Table of Contents

Web Ambassador Guide
Release 7

Chapter 1 Getting Started

About Web Ambassador

About Web Ambassador

The **Web Ambassador** is a software program that enables you to access patient exams via the Internet.

Before you start

Before you start using Web Ambassador, review these tips:

- About the Web Ambassador workspace
- About receiving exams automatically
- Tips for viewing exams

Features

Using Web Ambassador, you can:

- **Search for your patient**. In the Search box, type the patient's last name, or the first letters of the name. Carefully read any warnings.
- **View images**. View the images for a selected exam.
- **View a report**. View the completed report for the selected exam. Note: Viewing reports is an optional feature. To use this feature, the facility's Communicator web server must be configured for report viewing.
- **Listen to a recorded audio summary**. Listen to an audio conclusion recorded by the reading physician.
- **View exam notes**. View text notes and listen to audio notes about the exam

For details on requirements for your PC to use Web Ambassador, check the System Requirements.

About the Web Ambassador Workspace

When you log into Web Ambassador, you'll see the following tabs:

- The Web site tab. Provides an easy way to access the facility's web site.
- The Exam Server tab. Lists exams that you have access to view.

The Web Site tab

This is the general web site for the facility.

To view the facility's web site:

1. Click the **Web Site** tab.

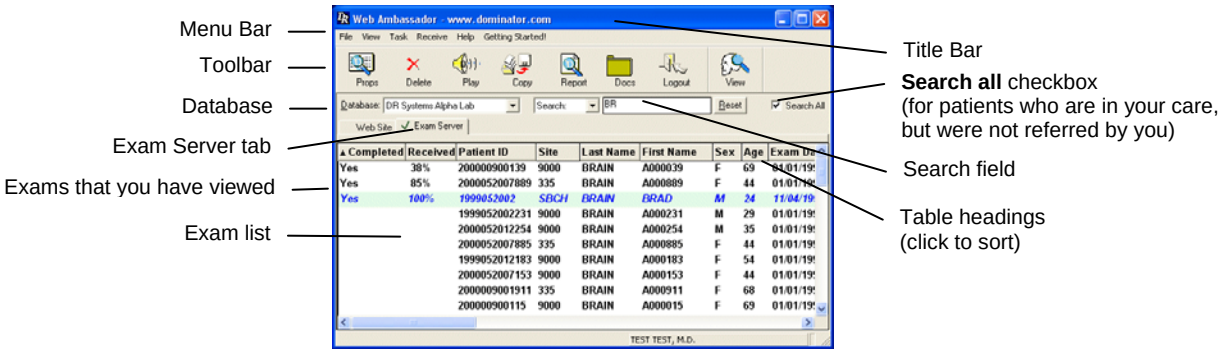
The Exam Server tab

This is the tab that lists all exams that you have permission to access.

To view the list of exams:

1. Click the **Exam Server** tab.

   The Exam Server tab displays a list of exams.



The Exam Server tab

Note: The Toolbar also includes a Report icon 

if the facility's Communicator web server is configured for report viewing.

From this window, you can:

- View exam images.
- View exam report.
- View exam properties.
- Play a recorded audio conclusion.
- Copy the exam.
- View or listen to exam notes.

System Requirements

Web Ambassador Requirements

Recommended Components

Before installing Web Ambassador, ensure that your system meets or exceeds the following requirements.

Processor and speed	Pentium class processor 1.0 GHz or higher
RAM	512 MB (minimum)
Operating system	Microsoft® Windows XP OR Microsoft Windows 2000 with Service Pack 4 or higher
Internet browser	Internet Explorer 6 or higher
Hard disk space	At least 5 GB available of hard disk space for program files and to copy exams to the computer's local drive.
Monitor	Video display resolution of at least 1024 x 768 with 256 colors. Note: 15 and 16-bit color modes are not recommended since they do not provide for the display of 256 shades of gray. 24-bit and 32-bit color modes provide for 256 shades of gray and excellent color display, but may have some impact on graphics performance for larger images.
Sound card	Required for playback of audio conclusion.

Note: With many Windows based applications, performance may increase with additional RAM and processor speed. Contact your system administrator to determine if your computer will get increased performance from upgrading these items.

ISP Requirements

The system requires a connection to an Internet Service Provider (ISP) or a direct dial up connection (if your Communicator is so equipped). Your connection through an ISP may also use Virtual Private Networking (VPN). Consult your system administrator for details.

Supported ISP connections include the following:

- Modem dial-up
- DSL
- Cable Modem
- SDN
- T1
- Frame Relay

Internet Browser option

You can also view exam images on a Communicator web site without installing Web Ambassador, by accessing the web site using only a web browser.

Note: The Web Ambassador offers many image display options not available using only a standard web browser.

Installing the Program

Installing Web Ambassador

To install Web Ambassador:

1. Ask the facility administrator for the web site where you can download Web Ambassador.
2. Type the address for the Web Ambassador download page
3. At the DR Systems Web Download page, click the appropriate download link.
4. At the File Download page, click **Open**.
5. Follow the prompts to complete the download.
   The Web Ambassador setup program guides you through the installation process.

Updating Web Ambassador

Each time you use Web Ambassador, the system checks to be sure you have the most current version. If a newer version is available, the system prompts you to download the new version.

1. Start Web Ambassador.
   If you don't have the most current version of the program, the systems asks if you want to update your program to the latest version.
2. Log in.

3. Click **Yes**.
   The system reminds you that you'll need to log in again, and that the application will be closed.
4. Click **OK** to continue.
5. Enter your user name and password.
6. At the DR Systems Web Download page, click the appropriate download link.
7. At the File Download page, click **Open**.
8. Follow the prompts to complete the download.
   The Web Ambassador setup program guides you through the installation process.

Setting Options

Receiving Exams Automatically via the Internet

- About automatic receiving
- Setting receive options
- Disabling standby or hibernation mode

About automatic receiving

What programs can receive exams automatically

Web Dominator and Web Ambassador users can receive exams automatically.

Why receive exams automatically?

By receiving exams automatically, you can reduce the time waiting for an exam to download over an Internet connection.

What can you specify?

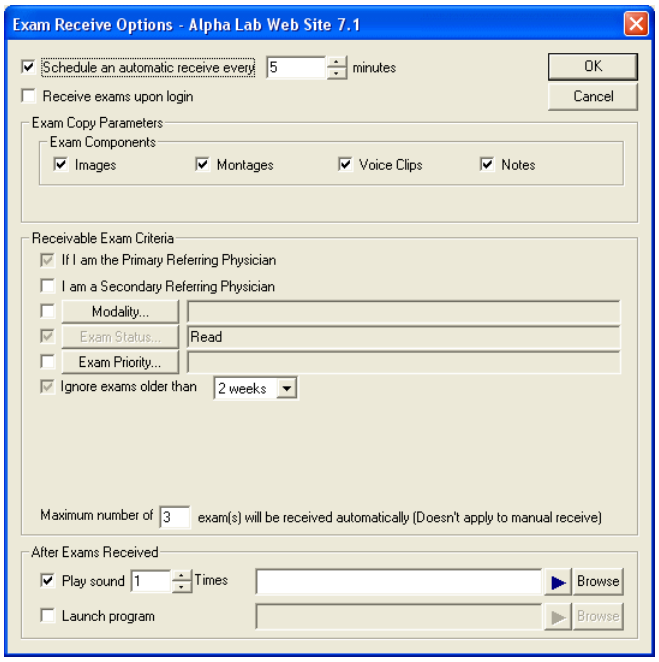
When you automatically receive exams, you can specify:

- The exam components.
- The exam modality.
- The exam status (such as unread) and priority (such as STAT or ASAP).
- The type of notification, if any. The system can play a sound or run a program.

Setting receive options

1. On the Receive menu, click Receive Options.

   The **Exam Receive Options** dialog box opens.



2. Complete the fields in the **Exam Receive Options** dialog box. Select:
   - How frequently you want to receive exams automatically.
   - The components you want to receive. For example, select images and montages, or all components.
   - The criteria for receiving the exams. For example, select the modality, exam status, and exam priority.
   - Any actions you want to take after receiving exams. For example, you can play a specific sound to indicate that exams have arrived.

     For details, see **Exam Receive Options** dialog box in Chapter 8, Reference.

Disabling Standby or Hibernation mode

To receive exams automatically:

- Your computer must be powered on.
- Web Dominator must be open.
- The computer must not be in standby or hibernation mode.

To disable hibernation and standby mode:

1. Click **Start**, point to **Settings**, and click **Control Panel**.
2. Double-click **Power Options**. Change **System Standby** and **System Hibernates** to Never.

Adding an Additional Data Source

You can add an additional data source if you need to connect to multiple facilities.

Note: Before you start, ask the system administrator at the facility for the Web site address.

To add an additional data source:

1. Double-click the Web Ambassador icon 

.
2. Add the facility as a data source.
   From the **File** menu, click **Add Web Site Data Source**.
3. The following dialog box opens:

4. Enter the web site address.
5. Click **Go**.

   The Logon dialog opens.

6. Log on. Enter your User Name and Password.
   The system prompts you to add the data source.
7. Click **Yes**.
   The system prompts you to save the data source.
8. Click **Yes**.

About Deleting Exams from the Local Exam Cache

What is a cache?

A **cache** is a directory on the computer's hard drive where the system stores exams that have been accessed over the Internet or a network. By storing exams on a local drive, the system can quickly display images, rather than trying to access them over a slow network connection.

Why delete exams from the cache?

Stored exams can be very large, and can significantly reduce the available disk space on your PC. By clearing the cache, you can regain disk space.

What programs use exam cache directories?

Web Ambassador, Web Dominator, and WAN Dominator use exam cache directories.

When are exams copied to the cache?

Exams are copied to the cache during the following activities:

- Automatically receiving an exam.
- Copying an exam.
- Viewing an exam
- Adding an exam to a Worklist (Web Dominator only).

Where and when are exams purged?

Exams are purged only:

- From a local drive.
- From cache directories.
- When the exams meet purge criteria that you set.

Deleting Exams from the Local Exam Cache

- ▶ You can set options to have the system automatically delete files ("purge" them) from the local exam cache.
- ▶ You can also delete files manually from the local exam cache.

Setting options to have the system automatically delete files

1. From the File menu, click **Delete Local Exam Properties**.
   The Delete Local Exam Properties dialog box opens.
2. Type the number of days that you want to retain exams in the cache after you last accessed them.
3. Select the **Enable automatic purging of cached exams** checkbox to allow the system to purge exams automatically from the cache.
4. Click the **Save Setting** button to save the settings, and close the dialog box.

Deleting files manually from the local exam cache

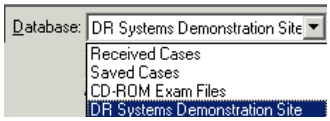
1. From the File menu, click **Delete Local Exam Properties**.
   The Delete Local Exam Properties dialog box opens.
2. Type the number of days that you want to retain exams in the cache after you last accessed them.
3. Select the **Purge Now** checkbox to delete exams from the cache that meet the criteria you set above.

Starting the Program

Starting Web Ambassador

1. Double-click the Web Ambassador icon 

.
2. Select the facility or other location that contains the exams you want to view. In the **Database** list, click the drop-down arrow and select the database.



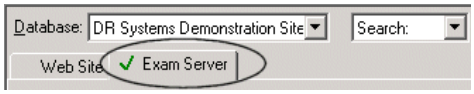
Note: If you select CD-ROM Exam Files and insert a second CD, select the **Reset** button to list the exam files on the current CD.

3. Enter your user name and password to log in.

Searching for Exams in Web Ambassador

To retrieve an exam for viewing:

1. Start Web Ambassador.
2. Click the Exam Server tab.



Note: When you first view the Exam Server tab, no exams are in the list. You need to type a name in the Search box to see entries in the list.

3. Search for the patient.
In the **Search** box, type the patient's last name, or the first letters of the last name. Carefully read any warnings.

Tip: To search for all patients, including patients where you are not listed as a referring physician, , click **Search All**.

If the checkbox is not visible, you do not have permission to view exams for patients where you are not the referring physician.

Logging in and out

Setting and Changing Passwords

About setting or changing your password

You can change your password:

- When the system prompts you to change your password.
- As needed.

  Note: To change your password, your user account must allow changing passwords. If you cannot change your password, the **Set Password** button is unavailable and you cannot change your password.

Changing your password when prompted

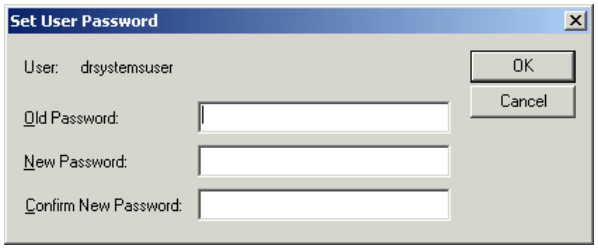
To change your password when the system requires it:

1. Log in to DR Systems PACS. For details on logging in, see "Logging in."

   The system displays a message requiring you to change your password.

2. Click **OK**.

   The **Set User Password** dialog box opens.



3. Complete the **Set User Password** dialog box:
   - **Old Password**. Type the current password.
   - **New Password**. Type the new password.
   - **Confirm New Password**.

     If your new password doesn't meet the requirements set by your system administrator, the system displays an error message. The message

prompts you to check the requirements for password length, complexity, and history.

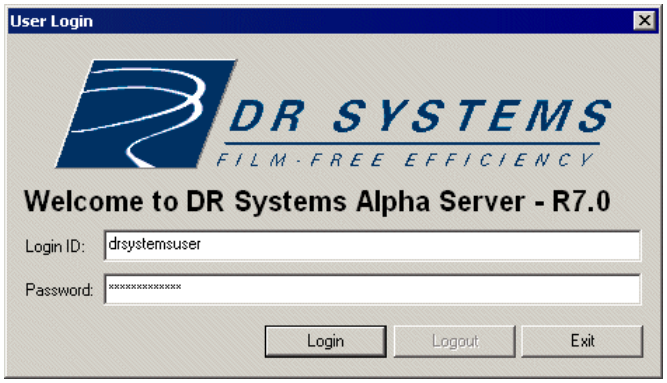
Click **OK** for the message and type a revised password in the **New Password** box and the **Confirm Password** box.

4. Click **OK**.

   A confirmation message opens.

5. Click **OK** at the message that the password changed for the user.

   You are returned to the DR Systems **User Login** window.



6. In the **Password** box, select the old password entirely. Type your new password over the old password.
7. Click **Login**.

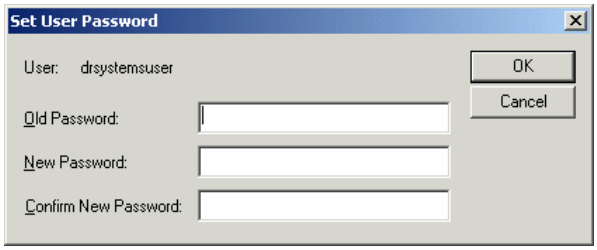
   Dominator opens to the tab set for the workstation.

Changing your password as required

To change your password:

1. Log in to Dominator. For details on logging in, see "Logging in."
2. From the **File** menu, select **Set Password**.

   The **Set User Password** dialog box opens.



3. Complete the process for changing your password. For details, see "Changing your password when prompted."

Login Errors

Depending on the processes established by your system administrator, you could see the following error messages.

- **Password incorrect**. If you type the password incorrectly, the system displays the following message:

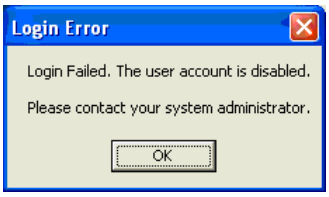
  Click **OK** and retype the password.

Note: If your system is configured to allow a specific number of attempts to log in, and you exceed that number, you can be locked out. Contact your system administrator.

- **Account expired**. If the date passed that your account was set to expire, the system displays the following message:

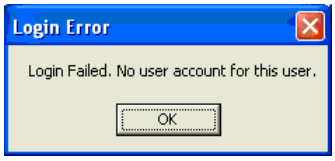
  Click **OK** and contact your system administrator.

- **Account disabled**. If your account was disabled by your system administrator, the system displays the following message:



Click **OK** and contact your system administrator.

- **No user account**. If you type a user name in the **Login ID** box that is not in the system, the system displays the following message:



Click **OK** and retype the **Login ID**.

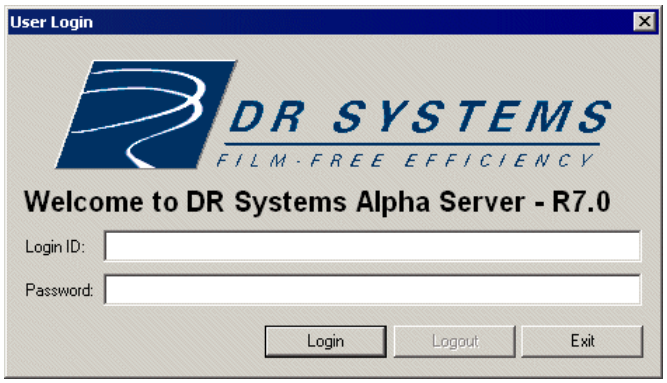
Logging Out

To log out of DR Systems PACS:

1. Click the **Logout** button 

on the tool bar.

   The **User Login** opens.



   Typically, you leave the User Login dialog box open for the next user to log in.

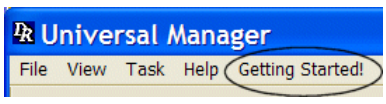
2. If you need to shut down the application, click **Exit**.

Getting Help in Web Ambassador

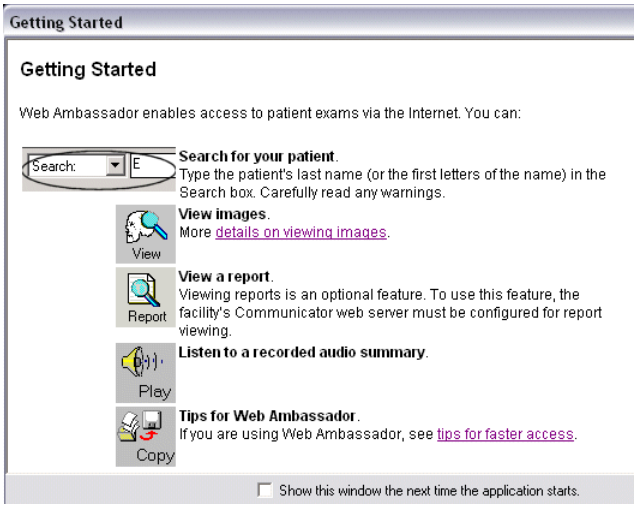
To get help, you can click **Getting Started** or **Help** on the menu bar.

The Getting Started menu

- Click the **Getting Started** menu for a quick overview of standard procedures.



The Getting Started instructions open:



The Help menu

- Click **Help Topics** in the **Help** menu for detailed step-by-step instructions.

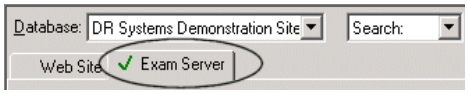
Web Ambassador Guide
Release 7

Chapter 2 Viewing Exams

Listing Exams for Viewing

To retrieve an exam for viewing:

1. Start Web Ambassador.
2. Click the **Exam Server** tab.



Note: When you first view the **Exam Server** tab, no exams are in the list. You need to type a name in the **Search** box to see entries in the list.

3. Search for the patient.
   In the **Search** box, type the patient's last name, or the first letters of the last name. Carefully read any warnings.

Tip: To search for all patients, including patients where you are not listed as a referring physician, click **Search All**.

If the check box is not visible, you do not have permission to view exams for patients where you are not the referring physician.

About the Exam List in Web Ambassador

Number of exams displayed

In Web Ambassador, the system restricts the exam list to displaying 250 exams at one time. This goal of this restriction is to improve performance over an Internet connection.

Note: The 250 exam number is a default. Your facility may change the number of exams to be displayed.

When the exam list is updated

The exam list is updated each time you search.

Note: When you sort, the current 250 exams in the exam list are sorted. The order is changed, but the list contains the same set of exams.

Searching and Sorting in Web Ambassador

You can search for a patient's name, a patient's ID, and many other parameters. You can search by:

- Sorting on a column.
- Using the Search box**.**

You can also start a new search by:

- Clearing the Search box.

Sorting on a column

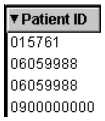
To sort a column:

1. Click the column heading (such as **Patient ID**) that you want to sort by.

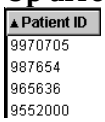
   The system displays the list sorted by your selection.

   An arrow indicates the sort order:

   - **Down arrow**: Ascending order (from first to last):

   - **Up arrow**: Descending order (from last to first)

2. To switch the order, click on the column heading again.
   OR Right-click the column to select sort options from the shortcut menu.

Searching by using the Search box

To search by using the Search box:

1. In the Search box, enter the patient's last name or Patient ID number.
   Tip: You can enter part or all of the patient's name. Type the last name first, and use a comma (,) to separate the last and first name. For example, you can enter **SMI** or **SMITH** or **SMI,B** or **SMITH,B** or **SMITH,BOB**.

   The system displays the records that match the search.

Clearing the Search box

To clear the search:

1. Click **Reset**.
   OR Click **Alt+R**.
2. Start another search if required.

Viewing Exams in Web Ambassador

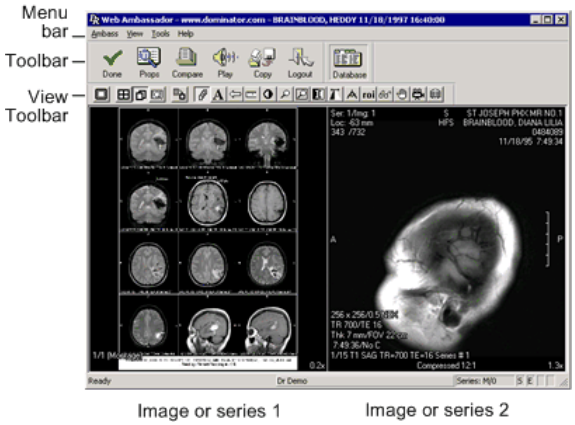
To view an exam in Web Ambassador:

1. On the **Exam Server** tab, select an exam.
2. Click the **View** button 

.

   Note: You can also double-click the exam, or right-click to view it.

   The system displays the first image in the exam.



   Note: If a montage exists, it is the first image in the left pane.

3. Select an action from the toolbar:
   - 

to view exam properties.
   - 

to compare this exam with a previous exam for the same patient.
   - 

to listen to a recorded audio conclusion.
   - 

to copy the exam.
4. Use the tools on the View Exam toolbar as required.

5. When finished, click one of the following buttons to return to the Exam Server window:
   - 

.

     OR
   - 

.

Viewing Exams on a USB Flash Drive

To view exams on a USB flash drive:

1. Insert the USB flash drive into an available USB port.

   If the system displays a dialog box indicating that the operating system detected the new device and requires specific drivers, load any required drivers to access the device as a removable drive.

   Wait 10-15 seconds before attempting to use a newly inserted drive.
2. Select the USB flash drive from the Datasource list.

   The system displays the newly inserted drive with a designation such as:

   `G:\Removable Drive.`
3. Select the exam you want to view.

Tips for Viewing Exams

The following are basic tips for viewing exams.

To:	Do this:
Scroll through images:	Click (the left mouse button) and move the mouse up or down. OR Press the Up arrow or Down arrow.
Change between series:	Press **Page Up** or **Page Down**.
Specify the number of images displayed at once:	Press **1** to display one image. Press **2**, **3**, **4**, **6**, **8**, **9** to display that number of images. Press **0** to display 10 images. Press **-** to display 20 images. Press **=** to display 24 images.
Compare exams.	Click **Compare** to display a previous exam for the same patient.

Note: For detailed instructions, see "Viewing Exams in Web Ambassador."

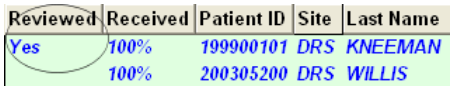
Marking Exams as Reviewed in Web Ambassador

- About marking exams as reviewed
- Marking the exam as reviewed after viewing images
- Marking the exam as reviewed from the **Exam Server** tab

About marking exams as reviewed

After you finish viewing an exam, you can mark it as reviewed. At a glance, you can see which exams you still need to review.

Example of exam marked as reviewed:



Reviewed	Received	Patient ID	Site	Last Name
Yes	100%	199900101	DRS	KNEEMAN
	100%	200305200	DRS	WILLIS

Marking the exam as reviewed after viewing images

To mark an exam as reviewed after viewing images:

1. View the exam.
2. When finished, click **Done**.
   The system asks if you want to mark the exam as reviewed.
3. Click **Yes**.

Marking the exam as reviewed from the Exam Server tab

To mark an exam as reviewed:

1. Select an exam in the **Exam Server** tab.
2. Do one of the following:
   - Right-click the exam, and click **Mark as Reviewed** in the shortcut menu.
     OR
   - Select the exam, and click **Mark as Reviewed** from the **Task** menu.

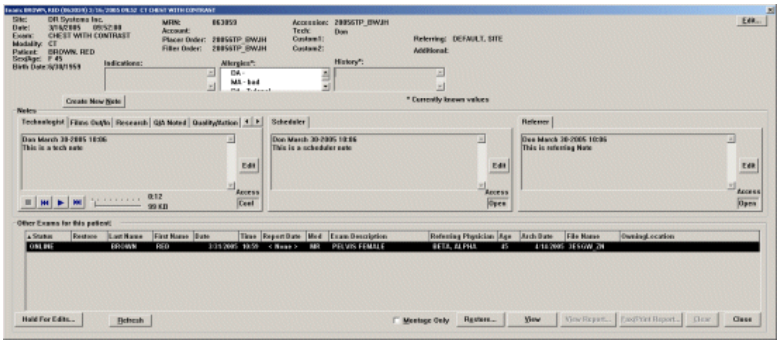
Clearing the Reviewed Mark from an Exam

To clear the reviewed mark from an exam:

1. Select the exam.
2. Click **Mark as Not Reviewed** from the **Task** menu.

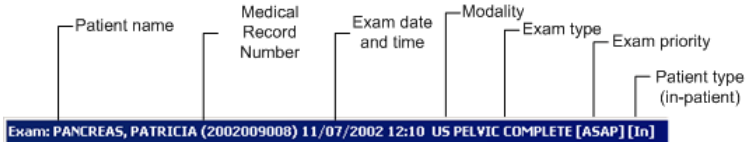
About the Electronic Requisition

The **Electronic Requisition** contains a summary of the patient's history.



Electronic Requisition title bar

The title bar of the **Electronic Requisition** summarizes the data about the exam.



Electronic Requisition opens for comparison exams

If you set a viewing preference to automatically load comparison exams, the **Electronic Requisition** is displayed regardless of your preference setting for "Hide Req after Comparison exam selection." For details on setting viewing preferences, see "Setting Preferences for Reading Physicians.

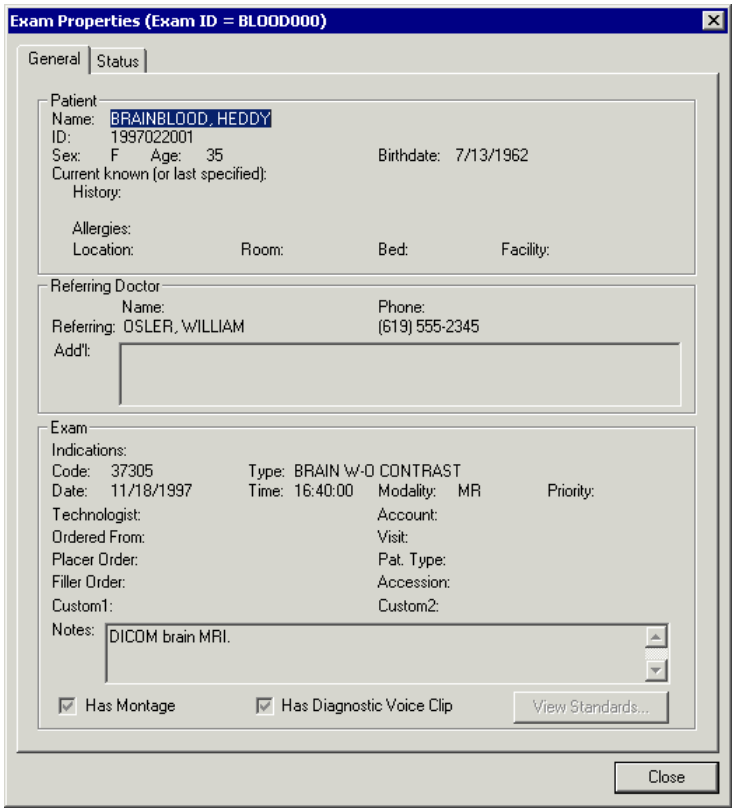
Viewing Exam Properties

To view exam properties:

1. Select an exam.
2. Click the **Properties** button 

.

   The Properties dialog box displays:



3. When finished viewing properties, click **Close**.

Selecting Viewing Modes and Options

Displaying a Series Per Square

Series per Square displays a series in each window square. The number of squares shown on a screen can be changed through the **View Menu**. The **Page** function is active in this mode, allowing you to scroll through each series.

To set Series per Square display:

1. Click the **Series per Square** button .

   OR

   From the **View Menu**, select **Panel Properties**. Change the layout method to **Series per Square**.

Displaying One Image in Each Square

About Image per Square mode

Image per Square displays each image in a series in a viewing window.

You can change the number of squares shown on a screen through the **View Menu**. The **Mag Box** function is active in this mode. To move the images on the screen through the panels, use the **Scroll** function.

Viewing an image per square

To view an image per square:

1. On the toolbar, click the **Image per Square** button  .

   OR

   From the **View Menu**, select **Panel Properties**. Change the layout method to **Image per Square**.

Note: In Image per Square display mode, there are additional viewing functions on the toolbar.

Web Ambassador Guide
Release 7

Chapter 3 Using Viewing Tools

About Viewing and Editing Tools

You can use a variety of tools to view and edit exam images.

The ability to save edits to images depends on user rights:

- **Ability to save**. Typically, technologists and reading physicians can save edits to images.
- **Ability to view only**. Other users, including referring physicians, can use the following tools. However, they cannot save an edited image.

Tool / action	Topics
3-D image processing:	Image processing (Voxar)
Annotating images:	Adding Arrow Annotation Adding Measurement Annotation Adding a Region of Interest Adding Text Annotation
Cardiology tools:	Calibration (new in Release 7) Cine - playing images continuously Poly line measurement (new in Release 7) Stenosis measurement (new in Release 7) Image Subtraction Masks (new in Release 7)
Comparing images:	Flipping between Images for Comparison (new in Release 7) Position-linked Scrolling for Comparison Shuffling Images for Comparison (new in Release 7) Targeting Areas for Comparison
Cropping:	Cropping images
Image processing:	Using Image Processing to enhance contrast
Interpolation:	Controlling Image Interpolation for Display Controlling Image Interpolation for Printing Using Bilinear Interpolation and Pixel Replication
Inverting, rotating, and flipping images:	Inverting an image Rotating and Flipping an Image
Magnifying images:	Magnifying Images Magnifying a Portion of the Image Magnifying Portions of Adjacent Images Simultaneously
Tracking viewed areas:	Pixel tracking (new in Release 7) - useful tool for mammography
Roaming:	Roaming Roaming Adjacent Images Simultaneously (new in Release 7) Applying Roaming to all Images in Series
Scout insets:	Plotting with scout insets
Series:	Selecting a Series to Display Selecting and Dropping a Series Specifying an Image in a Series to View Simultaneously Paging Through Series Across Monitors Viewing a series

Tool / action	Topics
Scrolling images:	Scrolling Images
Window/level:	Adjusting the window/level

Advanced Image Processing

About Advanced Image Processing using Voxar 3D

Advanced image processing using Voxar 3D™ is an option available from DR Systems. Voxar provides visualization and analysis tools to improve your workflow and increase your productivity, with the increased demands of interpreting MDCT, multi-channel MRI and PET studies.

Note: For details on using Voxar 3D, see Voxar's Online Help.

Workstations where available

Voxar 3D™ advanced image processing is available on the following workstations:

- **Dominator** reading physician workstation.
- **Web Dominator** reading physician workstation.
  Note: Web Dominator users can use Voxar locally, but cannot save Voxar-generated images to the server.
- **Advanced Windows Catapult**, the technologist's QA workstation.

Imaging processing features

Advanced image processing, traditionally performed on scanner consoles, includes the following features:

- 3D modeling reconstruction.
- Color shading.
- MPRs and MIPs.
- Curved rendering.
- Volume rendering.
- Volume measurement.
- Surface shading.
- Tissue segmentation.
- A VesselMetrix module to measure vessels in CTA and MRA images.

Other features

Other features include:

- On Windows XP workstations, you can display text and cross-hairs using green lines.
- Images generated by Voxar can be used as insets.
- Ability to apply insets to series generated by Voxar.
- Support for concurrent licensing, which provides an option to have concurrent, rather than licenses per workstation.
- Voxar start automatically with the MPR screen.
- Controls for selecting view modes.

Annotating images

Adding an Arrow Annotation

- Placing an arrow on an image.
- Moving an arrow annotation.
- Changing the size of an arrow annotation.
- Changing the direction of the arrow annotation.

Placing an arrow on an image

To place an arrow on an image:

1. Click the **Arrow Annotation** button  .
2. Click on the image to place the arrow.
   OR Right-click to place a labeled arrow.

Moving an arrow annotation

To move an arrow annotation:

1. Click the arrow.
2. Hold and drag the arrow to the new location.

Changing the size of an arrow annotation

To change the size of an arrow annotation:

1. Click the arrow.
2. Click on the box at either end of the arrow and drag to the new location.

Changing the direction of the arrow annotation

To change the direction of the arrow annotation:

1. Right-click the image.
2. Select **Up**, **Down**, **Right**, or **Left** from the shortcut menu.
3. Click the image to place the arrow.

Adding Text Annotation

- Placing text on an image.
- Moving a text annotation.
- Copying text annotation.

Placing text on an image

To place text on an image:

1. Click the **Text Annotation** button  .
2. Right-click the image.
3. Select a phrase from the shortcut menu.
   OR Click **Edit** to type text.
4. Click the image to place the text.

Moving a text annotation

To move a text annotation:

1. Click the text.
2. Click the shaded line and drag to move the text.

Copying text annotation

To copy a text annotation:

1. Right-click the text.
2. Select **Copy** from the shortcut menu.
3. Click to place text.

Adding a Measurement Annotation

- About measurements
- Adding a measurement type
- Deleting measurements

About measurements

Types of measurements

You can add the following measurements to images:

- Line measurement. Measures the straight line distance between two points. Line is the default measurement.
- Poly line measurement. Measures the distance between two points along multiple line segments, for example, the curved segment of a vessel.
- 3-point angle measurement. Measures the angle between the X axis and the Y axis of three designated points.
- Cobb angle measurement. Measures the angle between two designated line segments that cross a bone or vessel, for example when measuring the degree of scoliosis.
- Stenosis measurement. Measures the ratio of the diameter of a normal segment of a vessel and a constricted segment of a vessel.

Images must be calibrated

The image must be calibrated to use the measurement tools. For details on how to calibrate the image, see "Calibrating an Image."

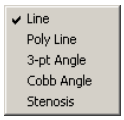
Note: If you calibrate an image, your calibration is not saved with the exam. Any measurement annotations are saved with the exam, but cannot be modified. They can, however, be deleted.

Accessing the measurement menu

To add a measurement, access the measurement menu:

1. Click the **Measurement Annotation** button  .
2. Right-click on an image panel.

   The shortcut menu opens.



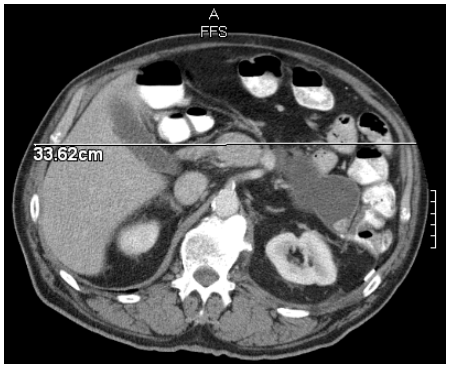
3. Select the measurement you want to add.

Adding a line measurement

To place a measurement rule on an image:

1. Access the measurement menu. For details, see "Accessing the measurement menu."
2. Click the image at the starting location.
3. Drag the line to the ending location and release the mouse button.

The system displays a line showing the starting point and the ending point and the line measurement.



Adding a poly line measurement

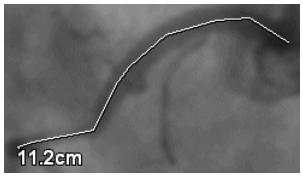
To add a poly line measurement:

1. Access the measurement menu. For details, see "Accessing the measurement menu."
2. Select **Poly Line**.

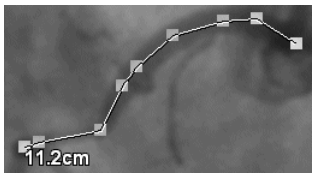
   The cursor changes to the angle symbol  .
3. Click and hold the left mouse button where you want to start the poly line measurement, drag to the next point, click and release the mouse button, move to the next point and click. Continue clicking points, releasing, and moving the mouse to capture the distance you want to measure.

   The system traces the line between each point.
4. Double-click at the end point.

   The system stops tracing lines and inserts the measurement.



Tip: To adjust the poly line measurement, select it and move the handles to the preferred location.



Adding a 3-point angle measurement

To measure an angle:

1. Access the measurement menu. For details, see "Accessing the measurement menu."
2. Select **3-pt Angle**.

   The cursor changes to the 3 point angle symbol.  .
3. At the starting point of the angle segment, click and hold the left mouse button and drag to the center point of the angle.
4. Release the mouse button.
5. Move the cursor to the end of the angle segment and click.

   The system inserts the degree of the angle.

Adding a Cobb angle measurement

To measure a Cobb angle:

1. Access the measurement menu. For details, see "Accessing the measurement menu."
2. Select **Cobb Angle**.

   The cursor changes to the angle symbol  .
3. Click the cursor on the starting point and drag. Release the cursor.
4. Repeat the previous step to add a second line.

   The system measures the Cobb angle between the two points.

Adding a stenosis measurement

The stenosis measurement estimates how much smaller a restricted vessel is compared to the normal vessel.

To measure the percent stenosis of a vessel:

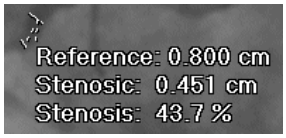
1. Access the measurement menu. For details, see "Accessing the measurement menu."
2. Select **Stenosis**.

   The cursor changes to the stenosis symbol  .

Caution: A stenosis measurement is an estimate. The system estimates the stenosis measurement by the width of a vessel from the available, 2-dimensional perspective. Another perspective may appear wider or narrower.

3. At the reference segment, click and hold the left mouse button on one edge of the vessel and drag to the opposite edge of the vessel. Release the mouse button.

4. Move the cursor to the cursor to the area where you want to measure the stenosis. Click and hold the left mouse button on one edge of the vessel and drag to the opposite edge of the vessel. Release the mouse button.

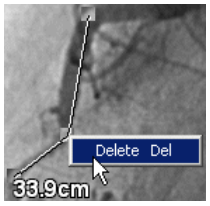


5. The system displays the diameter at two points and the ratio of the diameter of a normal segment of a vessel and a constricted segment of a vessel, the percent stenosis.

Deleting measurements

To delete a measurement:

1. Select a line segment. The system adds handles to the line segments.
2. Right-click and click the **Delete** button.



Adding a Region of Interest Annotation

To outline an area on an image:

1. Click the **Region of Interest** button 

.
2. Right-click the image.
3. Select a shape or free draw.
4. Click and drag on the image to draw.

   The Average pixel value and standard deviation will appear for the outline. A warning is displayed if the values are not in Hansfield units.

Deleting Annotations

To delete an annotation:

1. Click the annotation.
2. Press **Delete**.

Calibrating

Calibrating Images

About Image Calibration

Calibrating an image is necessary for video captured images from non-DICOM devices. Proper calibration is necessary for more precise measurements.

You can apply either of the following calibration types:

- **Standard**

  The **Standard** calibration tool allows you to generate a reference marker of a specified size, such as 5 mm, to estimate distance and for the system to measure more accurately.

- **Catheter**

  The **Catheter** calibration tool allows you to specify the catheter size and identify a catheter in an image.

How the system detects the catheter edges

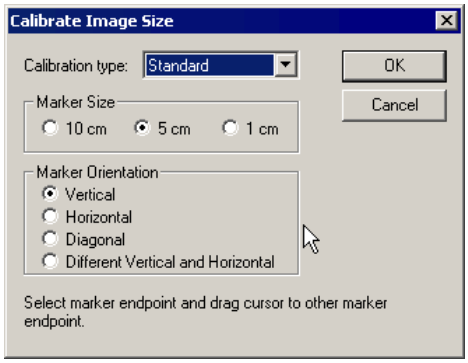
As you draw a short line down the center of the catheter, the system draws a bisecting line and scans the image pixels along the bisecting line to find the two points of greatest intensity change. The system uses these two points as the edges of the catheter.

Calibrating an Image

To place a reference marker on the image:

1. Click the **Calibrate Image** button  .
2. Click the image.

   The **Calibrate Image Size** dialog box opens.



3. Complete the fields in **Calibrate Image Size** depending on the calibration you want.
4. Select the **Calibration type**:
   - To calibrate an image that includes a marker of known size, select **Standard**.
   - To calibrate an image that has a catheter, select **Catheter**.

Standard calibration

If you selected **Standard** for the **Calibration type**, continue with these steps:

1. Select the **Marker Size** and **Marker Orientation**, and click OK.
2. Click the image at the starting location of the marker.
3. Drag to the ending location of the marker and release the mouse button.

   The system displays the calibration reference marker.

Catheter calibration

If you selected **Catheter** for the **Calibration type**, the system makes the **Marker Size** and **Marker Orientation** unavailable. Continue with these steps:

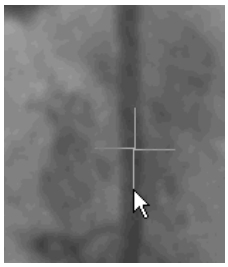
1. Click **OK**.

   The **Calibrate Image Size** dialog box closes.
2. Click the cursor in the center of the catheter and release.
3. Drag the cursor along the center of the catheter.

   Note: It is not necessary to hold down the mouse button while dragging.

   Drag the cursor as far as necessary for the perpendicular-bisector to intersect both sides of the vessel.

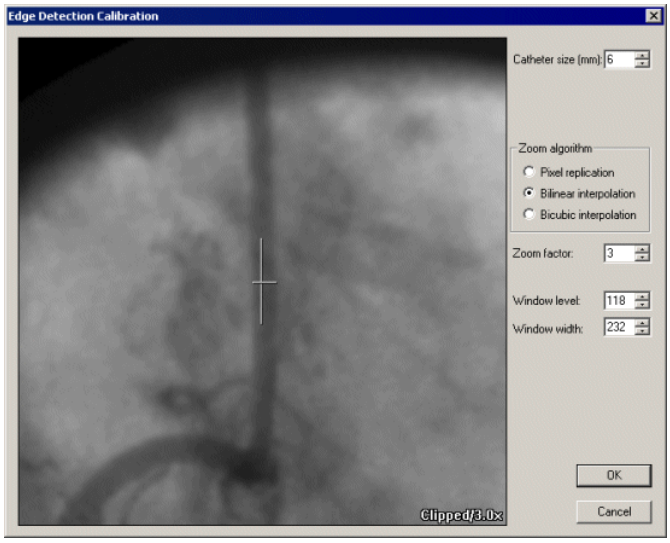
Note: The calibration should be performed in an area of the image where the catheter is the most prominent feature. Avoid allowing the perpendicular bisector to intersect with objects on the image other than the catheter.



4. Click again to end the line.

   The system uses this information to detect the edges of the catheter.

   The **Edge Detection Calibration** dialog box opens.

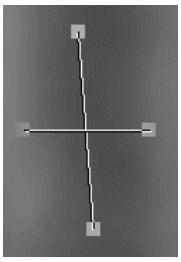


5. In the **Catheter size (mm)** box, specify the catheter size.
6. Verify the proper detection of the catheter edges.

   If needed:

   - **Adjust zoom factor**. To verify the accuracy of the catheter edge detection, increase or decrease the **Zoom factor** by clicking the up arrow or down arrow respectively.

- **Adjust the lines**. Click the bisector to select it. Select one of the vertical handles and drag for better positioning. The system attempts to detect the catheter edges each time you move the lines.



- **Adjust Window level or width**. To enhance viewing, adjust the **Window level** or **Window width**.

7. Click **OK**.

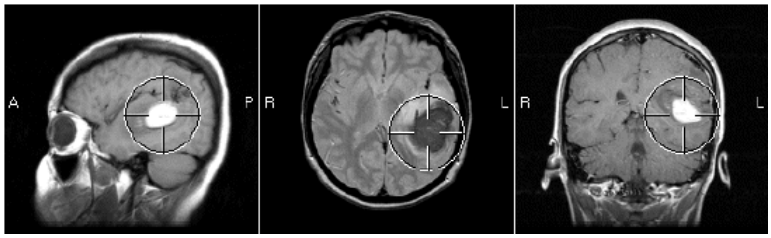
   The system draws a 5 mm vertical reference marker to scale.

   Caution: The system measures the width of a catheter from the available, two-dimensional perspective. This measurement is an estimate.

Comparing exams

About Targeting Areas for Comparison

You can compare a selected anatomical area of an exam in one series to the same area in other series. Selecting the area with the **3D Cursor** searches for that area in all displayed comparison series and targets the same area.



About the 3D Cursor tool:

- **Supported workstations**. Available on the Universal Manager for Dominator, Ambassador, and Web Ambassador.
- **Display mode**. Requires that you set the display mode for the panel to Series-per-Square.
- **DICOM UIDs**. Searches through all displayed series with the same DICOM Frame of Reference UID and targets the area with the cross-hair symbol in all displayed series.
- **Temporary features**. Targets are temporary. They remain active for the current session. Closing a series clears the 3D Cursor targets.
- **One set at a time**. Displays only one set of 3D Cursor targets at a time.

For example, if two exams are displayed, only one exam shows 3D Cursor targets at any given time. If you use 3D Cursor targets on one exam and then another, the 3D Cursor targets are cleared from the first exam.

- **Viewed, not printed**. The 3D Cursor targets are only for viewing and do not appear on printed exams or on montages.
- **On all affected panels**. The 3D Cursor targets appear on related images for all affected panels. If you move a targeted image to another panel, the target remains with the image.
- **Multiple copies**. The 3D Cursor targets appear on multiple copies of the same image.
- **Tolerance**. The tolerance for matching target areas with the 3D Cursor is + or - 5 mm from the center of the selected target area.

Targeting Areas for Comparison

Use the 3D Cursor tool to target a specific anatomical area of an exam in the primary series and the same area in all displayed series. See the following topics:

- Targeting specific areas of an exam by using the 3D Cursor tool.
- Clearing target highlights.
- Using other tools with 3D Cursor targets.

Targeting specific areas of an exam

To target an area of an exam for comparing images in series:

1. View an exam in Universal Manager.
2. Set the display mode to **Series per Square Mode**.
   - Press the **Z** key on the keyboard.

     OR
   - On the **View** menu, click **Layout Images** and select Series-per-Square Mode.
3. Click the 3D Cursor tool  on the View Exam toolbar.
   The cursor changes to the 3D Cursor  .
4. Select the target area for comparison by clicking the top, left mouse button.

Caution: Because the 3D Cursor target area could obscure an important part of the associated images, place it carefully on the image.

Clearing 3D Cursor targets

At any time while viewing exams, you can clear 3D Cursor targets from the exam images. Clearing the 3D Cursor targets does not clear associated annotations such as text or arrows.

To clear 3D Cursor targets from the exam:

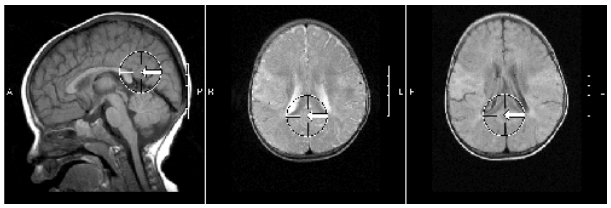
1. Put the cursor on the image while the 3D Cursor tool is active.
2. Click the right mouse button.

Using other tools with the 3D Cursor

Targeting areas of an image by using the 3D Cursor works with the arrow, text, and magnify tools within the targeted area.

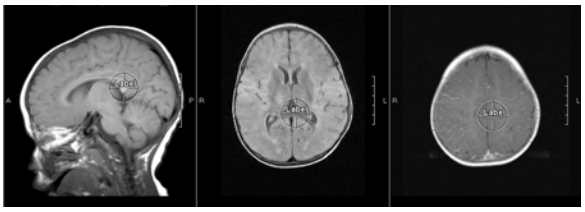
Arrows

If you use an arrow annotation within the 3D Cursor target area, the system adds the arrow to all images that contain the 3D Cursor target area. The location of the arrow on all images is the center of the target area. The positioning of arrows is not relative to the position of the patient.



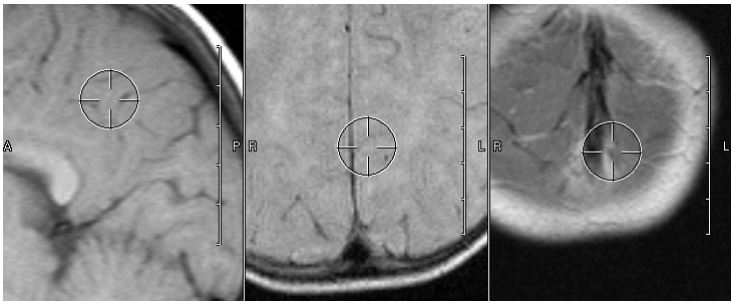
Text annotation

If you use text annotation within the boundaries of a 3D Cursor target area, the system adds the text to all images that contain the 3D Cursor target area. The location of the top-left corner of the text on other images is the same distance from the center of the target area. The positioning of the text is not relative to the position of the patient.



Magnify

If you use magnification within the 3D Cursor target area, the system magnifies all images that contain the 3D Cursor target area simultaneously by the same amount. The target area is approximately centered in each magnified image.



About Position-linked Scrolling

You can simultaneously view multiple adjacent series while synchronizing the views to the same patient position. **Position-linked scrolling** enables you to compare multiple exam series images simultaneously.

Be aware of the following requirements and functions regarding position-linked scrolling:

- Requirements.
- How position-linked scrolling works.

Requirements

- Each series in the comparison must consist of DICOM images.
- The Page Through Series tool must be active.
- The comparison series must be adjacent to the primary series vertically or horizontally. They can be on different monitors, if they are in the same row.

How position-linked scrolling works

- **Register the starting point**. The starting point must be registered for each series.
- **Primary series**. The primary series is the image you select and scroll through by:
  - Pressing the **Ctrl** key.
  - Clicking the left mouse button.
  - Moving the mouse.
- **Comparison series**. You can compare up to four series and synchronize the images you are scrolling to the primary series image.
- **Scrolling in each series**. Each series scrolls to the slice that is nearest the patient position of the primary series.

Caution: Some images may be skipped in one or more series while scrolling. The thickness of the slices and the number of images in a series affect which images are displayed while scrolling. Position-linked scrolling displays the image closest to the primary image and may skip one or more images to accomplish that.

 **Warning:** Do not mark an exam read, if you exclusively used position-linked scrolling to view the images. In most cases, you did not view all the images.

- **Compares position of image centers**. Position-linked scrolling compares the positions of the image centers, not where you clicked the mouse.
- **Stops or loops back to original image**. Scrolling stops or loops back to the original image when you page to the end of the primary series

regardless of the end of the comparison series.
You can set the looping or stopping functions in one of the following dialog boxes: Reading Physician Preferences or Image Panel Properties.

- **Calculating slice thickness**. If you release the Ctrl key while scrolling, scrolling continues but does not continue to calculate slice thicknesses with the comparison series. The image slices are no longer synchronized to the closest anatomical position of the primary series.
- **Accounting for reverse scrolling**. The system accounts for cases where two series are assembled in reverse order. For example, one series progresses from anterior to posterior, while the other progresses from posterior to anterior. When you scroll one series forward the other scrolls backward.
- **Setting preference for position-linked scrolling**. You can set a **Reading Physician Preference** to **Use position-linked scrolling as a default**. This option makes position-linked scrolling the default. Clearing this option makes position-linked scrolling available by pressing the **Ctrl** key while using the **Page Through Series** tool. For details on setting preferences, see "Reading Physician Preferences dialog box."

Position-linked Scrolling for Comparison

- Position-linked Scrolling for Comparison
- Synchronizing scrolling in primary and comparison exams

About position-linked scrolling for comparison

You can synchronize adjacent slice views to the same patient position for comparison.

Note: You must register the starting point for each series you are comparing. You are registering the image centers of the two series. After you register the starting point, position-linked synchronized scrolling is automatic for each series in the comparison.

Synchronizing scrolling in primary and comparison exams

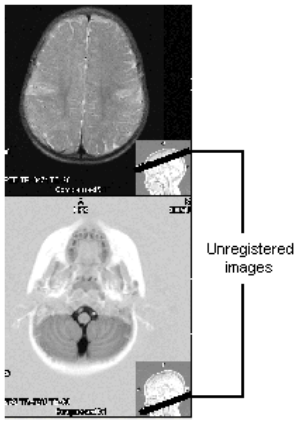
To scroll through a series and synchronize with the same slice in the comparison series:

1. View or read an exam.
2. Arrange up to four series in adjacent image squares.

   Tip: Insert a scout on each image to simplify the process of aligning the series.
3. Click the **Page Through Series** tool .

4. Scroll each series individually until the image with the slice you want to start with is displayed.

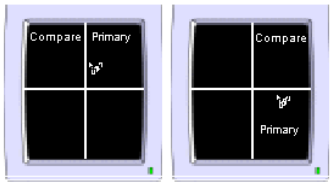
   Tip: Select the starting point in the scout. The slice line enables you to select parallel starting points.



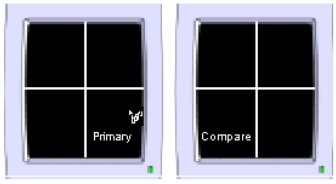
5. Move the cursor near the border of two adjacent series or to the intersection of up to four adjacent series that you want to compare. The primary image is the square containing the cursor.

   To compare series in adjacent monitors, move the cursor toward the edge of a comparison image window.

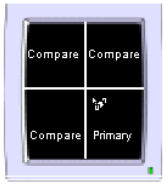
   - Horizontal and vertical position-linked scrolling



   - Horizontal position-linked scrolling across monitors

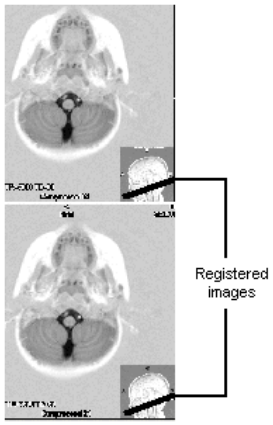


   - Position-linked scrolling of four squares



6. While the page tool is selected, press and hold the **Ctrl** key, click and hold the left mouse button, and move the mouse.

   This triggers the position-linked scrolling. Each comparison series scrolls to the same slice of the primary series.



7. Scroll to the end of the primary series.
   - If looping is turned off, the scrolling stops.
   - If looping is turned on, the scrolling returns to the original position of the primary and comparison series.

Flipping between Images for Comparison—Quick Flip

- About flipping between images for comparison.
- Flipping between images on the same monitor.
- Flipping between images on different monitors.

About flipping between images for comparison

While you are comparing images, you can temporarily switch from the primary image to a comparison image, which allows you to keep both images in your immediate focus. The system switches the images in the current square. Quickly flipping between images in the same place is useful in detecting differences in size and location, for example when examining tumor growth.

Using this Quick Flip tool, you can temporarily replace the primary image with the comparison image, and continue to switch quickly back and forth to determine differences between the two images:

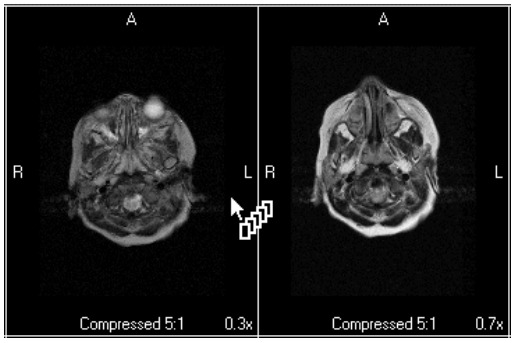
- Flipping between images on the same monitor.
- Flipping between images on different monitors.

Flipping between images on the same monitor

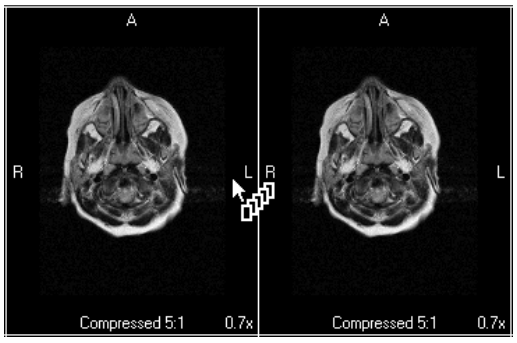
To flip between the primary image and a comparison image on the same monitor:

1. View the exam in the Universal Manager.
2. Select **Series per Square Mode**. If it is not the default set in the Reading Physician Preferences, do one of the following:
   - Press the **Z** key on the keyboard.

     OR
   - On the View menu, click Layout Images and select Series per Square Mode.
3. Display the comparison image in the adjacent window.
4. Click the **Page Through Series** button  .
5. Select the primary image by clicking in its square.
6. Move the cursor toward an edge of a comparison image window that is shared with the primary exam window. Do not move the cursor beyond the primary image window.



7. Press and hold the **F** key.
   The comparison image overlays the primary image and remains displayed in the adjacent comparison window.



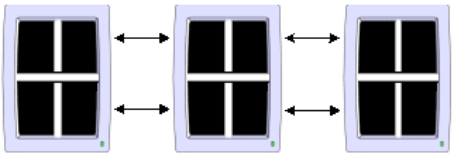
8. Release the **F** key. The system removes the comparison image from the primary image window.

9. Continue pressing and releasing the **F** key to quickly flip between the two images.
10. You can move the cursor toward another edge of a different comparison image window.
    - Press the **F** key. That comparison image overlays the primary image.
    - Release the **F** key to display the primary image.
    - Repeat to flip between the two images.

Flipping between images on different monitors

To flip between a comparison image in an adjacent monitor and the primary image:

1. Access the primary and comparison image as described in Flipping between images on the same monitor.
2. Move the cursor toward the edge of a comparison image window in an adjacent monitor.



3. Press the **F** key. The comparison image from the adjacent monitor overlays the primary image.
4. Release the **F** key to display the primary image.
5. Repeat to flip between the two images.

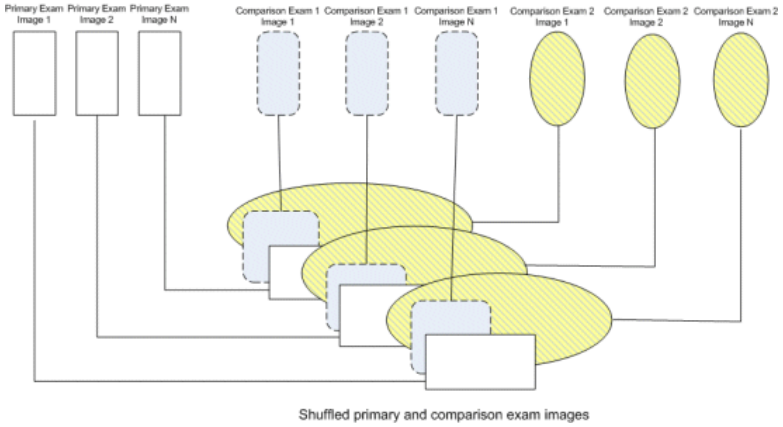
Shuffling Images for Comparison

- About shuffling images
- Tracking primary and comparison images while shuffling
- Shuffling a primary exam and a comparison exam by series name
- Shuffling a primary exam and a comparison exam by series name 1:1
- Shuffling primary exam images and adjacent comparison exam images
- Shuffling a primary exam and a comparison exam by series name 1:1

About shuffling images

Description of shuffling

Shuffling momentarily stacks in a single window the first primary exam image followed by the first image in each successive comparison exam. This repeats for the second image in the primary and comparison exams, followed by the third image in each series, until the system displays all the images in the primary exam and the successive comparison exams. This allows you to view a series of interlaced primary exam series images and up-to-four comparison exam series images.



Shuffled primary and comparison exam images

Shuffling order

The order the images are displayed as you page through the sets of images is:

1. Primary Exam Series, image 1.
2. Comparison Exam 1 series, image 1.
3. Comparison Exam 2 series, image 1.
4. Comparison Exam 3 series, image 1.
5. Primary Exam series, image 2.
6. Comparison Exam 1 series, image 2.
7. Comparison Exam 2 series, image 2.
8. Comparison Exam 3 series, image 2.
9. Primary Exam series, image N.
10. Comparison Exam 1 series, image N.
11. Comparison Exam 2 series, image N.
12. Comparison Exam 3 series, image N.

Caution: Labels on the exam images provide information for you to track the exam you are viewing. Verify that system annotations are displayed before shuffling. For details see, "Tracking primary and comparison images while shuffling."

Shuffling principles

Be aware of the following when using shuffling:

- Primary and comparison series must be graphically similar to effectively use shuffling.
- Primary and comparison series must have the same name to use the **Shuffle by Series Name** option.
- Shuffling is most helpful when the primary and comparison exam series have the same:
  - Anatomical area
  - Image size
  - Order or images
- The exams to be shuffled must be open.

Shuffling options

You can choose to shuffle by:

- **Shuffle by series name**. Shuffle the primary and comparison exam series of the same name.
- **Shuffle by series name 1:1**. Same as **Shuffle by series name**, except the display uses the full panel.
- **Shuffle adjacent**. Select the comparison series to shuffle with the primary exam series by moving the mouse near an edge between the series.
- **Shuffle adjacent 1:1**. Same as **Shuffle adjacent**, except the display uses the full panel.

Tracking primary and comparison images while shuffling

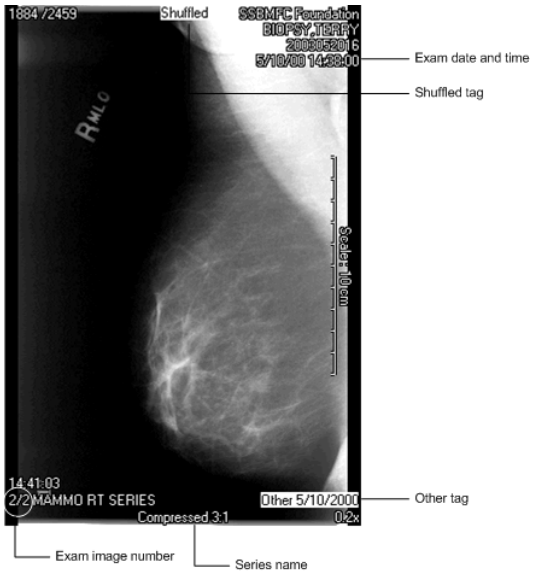
To know which image you are viewing while shuffling primary and comparison exam images, watch the following labels:

Tip: Press **A** to toggle image labels on if they aren't showing.

- **Shuffled tag** 

. If the system shows the shuffle tag at the top of the image, you are viewing a series of shuffled images.
- **Other tag**: The **Other** tag at the bottom right shows the comparison exam and date.

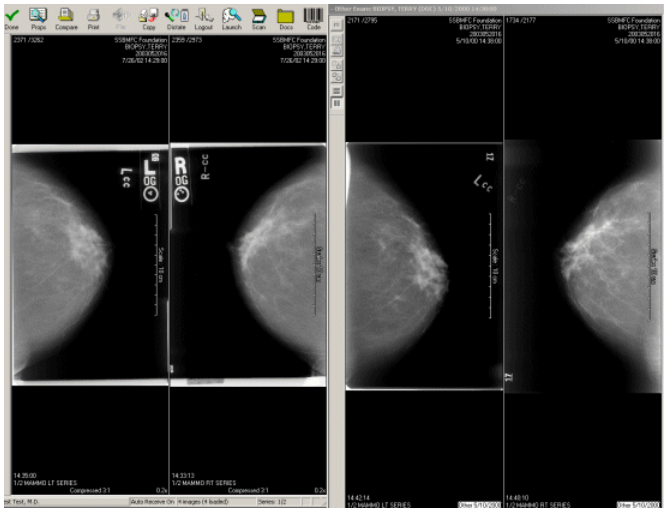
- **Exam date and time**. Each image shows the exam date and time.
- **Exam image number and series name**. Shows the series name and the position of the image within the series.



Shuffling a primary exam and a comparison exam by series name

To shuffle primary exam and comparison exam series of the same name:

1. Open the primary exam and the comparison exam, for example:
   - A primary left and right breast exam, Mammo LT Series and Mammo RT Series.
   - A comparison left and right breast exam, Mammo LT Series and Mammo RT Series.



- **Caution**: If you do not see the image name and date and time stamp annotations in the corners, click **A**. For details on the page annotations, see "Tracking primary and comparison images while shuffling." The annotations give you information you need to ensure you know which image you are viewing.

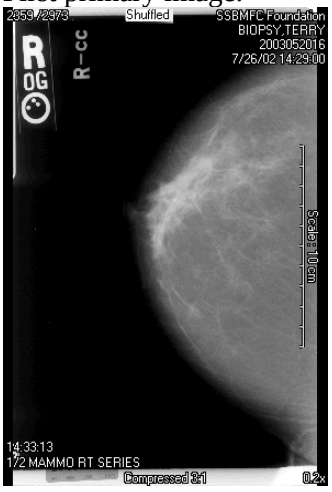
2. Select the **Page Through Series** tool.
3. Determine which series you want to shuffle. Use the **Page Through Series** tool to position each of the series to the desired starting image.
4. Right-click an image.
   The shortcut menu opens.
5. Select one of the following commands:
   - **Shuffle by Series Name**.
   - **Shuffle by Series Name 1:1**.

     The cursor changes to a series of a black pages interlaced with white pages.

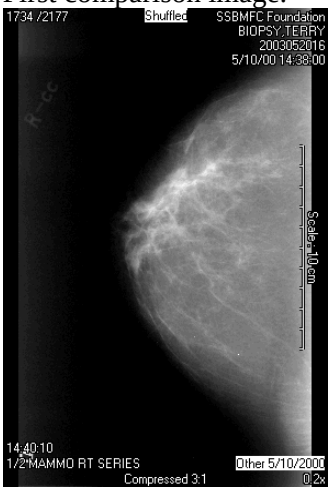
     
6. Click and hold the mouse on a series that you want to shuffle.

   A **Shuffle** tag appears at the top of the image to show that you are in shuffle mode Shuffled. This tag appears on each image while you are in shuffle mode.
7. Drag the mouse to view the first comparison image.

   As you continue to move the mouse, the image you are viewing quickly pages through the interlaced primary and comparison images in each series in the following pattern:
   - First primary image.

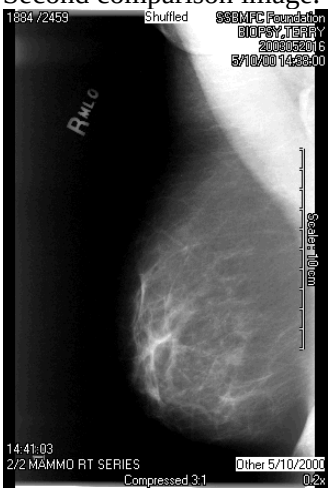
     

- First comparison image.



- Second primary image.

- Second comparison image.



This pattern repeats for each series of the same name.

8. Pause shuffling by releasing the mouse button.
9. Exit shuffling by selecting one of the following:
   - **Page through series** tool from the shortcut menu.
   - Another tool from the toolbar or the menus.

Tip: After using other tools, you can press **Q** to resume using the **Page Through Series** tool in shuffling mode.

Shuffling a primary exam and a comparison exam by series name 1:1

The differences between **Shuffle by Series Name** and **Shuffling by Series Name 1:1** are:

- **Shuffle by Series Name**
  - Performs the shuffle operation in the same window where you click the tool.
  - Restores the previous layout when you release the mouse button.
- **Shuffle by Series Name 1:1**
  - Displays the shuffled images in one panel that fills the entire display.
  - Displays a **Clear Shuffle** 

button at the top of the panel after you release the mouse button to let you exit shuffle mode and return to the original layout of images.
  - Allows you to perform multiple shuffle operations simultaneously.

Shuffling Adjacent Series

To shuffle the images of up to four adjacent exam series:

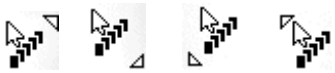
1. Select the **Page Through Series** tool.
2. Determine which series you want to shuffle. Use the **Page Through Series** tool to position each of the series to the desired starting image.
3. Right-click an image and select one of the following commands from the shortcut menu:
   - **Shuffle Adjacent**
   - **Shuffle Adjacent 1:1**

     The cursor changes to a series of black pages interlaced with white pages.

     
4. Move the mouse near the image you want to compare.
   As you approach the edge, the cursor changes to show which adjacent series will be shuffled with the primary series.

- The following cursors shuffle images in two adjacent series:

- The following cursors shuffle images in up to four adjacent series:



5. Click-left and hold the mouse button.

   A **Shuffle** tag appears at the top of the image to show that you are in shuffle mode  . This tag appears on each image while you are in shuffle mode.

6. Drag the mouse to view the first image from an adjacent series.

   As you continue to move the mouse, the image your are viewing quickly pages through the images of each series.

   You remain in shuffle mode while the shuffling cursor is active.

7. Release the mouse button.

   The shuffling stops and the series involved in the shuffle are updated to display the last image viewed.

Shuffling Adjacent Series 1:1

The differences between **Shuffling Adjacent** and **Shuffle Adjacent 1:1** are:

- **Shuffle Adjacent**
  - Performs the shuffle operation in the same window where you click the tool.
  - Restores the previous layout when you release the mouse button.
- **Shuffle Adjacent 1:1**
  - Displays the shuffled images in one panel that fills the entire display.
  - Displays a **Clear Shuffle**  button at the top of the panel to let you exit shuffle mode and return to the original layout of images.
  - Allows you to perform multiple shuffle operations simultaneously.

Adding text, arrow, and measurement annotations to primary exam images while shuffling

To add annotations to the primary exam images while shuffling:

1. Page through the images in the shuffling mode **Shuffle by Series Name 1:1** or **Shuffle Adjacent 1:1**.
2. Release the mouse at the image you want to annotate.
3. Insert annotations as needed.

   The annotations are saved with the image.

Cropping

Cropping Images

- About cropping
- Cropping an image
- Cropping multiple images in series
- Using keyboard shortcuts

About Cropping

 **Warning:** If you crop an image and save it when you close the exam, you cannot restore the original image.

Cropping an image

To crop an image:

1. Click the **Crop** button  .
2. Click and drag to select the portion of the image you want to keep. The portion of the image outside the box will be deleted.
3. To adjust the size or position of the box, click on the box outline.
   - Use the squares on the outline to adjust the size.
   - Click the shaded outline and drag to move the box.
4. Right-click the image. From the shortcut menu, select **Preview cropping for this image**.

   The system displays a preview of the cropped image.
5. You can cancel the preview, delete the crop box, or save the previewed image.
   - To delete the crop box, right-click and select **Delete crop box for this image**.

- To cancel the preview but keep the crop box, right-click **Cancel preview for this image**.
- To save the cropped image, exit the exam.
  The system prompts you to decide if you want to save the cropped image when you exit the exam.

  Warning: If you crop an image and save it when you close the exam, you cannot restore the original image.

Cropping multiple images in series

To crop multiple images:

1. Click the **Crop** button  .
2. Click and drag to select the portion of the image you want to keep. The portion of the image outside the box will be deleted.
3. To adjust the size or position of the box, click on the box outline.
   - Use the squares on the outline to adjust the size.
   - Click the shaded outline and drag to move the box.
4. Right-click the image. From the shortcut menu, select one of the following options:
   - Copy this crop box to all series images.
   - Copy this crop box to following series images.
5. From the shortcut menu, select **Preview cropping all series images**.

   The system displays a preview of the cropped image.
6. You can cancel the preview, delete the crop box, or save the previewed image.
   - To delete the crop box, right-click and select **Delete crop box for all series images**.
   - To cancel the preview but keep the crop box, right-click **Cancel preview for all series images**.
   - To save the cropped images, exit the exam.
     The system prompts you to decide if you want to save the cropped images when you exit the exam.

     Warning: If you crop an image and save it when you close the exam, you cannot restore the original image.

Using keyboard shortcuts

You can use the following keyboard shortcuts for the Crop tool:

Shortcut	Tool		Action
> or .		Crop	Mode to apply action to all images in the series. After you apply the shortcut, the cursor displays an "A" (for All).
Shift		Crop	Immediately shows a preview of the cropped image.

Caution when using the > key, Apply to Whole Series

When using the > shortcut or the View menu option **Apply to Whole Series** to apply the imaging tool to all images in the series, you may affect images that are not currently visible on the display.

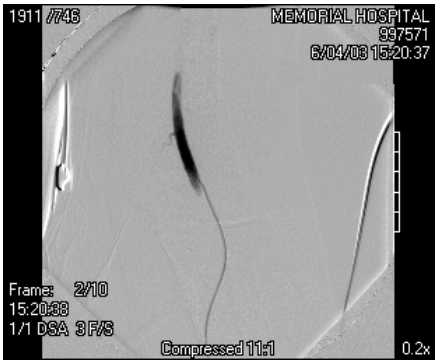
Image Subtraction Masks

About Applying Image Subtraction Masks

Image subtraction masks

The system provides image subtraction masks between two frames of a multiframe image if the DICOM header or the Image Processing tool enables subtraction. By using subtraction, you can, for example, focus on the movement of the contrast agent in an image. When viewing a subtracted-image series by using the cine tool or by paging through the series, all frames are subtracted.

The following is an example subtracted image that shows the contrast agent beginning to flow through a vessel:



About the mask

A mask is an image used to subtract from each of the images in a set of one or more images. Typically a mask image is an image that is captured before a change is introduced into the set of images to be subtracted, for example, before introducing a contrast agent.

About subtraction

Subtraction is an image processing operation that is performed between a mask and a reference image. The system displays the subtracted result, which provides the ability to focus on the differences between the mask and the subsequent images.

Displaying and removing subtraction

You have the option to:

- Apply the mask subtraction to each frame of a multiframe sequence.
- Disable mask subtraction to view the images without mask subtraction.
- Opacify the subtracted image, which accumulates a series of subtractions to emphasize particular detail.

Specifications of mask subtraction

- When your run the cine tool on a subtracted image, all images in the cine sequence are subtracted.
- The DICOM header controls whether the system displays the first image in the series in subtracted format or normal format.
- The first image, which is subtracted from itself, results in a "zero" image that appears as a flat, gray field.
- The system applies the current Window-Level, Rotation, and Image Processing settings to all images in the sequence.

Availability of viewing mask subtracted images

Mask subtraction is available on the following DR Systems products:

- Dominator
- Web Dominator
- Ambassador
- Web Ambassador
- Catapult

For details on using image subtraction, see

- Accessing Exams to View Subtracted Images
- Determining if Images Have a Subtraction Mask Defined
- Viewing Subtracted Images
- Disabling Subtraction Masks
- Activating Image Subtraction
- Opacifying Subtracted Images

Accessing Exams to View Subtracted Images

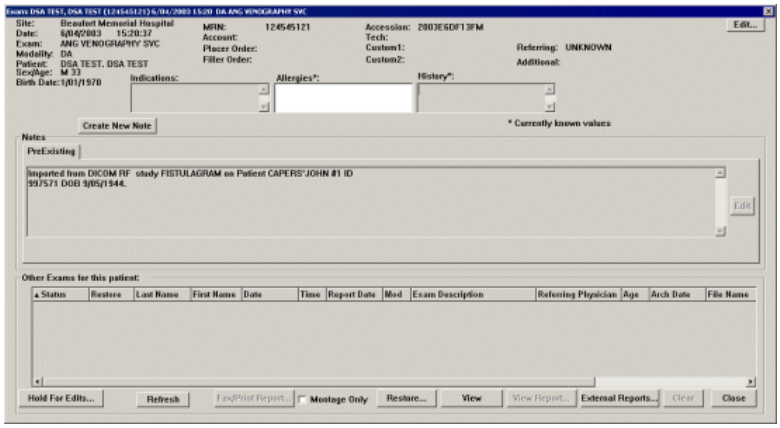
To access an exam to view the subtracted images:

1. Select the exam. For details on selecting exams, see "Selecting Exams in a List."
2. Click the **View** button 

.

   Tip: You can also double-click the exam, or right-click and select **View** from the shortcut menu.

   The exam and the **Electronic Requisition** open.



3. Close the **Electronic Requisition**.

   Tip: Press the **spacebar**.

Determining if Images Have a Subtraction Mask Defined

To determine if the image you are viewing has a defined subtraction mask:

1. Access the exam. For details on accessing the exam, see "Accessing an exam to view subtracted images."
2. Select the **Apply Image Processing** tool  .
3. Right-click the exam image.
   The **Apply Image Processing** menu opens.
4. View the available options in the menu.
   - If the **Subtraction** menu items are listed, you can apply a subtraction mask to the images in the exam.
   - If the image does not have a subtraction mask defined, the system does not list **Subtraction** menu options.

Viewing Subtracted Images

About viewing subtracted images

The DICOM header specifies the default. If image subtraction is the default, the image opens displaying the image subtracted. If the default does not display image subtraction, you can activate it. For details on activating image subtraction, see "Activating Image Subtraction."

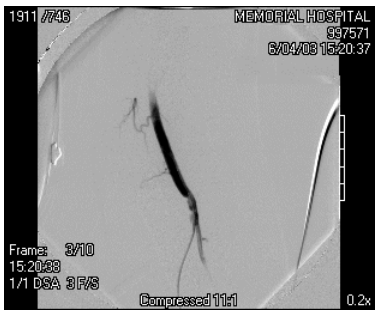
View subtracted images

To view subtracted images:

1. Access the exam. For details on accessing the exam, see "Accessing an exam to view subtracted images."
2. Click the **Cine** tool and click the image.

   The system subtracts the mask from all the images as they are displayed. The mask image is displayed as black. For details on using the cine tool, see "Using Cine for Continuous Viewing of a Series."

   The following figure is the third image of a cine sequence that shows the contrast agent continuing to flow through a vessel:



   The following figure is the fourth image of a cine sequence that shows the contrast agent continuing to flow through a vessel:

3. To view each image in detail, stop the cine sequence by clicking on the exam image and selecting the **Page-Through-Series** tool .

Disabling Subtraction Masks

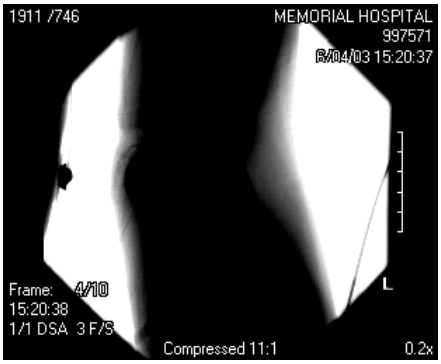
To remove the subtraction mask from images while you are viewing the exam:

1. Access the exam. For details on accessing the exam, see "Accessing an exam to view subtracted images."
2. Select the **Apply Image Processing** tool  .
3. Right-click the exam image that includes image subtraction.
   The **Apply Image Processing** menu opens.
4. Click **Cancel Image Processing**.

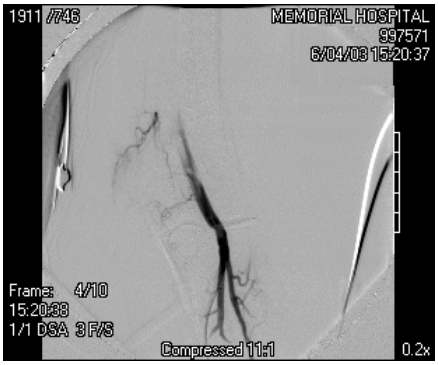
   The system removes the image subtraction.

   The following figures show the same image with subtraction canceled and with subtraction active:

   - Image with subtraction cancelled:



   - Image with subtraction activated:



Activating Image Subtraction

To activate image subtraction:

1. Access the exam. For details, see "Accessing exams to view subtracted images."
2. Select the **Apply Image Processing** tool  .
3. Right-click the image that has mask subtraction off.
   The **Apply Image Processing** menu opens.
4. Select **Apply Subtraction**.

   The system displays the subtracted images.

Opacifying Subtracted Images

About opacifying subtracted images

Opacification accumulates a series of subtracted images to emphasize a particular detail. Each image builds on the previous image. Subtracted images displayed without opacify show each image as the contrast agent flows through the vessel and the previous image has no effect on the current image.

Opacifying a subtracted image

To opacify the subtracted image:

1. Access the exam. For details on accessing the exam, see "Accessing an exam to view subtracted images."
2. Select the **Apply Image Processing** tool  .
3. Right-click the image with mask subtraction.

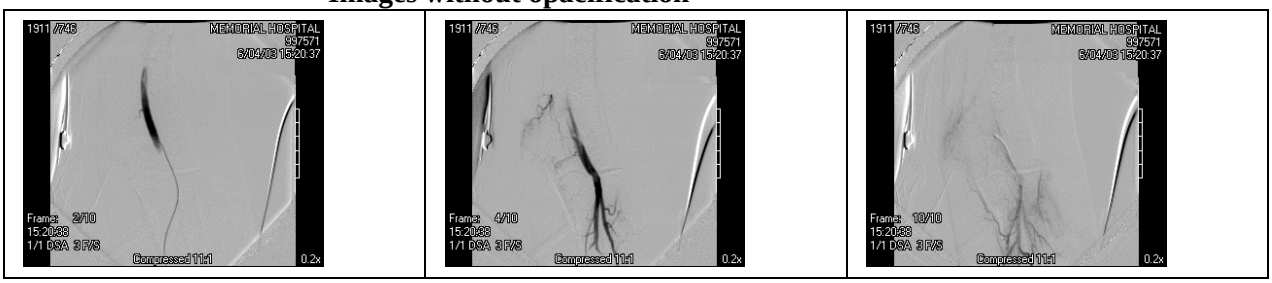
   If you are not on the first image, scroll to the first image in the series.

   The **Apply Image Processing** menu opens.
4. Select **Apply Subtraction Opacify**.

   The following is an example of a series of subtracted images with opacification turned on. The figure shows the contrast building from the first subtracted image to the last.

Images with opacification

Images without opacification



Interpolation

Controlling Image Interpolation for Display

Images can be resized to be larger than originally acquired. If very small images are enlarged or magnified many times, they can appear blocky or pixellated depending on what algorithm is used to increase the size of the image.

DR Systems supports **Pixel Replication** and **Bilinear Interpolation** when enlarging images for display.

Controlling Image Interpolation for Printing

Images can be resized to be larger than the original acquisition size. If very small images are enlarged or magnified many times, they can appear blocky or pixelated depending on what algorithm is used to increase the size of the image.

When enlarging items for display, DR Systems supports the following resizing methods:

- Pixel replication
- Bicubic interpolation
- Bilinear interpolation

The resizing method is controlled when you select the printing options for the print job. **Bilinear interpolation** or **Bicubic interpolation** should be used for optimal image quality, especially with smaller images (256 x 256 or less).

Using Bilinear Interpolation and Pixel Replication

When small images are magnified they can appear blocky or “pixilated.” Bilinear Interpolation smoothes the block appearance of the image for better viewing. Bilinear Interpolation should be used for optimal image quality, especially with smaller images (256x256 or less). The Bilinear Interpolation feature is on as default. If deselected, the image will be resized by the **Pixel Replication** method.

To turn off bilinear interpolation, and turn on pixel replication:

1. Click the **View** menu.
2. Select **Bilinear Interpolation**.

Inverting, Rotating, and Flipping

Inverting an Image

- About Inverting
- Inverting one image
- Inverting all images in a series
- Using keyboard shortcuts

About Inverting

Use the **Invert** function to show the negative of the image.

Inverting one image

To invert an image:

1. Click the **Invert** button  .
2. Click the image to view the negative.

Inverting all images in a series

To invert all images in a series:

1. Click the **Invert** button  .
2. Right-click the image with the Invert tool.
3. Select **Apply invert to all series images**.

Using keyboard shortcuts

You can use the following keyboard shortcuts for the Invert tool:

Shortcut	Tool		Action
> or .		Invert	Mode to apply action to all images in the series. After you apply the shortcut, the cursor displays an "A" (for All).

Caution when using the > key, Apply to Whole Series

When using the > shortcut or the **View** menu option **Apply to Whole Series** to apply the imaging tool to all images in the series, you may affect images that are not currently visible on the display.

Rotating and Flipping an Image

- About rotating and flipping images
- Flipping the image from left to right
- Flipping the image from top to bottom
- Rotating the image
- Using keyboard shortcuts

About rotating and flipping images

You can flip the image or rotate it in 90-degree increments.

Flipping the image from left to right

To flip the image left to right:

1. Click the **Rotate** button  .
2. Right-click the image.
3. From the shortcut menu, select **Mirror Right/Left**.

Flipping the image from top to bottom

To flip the image top to bottom:

1. Click the **Rotate** button  .
2. Right-click the image.
3. From the shortcut menu, select **Flip Top/Bottom**.

Rotating the image

To rotate the image:

1. Click the **Rotate** button  .
2. Right-click the image.
3. From the shortcut menu, select one of the following options:
   - **Rotate Right 90**
   - **Rotate Left 90**
   - **Rotate 180**
4. Click the image.

Note: The shortcut menu has options for applying operations to other images in the series. You can right-click the image and select an option to apply the rotate/flip to all the series images or the following series images.

Using keyboard shortcuts

You can use the following keyboard shortcuts for the Rotate tool:

Shortcut	Tool		Action
> or .		Mirror left-right	Mode to apply action to all images in the series. After you apply the shortcut, the cursor displays an "A" (for All).
		Flip top-bottom	
		Rotate 180 degrees	
		Rotate left 90 degrees	
		Rotate right 90 degrees	

Caution when using the > key, Apply to Whole Series

When using the > shortcut or the View menu option **Apply to Whole Series** to apply the imaging tool to all images in the series, you may affect images that are not currently visible on the display.

Flipping between Images for Comparison—Quick Flip

- About flipping between images for comparison.
- Flipping between images on the same monitor.
- Flipping between images on different monitors.

About flipping between images for comparison

While you are comparing images, you can temporarily switch from the primary image to a comparison image, which allows you to keep both images in your immediate focus. The system switches the images in the current square. Quickly flipping between images in the same place is useful in detecting differences in size and location, for example when examining tumor growth.

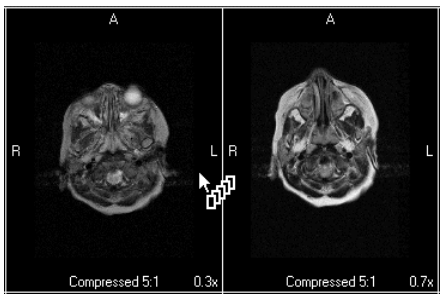
Using this Quick Flip tool, you can temporarily replace the primary image with the comparison image, and continue to switch quickly back and forth to determine differences between the two images:

- Flipping between images on the same monitor.
- Flipping between images on different monitors.

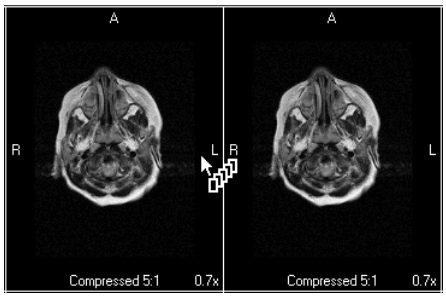
Flipping between images on the same monitor

To flip between the primary image and a comparison image on the same monitor:

1. View the exam in the Universal Manager.
2. Select **Series per Square Mode**. Radiologist PreferencesIf it is not the default set in the Reading Physician Preferences, do one of the following:
   - Press the **Z** key on the keyboard.
     OR
   - On the View menu, click Layout Images and select Series per Square Mode.
3. Display the comparison image in the adjacent window.
4. Click the **Page Through Series** button  .
5. Select the primary image by clicking in its square.
6. Move the cursor toward an edge of a comparison image window that is shared with the primary exam window. Do not move the cursor beyond the primary image window.



7. Press and hold the **F** key.
   The comparison image overlays the primary image and remains displayed in the adjacent comparison window.

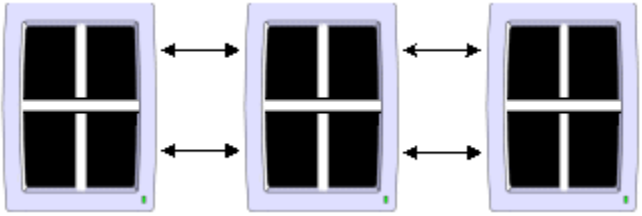


8. Release the **F** key. The system removes the comparison image from the primary image window.
9. Continue pressing and releasing the **F** key to quickly flip between the two images.
10. You can move the cursor toward another edge of a different comparison image window.
    - Press the **F** key. That comparison image overlays the primary image.
    - Release the **F** key to display the primary image.
    - Repeat to flip between the two images.

Flipping between images on different monitors

To flip between a comparison image in an adjacent monitor and the primary image:

1. Access the primary and comparison image as described in Flipping between images on the same monitor.
2. Move the cursor toward the edge of a comparison image window in an adjacent monitor.



3. Press the **F** key. The comparison image from the adjacent monitor overlays the primary image.
4. Release the **F** key to display the primary image.
5. Repeat to flip between the two images.

Magnifying and Roaming

Magnifying Images

- About Magnifying Images
- Magnifying an image.
- Using keyboard shortcuts.

About Magnifying Images

This function magnifies the entire image. You can also magnify a portion of the image.

Magnifying an Image

To magnify an image:

1. From the Tools menu, select **Magnify**.
   OR
   On the toolbar, click the **Magnify** button  .
2. Press and hold the left mouse button as you move the magnifying glass over the image.
   - Moving the mouse forward increases the magnification.
   - Moving the mouse back decreases the magnification.
3. When you reach the desired magnification, release the mouse button.
4. To select a magnification option, right-click the image and select one of the following:
   - Apply last magnification to this image.
   - Reset to the original magnification.
   - Apply magnification to all series images.
   - Apply magnification to following series images.

Using keyboard shortcuts

You can use the following keyboard shortcuts for the Magnify tool:

Shortcut	Tool		Action
> or .		Magnify	Mode to apply action to all images in the series. After you apply the shortcut, the cursor displays an "A" (for All).

Caution when using the > key, Apply to Whole Series

When using the > shortcut or the View menu option **Apply to Whole Series** to apply the imaging tool to all images in the series, you may affect images that are not currently visible on the display.

Magnifying a Portion of the Image

About magnifying a portion of the image

The **Mag Box** magnifies a small area of the image. The magnification default is Full Resolution. The **Mag Box** is the default tool when viewing an image.

Using the Mag Box

To use the Mag Box:

1. Place the **Mag Box**  over the image.
2. Press and hold the left mouse button as you move the **Mag Box** over the image.
3. Right-click and select a **Mag Box** option:
   - Change the magnification to 2X or 4X.
   - Change the size of the **Mag Box.**

Magnifying Portions of Adjacent Images Simultaneously

- ▶ About magnifying portions of primary and comparison images simultaneously
- ▶ Magnifying portions of primary and comparison images simultaneously

About magnifying portions of primary and comparison images simultaneously

Caution: The position of the linked and mirrored magnification boxes are not patient relative.

Linked and mirrored magnification boxes

Linked and mirrored magnification boxes allow you to simultaneously:

- Magnify the same general area of two images.
- Move the magnification boxes in the same or opposite directions.
  - **Linked magnification**. Moves both magnification boxes in the same direction.
  - **Mirrored magnification**. Moves the boxes according to their relative positioning. If positioned side-by-side, the boxes move in opposite horizontal directions. If positioned one above the other, the boxes move in opposite vertical directions.

Requirements for using linked and mirrored magnification boxes

Be aware of the following when using linked and mirrored magnification boxes:

- **Adjacent images**. The images must share a window edge. They must be adjacent horizontally or vertically.
- **Linked graphically**. The system links the magnification boxes graphically, not anatomically. Use magnification when comparing exams that are similar, for example:
  - The exams are of the same area but taken at different times
  - The exams are for left-and-right comparisons.
- **Left-click for linked magnification boxes**. The system links the box movements as you drag the mouse horizontally and vertically. The magnification boxes move in parallel.
- **Right-click for mirrored magnification boxes**. The system mirrors the box movements as you drag the mouse horizontally and vertically. The magnification boxes move in opposite directions on one axis and the same direction on the other axis.
  - **Horizontal mirrored movement**. If you position the adjacent images horizontally and drag the mouse horizontally, the system mirrors the magnification box movements. The system links the magnification box movements when you drag the mouse vertically.
  - **Vertical mirrored movement.** If you position the adjacent images vertically and drag the mouse vertically, the system mirrors the magnification box movements. The system links the magnification box movements when you drag the mouse horizontally.
- **Movement in different sized images**. If the adjacent images are different sizes, the magnification boxes move an equivalent percentage of the images size. For example, if the image in the adjacent window is twice the size of the primary image, each movement in the primary image moves twice as many pixels in the adjacent image.

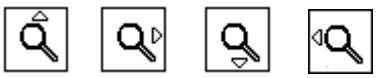
Magnifying portions of two images simultaneously

To magnify a portion of a two images simultaneously:

1. Display two images.
2. Click the **Mag Box** button  .

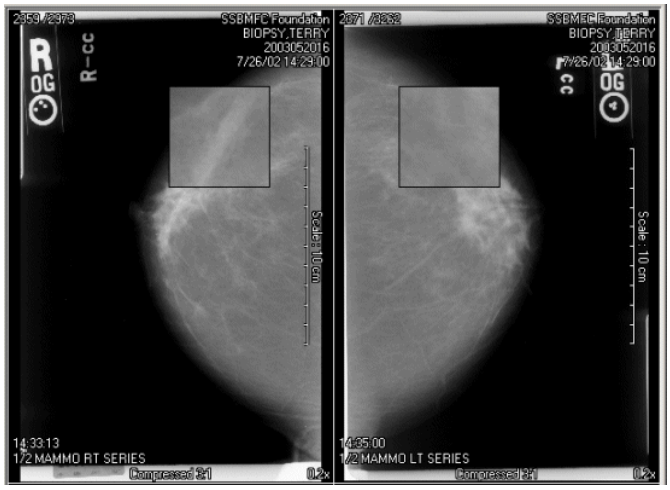
   The cursor changes to a boxed magnifying glass  .
3. Drag the cursor to the edge adjacent to the an image.

   The cursor changes to one of the following depending on the edge of the image where you place the cursor:



4. Do one of the following:
   - **Linked magnification boxes**. Click-left and hold the mouse button for linked magnification boxes.
   - **Mirrored magnification boxes**. Click-right and hold the mouse button for mirrored magnification boxes.
5. While holding the left or right mouse button, drag the cursor over the exam.

   A magnifying box in both images enlarges the same geographic areas of the two images. The magnifying boxes move simultaneously horizontally and vertically as you move the mouse.



Roaming

About Roaming

Roaming moves the image within a cell if the image is magnified so it is larger than the cell.

Using the Roam tool

To roam:

1. Click the **Roam** button .
2. Place the icon on the image you want to roam.
3. Move the icon to view the image.

Roaming Adjacent Images Simultaneously

About roaming adjacent images simultaneously

You can use the roaming tool to simultaneously move two adjacent images.

Linked and mirrored roaming

Linked and mirrored roaming allows you to simultaneously:

- Roam to the same general area of two adjacent exams.
- Move two images in the same or opposite directions.
  - **Linked roaming**. Moves the two images in the same direction.
  - **Mirrored roaming**. Moves the two images in opposite directions.

Linked and mirrored roaming principles

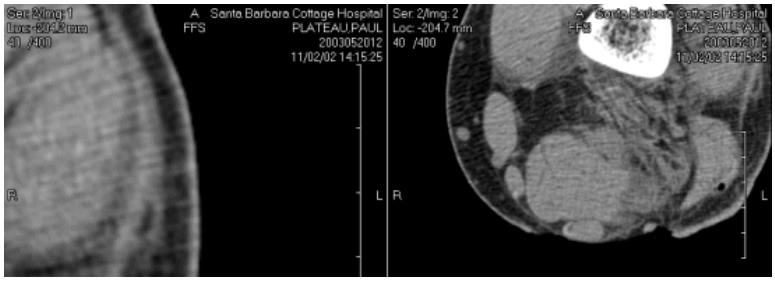
Be aware of the following when using linked and mirrored roaming:

- **Images are larger than the display area**. To use the Roaming tool, the images must be larger than the display area allocated for them.
- **Adjacent images**. The images must be adjacent horizontally or vertically. They must share a window edge.
- **Linked graphically**. The system links the roaming graphically, not anatomically. Use roaming when comparing exams that are similar, for example:
  - The exams are of the same area but taken at different times.
  - The exams are for left-and-right comparisons.
  - The exam images are magnified similarly and your view of the images is similar.
- **Left-click for linked roaming**. The system links image movements as you drag the mouse horizontally and vertically. The images move in parallel.
- **Right-click for mirrored roaming**. The system mirrors the image movements as you drag the mouse horizontally and vertically. Images move in opposite directions on one axis and the same direction on the other axis.
  - **Horizontal mirrored movement**. If the images are side-by-side and you drag the mouse horizontally, the system mirrors the image movements. The system links the image movement when you drag the mouse vertically.
  - **Vertical mirrored movement.** If the images are one-above-the-other and you drag the mouse vertically, the system mirrors the image movements. The system links the image movement when you drag the mouse horizontally.
- **Movement in different sized images**. If the adjacent images are different sizes, the images move an equivalent percentage of the images size. For example, if the image in the adjacent window is twice the size of the primary image, each movement in the primary image moves twice as many pixels in the adjacent image.

Roaming two images simultaneously

To roam two images simultaneously:

1. Open two or more images.



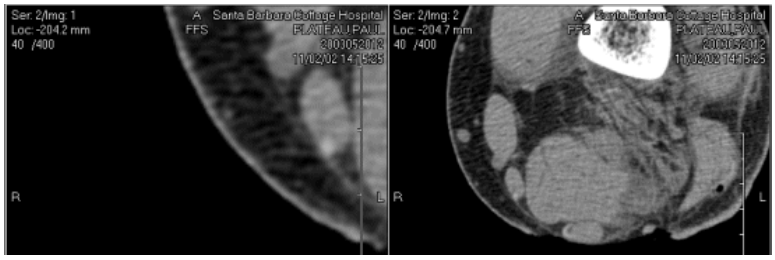
2. Click the **Roam** button  .

   The cursor changes to a hand for grabbing the image and moving it  .

3. Drag the mouse to the window edge of the adjacent image.

   The cursor changes to one of the following depending on the edge of the image where you place the cursor:

4. Click and drag the mouse to roam images in both exams simultaneously.



Pixel Tracking

About pixel tracking

Use pixel tracking to identify how much of the image you have viewed.

When to use pixel tracking

This tool is useful when:

- You are viewing an image that is larger than the display area of your monitor.
- You want to be sure that you have viewed the entire image.

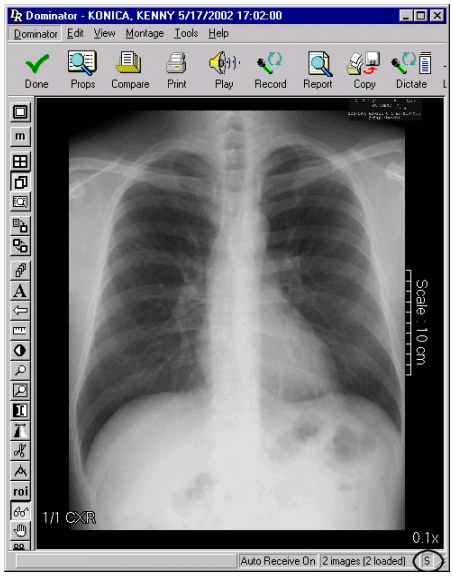
Tools that enable pixel tracking

You can use pixel tracking with the following tools:

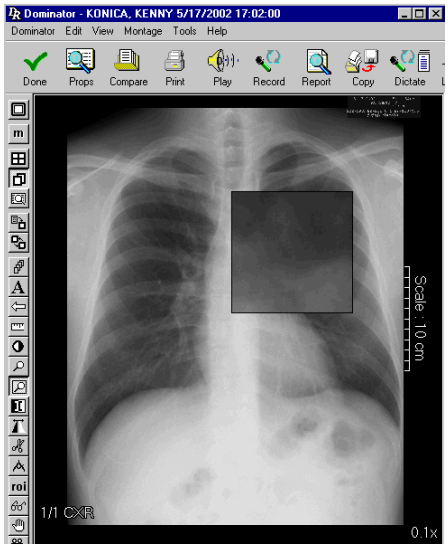
- **MagBox** tool
- **Roam** tool

Using pixel tracking with the MagBox tool

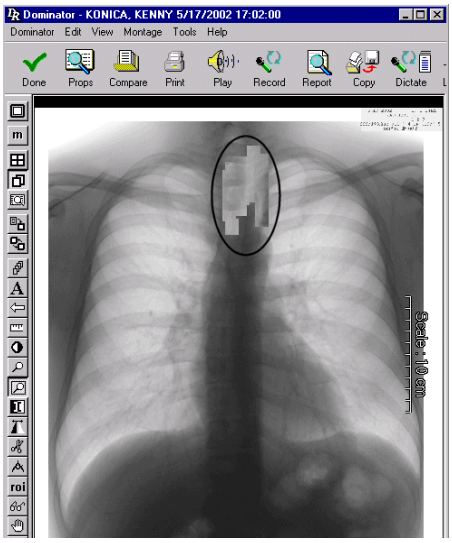
1. Be sure that shrink mode is **on**.
   If shrink mode is not turned on, press the **S** key to turn it on.
   Tip: The character '**S**' displays at the right of the status bar at the bottom of the window.



2. Click the **MagBox** tool .
3. Use the **MagBox** tool to view some areas of the image.



4. Press and hold the **Insert** key.



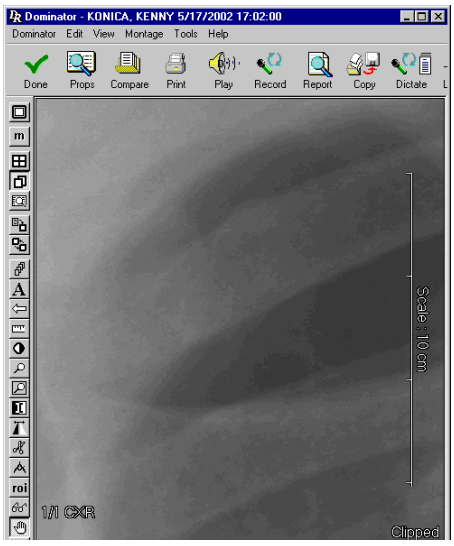
   - The viewed area is displayed in the original color.
   - The unviewed area is displayed in reversed color.

5. Release the **Insert** key to return to normal view.
6. Continue using the **MagBox** until you have viewed all the areas of interest.

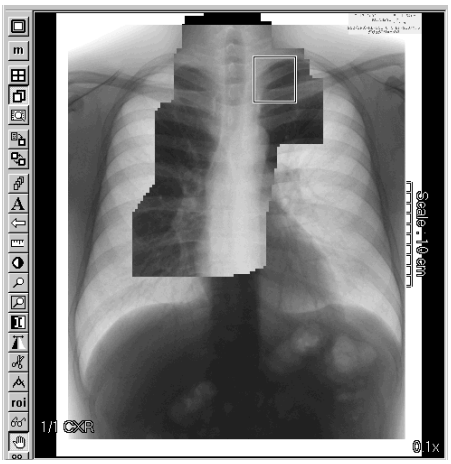
   Note: When you finish viewing the exam, the system clears the pixel tracking.

Using pixel tracking with the roaming tool

1. Be sure that shrink mode is **off**.
   If shrink mode is turned on, press the **s** key to turn it off.
   Tip: The character 'S' does **not** display at the right of the status bar at the bottom of the window.

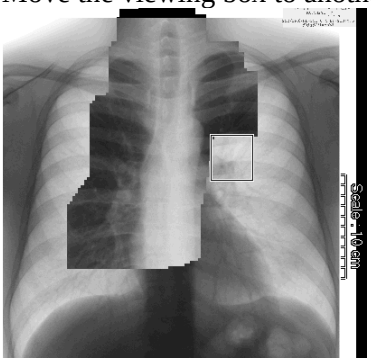


2. Click the **Roam** tool  .
3. Use the **Roam** tool to pan through some areas.
4. Press and hold the **Insert** key.



   - The viewed area is displayed in the original color.
   - The unviewed area is displayed in reversed color.
   - The current viewing area is marked by a box.

5. Move the viewing box to another area.



6. Release the Insert key to return to normal view.
   The view area is moved to the designated area.
7. Continue using the **Roam** tool until you have viewed all the areas of interest.

   Note: When you finish viewing the exam, the system clears the pixel tracking.

Scout Insets

Creating a Scout Inset for Specific Images in a Series

For some series it may be useful to plot only half of the series images, or to have two scout insets with a portion of the series plotted on each.

To create a scout inset for specific images:

1. Plot the entire series.
2. Click the **Cross-ref scout** button  .
3. With the **Cross-ref scout** tool, right-click an image in the series.
4. Choose **Select slices**. A dialog box appears showing the scout inset with the slices plotted.
5. Click **Select Slices**. The slice lines become shorter.
6. Click on the image and drag to create a box around the slice lines that should have the scout inset.
7. Click **OK**.

Note: To have portions of the series plotted on two scout insets, create the two scout insets and then separately specify which images are to be plotted to which scout inset.

Selecting a Scout Inset to Display

Although more than one scout can be put as an inset on a series, only one scout inset can be displayed at a time.

To switch between insets:

1. Click the **Cross-ref scout** button  .
2. Right-click a series image.
3. Select **Next scout** or **Previous scout** from the shortcut menu.

Moving and Resizing Scout Insets

Scout insets can be moved to any place within the image and resized to any desired size.

To move or resize the scout inset:

1. Click the **Cross-ref scout** button  .
2. Click on the scout inset. Resize handles will appear on the inset.
   - To **move** the inset, click inside the inset and drag it to the desired location.
   - To **resize** the inset, click on a resize handle and drag to the desired size.

Removing a Scout Inset from a Series

To remove a scout inset:

1. Click the **Cross-ref scout** button  .
2. Right-click the image.
3. Select **Unplot series** from the shortcut menu.

Viewing Scout Insets at Full Resolution

To view a scout inset at full resolution:

1. Click the **Cross-ref scout** button  .
2. Double-click on the scout inset. The inset appears in a dialog box.
3. Resize the dialog box to enlarge or shrink the scout inset.
4. When finished, click **OK**.

Scrolling

Scrolling Images

When viewing exams in Image per Square display mode, the scroll function will move through the panels.

Note: This mode of viewing is the same as the All Series Monitor mode on the DOS **Dominator**.

To use Scroll:

1. Click the **Scroll** button.
2. Click an image to move it to the start of the first panel.

Series

Applying Roaming to all Images in Series

About applying Roaming to all Images in Series

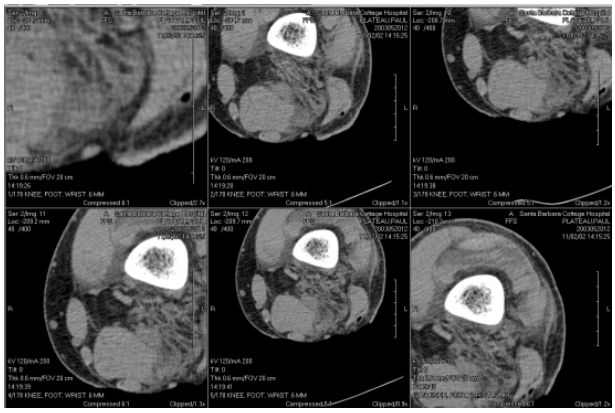
You can simultaneously roam all the images in a series by using the **Roam** tool. By using the **Roam** tool with the **Apply to Whole Series** option activated, you can grab-and-roam all the images in the series.

Caution: Using roaming can move important parts of exams that have not yet been displayed out of the viewing range.

Realigning all images in a series

To apply roaming to all images in a series:

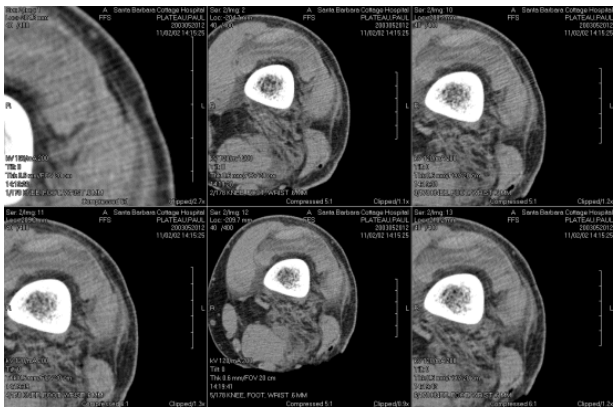
1. Open a series in any display mode.



2. Click the **Roam** button  .
3. Press the greater-than key > to activate **Apply to Whole Series**.

   Tip: You can also select **Apply to Whole Series** from the **View** menu.

   The cursor changes to the **Roam Series** icon  .
4. Click and hold. Drag the mouse on one image to move all the images in the series.



Replacing the Viewed Series

You can replace the series you are viewing with another series while you are in Series-per-Square mode.

To replace a series you are viewing with another series:

1. View an exam.
2. Select **Series per Square Mode**.

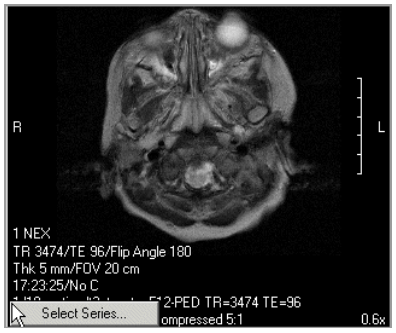
If it is not the default set in the Reading Physician Preferences, do one of the following:

- Select the **Z** key on the keyboard,

  OR

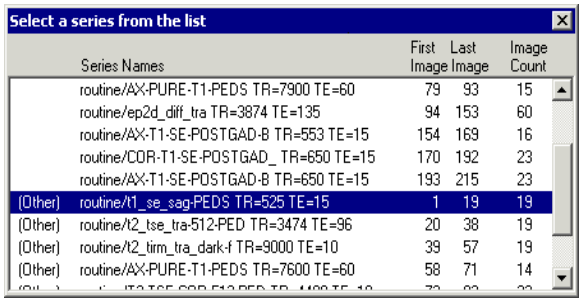
- On the **View** menu, click **Layout Images** and select **Series-per-Square Mode**.

3. Select the square with the series in it that you want replaced.
4. Move the pointer to the lower left corner of the image.



The **Select Series** button appears.

5. Click the **Select Series** button.
   The Select-a-series-from-the-list dialog box opens.



The system lists series from the primary exam as well as any series from the comparison exam, if they are loaded.

Note: To close the dialog box without selecting a series, press the Esc key or the X close button in the window corner.

6. Select the series name that you want to replace the current series, and press **Return** or double-click the series name. The dialog box closes.

   The system displays the series you selected in the square.

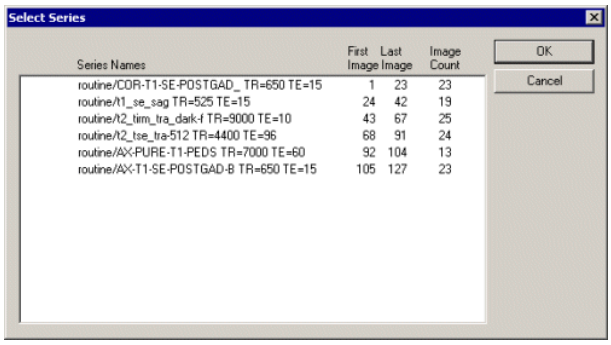
Selecting a Series to Display

You can choose a series to display rather than paging through the entire exam.

To select a series:

1. When viewing an exam, click the **Select Series** button  **OR** from the **Tools** menu, click **Set Series**.

   The **Select Series** dialog box opens.



2. Do one of the following:
   - If you are viewing images in the **Image-per-Square Display Mode:** Double-click the desired series. The first image in the selected series displays.

     OR
   - If you are viewing images in the **Series-per-Square Display Mode:** Double-click the series to display. The mouse pointer changes to the series icon.

     Move the icon to a cell and click the left mouse button. The selected series displays in the selected cell.

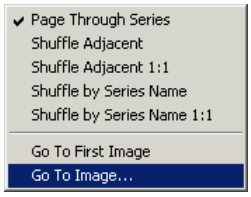
Specifying an Image in a Series to View

To specify a specific image in a series to display:

1. Open a series.
2. Click the **Page Through Series** button  .
3. Move the mouse to place the **Page-Through-Series** cursor  over the series you want to view.

4. Right-click.

   The shortcut menu opens.



5. Select **Go to Image** from the shortcut menu.

   The **Display series image** dialog box opens.

   The default **Image number** is the number of the currently displayed image.

6. Type the image number of the image you want to view.
7. Click **OK**.

   The system displays the image.

Simultaneously Paging through Series Across Monitors

About paging through series across monitors

While viewing or reading exams that have multiple series displayed on multiple monitors, you can page all series simultaneously.

For example, you open a primary exam and a comparison exam on four monitors:

- Each of the two center monitors display a series from the primary exam.
- The far left monitor displays a series from the comparison exam.
- The far right monitor displays a series from the comparison exam.

You can page through a series on one of the monitors and simultaneously page through the series on all the other monitors.

Paging through multiple series across monitors

To simultaneously page through series of exam images all other monitors:

1. Display multiple series in multiple monitors.
2. Select the **Page-Through-Series** tool by doing one of the following:
   - Click the **Page Through Series** button  .
   - Right-click on an image and select **Page Through Series** in the shortcut menu.
3. Press and hold the **Shift** key while dragging the mouse.

   All the series page through their images simultaneously.

Viewing a Series

When viewing exams in Series per Square display mode, you can view the images in a series with the **Page** function.

To page through a series:

1. Click the **Page** button  .
2. Click and drag over the series to view.

Note: If two exams are displayed, press **Shift** to page through both exams at the same time.

Tips: If you need to select a different tool than the **Page Through Series** tool, press **Q** for the **Quick Select Paging** tool to return you to your previously used **Page Through Series** tool in shuffling mode.

Window/Level and Image Processing

Adjusting the Window/Level of an Image

- About Window/Level
- Window/Level for a single image
- Window/Level based on a region
- Window/Level for multiple images
- Apply color LUT

About Window/Level

Window/level refers to a special form of contrast and brightness adjustment that is routinely applied to medical images. A more precise term is Window Width and Window Level adjustment.

Use Window/Level to adjust the brightness and contrast of an acquired image.

Adjusting the Window/Level for a single image

To adjust the Window/Level (W/L):

1. From the Tools menu, select **Window/Level Image**.

   OR Click the **Window/Level Image** button  on the toolbar.

2. To adjust the window and level, you can use the mouse or the arrow keys.
   - To change the level:
     - Move the mouse up and down.
       OR
     - Use the up and down arrow keys.
   - To change the window width:
     - Move the mouse left and right
       OR
     - Use the left and right arrow keys.
3. To select additional options, right-click the image.
4. From the shortcut menu, select one of the Window/Level options:
   - Apply last W/L to this image.
   - Auto W/L this image.

Note: Each modality may have specific options on the shortcut menu, depending on the configuration set for your facility.

Mouse shortcuts and accelerators for window/level

Select  and move	To ...
mouse up	decrease level
mouse down	increase level
mouse left	decrease window width
mouse right	increase window width
Ctrl + mouse up	decrease level x 10
Ctrl + mouse down	increase level x 10
Ctrl + mouse left	decrease window width x 10
Ctrl + mouse right	increase window width x 10
Shift + mouse up	decrease level x 20
Shift + mouse down	increase level x 20
Shift + mouse left	decrease window width x 20
Shift + mouse right	increase window width x 20

Keyboard shortcuts and accelerators for window/level

Select  and press	To ...
up arrow	decrease level
down arrow	increase level
left arrow	decrease window width
right arrow	increase window width
Ctrl + up arrow	decrease level x 50
Ctrl + down arrow	increase level x 50
Ctrl + left arrow	decrease window width x 50
Ctrl + right arrow	increase window width x 50
Shift + up arrow	decrease level x 100
Shift + down arrow	increase level x 100
Shift + left arrow	decrease window width x 100
Shift + right arrow	increase window width x 100

Note: The Shift control used with the arrow keys, which accelerates the motion 100 times, is useful for adjusting the Window/Level on very large images such as CR (computed radiography) and DX (digital x-ray).

Adjusting the Window/Level automatically based on a region

To adjust the Window/Level (W/L):

1. From the Tools menu, select **Window/Level Image**.

   OR Click the **Window/Level Image** button  on the toolbar.
2. Right-click the image.
3. From the shortcut menu, select one of the following options:
   - Apply Auto W/L to region.
     - The cursor changes to:

       
     - Drag the cursor to draw a box around the region of interest.

       This system automatically window/levels the entire image based on the contents of the box that you draw.
   - Apply Auto W/L to following series images.

Adjusting the Window/Level for multiple images

To adjust the Window/Level (W/L) for multiple images:

1. From the Tools menu, select **Window/Level Image**.

   OR Click the **Window/Level Image** button  on the toolbar.
2. To adjust the window and level, you can use the mouse or the arrow keys.
   - To change the level:
     - Move the mouse up and down.
       OR
     - Use the up and down arrow keys.
   - To change the window width:
     - Move the mouse left and right
       OR
     - Use the left and right arrow keys.
3. Right-click the image.
4. From the shortcut menu, select one of the Window/Level options:
   - Apply last W/L to all series images.
   - Apply last W/L to following series images.
   - Apply Auto W/L to entire exam.
     The system automatically window/levels every medical image in the exam. Montage images are skipped.
   - Apply Auto W/L to following series images.

Note: Each modality may have specific options on the shortcut menu, depending on the configuration set for your facility.

Keyboard shortcut for all images in series

You can use the following keyboard shortcuts for the Window/Level tool:

Shortcut	Tool		Action
> or .		Window/Level	Mode to apply action to all images in the series. After you apply the shortcut, the cursor displays an "A" (for All).

Caution when using the > key, Apply to Whole Series

When using the > shortcut or the View menu option **Apply to Whole Series** to apply the imaging tool to all images in the series, you may affect images that are not currently visible on the display.

Using color LUT

About color LUT

The LUT stands for "Lookup table." A color LUT creates a color map - an artificial mapping of a grayscale image to arbitrary color values.

Patient Safety Warning when using Color LUT

Some color lookup tables (LUTs) emphasize aspects of diagnostic interest to the viewer by mapping particular grayscale values to certain meaningful color, such as red.

The Window/Level tool allows you to adjust grayscale contrast and brightness values. These modified grayscale values are colorized by the color LUT.

Potential problems with adjusting grayscale contrast and brightness

Adjusting grayscale contrast and brightness could result in:

- Misleading (false positive) color mapping with regard to the size and extent of pathology.
- Misleading (false negative) color mapping with regard to the presence or absence of pathology.

Potential problems with lossy compression of these images

Using lossy compression on images with adjusted grayscale contrast and brightness could result in:

- Changes to the Color Mapping characteristics of an image. This could be diagnostically significant.

Applying color LUT

Note: The system does not save color LUT settings. Subsequent viewing of the image will not display any color LUT.

To apply color LUT:

1. From the Tools menu, select **Window/Level Image**.

   OR Click the **Window/Level Image** button  on the toolbar.

2. Right-click and select a color LUT option from the shortcut menu.

   Examples of color LUT options include:

   - Cool LUT.
   - Warm LUT.
   - Thermal LUT.

   Note: The color LUT options on the Window/Level shortcut menu may vary, depending on the specific configuration settings for your facility.

3. After you select a color LUT and a window-level setting, you can apply these settings to:
   - All images in the same series. From the shortcut menu, select **Apply last LUT to all series images**.
   - All images in the following series. From the shortcut menu, select **Apply last LUT to following series images**.

Enhancing Contrast Using Image Processing

- About image processing
- Applying image processing
- Using keyboard shortcuts

About Image Processing

Image Processing makes fine details in low-contrast images stand out clearly by applying a two-dimensional Unsharp Mask to the image. This process works by subtracting from the original image an Unsharp Mask created by blurring or smoothing a copy of the original image. As a result, features that are smooth and have large scale structures are suppressed in favor of features with fine structures.

The degree of fine detail enhancement can be adjusted with pre-selected parameters for the detail and contrast or you can create custom parameters.

- The **Detail** parameter affects the kernel size over which the Unsharp Mask is computed; larger values result in enhancement of larger structures in the image.
- The **Contrast** parameter controls the amount of gray scale enhancement applied; large numbers result in greater contrast enhancement.

Applying Image Processing

To apply Image Processing:

1. Click the **Apply Image Processing** button  .
2. Right-click the image.
3. From the shortcut menu, select one of the image processing options:
   - Apply Edge Enhancement–Low.
   - Apply Edge Enhancement–Medium.
   - Apply Edge Enhancement–High.
   - Apply Edge Enhancement–Custom.
   - Apply Image Processing to all series images.
   - Custom Edge Enhancement Settings.
   - Cancel Image Processing.

Using keyboard shortcuts

You can use the following keyboard shortcuts for the Image Processing tool:

Shortcut	Tool		Action
> or .		Image processing	Mode to apply action to all images in the series. After you apply the shortcut, the cursor displays an "A" (for All).

Caution when using the > key, Apply to Whole Series

When using the > shortcut to apply the imaging tool to all images in the series, you may affect images that are not currently visible on the display.