



# NilRead User Guide

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# 1. Overview

## About NilRead

NilRead is a web-based, no installation, diagnostic viewer. NilRead provides physicians with secure, interactive processing, viewing, and sharing of 2D, MPR, 3D, and Fusion radiology exams. The product is designed for use by qualified medical practitioners to review and interpret imaging studies and reports. NilRead provides interactive image visualization tools, and rule-based hanging protocols for exam viewing according to physician preference and multi-monitor display configuration. NilRead can be easily integrated with any DICOM or HL7 network, connected with a VNA, and can be invoked from a RIS or workflow/reporting solution. NilRead can also query-retrieve remote DICOM nodes, XDS repositories and other medical archives.

Physicians can easily customize how a patient study is presented using a number of configurable layouts, then further arrange images by dragging and dropping series into viewports. This allows each physician to review images based on their personal preferences.

Access NilRead using your mobile device or desktop computer. NilRead runs on all major browsers and supports multi-touch gestures on mobile devices (for details, see "Device specifics" on page 11). For hardware requirements and supported browsers, see "Hardware requirements" on page 123. Please also review the "Warnings and precautions" on page 121.

NilRead uses industry standard security mechanisms (HTTPS, SSL) and does not transfer any patient data to the client device running the viewer. This allows radiology departments and other health care organizations to provide secure access to referring physicians and radiologists on the go without having to setup and maintain an IT infrastructure on devices outside the organization. NilRead supports many modalities (see "Supported modalities" on page 2).

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



View additional regulatory information including warnings and precautions (see "Regulatory " on page 121).

## Version number

The NilRead version number can be viewed by hovering over the NilRead logo.

## Intended use within the USA

The NilRead software application provides desktop and portable access to multi-modality softcopy medical images, reports and other patient related information for conducting diagnostic review, planning, and reporting through the interactive display and manipulation of medical data, including mammography and breast tomosynthesis. NilRead also allows users to collaborate by sharing application sessions.

Lossy compressed mammographic images are not intended for diagnostic review. Mammographic images should only be viewed with a monitor approved by FDA for viewing mammographic images. For primary diagnosis, post process DICOM “for presentation” images must be used.

On mobile platforms, this device is not intended for diagnostic use.

## Manufacturer

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## Supported modalities

NilRead provides imaging data to physicians in many different specialities. Modalities such as MR, CT, Xray, fluoroscopy, ultrasound, mammography, and many more are supported by NilRead.

For a full list of supported modalities, see the NilRead DICOM Conformance Statement at [http://www.lexmark.com/en\\_us/solutions/healthcare/enterprise-imaging/enterprise-viewing/nilread-regulatory-and-approvals.html](http://www.lexmark.com/en_us/solutions/healthcare/enterprise-imaging/enterprise-viewing/nilread-regulatory-and-approvals.html).

## User interface overview


NilRead contains two main areas: the Patient Study Directory and the image viewing area.

### Patient Study Directory

When you first login to NilRead, the Patient Study Directory opens. The navigation tree on the left side of the directory opens at the item you used most recently during your last NilRead session (for example, Patient Directory or a worklist).

Use the navigation tree to:

- Open patient studies (see "Open patient studies" on page 15 and "Open multiple studies" on page 17).
- Access folders and worklists (see "Use worklists and folders" on page 55).

To hide the navigation tree, select  in the top-left corner.

## Image Viewing Area

When you open a study, the NilRead image viewing area opens. The image viewing area contains a toolbar and side panel.

<b>Toolbar and side panel</b>	The toolbar and side panel provide quick access to the NilRead areas and features (see "Toolbar and side panel overview" on page 3).
<b>Image viewing area</b>	The image viewing area is organized differently depending on the current study layout and view (see "Customize the image viewing area" on page 6).
<b>Maximize a viewport</b>	Double-click (or double-tap) a viewport to maximize it and hide other viewports. The toolbar and side panel are still available while the viewport is maximized. This can be useful for mobile devices with smaller screens. Double-click (or double-tap) again to restore the original viewport layout.
<b>Full screen view</b>	You can view an image using the full screen (see "Use full screen view" on page 42). Other viewports, the toolbar and the side panel are hidden when using full screen view.
<b>Reference lines</b>	Reference lines are shown on all series on the current screen that are in the same frame of reference. The intersection of the reference lines represents the corresponding position in all viewports.
<b>Image details</b>	Details about the study, series and image are shown on an image (see "View image details" on page 42).
<b>Image orientation</b>	Each viewport contains information regarding the image orientation (see "View image orientation" on page 48).

## Toolbar and side panel overview

The toolbar and side panel provide quick access to the NilRead areas and features.

### Note




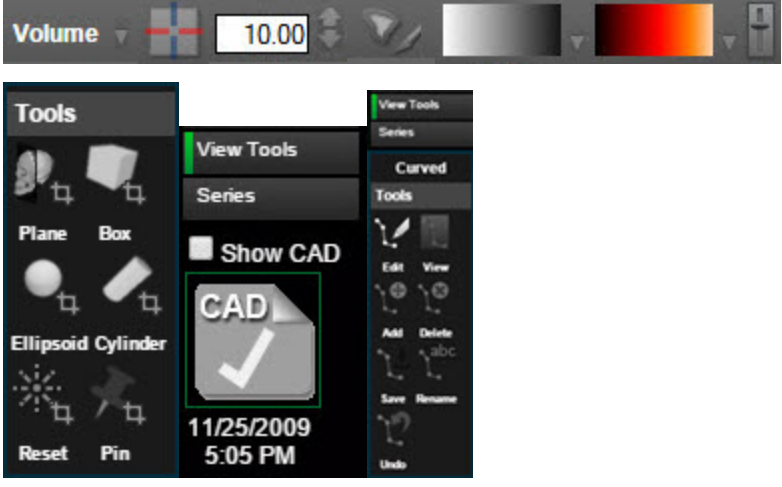
Many tools in the toolbar are also available by right-clicking the image viewing area. You can also assign









tools to mouse buttons, keyboard shortcuts and touch gestures (see "Change mouse and keyboard preferences" on page 81).


## Toolbar

To move through the tools, use the arrows at the ends of the toolbar. On touch devices, fling the toolbar.

<p><b>Image visualization tools</b></p>	 <p>Use these tools to adjust image visualization settings (see "Review studies" on page 23). These tools are available in all views.</p>
<p><b>Hanging protocols</b></p>	 <p>Use hanging protocols to customize the image viewing area (see "Select hanging protocols" on page 41).</p>
<p><b>Study layouts and views</b></p>	 <p>Use study layouts and views to customize the image viewing area (see "Select study layouts and views" on page 40).</p>
<p><b>Other view specific tools</b></p>	 <p>Certain tools are available for specific views only (see "Review studies" on page 23).</p>

<b>Cine</b>	 <p>View the images in a study as a "movie" (see "Cine" on page 38).</p>
<b>Scrolling arrows</b>	 <p>Scroll through the series in a study.</p>
<b>Save</b>	 <p><b>Bookmarks</b> Use a bookmark to tag an image in a patient study that you want to find again quickly or that you want to share with others (see "Share bookmarked images" on page 72). Bookmarked images are saved in the Presentations panel.</p> <p><b>Capture</b> You can create a series of secondary capture images for a patient study (see "Create secondary capture images" on page 72). Secondary capture images are static screenshots and cannot be modified.</p> <p><b>Export</b> Export the images currently on the screen (see "Export images" on page 73). You can export a single viewport or all viewports.</p>
<b>Print</b>	 <p>Print the images currently on the screen (see "Print images" on page 74). You can print a single viewport or all viewports.</p>
<b>Studies</b>	 <p>View the Patient Study Directory (see "Open patient studies" on page 15).</p>
<b>Logoff</b>	 <p>Exit your current NilRead session.</p>

## Side Panel

<b>Collaboration</b>	Start or join an online meeting (see "About meetings" on page 67). Meeting participants all see the same screen and can annotate images at the same time.
<b>Tissue</b>	View and edit tissues (see "Segment" on page 37).
<b>Presets</b>	Apply a preset to the current study (see "Apply presets" on page 52).
<b>Presentations</b>	View a presentation for the current study (see "Create presentations" on page 52).
<b>Series</b>	Select a series for the current study (see "Select series" on page 40).
	Use the arrows to hide or view the side panel.

## Customize the image viewing area

Use study layouts and views to customize the image viewing area. This allows you to quickly arrange the series and images you want to view.

<b>Study Layout</b>	Apply a study layout to the image viewing area. This divides the area into multiple "screens". You can drag a different series into each screen, allowing you to view multiple series simultaneously.
<b>View</b>	Apply a view to a screen. A view is a predefined viewport arrangement specific to a clinical scenario. Some views display a single viewport while others display multiple viewports, each with a different type of visualization. You can apply different views to each screen or apply the same view to all screens.

### Note

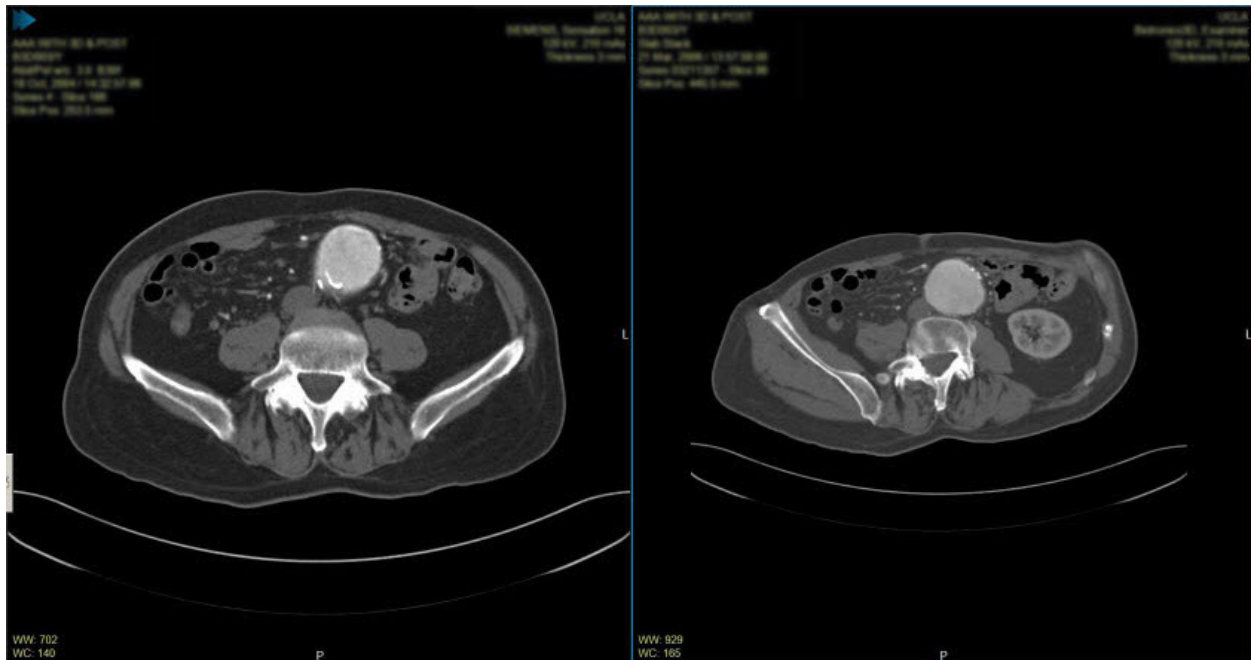
For more information, see "Select study layouts and views" on page 40.

## View examples

The following examples show NilRead study layouts and views. Available views depend on your NilRead implementation.

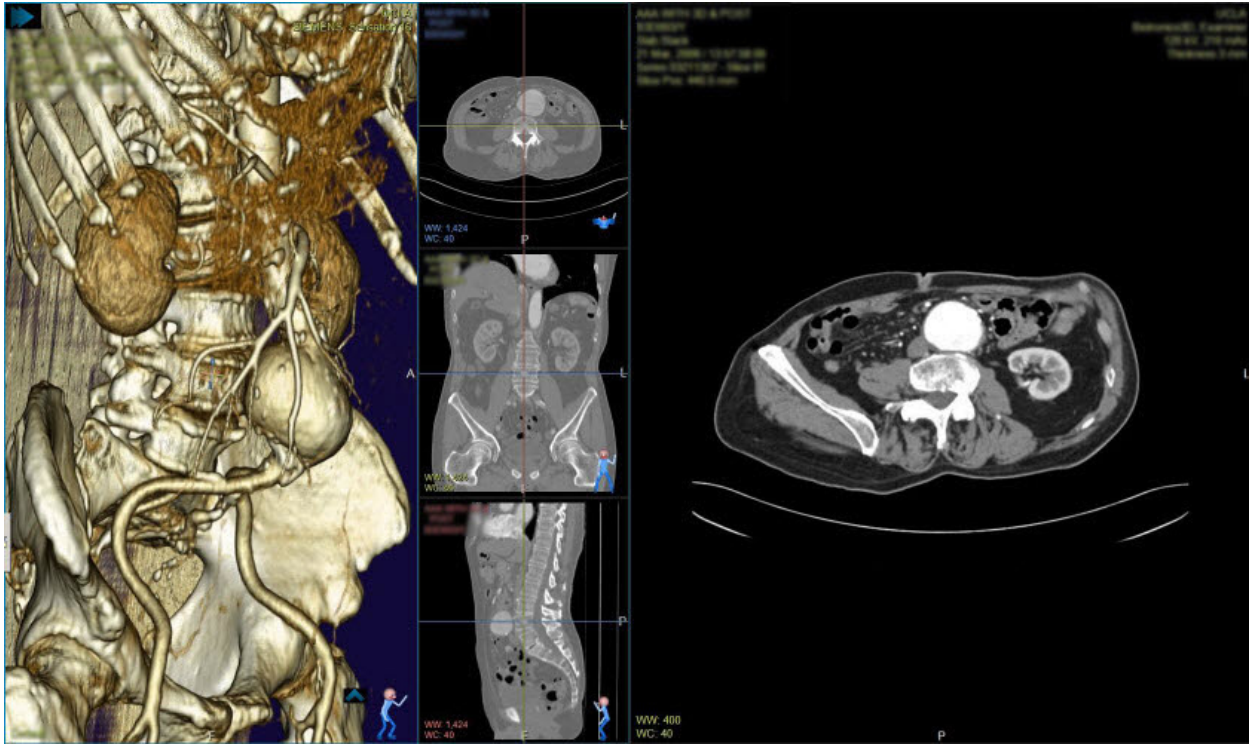
### 1x2 layout

The following example shows a 1x2 study layout. This creates two side-by-side screens with a different series in each screen:



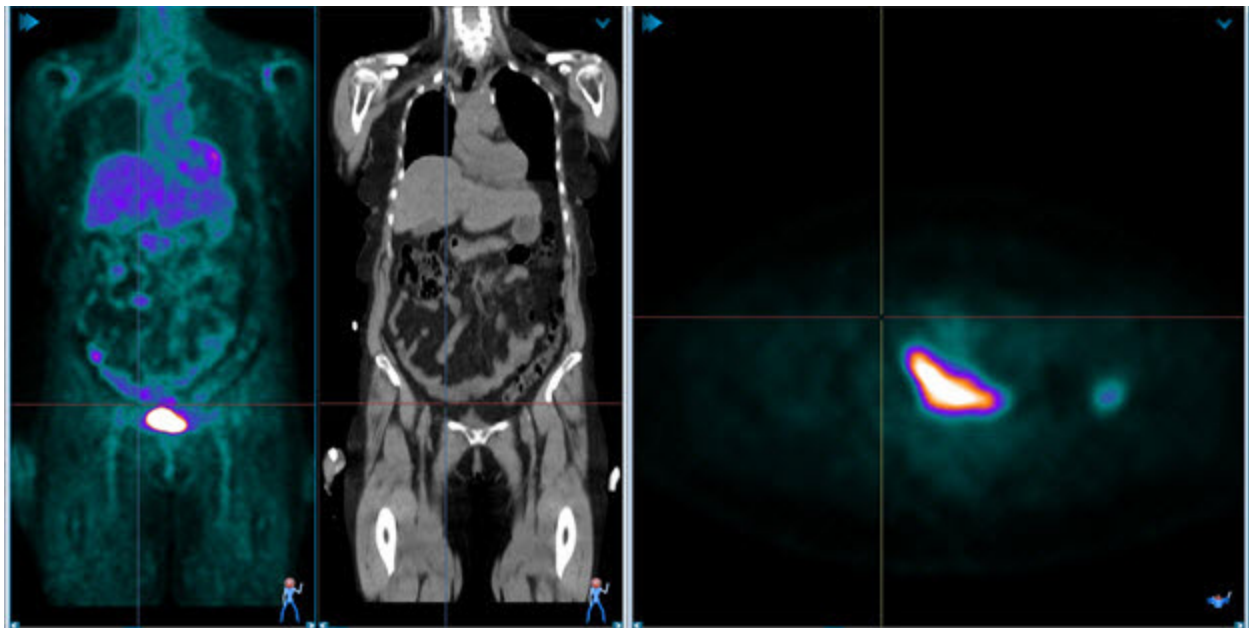
### Multiple viewports

When a view is applied to a screen, the screen may be divided into multiple viewports. In the following example, the MPR 3D view has been applied to the first screen, dividing the screen into four viewports. Note that a different view (or the same view) could also be applied to the second screen.



### Multiple monitors

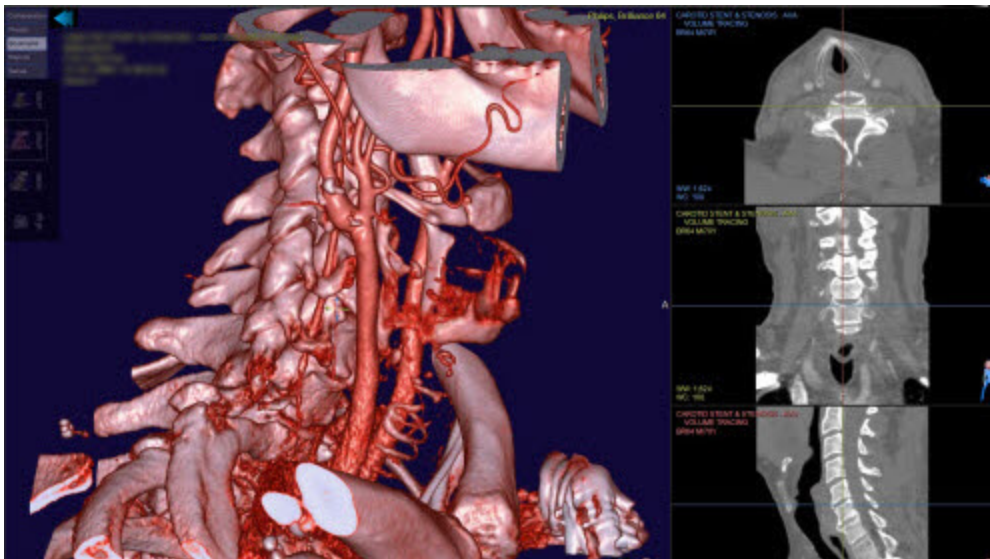
Each monitor can have its own study layout. In the following example, the first monitor displays two coronal MPR views and the second monitor displays an axial MPR:



### Side-by-side series comparison (study layout)

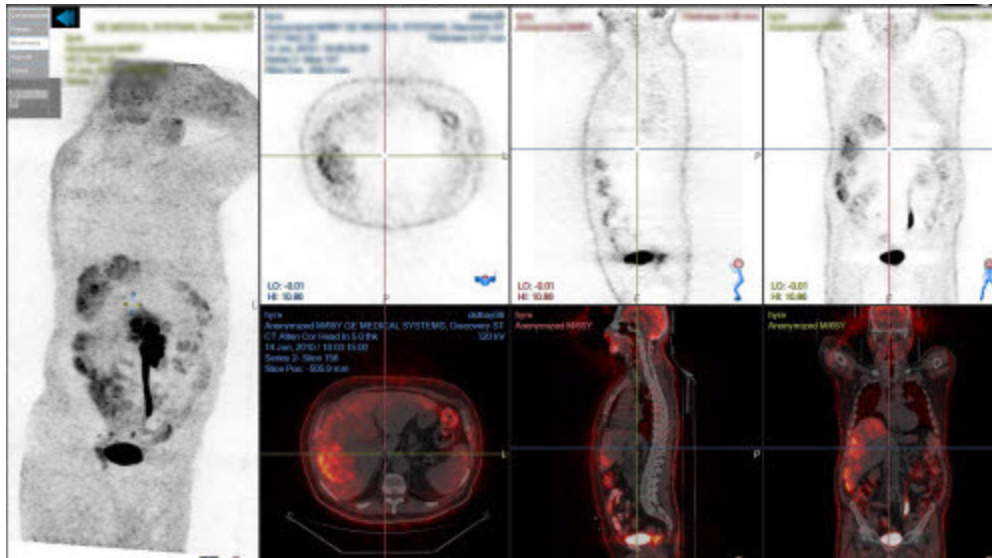


### 3D view

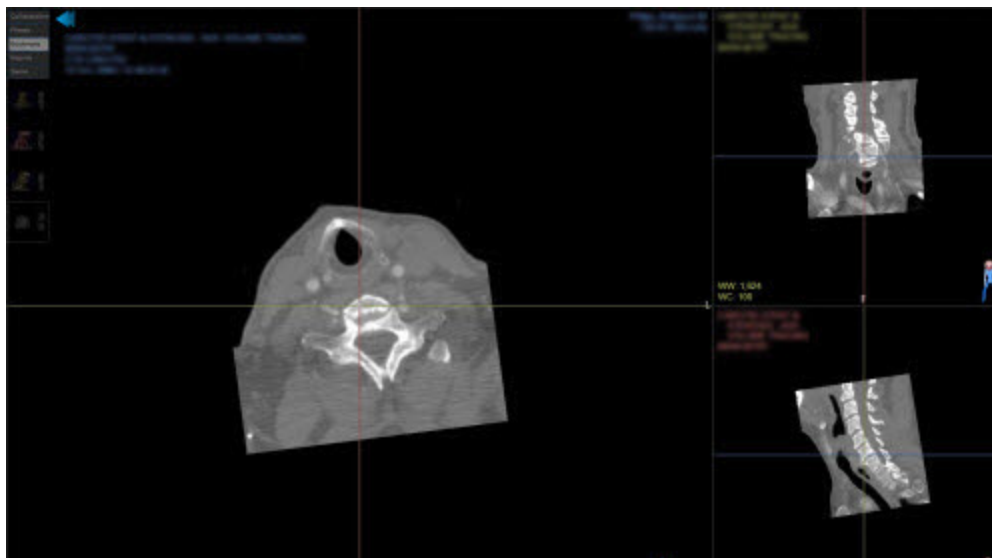




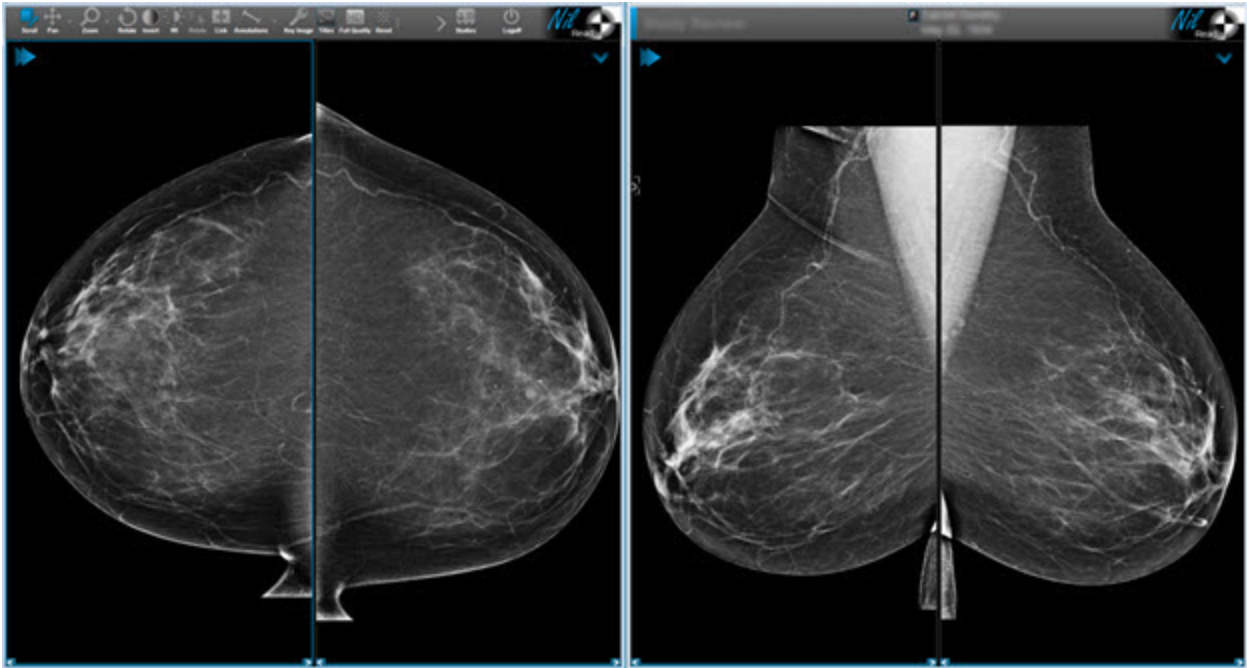
### PET-C fusion view



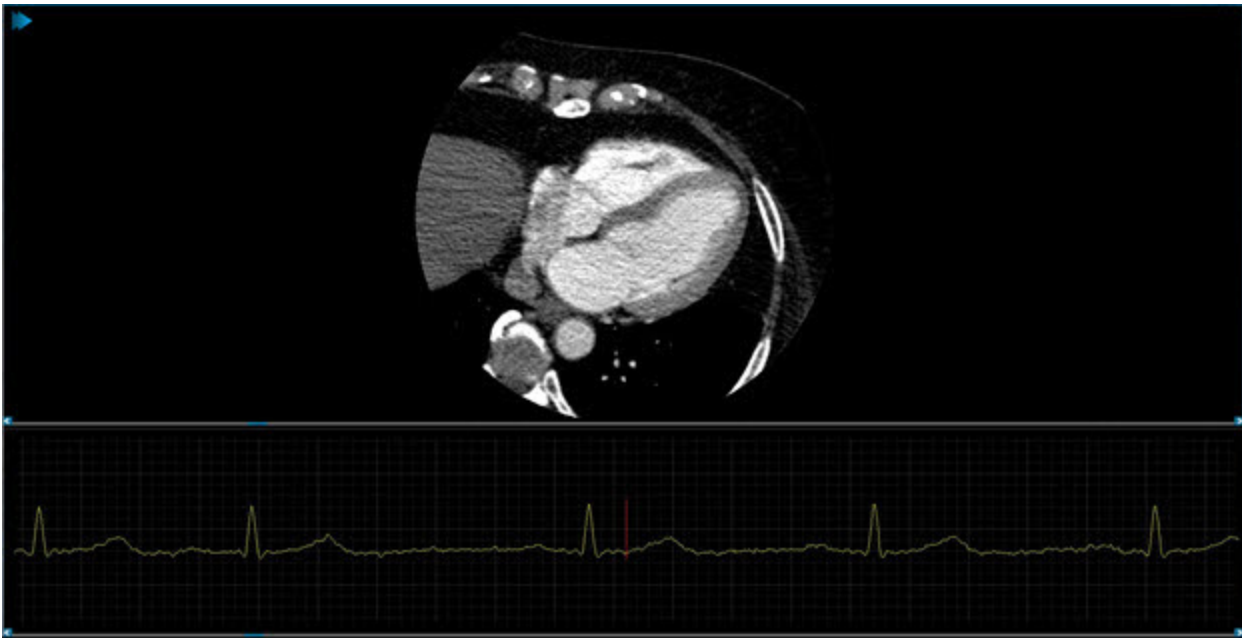
### Slab view



### **Multi-monitor auto-aligned mammography hanging protocol**



### **Non-symmetric 2x1-1/3 study layout with ECG view**



## **Device specifics**

NilRead is available for desktop computers with a diagnostic monitor and for mobile devices. For details, see "Hardware requirements" on page 123.



On mobile devices, images are displayed for informational purposes only — NilRead is not for diagnostic use on mobile devices.

It is the user's responsibility to ensure NilRead is used on appropriate hardware and that image quality, including display monitors, image resolution and environment lighting, are suitable for the clinical application. Lexmark Canada Inc. recommends that users comply with the applicable regulatory guidelines for the anatomy and pathology being studied. For reference:

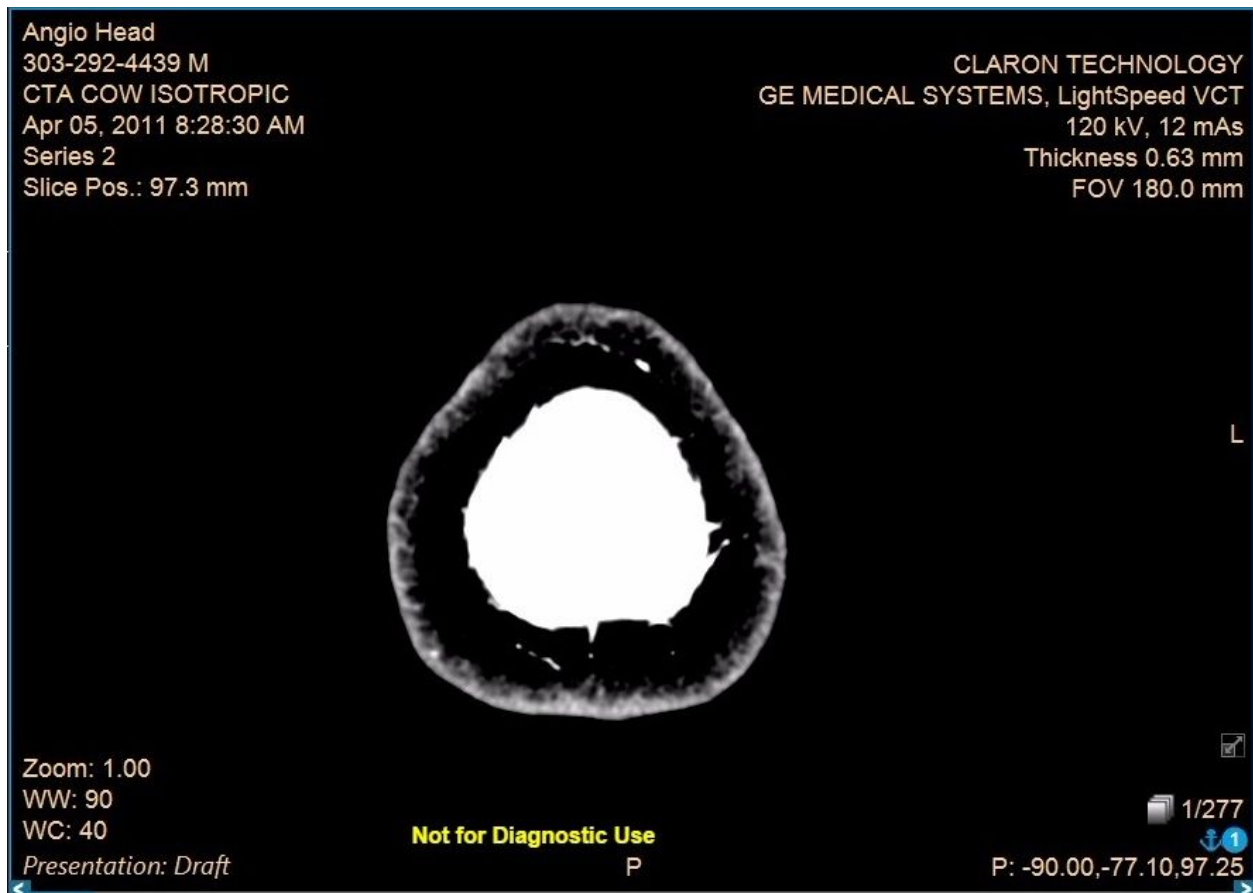
- American College of Radiology Practice Guidelines (<http://www.acr.org/Quality-Safety/Standards-Guidelines>)
- Canadian Association of Radiologists Practice Guidelines (<http://www.car.ca/en/standards-guidelines/standards.aspx>)

Using NilRead is slightly different on desktop computers and mobile devices.

<b>Desktop computer with a diagnostic monitor</b>	All NilRead features are available.
<b>Mobile devices</b>	Multi-touch gestures are supported (tap, double-tap, drag, swipe, pinch, flingable toolbar). Collaboration is not supported on smartphones.

## Reading environment verification

NilRead provides a reading environment verification tool to assist the user in adjusting device settings (such as brightness) on mobile platforms. It is recommended that users keep mobile screens clear of thumbprints and dirt and that they disable the auto brightness adjustment.



Follow these steps to perform a reading environment verification:

1. Select **Settings**. Under **Preferences**, select **Reading environment verification**.
2. A low contrast pattern is shown in the viewport. Note that in the following example, the contrast has been highlighted for demonstration purposes:



3. Touch the low contrast pattern to indicate its location.

If you do not select the correct location, the lighting conditions may be too bright or the device's screen may not be at maximum brightness. It is recommended that the auto-brightness adjustment is disabled and the presence of thumbprints in critical parts of the screen is checked frequently. A bright and clean display is the best starting point for viewing images on a mobile device. Also note that LCD displays have angular dependence characteristics. During the assessment, it is recommended that the images are viewed from the front within 10-20 degrees of the viewing angle.

## Mobile device calibration

NilRead allows you to calibrate your mobile device using the DICOM grayscale standard display function (GSDF). The DICOM GSDF defines the luminance response of a display such that an observer's perception of image contrast is consistent throughout the pixel value range of a displayed image.

1. Select **Settings**.
2. Under **Preferences**, select **Mobile Device Calibration**.
3. Select **Instructions**. Follow the instructions to calibrate your mobile device.
4. Select **Apply**.

## 2. View patient studies

### Open patient studies

Use the Patient Study Directory to find and open a patient study. The directory contains several options for finding a study:

- **Patient Directory** Lists all studies.
- **Patient Search** Search for a study.
- **Worklists and Folders** Create a collection of studies that you want to view as a group. For details, see "Manage worklists" on page 55 and "Manage folders" on page 59.

You can also open multiple studies at once (see "Open multiple studies" on page 17). This allows you to review multiple studies in a single session without having to return to the Patient Study Directory.

### Patient Directory

1. To access the Patient Study Directory, select **Studies**.
2. Select **Patient Directory**. By default, all patient studies are shown. If multiple studies exist for a patient, they are listed on separate lines.


#### Note




Use the arrows and page numbers at the bottom of the screen to scroll through the pages. On mobile devices, you can also swipe to move through the pages.

3. To open a study, click (or tap) anywhere on the directory entry for the study.

To search for a study:

1. Enter search information in the blank row below the column headings (patient name, patient ID and so on).
2. In the **Status** column, select a filter to view studies with a specific status.
  - **All** Show all patient studies.
  - **Available** Show patient studies containing at least one report.
  - **Approved** Show patient studies containing at least one approved report.
  - **Not Available** Show patient studies with no reports.
  - **Locked** Show locked patient studies.

3. To reload all studies, select **Clear** .
4. Click (or tap) a column heading to sort the column in ascending or descending order.

5. To add columns, select **Customize** . In the **Field Chooser** list, drag a field to the location you want to place the new column.
6. Select  **Reset** to reset the columns to the default sort order, remove any custom columns you have added, and reload all studies.
7. Select  **Refresh** to refresh the Patient Study Directory and view the latest changes made by all users.

## Patient Search

1. To access the Patient Study Directory, select **Studies**.
2. Select **Patient Search**.
3. Enter information about the study. Select **More** to view additional fields.





<b>Accession No.</b>	Study accession number.
<b>Data Sources</b>	DICOM and XDS servers you want to search. You can select multiple servers.
<b>Time Range</b>	Time period during which the study was created.
<b>Patient ID</b>	Patient's ID.
<b>Patient Name</b>	Patient's name.
<b>Date of Birth</b>	Patient's date of birth.
<b>Sex</b>	Patient's gender.

4. Select **Query**. Studies matching your search criteria are shown.
5. To find a study in the search results, enter search information in the blank row below the column headings (patient name, patient ID and so on). You can enter partial information (for example, the first few numbers in the patient ID).

### Note

Use the arrows and page numbers at the bottom of the screen to scroll through the

pages. On mobile devices, you can also swipe to move through the pages.

6. To open a study, click (or tap) anywhere on the directory entry for the study.
7. To reload all studies, select **Clear** .
8. Click (or tap) a column heading to sort the column in ascending or descending order.
9. To add columns, select **Customize** . In the **Field Chooser** list, drag a field to the location you want to place the new column.
10. Select  **Reset** to reset the columns to the default sort order, remove any custom columns you have added, and reload all studies.
11. Select  **Refresh** to refresh the Patient Study Directory and view the latest changes made by all users.

## Open multiple studies

You can open multiple studies at once. This allows you to review multiple studies in a single session without having to return to the Patient Study Directory.

1. In the Patient Study Directory, select **Patient Directory** or **Patient Search**.
2. Select the checkbox beside the studies you want to open in the image viewer (for details on finding studies, see "Open patient studies" on page 15). You can also select studies from a folder or worklist. To select all studies in a folder or worklist, select the checkbox in the top row.
3. Right-click (or touch and hold) one of the studies and select **Load Studies**. Select one of the following options:
  - **Load as batch** Load the studies separately (as separate patients). You can also select the **Load** button to load studies separately.
  - **Load as priors** Treat the studies as a collection of studies from a single patient. The most recent study will open in the image viewer and older studies will appear as prior studies in the timeline.
4. The studies open in the image viewer. If you selected **Load as batch** (or the **Load** button), the number of loaded studies is shown at the top of the image viewer (for example, **1 of 5**).
  - Use the arrows beside the number of loaded studies to navigate through the studies.
  - Click (or tap) the number of loaded studies to select a study.
  - Click (or tap) the patient name to view patient details.

## Use Break Glass to find patient studies

If you are a NilRead guest user, you may be able to use emergency override ("break glass") to find a patient study. Emergency override should only be used to search for studies that you should be

authorized to view but are not appearing in the Patient Study Directory.

1. In the Patient Study Directory, select **Break Glass**.
2. Read the privacy rule requirements, then select **I agree** if you agree to comply with the requirements. The **Emergency Override** page appears.
3. To find a patient study, enter information in the search fields at the top of the page:

<b>Family Name</b>	Patient's last name.
<b>Given Name</b>	Patient's first name.
<b>Soundex</b>	Select this option to also search for names that sound like the <b>Family Name/Given Name</b> you have entered.
<b>Accession Number</b>	Study accession number.

4. Select **Find**.

## Lock patient studies

NilRead automatically deletes older studies from the database when disk space is low. You can lock studies to ensure they are never deleted.


### Note

Data purge settings are configured in the DICOM configuration settings (see "Manage DICOM services" on page 86).

In the Patient Study Directory:

1. To lock or unlock a study, right-click (or touch and hold) a study, then select **Lock** or **Unlock**.
2. To lock or unlock multiple studies, select the checkbox beside each study, then right-click (or touch and hold) one of the studies and select **Lock** or **Unlock**.

### Note

 appears beside locked studies. The total number of locked studies is shown in the top-right corner of the Patient Study Directory.

## Upload studies

You can upload a new study to the database. To upload multiple files at once, first create a .zip file containing the files you want to upload.

### Note

Ensure popups are enabled in your browser settings.

In the Patient Study Directory:

1. Select **Upload New Study**.
2. Select **Choose Files** and select the file to attach.
3. Select the type of files you are attaching (**DICOM** or **Image/Video**).
4. If attaching an image or video file, enter the patient and study information.
5. Select **Upload**.
6. Select **Refresh** to refresh the Patient Study Directory and view the new study.

## Attach files to studies or patients

You can attach files to a study or patient. If you attach files to a study, they are saved as a new series. If you attach files to a patient, they are saved as a new study. You can attach files using the Patient Study Directory or when viewing a study.

### Note

Ensure popups are enabled in your browser settings.

1. In the Patient Study Directory, right-click (or touch and hold) a study, then select **Attach files to this study** or **Attach files to this patient**.  
or  
While viewing a study, right-click (or touch and hold) a series (side panel), then select **Upload**.  
Select **Attach files to this study** or **Attach files to this patient**.
2. Select **Choose Files** and select the files to attach. You can select multiple files if they are located in the same folder.
3. Select the type of files you are attaching (**DICOM** or **Image/Video**).
4. If attaching an image or video file, enter the patient and study information.
5. Select **Upload**.

## Edit patient studies

You can make changes to a patient study. You can change the original study or create a copy of the study.

In the Patient Study Directory:



1. Right-click (or touch and hold) a study, then select **Edit Patient/Study**.
2. Make changes to the patient and study information. If you want to retrieve information about the patient from a modality worklist, select **Reconcile**. Enter information about the patient and select **Search**. If a match is found, select the patient and select **Select**.

**Note**

To use Reconcile, a modality worklist service must be configured for NilRead (see "Manage DICOM services" on page 86).

3. To save your changes in a new study, select **Copy to new study**. To make changes to the original study, do not select this option.
4. To apply your changes to all studies for this patient, select **Apply changes to all studies for the same patient**.
5. If you are saving your changes in a new study and want to delete the original study, select **Delete original study**.
6. Select **Save**.

## Merge patients

You can update patient information in one study to match patient information in another study. You can also update information in all studies for the same patient. This ensures consistent patient information exists across all studies.

In the Patient Study Directory:

1. Select the checkbox beside the study that contains the patient information you want to copy into another study.
2. Select the checkbox beside the study you want to copy the patient information into.
3. Right-click (or touch and hold) one of the studies, then select **Merge Patients**. Information for the selected patients is shown.
4. To update patient information in all studies with the same patient ID, select **Apply changes to all studies for the same patient**.
5. To use the patient information from the study shown on the left, select **Merge to left**. The study on the right will be updated to match the study on the left.
6. To use the patient information from the study shown on the right, select **Merge to right**. The study on the left will be updated to match the study on the right.
7. Select **Continue**. The patient information in the study is updated. If you selected **Apply changes to all studies for the same patient**, the patient information is also updated in all studies with the same patient ID.

## Merge studies

You can combine two studies into a single study. When you merge studies, one of the studies is deleted.

In the Patient Study Directory:

1. Select the checkbox beside the two studies you want to merge.
2. Right-click (or touch and hold) one of the studies, then select **Merge Studies**. Information for the selected studies is shown.
3. To merge the studies into the study shown on the left, select **Merge to left**.
4. To merge the studies into the study shown on the right, select **Merge to right**.
5. Select **Continue**. The studies are merged into the study you selected. The other study is deleted.

## Delete studies, series or images

You can permanently delete a patient study, a series or an image.

To delete a study:

- In the Patient Study Directory, right-click (or touch and hold) a study, then select **Delete**.

To delete a series or image:

1. Open a patient study.
2. Right-click (or touch and hold) a series (side panel), then select **Delete Series**.
3. Right-click (or touch and hold) an image, then select **Delete Image**.

## Delete series containing segmentation results

You can delete series that contain part segmentation results. Part segmentation results are typically created through a data lifecycle activity (see "Manage data lifecycle settings" on page 95).

In the Patient Study Directory:

1. Right-click (or touch and hold) a study, then select **Delete Pre-processed Results**.
2. Select **OK**.



## 3. Review patient studies

### Review studies

Use the tools in the toolbar to adjust image visualization settings. The study modality and view determine which tools are available.

You can use the tools in any viewport. Changes to one viewport affect all viewports displaying the same series. If the Link feature is active, then changes to one series will affect all series in all viewports.

#### Note

You can also right-click (or touch and hold) a viewport to access the tools.

After using a tool, your changes are saved unless you select Annotations > Delete Last or Delete All (removes changes from current image) or Reset (removes changes from all images in the series) before closing the patient study.

The toolbar contains the following tools:

- Scroll
- Pan
- Zoom
- Rotate
- Invert
- Window Level
- Gamma
- Enhance
- Smart Zoom
- Relate
- Link
- Annotations and Measurements
- Key Image
- Titles
- Full Quality
- Reset
- Hanging Protocols
- Study Layout
- View
- Rendering
- Reference
- Thickness

- Clipper
- Curved MPR
- Segment
- NM Map
- Fusion Map
- Fusion Blend
- Cine
- First, Previous, Next, Last
- Computer-aided detection (CAD) marks

## Scroll



Drag or use the mouse wheel to scroll through images.

- **2D** Drag to scroll forwards or backwards through the images in a series.
- **MPR** Drag to navigate forwards or backwards through the stack of images. The navigation step depends on the slice thickness that is currently selected.
- **3D** Drag to rotate an image with a full three degrees of freedom.
- **Sculpting** Drag to navigate forwards or backwards through the stack of images. The navigation step depends on the slice thickness that is currently selected.
- **ECG** Drag to navigate forwards or backwards in time.

You can also scroll through images using the arrow keys on your keyboard, the arrows at each end of the scroll bar below an image, or by dragging the scroll bar.

## Pan



Drag to move an image within a viewport. Panning is applied to all images in the series.

<b>Oblique</b>	Drag to move an image in any direction within a viewport.
<b>Constrained</b>	Drag to move an image vertically or horizontally within a viewport.

### Note

To move an image at any time, hold ALT while dragging the image.

**Note**

To focus on a specific area, pan the image so the area is centred in the viewport, then zoom in. On mobile devices, use pinch-to-zoom to pan and zoom simultaneously.

## Zoom



Drag up to zoom in on an image; drag down to zoom out. Zooming is applied to all images in the series.

**Note**

To zoom an image at any time, hold CTRL while dragging on the image.

**Note**

To focus on a specific area, pan the image so the area is centred in the viewport, then zoom in. On mobile devices, use pinch-to-zoom to pan and zoom simultaneously.

## Rotate



- **MPR** Drag to rotate an image in any direction. Rotation is applied to all images in the series.
- **3D** Drag to rotate an image with a full three degrees of freedom.
- **Sculpting** Drag to rotate an image in any direction. Rotation is applied to all images in the series.
- **Fusion 3D** Drag to rotate an image with a full three degrees of freedom.

**Note**

The orientation figure and orientation information is updated when you rotate an image (see "View image orientation" on page 48).

## Invert



Invert grey images. Will be applied to all images in the series.

## Window Level



Drag to adjust the window level. Window level changes are applied to all images in the series.

### Note

To change the window level for an image at any time, hold SHIFT while dragging on the image.

### Note

Use presets (side panel) to apply common window levels (see "Apply presets" on page 52).

## Gamma



Drag up or down to adjust the gamma correction. You can adjust the gamma correction for both color and monochrome images.

The gamma value is shown in the lower-left corner of the image.

## Enhance



Drag up to sharpen the image. Drag down to blur the image.

The enhancement level is shown in the lower-left corner of the image. A negative value is shown if the image is blurred (maximum is -3); a positive value is shown if the image is sharpened (maximum is +3).

## Smart Zoom



To use the Smart Zoom box:

- Using the handles on the sides of the box, drag the box to an area on an image.
- To resize the box, drag the handles on the corners of the box.
- Select **Reset** to reset the Smart Zoom box to the default settings. You can change the Smart Zoom default settings in your user preferences (see "Change your preferences" on page 79).
- To remove the Smart Zoom box, select the **Smart Zoom** icon in the toolbar.

### ***Zoom In on a Portion of an Image***

You can use Smart Zoom to increase the magnification and window level for a selected area.

Place the Smart Zoom box on the area you want to magnify. Select the box, then use the Zoom tool to change the magnification within the box. You can also change the Window Level within the Smart Zoom box.

## Compare Images

You can use Smart Zoom to compare two series.

To overlay a series on top of another series, drag a series from the Series panel or prior studies timeline into the Smart Zoom box. You can also drag a preset into the Smart Zoom box.

You can use the following tools on an overlay series. Select the Smart Zoom box, then select the tool.

<b>Zoom</b>	Change the magnification factor for the overlay series. Note that if you change the magnification factor for the underlay series, the overlay series will also be affected.
<b>Window Level</b>	Change the window level for the overlay series. Note that if you change the window level for the underlay series, the overlay series will also be affected.
<b>Scroll</b>	Change the overlay image by scrolling through the images in the series.
<b>Pan</b>	Pan the overlay series.
<b>Rotate</b>	Rotate the overlay series.
<b>Gamma</b>	Adjust the gamma correction.
<b>Rendering</b>	Change the rendering mode for the overlay series.
<b>Thickness</b>	Change the plane thickness for the overlay series.

## Relate



Not available for 2D views.

Modify the reference lines. Reference lines are shown on all series on the current screen that are in the same frame of reference. The intersection of the reference lines represents the corresponding position in all viewports.

Click (or tap) an image where you want to place the intersection of the reference lines. You can also drag the horizontal and vertical lines individually, or drag the intersection to move both lines simultaneously.



**Note**

Use Reference to show or hide the reference lines (see "Reference" on page 34).

## Link



Link or unlink all currently open series. This allows you to scroll through the linked series in a synchronized manner. Changes (such as rotation and zoom) applied to one series are also applied to the other series.

## Annotations and measurements



Use these tools during image analysis to mark and measure features on an image. Use the arrow beside **Annotations** to select a tool.

**Note**

Measurement units are set in your user preferences (see "Change your preferences" on page 79).

**Note**

A draft presentation is automatically saved when you add annotations and measurements to an image (see "Create presentations" on page 52).

### ***About wide field ophthalmic photography images***

NilRead calculates linear and area measurements on wide field ophthalmic photography images. The calculations are done using a 3D geometric model of the eye.

When you apply a linear measurement to a wide field ophthalmic photography image using the ruler tool, the measurement is calculated as the shortest distance on the surface of retina between the end-points of the ruler. A dashed arc is shown to represent the shortest distance. Area measurements are performed on a 3D model of the eye by projecting the 2D shape (ellipse or ROI) from the image to the 3D model. The area measurement is calculated from the enclosed pixels on the 3D model.

If the distance or area cannot be measured, the measurement value will be \*\*\*. If you move a linear or area measurement to a different location on the image, the measurement will be recalculated based on the measurement's new location.

## Annotations

<b>Arrow</b>	Click (or tap) to add an arrow pointing to a feature of the image. Drag to add an arrow and note.
<b>Text</b>	Click (or tap) to add a note without an arrow.
<b>Plumbline</b>	<ul style="list-style-type: none"> <li>• Drag up or down to create vertical lines.</li> <li>• Drag left or right to create horizontal lines.</li> <li>• Drag a line to move it to a new position.</li> </ul>
<b>Curvature</b>	<ul style="list-style-type: none"> <li>• Drag to draw a curve between two points.</li> <li>• To adjust the curve radius, drag the box in the center of the curve or drag a box on an end of the curve.</li> <li>• Drag the curve to move it to a new position.</li> </ul>
<b>Spine Labels</b>	<ul style="list-style-type: none"> <li>• Click (or tap) on the first spinal vertebra, then select the label. Click (or tap) on the remaining vertebrae to apply consecutive labels.</li> <li>• To display the labels across all views of this body location in the current study, select <b>Study</b>. Select <b>Not Shared</b> to only display the labels on the current view-port.</li> <li>• If sharing labels across views, set the <b>Display Threshold</b> to indicate how many neighboring slices the label should be displayed on. Labels are displayed on consecutive slices up to the <b>Display Threshold</b> (in mm).</li> </ul>

## Linear Measurements

<b>Cursor</b>	Click (or tap) to display a point intensity measurement. The value is shown in measurement units appropriate for the study type.
<b>Ruler</b>	Drag to create a linear measurement. After the line is drawn, the line length is calculated and displayed. Measurements are not shown on uncalibrated images.
<b>Contour</b>	Drag to create a free hand curve and measure its length. Measurements are not shown on uncalibrated images.
<b>Polyline</b>	Use to create a multi-segment line. <ul style="list-style-type: none"> <li>• Click (or tap) to create each point in the line. Right-click (or touch and hold) after creating the final point.</li> <li>• Drag a point to move it to a new position.</li> </ul>
<b>Ratio</b>	Use to measure the ratio between two lines. <ul style="list-style-type: none"> <li>• Click (or tap) and drag to draw the first line, then click (or tap) and drag to draw the second line. The ratio is shown between the lines.</li> <li>• Drag a box at the end of a line to adjust a line's length.</li> <li>• Drag the box in the center of a line to adjust the line's position.</li> <li>• Drag the dashed connecting line to move the entire measurement to a new position.</li> </ul>
<b>Calibrate</b>	Enabled for images that need to be calibrated due to missing size attributes in the image (for example, an analog image that has been scanned). The <b>Calibrate</b> tool should only be used when a scale or an object of known size is present on the image.  Drag to draw a line between scale marks on the image or to cover a known object, then enter the distance. After this calibration, the measurement tools are available for the image.

## Area Measurements

### Note

You can define patterns for these tools in your user preferences (see "Change your preferences" on page 79).

### ROI-Free, ROI-Ellipse

Use to create a border around a region of interest using an elliptical or freehand shape. Statistics for the area are shown as appropriate for the study type (for example: average intensity, standard deviation, area and main diameters).

- Drag to create a border around a portion of the image.
- Drag a box to move the measurement to a new position.
- To increase the measurement area, click (or tap) anywhere on the border (do not select a box). Draw a line outside the border that connects to another point on the border. This area is added to the measurement.
- To decrease the measurement area, click (or tap) anywhere on the border (do not select a box). Draw a line inside the the border that connects to another point on the border. This area is removed from the measurement.

### Note

To increase or decrease the measurement area, the ROI-Free or ROI-Ellipse tool must be selected.

### Cup-to-Disc Ratio

Use to measure the cup-to-disc ratio on images of the eye.

- Click (or tap) and drag to create a border around the cup, then click (or tap) and drag to create a border around the disc. The area of the cup and disc are shown. The ratio of the smallest area to the largest area is also shown.
- Drag a box to move the measurement to a new position.
- To increase the measurement area, click (or tap) anywhere on the border (do not select a box). Draw a line outside the border that connects to another point on the border. This area is added to the measurement.
- To decrease the measurement area, click (or tap) anywhere on the border (do not select a box). Draw a line inside the the border that connects to another point on the border. This area is removed from the measurement.

### Note

To increase or decrease the measurement area, the Cup-to-Disc Ratio tool must be selected.

## Angle Measurements

<b>Angle</b>	Drag to create the first side of the angle (the start of this side will be the vertex). Click (or tap) where you want to place the bottom of the second side of the angle. The two sides are automatically connected. The angle between the two sides is shown.
<b>Cobb Angle</b>	Drag to create the first side of the Cobb angle, then drag to create the second side. The two sides are automatically connected. The angle between the two sides is shown.

## Color

Select the color to use for annotations.

## Manage

<b>Delete Last, Delete All</b>	Remove the last change or all changes from the current image.
<p><b>Note</b> Use Reset to remove changes from all images in the series.</p>	
<b>Editing Annotations</b>	You can edit annotations. For example, you can drag to change the annotation's position or size. You can also double-click (or touch and hold) the text in an arrow or text annotation to modify it.
<b>Deleting Annotations</b>	To remove an annotation, right-click (or touch and hold) the annotation, then select Delete.

## Key Image



Available for 2D views only.

Create a series of key images for a study. This allows you to quickly access important images within a large series of images.

To mark the current image as a key image, select **Key Image**. The image is added to a key images series and is labelled as a key image.

## Titles



Show or hide image details in all viewports (see "View image details" on page 42).

## Full Quality



View the original, uncompressed image.

## Reset



Remove changes from all images in the series. Changes will only be removed from the current view.

### Note

Use Annotations > Delete Last or Delete All to remove changes from the current image only.

## Hanging Protocols



Use hanging protocols to customize the image viewing area (see "Select hanging protocols" on page 41).

## Study Layout



Use study layouts to customize the image viewing area (see "Select study layouts and views" on page 40).

## View



Use views to customize the image viewing area (see "Select study layouts and views" on page 40).

## Rendering



Select the rendering mode for the study. Options are MIP (maximum intensity projection), volume rendering and average.

**Note**

Use presets (side panel) to apply common rendering settings (see "Apply presets" on page 52).

## Reference



Show or hide reference lines.

**Note**

Use Relate to change the position of the reference lines (see "Relate" on page 27).

## Thickness



Use the arrows to increase or decrease the plane thickness.

## Clipper



Clippers are used to selectively remove portions of a study from a 3D rendering. This is generally used to expose a part of anatomy or a pathology. Several types of clippers are available: Plane, Box, Ellipsoid and Cylinder.

To use the clipper, select **View Tools** (side panel).

**Note**

You can perform other actions, such as rotating the image, while using a clipper. You can also save a clipped image as a bookmarked image (see "Share bookmarked images" on page 72).

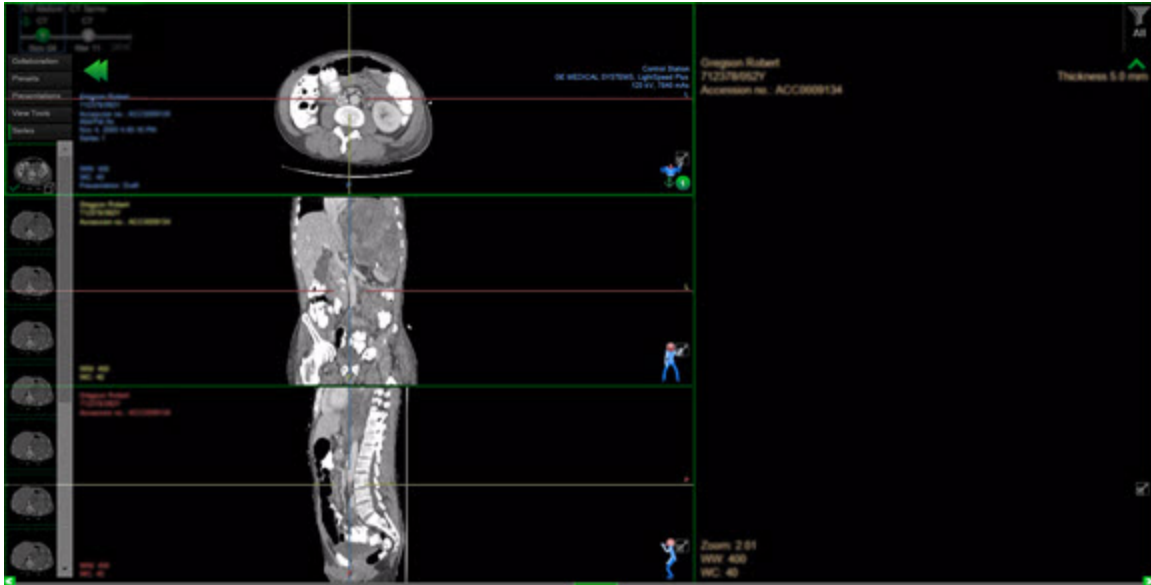
<b>Plane</b>	Front plane clipper. Click (or tap) on an image to enable the clipper. Drag to push the plane in and out.
<b>Box</b>	Rectangular clipper. Click (or tap) on an image to enable the clipper. Drag a handle on the corner of the box to change the box size. Drag the center of the box to move it.
<b>Ellipsoid, Cylinder</b>	Elliptical or cylindrical clipper. Click (or tap) on an image to enable the clipper. Drag the center of the shape to move it.
<b>Clear</b>	Remove all clipping from the image.
<b>Reset</b>	Reset the currently selected clipper to the default settings.
<b>Pin, Unpin</b>	Lock or unlock the clipping changes that have been made to an image. This allows you to retain the current clipping while working with an image (rotating, zooming, etc.). Further clipping cannot be performed until the image is unpinned.  Pin is not available for the Plane clipper.

## Curved MPR

Curved MPR allows you to define a curve in the volumetric dataset and then view an image along this curve. This is useful for viewing structures such as blood vessels or the spine.

1. Select **View**.
2. Under **MPR Views**, select **Curved**. Three MPR views are shown on the left and a blank viewport is shown on the right.





3. Select **View Tools** (sidebar). The curved reformat tools are shown:



4. To create or edit a curved reformat, select **Edit**. You can then select **Add** and add points to the curve reformat. Once you begin adding points, the curved reformat view is shown in the viewport on the right and the curved reformat is listed under **Reformats** in the sidebar.



5. When editing a curved reformat, select **Undo** to remove the last action you performed.

6. To save the curved reformat, select **Save**. The curved reformat will be saved in the local database and will be available when the study is reloaded.
7. To rename a curved reformat, select **Rename**.
8. To delete a curved reformat, select **Delete**. The curved reformat will be deleted from the local database.
9. To view a curved reformat, select **View**.

## Segment



Available for 3D views. Use to view and edit tissues.


### Note

Changes made with the **Segment** tool are not saved when you close the study. However you can save a static screenshot using a secondary capture image (see "Create secondary capture images" on page 72).

To view a tissue:

1. Select a 3D view.
2. Select **Tissue** (side panel). The **Tissue** panel contains part segmentation results by tissue.
3. Select a tissue from the panel. You can select multiple tissues to view simultaneously.

To edit a tissue:

1. In the **Tissue** panel, select  beside a tissue, then select **Segment** (toolbar).  
The **Current Tissue** area shows the tissue you are currently editing. This area also contains rendering presets you can apply to the tissue.
2. You can use the Segmentation tool to edit the tissue. See the following section for details.
3. Select **Undo** to undo the last change made to the tissue.
4. Select **Reset** to remove all changes made to the tissue.

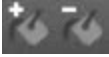
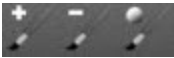
### Note

If you do not select a tissue, any changes you make with the **Segment** tool will be saved as a new tissue. You can also create a new tissue based on an existing tissue. If you edit an existing tissue then deselect the tissue in the **Tissue** panel, the edited tissue will be added as a new tissue. You can only create one new tissue.

### Segmentation Tools (Available on MPR viewports)

These tools select an area in close proximity to the tissue you select, then grow or shrink this area.

1. Select the type of tissue (**Tissue**, **Nodule**, **Lesion**, or **Vessel**).
2. To select an area, use of the following tools:

- 
 Hover over the area, then click (or tap) to select the area.
- 
 Drag to select the area. The tool will apply color to the area identified as part of the tissue.

### NM Map



Assign a color map to nuclear medicine images.

### Fusion Map



Assign a color map to fusion images.

### Fusion Blend



Adjust the fusion blend level.

### Cine



View the images in a study as a "movie". Use the Cine controls to:

<b>Run</b>	Play the cine.
<b>Sync Run</b>	Synchronized play of all viewports.
<b>Pause</b>	Pause the cine.
<b>Speed</b>	Change the desired playback speed. The actual playback speed is shown while the cine is playing.

<b>Range</b>	Select the range of images from the series to include in the cine, based on the current image. For example, selecting 40 will include the 20 images before the current image and the 20 images after the current image. You can also choose to include all images in the series.
<b>Replay/Yoyo</b>	Replay the cine continuously or yoyo (play forwards then backwards).

## First, Previous, Next, Last



Scroll through the series in a study.

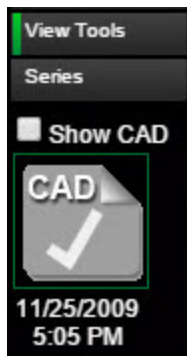
## View CAD marks

If a study has an associated computer-aided detection (CAD) report, you can view the CAD marks on the relevant mammography images.

### Important

Users are instructed to review all images in the study before enabling CAD marks.

1. Select **View Tools** (sidebar). An icon for the CAD report is shown. For example:



2. Hover over the icon to view the following information:
  - **Manufacturer** CAD report manufacturer.
  - **Algorithms** Algorithms used by the CAD software.
  - **Calc** Number of calcification marks.
  - **Mass** Number of mass marks.
  - **Total** Total number of CAD marks in the report.
3. Select **Show CAD** to enable CAD marks on the study images. If an image contains CAD marks, the number of marks is shown on the image.
4. Clear **Show CAD** to hide CAD marks.

## Select study layouts and views

Use study layouts and views to customize the image viewing area. This allows you to quickly arrange the series and images you want to view.

### Note

For more information, see "Customize the image viewing area" on page 6.

## Apply a study layout to the image viewing area

This divides the area into multiple "screens". You can drag a different series into each screen, allowing you to view multiple series simultaneously.

1. Select **Study Layout** (toolbar).
2. Select a study layout. The study layout is applied, dividing the image viewing area into multiple screens.

## Apply a view to a screen

A view is a predefined viewport arrangement specific to a clinical scenario. Some views display a single viewport while others display multiple viewports, each with a different type of visualization. You can apply different views to each screen or apply the same view to all screens.

1. Click (or tap) a screen, then select **View** (toolbar).
2. To apply the same view to all screens, select **Apply View Mode to Whole Screen**.
3. Select a view. The view is applied to the selected screen (or all screens).


You can drag a different series into each viewport. You can also drag a study from the prior studies timeline to a viewport.

## Select series

You can view multiple series by dragging different series into different viewports.

### Note

For details on enabling multiple viewports, see "Select study layouts and views" on page 40.

1. Select **Series** (side panel). The series in the study are shown below the side panel. A filmstrip icon  is shown on series with a multiframe cine sequence.
2. Hover over a series thumbnail for information (series ID, image count, date, modality, description).
3. Select a series thumbnail to load the series in the viewer. The series is opened in all viewports.  
or  
Drag a series onto a viewport.

4. You can view the images in the series using:
  - scrolling (see "Scroll" on page 24)
  - bookmarks (see "Share bookmarked images" on page 72)
  - key images (see "Key Image" on page 32)
  - secondary capture images (see "Create secondary capture images" on page 72)

## Select hanging protocols

The purpose of a hanging protocol is to display the images in a study in a consistent manner. While the term originally referred to the arrangement of physical films in a film box, it now refers to the display of images on a computer monitor. When properly setup, the use of hanging protocols significantly improves reading quality and efficiency.

When opening a study, NilRead analyzes the DICOM attributes of the study and identifies matching hanging protocols. If any candidates are found, the best one is selected and applied automatically.

You can manually select a hanging protocol from the list of matched protocols. You can also create a new hanging protocol based on the current image viewing area.

### Note

See the **Hanging Protocols Handbook** for more information about using hanging protocols.

## Apply a hanging protocol

1. Select **Hang. Prot.** (toolbar). Available hanging protocols and the stages within each protocol are shown.
2. Select a stage within a hanging protocol. The image viewing area is updated.
3. Select **Prev H.P.** and **Next H.P.** (toolbar) to move through the stages in the hanging protocol.

## Create a new hanging protocol

You can customize the study layout and presentation state (window level, zoom, etc.) while viewing a hanging protocol, then create a new hanging protocol using these settings.

1. Select **Hang. Prot.** (toolbar), then select **Capture**. The **Hanging Protocol Editor** appears.
2. Change the protocol name and any other customizable information. Customizable areas are underlined and are also highlighted when you hover over them. For details, see "Manage hanging protocols" on page 91.
3. Select **Save**.

## Edit a hanging protocol

You can edit the hanging protocol currently applied to the image viewing area. (You must have the appropriate user privileges to edit hanging protocols.)

1. Select **Hang. Prot.** (toolbar), then select **Edit**. The **Hanging Protocol Editor** appears.
2. Customizable areas are underlined and are highlighted when you hover over them. Click (or tap) a customizable area to edit it. For details, see "Manage hanging protocols" on page 91.
3. Select **Save**.

## Add a stage to a hanging protocol

While viewing a hanging protocol, you can add more stages. You can create a stage based on the current image viewing area or add a blank stage.

1. If desired, customize the image viewing area to use the settings you want for the new stage. For example, select a study layout and view, select the series to be viewed, and adjust the presentation state (window level, zoom, etc.). All of these settings will be automatically entered in the corresponding sections of the hanging protocol.
2. Select **Hang. Prot.** (toolbar), then select **Add Stage**. The **Hanging Protocol Editor** appears. A new stage is added, based on the current settings in the image viewing area.



### Note

You can also select **<add stage>** to add a blank stage you can customize.

3. Customizable areas are underlined and are highlighted when you hover over them. Click (or tap) a customizable area to edit it. For details, see "Manage hanging protocols" on page 91.
4. Select **Save**.

## Use full screen view

You can view an image using the full screen. This hides the toolbar, side panel and other viewports. While in full screen, right-click (or touch and hold) the image to view a list of tools. You can also use keyboard shortcuts to select tools.

1. Select  on a viewport to display the image in full screen view.
2. Select  again to restore the original viewport layout.

### Note

You can also maximize a viewport (see "User interface overview" on page 2). The toolbar and side panel are still available while the viewport is maximized.

## View image details

Details about the study, series and image are shown on an image. The details shown depend on the view mode and image modality.

## 2D Images

Modality	Top-Left	Top-Right	Bottom-Left
CT	Patient Name Patient Details Series Description Date and Time Series Number Slice Location Key Image Flag	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Diameter	Window Center Window Width
MR	Patient Name Patient Details Series Description Date and Time (Philips) Scan and Slice Number (Philips) Scan Technique (Philips) MR Echo Repetition (Philips) Flip Angle (Philips) Delay Time (Philips) B Factor Diffusion Direction (Philips) Trigger Delay Time (Philips) Temporal Position Id Slice Location Key Image Flag	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Diameter	Protocol Name and Receiving Coil Window Center Window Width
NM	Patient Name Patient Details Series Description Date and Time Series Number Slice Location Key Image Flag	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Diameter	Window Center Window Width



Modality	Top-Left	Top-Right	Bottom-Left
OP	Patient Name Series Description Date and Time Instance Number Columns Rows	Hospital Name Equipment Name Image Laterality	Enhancement Gamma Window Width Window Center Image Compression Presentation
OPT	Patient Name Patient Details Series Description Date And Time Series Instance Number Slice Location Key Image Note	Hospital Name Equipment Name Image Laterality	Enhancement Gamma Window Width Window Center Presentation
PT	Patient Name Patient Details Series Description Date and Time Series Number Slice Location Key Image Flag	Hospital Name Equipment Name Voltage And Amper- age Slice Thickness Reconstruction Dia- meter	Window Center Window Width
Others	Patient Name Patient Details Series Description Date and Time Series Number Slice Location Key Image Flag	Hospital Name Equipment Name Voltage And Amper- age Slice Thickness Reconstruction Dia- meter	Window Center Window Width

## Slab Images

Modality	Top-Left	Top-Right	Bottom-Left
CT	Patient Name Patient Details Series Description Date and Time Series and Instance Number Slice Location	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Diameter	Window Center Window Width Rendering Preset Name
MR	Patient Name Patient Details Series Description Date and Time Series and Instance Number Slice Location	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Diameter	Protocol Name and Receiving Coil Window Center Window Width Rendering Preset Name
NM	Patient Name Patient Details Series Description Date and Time Series Number Slice Location	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Diameter	Window Center Window Width Rendering Preset Name
OPT	Patient Name Patient Details Series Description Date And Time Series Instance Number Slice Location Key Image Note	Hospital Name Equipment Name Image Laterality	Enhancement Gamma Window Width Window Center Presentation

Modality	Top-Left	Top-Right	Bottom-Left
PT	Patient Name Patient Details Series Description Date and Time Series Number Slice Location	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Dia- meter	Window Center Window Width Rendering Preset Name
Others	Patient Name Patient Details Series Description Date and Time Series Number Slice Location Key Image Flag	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Dia- meter	Window Center Window Width

### 3D Images





Modality	Top-Left	Top-Right	Bottom-Left
CT	Patient Name Patient Details Series Description Date and Time Series and Instance Num- ber Slice Location	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Dia- meter	Window Center Window Width Rendering Preset Name

<b>Modality</b>	<b>Top-Left</b>	<b>Top-Right</b>	<b>Bottom-Left</b>
MR	Patient Name Patient Details Series Description Date and Time Series and Instance Number Slice Location	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Diameter	Protocol Name and Receiving Coil Window Center Window Width Rendering Preset Name
NM	Patient Name Patient Details Series Description Date and Time Series Number Slice Location	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Diameter	Window Center Window Width Rendering Preset Name
OPT	Patient Name Patient Details Series Description Date And Time Series Instance Number Slice Location Key Image Note	Hospital Name Equipment Name Image Laterality	Enhancement Gamma Window Width Window Center Presentation
PT	Patient Name Patient Details Series Description Date and Time Series Number Slice Location	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Diameter	Window Center Window Width Rendering Preset Name

Modality	Top-Left	Top-Right	Bottom-Left
Others	Patient Name Patient Details Series Description Date and Time Series Number Slice Location Key Image Flag	Hospital Name Equipment Name Voltage And Amperage Slice Thickness Reconstruction Dia- meter	Window Center Window Width

## View image orientation

Applies to MPR and volume viewports. The figure in the bottom-right corner of an image represents the image orientation:

	<b>Axial</b> Figure standing on head (feet up)
	<b>Sagittal</b> Figure standing sideways
	<b>Coronal</b> Figure facing forward
	Select the arrow above the orientation figure to change the cardinal orientation or flip the image 180 degrees.

The orientation is also indicated by the letters to the right of and below the image:



<b>H</b>	head
<b>P</b>	posterior
<b>A</b>	anterior
<b>L</b>	left
<b>R</b>	right

## View DICOM attributes

You can view the DICOM attributes for an image.

1. Right-click (or touch and hold) a viewport, then select **View DICOM attributes**. The DICOM attributes appear in a new browser window or tab.
2. Use your browser to search, print or save the attribute list.

## View study information

While viewing an image, you can view details about the study.

1. Right-click (or touch and hold) a viewport, then select **View study info**. The study information appears in a new window.
2. Select **OK** to close the window.

## View prior studies timeline

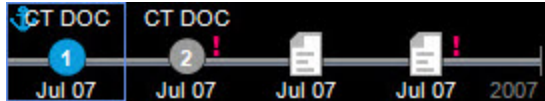
When you open a study, a timeline with additional studies and reports for the patient is shown at the top of the image viewing area. The current study is also included in the timeline and is marked with an anchor.

### Note

The timeline is only shown if prior studies exist for the patient in the database or are accessible through an XDS registry or a query to connected DICOM devices.

## Timeline information

The following information is shown on the timeline:





- Prior studies and DICOM embedded PDF reports are shown in chronological order.
- The studies in the timeline are numbered.
- For studies, the modality and date are shown. For reports, the date is shown.
- An exclamation mark is shown if a warning exists for a study or report.
- The current study (the study opened from the Patient Study Directory) is marked with an anchor.

In each viewport, the number of the currently loaded study is shown in the bottom-right corner.



## Timeline actions

<b>View study or report details</b>	Hover over a study or report in the timeline to view more detailed information, such as the number of series and images in a study or the title of a report.
<b>View a study</b>	<p>Select a study in the timeline to load it in all viewports. The study is opened using the default hanging protocol for the study.</p> <p>or</p> <p>Drag a study from the timeline to a viewport. This allows you to place different studies in different viewports. A warning appears near the top of the image viewing area stating that multiple studies are displayed.</p>

<p><b>View a report</b></p>	<p>Select a report in the timeline. The report opens below the timeline. The following options are available when viewing reports:</p> <ul style="list-style-type: none"> <li>• <b>Save</b> Save a PDF copy of the report.</li> <li>• <b>Print Report</b> Print the report from your browser.</li> <li>• <b>Vert/Horiz</b> Place the report area on the right side (Vert) or bottom (Horiz) of the screen.</li> <li>• <b>Maximize/Restore</b> View the report area only and hide the image viewing area (Maximize) or view both the report area and the image viewing area (Restore).</li> <li>• <b>Close</b> Close the report.</li> </ul> <p><b>Note</b> To resize the image viewing and report areas, drag the divider between the two areas.</p>
<p><b>Find studies</b></p>	<p>You can limit the studies displayed in the timeline.</p> <ol style="list-style-type: none"> <li>1. Select  on the right side of the timeline.</li> <li>2. Select <b>Display only relevant priors</b>.</li> <li>3. Enter your search criteria. You can select studies based on modality, keywords or age. Keywords are matched against DICOM attributes such as study and series description, procedure, body part or anatomic region.</li> <li>4. Click (or tap) anywhere on the image viewing area. The timeline is updated and only studies matching your search criteria are available.</li> </ol> <p><b>Note</b> The number under  indicates how many studies are displayed in the timeline (for example, All or 2/3).</p> <ol style="list-style-type: none"> <li>5. To view all studies, clear the <b>Display only relevant priors</b> checkbox.</li> </ol>
<p><b>Hide the timeline</b></p>	<p>Use the blue arrow below the timeline to hide or view the timeline.</p> <p><b>Note</b> The timeline content and visibility can also be controlled using hanging protocols (see "Manage hanging protocols" on page 91). Use the <b>Relevant patient history</b> section to automatically display only relevant priors in the timeline. Use the <b>Application preferences</b> section to keep the timeline closed when that specific hanging protocol is in use.</p>
<p><b>Retrieve prior studies</b></p>	<p>Use the prior icon in the timeline to trigger a background retrieve of prior studies while reading the current (anchor) study. This icon is only available if all of the prior studies have not yet been loaded.</p>



## Create presentations

Use a presentation to save a copy of the measurements and annotations you have added to an image. A draft presentation is automatically saved when you add measurements and annotations. Your changes will continue to be added to the draft until you approve the presentation.

## Select a presentation

1. Select **Presentations** (side panel) to view the existing presentations for a study.
2. Select a presentation to view it.

## Approve a presentation

Right-click (or touch and hold) a presentation, then select **Approve**.

An approved presentation cannot be modified. If you attempt to make changes, you will be given the choice to:

- Make a new draft copy of the presentation, which you can modify and save as a new presentation.
- Make transient changes to the approved presentation. These changes are temporary and will not be saved.

## Delete a presentation

Right-click (or touch and hold) a presentation, then select **Delete**.

## Apply presets

Use a preset to visualize different aspects of a study. For example, a CT study could include a preset to visualize vessels or a preset to visualize bones. The study view, modality and rendering mode determine what presets are available.

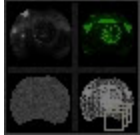
- **2D** Presets can change window level.
- **MPR** Presets can change rendering mode and opacity.
- **3D** Presets can change rendering mode and opacity.
- **Sculpting** Presets can change rendering mode and opacity.

When you apply a preset, any changes you have made to an image will be removed (rotation, annotations, etc.). Any changes you make to a preset are not saved.

1. Select **Presets** (side panel). The presets available for the study are shown below the side panel.
2. Select a preset thumbnail.

## Combine all images in a single series

NilRead can automatically create a "virtual series" that contains all images in a study in the order they were acquired. The virtual series is added to the side panel and the series icon shows four images side-by-side. For example:



When you hover over the series, the description is "All images".

You can control whether virtual series are created automatically. You can also choose whether virtual series are created only for studies containing a specific modality.

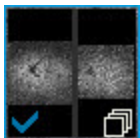
1. Select **Settings**.
2. Under **Preferences**, select **Modality Preferences**.
3. Enter the following information:

<b>Modality</b>	Select the modality for which you want to set the virtual series preference.
<b>Virtual Series</b>	<ul style="list-style-type: none"> <li>• Select <b>Yes</b> to automatically create virtual series for the modality you selected.</li> <li>• Select <b>No</b> if you do not want to create virtual series for the modality you selected.</li> </ul>

4. Select **Save**.

## View stereometric images

If a study contains stereometric images, NilRead automatically creates a series containing all stereometric pairs of images in the study. The series is added to the side panel and the series icon shows two images side-by-side. For example:



- When you hover over the series, the series description is "All stereometric images".
- When you view images from the series, the 1x2 view is automatically applied and the images in each stereometric pair are shown side-by-side.
- Scrolling through the series will scroll through each pair of images.



## 4. Use worklists and folders

### About worklists

You can use a worklist to create a collection of studies that you want to view as a group. The studies in the worklist are selected based on the data source and conditions you set. For example, you could create a worklist that includes all studies with a specific modality that originate from a specific data source.

Every time you access a worklist, the worklist is automatically updated to include any new studies that meet the worklist conditions. The studies are not actually moved to the worklist; the worklist just provides you with an easy way to access them.


Worklists created by users with no administrative privileges are automatically private. Users with administrative privileges can also create public worklists that can be accessed by all NilRead users or assign worklists to specific users or groups.

#### Note

You can also use folders to create a group of studies (see "About folders" on page 59).

### Manage worklists

#### Add a worklist

1. In the Patient Study Directory, select . You can also right-click (or tap and hold) an existing worklist, then select **Copy**.  
or  
Select **Settings**. Under **Preferences**, select **Work Lists and Folders**. Select **Add**. You can also select an existing worklist, then select **Copy**.
2. Enter the following information:

<b>Name</b>	Worklist name.
<b>Comment</b>	Worklist description.
<b>Folder</b>	Do not select this option. This will create a folder instead of a worklist (see "Manage folders" on page 59).

<b>Deidentify</b>	<p>If selected, studies in this worklist will be anonymized when viewed in NilRead. Select <b>Nominal</b> to use the default anonymization profile or select a profile you have created (see "Manage confidentiality profiles" on page 63).</p> <p><b>Note</b> Once the worklist is created, you cannot change the <b>Deidentify</b> option.</p> <p><b>Note</b> Studies are only anonymized when opened from a worklist or folder with the <b>Deidentify</b> option. Regular patient data will appear if a study is opened from the Patient Study Directory.</p>
<b>Groups</b>	<p>(Administrators only) Select the groups that can access the worklist. Note that this option is not available if no groups are currently defined.</p>
<b>Users</b>	<p>(Administrators only) Select the users that can access the worklist. Note that if you do not have administrative privileges, any worklists you create will be private worklists that only you can access.</p> <ul style="list-style-type: none"> <li>• To create a public worklist that all users can access, do not select any users.</li> <li>• To create a private worklist for specific users, select one or more users in the <b>Unassigned</b> area, then select <b>Add</b>. These users will see the worklist in their <b>My Worklists</b> area. To remove a user's access, select a user in the <b>Assigned</b> area, then select <b>Remove</b>.</li> </ul>

**Rule**

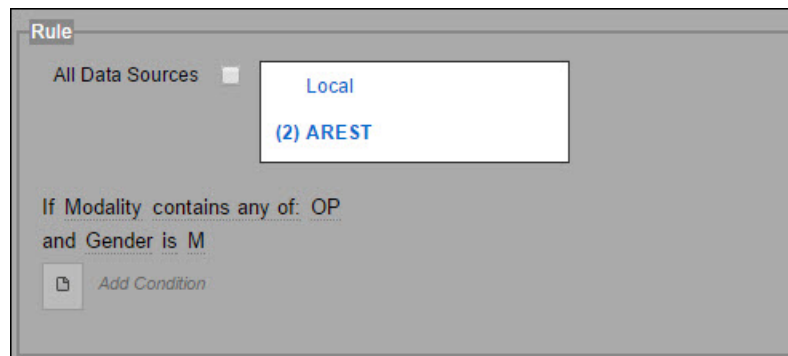
Specify the rule for the worklist by adding one or more conditions. All conditions must be satisfied in order for a study to be included in the worklist.

1. Select **All Data Sources** to search all data sources when selecting studies for the worklist.

or

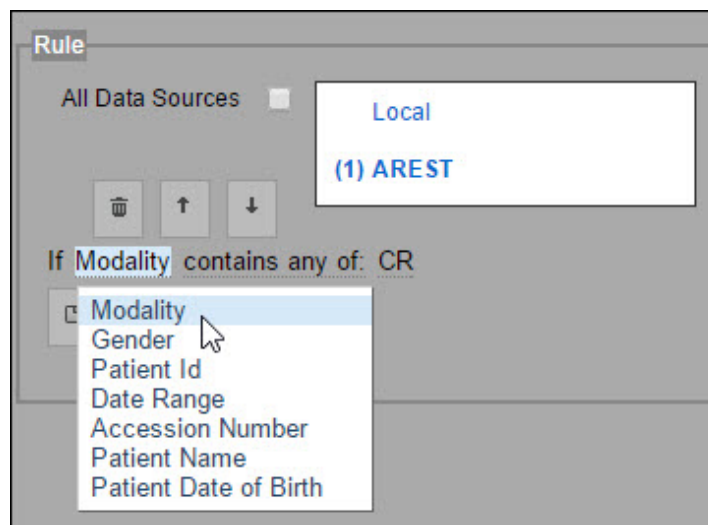
Select a data source from the list to select studies from this data source only.

Note that if a data source has any existing rules (from other worklists), the number of existing rules is shown before the data source name. When you select the data source, the existing rules are shown. In the following example, the data source "AREST" has two existing rules:

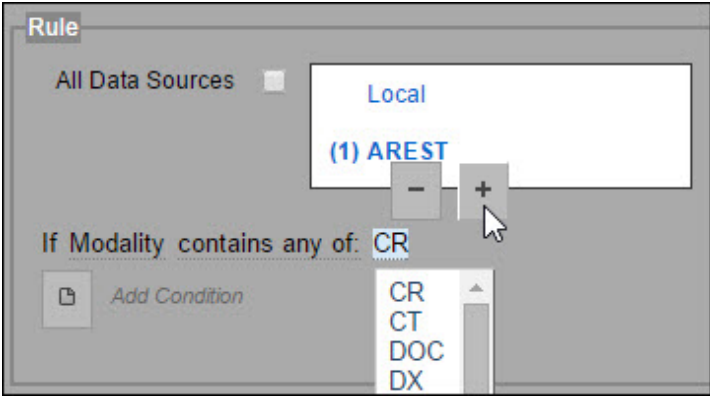



You can delete the existing rules if desired (see step 4).


2. Select **Add Condition**. Customizable areas are underlined and are highlighted when you hover over them. Click (or tap) a customizable area to edit it.



3. To add an item to a condition, select a customizable area, then select +. To remove an item, select -.



4. To delete a condition, select the first customizable area, then select .

5. To move a condition to a new position, select the first customizable area, then select .

3. Select **Save**.

## Edit or delete a worklist

In the Patient Study Directory:

1. Right-click (or tap and hold) a worklist.
2. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

In Settings:


1. Select **Settings**. Under **Preferences**, select **Work Lists and Folders**.
2. Select a worklist.
3. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## Use a worklist to view studies

In the Patient Study Directory:

1. Select **+** beside **Public Worklists** or **My Worklists** to expand the category and view the available worklists. Select **–** to collapse the category.

#### Note

Select  to refresh the navigation tree and see any new worklists.

2. Select a worklist. Studies matching the worklist conditions are shown on the right.
3. Select a study to open it.

## About folders

You can use a folder to create a collection of studies that you want to view as a group. For example, you can use a folder to group studies that you want to review in a collaboration session with other users. You select the specific studies you want to include in a folder. The studies are not actually moved to the folder; the folder just provides you with an easy way to access them.


Folders created by users with no administrative privileges are automatically private. Users with administrative privileges can also create public folders that can be accessed by all NilRead users or assign folders to specific users or groups.

#### Note

You can also use worklists to create a group of studies (see "About worklists" on page 55).

## Manage folders

### Add a folder

1. In the Patient Study Directory, select . You can also right-click (or tap and hold) an existing folder, then select **Copy**.  
or  
Select **Settings**. Under **Preferences**, select **Work Lists and Folders**. Select **Add**. You can also select an existing folder, then select **Copy**.
2. Enter the following information:

<b>Name</b>	Folder name.
<b>Comment</b>	Folder description.
<b>Folder</b>	Select this option. This will create a folder instead of a worklist.



<b>Deidentify</b>	<p>If selected, studies in this folder will be anonymized when viewed in NilRead. Select <b>Nominal</b> to use the default anonymization profile or select a profile you have created (see "Manage confidentiality profiles" on page 63).</p> <p><b>Note</b> Once the folder is created, you cannot change the <b>Deidentify</b> option.</p> <p><b>Note</b> Studies are only anonymized when opened from a worklist or folder with the <b>Deidentify</b> option. Regular patient data will appear if a study is opened from the Patient Study Directory.</p>
<b>Groups</b>	<p>(Administrators only) Select the groups that can access the folder. Note that this option is not available if no groups are currently defined.</p>
<b>Users</b>	<p>(Administrators only) Select the users that can access the folder. Note that if you do not have administrative privileges, any folders you create will be private folders that only you can access.</p> <ul style="list-style-type: none"> <li>• To create a public folder that all users can access, do not select any users.</li> <li>• To create a private folder for specific users, select one or more users in the <b>Unassigned</b> area, then select <b>Add</b>. These users will see the folder in their <b>My Folders</b> area. To remove a user's access, select a user in the <b>Assigned</b> area, then select <b>Remove</b>.</li> </ul>

3. Select **Save**.
4. You can now add studies to the folder (see "Add studies to a folder" on page 61).

## Edit or delete a folder

In the Patient Study Directory:

1. Right-click (or tap and hold) a folder.
  2. Select **Edit**. Modify the details, then select **Save**.
- or
- Select **Delete**.

In Settings:

1. Select **Settings**. Under **Preferences**, select **Work Lists and Folders**.
2. Select a folder.

3. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## Add studies to a folder

You can add the same study to multiple folders.

In the Patient Study Directory:

1. Right-click (or tap and hold) a study.
2. Select **File Study**, then select a folder.

## Remove studies from a folder

In the Patient Study Directory:

1. Select a folder.
2. Right-click (or tap and hold) a study.
3. Select **Remove from Folder**.

In Settings:

1. Select **Settings**. Under **Preferences**, select **Work Lists and Folders**.
2. Select a folder in the **Work Lists** area. The studies in the folder are shown at the bottom of the screen.
3. Select a study, then select **Remove**.

## Use a folder to view studies

In the Patient Study Directory:

1. Select **+** beside **Public Folders** or **My Folders** to expand the category and view the available folders. Select **-** to collapse the category.

### Note

Select  to refresh the navigation tree and see any new folders.


2. Select a folder. The studies in the folder are shown on the right.
3. Select a study to open it.

## Customize the navigation tree

Administrators only

By default, the navigation tree in the Patient Study Directory shows only public and your own worklists and folders. You can customize the navigation tree to show worklists and folders belonging to different groups and users.



1. In the Patient Study Directory, select  above the navigation tree.
2. Enter the following information:
  - **Groups** To view work items available to specific groups, select one or more groups in the **Hidden** area, then select **Show**. To hide work items for groups, select one or more groups in the **Shown** area and select **Hide**.
  - **Users** To view work items available to specific users, select one or more users in the **Hidden** area, then select **Show**. To hide work items for users, select one or more users in the **Shown** area and select **Hide**.
3. Select **OK**. The worklists and folders for each group and user you selected are now shown on the navigation tree.

## 5. Anonymize patient data

### About anonymization

NilRead supports anonymization of studies for research, clinical trials or any other workflow which requires patient confidentiality. Anonymization allows you to remove identifying and confidential patient information from studies.

To anonymize studies, do the following:

1. **Create confidentiality profiles** that define how patient data will be anonymized (see "Manage confidentiality profiles" on page 63). You can also use the default confidentiality profile, called Nominal.
2. (Optional) **Create confidentiality masks** that define regions of an image that contain patient data as part of the image. These areas will be redacted to obscure the patient data. Masks are only applied if enabled in the confidentiality profile.
3. **Assign a confidentiality profile to a worklist or folder** (see "Manage worklists" on page 55 and "Manage folders" on page 59). Patient data for studies in the worklist or folder will be anonymized when the study is viewed in the Patient Study Directory or the image viewer. This anonymization is temporary; the original study data is not modified.

#### Note

Studies are only anonymized when opened from a worklist or folder that contains the **Deidentify** option. Regular patient data will appear if a study is opened from the Patient Study Directory.

4. **Create a permanent anonymized copy of a study** by applying a confidentiality profile when downloading a study, series or image (see "Download studies, series or images" on page 71).

### Manage confidentiality profiles

You can create confidentiality profiles that define how patient data will be anonymized based on DICOM attributes. You can also use the default confidentiality profile, called Nominal, which is based on the DICOM standard "PS3.15 Table E.1-1. Application Level Confidentiality Profile Attributes". For details, see <http://dicom.nema.org/standard.html>.

You can then assign a confidentiality profile to a worklist or folder (see "Manage worklists" on page 55 and "Manage folders" on page 59). Patient data for studies in the worklist or folder will be anonymized when the study is viewed in the Patient Study Directory or the image viewer. This anonymization is temporary; the original study data is not modified.

#### Note

Studies are only anonymized when opened from a worklist or folder that contains the **Deidentify** option. Regular patient data will appear if a study is opened from the Patient Study Directory.

You can also create a permanent anonymized copy of a study by applying a confidentiality profile when downloading a study (see "Download studies, series or images" on page 71).

## Add a confidentiality profile

1. Select **Settings**.
2. Under **Preferences**, select **Confidentiality Profiles**.
3. Select **Add**. You can also select an existing profile and select **Copy**.
4. Enter the following information:

<b>Name</b>	Profile name.
<b>Comment</b>	Profile description.
<b>Enabled</b>	<p>If selected, the profile can be used to anonymize data.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p><b>Note</b> To use a profile, you must assign it to a worklist or folder (see "Manage worklists" on page 55 and "Manage folders" on page 59) or select the profile when downloading a study (see "Download studies, series or images" on page 71).</p> </div>
<b>Apply Masks</b>	If selected, confidentiality masks may be used to redact patient data (see "Manage confidentiality masks" on page 65).
<b>Options</b>	Anonymization options for the profile. To add options to the profile, select one or more options in the <b>Disabled</b> area, then select <b>Enable</b> . To remove an option, select an option in the <b>Enabled</b> area and select <b>Disable</b> .
<b>Details</b>	DICOM attributes that will be anonymized by this profile. The action that will be applied to each attribute is shown. If you do not want to anonymize an attribute, select the <b>Disabled</b> checkbox beside the attribute.

5. Select **Save**.

## Edit or delete a confidentiality profile

1. Select **Settings**. Under **Preferences**, select **Confidentiality Profiles**.
2. Select a profile.

3. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## Refresh the confidentiality profiles list

1. Select **Settings**. Under **Preferences**, select **Confidentiality Profiles**.
2. Select **Refresh** to view the latest changes made by all users.

## Manage confidentiality masks

In addition to confidentiality profiles, you can create confidentiality masks that define regions of an image that contain patient data as part of the image. These areas will be redacted to obscure the patient data.

If you are using a confidentiality profile that has masks enabled, a confidentiality mask will be applied if a mask exists that matches all of the following study attributes: modality, manufacturer and (optionally) scanner model. See "Manage confidentiality profiles" on page 63.

## Add a confidentiality mask

1. Select **Settings**.
2. Under **Preferences**, select **Confidentiality Masks**.
3. Under the **Masks** area, select **Add**. You can also select an existing mask and select **Copy**.
4. Enter the following information:

<b>Name</b>	Mask name.
<b>Comment</b>	Mask description.
<b>Modality</b>	Modality. The mask will only be applied to images with this modality.
<b>Manufacturer</b>	Manufacturer. The mask will only be applied to images with this manufacturer.
<b>Model Name</b>	(Optional) Scanner model. The mask will only be applied to images with this scanner model name.
<b>Height, Width</b>	Height and width of the image (in pixels).

<b>Enabled</b>	If selected, the mask can be used as part of a confidentiality profile. Clear this checkbox if you do not want NilRead to use this mask.
----------------	--

5. Select **Save**.

You can now define the regions of the image to be redacted (see the following section).

## Add regions to be redacted

You can add multiple regions to a mask.

1. Select **Settings**.
2. Under **Preferences**, select **Confidentiality Masks**.
3. In the **Masks** area, select a mask. The **Mask Regions** area shows the regions defined for the mask.
4. Under the **Mask Regions** area, select **Add**. You can also select an existing region and select **Copy**.
5. Enter the following information:

<b>Top</b>	Top of the region to be redacted (in pixels).
<b>Left</b>	Left side of the region to be redacted (in pixels).
<b>Width, Height</b>	Height and width of the region to be redacted (in pixels).

6. Select **Save**.

## Edit or delete a confidentiality mask or region

1. Select **Settings**. Under **Preferences**, select **Confidentiality Masks**.
2. Select a mask or mask region.
3. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## Refresh the confidentiality masks or regions list

1. Select **Settings**. Under **Preferences**, select **Confidentiality Masks**.
2. Select **Refresh** to view the latest changes made by all users.

## 6. Share patient studies

### About sharing studies

Share a patient study using one of the following methods.

<b>Collaboration session</b>	Online meetings allow you to collaborate with other physicians and interactively review a patient study (see "About meetings" on page 67).
<b>Study links</b>	Share a patient study with others by sending them a link (see "Send study links" on page 70).
<b>Series links</b>	Share a series of images with other users by sending them a link (see "Send series links" on page 71).
<b>Bookmarks</b>	Use a bookmark to tag an image in a patient study that you want to find again quickly or that you want to share with others (see "Share bookmarked images" on page 72).
<b>Secondary capture images</b>	You can create a series of secondary capture images for a patient study. Secondary capture images are static screenshots and cannot be modified (see "Create secondary capture images" on page 72).
<b>Export</b>	You can export a screenshot of the patient study currently loaded in the image viewing area (see "Export images" on page 73).
<b>Print</b>	You can print the patient study currently loaded in the image viewing area (see "Print images" on page 74).
<b>Download</b>	You can download a copy of a patient study, series, or image (see "Download studies, series or images" on page 71).

### About meetings

Online meetings allow you to collaborate with other physicians and interactively review a patient study. Meeting participants all see the same screen and can annotate images at the same time.

- Start a meeting (see "Start a meeting" on page 68)
- Join a meeting (see "Join a meeting" on page 68)



## Start a meeting

Online meetings allow you to collaborate with other physicians and interactively review a patient study. Meeting participants all see the same screen and can annotate images at the same time. The person who starts the meeting is the organizer.

### Note

The displayed screen size may be reduced if a participant uses a small resolution device such as a phone.

1. Open a patient study.
2. Select **Collaboration** (side panel). The **Collaboration** tools appear below the side panel.
3. Select **Share**. The meeting control panel opens. You can drag the control panel to any location on the screen.
4. To invite participants, select **Invite** on the meeting control panel. A new email is created using your default email application. Enter the email addresses for the participants and any additional information, then send the email.

Participants currently in the meeting are shown in **Active Users** (below the side panel). The symbols beside a participant's name indicate if they are the meeting organizer (O) or the presenter currently in control of the meeting (P). \* is shown beside your own name.

During the meeting, you can:

- Start a Skype session (see "Use Skype" on page 70).
- Annotate images with drawings and notes, invite others, and transfer control of the meeting to another participant (see "Use meeting controls" on page 69).

## Join a meeting

Online meetings allow you to collaborate with other physicians and interactively review a patient study. Meeting participants all see the same screen and can annotate images at the same time. The person who starts the meeting is the organizer.

### If you receive a meeting link by email:

1. Click (or tap) the link. The NilRead Waiting Room will open in your browser.
2. In the Waiting Room, enter the meeting ID and your name. Select **Join**.

### If you are logged into NilRead, you can:

- In the Patient Study Directory, select **Waiting Room**. Enter the meeting ID and your name, then select **Join**.

or






- While viewing a patient study, select **Collaboration** (side panel), then select **Join**. Enter the meeting ID, then select **Join**.

Participants currently in the meeting are shown in **Active Users** (below the side panel). The symbols beside a participant's name indicate if they are the meeting organizer (O) or the presenter currently in control of the meeting (P). \* is shown beside your own name.

During the meeting, you can annotate images with drawings and notes (see "Use meeting controls" on page 69).

## Use meeting controls

You can use the following controls during an online meeting. Some controls are only available to the meeting organizer.

	<p><b>Transfer control</b></p> <p>The organizer can transfer control of the meeting to another participant. Only the participant in control is able to use the NilRead toolbar containing the image tools.</p> <p>To transfer control, select a participant from the <b>Control</b> list. The organizer can regain control by selecting their own name.</p>
	<p><b>Annotate images</b></p> <p>To draw on an image, select <b>Highlighter</b>. To add an arrow and note, select <b>Arrow</b>. Participants can annotate images at the same time. Annotations made by a participant are shown in the same color as the participant name in the <b>Active Users</b> list.</p>
	<p><b>Undo all</b></p> <p>Select <b>Undo all</b> to remove all annotations made by all of the meeting participants.</p>
	<p><b>Undo</b></p> <p>Select <b>Undo</b> to remove the last annotation made by any meeting participant.</p>
	<p><b>Invite others</b></p> <p>Select <b>Invite</b>. A new email is created using your default email application. Enter the recipient's email address and any additional information, then send the email.</p>

**End meeting**

Select **Quit**. This can only be done by the meeting organizer.

**Note**




All annotations are removed from images when the meeting ends. If you want to save the image with annotations, capture the image before ending the meeting (see "Create secondary capture images" on page 72).

## Use Skype

You can use Skype™ calls and instant messaging to communicate with other physicians associated with a study. You can initiate a Skype session at any time when viewing a study, including during an online meeting.

**Note**

You can only initiate Skype sessions with physicians who are associated with your user profile (see "Manage your user profile" on page 77). Skype must be enabled in your user preferences (see "Change your preferences" on page 79). Skype software must also be installed and running on participants' devices.

1. Open a patient study.
2. Select **Collaboration** (side panel). The names of any physicians associated with both the study and your user profile are listed below  **Settings**.
3. Select  **Settings**. Select the type of Skype session:
  - **Call** Voice call. Note that you can enable video once the Skype session is in progress.
  - **Chat** Instant messaging.
4. To start a Skype session, select a physician below  **Settings**.
5. To search for a physician in the list:
  - a. Enter the physician's first name, last name or NilRead user name in the **Search Users** field.
  - b. Select **Search**. Any matching physicians are shown below the **Search** button.
  - c. Select a physician to start a Skype session.

## Send study links

Share a patient study with others by sending them a link. Others will see the default view of the study, not the view you are using.

**Note**

Depending on your organization's NilRead configuration, users may require a login name and password for NilRead to view the study.

In the Patient Study Directory:

1. Right-click (or touch and hold) a study, worklist or folder, then select **Send Study Link**.
2. A new email is created using your default email application. Enter the recipient's email address and any additional information, then send the email.

or

1. Right-click (or touch and hold) a study, worklist or folder, then select **Copy Link**.
2. A box appears with the link. Copy the link and paste it into an email or instant message.

## Send series links

Share a series of images with other users by sending them a link. Others will see the default view of the series, not the view you are using.

**Note**

Depending on your organization's NilRead configuration, users may require a login name and password for NilRead to view the study.

1. Open a patient study.
2. Right-click (or touch and hold) a series, then select **Send Series Link**.
3. A new email is created using your default email application. Enter the recipient's email address and any additional information, then send the email.

## Download studies, series or images

You can download a copy of a patient study, series, or image.

In the Patient Study Directory:

1. Right-click (or touch and hold) a study, then select **Download Study**.
2. To anonymize the study, select **Deidentify**, then select a confidentiality profile. For more information, see "About anonymization" on page 63.
3. Select **Download**.

While viewing a study:

1. Right-click (or touch and hold) an image, then select **Download**.
2. Select **Download Study**, **Download Series** or **Download Image**.
3. To anonymize the study, series or image, select **Deidentify**, then select a confidentiality profile. For more information, see "About anonymization" on page 63.
4. Select **Download**.

## Share bookmarked images

Use a bookmark to tag an image in a patient study that you want to find again quickly or that you want to share with others.

### Create a bookmark

Select **Save**, then select **Bookmark** (toolbar). A bookmark is created for the current screen. Bookmarks are saved in the **Presentations** panel.

### View a bookmark

1. Select **Presentations** (side panel). Presentations and bookmarks for the study are shown below the side panel.
2. Select a bookmark thumbnail.
3. While viewing a bookmark, select **Series** (side panel) to see which series the image belongs to. The series is highlighted.

### Send a bookmark

Share a bookmarked image with others by sending them a link. Others will see the image as you do, including your annotations and visualization changes.

To send a bookmark, you can:

- Right-click (or touch and hold) a bookmark, then select **Email**. A new email is created using your default email application. Enter the recipient's email address and any additional information, then send the email.
- Right-click (or touch and hold) a bookmark, then select **Copy Link**. A window opens with the link text. Select and copy the link text. You can now paste the link into an email or instant message.

#### Note

Depending on your organization's NilRead configuration, users may require a login name and password for NilRead to view the study.

### Delete a bookmark

Right-click (or touch and hold) a bookmark, then select **Delete Bookmark**.

## Create secondary capture images

You can create a series of secondary capture images for a patient study. Secondary capture images are static screenshots and cannot be modified.

## Create a series of secondary capture images

Select **Save**, then select **Capture** (toolbar). A secondary capture image is created for the current screen and is added to a new series. Other secondary capture images created during this NilRead session will be added to the same series.

### Note

If you create secondary capture images for the same study in a future session, the images will be saved in a new series.

## Share a series of secondary capture images

Share a series of secondary capture images with others by sending them a link.

1. Right-click (or touch and hold) a series thumbnail, then select **Send Series Link**.
2. A new email is created using your default email application. Enter the recipient's email address and any additional information, then send the email.

### Note

Depending on your organization's NilRead configuration, users may require a login name and password for NilRead to view the study.

## Delete a series of secondary capture images

1. Select **Series** (side panel).
2. Right-click (or touch and hold) a series thumbnail, then select **Delete Series**.

## Export images

You can export a screenshot of the patient study currently loaded in the image viewing area. The screenshot can include one or all viewports and is saved as an image (JPG).

1. (Optional) If you want to export a screenshot of a single viewport, click (or tap) the viewport to select it.
2. Select **Save**, then select **Export** (toolbar).
3. Select the following options for the screenshot:
  - **Save: Viewport/Display** Create a screenshot of the selected viewport (**Viewport**) or all viewports (**Display**).
  - **Titles: Show/Hide** Include (**Show**) or exclude (**Hide**) the information shown on the image (patient name, series number, and so on).
4. Enter a filename in the **Save as** field in the bottom-left of the screen.
5. Select **Download**.
6. When done, select **Close**.

## Print images

You can print the patient study currently loaded in the image viewing area. You can print one or all viewports.

1. (Optional) If you want to print a single viewport, click (or tap) the viewport to select it.
2. Select **Print** (toolbar).
3. Select the following options for the screenshot:
  - **Save: Viewport/Display** Print the selected viewport (**Viewport**) or all viewports (**Display**).
  - **Titles: Show/Hide** Include (**Show**) or exclude (**Hide**) the information shown on the image (patient name, series number, and so on).
4. Select **Print**.

or

To use a DICOM printer, select **DICOM Print**. Select a printer and the page layout options, then select **OK**.

### Note

You must first configure a DICOM printer to use with NilRead (see "Manage DICOM services" on page 86).

5. When done, select **Close**.

## View reports

If one or more reports exist for a patient study, a folder icon is shown in the study's Status column in the Patient Study Directory. Reports can be DICOM structured reports or can be provided through DICOM Detached Interpretation. NilRead also supports custom HL7 integration for obtaining reports from a RIS/HIS system.

### Note

You can also access DICOM embedded PDF reports through the prior studies timeline when viewing a patient study (see "View prior studies timeline" on page 49).

1. (Optional) In the blank row at the top of the Patient Study Directory, select an option in the **Status** column.
  - **All** Show all patient studies.
  - **Available** Show patient studies containing at least one report.
  - **Approved** Show patient studies containing at least one approved report.
  - **Not Available** Show patient studies with no reports.
2. To view the reports for a study, select the folder icon beside the patient name. The reports in the study appear below the directory. If the study contains multiple reports, use the arrows in the report area to scroll through the reports.
3. The following options are available when viewing reports:

- **Save** Save a PDF copy of the report.
- **Print Report** Print the report from your browser.
- **Vert/Horiz** Place the report area on the right side (**Vert**) or bottom (**Horiz**) of the screen.
- **Maximize/Restore** View the report area only and hide the directory (**Maximize**) or view both the report area and the directory (**Restore**).
- **Close** Close the report.

**Note**

To resize the directory and report areas, drag the divider between the two areas.





## 7. Manage your account

### Manage your user profile



You can manage information in your user profile. You cannot change information such as your username and privileges.

#### Note

If you access **Settings** while viewing a study, select **Back to Viewer** to return to the image viewing area.

1. Select **Settings**.
2. Under **User Management**, select **Profile**.
3. Change information in the **Account** area.

<b>User Name</b>	Username to login to NilRead. This information cannot be modified.
<b>Role</b>	<p>NilRead role (Admin, User, Guest). By default:</p> <ul style="list-style-type: none"> <li>• Guests have no privileges.</li> <li>• Users have basic privileges, such as accessing the Patient Study Directory.</li> <li>• Administrators have full privileges. Only Administrators can manage users.</li> </ul> <p>This information can be modified by Administrators only.</p>
<b>Email</b>	Email address.
<b>Skype ID</b>	Skype ID. Allows the user to participate in Skype sessions.
<b>Phone</b>	Phone number.
<b>Facility, Department, Job Description</b>	User's facility and job information.
<b>Notify on Study Arrival</b>	User will receive an email when a new study containing one of the user's DICOM person name matches is added to the database.

<b>Last Name, First Name, Middle Name, Prefix, Suffix</b>	User's name.
<b>Expiry Date</b>	<p>Date the user's access to NilRead will expire.</p> <ul style="list-style-type: none"> <li>• Select  and select an expiry date. Select whether the user's account will be locked or deleted on the expiry date.</li> <li>• Select  to remove the expiry date and set the user's access to <b>Unlimited</b>.</li> </ul> <p>This information can be modified by Administrators only.</p>

4. Change your password.
  - a. Select Change Password.
  - b. **Old** Enter your current password.
  - c. **New, Confirm** Enter your new password.
  - d. Select **OK**.
5. The **Groups** area contains the groups you belong to. This information cannot be modified.
6. The **Privileges** area contains your privileges. This information cannot be modified.
7. The **DICOM Physician Names** area contains the DICOM person names you are matched with. This information cannot be modified.
8. Select **OK**.

## Change your password

You can change the password you use to login to NilRead.

### Note

If you access **Settings** while viewing a study, select **Back to Viewer** to return to the image viewing area.

1. Select **Settings**.
2. Under **User Management**, select **Profile**.
3. Select **Change Password**.
4. Enter your password:
  - a. **Old** Enter your current password.
  - b. **New, Confirm** Enter your new password.
  - c. Select **OK**.
5. Select **OK**.

## Change your preferences

You can set your preferences for using NilRead.

### Note

If you access **Settings** while viewing a study, select **Back to Viewer** to return to the image viewing area.



1. Select **Settings**.
2. Under **Preferences**, select **User Preferences**.
3. Select your preferences:

<b>Connection Type</b>	<p>Default connection type to access NilRead. (You can select a different option when logging in.) NilRead uses different compression policies based on the selected connection type to provide both interactive performance and image quality.</p> <ul style="list-style-type: none"> <li>• <b>Auto detect</b> Allow NilRead to detect the network connection.</li> <li>• <b>Local network</b> Connection over a local network.</li> <li>• <b>Internet</b> Connection over the Internet.</li> </ul> <p>Select <b>Speed Test</b> to check your NilRead connection speed.</p>
<b>User Interface Size</b>	<p>View NilRead using the default interface size (100%) or a larger size (150%). If using a larger size, you can also choose to enlarge the patient directory.</p>
<b>Login Landing Page</b>	<p>First page to view after logging into NilRead. You can choose the Patient Study Directory page or the Patient Search page.</p>
<b>Monitors</b>	<p>Virtual monitor layout. Select a layout based on the number of monitors you are using. Using multiple monitors allows you to display the Patient Study Directory on one monitor and the image viewing area on the remaining monitors.</p>
<b>Series Navigation</b>	<p>Behaviour when scrolling through the series in a study.</p> <ul style="list-style-type: none"> <li>• <b>Scroll By One</b> Scroll through one series at a time.</li> <li>• <b>Scroll By Group</b> Scroll through all of the series currently shown in the imaging viewing area at the same time.</li> </ul>
<b>Magnify Glass</b>	<p>Default magnifying glass size and zoom factor for smart zoom (see "Smart Zoom" on page 26).</p>

<b>Always show timeline and sidebar in image viewer</b>	Whether the prior studies timeline and side panel are always visible in the image viewer. If this preference is enabled, the option to hide these items will be hidden.
<b>Microscopy Measurement Units</b>	Units used for microscopy measurements. Applies to all measurement tools (see "Annotations and measurements" on page 28).
<b>Ruler label placement</b>	Placement of the label on the ruler measurement tool (see "Annotations and measurements" on page 28).
<b>Desktop Touch UI</b>	Whether the NilRead desktop touch interface is enabled. Select this option if you are using a desktop operating system with touch features.
<b>Skype Enabled</b>	Whether other meeting participants can contact you using Skype.
<b>Skin</b>	NilRead skin (dark or light).
<b>Viewer Monitor Type</b>	Whether you are using a color or grayscale monitor.
<b>Preferred Language</b>	Language to use for the NilRead application.

### Measurement Patterns

Pre-defined patterns for the area measurement tools (see "Annotations and measurements" on page 28). You can also create new patterns.

1. Select **Add Pattern**.
2. To customize the pattern, select any of the underlined areas and choose an option. (Customizable areas are highlighted when you hover over them.)
3. To delete a pattern, select the first customizable area, then select .
4. To move a pattern to a new position, select the first customizable area in the pattern, then select . The patterns will be shown in the Annotations and Measurement tool in the order defined here.

4. Select **Save**.

## Change mouse and keyboard preferences

You can assign NilRead tools (such as zoom and scroll) to mouse buttons, keyboard shortcuts and touch gestures. This allows you to quickly access tools you use frequently.

Customizing mouse, keyboard, and touch actions involves two steps:

1. Create templates that define the tools assigned to mouse buttons, keyboard shortcuts and touch gestures.
2. Select the mouse, keyboard and touch templates you want to use when working in NilRead. Also select whether the templates will apply to all NilRead users or a specific type of user (Admin, User, or Guest).

### Note

If you access **Settings** while viewing a study, select **Back to Viewer** to return to the image viewing area.

## Add a template

1. Select **Settings**.
2. Under **Preferences**, select **Mouse and Keyboard**.
3. Select the **Templates** tab.
4. Select **Add**. You can also select an existing template, then select **Clone**.

The **Mouse and Keyboard Template Editor** opens. Customizable areas are underlined and are highlighted when you hover over them. Click (or tap) a customizable area to edit it.

5. Enter the following information:

<b>Template Info</b>	<ol style="list-style-type: none"> <li>1. Enter a name for the template.</li> <li>2. Select whether this is a <b>Mouse</b>, <b>Keyboard</b> or <b>Touch</b> template.</li> <li>3. Enter a description for the template.</li> </ol>
<b>Template Rules Definition</b>	<p>Select the tools you want to assign. Depending on the type of template, you can assign tools to the mouse buttons and scroll wheel, create keyboard shortcuts, or assign tools to gestures.</p> <p>Default tools are already assigned. To change a tool:</p> <ol style="list-style-type: none"> <li>1. Click (or tap) the tool. A list appears with available tools you can choose from.</li> <li>2. Select a tool from this list or search for a tool.</li> </ol>

6. Select **Save**. The template is added to the **Templates** tab.

## Edit or delete templates

1. On the **Templates** tab, select a template.
2. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## Select a template to use in NilRead

Create definitions that specify the templates you want to use in NilRead. For example, you could create different definitions for mouse, keyboard and touch gestures. You can also use different keyboard shortcuts for different devices.

1. Select the **Definition** tab.
2. Select **Add**. You can also select an existing definition, then select **Clone**.

The **Mouse and Keyboard Editor** opens. Customizable areas are underlined and are highlighted when you hover over them. Click (or tap) a customizable area to edit it.

3. Enter the following information:

<b>Protocol Info</b>	<ol style="list-style-type: none"> <li>1. Enter a name.</li> <li>2. Select whether this is a <b>System</b> or <b>User</b> protocol. A system protocol will be applied to all users of NilRead. A user protocol will only be applied to the type of user you specify (<b>Admin</b>, <b>User</b>, or <b>Guest</b>).</li> <li>3. Select whether this is a <b>Mouse and Touch</b> protocol or a <b>Keyboard</b> protocol.</li> <li>4. Select the view mode and modality the protocol applies to.</li> </ol>
<b>Mouse</b>	<ol style="list-style-type: none"> <li>1. Select <b>&lt;add new&gt;</b>.</li> <li>2. Select <b>&lt;pick&gt;</b> and select a mouse template.</li> <li>3. You can select <b>&lt;add new&gt;</b> again and add additional mouse templates.</li> <li>4. To remove a mouse template, select <b>Cycle</b> to switch to <b>Delete</b>.</li> </ol>
<b>Touch</b>	Select <b>&lt;pick&gt;</b> and select a touch template.
<b>Keyboard</b>	<ol style="list-style-type: none"> <li>1. Select which devices these keyboard assignments apply to.</li> <li>2. Select <b>&lt;pick&gt;</b> and select a keyboard template.</li> </ol>

4. Select **Save**. The definition is added to the **Definition** tab and is enabled by default, meaning it will be applied to NilRead. To disable the definition, clear the **Enabled** checkbox.

## Edit or delete definitions

1. On the **Definition** tab, select a template.
2. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## Change modality preferences

You can change NilRead settings for different modalities.

### Note

If you access **Settings** while viewing a study, select **Back to Viewer** to return to the image viewing area.

1. Select **Settings**.
2. Under **Preferences**, select **Modality Preferences**.
3. Enter the following information:



<b>Modality</b>	<p>Select the modality that you want to set preferences for. The changes you make on the Modality Preferences page will only affect studies containing this modality.</p> <p>For the <b>Series Navigation</b> preference, you can select <b>All</b> to apply the changes to all modalities.</p>
<b>Series Navigation</b>	<p>Determines the behaviour of the scroll tool for the modality you selected. By default, the scroll tool will scroll through images in the current series only.</p> <ul style="list-style-type: none"> <li>• <b>None</b> Scroll through the current series only.</li> <li>• <b>Single Frame Only</b> Scroll through all of the series in the study. When advancing to the next series, scroll through single frame images only (omit multiframe images).</li> <li>• <b>All</b> Scroll through all of the series in the study. When advancing to the next series, scroll through all images (single frame and multiframe).</li> </ul>
<b>Virtual Series</b>	<p>Determines whether a virtual series is automatically created for a study (see "Combine all images in a single series" on page 53).</p> <ul style="list-style-type: none"> <li>• Select <b>Yes</b> to automatically create virtual series for the modality you selected.</li> <li>• Select <b>No</b> if you do not want to create virtual series for the modality you selected.</li> </ul>

4. Select **Save**.

## 8. Manage DICOM study transfers

### Retrieve studies to the local database

Use **Patient Search** to find patient studies on a remote DICOM server and retrieve the studies to the local database. You can also choose to load a study (open it in NilRead) immediately after retrieving it.

#### Note

Your user privileges determine whether you can retrieve studies to the local database. Your DICOM settings for Query/Retrieve Service Class Providers also determine whether you are able to retrieve studies (see "Manage DICOM services" on page 86). If retrieve mode is not enabled, you can load studies from a remote server but the studies are not saved in the local database.

#### Note

You can monitor patient study transfers using the DICOM Activity page (see "Monitor DICOM patient study transfers" on page 86).

1. In the Patient Study Directory, select **Patient Search**.
2. Find the study or studies you wish to retrieve (see "Open patient studies" on page 15).

You can now transfer studies to the local database. You can also choose to open studies in NilRead after they are transferred.

#### ***View a study***

Click (or tap) a study in the search results. You can also right-click a study, then select **Load Studies**.

The study is opened in NilRead. Depending on the retrieve mode that has been configured for the remote DICOM server, the study may also be transferred to the local database (if it is not already in the directory).

#### ***View multiple studies***

Select the checkbox beside each study. Right-click (or touch and hold) one of the studies and select **Load Studies**.

The studies are opened in NilRead. Depending on the retrieve mode that has been configured for the remote DICOM server, the studies may also be transferred to the local database (if they are not already in the directory).

#### ***Transfer one or more studies***

Select the checkbox beside each study. Right-click (or touch and hold) one of the studies and select **Retrieve Studies**. The studies are transferred to the local database (if they are not already in the directory).

## Send studies, series or images to a DICOM server

You can send a patient study, series or image to a remote DICOM server. The study, series or image remains in NilRead as well.

In the Patient Study Directory:

- Right-click (or touch and hold) a study, select **Send Study**, then select a remote device.

While viewing a study:

1. To send a series, right-click (or touch and hold) a series (side panel), then select **Send Series**.
2. To send an image, right-click (or touch and hold) an image, then select **Send Image**.

## Monitor DICOM patient study transfers

Monitor patient studies transfers between the local database and remote DICOM servers. You can view current, completed, and failed transfers.

In the Patient Study Directory:

1. Select **DICOM Activity**.
2. The **Current**, **Completed** and **Failed** tabs contain the following areas. Click (or tap) a column heading to sort the column in ascending or descending order.

<b>Inbound Associations</b>	Studies received by NilRead from a remote DICOM server.
<b>Outbound Associations</b>	Studies sent from NilRead to a remote DICOM server.
<b>Retrievals</b>	Studies retrieved by NilRead from remote DICOM servers (see "Retrieve studies to the local database" on page 85).

3. The **Deleted** tab lists the studies that have been purged from the local database.
4. To update a tab with the latest activities, select **Refresh**.
5. To remove the activities list from a tab, select **Clear**. You cannot clear the **Current** tab.

## Manage DICOM services

Configure your NilRead server and the remote DICOM servers on the network. You can use several types of DICOM services:

<b>Local Application Entity Configuration</b>	Refers to NilRead. NilRead is a Storage Service Class Provider that can receive patient studies from remote DICOM servers.
---	--

<b>Streaming Service</b>	NilRead DICOM Query/Retrieve Service Class User service, which incrementally retrieves DICOM data and loads it directly to the NilRead viewer without caching in the file system.
<b>Repository</b>	Refers to a data directory path which can be used to store imported DICOM data.
<b>Storage Service Class Providers</b>	Remote DICOM servers that can receive patient studies from NilRead.
<b>Storage Commitment Service Class Providers</b>	Remote DICOM servers that support the DICOM storage commitment service. Used to confirm that data has been permanently stored by a server to ensure it is safe to delete the data locally.
<b>Query/Retrieve Service Class Providers</b>	DICOM servers that NilRead can query and retrieve patient studies from.
<b>Modality Worklist Service Class Providers</b>	Facilitate the communication of patient and scheduled acquisition procedure information to imaging modalities.
<b>Detached Interpretation Management Service Class Providers</b>	Provide detached reports and notifications associated with studies.
<b>Print Service Class Providers</b>	Remote DICOM servers which support DICOM printing.
<b>RESTful Dicom Service Providers</b>	Remote DICOM servers which support DICOM QIDO-RS, WADO-RS, and STOW-RS protocols.

## Access DICOM configuration settings

1. Select **Settings**.
2. Under **Devices**, select **DICOM**.

See the next sections for details on configuring your services.

## Configure the NilRead DICOM Storage Service

1. In the **Local Application Entity Configuration** area, select **Edit**.
2. Modify the service details.

<b>AE Title</b>	NilRead DICOM server's DICOM Application Entity Title.
<b>Host</b>	IP address of the TCP/IP network endpoint that the NilRead DICOM server listens at.
<b>Port</b>	Port number of the TCP/IP network endpoint that the NilRead DICOM server listens at.
<b>Maximum Inbound Associations, Maximum Outbound Associations</b>	Maximum number of DICOM associations that the DICOM server will execute concurrently. This controls system resources utilization of the DICOM server (CPU, Disk I/O, etc.).

3. Select **Save**.

## Configure Streaming Service

1. In the **Streaming Service** area, select **Edit**.
2. Modify the service details.

<b>AE Title</b>	NilRead streaming service's DICOM Application Entity Title.
<b>Port</b>	Port number of the TCP/IP network endpoint that the NilRead streaming service listens at.
<b>Maximum Inbound Associations, Maximum Outbound Associations</b>	Maximum number of DICOM associations that the DICOM streaming service will execute concurrently. This controls system resources utilization of the DICOM server (CPU, Disk I/O, etc.).
<b>Enabled</b>	Indicates whether the DICOM streaming service is enabled.

3. Select **Save**.

## Configure Repository Information

1. In the **Repository** area, select **Edit**.
2. Modify the repository details.

<b>Repository path</b>	Path to the data repository.
<b>Free disk space watermark</b>	Drag to select the low and high watermark settings used to trigger the purging service.
<b>Critical disk space watermark</b>	Drag to select the watermark settings that will trigger the DICOM storage SCP service to enter suspended mode. The service will remain in suspended mode until enough free disk space is available.
<b>CPU idle watermark</b>	Drag to select the CPU idle threshold when purging can be performed.
<b>Number of protected studies</b>	Auto-purging will stop if the number of studies in the database is equal to or less than this number.
<b>Free disk space check interval (seconds)</b>	Interval (in seconds) to check for free disk space. Also triggers purging if all purging criteria are met.
<b>Number of studies to delete per batch</b>	Number of studies to delete when the system performs an automatic data purge (performed when disk space is reaching capacity).
<b>Dicom activity retention period (days)</b>	Number of days to retain DICOM activity logs. Logs will be deleted after this period.

**Email  
notification  
address**

Email address to send notifications when the critical disk space watermark is reached.

3. Select **Save**.

## Add a remote DICOM server

1. In the **Remote AE Configuration** area, select a DICOM services type. The existing servers are shown.
2. Select **New**.
3. Enter the server details.
4. Select **Update**.

## Edit or delete settings for a remote DICOM server

1. In the **Remote AE Configuration** area, select a DICOM services type. The existing servers are shown.
2. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## 9. Manage hanging protocols

### About hanging protocols

The purpose of a hanging protocol is to display the images in a study in a consistent manner. While the term originally referred to the arrangement of physical films in a film box, it now refers to the display of images on computer monitors. When properly set up, the use of hanging protocols significantly improves reading quality and efficiency.

When opening a study, NilRead analyzes the DICOM attributes of the study and identifies matching hanging protocols. If any candidates are found, the best one is selected and applied automatically. You can also choose a hanging protocol when viewing a study (see "Select hanging protocols" on page 41).

The Hanging Protocols page has two tabs:

- **Protocols** Contains a list of all hanging protocols in NilRead (see "Manage hanging protocols" on page 91). You can add, edit, clone, delete, enable/disable, import and export protocols.
- **Rules templates** Contains a list of rules templates you can optionally use when creating a hanging protocol (see "Manage hanging protocol rules templates" on page 94). Rules templates make it easy to apply a standard set of rules to multiple hanging protocols. If you make changes to a rules template, the changes will also be applied to all protocols using the template.

#### Note

See the **Hanging Protocols Handbook** for more detailed information about using hanging protocols.

### Manage hanging protocols

1. Select **Settings**.
2. Under **Preferences**, select **Hanging Protocols**.

See the next sections for details on configuring hanging protocols.

#### Note

If you access **Settings** while viewing a study, select **Back to Viewer** to return to the image viewing area.

### Add hanging protocols

1. On the **Protocols** tab, select **Add**. You can also select an existing protocol, then select **Clone**.

The **Hanging Protocol Editor** appears. Customizable areas are underlined and are highlighted when you hover over them. Click (or tap) a customizable area to edit it.

#### Note

See the **Hanging Protocols Handbook** for more detailed information about using hanging protocols.



## 2. Enter the following information:

<b>Protocol Info</b>	<ol style="list-style-type: none"> <li>1. Enter a name for the protocol.</li> <li>2. Select whether this is a <b>System</b> or <b>User</b> protocol. A system protocol will be applied to all users of NilRead. A user protocol will only be applied to the type of user you specify (Admin, User, or Guest).</li> <li>3. Select the type of users, based on job description, for this protocol.</li> <li>4. Enter a <b>description</b> for the protocol.</li> </ol>
<b>Anchor study matching</b>	<p>Define the type of studies the protocol will apply to.</p> <ol style="list-style-type: none"> <li>1. To add a new DICOM rule, select <b>&lt;add new&gt;</b>. Customize the rule. For example, you could state that images must be a specific modality.</li> <li>2. To add a rules template, select <b>&lt;add new ruleset&gt;</b>. Select <b>&lt;pick&gt;</b> and select a template.</li> <li>3. To remove a rule or ruleset, select <b>Verify</b> to switch to <b>Delete</b>.</li> </ol>
<b>Comparison study matching</b>	<p>Select whether the hanging protocol includes prior studies.</p> <ol style="list-style-type: none"> <li>1. By default, prior studies are not included. To include prior studies, select <b>will not be</b> to switch to <b>will be</b>.</li> <li>2. Select <b>&lt;add new&gt;</b> or <b>&lt;add new ruleset&gt;</b> and add the same rules as the <b>Anchor study matching</b> section.</li> </ol>
<b>Relevant Patient History</b>	<p>Define filters to determine which prior studies are shown in the prior studies timeline for this hanging protocol.</p> <ol style="list-style-type: none"> <li>1. By default, all prior studies are shown. To define filters, select <b>all</b> to switch to <b>these</b>.</li> <li>2. You can enter filters based on modality, keywords, and the study age. Keywords are words that will be searched in a few common DICOM attributes such as body part examined, region of interest, and study description.</li> </ol>

<b>Monitors and protocol stages</b>	<p>Define the image placement.</p> <ol style="list-style-type: none"> <li>1. On the <b>Stage 1</b> tab, the number of screens is shown under <b>Monitors and screen layouts</b>. The default number of screens is 1x1. If desired, select <b>1x1</b> and select a different number of screens.</li> <li>2. In the <b>Protocol layouts</b> section, define the rules for each screen.</li> <li>3. If desired, select <b>&lt;add stage&gt;</b> and add additional stages to the hanging protocol. Define the screen layout for each stage.</li> </ol>
<b>Application preferences</b>	<ol style="list-style-type: none"> <li>1. Select whether the side panel is visible or hidden.</li> <li>2. Select whether the prior studies timeline is visible or hidden.</li> </ol>

3. Select **Save**. The hanging protocol is added to the **Protocols** tab and is enabled by default, meaning it will be available in NilRead. To disable the hanging protocol, clear the **Enabled** checkbox.

## Edit or delete hanging protocols

1. On the **Protocols** tab, select a protocol.
2. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## Import and export hanging protocols

To import a hanging protocol:

1. On the **Protocols** tab, select **Import**.
2. Select a file to import, then select **OK**.

To export a hanging protocol:

1. On the **Protocols** tab, select a protocol.
2. Select **Export**.
3. Under **Export Range**, choose whether to export the selected protocol only or export all protocols.
4. Select **OK**. You will be prompted by your browser to save or open the exported file.

## Enable a hanging protocol

You must enable a hanging protocol to make it available in NilRead. You can disable protocols that you do not want to make available to NilRead users.

1. On the **Protocols** tab, select the checkbox beside a protocol. You can also select a protocol, then select **Enable**.
2. To disable a protocol, clear the checkbox beside the protocol.

## Manage hanging protocol rules templates

You can create rules templates to use in hanging protocols. If you make changes to a rules template, the changes will also be applied to all protocols using the template.

1. Select **Settings**.
2. Under **Preferences**, select **Hanging Protocols**.
3. Select the **Rules Templates** tab.

See the next sections for details on configuring rules templates.

### Note

If you access **Settings** while viewing a study, select **Back to Viewer** to return to the image viewing area.

## Add rules templates

1. On the **Rules Templates** tab, select **Add**. You can also select an existing template, then select **Clone**.

The **Hanging Protocol Template Editor** appears. Customizable areas are underlined and are highlighted when you hover over them. Click (or tap) a customizable area to edit it.

### Note

See the **Hanging Protocols Handbook** for more detailed information about using hanging protocols.

2. Enter the following information:

<b>Template Info</b>	<ol style="list-style-type: none"> <li>1. Enter a name for the protocol.</li> <li>2. Enter a description for the protocol.</li> </ol>
<b>Template rules definition</b>	<ol style="list-style-type: none"> <li>1. Select <b>&lt;add new&gt;</b> to add a new DICOM rule. Customize the rule. For example, you could state that images must be a specific modality.</li> <li>2. To remove a rule, select <b>Verify</b> to switch to <b>Delete</b>.</li> </ol>

3. Select **Save**.

## Edit or delete rules templates

1. On the **Rules Templates** tab, select a template.
2. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## 10. Data lifecycle policies

### Manage data lifecycle settings

Use data lifecycle policies to manage the lifecycle of any series imported into NilRead or created in NilRead. A data lifecycle policy is defined in terms of conditions and activities. If a series meets all of the policy conditions, the lifecycle activities defined in the policy are applied to the series. For example, a policy could state that all data imported from a specific institution (condition) will be retained in NilRead for six months before being moved to a new storage location (activity).

#### Note

NilRead automatically verifies series against your data lifecycle policies. You can also choose to apply a policy to a study (see "Apply a data lifecycle policy to a study" on page 100). This is useful if you created a new policy or modified your existing policies after the study was imported to the database.

#### Note

See the **Data Lifecycle Management Handbook** for more detailed information about creating policies.

### Access data lifecycle settings

1. Select **Settings**.
2. Under **Devices**, select **Data Lifecycle**.
3. The **Data Lifecycle** page contains three areas:
  - **Lifecycles** Contains a list of recent activities related to the execution of data lifecycle policies.
  - **Policies** Contains a list of all existing data lifecycle policies.
  - **Endpoints** Contains a list of non-DICOM endpoints (storage tiers and data pickup folders) that can be used for data lifecycle management.

#### Note

Select **Refresh** under each of these areas to view the latest changes made by all users.

See the next sections for details on configuring data lifecycle settings.

### Add a policy

1. In the Policies area, select **Add**.
2. Enter the policy information:

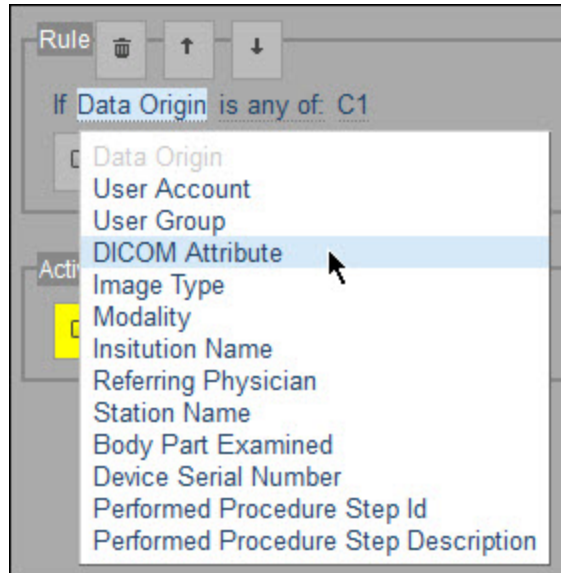
<b>Name</b>	Policy name.
-------------	--------------

<b>Comment</b>	Policy description.
<b>Enabled</b>	If selected, the policy can be applied to NilRead data.
<b>Training</b>	If selected, the policy will be run in a "training" mode. The activities will be logged but will not be applied to data.

**Rule**



Specify the rule for the policy by adding one or more conditions. All conditions must be satisfied in order for the policy to be applied to a study.

1. Select **Add Condition**.
2. Customizable areas are underlined and are highlighted when you hover over them. Click (or tap) a customizable area to edit it.



3. To add an item to a condition, select a customizable area, then select +. To remove an item, select -.



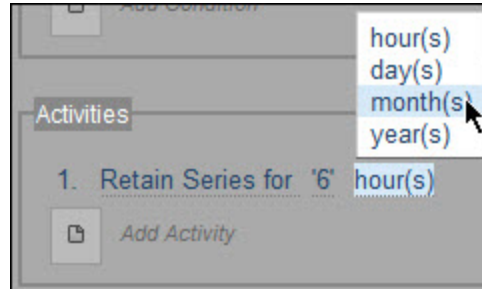
4. To delete a condition, select the first customizable area, then select .
5. To move a condition to a new position, select the first customizable area, then select .

## Activities

Specify the activities that will occur if the policy rule is satisfied. You can use a series of activities to manage data. For example, you could retain series for six months before moving them to a storage location; you could then move the series to an offline storage location after two years.



Activities are executed in the order listed in the policy.

1. Select **Add Activity**.
2. Customizable areas are underlined and are highlighted when you hover over them. Click (or tap) a customizable area to edit it.



You can use activities to:

- **Retain** Specify how long to retain data in the database. Typically used in conjunction with another activity, such as moving data to a storage location.
- **Route** Move data to a DICOM server.
- **Relocate** Copy data to a storage location (defined by a Storage Tier endpoint).
- **Recycle** Delete data.
- **Email** Send an email to a specified email address.
- **Notify Study Import** Receive a notification when a study is imported.

3. To delete an activity, select the activity, then select .
4. To move an activity to a new position, select the first customizable area, then select .

3. Select **Save**. The policy is added to the **Policies** area.

## Add an endpoint

1. In the **Endpoints** area, select **Add**.
2. Enter the endpoint information:

<b>Name</b>	Endpoint name.
<b>Type</b>	Endpoint type: <ul style="list-style-type: none"> <li>• <b>Storage Tier</b> Storage location used to store NilRead data.</li> <li>• <b>EventSink</b> Remote endpoint capable of receiving NilRead study import event notifications.</li> </ul>
<b>Path</b>	Path to the endpoint location (for example, c://storage1).

3. Select **Save**.

## Edit or delete a policy or endpoint

1. In the **Policies** area, select a policy.  
or  
In the **Endpoints** area, select an endpoint.
2. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## Correct or abort an activity

The **Lifecycles** area contains a log of activities performed on series based on lifecycle policies. The **Status** column indicates whether the activity was performed successfully.

- **OK** The activity is executing successfully and is not yet complete.
- **Waiting** The workflow is waiting for a condition in order to proceed.
- **Faulting** The activity failed to execute successfully. You can correct or abort the activity.
- **Completed** The activity executed and completed successfully.
- **Aborted** The activity was aborted.
- **Failed** The activity failed to execute successfully. The activity cannot be corrected or aborted.

If an activity has a Faulting status, you can correct the activity workflow and rerun the activity.

1. Select an activity, then select **Correct**.
2. Modify the workflow.
3. Select **Save**.

You can abort an activity that has not yet completed (OK, Waiting, or Faulting status).

- Select an activity, then select **Abort**.



## Apply a data lifecycle policy to a study

NilRead automatically verifies series against your data lifecycle policies. You can also manually apply a policy to a study. There may be cases when you need to manually apply activities associated with a data lifecycle policy to a particular study, either to bypass the policy rule conditions or to apply the policy to a series that was already in NilRead before you created (or modified) the policy.

In the Patient Study Directory:

1. Select the checkbox beside each study to which you want to apply the policy.
2. Right-click (or touch and hold) one of the studies and select **Apply Policy**, then select a data lifecycle policy. After the activities are applied, a message will appear with the results.

# 11. Manage NilRead settings

## Manage prefetch settings

NilRead can be configured to retrieve archived images from external sources in advance of a scheduled patient visit. This ensures prior exams are available for comparison.

Prefetch is controlled by user-defined policies. Each policy is defined in terms of triggers and actions. Triggers specify conditions on which prefetch should be performed while actions specify the prefetch details. NilRead can be configured to query multiple MWL service class providers for scheduled workflow items associated with a specific modality, station name, and AE title. Alternatively, prefetch can be triggered by an imported study based on a study modality, data source, or age.

If a trigger condition is satisfied, priors will be prefetched based on the configured number of studies, age, modality, data source, and patient matching. For example, a policy could state that when a CR acquisition is scheduled on a specific device (or when a CR study is imported from a specific DICOM server), NilRead will prefetch a maximum of three CR studies, not older than six months, from a specific data source, and the studies will be selected by matching the patient name.

### Note

Prefetch activities are logged and can be reviewed on the DICOM Activity page (see "Monitor DICOM patient study transfers" on page 86).

## Access prefetch settings

1. Select **Settings**.
2. Under **Devices**, select **Prefetch**.

See the next sections for details on configuring prefetch.

## Prefetch settings

1. In the **Services** area, define the prefetch settings:

<b>Enable</b>	If selected, prefetch is enabled.
<b>Modality Worklist Poll Period</b>	Frequency (in hours) to check the modality worklist. Select <b>Poll</b> to check the worklist immediately.

<b>Query Modality Worklist Items not older than</b>	Age (in days) of modality worklist items to include when checking the worklist.
<b>Prefetch Activation</b>	Frequency to run prefetch (check the modality worklist and fetch data). You can activate prefetch immediately or schedule it to run between specific hours. When <b>immediate</b> is selected, prefetch actions will be executed immediately when a worklist item is scheduled or a study is imported to NilRead which matches a policy trigger; otherwise, prefetch actions will be executed within the configured time range.
<b>Keep prefetch request records for</b>	Period (in days) to retain scheduled prefetched requests. If data cannot be accessed within this period, the requests will be removed from the system.

2. Select **Save**.

#### Note

Select **Reset** to restore the default settings.

## Add a prefetch policy

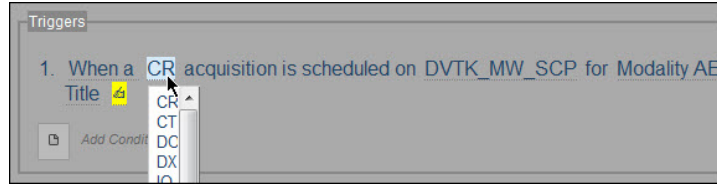
1. In the **Policies** area, select **Add**.
2. Enter the policy information:

<b>Name</b>	Policy name.
<b>Comment</b>	Policy description.
<b>Enabled</b>	If selected, the policy will be applied to NilRead data.

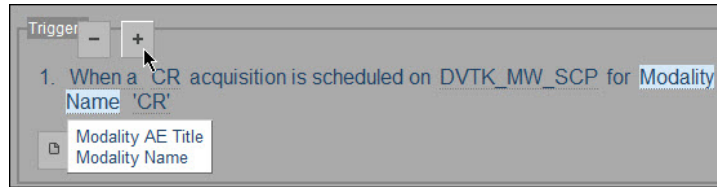
**Triggers**




Specify the triggers for the policy by adding one or more conditions. The policy actions will be triggered if any of the trigger conditions are satisfied.

1. Select **Add Condition**.
2. Customizable areas are underlined and are highlighted when you hover over them. Click (or tap) a customizable area to edit it.



3. To add an item, select a customizable area, then select +. To remove an item, select -.

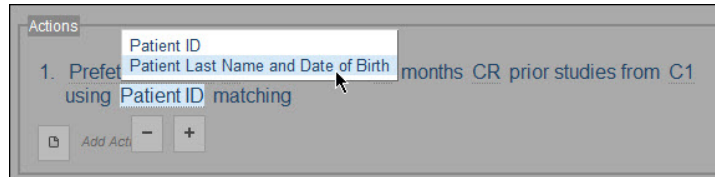


4. To delete a condition, select the first customizable area, then select .
5. To move a condition to a new position, select the condition, then select  .

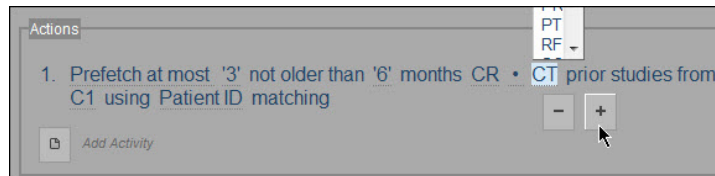
**Actions**


Specify the actions that will occur if any of the policies triggers are satisfied. Actions are executed in the order listed in the policy.

1. Select **Add Activity**.
2. Customizable areas are underlined and are highlighted when you hover over them. Click (or tap) a customizable area to edit it.



3. To add an item, select a customizable area, then select+. To remove an item, select -.



4. To delete an action, select the action, then select .
5. To move an action to a new position, select the action, then select



3. Select **Save**.

**Edit or delete a prefetch policy**

1. In the **Policies** area, select a policy.
2. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

**Manage XDS settings**

The XDS and XDS-I profiles (defined by Integrating the Healthcare Enterprise, or IHE) provide standards-based cross-enterprise document sharing among healthcare organizations. NilRead can be configured to use these profiles to obtain patient data from multiple healthcare organizations, allowing physicians to build comprehensive patient histories. NilRead XDS configuration requires the following:

- **XDS registry** Registry that stores meta-data for documents located in multiple XDS repositories (e.g. at multiple healthcare institutions).

- **Master Patient Index** Database that maintains a unique index for every patient registered at a healthcare organization.
- **XDS endpoints** Repositories that store patient documents.

## Access XDS settings

1. Select **Settings**.
2. Under **Devices**, select **XDS**.

See the next sections for details on configuring XDS settings.

## XDS Registry

1. In the **XDS Registry** area, select **Edit**.
2. Enter the XDS registry settings:

<b>Application</b>	XDS registry application name.
<b>Facility</b>	XDS registry facility name.
<b>Authority</b>	Master Patient Index assigning authority.
<b>Address</b>	XDS registry address.
<b>Disable</b>	Disable the use of the XDS registry.

3. Select **Save**.

## Master Patient Index

1. In the **Master Patient Index** area, select **Edit**.
2. Enter the Master Patient Index (MPI) settings:

<b>Application</b>	MPI application name.
<b>Facility</b>	MPI facility name.
<b>Address</b>	IP address (including port) of the TCP/IP network endpoint that NilRead XDS queries for MPI resolution.

3. Select **Save**.

## XDS Endpoints

### Add an endpoint

1. In the **XDS Endpoints** area, select **Add**. You can also select an existing endpoint, then select **Copy**.
2. Enter the endpoint information:

<b>Name</b>	A unique friendly name to identify the endpoint.
<b>UID</b>	Unique identifier supplied by the endpoint provider.
<b>Type</b>	Endpoint type: <ul style="list-style-type: none"> <li>• <b>XDS Repository</b> Endpoint supplying XDS documents.</li> <li>• <b>RAD 69 (Retrieve Imaging Document Set)</b> Endpoint supplying images over the RAD 69 protocol.</li> <li>• <b>RAD 55 (WADO Retrieve)</b> Endpoint supplying images over the RAD 55 protocol.</li> </ul>
<b>Address</b>	Web service address (URL) of the network endpoint that NilRead XDS queries for document or image resolution.

3. Select **Save**.

### Edit or delete an endpoint

1. In the **XDS Endpoints** area, select an endpoint.
2. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## Use the dashboard

Use the dashboard to view system information and counters regarding NilRead components and operational environment.

1. Select **Settings**.
2. Select **Dashboard**. The dashboard contains the following areas:

<b>Server Status</b>	<p>NilRead server system level information including the server name, build version, current CPU utilization, available RAM, and current number of users.</p> <p>Select the number of users to view statistics for the users currently logged into NilRead.</p>
<b>DICOM Statistics</b>	<p>NilRead DICOM service counters, including CPU utilization, inbound throughput, and total number of imported studies and images.</p>
<b>User Statistics</b>	<p>Statistics for the users currently logged into NilRead, including the user account name, current session start time, and recent inactivity time.</p>
<b>Database</b>	<p>Database information, including the database server name, database name, current database size, and database capacity usage.</p>
<b>Licensing</b>	<p>NilRead licensing information, including the maximum number of concurrent users, expiration time, and enabled NilRead features.</p>
<b>Network</b>	<p>NilRead server network interface card information, including the adapter name, network utilization, link speed, and operational status.</p>

## Use analytics

Use the NilRead analytics to view detailed information including audit trails, user activity, study access and load-balancing statistics.

1. Select **Settings**.
2. Select **Analytics**. You can view the following information:
  - Patient audit trail
  - User activity
  - Event audit trail
  - Patients accessed by user
  - Top users by patient access
  - Study access by modality
  - User login load-balancing across servers



- Study review load-balancing across servers

## Federation

Administrators only

1. Select **Settings**.
2. Select **Federation**. You can view the following information:
  - Status
  - Archiving & Backup
  - Software Updates
  - Network Utilization

## System preferences

Administrators only

Select the region where NilRead is deployed. This ensures that the appropriate NilRead settings and labels are shown for the region.

1. Select **Settings**.
2. Under **Preferences**, select **System Preferences**.
3. In **Deployment Region**, select the region where NilRead is being used.
4. Select **Save**.

## 12. Manage users (Admin only)

### About user privileges

#### Administrators Only

You can manage NilRead user privileges at several levels. This allows you to tightly control user access to NilRead features and the Patient Study Directory.

A user's privileges are initially based on their role and group assignment; these are both assigned in the user's account. Privileges can then be customized through the user's account and by restricting the user's access to patient studies.

#### Note

For more information about the privileges that can be assigned to users and groups, see "Privilege descriptions" on page 110.

Level	Description	More information
<b>Role</b>	<p>Users are assigned default privileges based on their role (Admin, User or Guest). These privileges can be customized in the user's account.</p> <ul style="list-style-type: none"> <li>• <b>Administrators</b> typically have full privileges for NilRead use and configuration; only Administrators can manage NilRead users. By default, Administrators have full privileges.</li> <li>• <b>Users</b> are regular NilRead users. Users typically have access to the entire Patient Study Directory; however, their access can be restricted if desired.</li> <li>• <b>Guests</b> are occasional NilRead users, such as external referring physicians. Guests can typically only see studies for their own patients and can also be given access to studies using DICOM person name matches (see Study Access below). Guests can access emergency override ("break glass"). By default, Guests have no privileges.</li> </ul>	"Manage user accounts" on page 115
<b>Group</b>	<p>Users are also assigned the default privileges of the group to which they belong. These privileges can be customized in the user's account.</p>	"Manage user groups" on page 114

Level	Description	More information
<b>Study Access</b>	<p>Users can be granted access to all studies in the local directory (through the PatientDirectory privilege). Alternatively, you can restrict a user's access to patient studies by:</p> <ul style="list-style-type: none"> <li>• Granting a user access to specific patient studies. and/or</li> <li>• Granting a user access to studies associated with specific DICOM person names.</li> </ul> <p>Note that users must also be assigned the StudyListAccess privilege in order to access the Patient Study Directory.</p>	<p>"Manage user access to studies" on page 119</p> <p>"Match users to DICOM person names" on page 119</p>
<b>Profile</b>	<p>Administrators can manage their privileges using their profile. Guests and Users can only change settings such as their name, email address and password.</p>	<p>"Manage your user profile" on page 77</p>

## Privilege descriptions

The following privileges can be assigned to a group or user.

Privilege	Allows the user to
<b>AutoEnroll</b>	Automatically create NilRead user accounts for members of a Windows group on their first login.
<b>BookmarkSaveSend</b>	Create and share a bookmark.
<b>Collaboration</b>	Access collaboration tools.
<b>CreateAccounts</b>	Create new NilRead user accounts.
<b>DicomClearLogs</b>	Remove logs from the DICOM Activity page (see "Monitor DICOM patient study transfers" on page 86).

<b>Privilege</b>	<b>Allows the user to</b>
<b>DicomConfig</b>	Manage DICOM services (see "Manage DICOM services" on page 86).
<b>DicomConfigEdit</b>	Edit DICOM configuration.
<b>DicomDelete</b>	Remove DICOM services from the database (see "Manage DICOM services" on page 86).
<b>DicomDownload</b>	Download DICOM files using NilFeed.
<b>DicomPrint</b>	Manage DICOM printers.
<b>DicomQueryRetrieve</b>	Access the Search tab in the Patient Study Directory and retrieve patient studies from a DICOM server (see "Retrieve studies to the local database" on page 85).
<b>DicomStore</b>	Access the DICOM store features.
<b>DicomUpload</b>	Upload DICOM files using NilFeed.
<b>EditAnonTemplates</b>	Create, modify and delete anonymization profiles and masks.
<b>EditHangingProtocols</b>	Create, modify, delete and enable/disable user hanging protocols.
<b>EditPatientStudy</b>	Edit study-level DICOM attributes.
<b>EditSystemHangingProtocols</b>	Create, modify, delete and enable/disable system hanging protocols.
<b>EditWorkItems</b>	Create, modify and delete worklists and folders.

Privilege	Allows the user to
<b>EmergencyOverride</b>	<p>Use emergency override ("break glass") to access patient studies (see "Use Break Glass to find patient studies" on page 17).</p> <p>NilRead guest users typically have limited access to the Patient Study Directory. However, guests may be given access to emergency override ("break glass") which allows them to search for studies based on patient name and study accession number.</p> <p>For example, a referring physician may only have access to studies containing his own name. If the referring physician's name is misspelled or missing from a study, he will be unable to access the study using the Patient Study Directory. However, the referring physician can search for the study if he has been granted the emergency override privilege.</p>
<b>GuiAdvanced</b>	Access all user interface features. (The user's role and privileges may limit the features they can view.)
<b>GuiBasic</b>	Access basic user interface features. Only a single study can be reviewed in the image viewing area. Advanced features, such as measurement tools and hanging protocols, will not be available. (The user's role and privileges may limit the features they can view.)
<b>GuiIntermediate</b>	Access intermediate user interface features. For example, basic measurement tools, screen layouts and cross-correlation between series are available. Multiple studies can be reviewed in the image viewing area at the same time. Advanced features, such as advanced measurement tools and hanging protocols, will not be available. (The user's role and privileges may limit the features they can view.)
<b>GuiPatient</b>	Access simple user interface features. Intended for patient use.
<b>LifecycleManagement</b>	Enable and modify data lifecycle options (see "Manage data lifecycle settings" on page 95).
<b>MprProtocols</b>	View Slab views.

Privilege	Allows the user to
<b>OverrideLosslessModalities</b>	Override system settings that specify that images from specific modalities are always shown as lossless, uncompressed images. If a user has this privilege, the user is able to turn off Full Quality for images, regardless of the default system settings (see "Full Quality" on page 33).
<b>PatientDirectory</b>	View all studies in the local database. If this privilege is not assigned to a user, the user is only able to access: <ul style="list-style-type: none"> <li>• studies the user has been specifically granted access to (see "Manage user access to studies" on page 119)</li> <li>• studies containing any DICOM person names the user has been matched with (see "Match users to DICOM person names" on page 119).</li> </ul>
<b>PersistentAnnotations</b>	Allow persistent annotations and measurements across review sessions.
<b>SaveEvidence</b>	Save secondary capture images, key images and bookmarks.
<b>SecondaryCaptureCreation</b>	Create secondary capture images (see "Create secondary capture images" on page 72).
<b>ShowBookmark</b>	Display a list of bookmarks in Presentations (see "Create presentations" on page 52).
<b>SkypeIntegration</b>	View Skype controls in the Collaboration panel.
<b>StudyListAccess</b>	Access the Patient Study Directory.
<b>ThreeDProtocols</b>	View 3D views.
<b>ViewAnalytics</b>	View Analytics (see "Use analytics" on page 107).
<b>XdsAccess</b>	Access XDS repositories.

## Manage user groups

### Administrators Only

You can use groups to assign NilRead privileges to users (see "Privilege descriptions" on page 110). If NilRead is part of a domain, you can also add Windows groups to NilRead. If changes are made to a Windows group, such as adding users, the changes are automatically applied in NilRead as well.

#### Note

Use the Accounts page to manage privileges for individual users, in addition to (or instead of) using groups (see "Manage user accounts" on page 115).

## Access group settings

1. Select **Settings**.
2. Under **User Management**, select **Groups**.

See the next sections for details on managing groups.

## Create an application group

An application group is specific to NilRead and is not linked to a Windows group.

1. In the **Group** field (below the **Application Groups** area), enter the group name.
2. Select **Create**.
3. Select the type of group (Admin or User).
  - The **Granted Privileges** area lists the default privileges assigned to the group.
  - The **Revoked Privileges** area lists the privileges not assigned to the group by default.
  - By default, User groups have basic privileges (such as accessing the Patient Study Directory) and Admin groups have full privileges.
4. To add or remove privileges from the group:

<b>Add a privilege</b>	Select a privilege in the <b>Revoked Privileges</b> area, then select <b>Grant</b> .
<b>Remove a privilege</b>	Select a privilege in the <b>Granted Privileges</b> area, then select <b>Revoke</b> .

## Add a Windows group to NilRead

1. In the **Windows Groups** area, select a group, then select **Add**. The group is added to the **Application Groups** area.
  - The **Granted Privileges** area lists the default privileges assigned to the group.

- The **Revoked Privileges** area lists the privileges not assigned to the group by default.
2. To add or remove privileges from the group:

<b>Add a privilege</b>	Select a privilege in the <b>Revoked Privileges</b> area, then select <b>Grant</b> .
<b>Remove a privilege</b>	Select a privilege in the <b>Granted Privileges</b> area, then select <b>Revoke</b> .

## Edit or delete a group

1. In the **Application Groups** area, select the group name.
2. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## Manage user accounts

### Administrators Only

A user account defines the NilRead user's username, role, and group assignment. The user's privileges and DICOM person name matches are shown in the user's account and can be modified. You can also lock user accounts and reset user passwords.

#### Note

Users can manage some of their account information through their profile (see "Manage your user profile" on page 77).

1. Select **Settings**.
2. Under **User Management**, select **Accounts**. Existing NilRead user accounts are shown.
3. If you have included Windows groups in NilRead, select **Refresh** to update the **Accounts** tab with any changes to Windows user accounts.



See the next sections for details on managing user accounts.

## Add an account

1. Select **Add**.
2. In the **Account** area, enter the user's information:



<b>User Name</b>	<p>Username to login to NilRead.</p> <p><b>Note</b> The user receives an automatic email with their NilRead password when their NilRead user account is created.</p>
<b>Role</b>	<p>NilRead role (Admin, User, Guest).</p> <p>By default:</p> <ul style="list-style-type: none"> <li>• Guests have no privileges.</li> <li>• Users have basic privileges, such as accessing the Patient Study Directory.</li> <li>• Administrators have full privileges. Only Administrators can manage users.</li> </ul>
<b>Email</b>	Email address.
<b>Skype ID</b>	Skype ID. Allows the user to participate in Skype sessions.
<b>Phone</b>	Phone number.
<b>Facility, Department, Job Description</b>	User's facility and job information.
<b>Notify on Study Arrival</b>	User will receive an email when a new study containing one of the user's DICOM person name matches is added to the database.
<b>Last Name, First Name, Middle Name, Prefix, Suffix</b>	User's name.
<b>Password</b>	Password to login to NilRead.

<b>Expiry Date</b>	<p>Date the user's access to NilRead will expire.</p> <ul style="list-style-type: none"> <li>• Select  and select an expiry date. Select whether the user's account will be locked or deleted on the expiry date.</li> <li>• Select  to remove the expiry date and set the user's access to <b>Unlimited</b>.</li> </ul>
--------------------	--

3. (Optional) In the **Groups** area, select the group to which the user belongs. Guests cannot be assigned to groups.

<b>Add a user to a group</b>	Select a group in the <b>Not Member</b> area, then select <b>Add</b> .
<b>Remove a user from a group</b>	Select a group in the <b>Members</b> area, then select <b>Remove</b> .

4. The privileges assigned to the user are shown in the **Privileges** area (see "Privilege descriptions" on page 110). These privileges are initially based on the user's role and group but can be modified.

<b>Grant a privilege to a user</b>	Select a privilege in the <b>Revoked</b> area, then select <b>Grant</b> .
<b>Remove a privilege from a user</b>	Select a privilege in the <b>Granted</b> area, then select <b>Revoke</b> .

5. The DICOM person names matched with the user are shown in the **Associated** area. The user will have access to studies associated with these DICOM person names.

<p><b>Match a user with a DICOM person name</b></p>	<ol style="list-style-type: none"> <li>1. Select <b>Associate</b>. The <b>DICOM Physician Names</b> screen appears.</li> <li>2. To find a name, enter search information in the blank row below the column headings (Last Name, First Name and so on). You can enter partial information (for example, the first few letters in the last name). To reload all names, clear all search boxes. <div style="background-color: #f0f0f0; padding: 5px; margin: 10px 0;"> <p><b>Note</b> Use the arrows and page numbers at the bottom of the screen to scroll through the pages. On mobile devices, you can also swipe to move through the pages.</p> </div> </li> <li>3. Select one or more names. Select <b>Associate</b>.</li> </ol>
<p><b>Remove the match between a user and a DICOM person name</b></p>	<p>Select one or more names in the <b>Associated</b> area. Select <b>Dissociate</b>.</p>

6. Select **OK**.

## Edit or delete an account

1. Select the user account. To find an account, enter account information in the blank row at the top of the tab.
2. Select **Edit**. Modify the details, then select **Save**.  
or  
Select **Delete**.

## Lock a account

1. Select the user account. To find an account, enter account information in the blank row at the top of the tab.
2. Select **Lock**. The user's Locked status changes to True.
3. To unlock an account, select **Lock**. The user's Locked status changes to False.

## Reset a user's password

If you reset a user's password, the user will receive an email with a new auto-generated password.

1. Select the user account. To find an account, enter account information in the blank row at the top of the tab.
2. Select **Reset**.

## Manage user access to studies

### Administrators Only

You can select the patient studies a user can access. You can also use DICOM person name matches to limit user access to patient studies (see "Match users to DICOM person names" on page 119). Alternatively, you can grant a user access to all patient studies (see "Manage user accounts" on page 115).

1. Select **Settings**.
2. Under **User Management**, select **Studies**.
  - Patient studies are listed in the top portion of the tab.
  - NilRead users are listed in the bottom portion of the tab.
3. Select a patient study. To find a study, enter information in the blank row above the study list.
4. Select a user. To find a user, enter information in the blank row above the user list. The **Actions** area shows whether the user currently has access to the study.
5. Select **Grant** to give the user access to the study.  
or  
Select **Deny** to remove the user's access to the study.

## Match users to DICOM person names

Use DICOM person name matches to restrict user access to the Patient Study Directory. Instead of granting a user access to the entire directory, you can match the user with a DICOM person name. This allows the user to only access studies containing the person name. You can match a user with multiple person names to accommodate potential spelling mistakes.

DICOM person names include referring physicians, reading physicians, performing physicians, physicians of records, and operators. A DICOM person name can be matched with one NilRead user only.

### Note

You can also grant a user access to specific studies (see "Manage user access to studies" on page 119).

1. Select **Settings**.
2. Under **User Management**, select **Studies**.
  - Patient studies are listed in the top portion of the tab.
  - NilRead users are listed in the bottom portion of the tab.
3. Select a patient study. To find a study, enter information in the blank row above the study list.
4. Select a user. To find a user, enter information in the blank row above the user list.
  - DICOM person names associated with the study are shown in the **Study References**

area.

- DICOM person names currently matched with the user are shown in the **Matching Names** area.



5. To match or unmatch a user with a DICOM person name:

<b>Match a user with a DICOM person name</b>	<ol style="list-style-type: none"><li>1. Select one or more names in the <b>Study References</b> area.</li><li>2. Select <b>Associate</b>.</li></ol>
<b>Remove the match between a user and a DICOM person name</b>	<ol style="list-style-type: none"><li>1. Select one or more names in the <b>Study References</b> area.</li><li>2. Select <b>Dissociate</b>.</li></ol>

## 13. Regulatory

### Warnings and precautions

Before attempting to use NilRead, you must read this manual thoroughly, paying particular attention to all Warnings and Cautions incorporated in it.

<b>WARNING</b>		Directions, which if not followed, could cause fatal or serious injury to an operator, patient or any other person, or could lead to a misdiagnosis or mistreatment.
<b>CAUTION</b>		Directions, which if not followed, could cause damage to the equipment described in this Instructions for Use and/or any other equipment or goods, and/or cause environmental pollution.

### General Usage



NilRead is intended for use by physicians trained in reviewing and interpreting medical images.



Users are to ensure that the appropriate study is loaded based on the identification on the timeline and in the viewport.



It is recommended that NilRead be installed on the minimum hardware requirements (see "Hardware requirements" on page 123). Users are to ensure guidelines and warnings (including maintenance provisions) provided by the hardware manufacturer are adhered to, and that hardware is used under safe operating conditions. Users shall not install any additional third party software on the NilRead server to prevent compromising the software performance.



A user's access to the NilRead software is dependent upon the connectivity of their computer or mobile device to the NilRead server. A NilRead site should maintain the network integrity since the network is a critical part of the distributed image viewing system.



NilRead uses compressed images during interactive manipulation, clearly marking them on the screen as "lossy" images. The diagnostic quality image is presented at the end of the manipulation, as part of a progressive refinement display.



NilRead has been qualified on a variety of operating system and browsers (see "Device specifics" on page 11). However, operating system and browser version updates may affect the NilRead software. We recommend verifying the NilRead functionality after a modification to the operating system or browser.



NilRead could be used as a temporary data cache and local changes might be out of synch with the master database. If NilRead is configured as a temporary cache, it is recommended that either the data correction functions are disabled or that an appropriate data lifecycle policy is setup to propagate changes to the master database.



Patient data may be incorrectly removed by improperly configuring a data lifecycle policy. The system administrator shall make sure that when NilRead is used as primary data storage, data lifecycle is setup to include hierarchical storage endpoints, including a long term archive. This will prevent purging policies from automatically deleting studies when the local cache is full.

## Use on Mobile Devices



Users are to ensure guidelines and warnings provided by the mobile device manufacturers are adhered to regarding care and operation of the mobile devices.

## Measurements



On MPR and 3D views, interpolation may be done depending on the spacing between the original slices (as the spacing increases, the amount of interpolated data increases). For any image, when displaying images on the monitor at a scale other than 100%, data is interpolated. Measurement results are affected when interpolation is done. Interpolation always implies a certain inaccuracy.



Do not perform pixel value measurement on compressed images. Compressed images are marked as "lossy" on the screen.



NilRead allows 3D measurements to be performed. 3D measurements can change significantly with small changes in a line's location or with changes in opacity.



The accuracy of any measurement also depends on the user's ability to select appropriate measurement points on the display device.



The accuracy of calibrated measurements should be visually verified with the size of an anatomical object.

## Hardware requirements

### Desktop computers

The minimum hardware requirements for desktop computers running NilRead are:

- CPU: 1GHz Intel processor
- Available Memory: 500MB

The minimum network connection speed for a desktop computer is 1Mbps download, 256Kbps upload. NilRead functions on any browser that supports JavaScript but has only been formally verified on the following browsers:

- Microsoft® Internet Explorer® (8.0 and higher)
- Mozilla® Firefox® (3.0 and higher)
- Google Chrome™ (3.0 and higher)
- Apple® Safari® (4.0 and higher)

### Mobile devices

NilRead is verified to work on the following mobile devices:

- Apple® iPhone® (iOS 3.0 and higher)
- Apple® iPad®
- Android™ devices (2.3 and higher)
- Microsoft® Surface™
- Windows® Phone (8.0 and higher)

NilRead requires mobile devices to have a minimum network connection of 3G or WiFi.

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## **DICOM conformance statement**

The NilRead DICOM Conformance Statement is available at [http://www.lexmark.com/en\\_us/solutions/healthcare/enterprise-imaging/enterprise-viewing/nilread-regulatory-and-approvals.html](http://www.lexmark.com/en_us/solutions/healthcare/enterprise-imaging/enterprise-viewing/nilread-regulatory-and-approvals.html).