplies the hanging protocols back to the default setting.
Display - Synchronization Menu				
	Synchronization On/Off (E)	X		Switches Synchronization on and off.
	Crosshair On/Off (E)	X		Shows or hides the Currently Selected Point (CSP).
	Image Text On/Off (E)	X		Switches the Image Information Overlay on and off.
	Show Synchronization Options (E)	X		Shows the list of Synchronization options.
Tools - Fast Stacking Menu				
	Fast Stack	X	X	Selects the Fast Stacking mode that allows you to quickly stack through the slices.
	Stack	X	X	Selects the Stack (ESM) mode (ESM - Every Slice Mode) that allows you to stack through each individual slice of an image.
N	Menu items marked with (E) are only available in the Expanded mode.			

Icon	Name	Global Toolbar	Pie Menu	Description
	Automatic Stacking	X	X	Selects the Automatic Stacking z only mode for stacking through slices.
	Cine	X	X	Selects the Cine mode (Automatic stacking t, with change speed) for stacking through the time points.
	Register Currently Selected Point		X	Registers the Currently Selected Point (CSP) for synchronizing different frames of reference. This option exists only if it is applicable to the viewport.
Tools - Window/Level Menu				
	Zoom	X	X	Selects the Interactive Zoom tool, which allows you to zoom in or out of images.
	Pan	X	X	Selects the Pan tool, which allows you to move images within a viewport.
	Rotate	X	X	Selects the Rotate tool, which allows you to rotate the images.
	Crosshair	X	X	Shows the Currently Selected Point (CSP) as a small crosshair.
Tools - Annotation Menu				
	Freehand ROI	X	X	Selects the Freehand ROI tool.
	Measure	X	X	Selects the Measure tool, which allows you to place lines and to measure distances.
	Oval ROI	X	X	Selects the Oval ROI tool.
	VOI	X	X	Selects the VOI tool.
	Arrow	X	X	Selects the Arrow tool.
N	Menu items marked with (E) are only available in the Expanded mode.			

Icon	Name	Global Toolbar	Pie Menu	Description
	Text	X	X	Selects the Text tool.
	Point (E)	X	X	Selects the Point tool.
	Double Line (E)	X	X	Selects the Double Line tool.
	Finding Marker	X	X	Selects the Finding Marker tool.
	Advanced			
	Print	X		Opens the Print Tool application.
	Image Orientation Menu			
	Original		X	Selects the Original orientation of the image.
	Axial		X	Selects an Axial (caudo-cranial) orientation.
	Coronal		X	Selects the Coronal (ventro-dorsal) orientation.
	Sagittal		X	Selects the Sagittal (right to left) orientation.
	Rotate Clockwise		X	Selects the Rotate Clockwise tool.
	Flip Image		X	Select the Flip Image tool.
(N)	Menu items marked with (E) are only available in the Expanded mode.			

Icon	Name	Global Toolbar	Pie Menu	Description
Window/Level Menu				
☀	**Window/Level**	X	X	Activates the Window/Level tool.
☀	**Sigmoid** (E)		X	Activates the non-linear Window/Level mode.
☀	**Defined W/L Presets**		X	Activates a defined Window/Level preset set by your site or system default. Presets are only available for the image types for which they were defined.
Snapshot Menu				
⬜	**Create Snapshot**		X	Activates the Snapshot 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.
	Copy Image to Clipboard		X	Copies the image in the currently selected viewport to the clipboard.
	Export Image		X	Exports the image in the active viewport as a .png, .jpg, .tif, or .dcm file. You can select the export directory.
	Export Image as AVI		X	Exports a result series as an .avi file. You can select the export directory.
	Export to Surgical Navigation System		X	Exports a result series to a Surgical Navigation System. You can select result and export options specific to the surgical navigation system.

Ⓝ   Menu items marked with (E) are only available in the Expanded mode.

Ⓝ

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 Work areas, etc.) and for configuring DynaSuite (language settings, time/clock format, etc.).

Figure 3-13 Setup Toolbar

Figure 3-14 Setup Toolbar

Icon	Name	Description
	Inspectors (E)	Opens a list of the available viewports from which you can select the viewport you want to use.
	Setup Tool (E)	Opens a Setup tool where you can select your preferences.
	Work area	Selects a Work area. The number of buttons depends on the number of Work areas. These icons only display when the hanging protocol is configured for dual monitors.
	Minimize	Minimizes the application.
	Close	Closes DynaSuite. This logs you off the system and the Logon dialog displays.
	Menu items marked with (E) are only available in the Expanded mode.	

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 Applications, Reports, and Results sections 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 menu.

Work Area

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.

- 2D Viewport: standard viewport that allows layering of image sets. See Image List.

- Alternator: standard viewport for displaying images or image groups.

- Mosaic: provides a well-arranged overview of the image series. It contains a subset of the tools and Context menu commands offered by the Alternator viewport.

- 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 3-15 displays an example Work area with various viewport types.

Figure 3-15 Work Area: Alternator Viewport (1), Mosaic Viewport (2), 2D Viewport (3), and MIP Viewport (4)
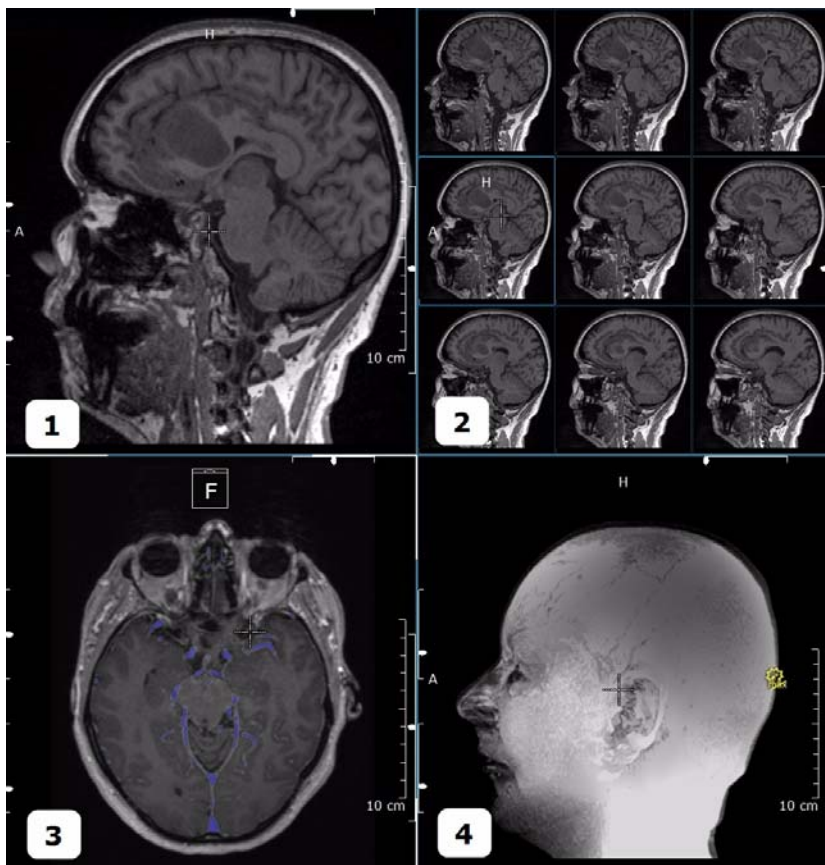
Curve Viewport

If the Curve viewport is connected to a 2D viewport that contains at least a base reference image and an fMRI activation map or a Dynamic map as an overlay, the Curve viewport displays a resulting curve for the currently selected ROI. The displayed curves are based on the ROIs drawn in the connected 2D viewport. In the fMRI activation curve example below (Figure 3-16), the white curve is the expected response and the yellow curve is the response for the ROI. If no or several ROIs are selected, activation curves are not displayed. For a selected ROI, a screen capture including the curves, statistics, and an image with the ROI can be taken.

Figure 3-16 fMRI Activation Curve
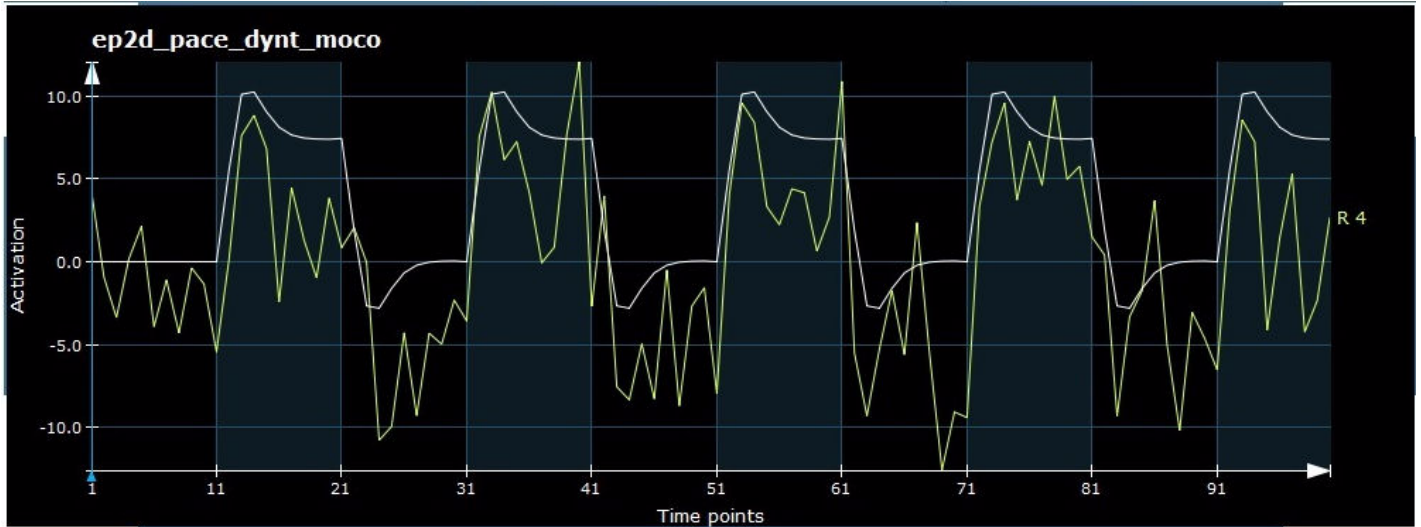
The Pie menu options are specific to the Curve viewport. The Context menu allows selection of the tools in Figure 3-17.

Table 3-17 Pie Menu Items of Curve Viewport

Menu Item / Submenu	Description
Select Source	Allows you to select the 2D source viewport for the Curve viewport.
Full Screen	Expands the window to the size of the Work area.
Tools • **Pan** • **Zoom**	Allows you to select the pan(scroll) or zoom (magnify) tools.
Tools > X Axis Unit • **Steps** • **Seconds** • **Minutes**	Allows you to define the unit of display of the X Axis in steps, seconds, or minutes.
Tools > Y Axis Scale	Allows you to automatically scale the unit of display of the Y Axis.
Create Snapshot	fMRI Curve: captures the screen of the selected ROI, including the fMRI activation curve and ROI statistics. Dynamic Curve: captures the screen of all visible ROIs, including the curves, statistics, and images with the currently displayed ROIs.

Sliders

When a viewport displays an image sequence, sliders (Figure 3-18) display for applicable image series.

Figure 3-18 Viewport Sliders

Table 3-19 Viewport Sliders

Reference Number	Name	Description
1	**View Axis Slider**	Rotates the viewing direction. Click and drag the slider or press **Alt** 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 **Left** and **Right** 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 **Up** and **Down** arrow keys.

Attention Icons

When you work with different viewports in DynaSuite, you may come across attention icons that notify you of specific viewport information. Table 3-20 provides an overview of the attention icons that are used in the DynaSuite software.

Table 3-20 Attention Icons

Icon	Name	Description
	Hidden Annotations	Annotations in the viewport are hidden. See Hide or Delete Annotation.
	Manual Synchronization	Different frames of reference have been synchronized. See Synchronize Images.
	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 Synchronize Images.
	No Common Frame of Reference	Synchronized viewports do not use the same frame of reference. See Turn Off/Remove Synchronization.
	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 Mirror (2D) and Flip (3D).

Data Orientation

The data orientation cube displays in the viewport

Figure 3-21 Data Orientation Cube

3-21

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 2D Viewport Pie Menu Options for a list of the available Pie menu tools.

Figure 3-22 Pie Menu

The ⬇ Context menu of the Pie menu contains additional menu items (Table 3-23).

Table 3-23 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.
Tools	
• Pan	Selects the Pan tool.
• Rotate	Selects the Rotate tool.
• Zoom	Selects the Zoom tool.

• Stacking
  – Stack (ESM)
  – Fast Stack
  – Automatic Stacking
  – Cine
  – Combined Stacking
	Allows you to select various stacking modes.

Ⓝ Menu items marked with (E) are only available in the Expanded mode.

Menu Item/ Submenu	Description

• Annotations
  – Measure
  – Freehand ROI
  – Oval ROI
  – VOI
  – Arrow
  – Text
  – Double Line
  – Point
  – Finding Marker
	Allows you to choose from a selection of annotation tools to measure and annotate on your images.

• Window/Level
  – Window/Level
  – Sigmoid
	Allows you to change the window/level of the image display.

• Currently Selected Point
  – Crosshair
  – Hide Crosshair
	Allows you to set a CSP and select an option for showing/hiding the CSP.

Image View	
• Rotate Clockwise	Rotates the image display 90° clockwise.
• Flip Image	Mirrors the image around a vertical axis (2D image) or flips the entire data set (3D images).

• Image Size
  – Full Screen
  – Original Size
  – Fit to Inspector
	Resizes the image area to the selected option.

• Orientation	Allows you to select the default image orientation (axial, coronal, sagittal, oblique, or original).
Displayed Information	
• Show/Hide Cutlines	Allows you to show/hide cutlines in a 2D viewport. This option displays if applicable to the data contained in the viewport.
• Show/Hide Layer List	Allows you to show/hide the Layer List in a 2D viewport. This option displays if applicable to the data contained in the viewport.

• Parameter Overlay
  – Hide
  – Show
	Allows you to show/hide color overlays in the source viewports. This option displays if applicable to the data contained in the viewport.

(N) Menu items marked with (E) are only available in the Expanded mode.

Menu Item/ Submenu	Description

• Image Information Overlay
  – All
  – Reduced
  – None
	Allows you to specify the image information settings.

Subtraction Settings (E)	

• Modes
  – None
  – Absolute Difference
  – Difference
  – Truncated Difference
	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.

• Time Point	Allows you to set the time point for image display.
• Reference Time Point	Allows you set the reference time point for the subtraction mode.
MIP Mode Settings (E)	

• Modes
  – None
  – MIP
  – MinIP
  – Average
  – Local MIP
  – Local MIP Threshold
	Allows you to select the Rendering mode for slabs and volumes.

• Slab Thickness
  – Default
  – 2
  – 4
  – 8
  – 16
  – 32
  – 64
  – 128
	Allows you to set the number of slices to be included in a slab.

• Show Only VOI	Displays only the selected volume.

Menu items marked with (E) are only available in the Expanded mode.

Menu Item/ Submenu	Description
Window Level Settings (E)	
• Presets – Original – Next Original – List of Presets	Allows you to select predefined window/level presets.
• Invert	Inverts the current window/level setting.
• Optimize LUT	Adapts the window/level setting (LUT) to the value range of the image.
Inspector Setup (E)	
• Combine Time/Slice Navigation	Allows stacking (scrolling through slices) to be combined with different time points.
• Show Synchronization Options	Displays attributes available for synchronization in all viewports.

• Initial Settings
 – Keep Current Time Point
 – Slice Selection
  ▫ First
  ▫ Center
  ▫ Last
 – Orientation
  ▫ Original
  ▫ Axial (Img)
  ▫ Coronal (Img)
  ▫ Sagittal (Img)
  ▫ Axial (Pat)
  ▫ Coronal (Pat)
  ▫ Sagittal (Pat)
  ▫ Flip Image
 – Initial Windowing Selection
  ▫ Optimize LUT
  ▫ List of Presets
	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.

(N)   Menu items marked with (E) are only available in the Expanded mode.

Menu Item/ Submenu	Description

• Mosaic Mode
  – Number of Columns (1-5)
  – Number of Rows (1-5)
  – Settings
    ▫ Show Slices
    ▫ Show Time Points
    ▫ Ascending/Descending
	Allows you to define the number of columns and rows for the Mosaic viewport and to specify the settings for sorting images.

• Scanlines
  – Hide
  – Show
  – Show in Localizer Only
	Allows you to set the scanlines display setting.

• Inspector Group
  – Create
  – Save
  – Break
  – Icon
    ▫ Icon
  – Layout Strategy
    ▫ Equal Layout
    ▫ Tiled Layout
    ▫ Update Aspect Ratios
	Allows you to define a new viewport and assign the icon and layout to be used. Saved viewports can be selected from the **Inspectors** menu in the Setup Toolbar.

• Move Inspector to Work area	Moves the specified viewport into the selected Work area.
Results	
• Create Snapshot	Creates a snapshot of the currently selected viewport.
• Create Result Series	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.
• Copy Image to Clipboard	Copies the result snapshot to a clipboard.
• Export Image	Exports a result snapshot to a designated file location.
• Export Image as AVI	Exports a results series as an .avi file to a designated location.
• Export to Surgical Navigation System	Exports a result series to a Surgical Navigation System. You can select result and export options specific to the surgical navigation system.

    Menu items marked with (E) are only available in the Expanded mode.

Image List

The Image list (Figure 3-24) displays in the bottom-left of 2D viewports. The list contains each image set (overlay) with a color indicator. Below the list is an arrow to open the Image panel.

Figure 3-24 Image List
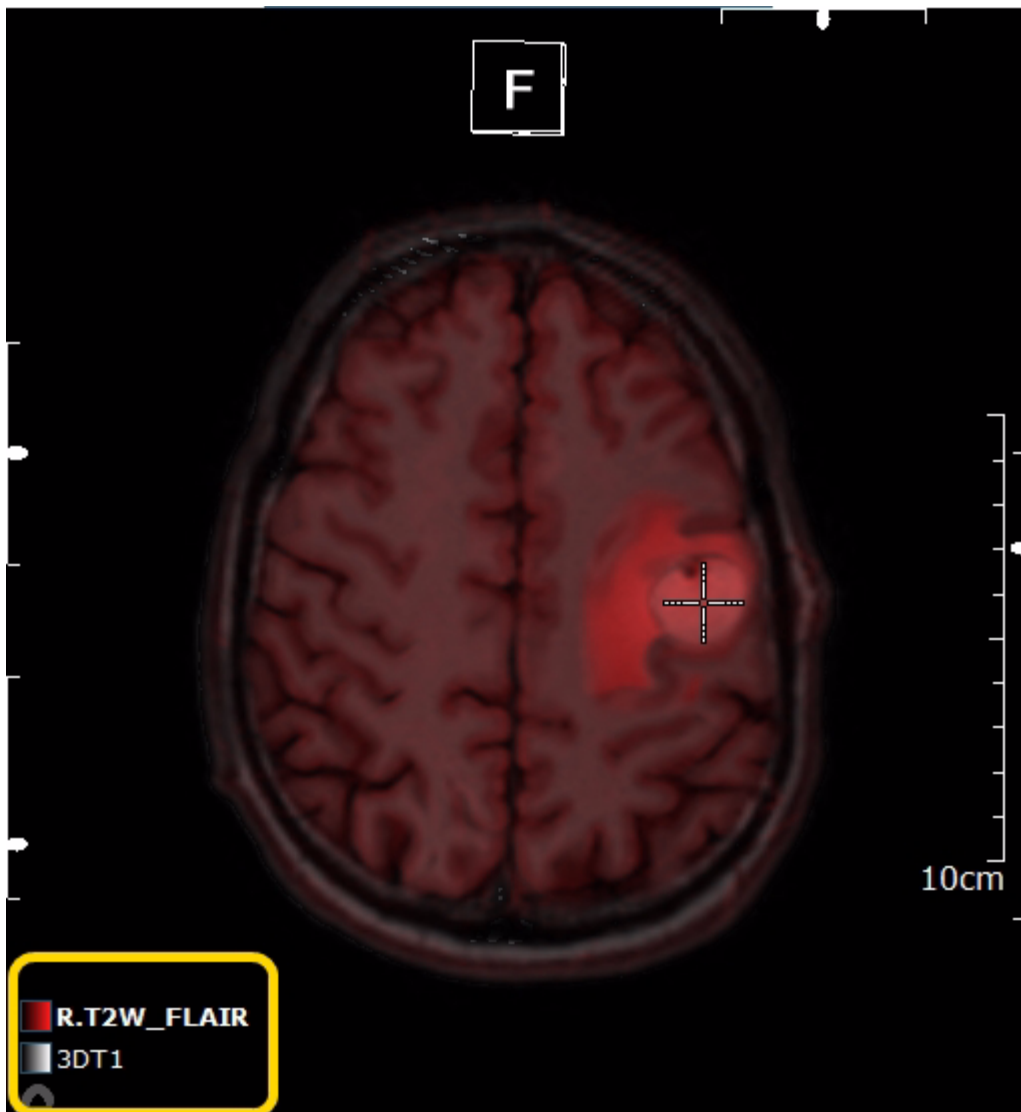
Image Panel

The Image panel (Figure 3-25) lists all of the image sets (overlay or base image) that are currently displayed in the 2D viewport. The active object is shown in bold text. This panel also includes functions that can be applied to each image set.

- Eye icon - toggle button that hides or shows the image set.

- Color indicator - provides a visual representation of the color assigned to the image set.

- Opacity slider - allows you to change the image opacity of each object via the slider or number input field. The value is related to the currently active object.

Figure 3-25 Image Panel

When an image set is dropped onto the Image panel, it creates a new layer or replaces the active one. Using the layering concept allows you to view and compare different types of image sets in one viewport.

Consider the following when working with overlays:

- The Image Information overlay belongs to the base image or lowermost object.

- Annotations do not appear as objects in the Image List.

- It is not possible to drag the image from another patient into the 2D inspector.

- Inhomogeneous data is only supported as a base image and cannot be displayed as an overlay since reformatting is not possible.

Side Panel

The Side panel contains different sections to organize studies, applications, images, reports, and results.

The Side panel is divided into three parts that provide different levels of information.

- **Level 1:** shows the available worklists

- **Level 2:** shows the list of studies that are contained in one or more of the selected worklists

- **Level 3:** has multiple sections that show an overview of the opened studies, available hangings, and lists the associated images (also Results and Reports, when applicable).

Figure 3-26 Side Panel: Level 1 (1), Level 2 (2), and Level 3 (3)

The worklists you actually see in your Side panel may be slightly different from the above figure. Administrative users can configure worklists and define the rules for specific worklists.

3-29

Level 1: Worklists

DynaSuite supports multiple worklists. Studies are automatically assigned to the worklists based on your specified configuration. The number of uncompleted studies assigned to each work list is displayed in parentheses. Each worklist is assigned an icon, described in Table 3-27.

Table 3-27 Worklist icons

Icon	Name	Description
	Opened	Worklist that includes the studies that are currently open.
	Personal	Personal worklists that are assigned to a specific user.
	Worklist	Worklists assigned to a specific modality or area of expertise.
	Presentation	Presentation lists (lists of studies that are to be shown in clinical presentations).
	Unassigned	Worklist that includes studies that have not been assigned to a specific worklist.
	Processing	System worklist including the studies that are being processed.
	Receiving	System worklist including the studies that are being received.

Context menu of the Worklist contains additional menu items (Table 3-28).
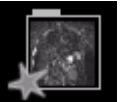
Table 3-28 Worklist Context Menu

Menu Item/Submenu	Description
Show System Lists • Receiving • Processing	Controls the display of the system-generated lists. The unprocessed DICOM series included in the Receiving list may be opened, (only the portion of the DICOM series that has been received), while the data are being transferred.
Open List	This option is only available when one list is selected.
Open n Lists	This option is available when multiple worklists are selected. The selected worklists are opened.

Level 2: Studies

Level 2 displays the studies contained in the opened worklists. The studies provide specific text information and are marked by symbols (Table 3-29), which show the status of the study for the currently logged-on user.

Table 3-29 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.

Figure 3-30 Study Information

When you move the mouse pointer to the study icon, a tooltip with more detailed study information displays (Figure 3-31).

Figure 3-31 Study Detailed Information

The Context menu for each study contains additional menu items (Table 3-32).

Table 3-32 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 Study	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 (E)	Reprocesses a study according to the selected configuration.
Remove	Removes the study from the worklist but not from the workspace. The study is still available in the workspace and Patient Browser, but is no longer shown in the worklist.
(N) Menu items marked with (E) are only available in the Expanded mode.	

3-32

Menu Item/ Submenu	Description
Administration	
• Reapply Hangings	Reapplies the hanging protocols.
• Reapply Rules − List Assignment Rules	Applies the list assignment rules again. Reapplying list assignment rules may assign the study to a different worklist if the rules have been changed since they were last applied.
− Report Creation Rules	Applies the report creation rules again. Reapplying report creation rules may add a report form to the study
− 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.
− Apply Advanced Processing Rules	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.
Show Text Information (E)	
• Study Date • Patient Age • Patient ID • Other Patient ID	Allows you to select the type of information for each study in the worklist.
• Study Description	Allows you to show/hide the study description in the last line.
• Anonymous	Allows you to anonymize the studies, i.e., to hide all personal data.
Sorting	
• By Patient Name • By Patient ID • By Study Date • By Arrival Time	Allows you to select the sorting criteria.
• Ascending (A to Z, old to new)	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".
• Place Deferred Studies at End	Allows you to define if deferred studies are to be placed at the end of the study list.
• Place Completed Studies at End	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.

Menu items marked with (E) are only available in the Expanded mode.

3-33

Level 3: Studies, Applications, and Images

Level 3 displays an icon overview of the currently opened study (or studies). When multiple studies are open, 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. This also applies to studies that are included in other worklists or in no worklist at all.

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

- Any reports created for the study

- The Control panel with image specific settings and features

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 is 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.

The Control panel section is specific to the currently selected image. It provides display settings and features that are automatically updated as new images are selected. Overlay thresholds, as well as color selection, are provided for you to customize your viewing experience when using the 2D viewport.

Figure 3-33 Control Panel: Overlay Setup
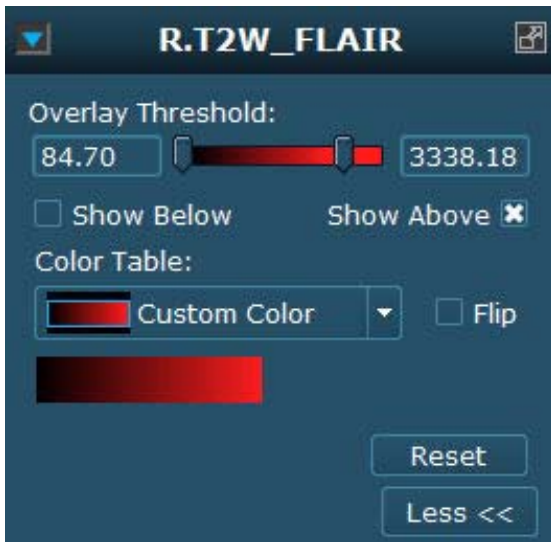
The Control panel also hosts the annotation section, which lists all annotations created for the currently selected image set. The highlighted annotation in the list is the currently active annotation in the image. Features and display options provided by the annotation section include:

- Eye icon - toggle button that hides or shows the annotation.

- Measurements or statistics for each annotation with the ability to report statistics creating result images for reporting.

- Double-click or drag and drop the annotation from the list into the work area to jump to display the annotation.

- Context menu - provides sorting options and the ability to rename, delete, and show/hide the annotations.

Figure 3-34 Control Panel: Annotation Section

Additional features may be available in the Control panel with the appropriate license.

Patient Browser

The Patient Browser lists all available studies in the workspace and allows you to search for patients locally or on connected SCPs such as a RIS or a PACS. It also allows you to import patient data from a file system or a CD-ROM.

Querying

DynaSuite allows you to run detailed queries. You can also save a query as a Predefined Query for later use.

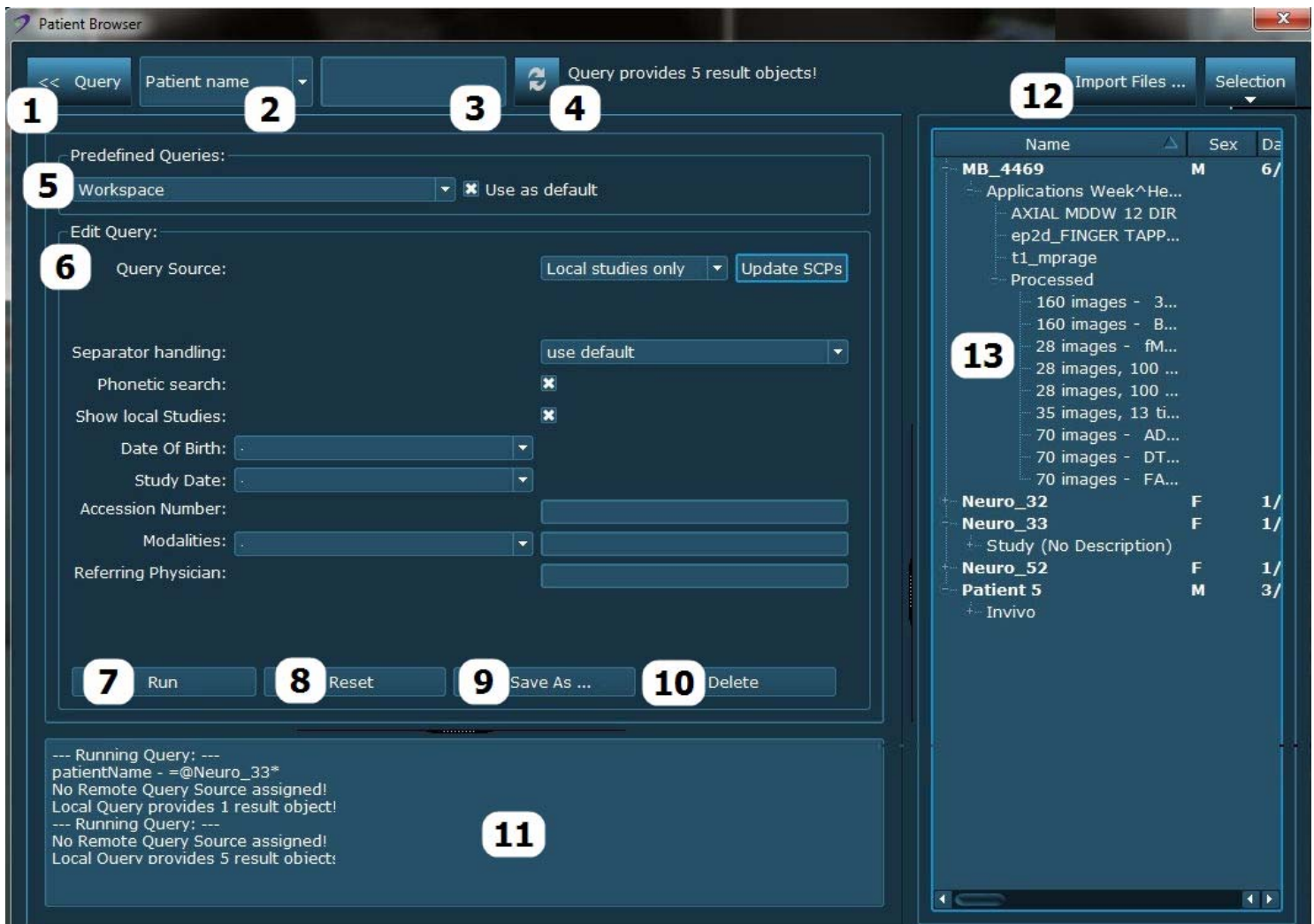**Figure 3-35** Patient Browser with Query Dialog

Table 3-36 Patient Browser Query

Reference Number	Name	Description
1	**Query**	Opens the Query dialog, where you set the query parameters. The parameters can be stored as predefined queries or used directly. Click again to close the panel.
2	**Input type**	Allows you to define the input type, e.g., Patient Name or ID.
3	**Input field**	Type the name or ID. Use "*" as a wildcard. "*" is added automatically to the end of any character string.
4		Runs the selected query.
5	**Predefined Query**	Allows you to select predefined queries and define as template, if needed.
6	**Edit Query**	Allows you to set the search criteria for the query parameters. The parameters can be stored as predefined queries or used directly.
7	**Run**	Runs the query directly with the set parameters.
8	**Reset**	Deletes the contents of the input fields.
9	**Save As**	Saves the settings as predefined query.
10	**Delete**	Deletes the currently selected predefined query.
11	**Log display**	Displays the query log.
12	**Import Files**	Imports images from file system or CD.
13	**Results list**	Displays the query results.

Results and Reports

Results

The Results section is generated when results are created by placing finding markers, taking snapshots, creating result series, etc. The Results section organizes the results of a study by placing them in folders.

The Context menu for each Result folder contains additional menu items (Table 3-37).

Table 3-37 Results Folder Context Menu

Menu Item/ Submenu	Description
Assign Type	Allows you to assign a finding type to the result.
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.
Export	Exports the selected results.

Reports

DynaSuite provides standard forms for creating reports, such as the Generic report templates. Additional templates designed for specific reporting needs of a study are available with the appropriate license. If configured to do so, selecting Complete upon closing a study will automatically send the reports to the specified destination.

The Context menu for each Report contains additional menu items (Table 3-38).

Table 3-38 Reports Context Menu

Menu Item/ Submenu	Description
Open in Editor	Opens the selected report in the corresponding Report Editor, where you can edit the report. You can also double-click the report to open it. See Edit an Existing Report.
Show Print Preview	Opens the selected report in Print Preview.
Rename	Opens a dialog box, where you can enter a new name for the report.
Delete	Deletes the selected report.
Export	Exports the selected report.

Chapter 4

DynaSuite Neuro Workflow

Introduction

This chapter describes the standard workflow for interpreting studies and the most commonly used features.

The following procedures will lead you through the diagnostic workflow.

1. Open a Study.

   - Open Additional Studies

   - Open a Study via the Patient Browser

   - Import Studies From External Media

   - Reopen Completed Studies

2. Select Hangings and Images.

   - Select Hangings

   - Open a Different Layout

   - Add/Remove/Change Viewports

   - Review/Replace Images

   - Manipulate Images as Base Image and Overlays

3. Manipulate Images.

   - Select a Pie Menu Tool

   - Select a Slice

   - Select a Time Point

4. Evaluate a Study in Smart Fusion Review.

- Review the Images

- Visualize the Skull and Cortex of the Brain in 3D

- Display a Clip Plane in the 3D View

- Review Vessels

- Track Fibers

  – Create and Modify Fiber Tracts

  – Compare the Image Results

5. Evaluate a Study in Diffusion Review.

- Review the Diffusion Maps

- Compare Regions of Interest

  – Create Snapshots of ROIs and Statistics

  – Compare ROIs and Report Statistics

6. Evaluate a Study in fMRI Review.

- Review the Images

- Check for Patient Motion

  – Manually Check for Motion

  – Review the Motion Curve

- Define ROIs and Review Curve

- Save and Review Results

7. Evaluate a Study in Dynamic Review.

- Review the Dynamic Maps

- Review the Curve

- Compare Regions of Interest

8. Evaluate a Study in NeuroQuant Review.

9. Create Results.

    • Take a SnapShot

    • Add Selected Annotation

    • Create a Result Series

    • View Results

    • Export a Result Image

    • Export an AVI file

    • Export to a Surgical Navigation System

10. Create Reports.

    • Create a New Report

    • Export a Report

    • Edit an Existing Report

11. Close a Study.

    • Defer or Complete a Study

    • Defer a Study and Open the Next/Previous

    • Remove a Study from the Worklist

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Open a Study

Open a Study

Use this procedure to open a study through the worklists on the Side panel.

1. Double-click the worklist title to see the list of studies within a worklist (Level 2).

    • A list of studies that are contained in the worklist display.

2. Double-click the study title to open a study (Level 3)

    • Alternatively, use one of the following methods to open a study.

        – Right-click the Context menu to open a study.

        – Click the study to view the list of hangings, and then click a hanging title to open the study with that hanging.

    • The first time a study is opened, it opens with a predefined hanging; subsequent times the study opens with its most recently viewed hanging.

    • Click **Level Up** to return to the previous level.

    • If you hover the mouse cursor over a study icon, a tooltip with additional information about the study displays.

3. Select another hanging or view the results or reports of the currently opened study.

Open Additional Studies

Use this procedure to open an additional study when a hanging is already opened.

1. From the Study list, right-click the selected study.

2. Select **Open Additionally**.

    • When you try to open different patients, a warning message displays.

    • When studies of the same patient are opened, the software checks to see if there is an applicable hanging protocol for a comparison study.

Open a Study via the Patient Browser

When you open a study from the results list of the Patient Browser, the Patient Browser saves all of the results of the query and closes.

After you have deferred or completed the study, the Patient Browser reopens automatically with the saved query results. This allows you to select the next applicable study.

1. From the Global toolbar, click ▦ **Patient Browser**.

   • The Patient Browser (Figure 3-35) opens.

2. Select a predefined query name from the list.

   • The search criteria for the selected query are displayed.

3. If you choose not to use a predefined query, click **Query** to open the menu for extended query options and select the desired parameters.

   a) Select the query source.

   – The DICOM SCPs are defined as Query/Retrieve SCPs.

   b) Select a separator option to separate the first name and the family name.

   – **Use default:** the query searches for the default separator (independently of the separator you enter in the Input field.

   – **Use all:** the query searches for the following separators: "^", " " or ",".

   – **Use given:** the query searches only for the separator that has been entered in the Input field.

   c) Select **Phonetic Search** to activate.

   – This function is only applicable for the German language.

   d) Select **Show Local Studies** to have all of the local studies included in the search.

   e) Define the search criteria.

   – For Date of Birth and Study Date, the search can be restricted by selecting >= (greater than or equal, => (less than or equal) = (equal), and [...] (from-to), or by entering specific dates.

   – Each selection made from the Modalities list is added to the search criteria. The modalities selected can be edited in the adjacent text box.

   – For Accession Number and Referring Physician, type the search criteria into the text field.

   f) From the Results list, open the Context menu of the desired study and select **Retrieve**.

   – **Retrieve** is enabled if the study is not local.

   – If the study is on the system, you can open the study.

Studies that are labeled as "Remote" in the Patient Browser, i.e., studies that are saved in an archive, must be transferred before they are opened. You can transfer a study by double-clicking the study in the Patient Browser or by selecting the Retrieve Context menu command. The data is then pre-processed and ready for use. The Studies section in the Side panel does not show studies that are saved in an archive.

g) To open further studies, from the Results List Context menu of the Query menu, select **Open Additionally**.

- The selected studies open in addition to the opened study.

- When multiple studies are opened simultaneously, all of the studies are closed upon deferral or closing.

Import Studies From External Media

Use this procedure to import studies from a file system or CD-ROM.

1. Click **Import Files...**.

2. Select the file source.

3. Browse to the folder containing the data.

4. Click **Import**.

Reopen Completed Studies

Use this procedure to reopen a study to work on it again.

1. From the Studies section, right-click the selected study.

2. Select **Reopen Study**.

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.

Figure 4-1 Applications Hangings

Select Hangings

1. From the Applications section of the Side panel, select the desired hanging name to open it.

   - The selected hanging replaces any currently open hanging.

   - Studies and hangings that are being displayed are highlighted.

   - Each hanging contains specific viewports and the tools necessary to manipulate the image data in the viewports.

   - Modifications made to hangings persist when switching between hangings and/or studies.

     – If the study has already been opened, the most recently viewed hanging opens in its last state.

     – If the study is opened for the first time, then the hanging that is defined as the default hanging protocol is opened.

2. Follow one of the recommended workflows, which support various hanging protocols.

   - Evaluate a Study in Smart Fusion Review

   - Evaluate a Study in Diffusion Review

   - Evaluate a Study in fMRI Review

   - Evaluate a Study in Dynamic Review

   - Evaluate a Study in NeuroQuant Review

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.

   - You can modify hangings in different ways.
     – Alter viewport types (Expanded mode).
     – Modify the viewport size and position.

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.

Add/Remove/Change Viewports

A viewport is selected (activated) when you click in the viewport, or when you use the sliders or tools in the viewport. The selected viewport is marked by white corners; the image icon in the study overview is highlighted in the same way. Viewports can be added, deleted, or the type can be changed in the Expanded mode only.

Add Viewport

1. From the Inspectors menu in the Setup toolbar, open the list of viewports.

2. Drag the desired viewport icon into an empty Work area or select **Create New Hanging Set** in the Applications section title of the Context menu.

   - An empty viewport displays.

Change the Viewport Type

1. From the **Inspectors menu** in the Setup toolbar, open the list of viewports.

2. Drag the desired viewport icon onto an existing viewport.

   - When a new viewport is dragged into the Work area, the viewport that it will replace is marked by a white frame.

Delete a Viewport

1. From the Pie Context menu, select **Delete Inspector**.

Review/Replace Images

To review a series, drag it from the Images section into the viewport. If the viewport already displays an image set, drag it over the Image List to open and replace the existing image set with the new one.

Manipulate Images as Base Image and Overlays

Viewports can contain multiple image sets overlaid on top of one another. Use the following procedures to manipulate the overlayed image sets.

Adding overlays to a viewport or changing the order can lead to images below being hidden. Opacity can be changed for each overlay.

Add an Overlay

From the Images section of the Side panel, click and drag an image set into the viewport.

- The active overlay displays in bold font.

- For multi-selection of overlays, the first selected overlay is the active one.

- Only one overlay can be active at a time.

Open the Image Panel

To open the Image panel, click the ▲ **Image List** icon.

Change the Image Order

From the Image panel, click the image set you want to move and drag and drop it at a new location in the list.

Hide/Show an Overlay

From the Image panel, click the ⬤ **Eye** next to the image set you want to hide/show.

Alternatively, right-click the series you want to hide/show and select **Show**.

Remove an Overlay

From the Image panel, right-click the overlay you want to remove and select **Delete**.

Alternatively you can select the overlay and press *Delete*.

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 (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 arrow next to 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.

   - Roll the middle mouse scroll wheel.

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.

Evaluate a Study in Smart Fusion Review

The DynaSuite Neuro software processes image data to generate a 3D volume model of the skull and brain. This 3D model can be manipulated and combined with vessels, dynamic analysis maps, diffusion maps, fiber tracts, or functional imaging maps.

Use the following procedures to display and review 2D and 3D images.

The Full Screen function only works in the 3D viewport with the Smart Fusion hanging. Full Screen cannot be applied to 2D or MPR viewports.

Review the Images

1. From the Applications section of the Side panel, select the **Smart Fusion Review** hanging.

   - The original image set displays in the viewports showing the same image with different initial orientations (axial, sagittal, and coronal).

   - The 3D viewport displays the skull and brain in 3D.

2. Adjust the Window/Level of the orthogonal images.

3. Scroll through the images to a location of interest.

4. Click and drag the **Crosshair** to place a point of interest in the image set.

5. Optional: use the **Rotate** tool or drag the edges of the cutlines to rotate the image plane.

   From the Global toolbar, click **Reset View** to reset the view of the currently selected hanging. Reapply hangings resets the application to the initial state (including removing all of the overlays).

6. Optional: Perform a 3D Check.

   a) Select the 3D viewport.

   b) From the Control panel, click **3D Check**.

   c) From the 3D Check window, use the marker tool and click on the brain to add a missing area to the segmentation.

      – Alternatively, click the colored brain mask to remove the corresponding area from segmentation.

   d) Optional: Use the **Threshold** slider to adjust the brain mask.

e) Click **Update 3D View**.

f) Click **Save**.

– Click **Reset to Default** to reset the images to the original automatic segmentation.

g) Click **Close**.

Figure 4-2 3DCheck
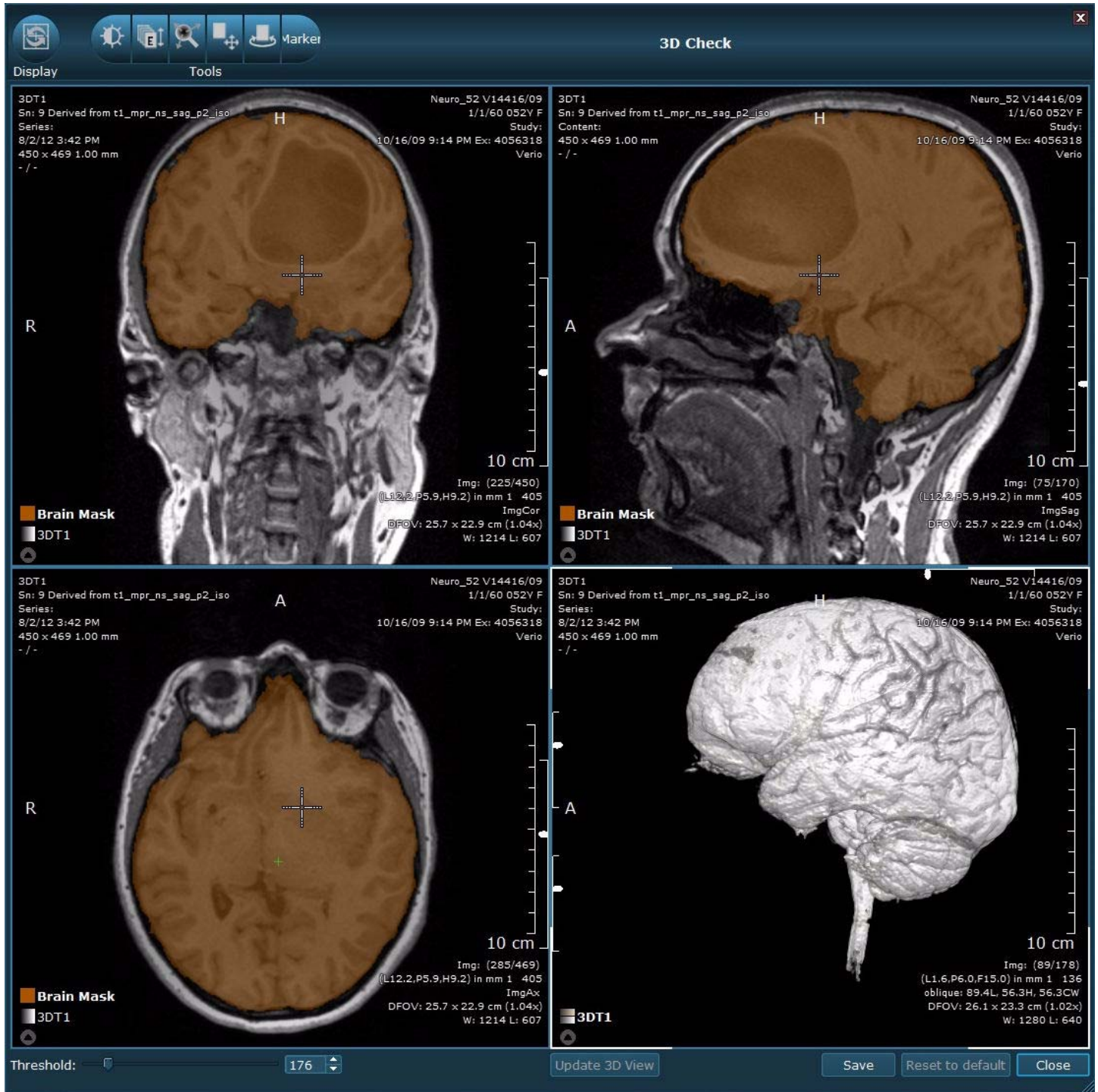
7. Add overlays to simultaneously view multiple images or maps.

- Overlay Vessels

- Overlay Diffusion Images

- Overlay fMRI Images

- Overlay Dynamic Images

8. Optional: Perform a Registration Check.

a) Select the overlay that you want to correct, click **Registration Check**.

All related images are changed after correcting one of the related images, e.g. when correcting registration using the FA map, all diffusion maps are corrected.

b) From the Registration Check window, window/level the image to adjust the transparency of the overlay.

c) Select a tool to adjust the registration.

– Click the **Pan** tool and click and drag the mouse.

– Click the **Rotate** tool and click and drag the mouse.

d) Optional: Select **Use Checkerboard mode** to apply a checkerboard display on the images.

e) Click **Save** to re-register the images.

Registration Check uses the highest resolution image as the base image and the registered image set that the window was opened for, as the overlay.

– Click **Reset to Default** to reset the images to the original automatic registration.

f) Click **Close**.

Figure 4-3 Registration Check
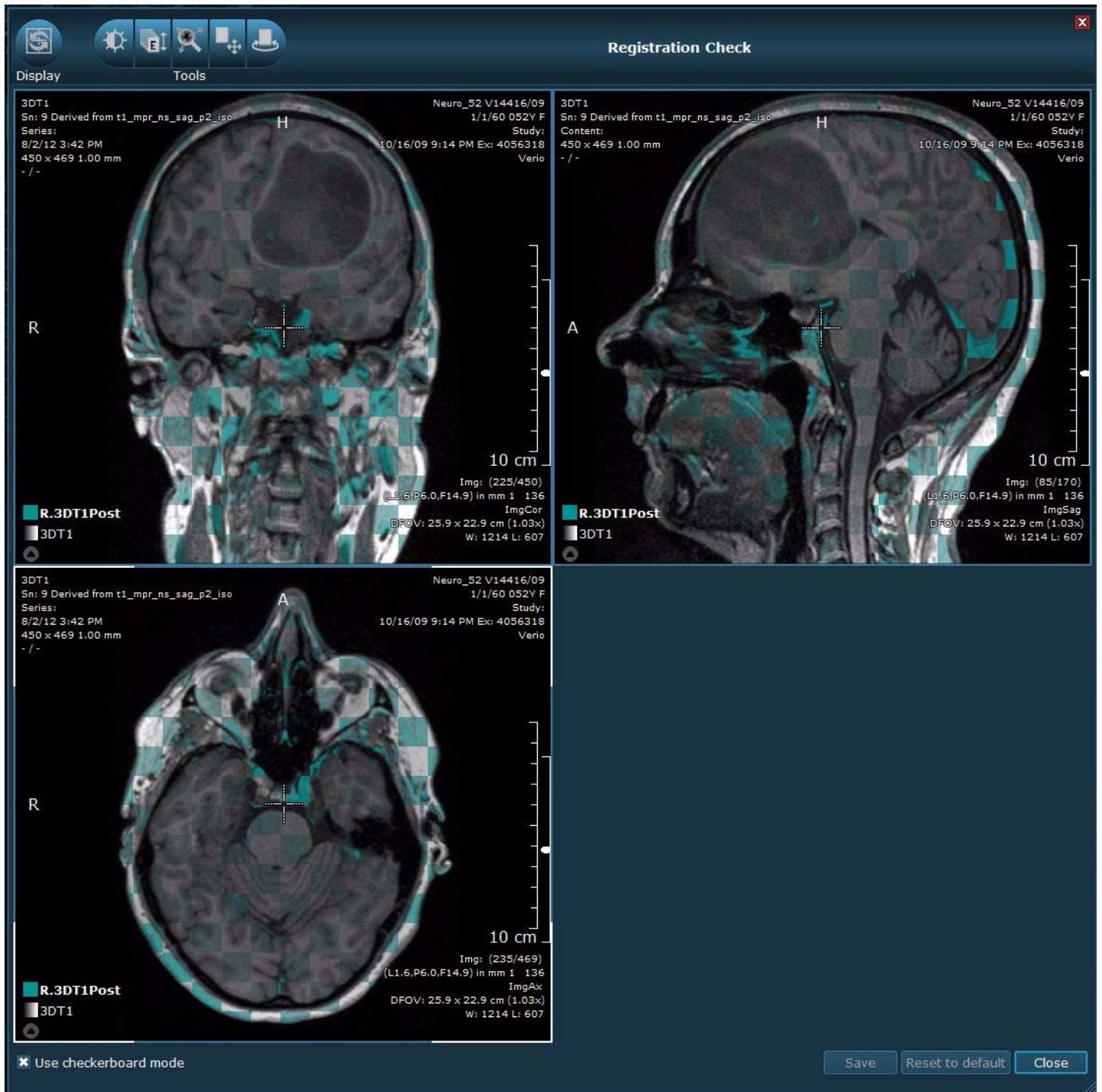
Visualize the Skull and Cortex of the Brain in 3D

Use this procedure to adjust the opacity of the skull and brain in the 3D viewport.

1. In the 3D viewport, click the ▲ **Image List** icon to open the Images panel (Figure 4-4).

    Figure 4-4 Images Panel

2. Click and drag the **Opacity Skull** slider to optimize visualization of the gyri and the sulci.

    • Alternatively, right-click and drag up/down in the 3D viewport to adjust the skull opacity.

3. Click and drag the **Opacity Brain** slider to see different 3D objects in relation to the area of interest.

    • Alternatively, right-click and drag right/left in the 3D viewport to adjust the brain opacity.

Display a Clip Plane in the 3D View

Use this procedure to dipslay a clip plane of the area of interest in the 3D viewport.

1. Move the CSP to the area of interest in a 2D viewport.

2. Click the ◣ **Image List** icon to open the Images panel (Figure 4-5).

   Figure 4-5 Images Panel
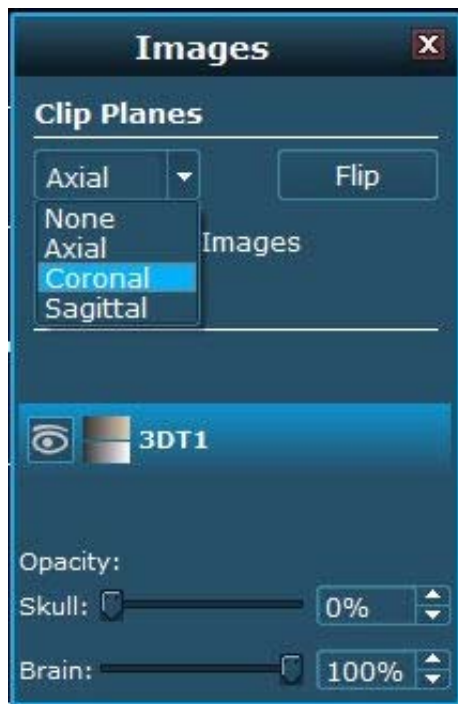
3. From the Clip Planes section, select **Axial**, **Coronal**, **Sagittal** or no clip plane.

   Ⓝ

   Selecting a clip plane results in the corresponding 2D viewport being applied as a clip plane in 3D.

4. Rotate, stack, and change the CSP position in the 2D viewport to adjust the clip plane of the 3D image.

5. Optional: Click **Flip** to flip the clip plane.

   • The image data on the opposite side of the clip plane is shown.

6. Optional: Toggle **Show Images** on/off to show/hide the image overlays on the clip plane.

Review Vessels

Use this procedure to review anatomical images with vessel data.

1. From the Images section of the Side panel, click and drag the Vessel image set to place as an overlay in the 2D viewport.

2. Adjust the image Window/Level and other display settings.

3. Scroll through the images to a location of interest.

   • Review the vessel images to follow the path of the vessels.

   • The 3D viewport displays a cut plane of vessels below the clip plane.

4. From the Images section, click and drag a Vessel image set into the 3D viewport.

   • The vessel image is displayed as an overlay on the anatomical image.

   • Review the combined images to follow the path of the vessels.

5. In the 3D viewport, click the ▲ **Image List** icon to open the Image panel.

6. Select the anatomical image.

7. Adjust the opacity of the image.

   Figure 4-6 Images Panel: Opacity

a) Click and drag the **Opacity Skull** slider to 0% to remove the skull.

b) Select the Vessel image set.

c) Click and drag the **Opacity** slider to optimize vessel visualization.

8. From the Control panel, make any of the following modifications.

   • Adjust the **Threshold** slider for an optimal view of the vessels.

     – Increase the threshold to view less of the small vessels.

     – Decrease the threshold to view more of the small vessels.

   • Click **More >>** to select the option to modify the vessel color.

     – Click the color selection icon and choose a new vessel color.

9. Display a Clip Plane in the 3D View.

   • The vessels are only visible below the clip plane.

   Figure 4-7 3D Vessel Image and Control Panel
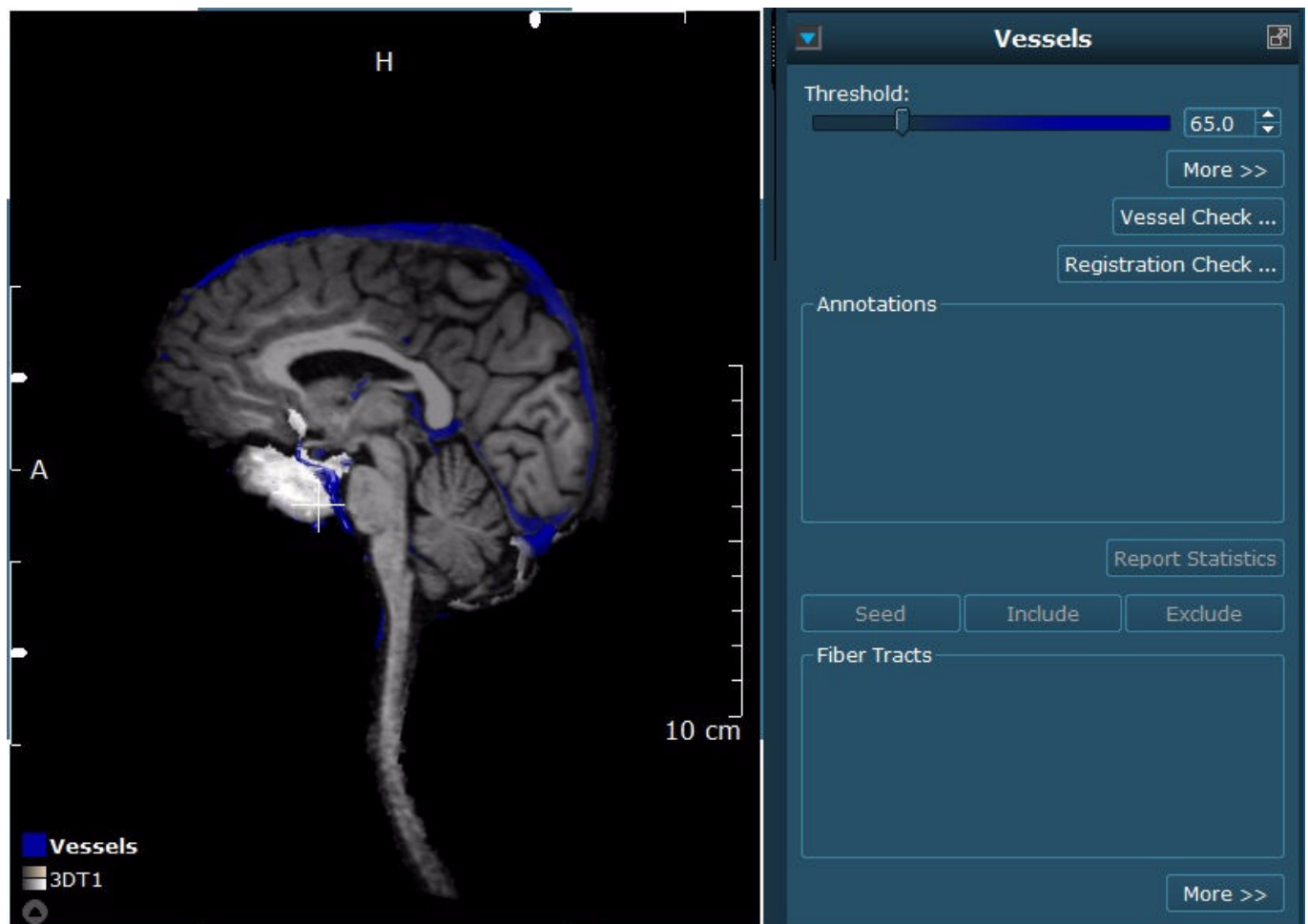
10. Optional: Perform a Vessel Check (Figure 4-8).

    a) From the Control panel, click **Vessel Check**.

    b) To add missing vessels to the segmentation mask, use the marker tool and click on the vessels.

    c) Optional: Use the **Threshold** slider to change the vessel segmentation mask.

    d) Click **Update 3D View**.

    e) Click **Save**.

        – Click **Reset to Default** to reset the images to the original automatic segmentation.

    f) Click **Close**.

11. Add any additional overlay image data.

12. Create a snapshot of the desired image views.

13. Review the results.

Figure 4-8 Vessel Check
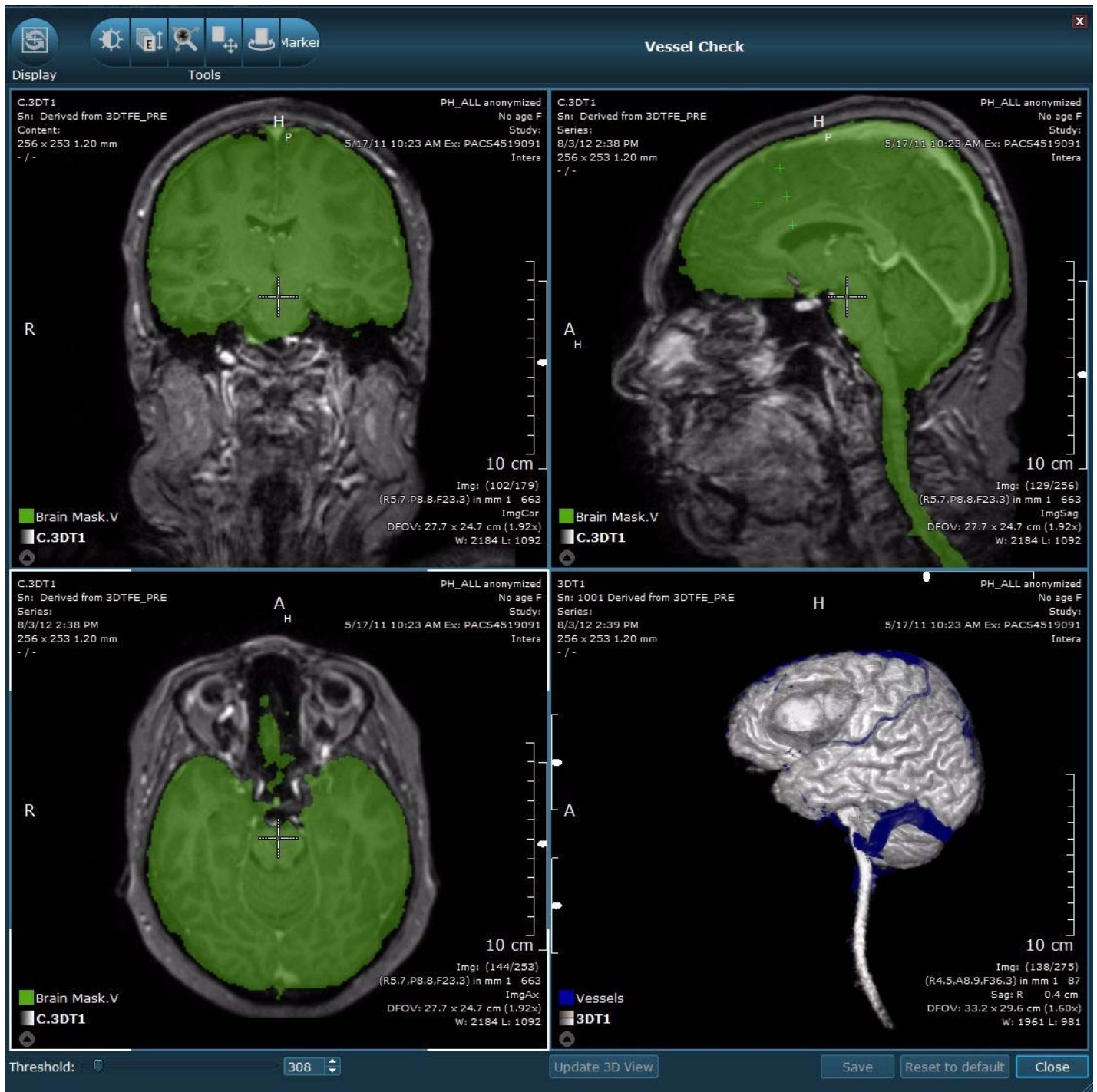
Track Fibers

Fiber Tracking allows you to track white matter structures, or fibers, to see their spatial relationship to other structures in the brain.

When you display a reference image set in the 3D viewport, fiber tracts are displayed in 3D with the skull and brain.

Fiber tracts are listed in the Control panel in the order they are created. Referenced ROIs are listed under each fiber tract and are automatically selected and visible in the Fiber Tract list when they are created.

Double-clicking a fiber tract in the list automatically jumps to the image displaying the fiber tract in the viewports. It is possible to rename, hide/show, change the color, and set the threshold for a selected fiber tract.

Figure 4-9 Fiber Tract Image
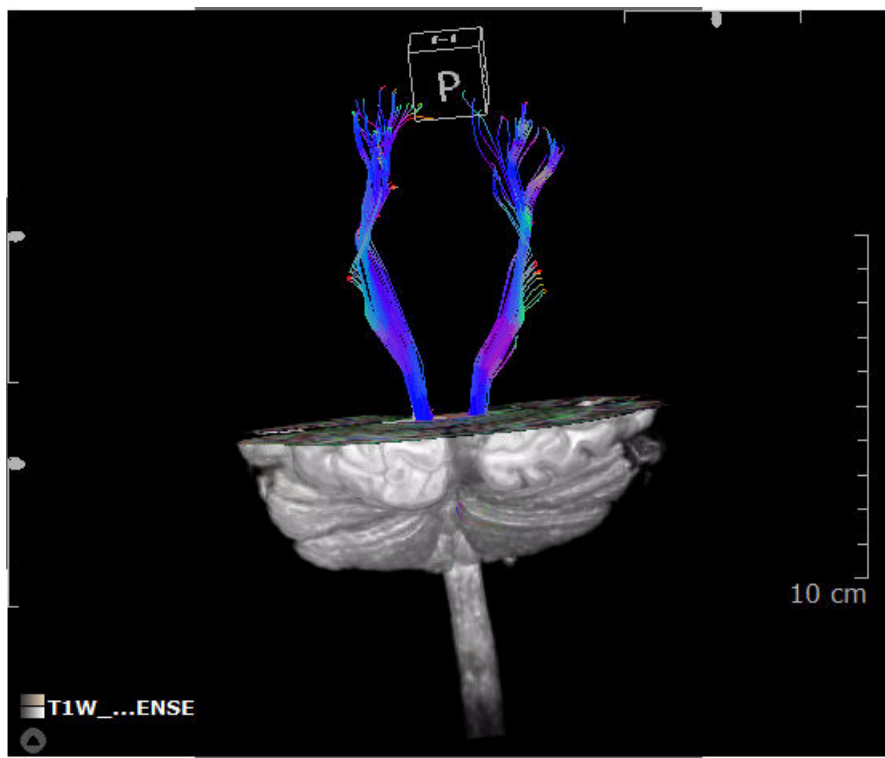
For reviewing fiber tracts and the seed points, review in 2D and 3D.

Create and Modify Fiber Tracts

Use this procedure to track fibers.

1. Draw an ROI around the area of interest.

2. From the Control panel, click **Seed**.

   • Alternatively, from the ROI Context menu within the viewport, select **Mark as Seed**.

   • The viewports update with the fiber tract oriented through the ROI.

3. In the 3D Rendering viewport, adjust the **Opacity** slider to display the skull as transparent and the brain semi-transparent to view the resulting fiber tract.

   • See Visualize the Skull and Cortex of the Brain in 3D.

Figure 4-10 Fiber Tract Image
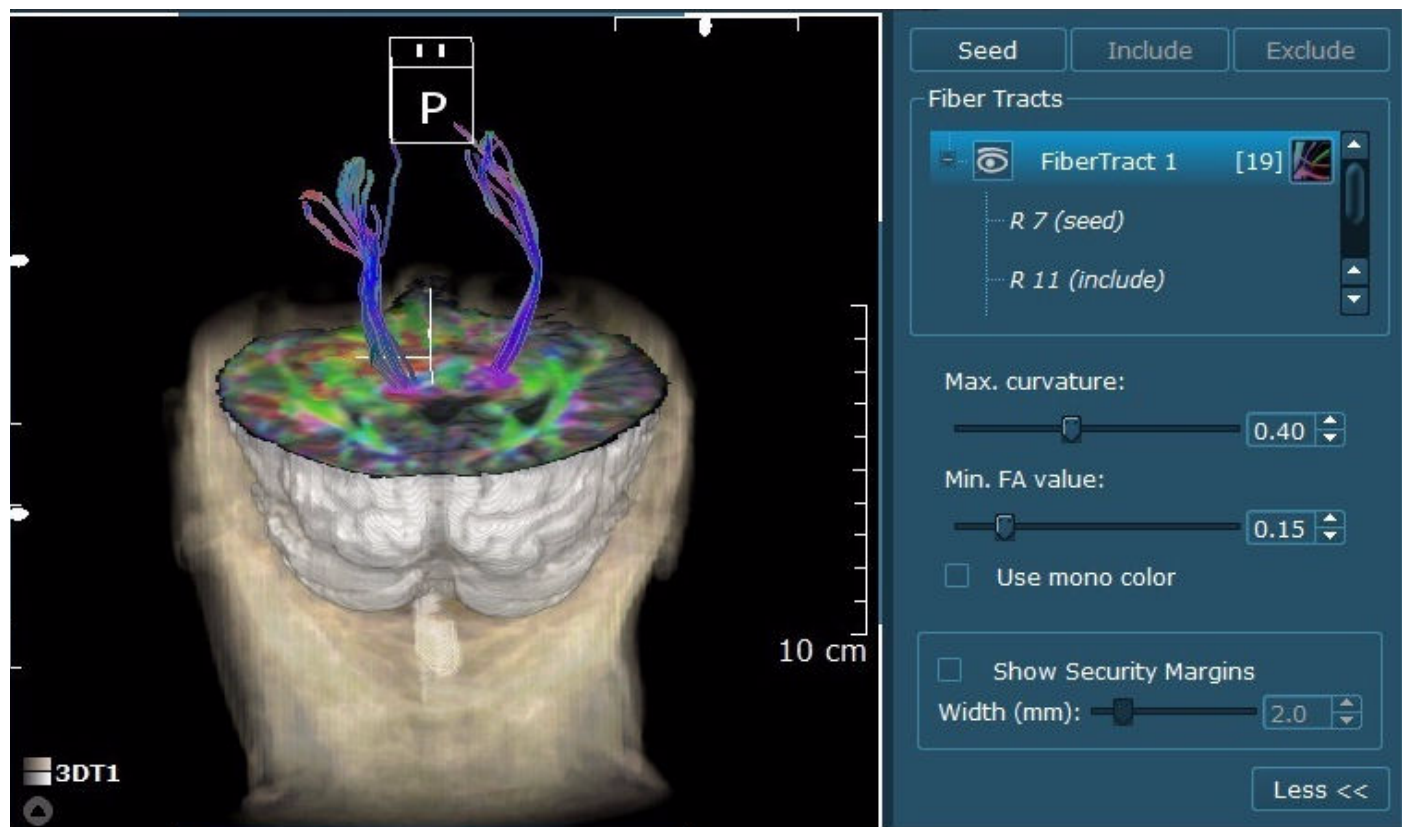
If you have multiple DTI data sets in the Image list, the **Seed** button is inactive. Drag and drop the desired DTI data set into the viewport so the application tracks the desired data.

4. Optional: to further modify results, create ROIs to include and/or exclude portions of the original fiber tract.

   • Draw an ROI and click **Include** to only view an isolated region in the original fiber tract.

   • Draw an ROI and click **Exclude** to omit an isolated region in the original fiber tract.

   • Alternatively, these options are available in the ROI Context menu within the viewport.

5. If necessary, click **More >>** for additional options to modify fiber tracts.

   • Click and drag the **Max. Curvature** slider to limit the fibers to a certain direction.

   • Click and drag the **Min. FA Value** slider to limit the fiber length.

   • Select **Use Mono Color** to change the fiber tract from direction to mono color, if necessary.

     – Additionally, select the color icon to change the fiber tract color.

   • Select **Use Security Margins** to visualize the boundaries around the fibers.

     – Additionally, click and drag the **Width** slider to increase/decrease the width of the security margins.

6. Repeat the steps for any additional fiber tracts.

Compare the Image Results

1. Review the results in both 2D and 3D.

2. Review the list of fiber tracts and the referenced ROIs that belong to each fiber tract.

3. Toggle the 👁 **Eye** icon to turn the fibers on and off.

4. Collapse/expand, show/hide, rename, delete, change color and sort fiber tracts, as necessary.

   Figure 4-11 Fiber Tract Menu

5. Review any other information collected in the study, such as anatomical images, fMRI, or dynamic maps.

6. Create a snapshot of the results for the report.

Evaluate a Study in Diffusion Review

The Diffusion Review application allows you to evaluate one or more diffusion maps in a single 2D review session to evaluate and compare regions of interest.

Diffusion MRI produces images that show the behavior of water molecules in biological tissue. In some clinical situations, diffusion imaging can show contrast differences between an area that has restricted diffusion from the surrounding tissue. Diffusion Tensor Imaging (DTI) enables the measurement of the restricted diffusion of water in tissue, which can be used for white matter tract visualization.

DynaSuite Neuro generates diffusion maps that can be viewed individually or as an overlay with anatomical images or additional maps. You are also able to track fibers to visualize the white matter tract orientations and view the results in 3D.

Diffusion data can be analyzed in DynaSuite Neuro with the **Diffusion Review** application hanging. Diffusion Review allows you to display the original image set, a DTI color map, an ADC map, and an FA map on 2D images.

Diffusion maps can be displayed as colored overlays. The following maps are available:

- **ADC Map** - The values of the Apparent Diffusion Coefficient (ADC) Map denote the magnitude of the diffusion.

- **FA Map** - The values of the Fractional Anisotropy (FA) Map denote the uniformity of the diffusion. They indicate how uniform the diffusion is.

    – 0: indicates perfectly equal diffusion in all directions.

    – 1: indicates diffusion in one direction.

- **DTI Color Map** - The Diffusion Tensor Imaging (DTI) Color Map is a Red Blue Green (RBG) image. It illustrates the main direction of each diffusion tensor.

    – Red shows left-right diffusion.

    – Green shows anterior-posterior diffusion.

    – Blue shows superior-inferior diffusion.

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Review the Diffusion Maps

1. From the Applications section of the Side panel, select the **Diffusion Review** hanging.

    •   The original (registered) image set, DTI color map, ADC map, and FA map are displayed in the 2D viewports.

2. Scroll through the images to check for excessive patient motion.

3. Optional: Change the threshold of the diffusion maps to adjust the coloring and data shown in the image.

    a) Click in the viewport of the map you want to threshold.

    b) Click and drag the **Threshold** slider or type a value in the text field.

    Figure 4-12 Control Panel: Threshold

4. Optional: Add any additional image series or maps as an overlay to the current views.

5. Optional: Open the Images panel to manipulate the layers.

    Figure 4-13 Images Panel

6. Optional: From the Control panel, click **More >>** to select the option to change the colors of the FA and/or ADC maps.

    •   Click the color selection icon and choose a new color.

    •   Click **Reset** to reapply the default threshold and color settings.

7. Optional: Perform a Diffusion Check.

a) From the Control panel, click **Diffusion Check**.

b) Scroll through the images to check for noise outside of the brain or holes inside the brain.

c) Click and drag the **Threshold** slider to remove the outside noise or to include missing areas of the brain.

   – Alternatively, click the **Up/Down** arrows or type in a value in the text box.

d) Click **Save** to recalculate the maps.

   – Click **Reset** to reset the images back to the original automatically calculated values.

e) Click **Close**.

Figure 4-14 Diffusion Check
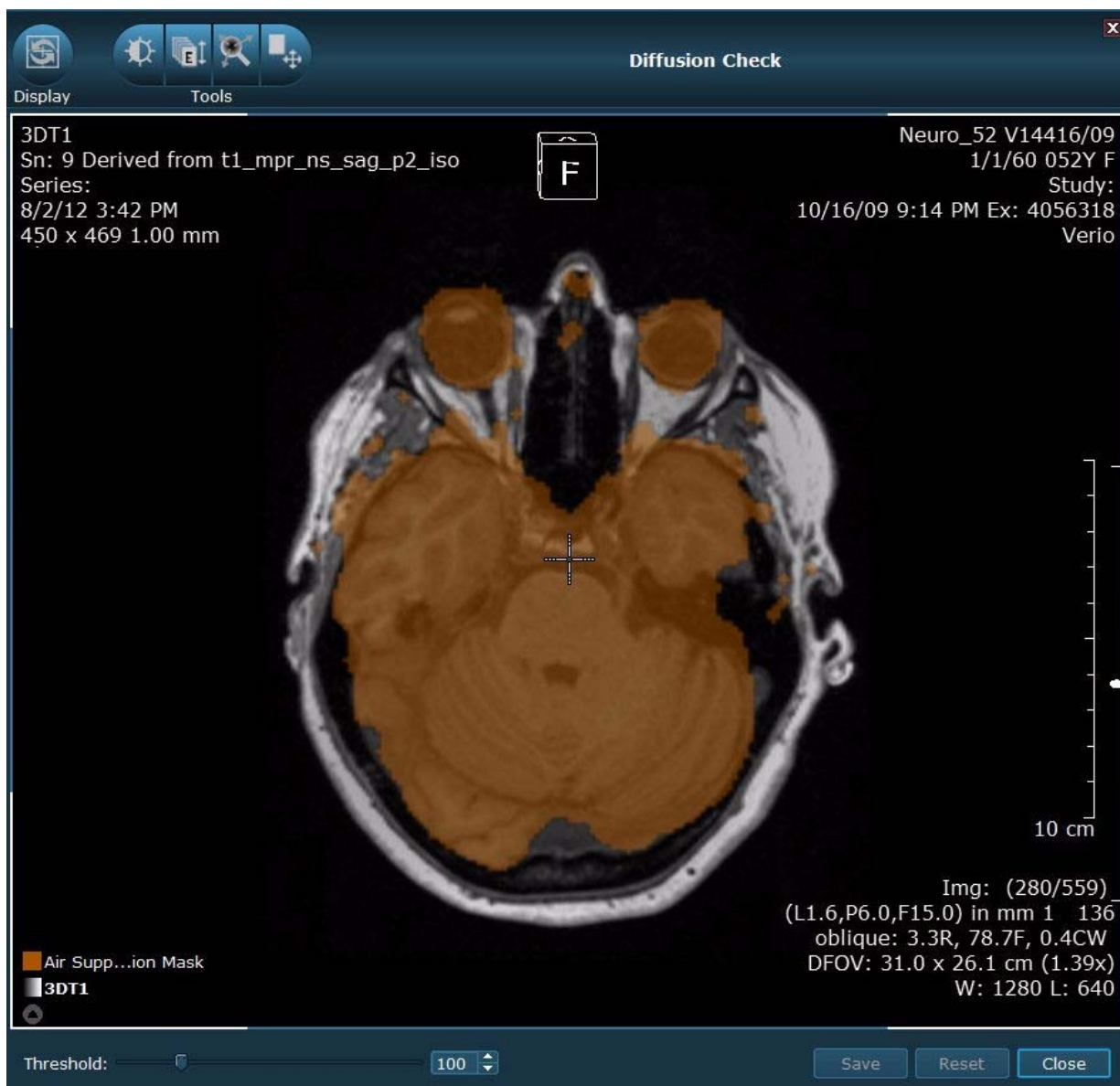
Compare Regions of Interest

Use one of the following procedures to compare FA or ADC values in different regions of the brain.

Create Snapshots of ROIs and Statistics

1. Select the FA or ADC map.

2. Draw an ROI.

3. Review the ROI statistics in the Annotations area of the Control panel.

4. Click **Report Statistics** to create a snapshot of the ROI and the statistical results.

Figure 4-15 Control Panel: Compare ROIs
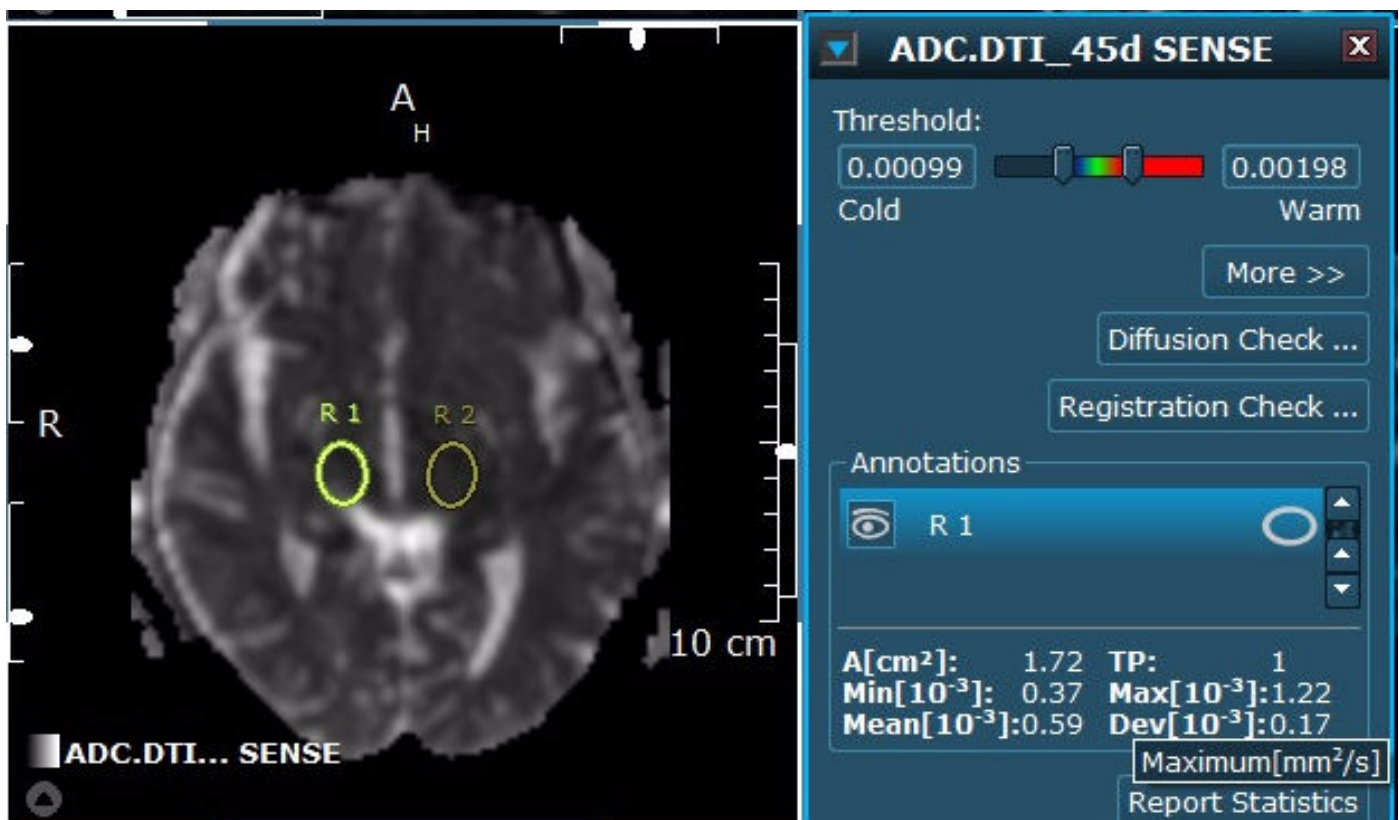
Compare ROIs and Report Statistics

1. Select the FA or ADC map.

2. Draw an ROI.

3. Duplicate the ROI.

4. From the Control Panel Annotations area, press **Ctrl** and select the first ROI so both ROIs are highlighted.

5. Click **Report Statistics**.

6. From the Side panel, click the Results heading to view the list of available results.

7. Double-click the result to view the reported statistics.

Figure 4-16 Control Panel: Compare ROI
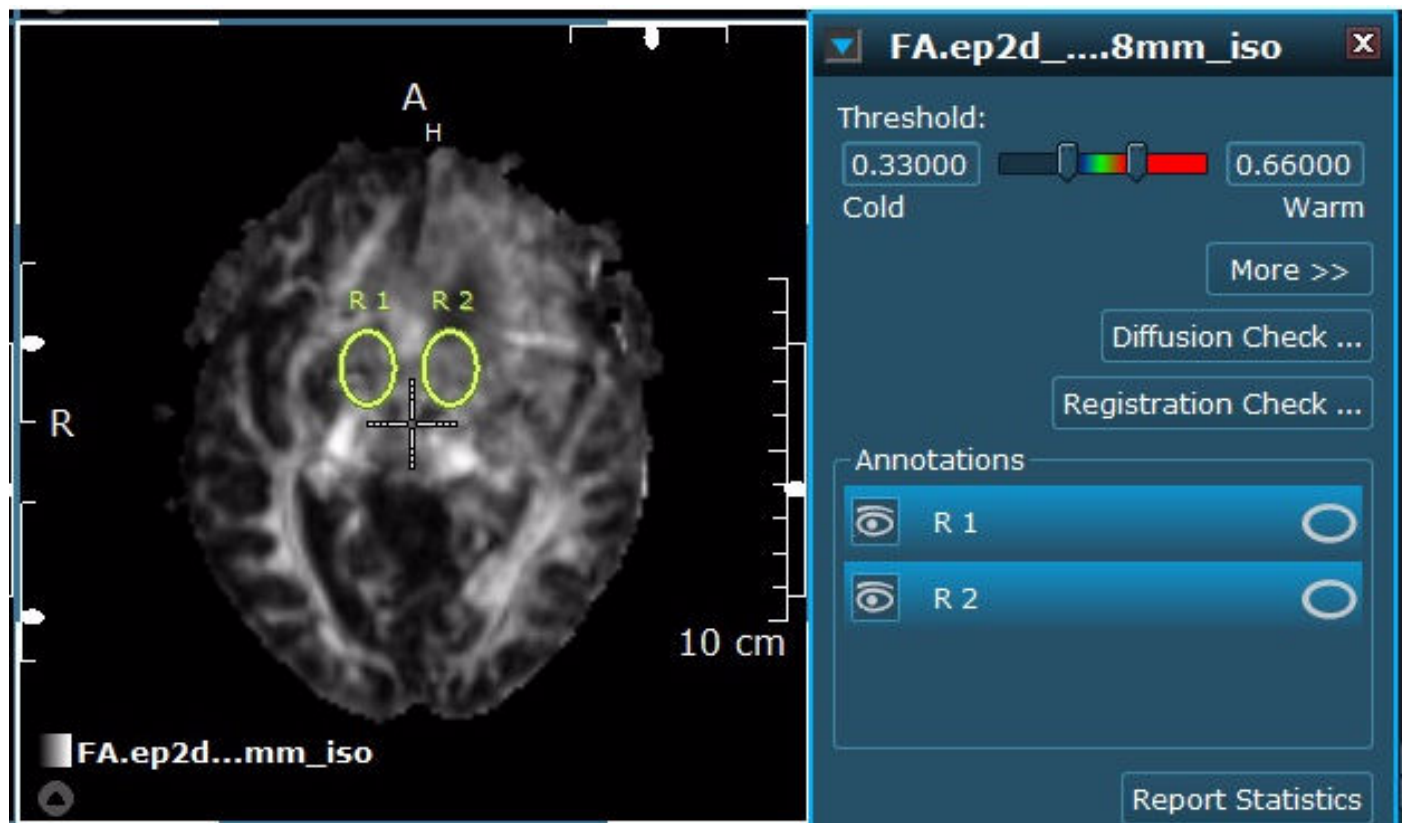
8. Click **Close** the close the results.

The calculation of an ROI's area is based on the combined area of all voxels included in the ROI. Therefore, for any duplicated ROI, the calculated area may be different than the area of the original ROI.

Evaluate a Study in fMRI Review

The fMRI Review application allows you to visualize and evaluate fMRI data. This tool allows you to view the functional color maps overlayed on anatomical and original fMRI image data.

Functional Magnetic Resonance Imaging (fMRI) acquires images that show signal intensity changes in blood flow during task activation. The DynaSuite Neuro software displays the intensity levels where task activation has occurred on functional (activation) maps. The maps allow you to visualize the functional areas that may be affected. Functional maps may include motor, language, vision, and/or auditory.

For each fMRI experiment, the following results are created:

- **Motion corrected fMRI** - allows you to review the original EPI data after motion correction.

- **Activation Map** - shows the positive and negative areas of activation. This map has been registered to the highest resolution image set and motion correction has been applied. Activation maps can be displayed as overlays.

Figure 4-17 fMRI Review
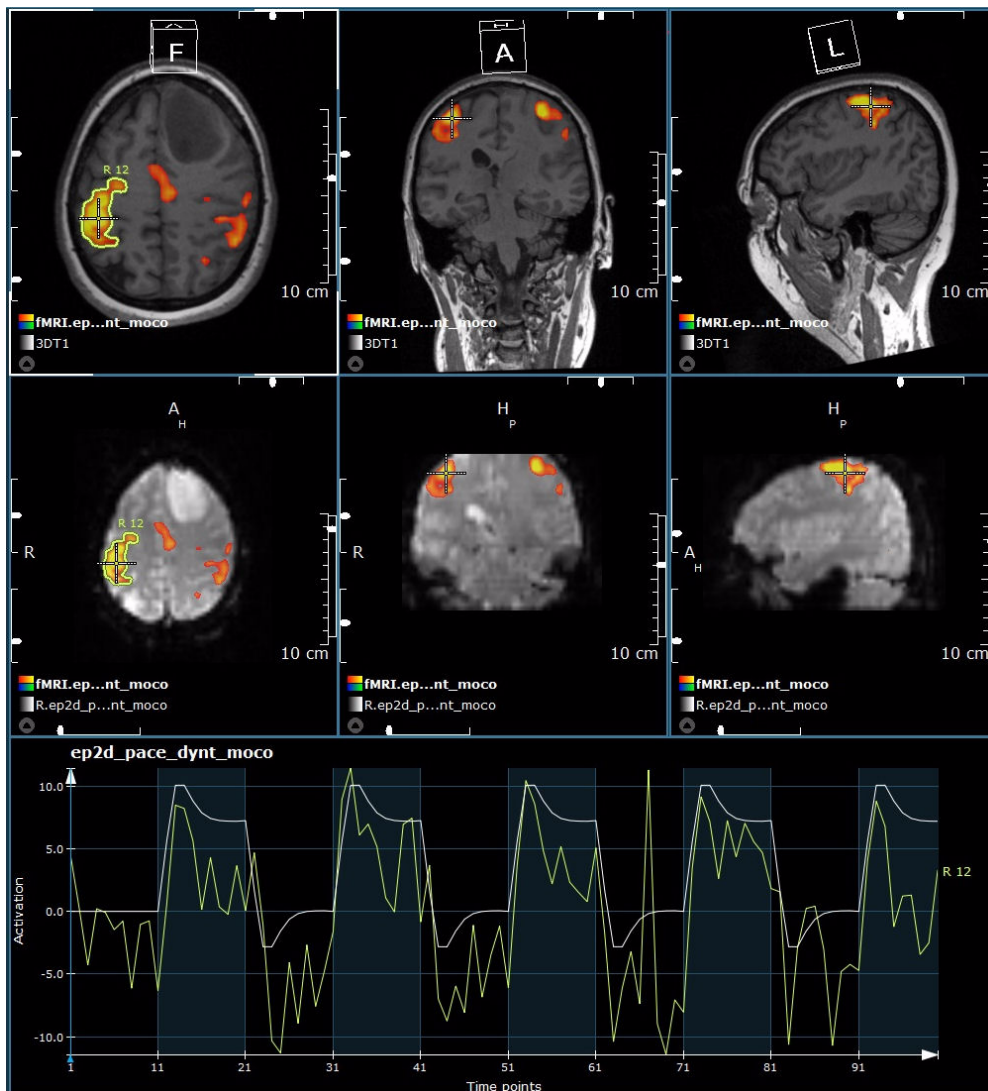
A motion correction technique is applied to the fMRI scan data. This produces a motion curve, which allows you to check if the patient moved while performing the task. To take a closer look at one of the functional maps, review the motion curve to check for motion artifacts and to determine the quality of the scan.

The fMRI advanced processor corrects the motion of fMRI data by registering the timepoints to the first timepoint.

If the maximum amplitude exceeds the user defined motion threshold, a warning displays in the Control panel.

Figure 4-18 fMRI Control Panel with Warning

Review the Images

1. From the Applications section of the Side panel, select the **fMRI Review** hanging.

   - Top three viewports - display an anatomical image set with axial, coronal, and sagittal views.

   - Bottom three viewports - displays an fMRI image set with axial, coronal, and sagittal views.

   - Curve viewport - displays an activation timeline when an ROI is selected.

2. Click and drag a corresponding fMRI image set into the upper-left viewport.

   - The activation map overlays the anatomical and original fMRI images.

   - A user defined default threshold is automatically applied. To change the threshold value for different maps, use one of the following methods.

     – Click and drag the **t-value** slider or type a value in the text field.

     – Click the **p(Bonf) Up/Down** arrows or type a value in the text field.

   Figure 4-19 Control Panel
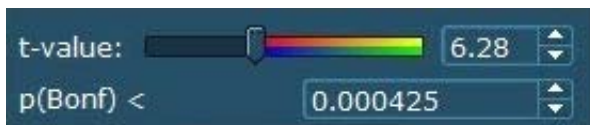
3. Scroll through the images to the location of interest.

Check for Patient Motion

Manually Check for Motion

1. Select a viewport with the orginal fMRI images.

2. Use one of the following methods to manually scroll through the images to check for patient motion.
   - Press the ***Right/Left*** arrow keys.
   - On the bottom of the viewport of interest, click and drag the **Time Point** slider.

Review the Motion Curve

1. From the Control panel, click **Motion Check**.

2. Review the maximum magnitude and rotation that is detected during each rest and activation phase.

Figure 4-20 Motion Check
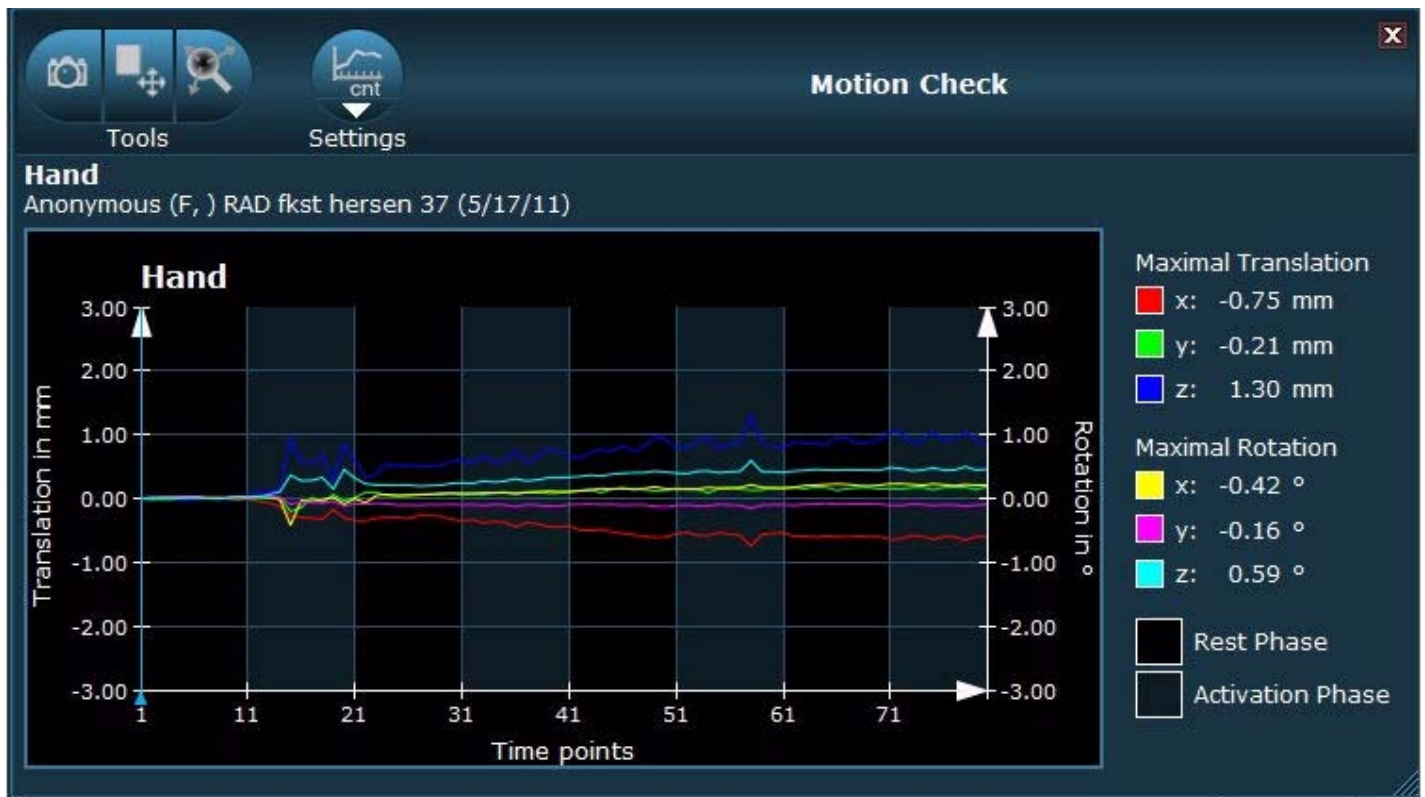
3. Use the display tools to increase your visualization of the motion curve.

   • Click [icon] **Pan** to move the curve within the window.

   • Click [icon] **Zoom** to zoom in and out of the curve.

4. Click **Settings** to change the unit of measurement of the Time Points.

   • Select [icon] **Steps** to measure the time points in steps.

   • Select [icon] **Seconds** to measure the time points in seconds.

   • Select [icon] **Minutes** measure the time points in minutes.

5. Click [icon] **Capture Motion** to take a snapshot of the motion curve.

6. Click ⊠ **Close** to exit the Motion Check window.

Define ROIs and Review Curve

1. Draw an ROI around a region of activation or from the Pie menu, select the ![fMRI icon] **fMRI Probe** tool to segment the activation.

2. Review the ROI statistics in the Annotations section of the Control panel.

   • To save the statistical results in a Results folder, click **Report Statistics**.

   Figure 4-21 Control Panel - Annotation for ROI
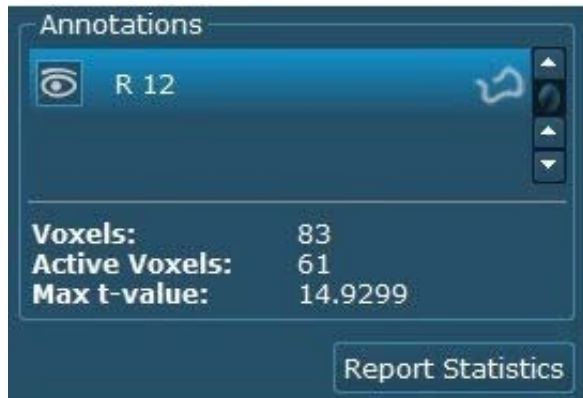
3. From the Control panel, click **More >>** and use any of the additional features, if needed.

   Figure 4-22 Control Panel - More Features
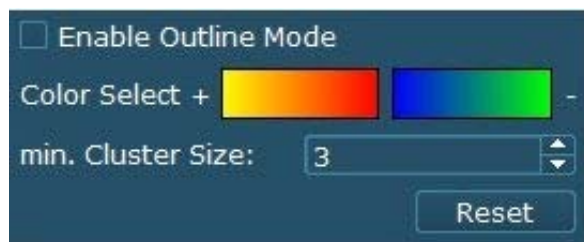
   • Select **Enable Outline Mode** to view only a border of the fMRI activated regions.

   • Click the color icons to change the colors assigned to the positive and negative activations.

     – Two colors define negative and two colors define positive activation.

   • Adjust the **min. Cluster Size** to display more or less voxels in the activated regions.

     – Type a value in the text field.

     – Click the **Up/down** arrows to adjust the value in increments of 1.

   • Click **Reset** to reapply the default threshold and color settings.

4. Review the fMRI activation curve.

   a) Click and drag the **Time Point** slider.

   b) Examine each rest and activation phase.

   c) Right-click to open the Pie menu and select a display tool to increase your visualization.

     – Click ▢ **Pan** to move the graph within the window.

     – Click ▢ **Zoom** to zoom in and out of the graph.

     – Click ▢ **Full Screen** to expand the graph to the size of the Work area.

     – Click ▢ **Create Snapshot** to save a screen capture of the activation graph, statistics, and image of the ROI.

Figure 4-23 fMRI Activation Curve
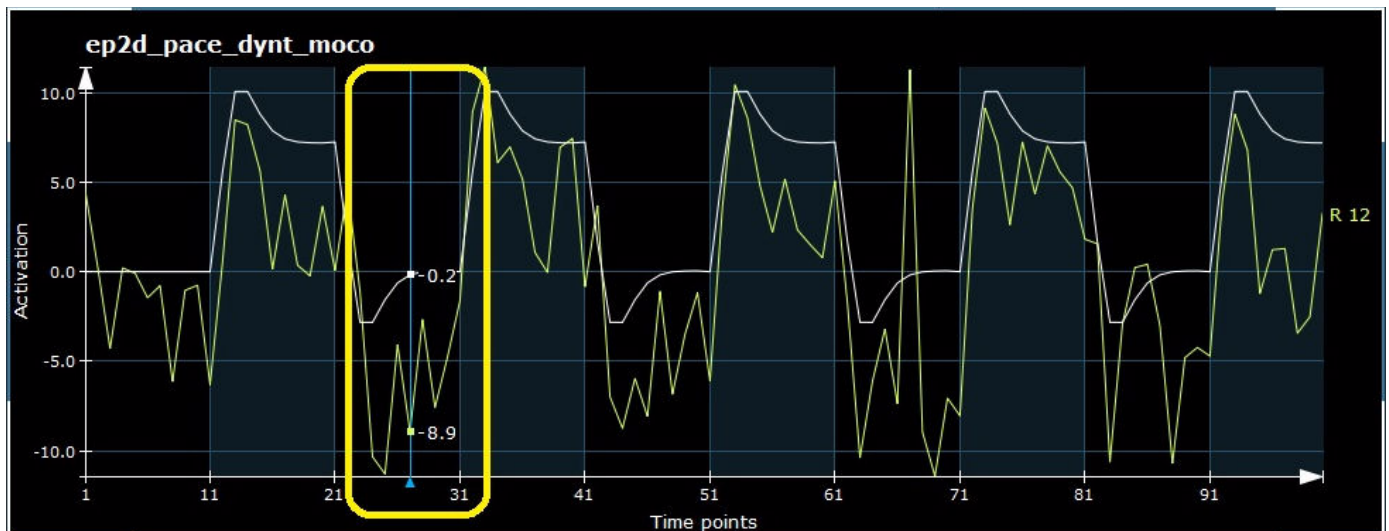
5. Draw any additional ROIs to analyze other regions of activation, if needed.

Save and Review Results

1. Create any additional snapshots to save in the Results folder.

2. Evaluate any additional fMRI maps.

3. Review the results.

Evaluate a Study in Dynamic Review

As a prerequisite to Dynamic Review, an acquisition of t2* images over time is needed. The DynaSuite Neuro software generates dynamic maps with different parameters to allow you to better assess changes in contrast over time. With this tool, you are able to visually inspect the calculated parametric images and time intensity curves and can apply additional image data as overlays to simultaneously view different types of data. This allows you to gain more insight into a particular case. You can then save the image maps and calculated data results to add to your report.

Based on your system configuration, for each dynamic study, the following dynamic maps may be available:

- **rCBV Map** - Generates a relative Cerebral Blood Volume (CBV) map based on a Standard, Gamma, or Corrected variant. Relative CBV describes the blood volume of one region relative to others. This is not an absolute measurement.

- **rCBF Map** - Generates a relative Cerebral Blood Flow (CBF) map based on a Standard or Gamma variant. Relative CBF shows the blood flow of one region relative to another. This is not an absolute measurement.

- **MTT Map** - Generates a Mean Transit Time map based on a Standard or Gamma variant. MTT measures the length of time a certain volume of blood spends per cerebral capillary circulation. MTT is rCBV/rCBF.

- **TTP Map** - Generates a Time to Peak (TTP) map based on a Standard, Gamma, or Corrected variant. The TTP is inversely related to the CBF in which the reduction of blood flow results in an increase in the time needed for the contrast to reach its peak in the brain tissue.

- **k1 Map** - Generates the k1 parameter map based on the corrected variant. k1 represents a coefficient in the correction algorithm.

- **k2 Leakage Map** - Generates the k2 parameter map based on the corrected variant. k2 represents the leakage in the correction algorithm.

Review the Dynamic Maps

Use this procedure with a t2* acquired timed series to review dynamic maps with different parameters. The maps allow you to assess contrast changes over time.

1. From the Applications section of the Side panel, select the **Dynamic Review** hanging.

2. Adjust the Window/Level of the images.

3. Scroll through the images to look for excessive patient motion, artifacts, or other incidental findings.

4. Add dynamic maps as an overlay to the current view.

5. Scroll to a slice displaying an area of interest.

Figure 4-24 Dynamic Map
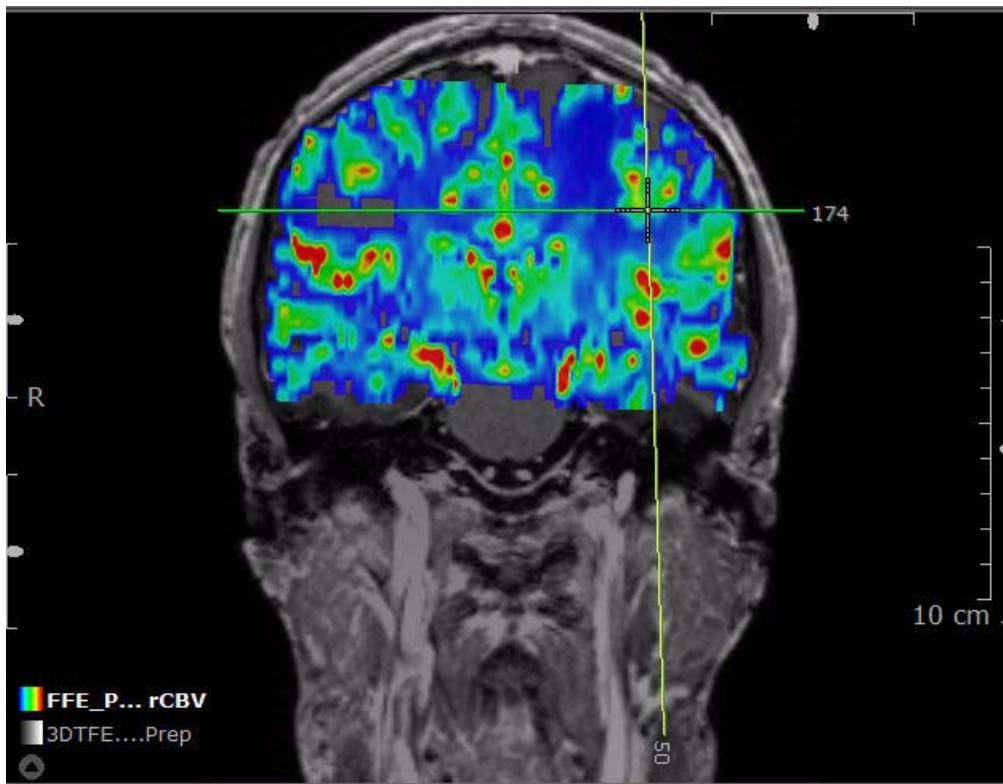
6. Optional: adjust the color settings and threshold to best display the data.

a) From the Control panel, click **More >>**.

Figure 4-25 Control Panel

b) Select a **Color Table** option.

    – Select **Flip** to flip the color scale. For example, if blue was assigned for low values, it will now be used for high values.

c) Click and drag the **Threshold Min** and **Max** sliders or type a value in the text field.

    – Values below the Min threshold are not displayed and values above the Max threshold are displayed in the color for the highest value (the highest value depends on the chosen Color Table).

    – Decrease the threshold to remove the lowest blood volume or increase the threshold to bring in additional color.

d) Select **Show Below** or **Show Above** to show/hide values below the lower or above the upper threshold.

7. Optional: Hide and redisplay the dynamic map overlay.

    a) Open the Images panel.

    b) Select the desired dynamic map.

    c) Toggle the 👁 **Eye** icon to hide/show the selected map.

Figure 4-26 Images Panel

4-38

Review the Curve

Use this procedure to review the time/intensity curve of a contrast enhanced area in the brain.

1. In one of the 2D viewports, draw an ROI on an area of interest.

2. Review the corresponding time/intensity graph in the Curve viewport.

   - Click and drag the **Time Point** slider to view the blood volume values for a desired phase.

     – Alternatively, press the **Right** and **Left** arrow keys.

   - Right-click to open the Pie menu and select a display tool to increase your visualization.

     – Click **Pan** to move the graph within the window.

     – Click **Zoom** to zoom in and out of the graph.

     – Click **Full Screen** to expand the graph to the size of the Work area.

     – Click **Create Snapshot** to save a screen capture of the graph, statistics, and image of the corresponding annotations.

Figure 4-27 Curve Viewport
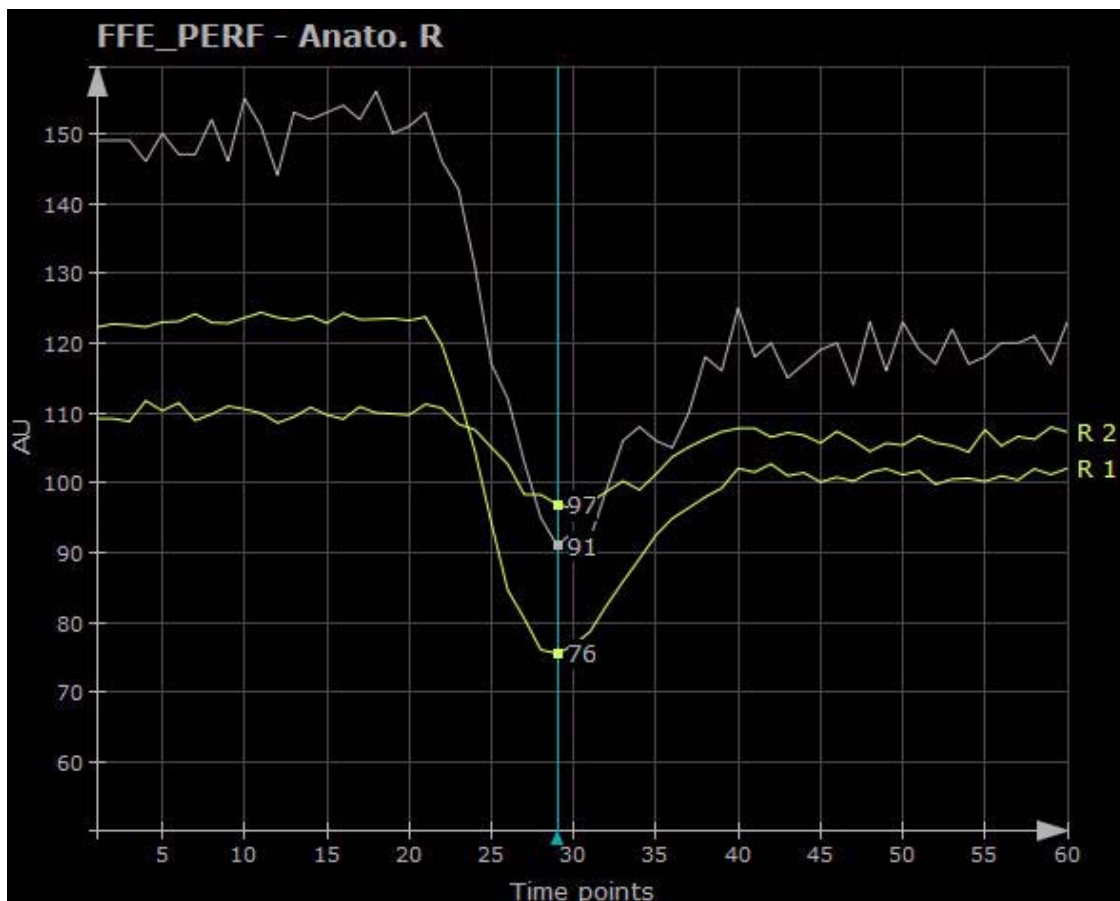
Compare Regions of Interest

Use this procedure to determine if the dynamic maps show different statistical values.

1. Compare the dynamic map values between an area of interest and an area of normal tissue.

    a) Select the desired dynamic map.

    b) Draw an ROI around the area of interest.

    c) Review the statistics and curve for the ROI.

    d) Duplicate the ROI in another region.

    e) Review the statistics and curve for the ROI.

    f) From the Curve viewport Pie menu, create a snapshot of the results for the report.

    –   Both ROIs and statistics will be shown.

Figure 4-28 ROI Comparison
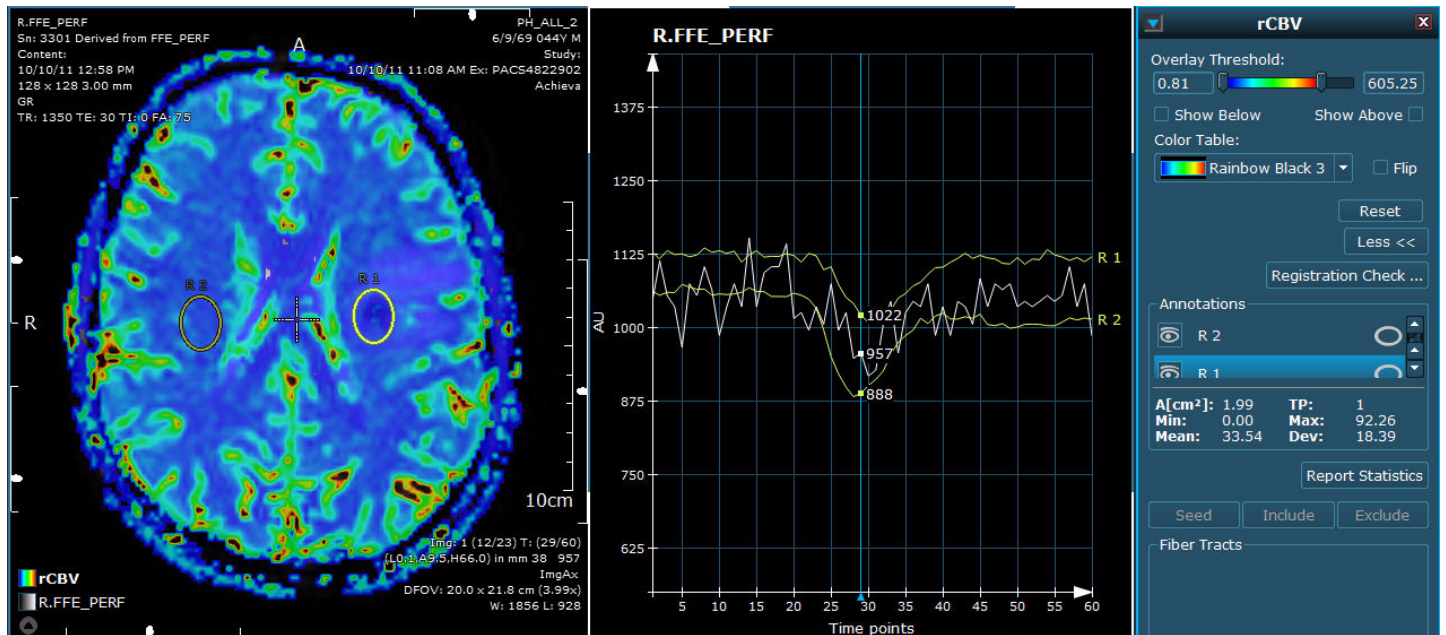
2. Select a new parameter map to display.

3. Repeat Step 1 for each parameter map.

4. Compare the values.

Evaluate a Study in NeuroQuant Review

Invivo has partnered with CorTechs Labs to provide NeuroQuant quantitative analysis within DynaSuite Neuro as an optional add-on. NeuroQuant, developed by CorTechs Lab, is a package that allows you to review the volumetric analysis, an age-related report and a general morphometry report

As a prerequisite to generate the NeuroQuant results, an acquisition of t1 images is needed and NeuroQuant needs to be available and connected to DynaSuite Neuro. Then data is automatically processed and displayed in customizable, predefined layouts.

A high-resolution 3D T1-weighted, sagittal, non-contrast-enhanced MRI image is needed for creating the following NeuroQuant results:

- A full-volume spatially corrected and anatomically labeled dataset in axial, sagittal and coronal orientation

- Two printable patient reports Age-Related Atrophy Report and General Morphometry Report containing the absolute and relative volumes of the hippocampus, temporal horn, and other structures.

NeuroQuant provides two reports from its volumetric analysis. Each NeuroQuant report and the multi-planar images can be analyzed in DynaSuite Neuro with the Age-Related or Morphometry report application hangings.

- **Age-Related Atropy Report**: provides absolute and relative volumes of brain structures that are automatically compared to age-appropriate reference distributions.

- **General Morphometry Report**: provides absolute and relative volumes for brain structures that result in an Asymmetry Index, which displays the difference between the left and right volumes divided by their mean.

Figure 4-29 Age-Related Hanging
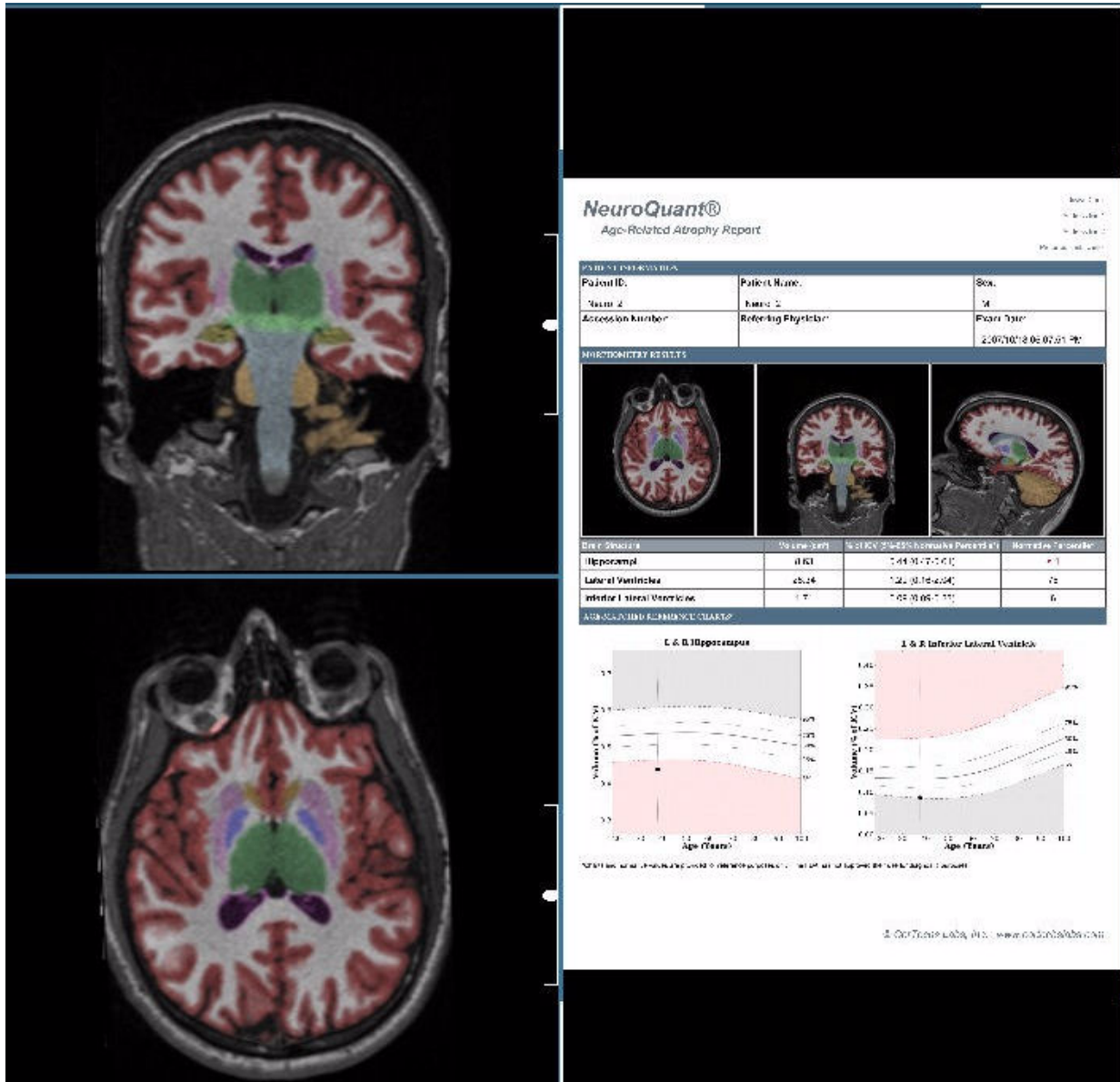
Figure 4-30 General Morphometry Hanging
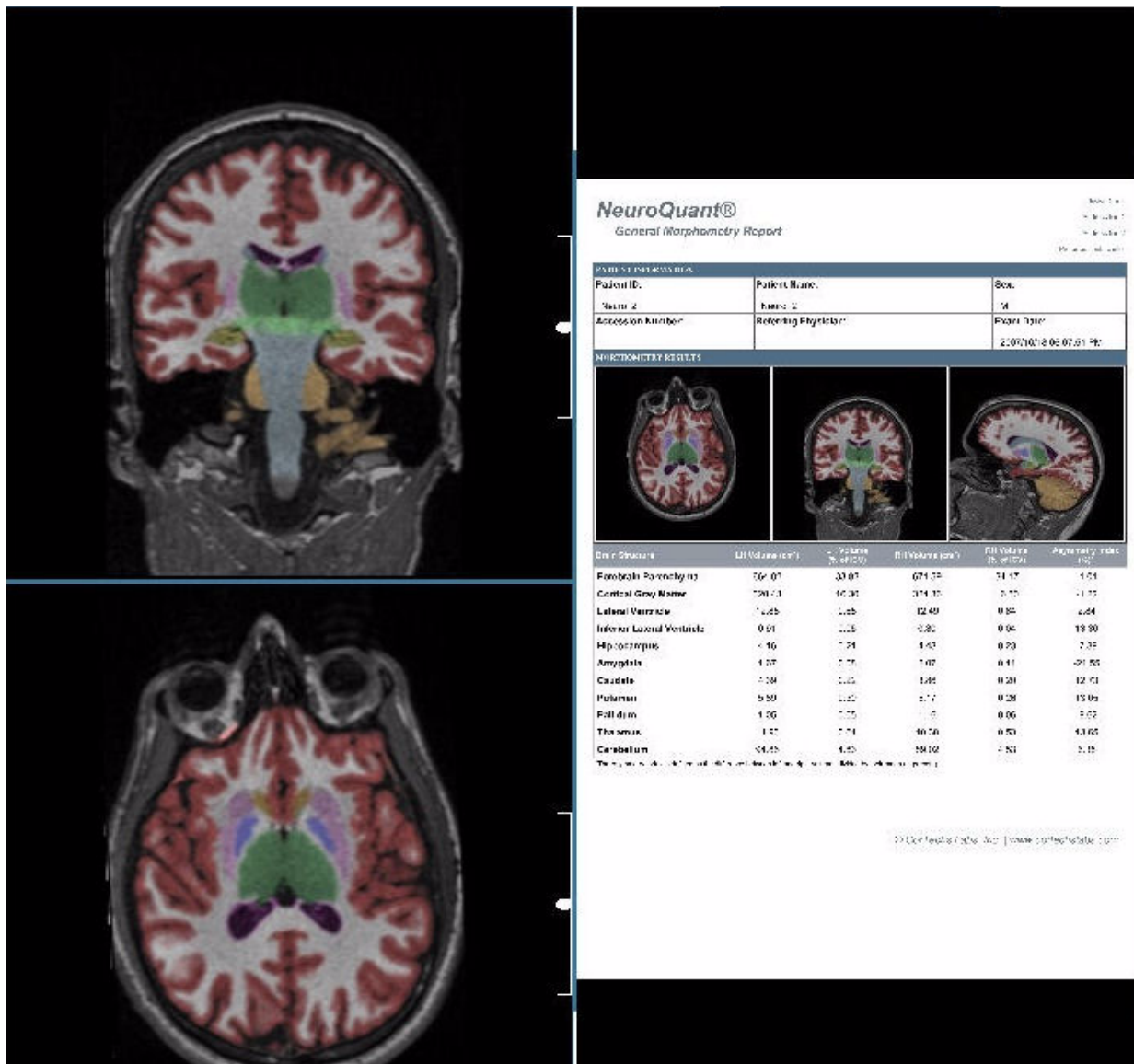
Create Results

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**.

   - Alternatively, press *Ctrl+R*.

2. Click a viewport to save the snapshot.

   - 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 results folders are listed.

   • Click the arrow 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.

Export a Result Image

Use this procedure to export result images.

1. From the Side panel, click the desired results folder.

2. From the Results list, right-click the desired result object and select **Export**.

   • The Export window (Figure 4-31) displays.

Figure 4-31 Export
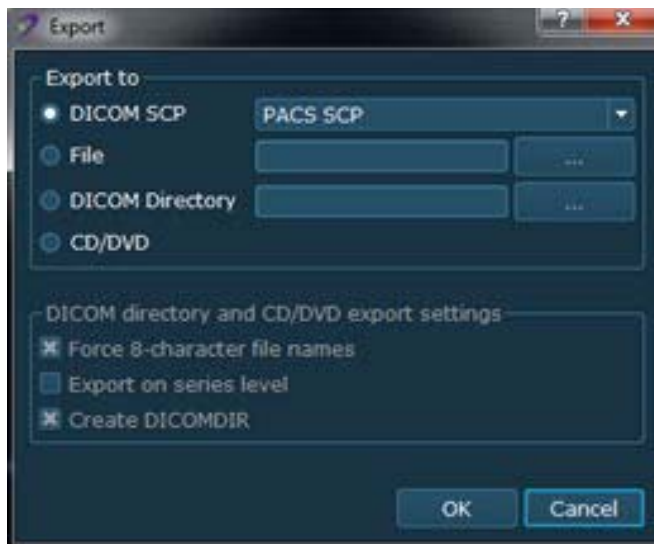
3. From the Export to area, select the location you want to export to.

4. From the DICOM directory and CD/DVD export settings area, define the export directory structure.
   - Select **Force 8 Character Filenames** to make sure that the file names of the exported files are not longer than eight characters.
   - Select **Export on series level** to place the files are placed in a directory per series (not per study).
   - Select **Create DICOMDIR** to place the files in a DICOM CD compliant directory (including the readme.txt and DICOMDIR files).

5. Click **OK**.

Export an AVI file

Use this procedure to export an image series of slices/time points as an AVI file.

1. From the Viewport Context menu, select **Results > Export AVI**.

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

3. Select the path and the file name for the new series.

Export to a Surgical Navigation System

Use the following procedure to export results to a surgical navigation system.

1. Display a base image and an overlay image in the viewport.

    • As a base image, it is possible to use an anatomical image.

    • As an overlay, it is possible to use an fMRI activation map, all visible fiber tracts, and/or vessels.

2. Use one of the following methods to select the export feature.

    • From the ◣◢ **Pie Context menu > Results > Export to Surgical Navigation System…**.

    • From the Pie menu, select the 📷 **Create Snapshot menu > Export to Surgical Navigation System…**.

3. From the Surgical Navigation System Export window, select the export location.

    • The choice is dependent upon your configuration; the exported surgical navigation results will be imported via a DICOM node or CD/DVD.

4. Select **Fuse Base Image and Overlays** to export as fused images.

    • This selection should be made if required by the surgical navigation system.

    Figure 4-32 Surgical Navigation System Export
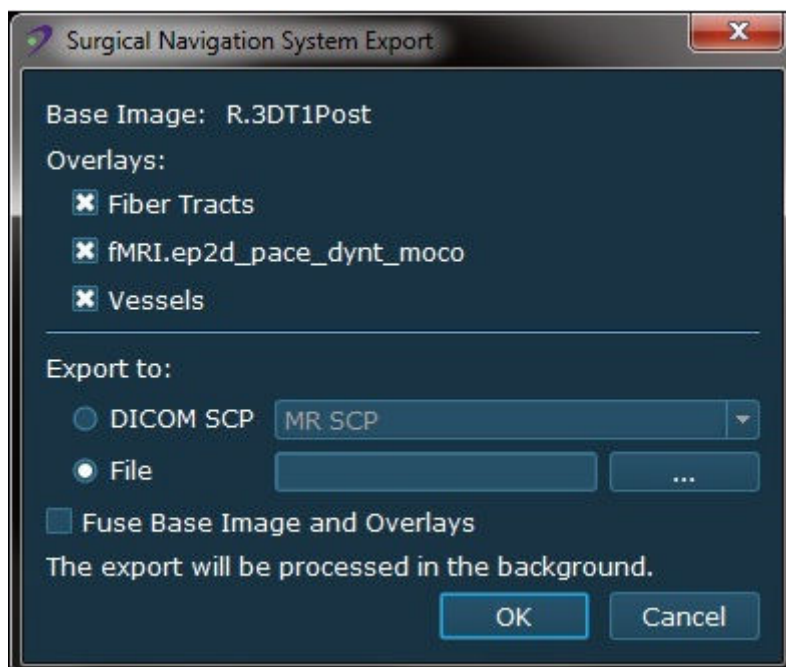
5. Click **OK**.

    • A message displays after the result is exported.

Create Reports

The report tool can only be used when a study is opened. Report templates applicable to the study may be generated during preprocessing and may be edited to include detailed study information, comments, impressions, etc. A report cannot be opened by two users simultaneously.

Create a New Report

1. From the Side panel, right-click the **Reports** heading and select **Create New Report**.

2. Select the desired type of report.

3. Double-click the new report in the Reports section to open the report form.

4. Review and complete the form.

   - By using DICOM headers, some study data will automatically be included in the report.

   - Result images are added automatically.

5. Select report options, as needed.

   - Click **Export as CSV...** to save the report to a .csv file.

   - Click **Store Report** to save the report as a DICOM report.

     – DICOM reports are listed in the result folders.

   - Click **Send to PACS** to send the report to a connected PACS.

   - Click **Print Preview** to see a preview of the report including the result images.

   - Click **Revert** to revert the report to the last saved state.

   - Click **Save** to to save the report when you have made changes to the form.

   - Click **Close Dialog** to close the Report tool.

     – If you have not saved your report, a message prompts you to save your changes.

Export a Report

1. From the Side panel, click the **Reports** heading to view the list of available reports.

2. Right-click a report and select **Export**.

3. Select the filename and location of the exported report.

4. Click **OK**.

Edit an Existing Report

1. From the Side panel, click the **Reports** heading to view the list of available reports.

2. Double-click a report to open the form in the Report Editor.

   • Alternatively, right-click on a selected report and select **Open in Editor**.

3. Edit the desired fields.

Close a Study

Use one of the following procedures to 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 worklists for further review.

  – Completing a study closes it and removes it from the worklists.

Changes performed to a study are saved and visible to other users upon deferral or completion.

Defer a Study and Open the Next/Previous

Press *F12* to defer the current study and open the next one in the worklist.

Press *F11* to defer the current study and open the previous one in the worklist.

Remove a Study from the Worklist

1. From the Studies section, right-click the desired study.

2. Select **Remove**.

   - The study is removed from its worklist, but not from the workspace.

   - The study can be reopened via the Patient Browser.

Display Tools

Introduction

This chapter describes the DynaSuite 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.

Use the following procedures to work with the display tools.

- Adjust the Window/Level

- Select a Current Point

- Stack Through Slices or Time Points

- Stack Automatically Through Time Points or Slices

- Zoom

- Pan

- Rotate

- Annotate

5-1

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 **Ctrl+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 right mouse button to activate the mode and move the mouse as described above.

   Ⓝ

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

Select a Predefined Window/Level

The window/level settings can be saved and recalled. A number is defined for each preset. The presets are only available for the image types for which they were defined. Use this procedure to select a predefined window/level value.

1. From the Pie menu, click ⚙ **Window/Level**.

2. Click the arrow and select a predefined setting.

   - Alternatively, click the ⬇ **Pie Context menu > Tools > Window/Level** and select the desired preset.

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.

Place 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, click the **Pie Context menu > 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 the ⬛ **Fast Stack menu >** ⬛ **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 ⬛ **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 (Figure 3-18).

  - 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).

> 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 **Fast 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 ▮ **Fast 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, click the ⬡ **Window/Level menu >** 🔍 **Zoom**.

    - Alternatively, from the Pie menu, click 🔍 **Zoom**.

    - Alternatively, from the Context menu, select **Tools > 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 5-1 Zoomed image: CSP (1), Scale (2), and Magnification Factor (3)

N
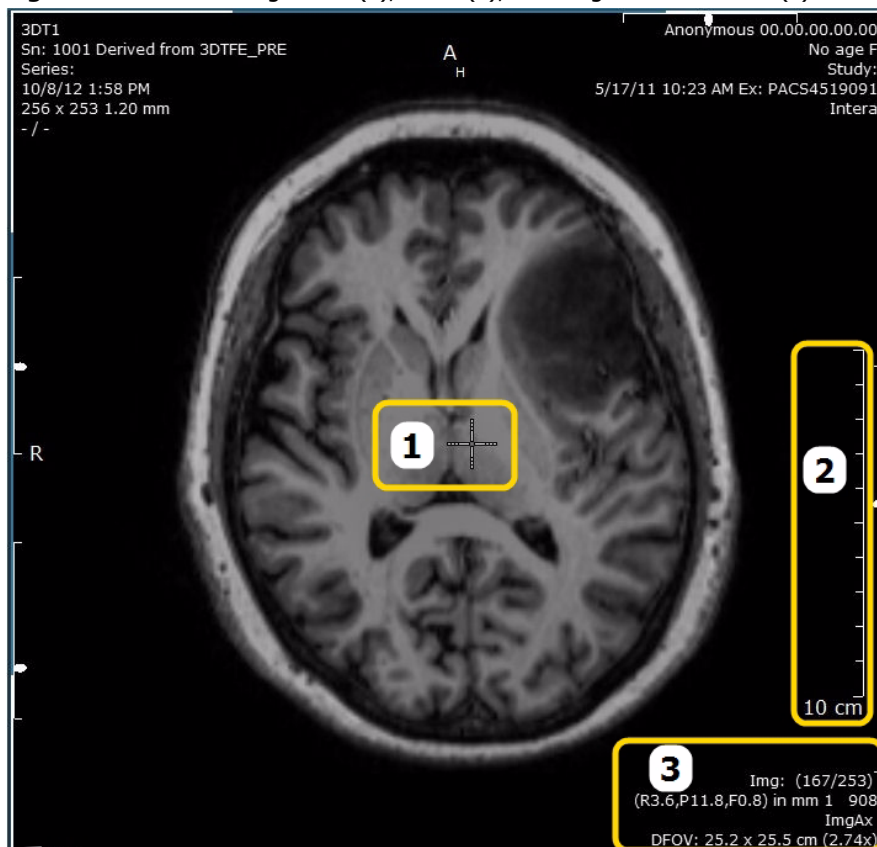
The magnification factor and scale units are labeled with "(PS)" for Pixel Spacing or "(proj.)" for Imager Pixel Spacing on all images with potential radiographic magnification.

Figure 5-2 Magnification Factor: Imager Pixel Spacing
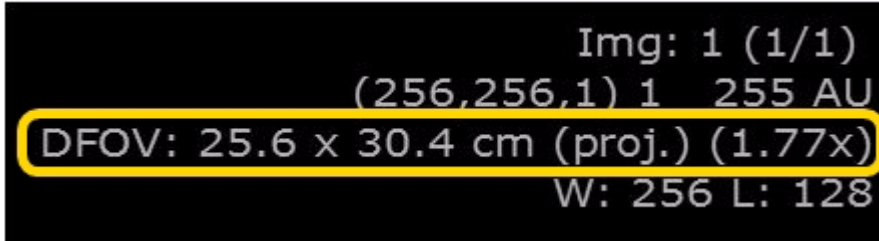
Pan

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

1. From the Global toolbar, click the ![icon] **Window/Level menu > Pan**.

   - Alternatively, from the Pie menu, click the ![icon] **Zoom menu >** ![icon] **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, click the [icon] **Window/Level >** [icon] **Rotate**.

    • Alternatively, from the Pie menu, click the [icon] **Zoom menu >** [icon] **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 5-3 Rotate Tool
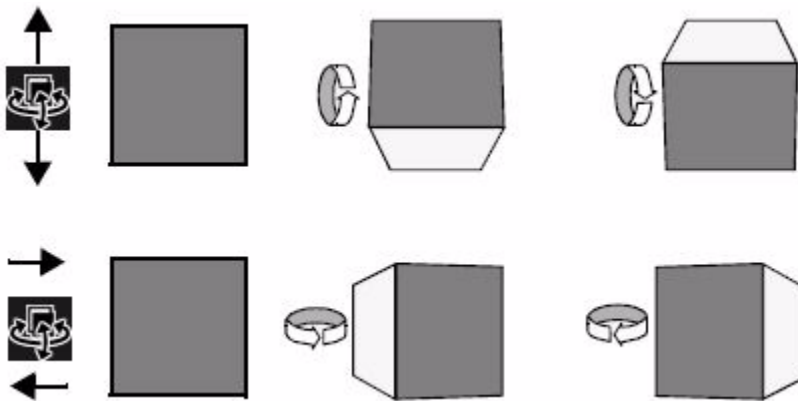
Rotate by 90°

1. From the Pie menu, click the [icon] **Orientation menu >** [icon] **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 [icon] **Orientation menu >** [icon] **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°.

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Annotate

Measurements are calculated by using conversion factors provided by the data source. Please refer to the manuals of the data source for accuracy claims.

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 **Freehand ROI 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.

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

All measurement units calculated for images with potential radiographic magnification are labeled with the suffix "(PS)" for Pixel Spacing or "(proj.)" for Imager Pixel Spacing.

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 Double Lines

Use the Double Line tool to create angles. Each line is labeled with a line number and it's length. Another label gives the degree of angle between the two lines.

1. Select the 📐 **Double Line** 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 [icon] **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.

[N icon]

> 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 [icon] **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 icon] **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 icon] **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 icon] **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 the Context menu of the arrow to set its display to thin.

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.

Chapter 6

Displayed Information

Introduction

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

Use the following procedures to work with the image information display.

- Overlay Image Information
- Display Scanlines
- Display DICOM Tag Information

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 Scanlines

A scanline is a line indicating where the current slice intersects the image displayed in the active viewport.

Scanlines can be switched on for individual viewports. When scanlines are switched on, the viewport displays scanlines corresponding to the currently active viewport (marked by white corners).

Figure 6-1 Scanlines: First and last slice (1) and Slice number of scanline (2)
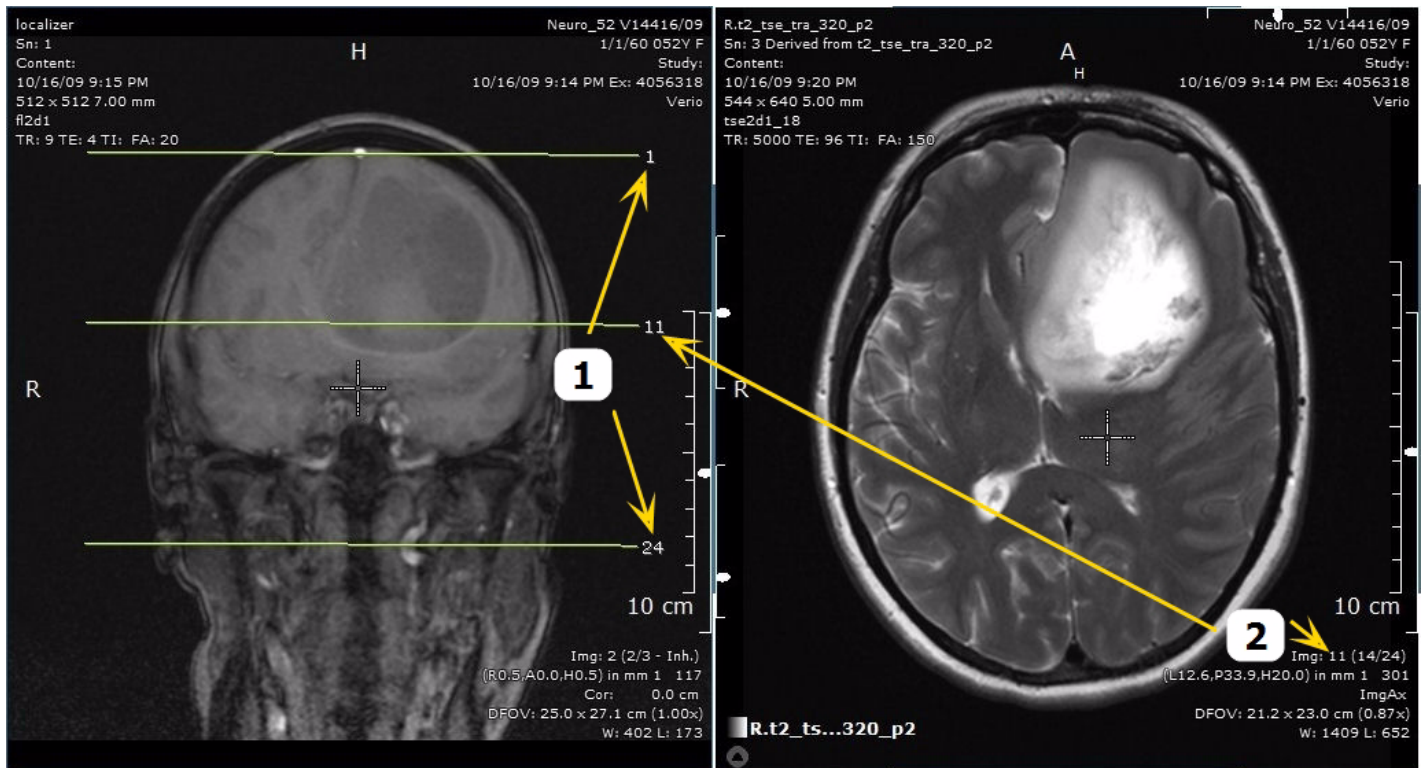
The display of scanlines requires the viewports to display image series that use the same coordinate system (DICOM frame of reference); also, the series must be sufficiently perpendicular to each other.

Show Scanlines

1. From the Pie menu, click the [icon] **Context menu**.

2. Select **Inspector Setup > Scanlines > Show**.

3. After you have activated the scanlines, click in a different viewport to display the scanlines for that dataset.

    •   Initially, the first, last, and current slice scanlines are shown in the viewport.

Hide Scanlines

1. From the Pie menu, click the **Context menu**.

2. Select **Inspector Setup > Scanlines > Hide**.

    *   Any scanlines are switched off.

Show Scanlines in Localizer Only

1. From the Pie menu, click the **Context menu**.

2. Select **Inspector Setup > Scanlines > Show in Localizer**.

    *   The scanlines are only displayed when the viewport displays a localizer series. If you drag another image series to the viewport, the scanlines are switched off until a localizer scan is displayed again.

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.
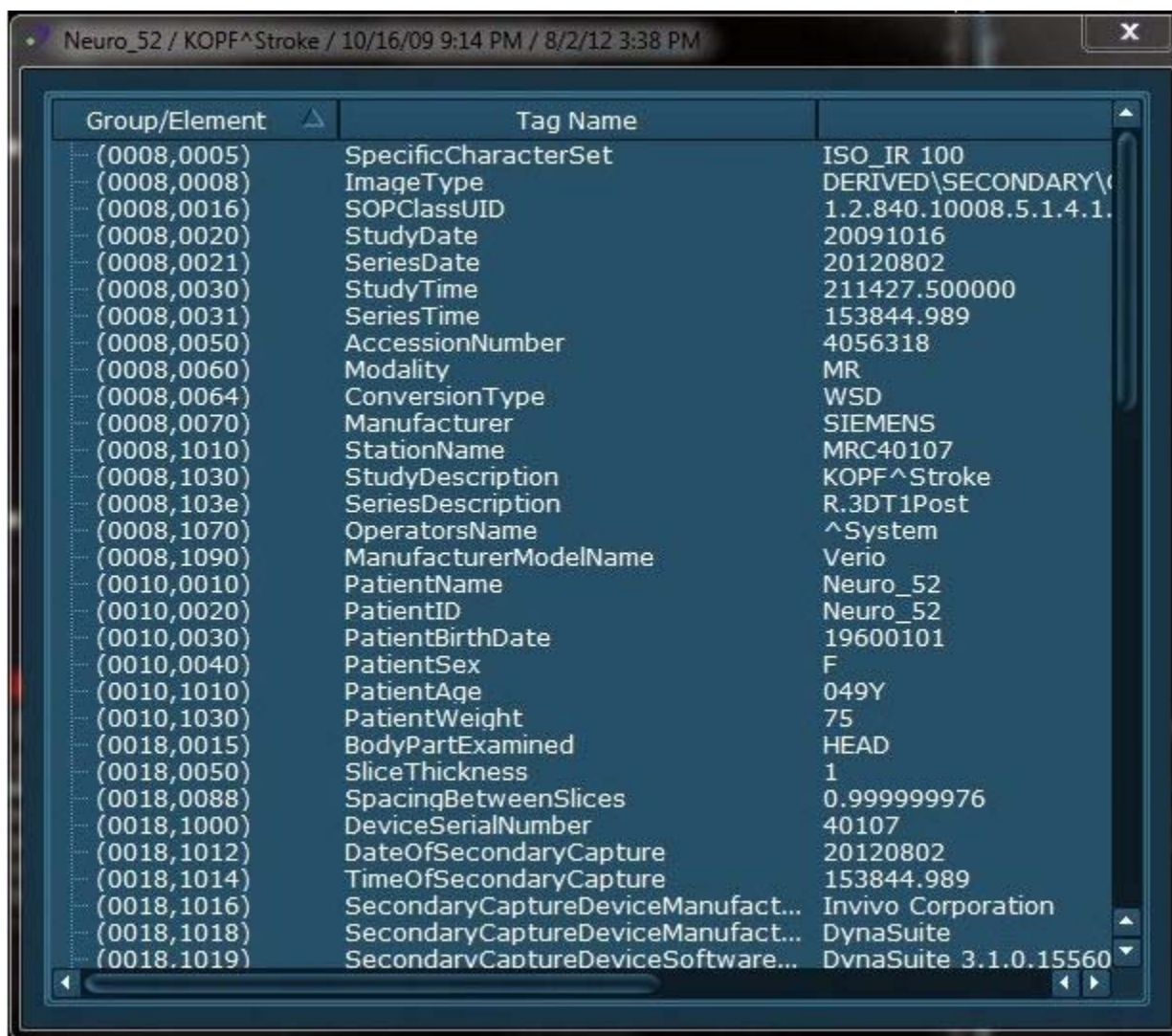
1. From the Pie menu, select the **Context menu**.

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 6-2 DICOM Tag Information

Chapter 7
Image View

Introduction

This chapter describes the various ways to view your images.

Use the following procedures to display various image views.

- Manipulate the Image Orientation

- Create Slabs and MIPs

- Subtract Images

- Synchronize

- Use Presentation Sets

- Automatically Interpolate 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.

   - Oblique orientation options are available for image series not taken in the standard 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 **Shift+S** to increase the slab size.

     – Press **S** 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 (Figure 3-18).

   - 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 $_{tc}$) and the reference image (time point $_{t0}$).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.

     – None (original data): switches Subtraction mode off

     – Absolute Difference: negative values are displayed bright

     – Difference

     – Truncated Difference: negative values are displayed black

   - 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 t0: from the Context menu, select **Subtraction Settings > Reference Time Point**.

   - Only available in Expanded mode.

3. Define a time point $_{tc}$ for subtraction: Click and drag the **Time Point** slider to select the desired image.

   - It is not possible to define tc = t0, 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 ![icon] **Synchronization menu > ![icon] Show Synchronization Options**.

    -   The Synchronization menu is only available in the Expanded mode.

    -   A list of synchronization options opens.

    Figure 7-1 Synchronization Options
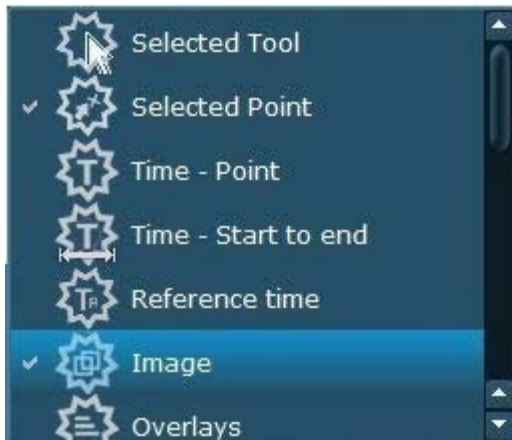
2. Drag options from the Synchronization Options list to the list of another viewport.

    -   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, click the ![icon] **Window/Level menu >** ![icon] **Crosshair**.

    - Alternatively, from the Pie menu, click the ![icon] **Zoom menu >** ![icon] **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 ![icon] **Fast Stack menu > Register Currently Selected Point**.

Turn Off/Remove Synchronization

To temporarily turn synchronization off:

- From the Global toolbar, click the ![icon] **Synchronization menu >** ![icon] **Syncronization 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 ![icon] **Fast 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 [icon] **Synchronization menu >** [icon] **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.

[N icon]

> 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.
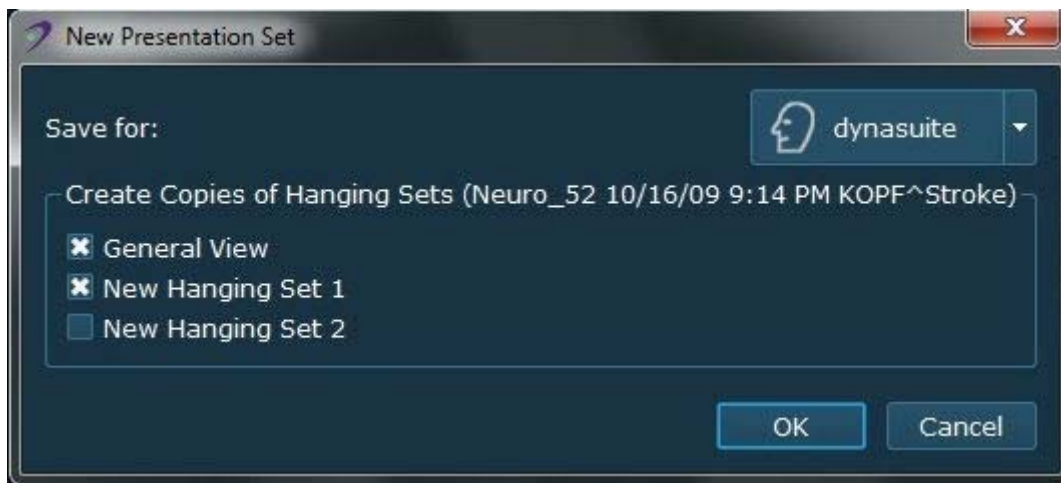
Use Presentation Sets

Presentation sets are hanging sets that can be created for a user or user group. Presentation sets maintain states, e.g., window/level and annotations. They are available to all users. If you open a presentation set created by another user, a warning message is displayed.

Create a New Presentation Set

1. From the Applications section title context menu, select **Create New Presentation Set**.

   Figure 7-2 New Presentation Set Dialog

2. From the New Presentation Set dialog (Figure 7-2), select the hanging sets to save in the presentation.

3. Select the user or user group you want the presentation set assigned to.

4. Click **OK**.

Delete a Presentation Set

1. From the Applications section title context menu, select **Delete Presentation Set**.

   • Presentation sets can only be deleted by an administrator or by the users assigned to the presentation set.

Apply a Presentation Set

1. From the Applications section, click the double arrow in the title bar.

   Figure 7-3 Applications Section Presentation Sets
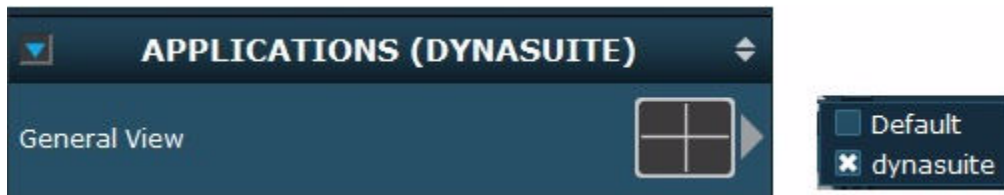
2. Select a presentation set from the list.

   • The currently used presentation set is shown in parenthesis in the title bar of the Applications section.

   • The standard presentation set is called Default.

Annotate and Report

Presentation sets also contain the annotations. The "Default Presentation Set" is generated by the first user reviewing the study. If a second user reviews the study simultaneously, the annotations in the default presentation set cannot be modified by the second user.

If the second user opens the study after it has been deferred by the first user, the second user can modify the default presentation set (e.g., edit existing and add additional annotations).

Every user can create additional presentation sets with their own annotations for presentation purposes, etc.

Only one user can create results or reports for a study at the same time. Reporting is automatically locked for a study when a user begins adding snapshots, working with result folders or working with the Reporting tool. Deferring the locked study will release the reporting lock and allow other users to change or update the report.

7-9

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

Chapter 8
Printing

Introduction

DynaSuite offers a printing tool for printing results and original data. The print tool allows you to print on normal printers, as well as to perform DICOM printing on DICOM comaptible film printers.

Use the following procedures to print images and results.

- Open the Print Tool

- Add/Delete Images, Series, and Results

- Add/Remove/Restore Images, Series, or Results

- Modify an Image Arrangement in Print Preview

Open the Print Tool

1. From the Global toolbar, click [🖨] **Print Tool**.

   • The Print Tool dialog box opens.

2. Click Print to print the images with the selected settings.

Figure 8-1 Print Tool
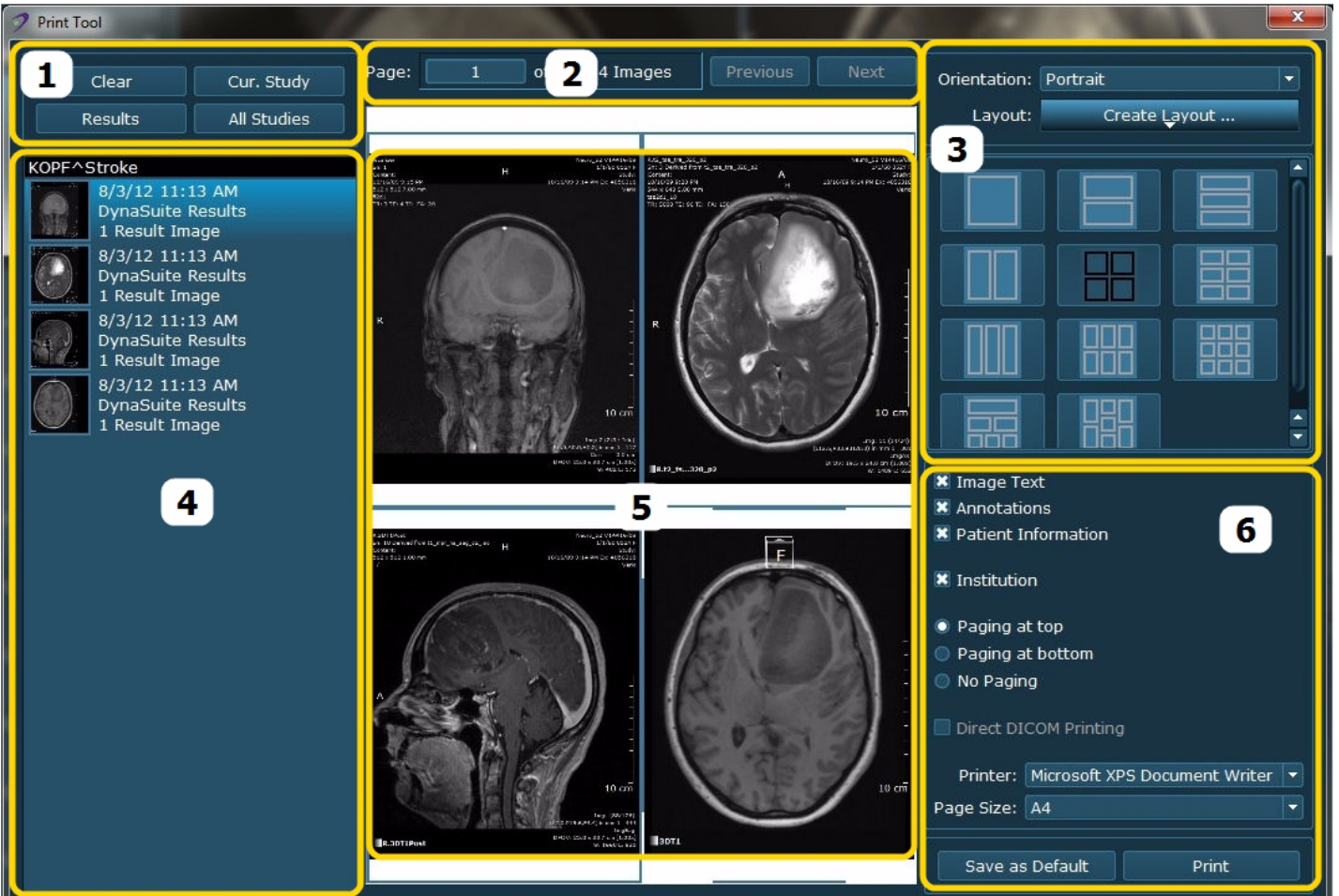
Table 8-2 Print Tool Options

Reference Number	Name
1	Default options for image selection
2	Page selection
3	Layout settings
4	Image Overview list with study description
5	Print Preview area
6	Printer settings

Add/Delete Images, Series, and Results

Use the following options for image selection to add and delete image series and results.

- Click **Clear** to remove all images and results from the Image Overview list and from the Print Preview area.

- Click **Results** to add all result images from the study to the Image Overview list.

- Click **Cur. Study** to add the series from the current study to the Image Overview list.

- Click **All Studies** to add the series from all opened studies to the Image Overview list. A warning message informs you that different studies will be placed on separate pages.

Add/Remove/Restore Images, Series, or Results

Add Individual Series/Results

In the Print Tool, drag image series icons or result icons from the study list to the Image Overview list.

- You can include studies from different patients; a warning message informs you that different studies will be placed on separate pages.

- You can drag an image series into the Print Tool more than once. This is useful when you want to print different variants of the same series.

Remove an Image Series or Result From Image Overview List

1. Select the series in the Image Overview list.

2. Press **Delete** or **Backspace**.

   - Alternatively, from the Series context menu, select **Delete Image Set**.

   - Alternatively, from the Print Preview context menu, select **Remove Corresponding Image Set**.

Remove Individual Images From Print Preview

1. Select the image in the Print Preview area.

2. Press **Delete** or **Backspace**.

3. Alternatively, from the Print Preview context menu, select **Remove Image From Page**.

Restore Removed Images

From the Image List or Series context menu, select **Show Removed Images**.

Modify an Image Arrangement in Print Preview

The Print Preview area allows you to check the images you have selected to print.

Change the Image Order in Print Preview

Drag the image series or results to the desired position in the Image Overview list.

- The order of the images in the Print Preview area updates to match the order of images in the Image Overview list.

Select Specific Image Sections to Print

You do not have to print the complete image series, but can define specific range and order of images to be printed.

Open Print Image Details dialog box:

1. Double-click the image icon in the Image Overview list.

   - Alternatively from the Image Series context menu, select **Detailed Print Settings**.

2. Select one of the following options from the Print Image Details window.

   - **All:** All images (slices) are printed.

   - **Print Range:** The selected range is printed. You can select slices or time points "from-to", in steps (every 2nd, 3rd etc. slice/time point), or a specific total number of images (images will be evenly distributed throughout the slices/time points).

   - **Reverse:** The images are printed in reverse order.

   - **Group by Time Point:** If selected, the images are sorted by slices per time point, otherwise the image are sorted by time points per slice.

   - **Pagination:** You can choose to have each series print in a new row, on a new page, or to print continuously.

Chapter 9

Troubleshooting

Introduction

This chapter describes the following Troubleshooting topics.

- Reprocess an fMRI Series

Reprocess an fMRI Series

Use this procedure to reprocess an fMRI series that has been performed using a non-standard paradigms, where you need to specify the correct processing parameters.

1. From the Side panel, select the study that you want to reprocess a series.

2. Select an original fMRI series that includes slices and time points.

3. Right-click the series and select **Apply Advanced Processing Rules**.

4. Select the type of rule you want to apply.
   - Select **Neuro fMRI Siemens** if you have a Siemens system.
   - Select **Neuro fMRI Preprocessing** for all other systems.

5. From the Advanced Processor Parameters window, set the timing parameters (**Duration of activation, Duration of rest**, **Start with activation**, and **Offset** of dummy scans) based on the current study.

Figure 9-1 Example Advanced Processor Parameters
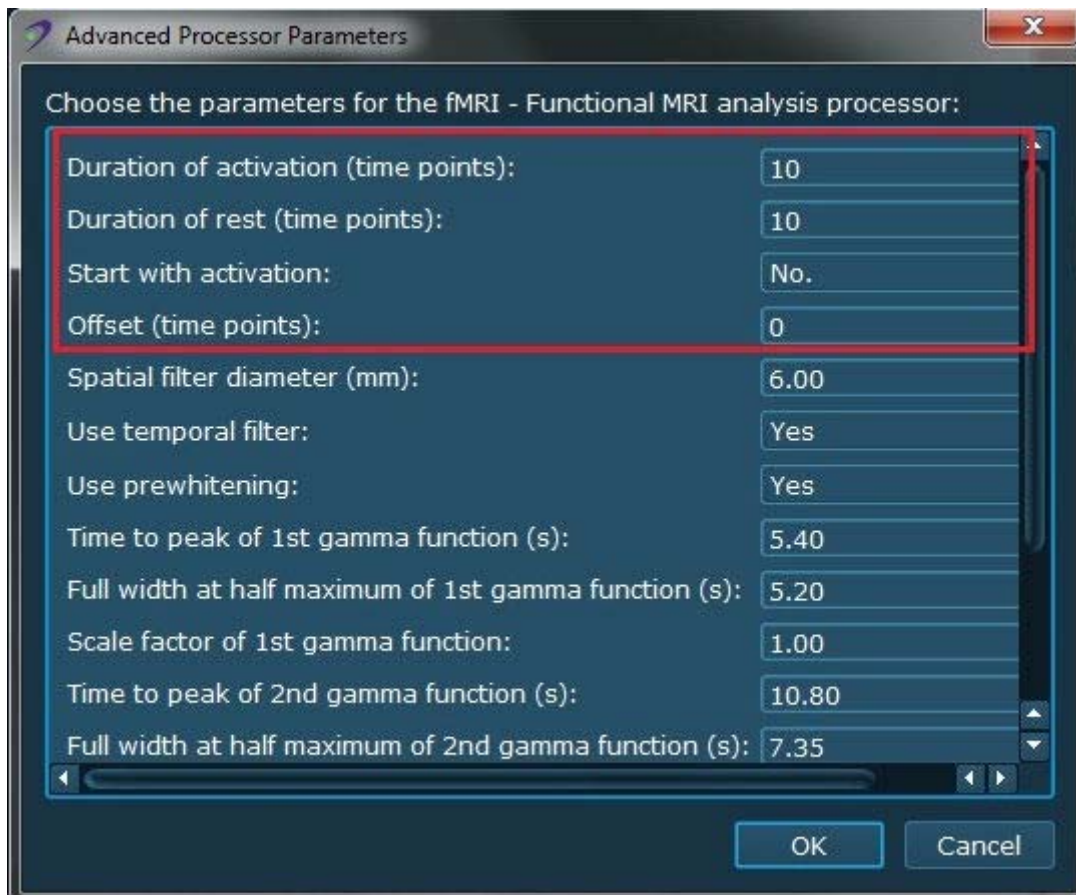
6. Click **OK** to reprocess the fMRI series.

7. Open the study to view the results.

Appendix A

Keyboard Shortcuts

Table A-1 shows the default settings for the keyboard shortcuts. An administrator can modify the settings for each user.

Table A-1 Keyboard Shortcuts

Shortcut	Description
Navigation	
Up arrow/down arrow	Next/previous slice
Right arrow/left arrow	Next/previous time point
Ctrl+G	Go to slice number
Alt+left arrow	First time point
Alt+right arrow	Last time point
Ctrl+E	Combined automatic stacking
Ctrl+Shift+E	Stack (ESM)
Image Orientation	
Alt+A	Axial
Alt+C	Coronal
Alt+S	Sagittal
Alt+(left mouse button+drag)	Rotate MIP/oblique reformat
Image Rendering	
Ctrl+Shift	Zoom tool
+/-	Increase/decrease zoom factor
*****	Fit to size
Alt+(left mouse button+drag)	Rotate
Ctrl+Shift+F	Full Screen mode
S	Decrease slab
Shift+S	Increase slab

Shortcut	Description
Annotation	
Delete	Delete active object, e.g., annotation
Shift	Allow use of the ROI tool or if the Annotation tool is already active, to draw an annotation or cutline close to another
F	Select finding marker tool
Common Options	
Ctrl+H	Hide application
F1	Show software version/manual
F2	Open Patient Browser
F3	Open Report tool
F4	Open Print tool
F6	Transfer study
F7	Open previous hanging
F8	Open next hanging
F9	Open previous hanging set
F10	Open next hanging set
F11	Close study and open the previous one
F12	Close study and open the next one
Ctrl+I	DICOM overlays toggle
Ctrl+D	Toggle subtraction mode
Results	
Ctrl+R	Screenshot
Ctrl+C	Copy to clipboard
Ctrl+Shift+R	Export to screenshot

Glossary

C

CSP	Currently Selected Point
CT	Computed Tomography
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.

D

DICOM Image	An image (an array of values for image pixels) stored in DICOM format, plus additional tagged information, uniquely identified by SOPInstance UID (as multiframe image it may contain more than one image).

E

ESM	Every Slice Mode

G

GUI	Graphic User Interface

H

Hanging	An arrangement of viewports and their parametrization (including the assignment of images to be shown and the descriptors which may be used to determine this assignment). The state of a hanging (image arrangement, window/level, annotation, reformatting, etc.) is remembered when the hanging is closed and the state is used when the hanging is reopened.
Hanging Protocol	A rule (which may be applied to a study if its images match certain descriptors) for creating a set of hangings.
HU	Hounsfield Unit value

I

Image Set	A (sorted) set of images from a DICOM series (e.g., representing a 3D data volume).
Important	Indicates information where adherence to procedures is crucial to ensure correct results and achieve optimal performance.
Interpolation	A method of constructing new data points within the range of a discrete set of known data points.

M

MPR	Multi-planar reformation
MR	Magnetic Resonance

N

Note   Provides additional information that is helpful to you. It may emphasize certain information or clarify a particular step or procedure.

P

PACS   Picture Archiving and Communication System

R

RIS   Radiology Information System
ROI   Region of Interest

S

SCP   Service Class Provider
System   Used here as a term to describe the softcopy reading and post-processing software product including the hardware it runs on.

V

VOI   Volume of Interest

W

Warning   Used to identify procedures that you must precisely follow to avoid injury to yourself or others.

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