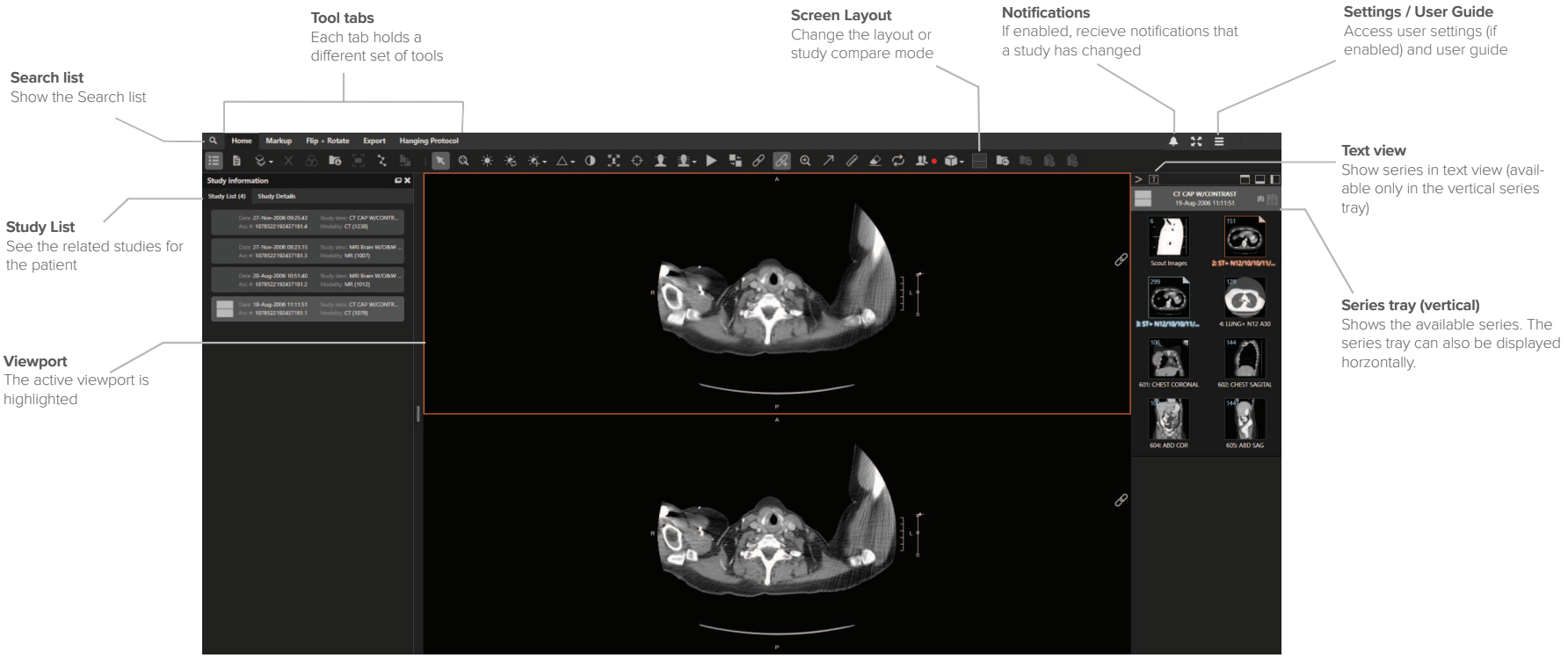
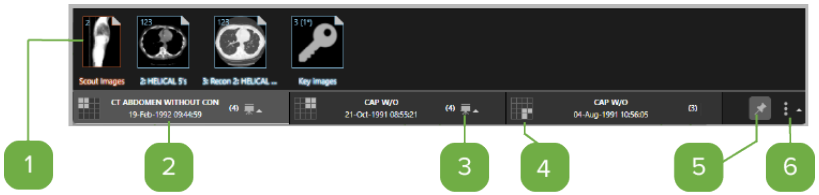
eUnity 7.7 Radiology Quick Start Guide

This document is not intended to be comprehensive. It is intended only as a quick reference or as a training support. Please see the eUnity User Guide for the complete product documentation.

eUnity is a zero-footprint diagnostic imaging viewing application for accessing full quality medical images on any web browser. Log in from a worklist manager or directly through a URL depending on your site's configuration. For example: http://localhost.



Series Tray (horizontal)



1 Series thumbnail view

Click the series thumbnail or drag it into a viewport to open it. The active series is outlined in orange. The series in view but not active are outlined in blue. The folded corner means at least one image was viewed in the series.

2 Study folder

Each rectangular folder represents a study that is available for the patient. The lighter gray background is the study that is currently active in the series tray.

3 Presentation state indicator

Presentation states available for the study. Click to select a presentation state.

4 Study position indicator

Study position on the screen. If no indicator is shown, the study is not in view.

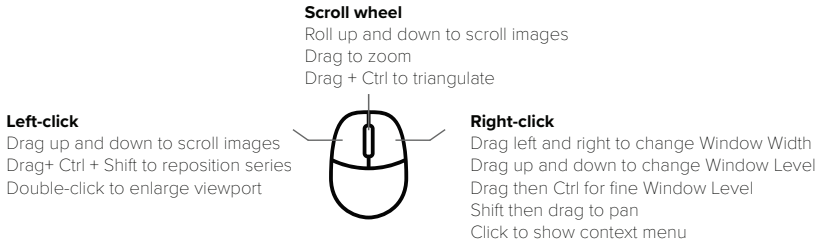
5 Pin the series tray

Pin the series tray in position or unpin it so that it is hidden when it is not active.

6 Reposition the series tray horizontally or vertically

Reposition the series tray at the top, bottom, left, or right of the screen.

Default mouse actions



View keyboard / mouse shortcuts

- To see the keyboard shortcut for a specific tool, hover your cursor over the tool on the toolbar.
- To see a list of all your keyboard shortcuts, in the upper-right corner of the viewer, click ☰ > List Keyboard / Mouse Shortcuts.

Customize the Toolbar or Context Menu

1. In the upper-right corner, click ☰ > Toolbar or Context Menu.
   - To add a tool, click ✚.
   - To move a tool, click and drag the ✣ handle beside the tool.
   - (Context menu only) To make a menu item available only for certain modalities, click ✎. Choose the modality types and click OK.
   - To remove a tool, click 🗑.
2. Click Save to save the changes. Click Reset to set back to default values.

Tools

Home

Study List (if available)

Open a panel containing information grouped into the following tabs: Study List, Study Details, Report, and Notifications.

Report / Comments

Open the study report in the Study Information panel, if available.

Navigate

Navigate study images using the mouse wheel, a left-click drag, touch drag, touch pad drag, or the up and down cursor keys.

Zoom / Pan

Zoom in on or pan an image in the selected viewport.

Window Level

Change the Window Level for the selected image.

Reset Window Level

Reset the images to their original Window Level settings.

Window Level Presets

Select a predefined Window Level.

Image Sharpening Presets

Click to apply a preset sharpening algorithm on an image in a viewport. Presets are configurable by the system administrator.

Invert Brightness

Click to apply a monochrome inversion to the selected series.

Toggle Demographics

Click to cycle through the demographic overlay levels (Full, Partial, and None) in the viewport. Note that partial overlays must be enabled by your administrator.

Triangulation

Navigate to a selected point in orthogonal series.

Reference Lines

Show where the selected image intersects other images from different planes.

Multiple Reference Lines

Project reference lines from multiple series onto the selected series.

Toggle Cine mode / Play video

Play a series of images in succession (like a movie) or play a video.

Series Reposition

Swap series between viewports.

Link Studies

Link series across all studies to apply zoom, pan, scroll, and optionally window level actions across all series from the same plane.

Link Active Study

Link series only within the active study to apply zoom, pan, scroll and optionally window level actions across series from the same plane.

Magnifying Glass

Click to enable the Magnifying Glass tool and magnify an area of an image. You can have up to four magnifying glasses open at a time.

Revert to Original

Revert a series to its original presentation.

Share this Session

Share your screen with other participants across all supported eUnity platforms (desktop web browser and mobile devices).

Screen Layout

Access study compare mode or change the layout of each monitor.

Markup

To draw markups, either left-click and drag or left-click to start the markup and left-click again to end the markup. To cancel the markup once you have started it, right-click or press the Esc key.

Markup Color Picker

Use the Markup Color Picker on the toolbar to select a color for a measurement or annotation. Use the Markup Color Picker on the context menu to edit the color of existing markup.

Eraser

Erase a measurement or annotation.

Measurement tools

Angle Measurement

Measure the angle between anatomical structures.

Caliper tool

Use the caliper tool to draw a line that intersects 2 parallel lines and measures the distance between the 2 parallel lines.

Cobb Angle Measurement

Measure angles using two separate, disjoint lines.

Linear Measurement

Measure length in mm or measure time and velocity for echo ultrasound. Time doppler ultrasound regions will create peak velocity with a single click.

Multi-Segment Measurement

Measure the distance of curved anatomical structures using multiple straight lines.

Perpendicular tool

Use the perpendicular tool to draw two lines that intersect at a 90° angle and provide a measurement of each line.

Ratio tool

Use the ratio tool to draw two separate lines and provide a measurement of each line as well as the ratio of the length of the first line (x) to the second line (y). That is, x/y.

Toggle Markup

Hide or show markup on images including markup on presentation states.

ROI tools

Display the Area, Perimeter, Radius, Average and Standard Deviation of the region of interest (modality-specific). The following additional values can be configured to display: ROI Pixel Count, ROI Size, ROI Minimum SUV, ROI Maximum SUV, ROI Updated SUV Parameters, ROI Min and Max values. Hounsfield (HU) is displayed for CT. SUV measurement is displayed for PET / CT.

Circle ROI

Draw a circular region of interest.

Ellipse ROI

Draw an ellipse region of interest.

Freeform ROI / Doppler Envelope

Draw a freeform region of interest. For cardiology, peak and mean velocity and peak and mean gradient are shown.

Trace ROI

Draw a region of interest using multiple curved lines.

Point Tool

Measure the value of a specific point.

Rectangle ROI

Draw a rectangular region of interest.

Annotation tools

Arrow

Add an arrow annotation.

Circle

Add a circle annotation.

Ellipse

Add an ellipse annotation.

Freehand

Add a freehand annotation.

Line

Add a line annotation.

Polygon

Add a polygon annotation.

Rectangle

Add a rectangle annotation.

Text Annotation

Click the location that the text should start.

Trace Tool

Outline a curved anatomical structure using multiple curved lines.

Spine labeling

Spine Labeling

Add spine-related labels to images.

Toggle Spine Labeling Markup

Hide or show spine labels.

Delete All Spine Labels

Delete all spine labels in the study.

Export

Export image to JPEG / PNG

Export an image to your local device in JPEG or PNG format.

Paper Print

Print reports, images, or a set of images.

Mammography

Fit to Window

Zoom the identified breast bounding box to fit the viewport and maintain "same size" on each viewport.

Quadrant View

Divide the mammography image into four equally sized quadrants of "same size" to evaluate the entire breast in four separate sections.

Quadrant View Backward

Step through the four quadrants of the image moving backward (counter-clockwise).

Quadrant View Forward

Step through the four quadrants of the image moving forward (clockwise).

Toggle between 2D and 3D series

Switch between a tomosynthesis slice and the 2D reconstructed view for the selected series in a mammography study.

Toggle CAD

Show or hide CAD data in mammography images.

Mark Location

Outline a region of interest with an ellipse and automatically add a line segment that measures from the edge of the ellipse to a landmark such as a nipple.

Flip and Rotate

Flip (Horizontally)

Click to flip the image horizontally in the viewport.

Flip (Vertically)

Click to flip the image vertically in the viewport.

Rotate Left

Click to rotate the image counter-clockwise in the viewport.

Rotate Right

Click to rotate the image clockwise in the viewport.

Free Rotate by Drawn Angle

Rotate the image by a custom amount in the viewport. Draw a line to rotate the image.

Other tools

These tools may not be available by default.

Clone Series

Clone a series so that you can see a copy of the series and the original series in the viewer at the same time. As a shortcut, right-click and drag a series from the series tray into the viewing area to clone it.

Close Clones Series

Close the cloned series and remove it from the series tray.

Close Study

Close the study and remove it from the series tray and the Relevant priors and Switch studies lists, if they are enabled.

DICOM Header

Show the DICOM header data for the selected series or image.

Download DICOM Study

Download the selected study to your local machine as DICOM files contained in a zip file.

Manual Calibration

If the modality-provided calibration is not sufficient, manually set a calibration value for measurements.

Multiphase Tool

Split a multiphase series into multiple phase-based series or sort a multiphase series by phase.

Navigate Study List (Previous)

Open the previous study for the patient.

Navigate Study List (Next)

Open the next study for the patient.

Navigate Relevant Priors (Previous)*

Open the previous relevant prior for the patient.

Relevant Priors List

Shows the list of relevant priors returned by the worklist, including any that were not loaded into the series tray.

Navigate Relevant Priors (Next)*

Open the next relevant prior for the patient.

*Navigate Relevant Priors works only when relevant priors are passed to eUnity via worklist.

Series Page Backward

Move to the previous series page.

Series Page Forward

Move to the next series page.

Switch Studies

Select a study to switch to. If you switch away from a study and then switch back to it, it is reopened to the state in which you left it.

Red Free Filter

Turn on the red free filter to block red and blue wavelengths in color images.

Verify Study

After quality control has been performed on a study, set the study status to "Verified" in the Mach7 VNA Universal Worklist.

Reset Viewer Session

Reset the viewer back to its original launch state and discard unsaved changes.

Advanced Visualization (if available)

Advanced Visualization modes

Select Advanced Visualization modes such as 3D, MPR, Advanced MPR, Curved MPR, and Fusion.

This feature requires a separate license and may not be available. Contact your system administrator to have this feature licensed and enabled.

Viewport Capture

Take a snapshot of the image in the selected viewport when you are in an advanced visualization mode. Viewport captures will be available in their own series and will include any modifications that were made to the original image such as markup, zoom, window level, etc.

Delete Viewport Capture

Delete the selected viewport capture as long as it has not already been saved. This button must be added to the context menu and will be available only after a viewport capture has been created.

Advanced Visualization layouts

Once you are in an Advanced Visualization mode, select a layout. Custom layouts (CST1 and CST2) must be added to the Toolbar.

MPR

Create oblique

To generate new planes, drag the controls corresponding to the color of the viewport you wish to change until desired orientation is achieved.

Curved MPR

Create Curved MPR

Click along curved anatomy in any of the 2D viewports and the perpendicular reconstruction is created in the CMPR viewport.

3D

Clip Box

Cut away some of the volume so that you can better see underlying anatomy. Drag down to move the plane into the volume (cut more). Drag up to move the plane out of the volume (cut less).

Cut Plane

Use the Cut Plane tool to cut away some of the volume at a custom rotation.

Scalpel Tool

Remove or isolate a section of an image by dragging the mouse along the border of the area to segment then clicking on the region you would like to keep.

Fusion

Advanced Visualization Parameters

View or change render types, render parameters, or SUV parameters.

Fusion Presets

Apply presets such as Hot Iron to fused PET / CT studies so that the metabolic data of the PET information is assigned a preset pseudo color value from the Color Look Up Table (CLUT).

Fusion Blending

Left-click and drag the mouse up or down to increase or decrease the PET opacity. Increasing the opacity shows more of the functional (metabolic) data from the PET. Decreasing the PET opacity shows more of the anatomical data from the CT.

Hanging protocols

Hanging protocol navigation

Select Hanging Protocol

This dropdown provides a list of "close match" hanging protocols. Choose a hanging protocol to apply to the current study in the viewer.

Presentation Steps

Click the dropdown arrow to show the available presentation steps for the active hanging protocol. Click a Presentation Step to jump to it.

Hover the cursor over the icon to show which hanging protocol is currently applied.

Backward

Move to the previous presentation step in the hanging protocol.

Forward

Move to the next presentation step in the hanging protocol.

Edit or create hanging protocols

Settings - Hanging Protocols

Open the hanging protocol panel (the Hanging Protocol tab in the Settings panel) to add, edit, copy, or delete hanging protocols.

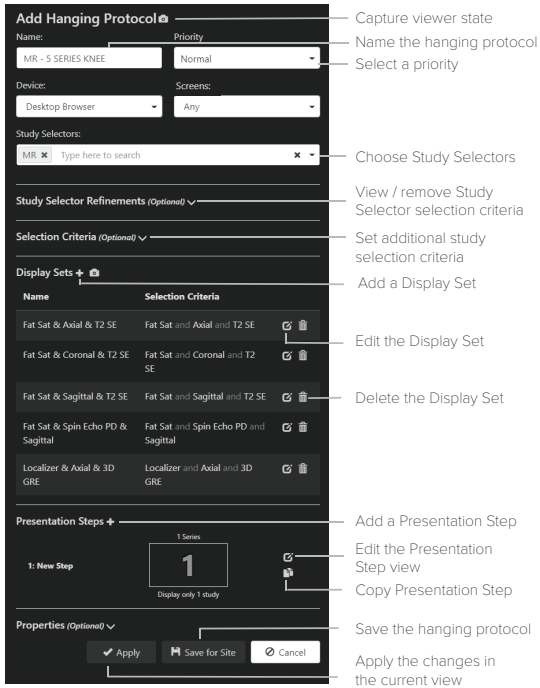
Add Hanging Protocol

Captures the information on screen (display sets and layout) and creates a new hanging protocol.

Edit Hanging Protocol

Edit the active hanging protocol. This icon is available only when there is an active hanging protocol. Access non-active hanging protocols in the hanging protocol panel (the Hanging Protocol tab in the Settings panel).

Hanging protocol editor



Edit a hanging protocol

1. To view the name of the hanging protocol you are editing, hover over .
2. To edit the active hanging protocol, click .
3. To edit a non-active hanging protocol, click . Select an HP and click Edit.
4. Edit the criteria as needed.

Create a hanging protocol

The following is a set of basic instructions so you can quickly get started with hanging protocols.

1. Open a study and arrange the series in the viewports as you'd like them to be seen in the first step of the hanging protocol.
2. On the Hanging Protocol tab, click  . eUnity opens the hanging protocol editor. The viewer state is captured as the first presentation step in the hanging protocol.
3. In the Name field, add a descriptive name for the hanging protocol.
4. Edit the Display Sets, if necessary.
5. To add a new presentation step, click  in the Presentation Steps section.
6. To edit the presentation step, click  in the new step. The Presentation Step dialog opens.
7. In the Presentation Step dialog, in the Name field, add a name for the new presentation step.
8. Rearrange the series in the viewer and click Get Viewer State. The viewer state is captured as a new presentation step.
9. In the Study Slots section of the Presentation Steps dialog, click the individual viewports to edit the display sets or set display set properties.
10. Click OK.
11. Repeat steps 5-10 for each presentation step that you want to add.
12. Click Apply at the bottom of the Hanging Protocol editor to apply the changes to the current view.
13. Click Save to save the changes.

Inheritance and prioritization of hanging protocols

The hanging protocol that is applied is selected from a pool that includes the user's hanging protocols which are also inherited from the user's groups and site. When multiple hanging protocols match, the prioritization is as follows:

a. The hanging protocol with the highest priority level is chosen.
b. The user-level hanging protocol is prioritized over group-level hanging protocols (even if the group-level hanging protocol is more specific). Similarly, group-level hanging protocols are prioritized over site-level hanging protocols.
c. If there are no user-level or group-level matches, the hanging protocol with the more specific expression is used. More specifically, eUnity assigns a score to the hanging protocols and chooses the hanging protocol with the highest score. The scoring is based on the operators that are used and the number of selection criteria in each expression.
d. If multiple hanging protocols have the same priority, context (user, group, or site), and selection criteria, the hanging protocol with the refined Study Selector will be chosen over the unrefined one.

Recommended workstation settings

For information on changing any of the following settings, see the manufacturer's instructions for the relevant component (i.e. OS, graphics card, browser).

Desktop resolution (OS)

Desktop resolution refers to the number of pixels contained on a display monitor.

- Desktop resolution must be set to a value where images appear with a zoom factor that is appropriate for diagnostic use according to the requirements of the user's radiological professional body.
- Monitors should be running at their native resolution. For example, a 5MP monitor should be running at 5MP.

Desktop scaling (OS)

Scaling refers to how much everything should be enlarged when measured in pixels. For example, with a halved resolution, the number of pixels is the same, but each pixel is twice as large.

- Desktop scaling must not be applied on imaging monitors.

Display bit depth (OS)

Bit depth refers to the number of color values that can be assigned to a single pixel in an image.

- The display bit depth must be set to a minimum of 32-bit color or 8-bit grayscale.

Browser zoom (browser)

Browser zoom refers to the zoom settings in your browser.

- Browser zoom must be set to 100%.

Graphics card (browser)

Graphics card refers to the graphics card that your browser is configured to use.

- Ensure the browser is configured to use the intended graphics card. For example, if your workstation has a dedicated graphics card, ensure the high performance option is selected in the browser graphics settings.

Hardware acceleration (browser)

- Hardware acceleration must be turned on in the browser (note that it is turned on by default). Hardware acceleration improves performance in the eUnity viewer.