NORTHSTAR

a teraRecon technology

Northstar® AI Results Explorer User Guide

Version 1.0.0

English | teraRecon

Symbols used in the label:

Symbol	Meaning
	**Consult Instructions for Use.**
	**The CE 0197 mark applies to Northstar AI Results Explorer Software.** The CE mark is affixed onto the Northstar AI Results Explorer software.
	**Manufacturer** The name and address of the manufacturer are listed next to this symbol.
	**Date of Manufacture** The year of manufacture is listed next to this symbol.
	**Authorized Representative in the European Community** The name and address of TeraRecon's authorized representative in the European Community are listed next to this symbol.

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Notices

Copyright

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Note: Any beta features extended are not to be used clinically, and can ***only*** be authorized, obtained or accessed through an appropriate beta agreement.

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General Description

Northstar® AI (Artificial Intelligence) Results Explorer is a software device used with the off-the-shelf hardware for medical image and associated metadata viewing and analysis. It consists of two components, a server (Northstar Server) and a web-based zero-footprint client (Northstar Viewer).

The Northstar Server software utilizes a web interface to connect to third party systems such as RIS, PACS, EMR, and other systems. The client is a web-based zero-footprint viewer and can run on hardware where a web browser such as Chrome, Edge, Firefox, and Internet Explorer is present. This includes, but is not limited to, locally sited off-the-shelf hardware systems and mobile devices. The main goal of Northstar is to integrate automated and semi-automated artificial intelligence and computer vision results within a clinical workflow and allow the end-user to access these results. Northstar AI Results Explorer is not for diagnostic use when used with mobile devices.

Visualization of 2D, 3D and 4D DICOM and non-DICOM image review are supported for single or multiple datasets (or combinations thereof). Image optimization tools are included such as window level, zoom, and pan, filter. Quantitative analysis tools include measurements such as distance.

Northstar can be launched as a stand-alone application or can be launched from a third-party solution with a URL. One example of a third-party solution is EnvoyAI™. EnvoyAI products include a software compute developer platform and a vendor neutral Application Programming Interface (API) for integration partners.

Northstar Server

The Northstar Server receives, stores, and transmits images from acquisition devices, in both DICOM (images and non-images) and non-DICOM (images and non-images) format using DICOM and Web interfaces. The server software can receive and transmit post-processed image datasets and any derived information from other systems such as PACS, EnvoyAI, and other platforms within the hospital network. The Northstar server utilizes the Web interface to connect to third party systems.

Northstar Client

The Northstar Client is web-based zero-footprint application which does not required any client installation. The client may run on any device connected to the backend server (Northstar server). The images and information are transferred securely from the backend to the web-based application, allowing the user to display, manipulate, accept, reject, and edit the image as well as any derived metadata. The Northstar client sends the requests for the images, the processed images, and/or the result/metadata to the server and the server sends the requested information to the client. The client may cache the obtained information in the web-browser memory for fast display. This interactive communication can occur within the same computer if both server and client viewer software run on it, or over the hospital network and/ or Internet if the server and client viewer software are on different computers.

Northstar Base Functionality

Northstar software can be launched as a stand-alone application. Northstar can also be launched from any third-party solution that can launch a Web-browser using some authentication and patient context as parameters.

The base functionality includes support of 2D, 3D, and 4D DICOM and non-DICOM image review. The capability to window level, zoom, pan, filtering, and measure (for example, length, area, volume, angles) is provided.

Support is provided to overlay image-derived metadata on relevant images. The user can use the Northstar system to inspect the images and metadata side-by-side or overlaid and can optionally accept/ reject/edit the metadata.

The main goal of this platform is to integrate the automated and semi-automated AI results within a clinical workflow. This goal includes allowing the end-user to access the AI results provided by any third- party algorithm developers in a seamless way. The integration of Northstar can be done with RIS, PACS, EMR, and other systems.

Product Naming Convention

Due to the product evolution, variations in the platform names may be seen in supporting documentation. An effort has been made to include all names in the Device Description.

Shelf Life

Northstar is considered to be Durable Medical Equipment and is assigned a shelf life of 15 years.

Northstar Indications for Use

Northstar AI Results Explorer is a zero-footprint, web-based software device indicated for use in clinical settings where medical images and image-derived metadata can be accessed or visualized to aid healthcare professionals in diagnosis and patient management decision making. Northstar AI Results Explorer's web interfaces can obtain and consume both DICOM and non-DICOM image-derived metadata generated by Artificial Intelligence (AI) or computer vision algorithms.

Northstar is intended to receive, store, transmit, post-process, display and allow manipulation of both DICOM and non-DICOM medical images generated by image acquisition devices and image derived metadata.

Northstar provides access to images, image derived metadata and derived images through a web browser on desktop computer or mobile devices. Visualization of 2D, 3D, and 4D are supported for single or multiple datasets, or combinations thereof. Visualization tools are provided to optimize image presentation through zooming, window leveling, panning, filtering and synchronization of images from different series. Northstar also provides quantitative analysis tools for measurements such as distance. The device also supports overlay of image-derived metadata such as text, contours, and so on.

Northstar provides capability for the end user to accept, reject or edit the metadata. Based on user interaction, new derived images or metadata can be created for internal use or for forwarding to other devices. Northstar is designed for use by healthcare professionals and is intended to aid the physician in diagnosis, who is responsible for making all final patient management decisions.

Important! Northstar AI Results Explorer is not for diagnostic use when used with mobile devices.

Intended Patient Population

NorthStar is a general image viewing and exploring platform that can be used with images from any patient that undergoes radiological and other imaging procedures that are not specific to any population group or clinical conditions.

Intended Part of the Body or Type of Tissue Applied to or Interacted With

NorthStar is not intended to be in direct or indirect contact with patients or users.

NorthStar is a general image viewing and exploring platform that can be used with images from any patient that undergoes radiological and other imaging procedures that are not specific to any body parts or tissue types.

Intended User Profile

The NorthStar device is designed to be used by healthcare professionals with a primary focus on imaging such as radiologists, radiology technicians, surgeons, cardiologists, dermatologists, and neurologists, and to assist the physicians in diagnosis, who is responsible for making all final patient management decisions.

Principle of Operations

NorthStar is a software device that is used with off-the-shelf hardware.

Using the hardware (for example, a computer, monitor, keyboard or mouse) or a mobile device (for example, an iPad or iPhone) to operate the client, user inputs from client software relates to a backend server software to achieve the intended use.

Safety Notifications

Northstar is a Class I medical device regulated by the Food and Drug Administration.

CAUTION! Federal law (USA) restricts the sale of this device to only sale by a physician or on orders from a physician.

If you require training, please contact TeraRecon or a suitably qualified trainer. Always keep this documentation readily available near the Northstar Viewer and updated with all corrections/addenda that may be released by TeraRecon.

Patient information is restricted, private, and extremely confidential, and subject to stringent legal regulations - you should control access to Northstar, and patient data contained therein should be protected accordingly.

Devices integrated to this product must comply with their own applicable safety standards.

You must review the *Northstar AI Results Explorer User Guide* for all warnings, notices, and precautions prior to using the software.

Precautions Relating to General Use

Northstar software may allow images to be generated in which parts of the original scan data are obscured, removed (including, but not limited to, through use of lossy compression), hidden, or modified. Similarly, output images and reports can be produced, saved, and annotated, with elements of the original acquisition omitted, obscured, modified, or hidden. The user should be careful and responsible in using the equipment and its output images. This requires the user to effectively communicate the important facts and usage to untrained or uninformed observers or recipients of the processed information.

Please ensure that all processing has completed (including completion of any final stage after an intermediate stage of processing) before formulating a final interpretative decision.

In certain situations, you may experience a delay in certain display processing. Please ensure that all processing has completed (including, as example, completion of any final stage after an intermediate stage of processing) before seeking to validate, or validating, a final interpretative decision.

Precautions Relating to Display Hardware

Northstar image display is limited in acuity, color or Grayscale depth to that of the display device used. Display hardware characteristics can vary widely. Interpretation of mammographic images or digitized film screen images is supported only when the software is used without compression and with an FDA- approved monitor that offers at least 5Mpixel resolution and meets other technical specifications reviewed and accepted by the FDA. If a monitor is not calibrated, image quality may vary. Monitors must be calibrated by the monitor vendor's calibration method.

Image quality is subject to the quality of the monitor. An image displayed on a color monitor can appear different from the same image displayed on a Grayscale monitor. A monitor may contain small defects on the surface, such as dust or scratches on the surface of the CRT or defects of LCD cell or other defects. A customer should understand this problem and not confuse the defects with a software problem.

The surrounding lighting conditions are critically important for optimal image viewing in Northstar. Lighting conditions can reduce the contrast of images being viewed and may hinder your ability to distinguish subtle changes in the image.

Important! The judgment of the medical imaging professional is essential to reaching the appropriate conclusion from the results presented by Northstar.

Precautions Relating to Interpretation

Calculations relating to distances, measurements, and other physical properties performed by Northstar are dependent on the accuracy of the input DICOM images. It is the responsibility of the operator to ensure that the source DICOM images are correctly formatted and to heed any warnings that the software may display during operation relating to potential problems with the information supplied in those DICOM images.

Further, in certain instances, there may be problems or inconsistencies in the image information left undetected by Northstar and an erroneous image display is unavoidable unless the user properly ensures the correctness of all input data in advance. Potential problems relating to errors in the DICOM information include incorrect dimensional readouts, incorrect orientation markings, and incorrect pixel value calibration. Limitations present in the original input data (such as those relating to spatial and/or temporal resolution, pixel size, and slice thickness) remain valid even when Northstar processes the data and these provisos should be considered when using the equipment for image review.

The image processing and display techniques offered by Northstar are only intended as an adjunct to, and not a substitute for, conventional diagnostic review of medical imaging data. All results should be validated by qualified physicians trained in the subject matter.

Northstar provides tools and protocols to quantify metrics and distances relating to structures in the CT, MR or other scans or images which are based upon the dimensions of the anatomy scanned or imaged at the time the images were originally acquired from the patient and based on the measurement calibrations provided by the acquiring device. The suitability for any purpose, especially monitoring the progression of disease, or the sizing or planning of a device to be implanted in a patient, is dependent upon many factors the extent to which the images acquired still represent the patient's anatomy.

Note, TeraRecon does not represent that the Northstar products are suitable for such purposes all such activities should always be cross correlated with other techniques to ensure a complete understanding of the patient and contemplated findings is obtained by the validating physician(s) in charge.

Precautions Relating to Magnetic Resonance Imaging Machines

Components of Northstar, including this document and its packaging or binding, may contain metallic or Ferro-magnetic components. Please ensure that no such component is introduced into the influence of magnetic fields from devices such as Magnetic Resonance Imaging Scanners, since injury or damage to equipment or property could occur.

Precautions Relating to Risk of Loss of Data

Northstar is not intended to be used as a primary archive for medical imaging data. A secure copy of any data should be maintained in a location separate from this software, for example, in the scanner, in a PACS archive, or on archive media. Please do not rely on Northstar as your primary archive.

In addition, do not rely on Northstar to convey data from its acquisition point to your primary archive, because in this configuration, a failure in Northstar could compromise your primary archive. Your primary archive should be maintained in a manner independent of, and not relying on, Northstar.

Precautions Relating to Computer Software and Hardware

The installation and use of any additional software or hardware component without the specific direction and approval of TeraRecon may impair the safety and effectiveness of the product. No additional software or hardware component should be added to Northstar nor should the configuration be changed in any way, except under the express direction of TeraRecon personnel. Do not use the software if it is damaged, compromised, or if you in any way suspect that its safety may have been compromised; in such case, contact your customer service representative immediately.

Microsoft Windows Operating System Updates

Northstar software relies on the integrity of the Microsoft Windows operating system to perform as documented by Microsoft. If a Microsoft Knowledge Base article is released that exposes a bug or defect adversely affecting specific hardware platforms documented for use with Northstar software, it is the customer's responsibility to remedy those defects using the steps outlined by Microsoft in its Knowledge Base articles.

Northstar is not accessible without a network, including LAN and WAN. The availability of a network is the customer's responsibility. This includes accessibility to other devices on the network including but not limited to authentication servers and storage locations.

Precautions Related to Image Output Option

Northstar allows for output of selected images and series to various computer standard file types. This technique does not maintain full image fidelity and may affect image quality. DICOM, PNG, and PDF files are not intended for diagnostic purposes.

Captured images for output may contain patient information and use and distribution must be controlled to ensure that secure access to PHI is maintained pursuant to all applicable U.S. and International Laws, including but not limited to, the Health Insurance Portability and Accountability Act ("HIPAA") and the Health Information Technology for Economic and Clinical Health Act (“HITECH Act”).

Measurement Accuracy

Based on published literature and our analysis, the derived Northstar values have approximately 3% of uncertainties, depending on the data.

Supported Data

Northstar supports DICOM GSPS, DICOM RT STRUCT, DICOM SC, JPEG, PNG, and PDF image formats.

Patent Information

U.S. patents apply to this product. For details, see http://www.terarecon.com/patents.

Welcome

Welcome to the Northstar AI Results Explorer User Guide. This manual is intended for users performing and analyzing different studies using the Northstar AI Results Explorer. Please read all chapters to gain a complete understanding of the Northstar AI Results Explorer. Use the table of contents to navigate to the desired information.

Pay special attention to all *NOTES, IMPORTANT, TIP, WARNING, and CAUTION* notifications, whether presented on-screen, or contained in this manual, including all precautionary statements and advisories in the Notice section, as these are essential to the effective and authorized use of the Northstar AI Results Explorer.

Conventions used in this Manual

This manual uses the following conventions:

- The text that appears on buttons, menu items, dialog boxes and other elements of the application are printed in a bold font. For example, Click the **Save** button.
- Screen names are capitalized. For example, Patient List, Viewer.
- The chapters are arranged based on the functions in the application.

A NOTE contains supplementary and important information about a topic. *Please do not ignore NOTES, IMPORTANT, TIP, WARNING, and CAUTION notifications.* ***Read each one carefully.***

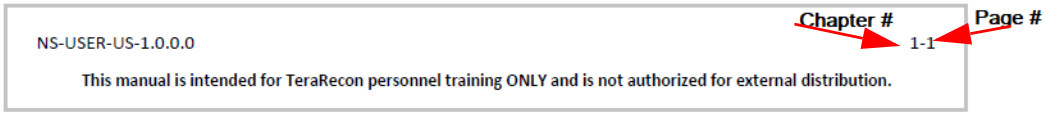
Additional Typographical Conventions

After an action, button, or command is spelled-out in the first instance, they are abbreviated:

- **RMB** – Right mouse button; also referred to as “right-click”
- **LMB** – Left mouse button; also referred to as “left-click”
- **MMB** – Middle mouse button

Page Numbering Conventions

Page numbers are formatted for ease of use at the bottom of each page in a position based on left and right pages. They contain the Chapter number and page number in this format:



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Chapter 1 Introduction to Northstar

Overview

Northstar is an AI results explorer which simplifies accessing the results from any machine (AI algorithm or more classic algorithm based) so that a Radiologist and other physicians can improve their diagnostic accuracy and efficiently. Northstar is more than a simple result explorer, it can accept, reject, and/or adjust results, and provide the user access to advanced tools needed for full diagnostic interpretation.

Northstar is both a standalone feature and an EnvoyAI integration feature. It is capable of loading images (DICOM and Non-DICOM) along with results (for example, DICOM, JPG, BMP, PDF). Any user can use the explorer to do access and manipulate any third party provided result within their diagnostic workflow and or in stand-alone mode.

Northstar Platforms

Northstar is available as a desktop or mobile device platform. See the following sections for further description.

Northstar Features

Viewer

Northstar's attributes include:

- Fast Image Display
- Basic Tool sets
- Zero Footprint
- Work-list Framework for searching and fast sorting
- Mobile/Responsive design

The AI Results Explorer

The explorer enables the user to view findings from any given machine and then give feedback to the EnvoyAI platform. EnvoyAI distributes this data for persistence as needed and sends feedback to maintain constant AI improvements.

The explorer allows users to consume the machine result in Northstar and accept, reject, an/or edit the results proposed by the machine, at the same time providing system learning. Northstar has the toolset needed to display images and allow the user to interact and manipulate findings.

Data flow

The mechanism sending data to the Northstar is based on modern web-based oriented communication. The Northstar platform communicates only through the EnvoyAI Liaison to get images and to send the results (accepted/rejected/edited) back to the archive.

Supported formats

Northstar supports DICOM GSPS, DICOM RT STRUCT, DICOM SC, JPEG, PNG, and PDF image formats.

Terminology

This user guide uses the terms listed in Table 1.1.

Table 1.1: Northstar Terminology

Term	Definition
AI	Artificial Intelligence.
Algorithm (Engine)	Algorithms or Engines analyze a study and produce a result that is deterministic or learning. Algorithms have well-defined input and output schema. A given study can be processed by multiple algorithms. Each algorithm (engine) produces independent results.
DICOM	Digital Imaging and Communications in Medicine. It is a standard format for handling, storing, printing, and transmitting information in medical images. It includes a file format definition and a network communications protocol. It enables the integration of medical imaging devices like scanners, servers, workstations, printers, network hardware, and picture archiving with communication systems such as the PACS platform. See PACS entry below.
DOB	Date of Birth.
Findings	A clinically significant observation usually used in relation to one found on a physical examination or laboratory test.
FPS	Frames per Second.
Frame	An image may contain one or more frames (for example, an Ultrasound).
GSPS	Grayscale Softcopy Presentation State is an image format used for medical digital imaging.
Image	Displayable pixel data that gets displayed in the Northstar Viewer. Images can be DICOM Instances, or non-DICOM images such as JPG, BMP, and PNG.
Image Overlays (Text and Icons)	Northstar image overlays are separate objects, representing meta information, on entities as the patient, the study, the series, or the image, that are displayed and visible in the Northstar Viewer. The text overlay is designed as an “active” element, such that additional controls and actions are accessed by the overlay information. These overlays are different from DICOM overlays and annotations.
Machine	A machine is a third party-provided algorithm which analyzes and processes an image(s) to detect findings (results).
Mobile Device	A mobile device is a computing device small enough to hold and operate in the hand with a flat screen providing a touchscreen interface with digital buttons and keyboard. Northstar supports OS or iOS devices.
MSMP	Multi-slice-multiple-phases is a cardiac gated sequence with different heart phases and several slices.
Northstar (NS)	The Viewer.
Patient	The patient is defined as the person receiving the medical examination.
Patient List	The list of patients.

Term	Definition
PACS	Picture Archiving and Communication Systems. A system based on the universal (Digital Imaging and Communications in Medicine) standard, which uses a server to store and allow facile access to high-quality radiologic images, including conventional films, CT, MRI, PET scans and other medical images over a network.
Phase	A point in time. You may have many images at different time points from the same slice position (for example, heart beats).
ROI	Region of Interest.
Report	A report is data associate with a study. The report can be DICOM SR, it can be an .PDF, or it can be stored. It can also be accessed as a TEXT report via services supported by Northstar. Typical service for a report would be the HL7 FHIR resource.
Result	A result is the output of an algorithm (via EnvoyAI Liaison) and contains several components (elements). The result also has a “result type” set. Results can include instructions to the Northstar Viewer setting the default layout of the view boxes for displaying the result (along with the original study data) appropriately.
Result Elements	Result Elements are a way to define the various components that can make up basic or complex results. Some examples of result elements: • Definition of Algorithm • Image Component • Result findings by text string
RT STRUCT	The focus for this Radiotherapy Structure Set IOD (RT Structure Set IOD) is to address the requirements for transfer of patient structures and related data defined on CT scanners, virtual simulation workstations, treatment planning systems, and similar devices.
Series	A collection of images inside a study as defined by DICOM series attributes. is contained within a study; can have one or more images. Series context is always in relationship to DICOM.
Slice	A position in the patient’s body where an image was taken. This is a 3D plane “slicing” through the body at a specific point.
SSMP	Single-slice-multiple-phase is a cardiac gated sequence with different heart phases in one slice.
Study	A single procedure/exam which contains images and other data. The study is generally defined by its DICOM attributes. A study can have one or more DICOM series. A study can also contain other non-DICOM images and results.
TTFI	Time to First Image.
Viewbox	Displays the series’ images based on min-x, min-y, width, and height. It is used to view and either accept or reject findings.

Mobile Device Platform

The mobile device platform provides a subset of Northstar usability and features. The Northstar mobile platform supports:

- OS
- iOS

Supported Gestures on the Mobile Platform

The following tables list all supported gestures and tap gestures used on the Northstar mobile platform.

Table 1.2: Supported Gestures

Operation	On-screen Gesture Description	Action
Rotate	With two fingers, rotate in a clockwise arc. If you travel more than 90 degrees, the command is triggered.	Rotates image clockwise.
	With two fingers, rotate in a counter-clockwise arc. If you travel more than -90 degrees, the command is triggered.	Rotates image counterclockwise.
Zoom	With two fingers pinch (thumb and index finger), do a pinch gesture (pinch in/pinch out) for zooming in and out on a viewbox.	Zoom in or out.
Window width	With two fingers, swipe from left to right on the image to increase window width.	Increases window width. For studies with a parametric map overlay, adjusting WW adjusts the map's color levels.
	With two fingers, swipe from right to left on the image to decrease window width.	Decreases window width.
Window level	With two fingers, swipe from top to bottom on the image to increase window level.	Increases window level.
	With two fingers, swipe from bottom to top on the image to decrease window level.	Decreases window level.
WW/WL on parametric map overlays	With two fingers together, move across the image.	Adjusts the color levels of the map overlay.
Pan	With three fingers on the viewbox, move all three fingers in desired direction to pan the image within the viewbox.	Pan image in desired area.
Scroll	With one finger, swipe from top to bottom on the image to move forward through the slice.	Scroll images forward.
	With one finger, swipe from bottom to top on the image to move backward through the slice.	Scroll images backward.

Operation	On-screen Gesture Description	Action
Phase Scroll	With one finger, swipe from left to right on the image area to move forward through phases in the case of multi-phase series.	Phase scroll forward.
	With one finger, swipe from right to left on the image area to move backward through phases in the case of multi-phase series.	Phase scroll backward.
Open Output Panel	With one finger, swipe from right to left from the edge of the viewbox (with some margin from the edge). **Location**: The start swipe area is the center area of the right edge of viewbox on the screen.	Opens the output panel; the output panel covers the entire screen area.
Close Output Panel	With one finger, swipe from left to right anywhere on the output panel to close it.	Closes output panel on the mobile device.
Open Content Selector	With one finger, swipe from left to right from the edge of the viewbox (with some margin from the edge). **Location**: The start swipe area is the center area of the left edge of viewbox on the screen.	Opens the content selector; the content selector covers the entire screen area.
Close Content Selector	With one finger, swipe from right to left on the content selector to close it.	Closes the content selector on the mobile device.
Swipe on A/R UI Toolbar	With one finger, swipe from left to right on the accept-reject toolbar for navigating to the next finding.	Navigate to next finding.
	With one finger, swipe from right to left on the accept-reject toolbar for navigating to the previous finding.	Navigate to previous finding.

Table 1.3: Tap Actions

Location	Action
Tap in the middle of image	Toggles text overlays and Show/Hide results button.
Tap on an Orientation marker	Flips image to that orientation.

Chapter 2 Logging in and User Authentication

On the log in panel, enter your username and password to authenticate and access the Northstar platform.

Note: Only an authenticated user can access the Northstar platform.

Log in Panel

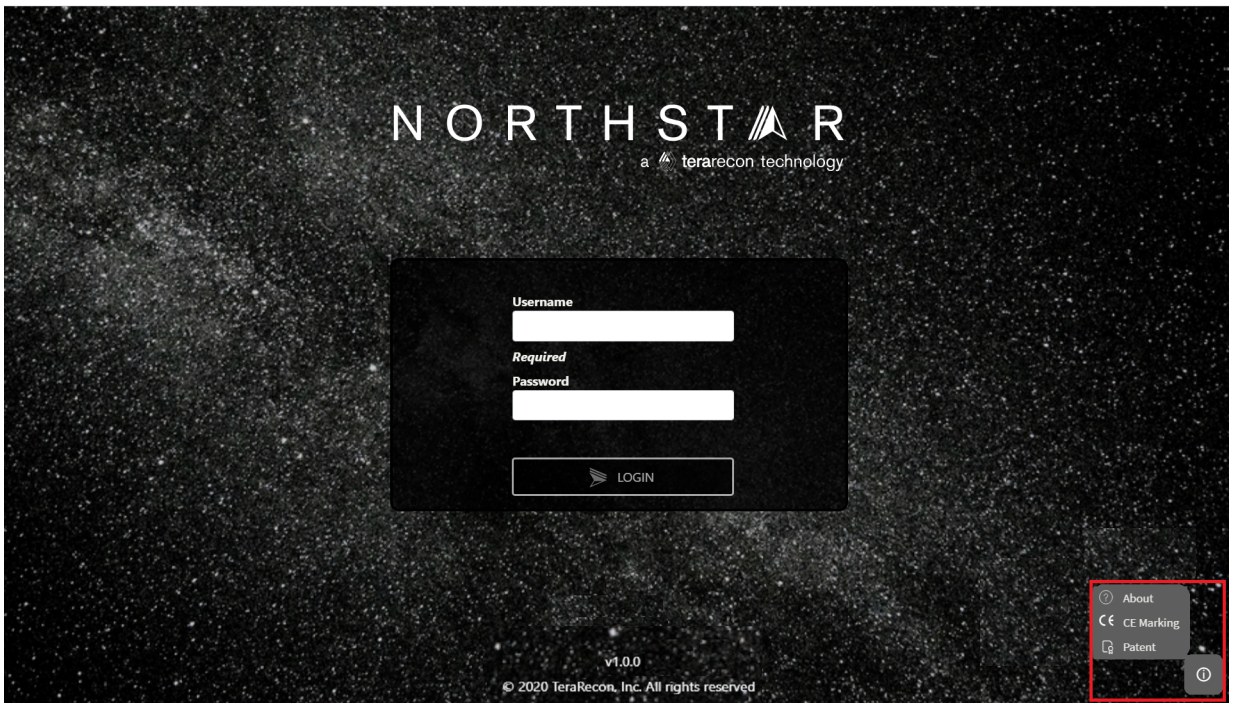


Figure 2-1 Northstar Log in Page

On the log in panel, at the bottom, right corner of the screen is an information link  . Selecting the “i” opens a popup window with the **About**, **CE Marking**, and **Patent** links. LMB-click on any of these links to open the additional information.

Selecting the **About** link opens another browser window and displays the following information:

- The Northstar Version, and,
- A list of the licenses for third party libraries used in the Northstar platform.

Selecting the **CE Marking** link opens another browser window and displays the following product label:

Figure 2-2 CE Marking

Selecting the **Patent** link opens another browser window and displays the Northstar AI Results Explorer patent information.

Mobile Device Log In

On mobile devices, the log in screen appears with the same features as the browser platform only sized to fit the device screen. You can access the **About**, **CE Marking,** or **Patent** links by tapping the **i** icon and then by tapping on **About**, **CE Marking,** or **Patent**.

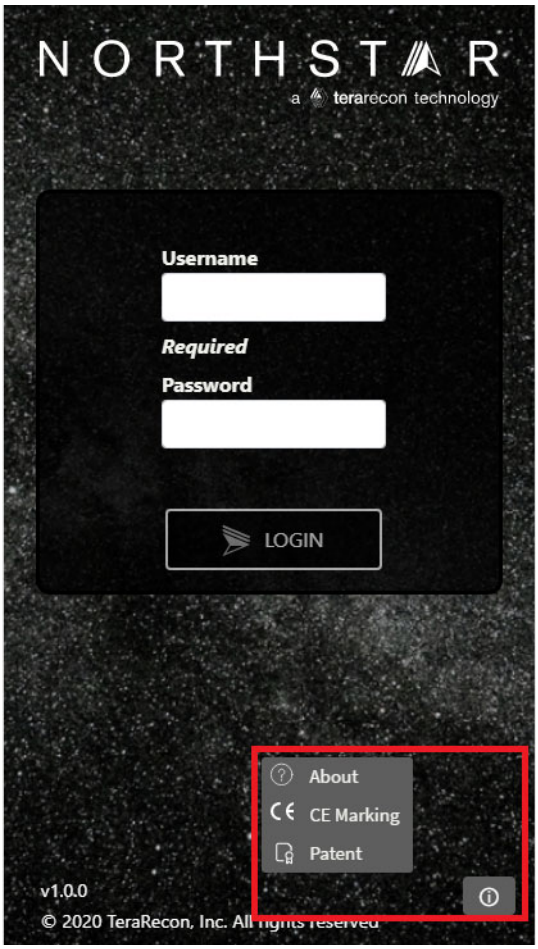


Figure 2-3 Mobile Log In

Logging Out

To log out of Northstar, you can use the browser back arrow to return to the log in page or LMB-click on your username (upper, right corner of the header bar) and then select **Log Out** from the drop-down menu.

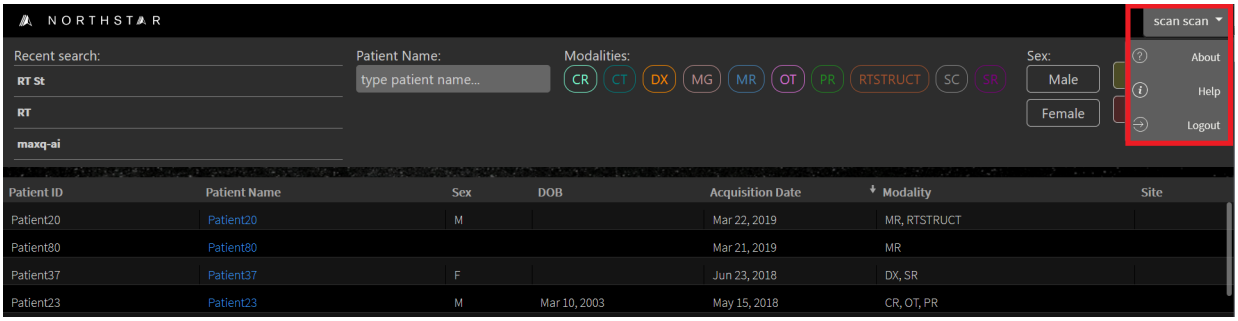


Figure 2-4 Drop-down Menu from Username

The drop-down menu contains an **About** link that reveals the same information as selecting it on the log in panel does and a **Help** link that opens the *Northstar AI Results Explorer User Guide* in a separate browser tab and in your default web PDF reader.

Mobile Device Logging Out

To log out of a mobile device, tap the  icon. This icon appears at the top of the screen while you are logged into Northstar.

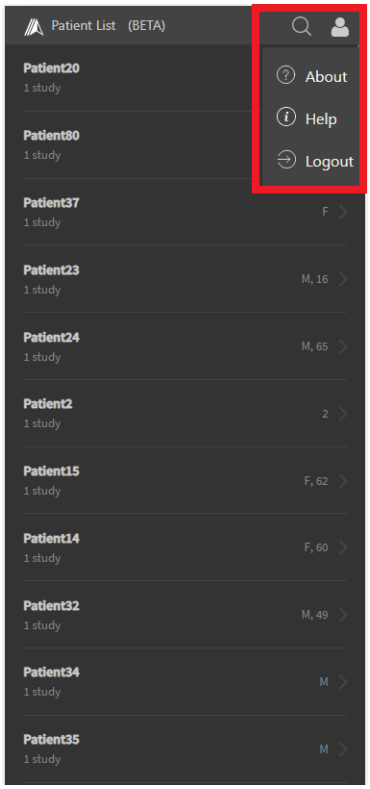


Figure 2-5 Mobile Device Log Out Menu

Once a study is loaded into a mobile Viewer, you can log out using the same drop-down menu.

Performance Warning

If your network, installation, or server resources are unstable or are limited to the point it impacts the performance of Northstar, a warning icon appears in the upper, right-hand corner of your screen.

Hovering over this icon, displays the text, “Poor Network Quality”.

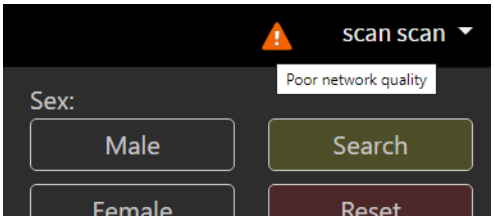


Figure 2-6 Network Warning

Please contact your Administrator to resolve this issue.

Chapter 3 Patient Management and Viewer Layout

The Patient List

Once you log in, Northstar opens to the Patient List page. (Figure 3-1)

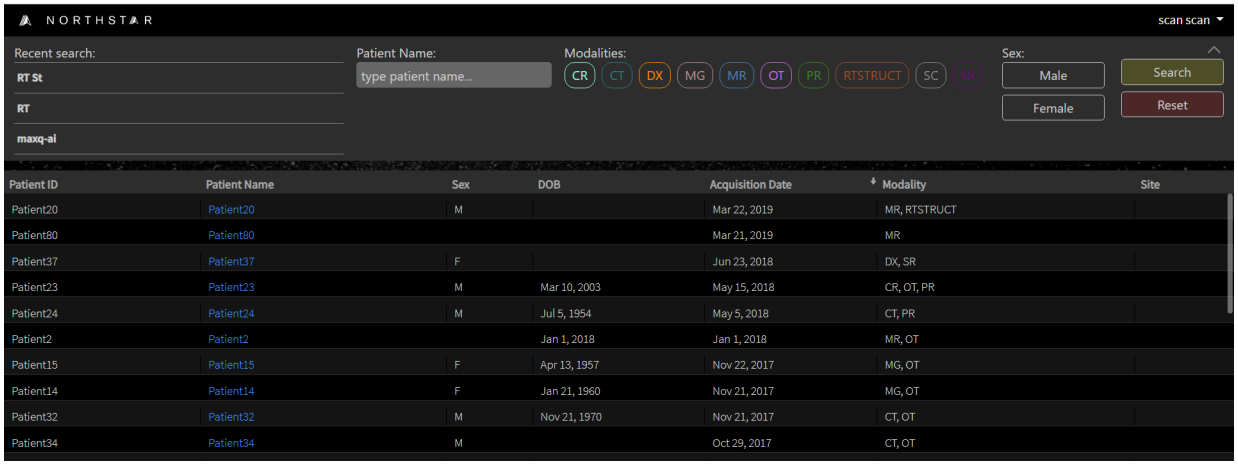


Figure 3-1 The Patient List Page

Note: For navigating between the Viewer windows, see Appendix B "Page Navigation and Conventions".

Patient List Organization

The Patient List is organized by columns:

- Patient ID
- Patient Name
- Sex
- DOB
- Acquisition Date
- Modality
- Site

These columns cannot be dragged and dropped into new positions. The columns can be sorted by left-clicking on each header. (Figure 3-2) When you click the column heading, an arrow appears at the far-right margin of the column showing the direction of a sort, ascending (up arrow) or descending (down arrow.

Figure 3-2 Filtering Sex Column in Ascending Order

Search Tool

You can search through the Patient list with the Search Tool filters at the top of the screen. This feature is available for both desktop and mobile platforms.

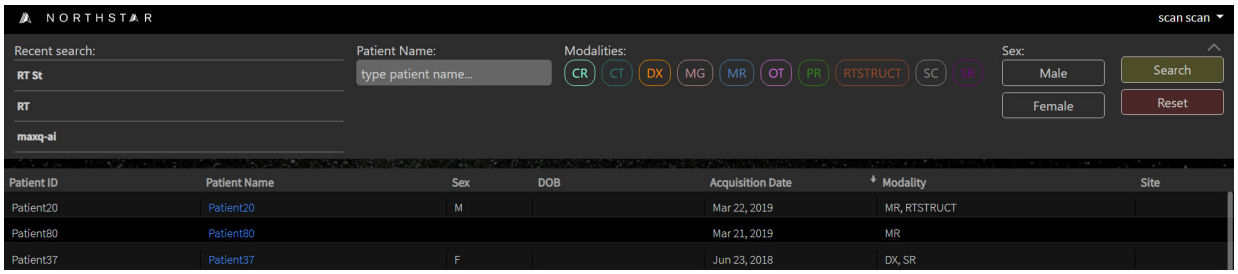


Figure 3-3 Modalities in the Search Panel

The Search Tool lets you search by patient name, the modality, and/or the sex. (Figure 3-3) You can filter the patient list by one, two, or combining all three of these criteria and then selecting the **Search** button. To clear the search and start over, select the **Reset** button. The **Recent search:** fields show the last criteria selected.

Mobile Device Patient List

On a mobile device, the Patient List appears after logging into the platform.

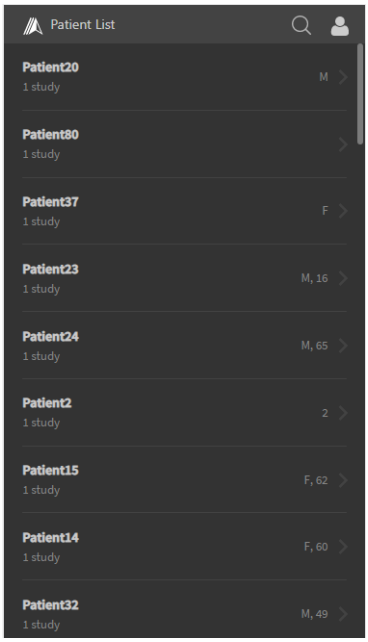


Figure 3-4 Mobile Patient List

Mobile Device Search Tool

To use the Search Tool, tap the  icon. (Figure 3-4) The Search Tool opens.

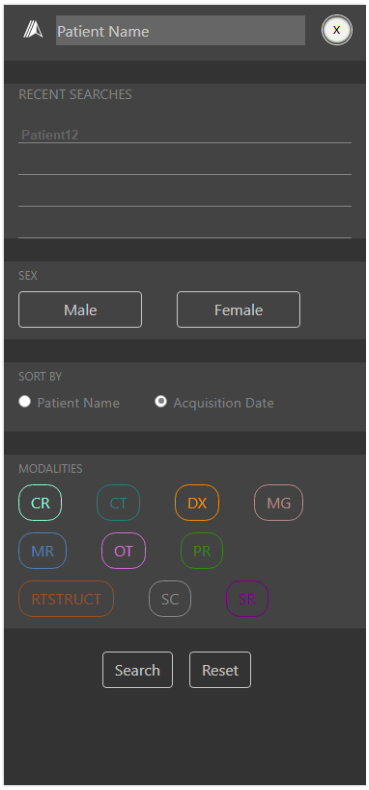


Figure 3-5 Search Panel

To go back to the Patient List, tap the circled X  . (Figure 3-5) To clear the Patient Name field, tap the small x  . (Figure 3-5)

To reset the search and start over, tap the **Reset** button. The **Search** Tool functions the same on both platforms.

The Study List

To select a patient study from the Patient List:

1. **LMB-click** (on Mobile Device - **Tap**) on the patient in the list.
2. The patient's Study List opens. (Figure 3-6)

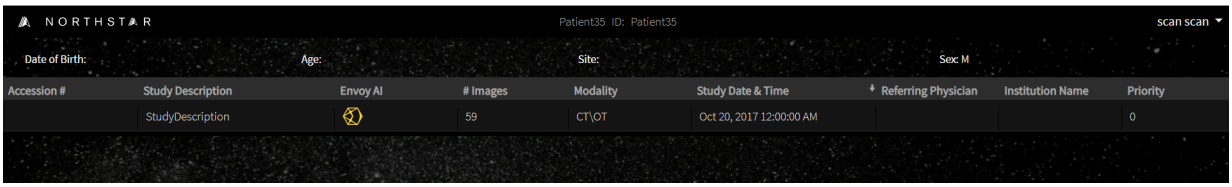


Figure 3-6 Study List View

The EnvoyAI icon in this view indicates that EnvoyAI algorithms have been run on the study. Hover your mouse over the icon and the results content are viewable. (Figure 3-7)

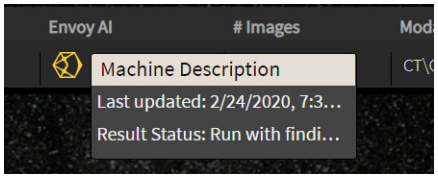


Figure 3-7 Hover over the EnvoyAI Icon

The Study List view is organized by columns:

- Accession #
- Study Description
- EnvoyAI
- # Images
- Modality
- Study Date & Time
- Referring Physician
- Institution Name
- Priority

These columns cannot be dragged and dropped into new positions. The columns can be sorted vertically by left-clicking on each header. When you click the column heading, an arrow appears at the far-right margin of the column showing the direction of a sort, ascending (up arrow) or descending (down arrow). (Figure 3-8)

Figure 3-8 Filtering Image Column in Ascending Order

Mobile Device Study List

On the mobile device platform, when you tap on a patient, the study list for that patient opens. To load the study into the Viewer, tap anywhere on the study.

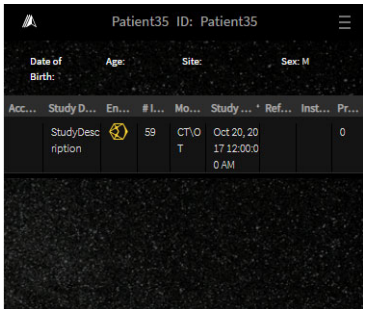


Figure 3-9 Mobile Study List

Loading a Study into the Northstar Viewer

To open the study results into the Viewer:

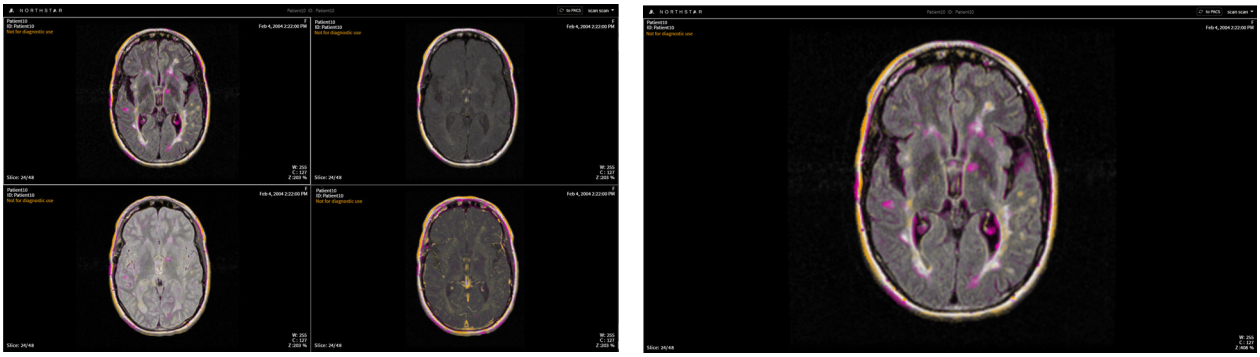
1. **LMB-click** (on Mobile Device - **Tap**) anywhere in the Study row to open in the Northstar Viewer. (Mobile platform, Figure 3-9)
2. The Northstar Viewer opens.

When the study is first loaded, the layout of the Viewer is automatically determined by the patient study, the available series, and/or the machine directive (algorithm suggestion).

Viewer Layout

There are two ways to change the Viewer's initial layout of a study:

1. For 1x1 images, double-LMB-click or tap on the image you want to enlarge. To go back to the previous layout, use the double-LMB-click or tap again. (Figure 3-10)
2. You can use the **Layout Changing Mechanism** from the Northstar drop-down menu, see "Chapter 4", Viewer Layout Changing Function, on page 4-1 for details. To go back to the previous layout out, use the Layout Changing Mechanism again. This tool is not available on mobile devices, see "Mobile Device Viewer Layout" on page 3-6 for further explanation.



Algorithm-specified Layout: 2x2

Double-LMB-click for a Single Image Layout and Double-LMB-click to go Back to Original 2x2 layout.

Figure 3-10 Changing Viewer Layouts

Moving Between Images or Phases in the Viewer

To scroll through slices in a series:

- LMB-click and hold, move your mouse up and down across the image; or,
- Use the MMB to scroll.

To scroll through phases of a multiphase series:

- LMB-click and hold, move your mouse left-to-right and right-to-left across the image.

See "Chapter 4, Mouse Usage" on page 4-9 and "Phase Number (1a)" on page 4-6 for more information.

For information on scrolling options on the mobile device platform see "Chapter 1", Supported Gestures on the Mobile Platform, on page 1-4, "Chapter 4", Mobile Device Radial Menu, on page 4-14, and/or "Chapter 4", Viewer Management on a Mobile Device, on page 4-10.

Mobile Device Viewer Layout

Depending on the mobile device and size of the viewing area, the Viewer Layout appears similar to the image in Figure 3-11.

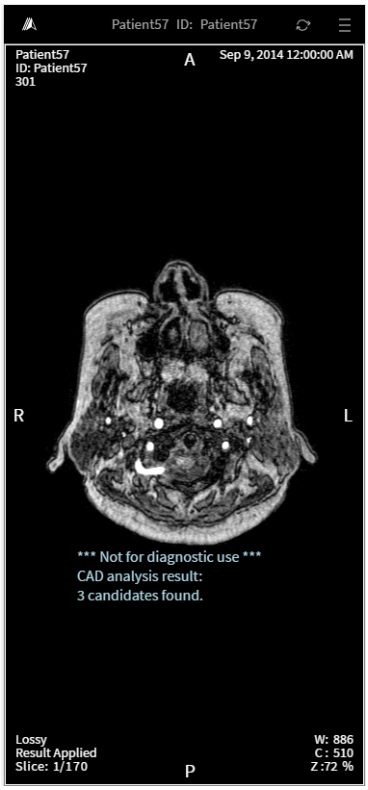


Figure 3-11 Mobile Device Viewer

The Viewer page is loaded when the user taps on a study in Study List page.

Both the desktop and mobile platforms load studies initially with an algorithm designated layout. The same method of changing the mobile device layout from 1x1 to a single viewbox is done on both platforms as well. See "Viewer Layout" on page 3-5 for more information. Similarly, the mobile and desktop platforms both support DICOM, SR, PDF, JPG, PNG data.

Changing Mobile Settings

To change mobile device Viewer settings, tap the Settings icon  in the top toolbar. The settings page opens.

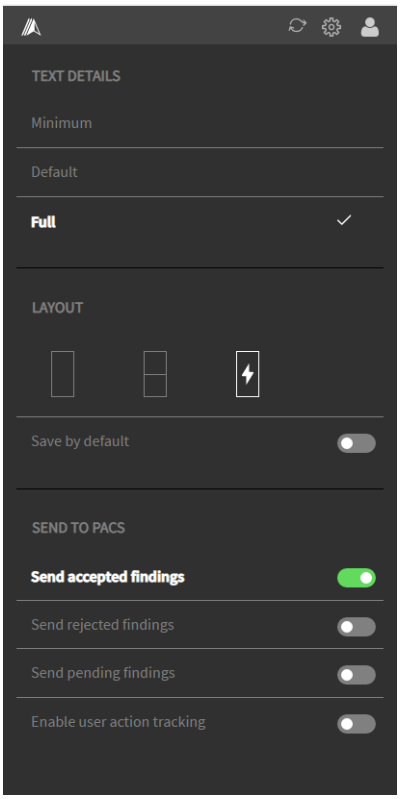


Figure 3-12 Mobile Device Settings

To close the settings panel, tap the Settings icon again.

Annotation Settings

The upper section of the Settings panel sets the amount of annotation shown on an image in the viewbox. You can set the amount to either Minimum, Default, or Full. To change this setting, tap the desired text detail setting. (Figure 3-13) For an example of annotation settings, see "Chapter 4", T: Annotation Overlays, on page 4-3.

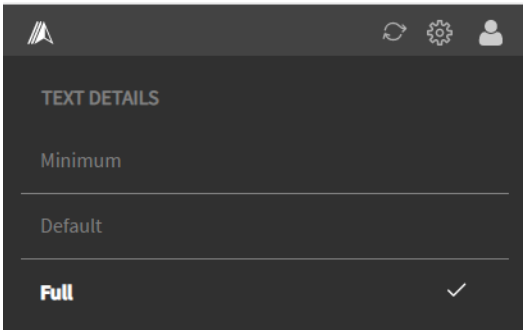


Figure 3-13 Mobile Annotation Settings

Layout Settings

On the settings panel, the Layout settings allow you to switch layout of the mobile device viewboxes. (Figure 3-14) To change the Viewer layout, tap the desired configuration. The mobile layout options are limited. The Viewer layout changing function is not available on mobile devices, see "Chapter 4", Viewer Layout Changing Function, on page 4-1 for more on this feature.

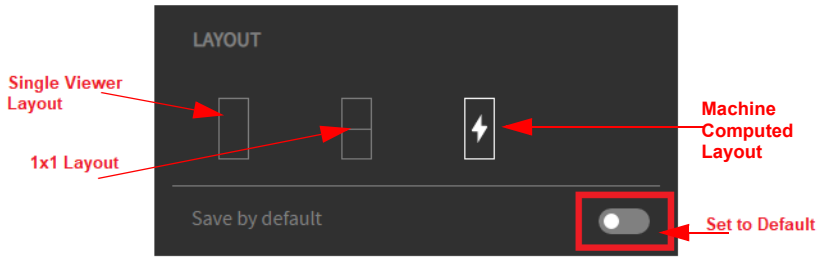


Figure 3-14 Mobile Device Layout Settings

Sync to PACS Settings

On the settings panel, you can set **Sync to PACS** options for the type of findings that are sent to PACS. (Figure 3-15)

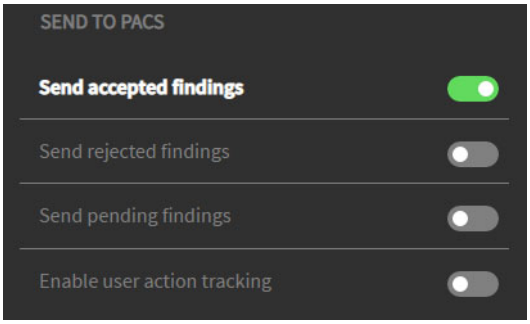


Figure 3-15 Sync to PACS Settings

To change a PACS setting, tap the desired option slider. For more information on this feature, see "Sync to PACS" on page 3-16.

Results and Findings

The Northstar allows the user to load images with or without results. The user can locate and indicate additional findings as desired. In the Study List, updated results and findings are indicated by on-screen Result Notifications, see "Results Notifications" on page 3-9.

The state of a finding is indicated by colors:

- **Blue** - pending state of a finding.
- **Green** – accepted state of a finding.
- **Red** - rejected state of a finding.

After accepting or rejecting a finding, the Viewer navigates automatically to the next finding.

Note: When a finding comes from a machine the default state is pending.

When ready, you can send the findings and edits to PACS from Northstar. See "Sync to PACS" on page 3-16 for details.

Menus and Tools for Findings

The use of Northstar tools and menu bars are detailed in Chapter 3 and 4. DICOM RT tools are detailed in Chapter 5: "DICOM Radiation Therapy (RT)".

When a user is editing any pending or rejected finding, the finding state changes to accepted. When a user edits any version of the result, a user copy is created and saved to the Northstar data base. This user copy can be reloaded using the **Content Selector**, see Chapter 4, "Content Selector" on page 4-5 for more information.

Note: The machine-created findings cannot be deleted from the database. The user can only mark them as rejected.

Results Notifications

When new or updated EnvoyAI results are available, Northstar notifies the user with an on-screen message, incremented findings numbers on the EnvoyAI icon, and with the "blinking" study list information. The notifications appear in:

1. the Study List page; or
2. the Patient's images in the Viewer.

In the Study List, you are alerted to updated data and you can select the new results by hovering your mouse over the EnvoyAI icon. (Figure 3-6)

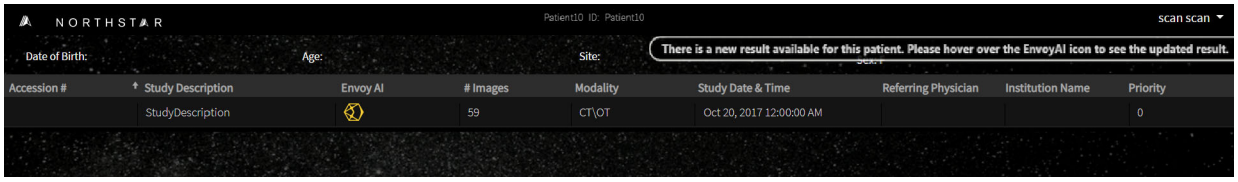


Figure 3-6 New Result Alert on the Study List Page

Blinking Alert

In the Study List, when new results are available for a current study or patient, the study row fades in and out; that is, the row "blinks". (Figure 3-16) When you mouse over the row, the blinking stops.

A text message also opens at the top-right corner, stating, "There is a new result available for this patient. Please check the content selector to see the updated result." (Figure 3-17) When the study updates, the message reads, "The study: (name) has been updated." (Figure 3-16) If new updates or results for a different study are available, the initial updated study stops blinking and the new study starts to blink.

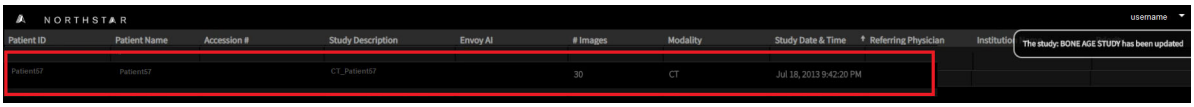


Figure 3-16 The "Blinking" Alert

Loading an Updated or New Study

From the Study List page, you can load the updated data into the Viewer just as you would load any study.

From the Viewer page, load the updated data from the Content Selector. See "Chapter 4", Content Selector, on page 4-5 for information.

In the Viewer, a text message appears only if the new data is for the current patient study in the Viewer. (Figure 3-17)

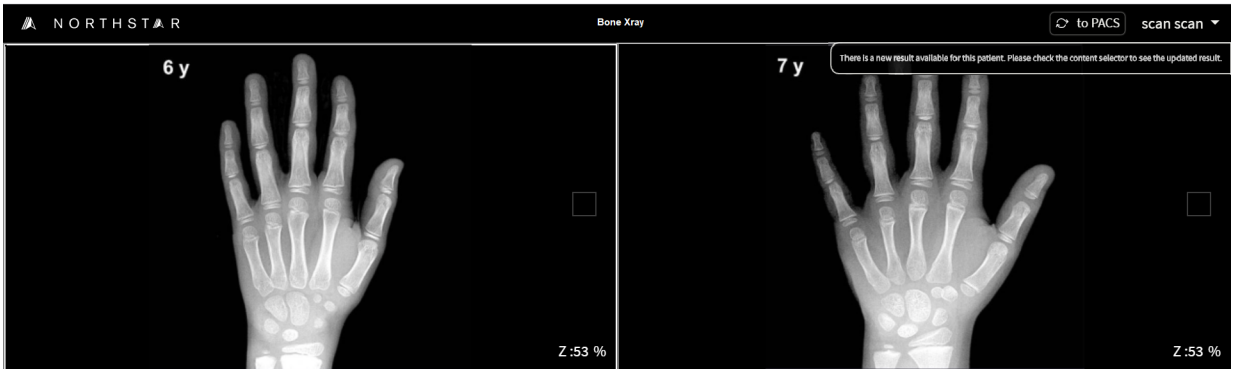


Figure 3-17 In the Viewer, Load from the Content Selector

When the new results are loaded from the Viewer, all the viewboxes (depending on selected layout) are updated. If the Viewer layout contains 3 viewboxes, and there are 4 results, the 3 viewboxes are loaded with the new results immediately. The 4th result is only loaded when the Viewer is reloaded.

After reloading the Viewer, previous viewbox presets are retained (zoom, pan, scroll).

Reload after a Rerun

If a parallel rerun is triggered either by EnvoyAI or a new study/new result request, the user sees two notifications across the Viewer. The first notification is a sliding banner that states that the content selector has been updated. (Figure3-17) The banner disappears after 6 seconds. A second notification appears. (Figure 3-18)

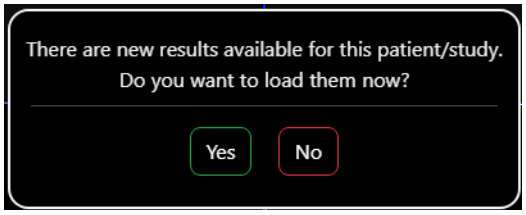


Figure 3-18 Second Notification

The second notification is a Yes/No dialog asking if the user wants to load the newly created results in the Viewer. Selecting “No” closes the dialog box.

Rerun and Result Conflict

A study has conflicting results when results from separate algorithms or a result from another run are loaded into the Viewer. The results from the same run highlight the viewbox with a blue outline. The user's active viewbox has both a white border and the blue outline. (Figure 3-19)

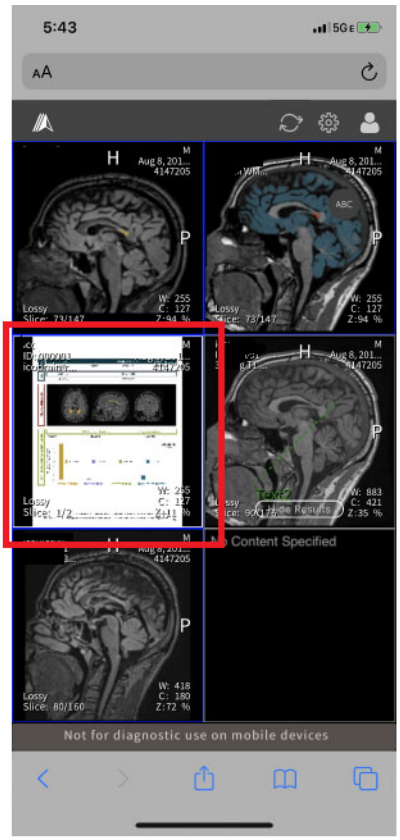


Figure 3-19 Active Viewbox Highlighted (Mobile Device)

Warning Banner and Conflicting Results

Conflicting results are a study with results from multiple algorithms. If a study has conflicting results a warning banner displays across the Viewer and an watermark overlay appears on the image. The Viewer banner is hidden automatically after 10 seconds. Clicking anywhere on the watermark overlay hides it. In addition to the watermark overlay, a "Conflicting Result" text message displays across the viewbox or viewboxes with the conflicting results. (Figure 3-20 and Figure 3-21)

Figure 3-20 "Warning: Data from different machine runs are being displayed."

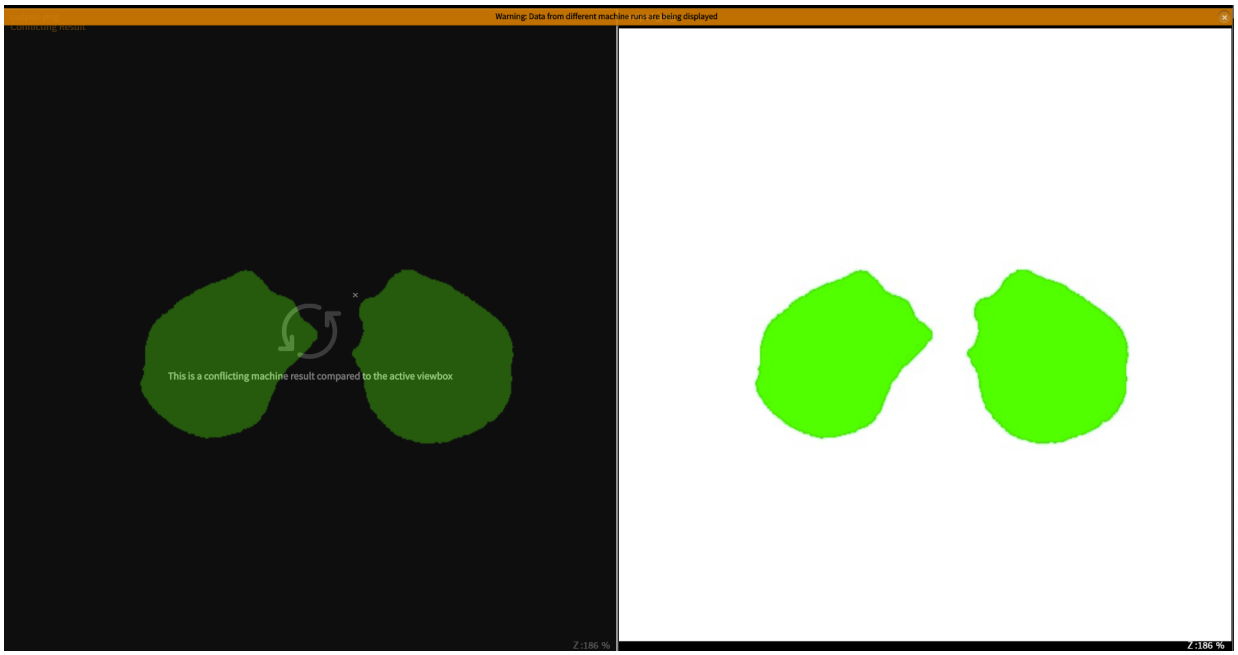


Figure 3-21 Batch Mismatch Banner and Batch Conflict Overlay

Findings on Mobile Devices

On a mobile device, when there are two viewboxes loaded into the Viewer, the Findings panel displays at the bottom of the screen. The panel displays a "Not for diagnostic use on mobile devices" message. The series description and findings count are displayed as **Series 1 description: x findings / Series 2 description: x**. If the text is too long, then series description is truncated and displays an ellipsis (...). For example, **Series 1 descrip...: x findings / Series 2 descrip...: x** findings. (Figure 3-22)

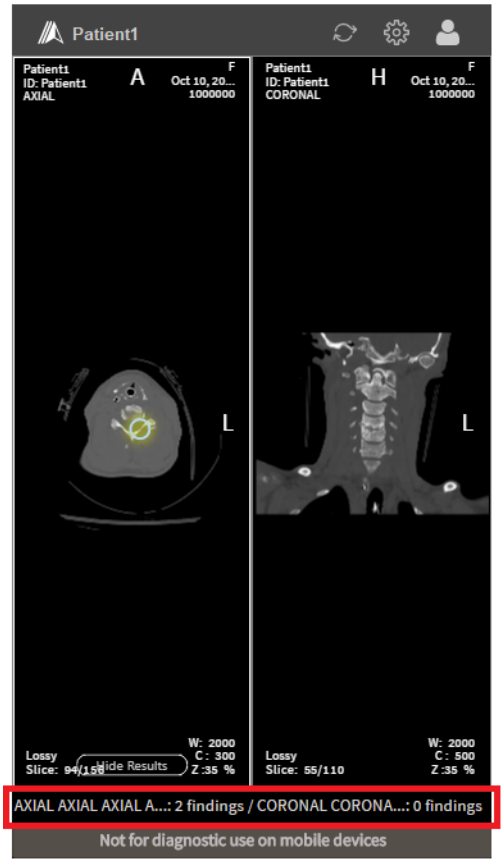


Figure 3-22 Series Description and Findings Count

1. For DICOM source or data with a selector type designated as unknown or not chosen, the findings footer is not displayed because there are no findings.
2. For PDF, PMAP Result, DICOM SC without GSPS, and SR results, the finding panel defaults to display a series description like “1 finding”. (Figure 3-23)

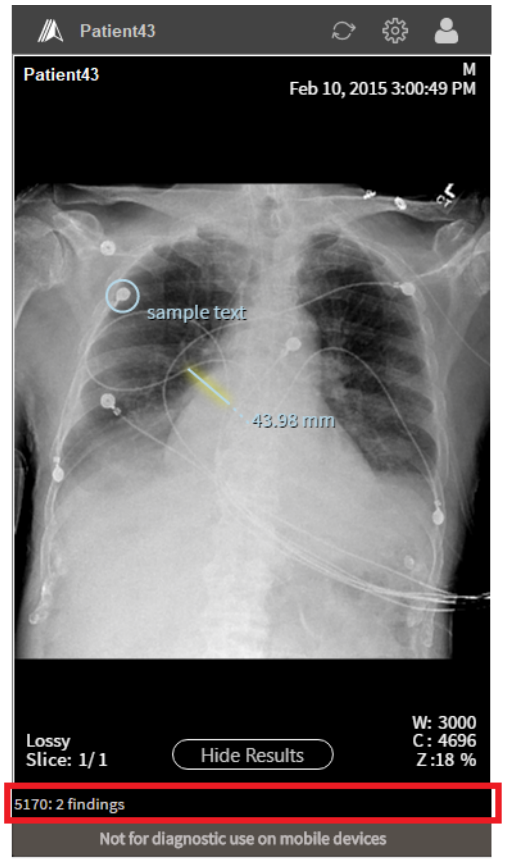


Figure 3-23 Findings Count

3. For DICOM SC, PMAP, and RTStruct with GSPS, the finding panel defaults to display 1+ numbers of GSPS objects on the series as the finding count.

4. Tapping on the findings panel changes the background color. Long pressing displays the tool tip. (Figure 3-24)

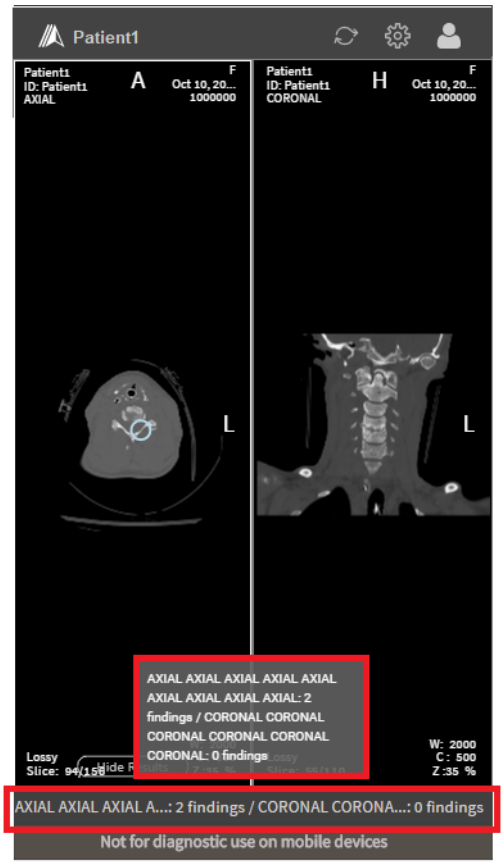
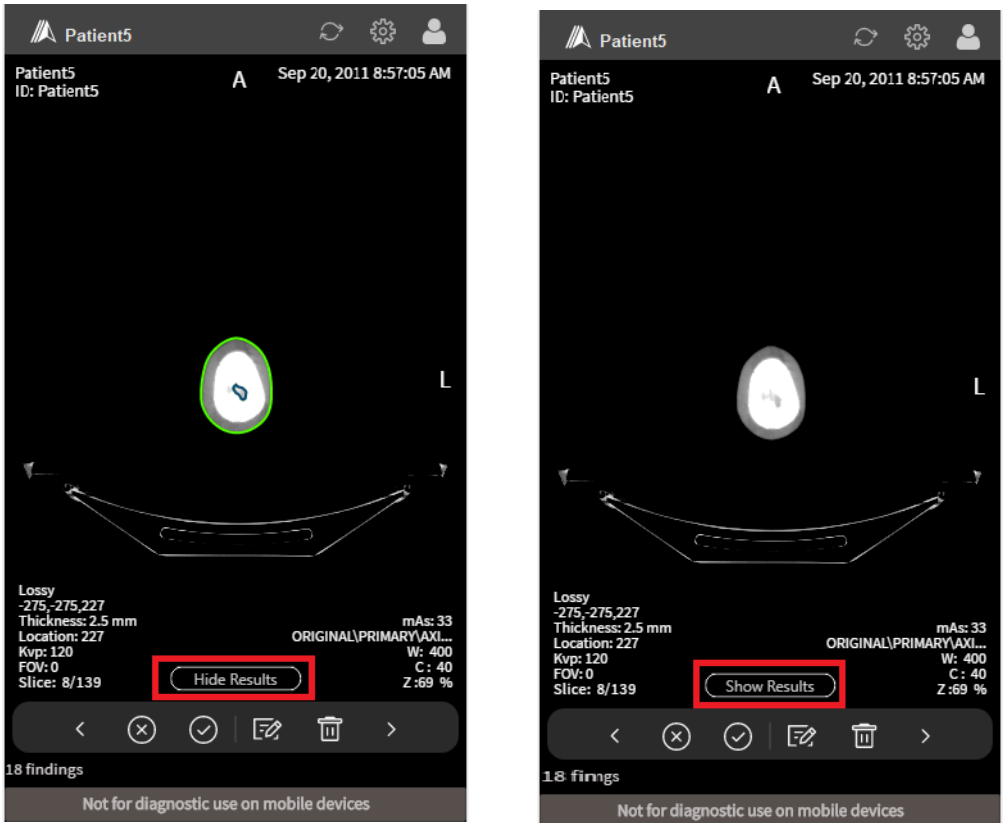


Figure 3-24 Tool Tip Display

5. Pressing on the panel and dragging up and down moves the panel and shows an empty panel under the header.
6. If you swipe up, the Output Panel displays. If the finding panel is dragged above 70% of the Viewer dimension height, then the finding panel should close and open Output Panel.

Hide/Show Findings in Mobile Device

To show or hide findings in the mobile Viewer, tap the Hide Results or Show Results button below the image. (Figure 3-25)



Show Results **Hide Results**

Figure 3-25 Hide/Show Findings in Mobile Device

Sync to PACS

On the desktop platform, the **Sync to PACS** button 

is in the upper-right corner next to the username. On the mobile device platform, a **Sync to PACS** icon  is next to the **Settings** icon at the top of the viewbox. For mobile device Sync to PACS settings, see "Changing Mobile Settings" on page 3-7.

After annotating, accepting, or rejecting the findings in a study, selecting Sync to PACS pushes all your annotations and data to EnvoyAI Liaison which redirects them to your archive(s). The toolbars and tools are explained in Chapter 4.

To change settings, RMB-click on the **Sync to PACS** icon. The settings menu opens allowing you to specify what type of information is sent:

- Accepted findings — Enabled by default — This is enabled in both the desktop and mobile platforms by default.
- Pending findings — Disabled by default.
- Rejected findings — Disabled by default.

- Enable user action tracking — Disabled by default.

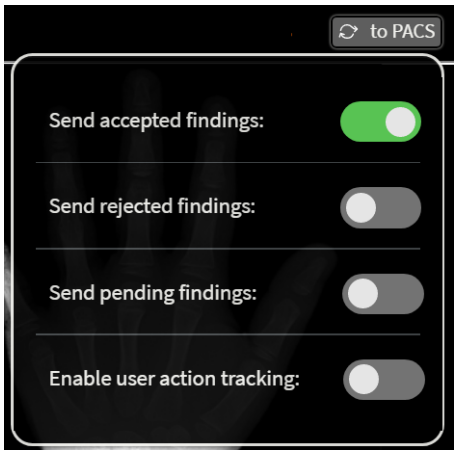


Figure 3-26 Sync to PACS Adjustable Settings

To changing Sync to PACS settings:

1. RMB-click on Sync to PACS, a menu window opens with settings options. (Figure 3-26) When **Enable user action tracking** is set to true, the actions are saved to the Northstar database for use in assessing and improving performance.
2. Slider turns to either green/gray depending on the true/false value for each user preference.
3. Close this menu either by pressing the ESC key or clicking anywhere in the Viewer.
4. Updated preferences are saved into the database at the user level.

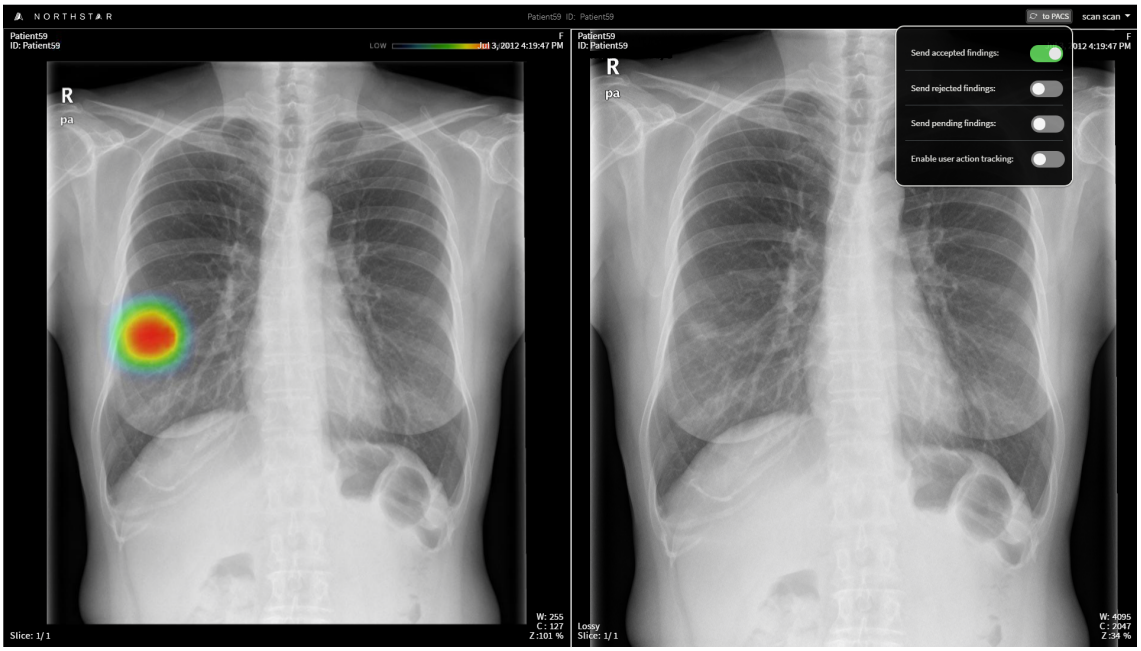


Figure 3-27 Sync to PACS Settings

Note: DICOM RT results can also be sent to PACS.

Sync to PACS Dialog Box

When you select Sync to PACS, a dialog box appears. The dialog box confirms what has been sent or was not sent to PACS. (Figure 3-28)

When you have set the state of your finding(s) to Accepted and select the Sync to PACS, a dialog appears:

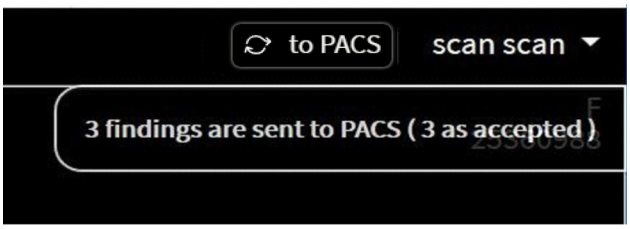


Figure 3-28 Accepted Findings Dialog

When there are Pending findings and you select Sync to PACS, you are prompted to confirm what to do with pending results and displays. (Figure 3-29)

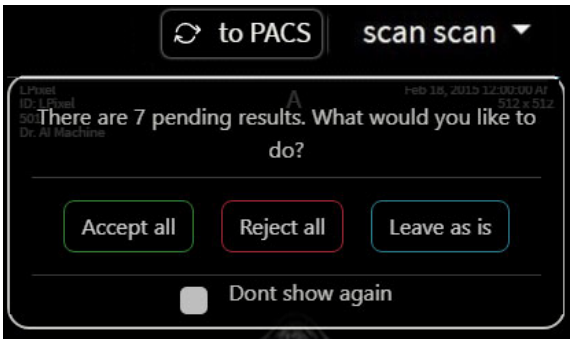


Figure 3-29 Pending Findings Dialog

Note: This Pending dialog is for DICOM GSPS results only.

If you select **Don't show again**, this dialog no longer appears. If findings are **Rejected**, the dialog displays. (Figure 3-30)

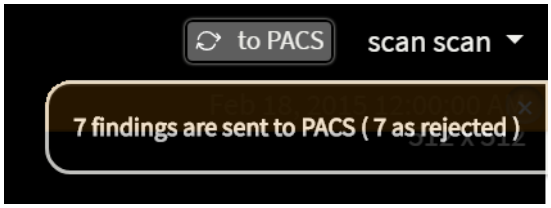


Figure 3-30 Rejected Findings Dialog

Mobile Device Sync to PACS

On a mobile device, use the  icon to send results to PACS. When you tap the Sync to PACS icon, you are prompted by a dialog asking what you would like to do with the findings. (Figure 3-31)

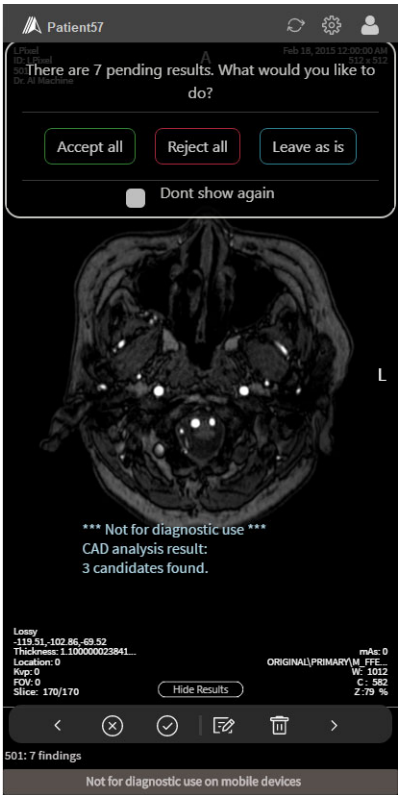


Figure 3-31 Sync to PACS Selection Dialog

To select an action, tap on either the Accept All, Reject All, or Leave as is button. Once you select what to send or not send to PACS, the Sync to PACS dialog confirms your choice. (Figure 3-32)

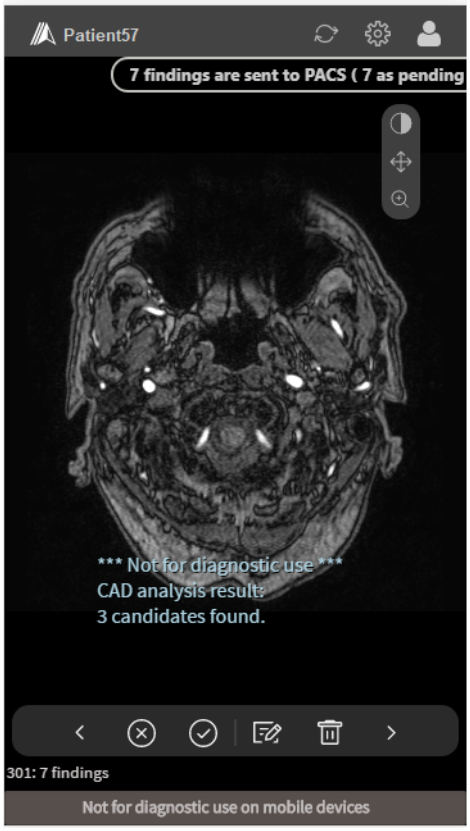


Figure 3-32 Confirmation Message

Warning Banners

Banners are information, error, or warning messages displayed related to AI Results Explorer usage or due to certain communications with EnvoyAI Liaison. (Figure 3-33) There are several reasons a banner is generated:

- Studies are not for diagnostic and/or clinical use.
- Studies are not correctly imported into Northstar.
- Study formats are not supported in Northstar.
- Viewer is a mobile device or device other than a desktop or laptop computer.

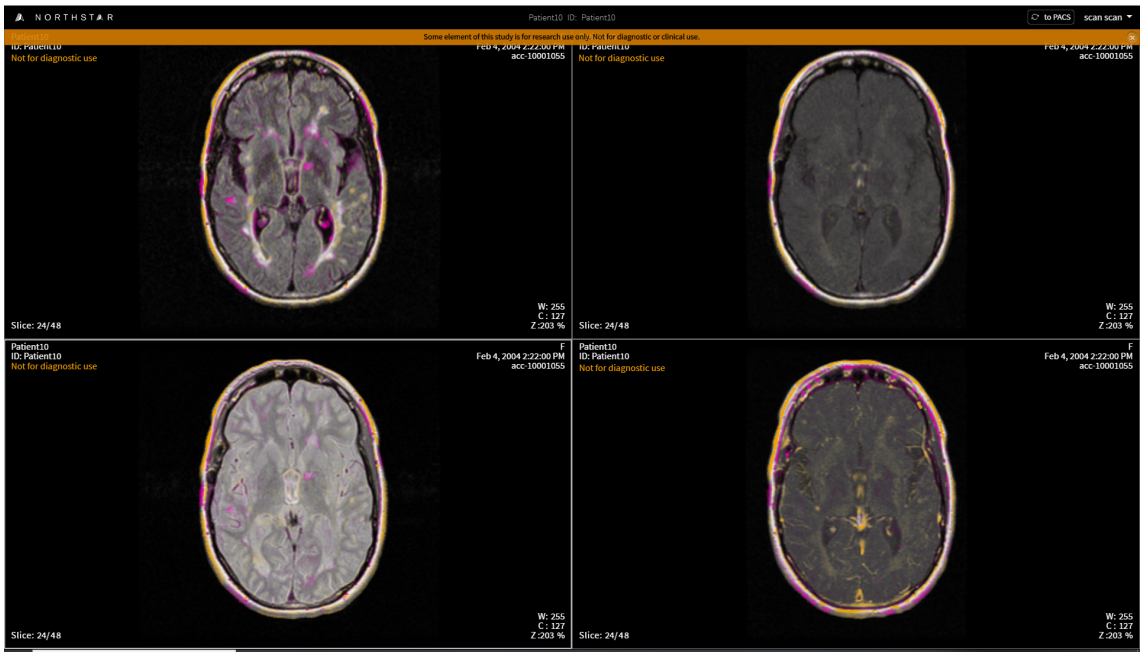


Figure 3-33 2x2 Viewer with Warning Banner Overlay

The banner above states, “Some element of this study is for research use only. Not for diagnostic or clinical use.” Select the **X** in the right side of this banner to close it. The viewbox still contains the banner message. (Figure 3-34)

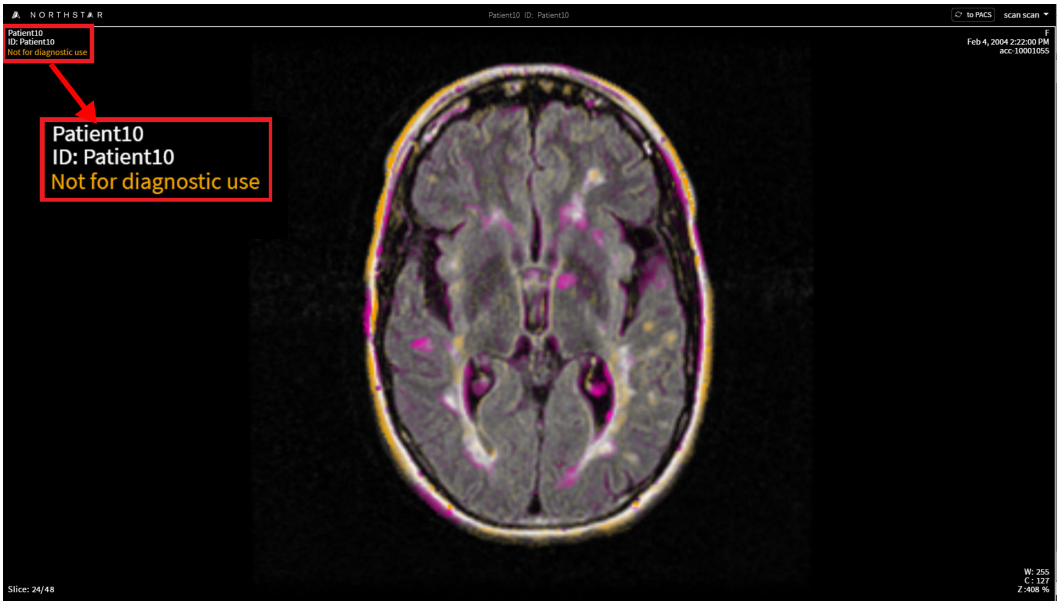


Figure 3-34 Enlarged “Not for Diagnostic Use” in Viewer

Multiple banners appear if there are multiple warnings. In the example image below, there is a non-diagnostic study that cannot be used for clinical use and, simultaneously, one viewbox has a rejected study. (Figure 3-35)

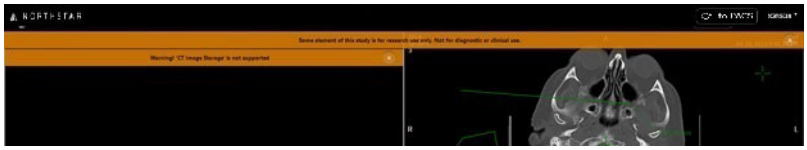


Figure 3-35 Double Warning Banners

If the user closes the Viewer level banner (top banner), then the banner displayed in the viewbox automatically shifts to the top border of the viewbox. (Figure 3-36)

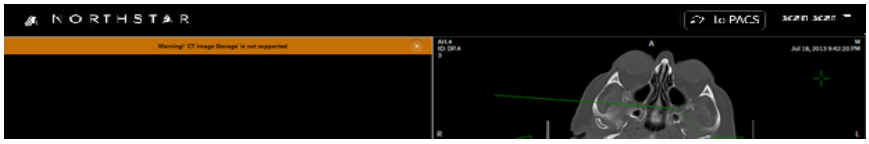


Figure 3-36 Banner Shifting

Mobile Device Warning Banners

In the mobile device Viewer, warnings appear at the top of the loaded image. (Figure 3-37)

Figure 3-37 Warning Banner in Mobile Device

You can tap the X in the banner to close it. The warning continues to appear on the image.(Figure 3-38)

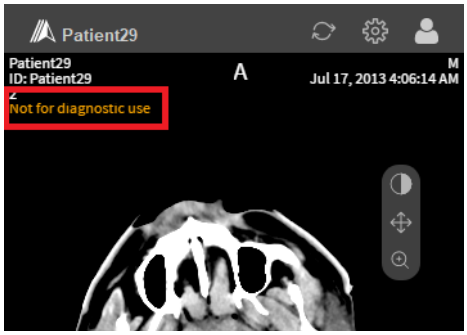


Figure 3-38 Warning on the Image in a Mobile Device

Mobile Device Alert

If you access the Viewer from a mobile device, a warning banner displays in a banner across the bottom of the image. (Figure 3-39)

Figure 3-39 Mobile Device Alert

Chapter 4 Northstar Viewer Menus and Tools

Viewer Header

The top toolbar across the Viewer contains:

1. The Northstar drop-down menu,
2. The name of the patient and the corresponding patient ID,
3. The **Sync to PACS** button, and
4. The user's name drop-down menu. The drop-down menu includes **About**, **Help**, and **Log out**.

Figure 4-1 Top Toolbar

Mobile Header Bar

Figure 4-2 Mobile Header Bar

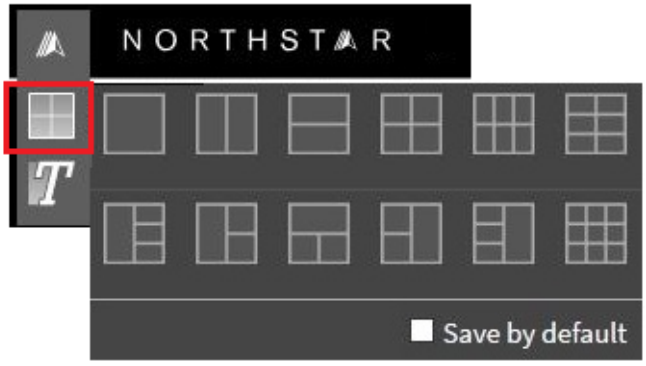
The mobile header bar provides tool icons for Sync to PACS, Settings, and the drop-down menu with About, Help, and Log out options. See "Chapter 2", Mobile Device Log In, on page 2-3 for more information. Tap any of the icons to access these tools and options.

Northstar Header Drop-Down Menu

At the uppermost, left side of the Viewer is the Northstar logo with a drop-down menu allowing the user to LMB-click on a menu item to:

- Select a different layout.
- Change the Annotation overlay model.

Viewer Layout Changing Function



The top icon in the drop-down menu is the Viewer layout changing function.

This menu expands and allows you to change the Viewer layout. When you select one layout, it is applied to the loaded series.

If you check the option to **Save by default** before selecting a layout, the selected layout applied to the loaded series is saved. It does not impact other Northstar users, it is a user and machine-specific preference.

IMPORTANT: The **Save by default** setting applies regardless of the number of series available for that patient and the loaded study. However, if the study does not have the corresponding number of series to match the chosen layout, reloading the study automatically adjusts the layout to a "best-match" layout and does not use the saved layout.

Opening a study with the layout designated as 1x1. (Figure 4-3)

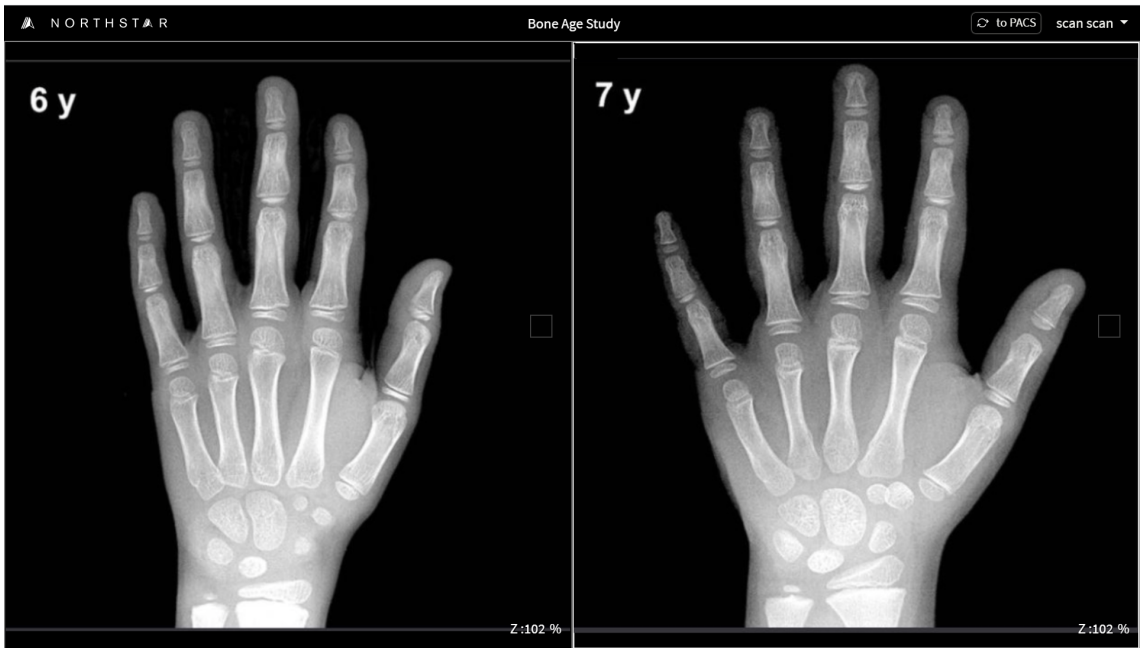


Figure 4-3 1x1 Layout

1. Select the Northstar icon from the toolbar menu to change the Viewer layout. (Figure 4-4) LMB-click the layout icon you want.

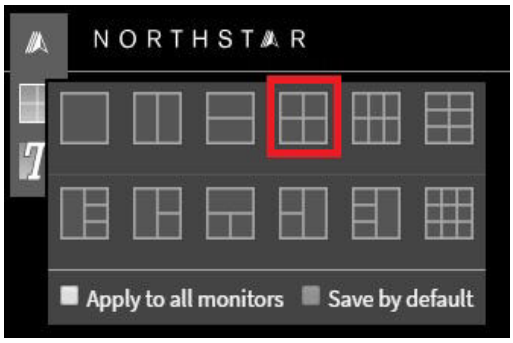


Figure 4-4 View Layout Changing Mechanism

2. The layout changes to the selected 2x2 layout. (Figure 4-5)

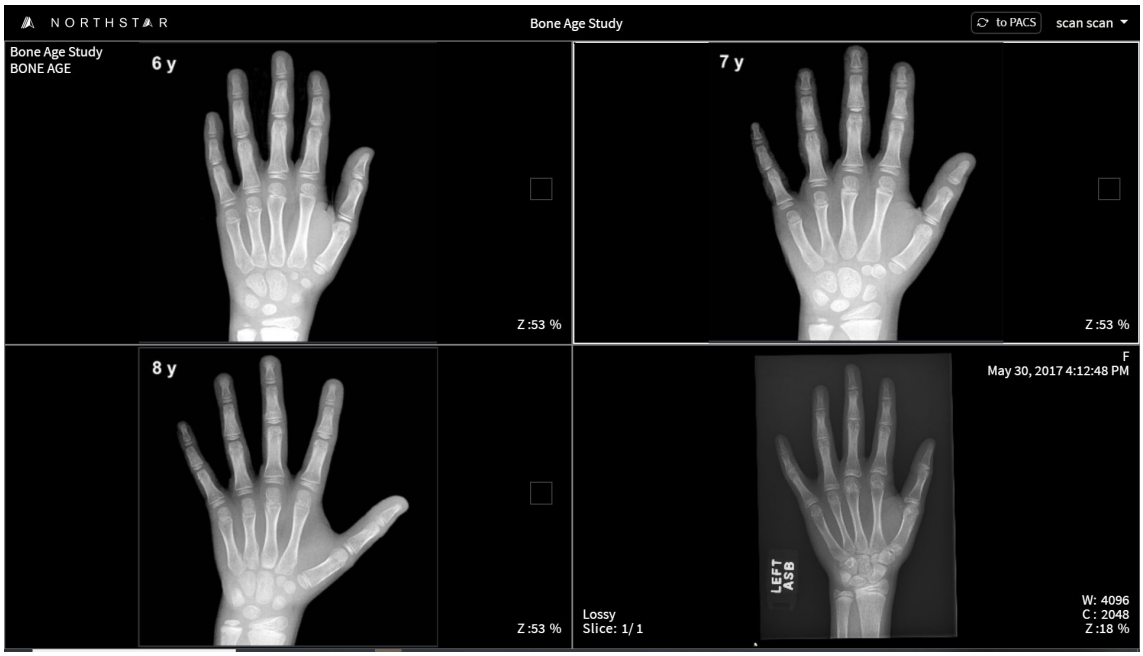


Figure 4-5 Example 2x2 View

When the layout is changed, the Viewer automatically selects the available series and loads that series into the available viewboxes (user copies and original series). The user can change any viewbox content using the Content Selector, see "Content Selector" on page 4-5.

For changing Mobile Device layout settings, see "Chapter 3", Mobile Device Viewer Layout, on page 3-6.

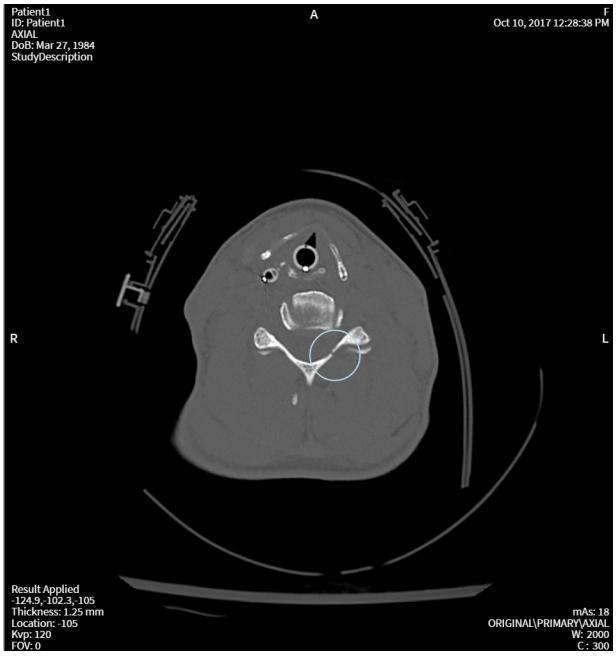
T: Annotation Overlays

Text options apply to the Viewer overlays. You can use the Default, Minimum, or Full setting to display the relevant information based on the Viewer overlay level. If the text in an overlay is too long, it is truncated.

- Selecting **Full** displays all available text overlays and information.
- **Default** refers to the original text overlays.
- Selecting **Minimum** minimizes the overlays and optimizes the space allocated for the image.

Figure 4-6 shows example annotation settings for **(1)** Full Display and **(2)** Minimum Display.

Full Overlay (1)

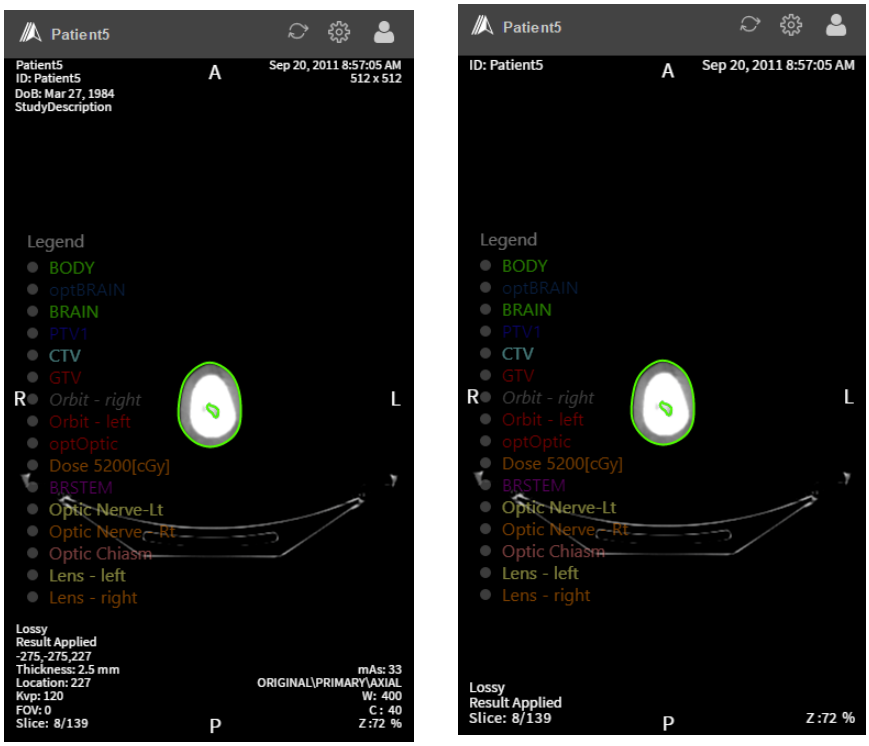


Minimum Overlay (2)

Figure 4-6 Annotation Overlay

Mobile Device Annotations

In the mobile device Viewer, annotation overlays are set in the Settings panel, see "Chapter 3, Changing Mobile Settings" on page 3-7 for information.



Full Annotations **Minimum Annotations**

Figure 4-7 Mobile Annotation Settings

To hide annotations, tap on the image. To show them again, tap the image again.

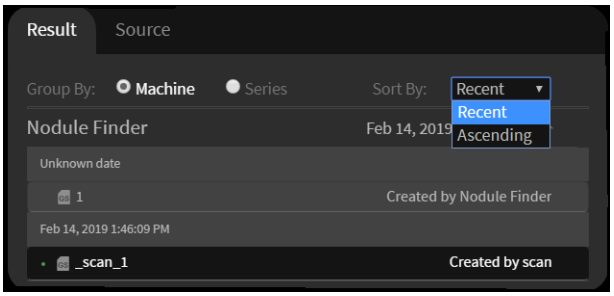
Content Selector

The **Content Selector** allows you to load additional images or findings into a Viewbox.

Figure 4-8 The Content Selector

LMB-click on the series description, in this example, on the “ENT IMRT.” (Figure 4-8)

Result Tab



Source Tab

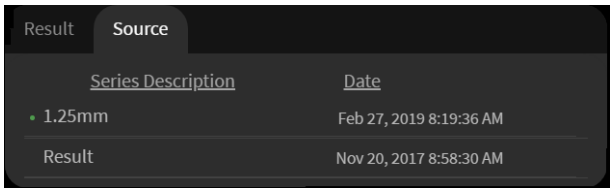


Figure 4-9 Content Selector Tabs

The **Content Selector** drop-down has a **Source** tab and a **Result** tab so that you can extend the series' information. The **Source** tab lists the original series, when you load the data from the source tab, you load the original data (without any result). The **Result** tab lists all findings generated by a user or a machine. The **Result** tab also lists all the user versions of the result. When you load content from the **Result** tab, you load the selected result with the related source data (if any). From the **Result** tab's drop-down menu, results can be sorted in Recent or Ascending order. (Figure 4-9)

The Content Selector displays icons for type of source or result data available. (Figure 4-10)

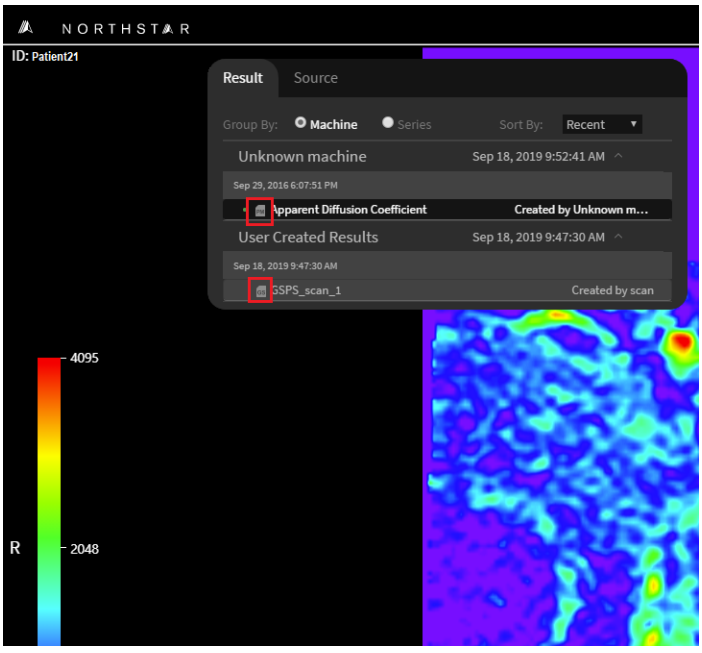
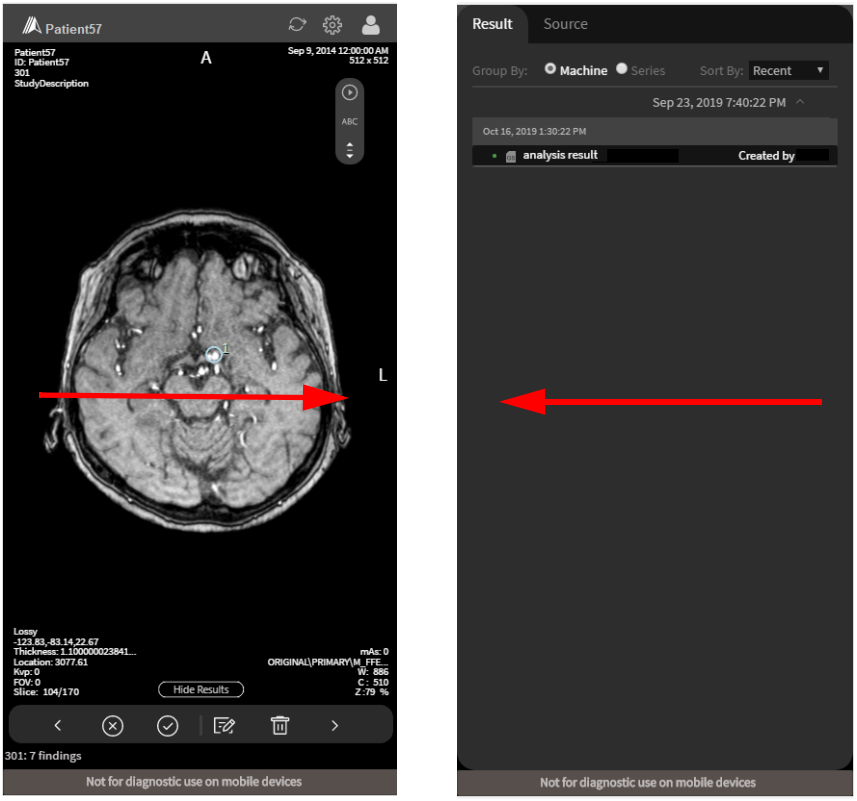


Figure 4-10 PM Icon for Loading Parametric Map Results

Content Selector on Mobile Devices

To use the Content Selector on the mobile platform, slide one finger across the display screen from the left side of the image to the right. To close the Content Selector, slide from the right side to the left side.



Swipe Left to Right to Open **Swipe Right to Left to Close**

Figure 4-11 Content Selector on Mobile Device

To load data from the Content Selector, tap on the desired Results tab or Source tab data.

Bottom Viewbox Menus

The menus at the bottom left and right of a viewbox displays this information: (Figure 4-12)

- **Phase: #/#** — If a series has multiphase data, this appears above the image number.
- **Im: #/#** — Select or change the slice displayed in the viewbox.
- **W:** — Select window width/length.
- **C:** — Select window center.

- **Z:** — Set or reset Zoom percentage.

Figure 4-12 Image showing Bottom Menus Labeled

Phase Number (1a)

When a series contains multiphase data, the phase numbers appear above the image number. To select a different phase:

1. LMB-click on the first number in the **Phase: #/#** and enter a different phase number; or,
2. Hold the LMB and move the mouse left to right.

Image Number (1b)

To select a different slice:

1. LMB-click on the first number in the **Im: #/#** and enter a different image number; or,
2. Holding the LMB and moving the mouse up and down.

Note: The additional bottom viewbox menus such as the Result Applied, Thickness, and Location round-up settings to 2 digits after the decimal point.

Window (2)

To select a new width/length, LMB-click the **W:**. Then scroll the menu list and LMB-click on a desired Window Level setting. You can also LMB-click on the number next to **W:** and manually enter a Window Level setting. The current settings appear italicized in the list. For studies with a Parametric map overlay, adjusting the WW/WL setting adjusts the overlay color levels. For information on WW/WL synchronization, see "WW/WL Synchronization" on page 4-33. For mobile WW/WL settings, see "Viewer Management on a Mobile Device" on page 4-10 and Chapter 1, Table 1.2, “Supported Gestures,” on page 4.

Center (3)

To select a new window center, LMB-click the **C:**. Then scroll the listed menu and LMB-click on the desired Center setting. You can also LMB-click the number next to **C:** and manually enter a Center setting. The current settings appear italicized in the list.

Invert Option (4)

On the **W:** or **C:** menu, the option to **INVERT** an image is only available for DICOM images. **INVERT** is generally used for an angiography with a contrast image study for viewing vessels and arteries in the brain. When you select **INVERT**, the image changes from white on black to black on white (Figure 4-13). Invert changes the pixel range and can provide a clearer image view.

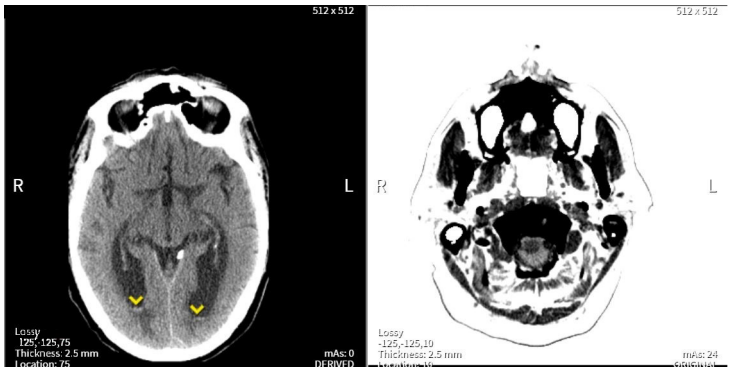


Figure 4-13 Comparison between a CT Slice and an Inverted CT Slice

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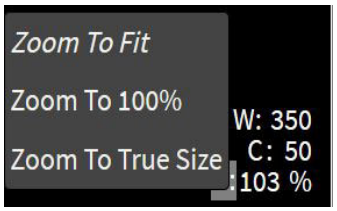
Note: For non-DICOM images, the **WW/WL (W:)** settings are not available.

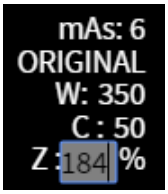
Zoom Selector (5)



The Zoom selector, indicated by **Z:** in the bottom viewbox menu, allows you to set the zoom level on the image. The current settings appear italicized.

You can use the preset levels:

- **Zoom To Fit** – zooms the image to fit the bounds of the Viewer**.**
- **Zoom To 100%** – zooms the image 100% of the original size. This allows the user to focus on smaller areas of the image
- **Zoom to True Size** — zooms the image to its original size.



These zoom percentages are based on available settings within DICOM images. You can also set zoom level by left-clicking in the numbers after the **Z:**, enter a zoom level, and then select enter.

Viewer Management Tools

This section describes Northstar's available tools to manipulate, adjust, or alter an image in the Viewer.

Viewer Management on a Mobile Device

With mobile devices, hand gestures using one or more fingers are used for selecting and adjusting images in the Patient List, Study List, and Viewer. For a full list of supported gestures, see Chapter 1, Table 1.2 on page 1-4.

- Tap once on an image in the Viewer to show or hide annotations.
- Use one finger to scroll up and down on the Viewer.
- Use two fingers slightly apart on the screen pinching in to zoom in and spreading outward to zoom out on an image.
- Use two fingers together and move across the image to change the WW/WL settings.
- On a study with a parametric map overlay, use two fingers together and move across the image to adjust WW/WL; this adjusts the color levels of the parametric map overlay.
- To pan an image, use three fingers together to move the image to a desired location.
- To rotate the image, use three fingers and rotate the image in a clock or counter-clockwise orientation.

Some of these options are available with the mobile device Radial Menu tools, see "Mobile Device Radial Menu" on page 4-14.

Scroll Bar

Scroll bars appear and can be used on the Log in panel, the Patient List, and in the Viewer. In the Viewer, when you move your mouse over to the right side the viewbox, the **scroll bar** appears. LMB-click the round handle and slide the mouse up or down to scroll through images or to locate findings. You can also jump to a slice in the study using the LMB-click on any point in the scroll bar.

As you move your mouse over the Viewer scroll bar, the findings information appears along with the findings state. (Figure 4-14) If there is more than one finding in the study, all the findings from the slice are marked along the scroll bar. You can select a slice or finding from the scrollbar by LMB-clicking on a marker.

Figure 4-14 Findings indicated on the Scrollbar

The appearance of the scroll bar does not disrupt the use of the position orientation arrows or opening the **Output** Panel. See "Image Orientation" on page 4-37 and Chapter 5, "Output Panel" on page 5-6 for more information.

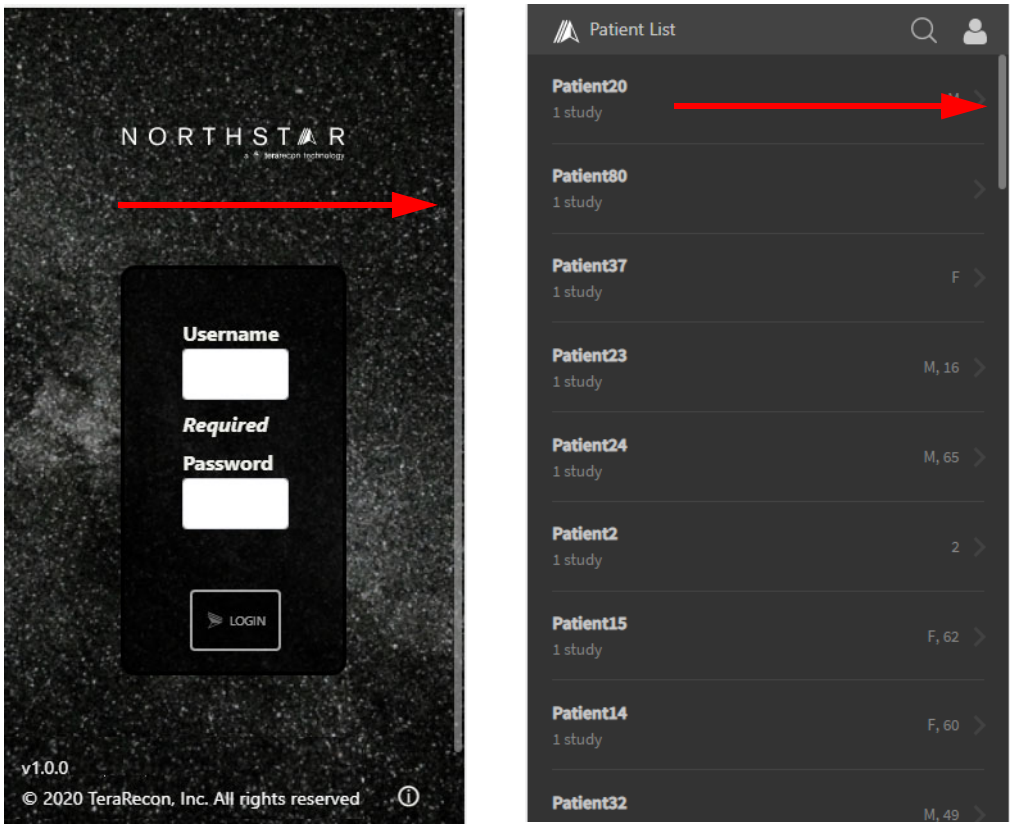
Finding marks appear along the scrollbar that indicate each finding and its state. The marks are colorized the color of a state:

- **Red** indicating rejected state
- **Green** indicating accepted state
- **Blue** indicating pending state
- **Green**/**Red** indicating mixed state

The scrollbar supports different formats: RTStruct, RTStruct mixed with GSPS, and GSPS.

Mobile Device Scroll Bars

On a mobile device, a scroll bar appears when additional information does not fit the display screen. This depends on the size of the device display.



Log in Page Scroll Bar **Patient List Scroll Bar**

Figure 4-15 Mobile Device Scroll Bars

To scroll through slices in the Viewer, move one finger up or down on the image. You can also use the Scroll tool from the Radial Menu. See "Mobile Device Radial Menu" on page 4-14 for information on the Scroll tool.

Mouse Usage

The mouse is used to manipulate an image, view menus, change settings, and draw within a viewbox. The default mouse operations are described in Table 4.1.

Table 4.1: Mouse Use on the Desktop Platform

Mouse Button	Desktop Platform Actions
Right mouse button (RMB-click)	Using RMB-hold in a viewbox opens the Radial Menu. See "Radial Menu" on page 4-13 below.
Left mouse button (LMB-click)	The LMB-click allows selection, scrolling through images by holding the button and dragging inside a viewbox, and changes zoom, image number, compression, and WW/WL settings manually. It is also used to draw or place shapes.
Right and Left mouse buttons	Hold both buttons down and drag the mouse across the image to change the W: and C: settings.
Mouse with middle wheel (MMB)	Rolling the middle mouse wheel allows you to scroll through all the images in a series. You can also select the Scroll tool from the Radial Menu, see "Radial Menu" on page 4-13. To zoom, hold the MMB and drag inward to zoom in and drag outward to zoom out. Use the MMB to scroll through the RT Legend. See Chapter 5: "Using DICOM Results" for information on the RT Legend.

Radial Menu

The Radial Menu provides tools for moving around the image, adjusting the image, adding findings, adding annotation and text, adding measurements, running 2D and 4D Cine, mouse scrolling, zooming, and panning.

Mobile Device Radial Menu

The Radial Menu in the mobile device Viewer is a limited subset of the browser tools. LMB-hold your finger on the Viewer display to access the menu.

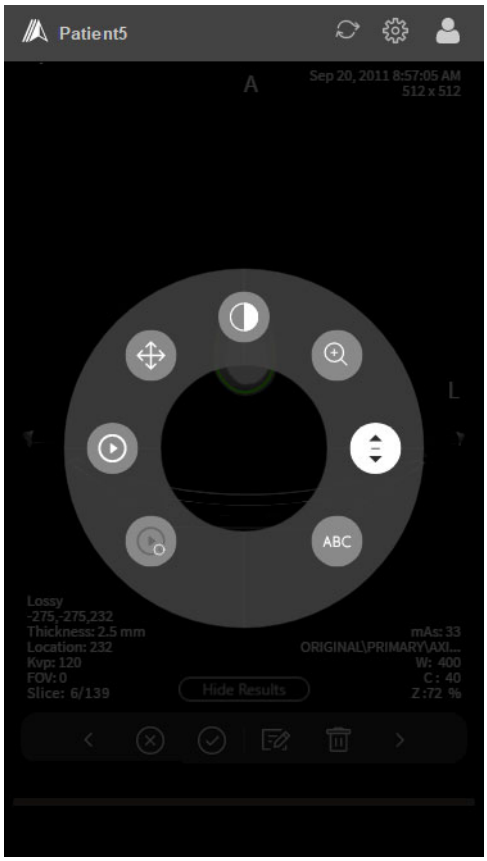
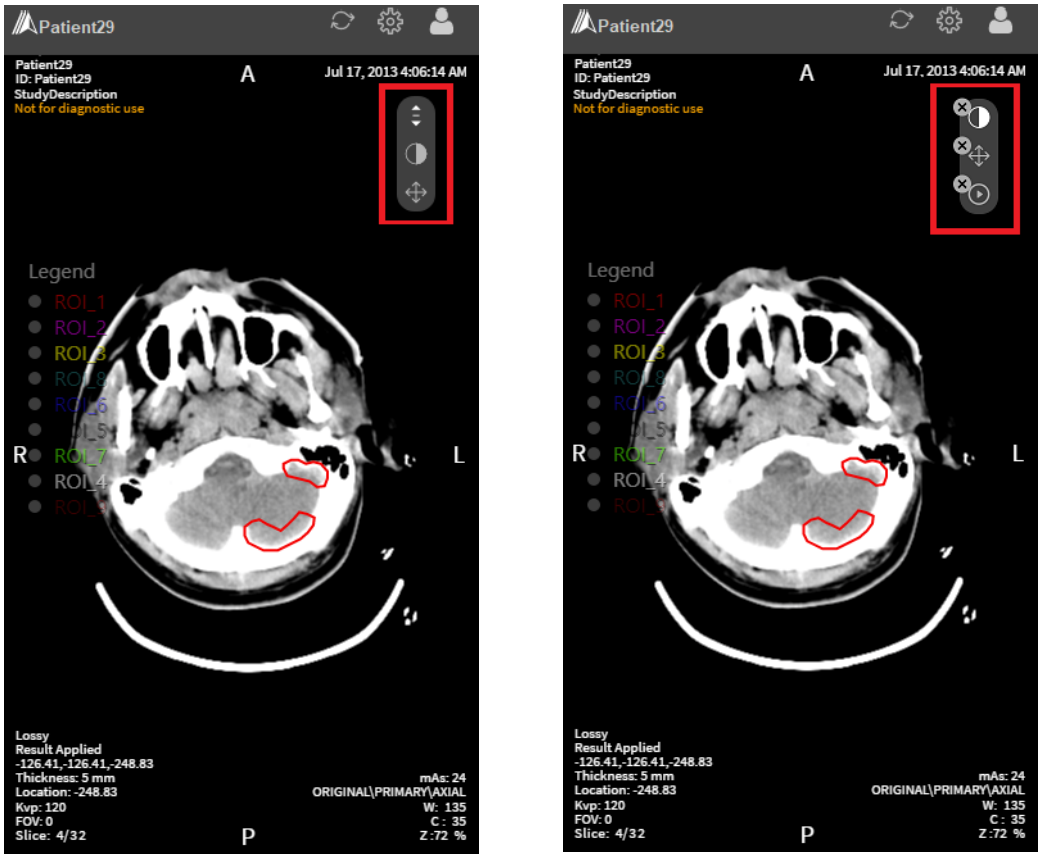


Figure 4-16 Mobile Device Radial Menu

The available tools appear on a circle background. When you select a Radial tool, the icon highlights. To close the Radial Menu, tap anywhere outside the circle. In the Viewer, a quick action bar provides the three most recently used Radial Menu tools.

To delete and replace one of the tools on the quick action bar, tap and hold the tool icon. Each tool displays an X in the right upper corner. Tap the X to delete the tool from the quick action bar. (Figure 4-17)



Quick Action Toolbar **Deleting Tools**

Figure 4-17 Quick Action Toolbar

Table 4.2: Radial Menu Mobile Tools

Icon	Description
	For a series with multiphase data, tap this icon to activate scrolling through the slices of a series quickly like a movie. To stop the Cine, tap the display again.
	Tap this icon to activate scrolling through the slices of a series quickly like a movie. To stop the Cine, tap the display again.
	Activates panning the image. Tap and then drag finger across image. To deactivate, select another tool.
	Activates WW/WL adjustment. Using two fingers together and move across the image to change the WW/WL settings.
	Activates zooming. Tap and move one finger across image to zoom in or zoom out.
	Activates scrolling through slices. Tap and hold one finger on the display, dragging up and down to scroll through slices.

Icon	Description
	Activates adding text to an image or finding. See "ABC Tool on a Mobile Device" on page 4-28 for details.

Note: For additional instructions on how to use the Radial Menu tools, refer to "How to use Radial Menu Tools" on page 4-17.

Radial Menu Desktop Platform

On the desktop platform, the Radial Menu is available when you RMB-hold anywhere on an image. Once the Radial Menu appears on the image, select any of the tools by LMB-clicking the icon.

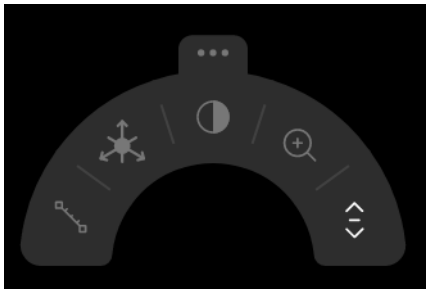


Figure 4-18 Radial Menu

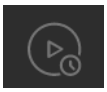
To expand the Radial Menu, select the "..." at the top of the menu to access additional tools.

Figure 4-19 Expanded Radial Menu

Table 4.3: Radial Menu Tools

Radial Menu Image	Definition/Action
 **Scroll**	Activates the mouse to scroll through each slice in a series. When activated, LMB-click and drag up/down or use the mouse's middle wheel to view all slices (default mouse button behavior).
 **Zoom**	Activates zoom. LMB-click and hold, drag mouse up or down to change the zoom factor.
 **Smooth**	Activates smooth. LMBt-click and hold, drag up or down and right or left to change the window level.
 **Triangulation Tool**	Activates the Triangulation Tool. See "Triangulation Synchronization" on page 4-31 for information on how to use this tool.
 **Measurement**	Activates a line measurement. LMB-click and drag the mouse from the start point to the end point. The measurement appears next to the line.

Table 4.4: Expanded Radial Menu Tools

Expanded Radial Menu	Definition
 **ALL**	Activates window with three tabs — Basic, Measurement, and Other. Each tab contains additional tools.
 **Circle**	Activates a circle to indicate a finding. LMB-click and drag to desired circle size over the finding.
 **4D Cine**	For a series with multiphase data, activates an automatic scrolling through the slices of a series quickly like a movie. (Cine symbol with a clock.) To stop the cine, LMB-click on an image in the Cine.
 **Polyline**	Activates both the Polyline and Freehand tools. Allows the user to create point by point a continuous line. Can be edited. Or the user can LMB-click-hold to use as a Freehand drawing tool.
 **ABC**	Activates an annotation box on the image. LMB-click on desired area or finding to open a text box. Enter text. Annotation appears on the image.
 **2D Cine**	This activates an automatic scrolling through the slices of a series quickly like a movie. To stop the cine, LMB-click on an image in the Cine.
 **Point**	Activates the Point tool and places points on the image. LMB-click anywhere on the image to indicate a finding.

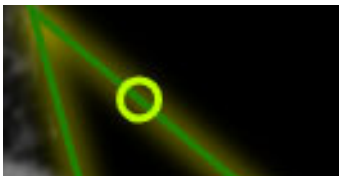
How to use Radial Menu Tools

The steps for using Radial Menu tools to highlight or identify a finding and how to activate or deactivate the tools begin with the "Mouse Scroll Tool" on page 4-18. These instructions appear in the same order as the menu tools listed in, first, Table 4.3 and then Table 4.4.

Selecting Finding Shapes on an Image

When selecting or editing finding contours on an image, a yellow halo appears around the selected (active) object or shape. If you mouse over the selected shape a lighter green circle appears. LMB-click the circle and then move (drag to new location), resize (drag and expand), or change the polygon shape (redraw a portion of the shape).

Circle Selected for Editing



Polygon Selected for Editing

Figure 4-20 Shape Selection

For more on editing a polygon shape and information on how to use the Freehand option, see "Polyline Tool" on page 4-15. For editing a circle, see "Circle Tool" on page 4-14.

Mouse Scroll Tool

This tool lets you scroll through slices in a study by activating the middle mouse button.

To user the Mouse Scroll Tool:

1. RMB-hold on the image.
2. The Radial Menu appears.
3. LMB the Mouse Scroll tool to activate the MMB.
4. Roll the MMB on the image to scroll through the slices or LMB-hold on the image and move the mouse up and down.
5. Alternatively, you can select a slice by entering an image number in the **Im:**, see "Image Number (1b)" on page 4-8 for more information.

Note: This only works for studies with more than 1 slice or image.

Zoom Tool

To use the Zoom Tool:

1. RMB-hold on the image.
2. The Radial Menu appears.
3. LMB-click on the Zoom tool to activate this tool.
4. LMB-click on the image and hold the mouse button.
5. Move your mouse on the image until the zoom percentage is at the desired size.
6. Alternatively, you can select a zoom setting by entering a percentage number in the **Z:** in the right, bottom corner of the Viewer. See "Zoom Selector (5)" on page 4-9 for more information.
7. Another way to access this tool is to select **ALL** from the extended Radial Menu, and then **Zoom** tool on the Basic tab.

Note: This tool stays activated until you select another tool or close the study.

Smooth Tool

This tool smooths the edges of an image and highlights those edges to make viewing easier.

To use the Smooth Tool:

1. RMB-hold on the image.
2. The Radial Menu appears.
3. Select the **Smooth** tool.
4. Hold down the LMB down and drag the mouse across the image.
5. This changes settings for **W:** and **C:** in the right, bottom of the active Viewbox. See "Window (2)" on page 4-8 for more information.

Note: This tool stays activated until you select another tool or close the study.

Triangulation Tool

See "Triangulation Synchronization" on page 4-31 for specific usage information.

Measurement Tool

To use the Measurement tool:

1. RMB-hold on the image.
2. The Radial Menu appears.
3. Select the Measurement tool.
4. LMB-click on the area to be measured or at the start point of the measurement, and then drag the tool to the desired endpoint.
5. Release the tool and the measurement is computed and appears on screen; the measurement numbers are attached to the measurement by dotted lines.
6. You can select-drag the measurement text (the measurement numbers) to move the text.
7. To deactivate this tool, select another tool from the Radial Menu.
8. If you create the wrong measurement, you use the trash icon on the A/R menu or the **DEL** key on the keyboard to remove it.

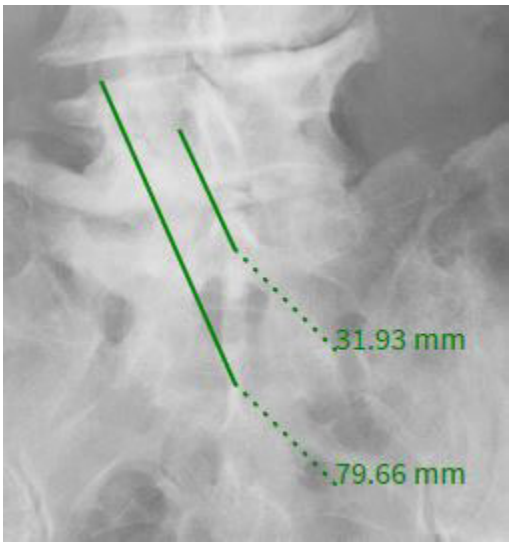


Figure 4-21 Measurement Tool showing Lines and Measurements

This tool is also available from **ALL > Measurement > Distance** tool.

ALL Tool Tabs

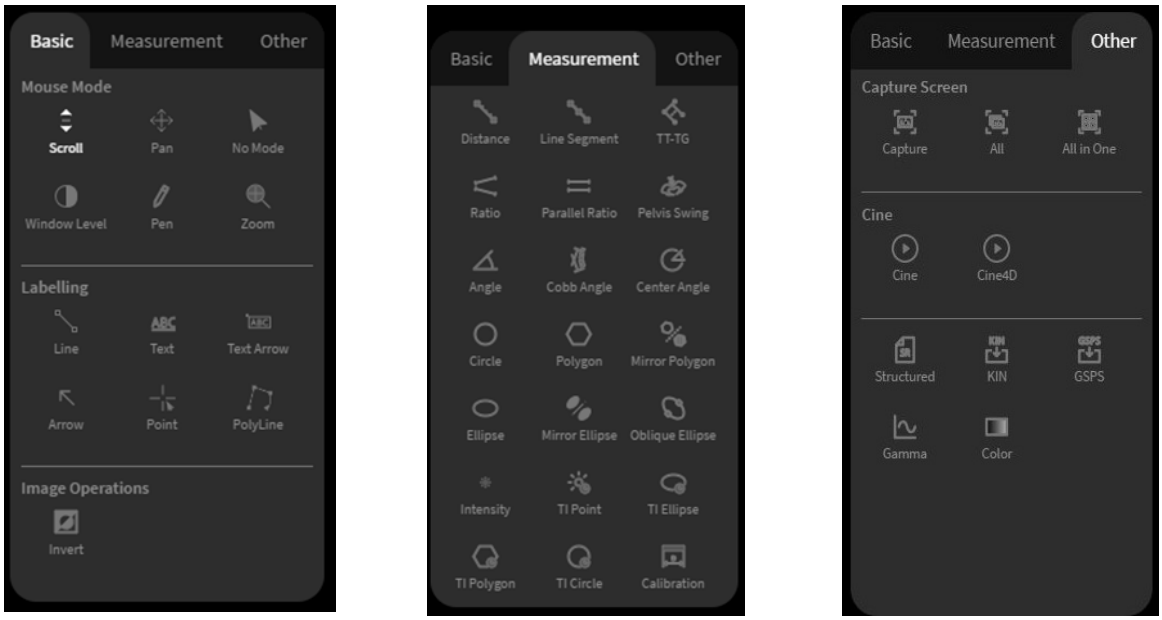
Selecting ALL in the expanded Radial Menu opens a new window with three tabs — Basic, Measurement, and Other. Each tab provides additional tools.

The **ALL** tool Basic tab provides Scroll, Pan, Window Level, Pen, and Zoom tools. The Measurement tab provides measuring tools such as Distance, Line Segment, TT-TG, Ratio, Parallel Ratio, Pelvis Swing, Angle, Cobb Angle, Polygon, and Ellipse. The Other tab provides Cine, Color, and Screen Capture tools.

To use the ALL Tool:

1. RMB-hold on the image.
2. The Radial Menu appears.
3. Select the "**...**" on the menu to expand the menu.
4. From the extended menu, select **ALL**.
5. The window opens.
6. Select a tab and then select a tool from that tab.

7. To deactivate this tool, select another tool on the Radial Menu or exit the study.



ALL > Basic Tab **ALL > Measurement Tab** **ALL > Other Tab**

Figure 4-22 Selecting the ALL Menu opens the 3-Tab View

Pan Tool

To use the Pan tool from the ALL tab:

1. Open and expand the Radial Menu.
2. Select the **ALL** tool.
3. A window opens with three tabs, Basic, Measurement, and Other.
4. Select Pan from the Basics tab. (**ALL > Basic > Pan**.)
5. LMB-hold and drag the mouse back and forth to pan across the image.
6. To deactivate the Pan tool, select another Radial Menu tool or close the study.

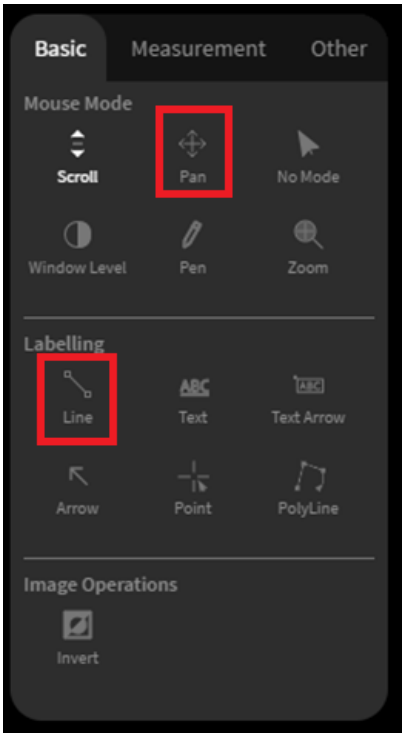


Figure 4-23 ALL > Basic Tab > Pan (ALL > Basic Tab > Line)

Line Tool

To draw a Line from the ALL Tab:

1. Open and expand the Radial Menu.
2. Select the **ALL** tool.
3. A window opens with three tabs, Basic, Measurement, and Other.
4. Select Line from the Basics tab. (**ALL > Basic > Line**.) (Figure 4-23)
5. LMB-hold and drag the mouse until the line is the desired length.
6. To delete the line, select the line, then select trash icon on the A/R UI Menu or the **DEL** key on the keyboard.

7. To deactivate the Line tool, select another Radial Menu tool or close the study.

Circle Tool

The Circle tool allows you to place a circle as a finding indicator. After placing the circle, you can either enlarge or shrink the circle, or move the circle to another location on the image. When your mouse hovers close to either the circle edge or center, you will see the selection activate. (Figure 4-24 and Figure 4-26) The circle can be resized, deleted, or redrawn. You cannot change the shape of the circle.

To place a finding using the Circle Tool:

1. Open and expand the Radial Menu.
2. Select the Circle tool.
3. LMB-click on the image and drag the mouse to create a circle in any size.
4. To deactivate the Circle tool, select another tool from the Radial Menu or close the study.

To edit the circle:

1. Hover your mouse over the circle and a smaller active circle appears. This is the selection tool or "handle."

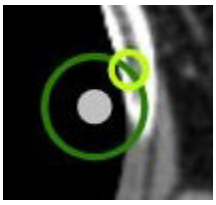


Figure 4-24 Circle "Handle"

2. LMB-click and drag your mouse inward (toward the center point) to shrink the circle or drag outward (away from the center point) to enlarge the circle.

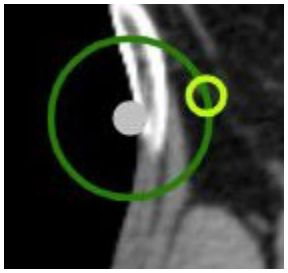


Figure 4-25 Enlarging the Circle

3. Release the mouse.
4. Choose another Radial Menu tool or close the study to deactivate this tool.

To move the circle to a new location:

1. Hover your mouse over the center of the circle to activate the center handle.

2. LMB-click on the activated circle.

Figure 4-26 Active Center Circle

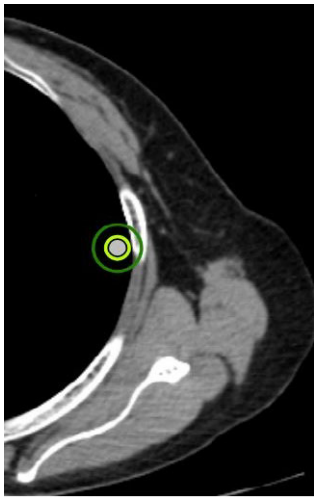


Figure 4-27 Original Location

3. Holding the LMB, drag the circle to a new location.

Figure 4-28 Relocating the Circle

To delete the circle:

1. Select the circle.
2. Select the trash icon on the A/R menu or the **DEL** key on the keyboard.
3. Select another Radial tool or close the study to deactivate the Circle tool.

This tool is also available from **ALL > Measurement > Circle**.

Cine (2D and 4D) Tool

This tool creates an automatic “movie” that scrolls through all slices in a study. The 2D-Cine Tool is used for data without multiphase data. The 4D-Cine Tool is used when a series has multiphase data.

To use the Cine Tool:

1. RMB-hold on the image.
2. The Radial Menu appears. For Multiphase series, select 4D-Cine by expanding the menu and using the Cine tool there. For all other series, select the 2-D Cine tool. See "Mobile Device Radial Menu" on page 4-14 for information about the mobile device Cine tool.
3. Select the **Cine** tool and the Viewer automatically begins the “movie” scrolling through all slices of the series.
4. This scrolling “movie” continues until you LMB-click on the image (deactivate) or until you select another Radial Menu tool.
5. If you want to go back to an image, LMB-click the **Cine** to stop it and use the MMB to scroll back to the desired image.
6. If you do not have an MMB or a mouse wheel, to go back to an image:
    - LMB on the image and hold the LMB as you move your mouse up and down on the image to move back or forward to a specific slice.

Alternatively, you can select **ALL > Other > Cine** (or **ALL > Other > Cine4D**).

Polyline Tool

The Polyline tool draws a line on the image that is curved or nonlinear. It can also be used as a **Freehand Tool** to draw additional contours. See "Using the Polyline Tool as the Freehand Tool" on page 4-24 for additional information.

To place a shape with the Polyline tool:

1. Open and expand the Radial Menu.
2. Select the Polyline tool.
3. Using the CTRL-LMB-click, select the first point of the Polyline shape.

Note: Polyline shapes do not have to be closed.

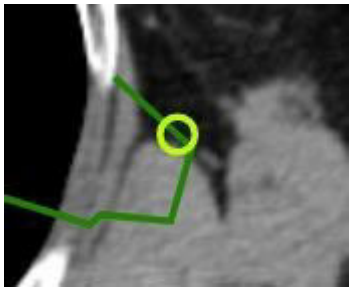
---

4. Once the first point is placed, release the CTRL key and LMB-click to add points along the contour. Note that for placing additional points, an LMB-click is enough.
5. Select another Radial tool or close the study to deactivate the Polyline tool.

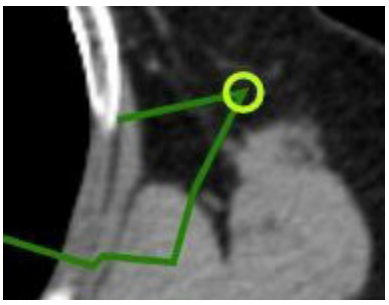
To reshape or edit the drawn Polyline:

1. Hover your mouse over any line segment or point on a contour line. You also can select a point at the middle of any line.
2. An active selection circle appears.

3. LMB-hold and drag the line to the new point. The Polyline reshapes..



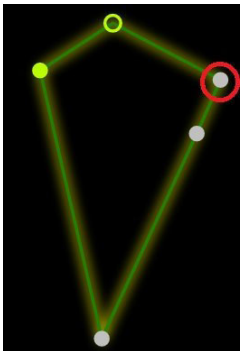
Hover over the line segment



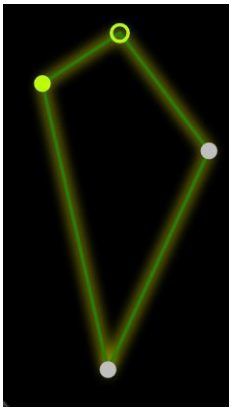
LMB>click and drag the line

Figure 4-29 Editing the Polyline Shape

4. You can also RMB on a point in the polygon to delete that point. Once the selected point is deleted, the points on to either side are joined to form a new line.



Red Circle indicates the Point to Delete



Shape after the Point is Deleted

Figure 4-30 Deleting a Point from a Shape

5. Select another Radial tool or close the study to deactivate the Polyline tool.

To delete the Polyline:

1. RMB-click on the Polyline shape.
2. Select the trash icon on the A/R menu or the **DEL** key on the keyboard.

Using the Polyline Tool as the Freehand Tool

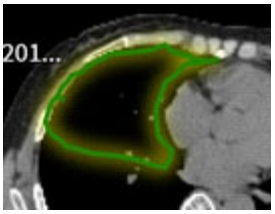
1. Open and expand the Radial Menu.
2. Select the Polyline tool.
3. Hold down the LMB and drag the mouse to create the shape's outline. You should see the shape being drawn as your mouse moves.
4. To close the shape, bring the begin point to the end point. If the points do not meet exactly but are close to each other, the shape is automatically closed.
5. To deactivate the Freehand tool, select another Radial tool or close the study.

Note: Shapes that are machine findings cannot be deleted. User findings can be deleted.

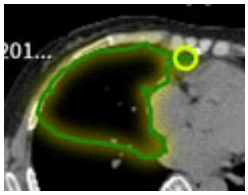
To edit with the Freehand Tool:

If you need to edit a shape created with the Freehand tool:

1. Select the shape. You will see a yellow halo around the shape and a light green circle on the edge of the line. See "Selecting Finding Shapes on an Image" on page 4-17 for more information.
2. LMB-hold and drag the active circle to the desired point.
3. Be sure to connect the new line back to the existing shape. If the line does not connect, the original shape is not edited.
4. Once you have edited the shape, it automatically updates to include the new added area.



Original Shape



Edited and Including New Area

Figure 4-31 Editing with the Freehand Tool

Note: This tool is also available for DICOM RT results. See "Chapter 5," page 5-1.

To delete the shape using the Freehand Tool:

1. Select the shape.
2. Select the trash icon on the A/R menu or the **DEL** key on the keyboard.

ABC Tool

This is the Annotation tool. You can use this tool to add text to a finding on an image.

To use the ABC tool:

1. Open and expand the Radial Menu.
2. Select the **ABC** tool.
3. LMB-click once near, in, or on a finding. (Figure 4-32)
4. The selected point on the finding connects with a dotted line to a gray text box.
5. Type your annotation in the text box and select Enter.
6. The Annotation text appears on the image.

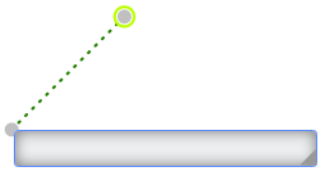


Figure 4-32 ABC Tool

To resize the Annotation box:

1. Open the expanded Radial Menu and select the ABC tool.

2. LMB-click on the image to place the annotation.

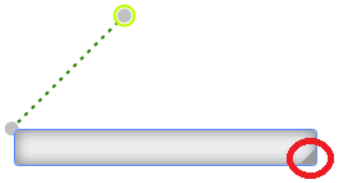


Figure 4-33 Resizing Corner

3. Select the bottom right corner and drag the corner until you reach the desired size.

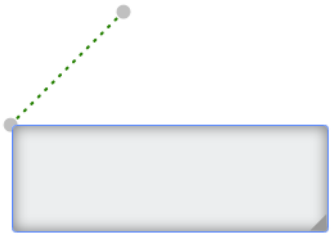
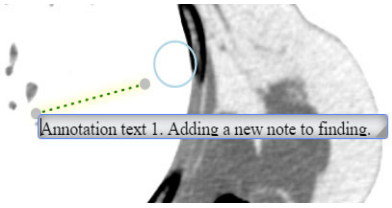


Figure 4-34 The Resized Annotation Box

To edit the Annotation:

1. LMB-double-click the text on the image.
2. The text box opens.
3. Edit the text and press **Enter** on the keyboard.
4. The Annotation tool deactivates when you select another tool.



Select the Text **Edited Annotation**

Figure 4-35 Editing the Annotation

When there is more than one line in the Annotation box, a scroll bar appears on the right side of the box.

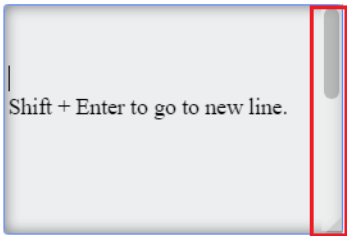


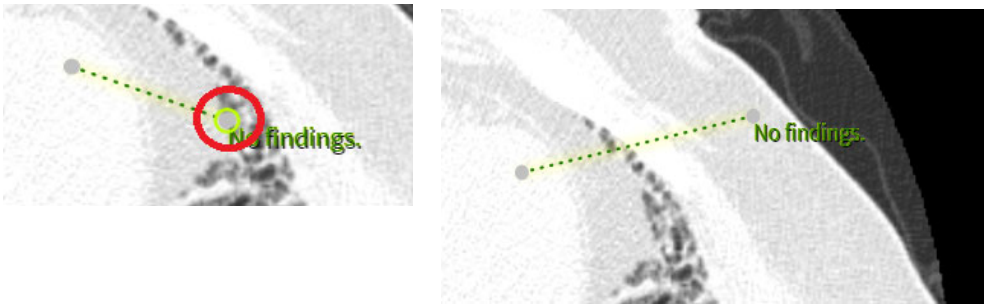
Figure 4-36 Scroll Bar

Note: While adding an Annotation, you can use the keyboard shortcut **Shift + Enter** to go to the next line.

To move the Annotation box:

1. LMB-click the circle on the text annotation. (Figure 4-37)
2. LMB-hold and drag the circle to a new location. The annotation box moves to the new location.

To move the entire annotation (line and text), LMB-click on the dotted line and drag the entire annotation to the new location.

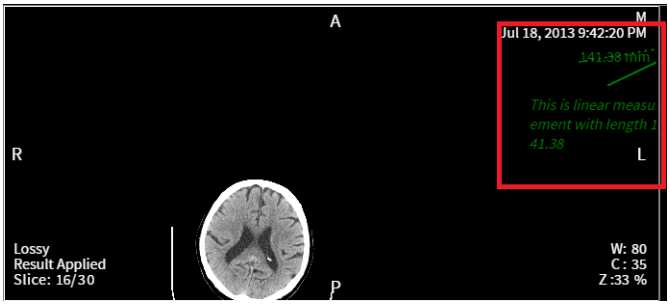


LMB-click to Active Text Circle **LMB-click, Hold, and Drag to New Location**

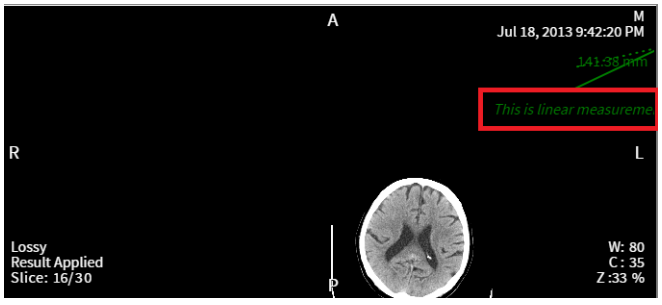
Figure 4-37 Relocating the Annotation

Annotation Position on the Image

When moving an annotation, if the annotation box touches the right, outermost edge of the viewbox, the text is (left-align) wrapped. (Top, Figure 4-38) A comment or annotation is cutoff when you are panning or zooming the image. (Bottom, Figure 4-38)



Annotation Wrapping



Annotation Cutoff

Figure 4-38 Wrapping an Annotation and Cutting off an Annotation

To delete the Annotation:

1. Select the dotted line.
2. Select the trash icon on the A/R menu or the **DEL** key on the keyboard.

You can also use the **Annotation** tool from the **Accept/Reject UI Menu**. For further description of this menu, see "Accept/Reject (A/R) UI Menu" on page 4-34.

ABC Tool on a Mobile Device

On a mobile device, to add a text annotation to an image:

1. Tap the ABC tool from the Radial Menu. (This will also add the tool to the quick access bar.)
2. You are prompted to select (tap) the place on the image for the annotation.

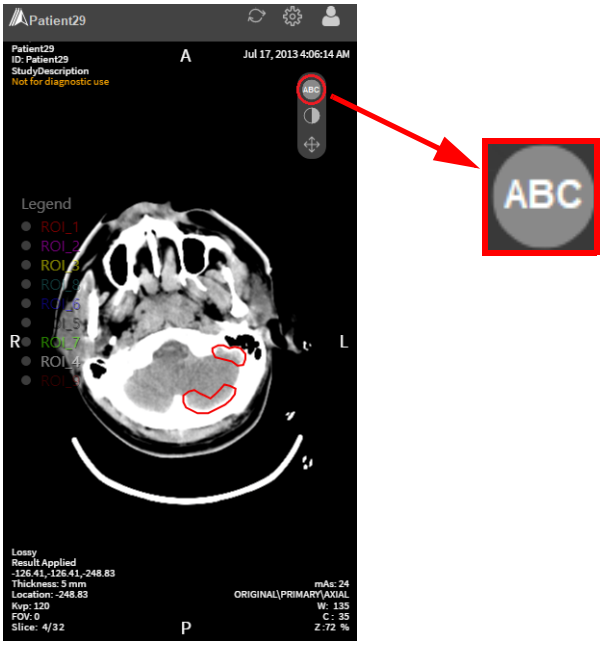


Figure 4-39 Prompt Message

3. Tap in desired place. The text tool panel opens.

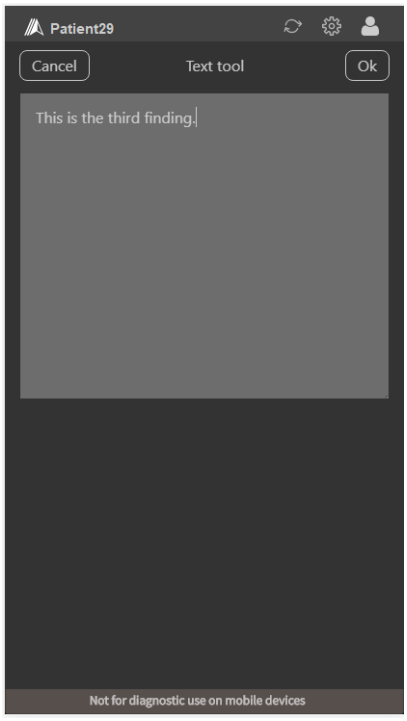


Figure 4-40 Text Panel

4. Enter the text in the text field.
5. Select **Ok** to keep the text or **Cancel** to exit the text tool panel.

6. The annotation appears on the image with dotted line connecting the text to selected area or finding. When the text is active, it appears highlighted in yellow.

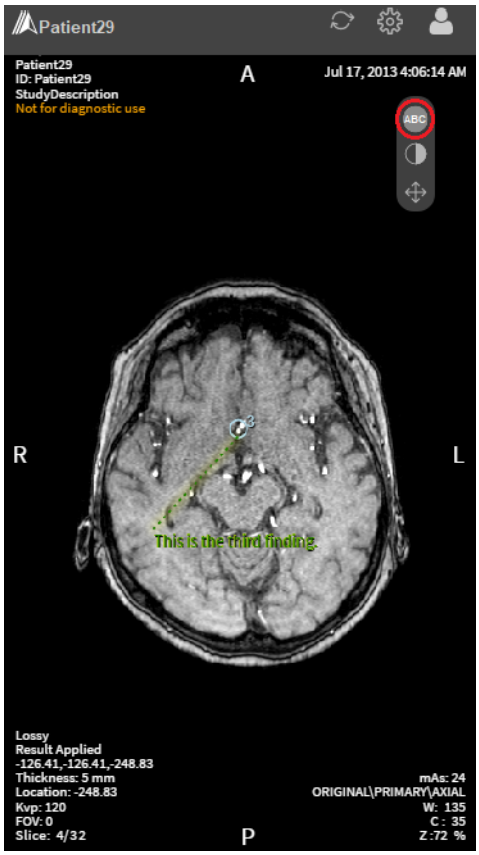


Figure 4-41 Active Annotation

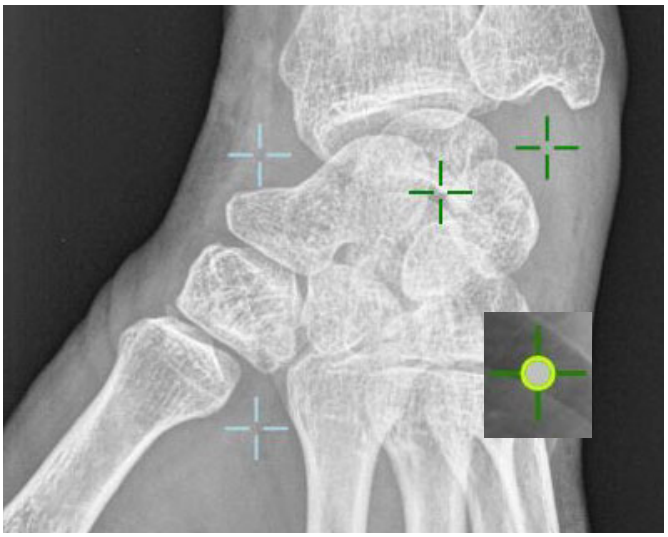
Point Tool

To use the Point tool:

1. Open and expand the Radial Menu.
2. Select the Point tool.
3. To mark a finding, LMB-click on the finding in the image.
4. The point appears on the image.
5. To accept your markings, hover over the bottom of the image and use the **Accept/Reject** UI Menu.
6. To deactivate the Point tool, select another Radial Menu tool or close the study.

To move the Point

1. LMB-click on the Point.
2. The center selection handle is activated.
3. LMB-drag the point to the new location.



This tool is also available from **ALL > Measurement > T1 Point**.

Figure 4-42 Findings Indicated by the Point Tool

To delete a Point:

1. Move your mouse over the point and the center of the point activates. (Inset, Figure 4-42)
2. Select the trash icon on the A/R menu or the **DEL** key on the keyboard.

Synchronization

The synchronization option is on by default. You can toggle synchronization on/off using the space bar. Synchronization enables multiple related images to synchronize with the user's actions. For example, when the user synchronizes scrolling in one viewbox, all images in the series are simultaneously scrolled. A related image is considered to have the same orientation (axial, coronal, sagittal) as the image in the active viewbox.

When first loaded into the Viewer, the loaded image synchronizes with images of the same orientation.

- DICOM — Image with the same orientation synchronizes with other images.
- Non-DICOM — Only works if the image number is the same.

Triangulation Synchronization

Note: For this release, the triangulation synchronization function is available only for the desktop platform.

Localizer Line

Northstar synchronizes different orientations for series or multiphase series with a blue localizer line in nonactive viewboxes. This allows the user to track nonactive viewboxes related to the slice in the active viewbox.

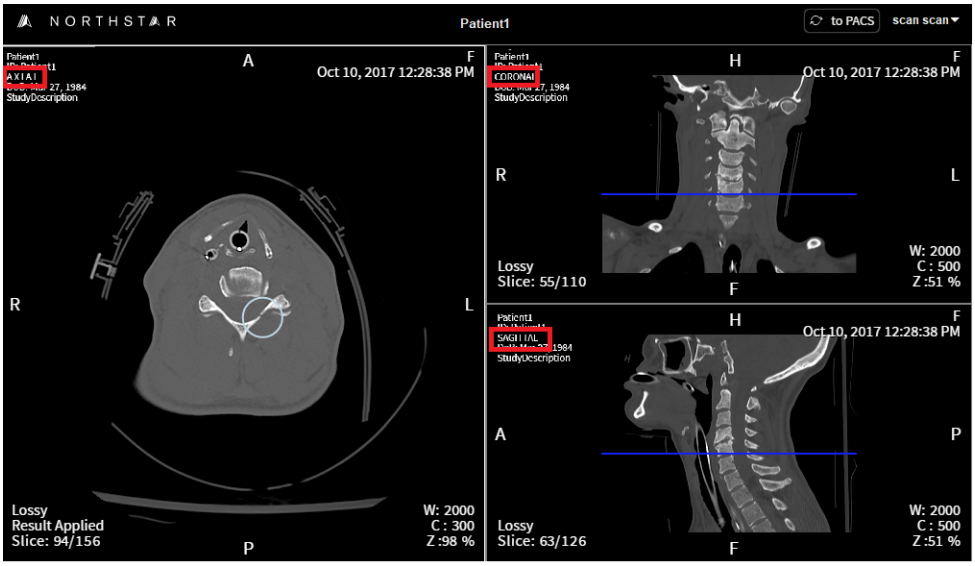


Figure 4-43 Axial Image is Active, Localizer Line on Coronal and Sagittal Images

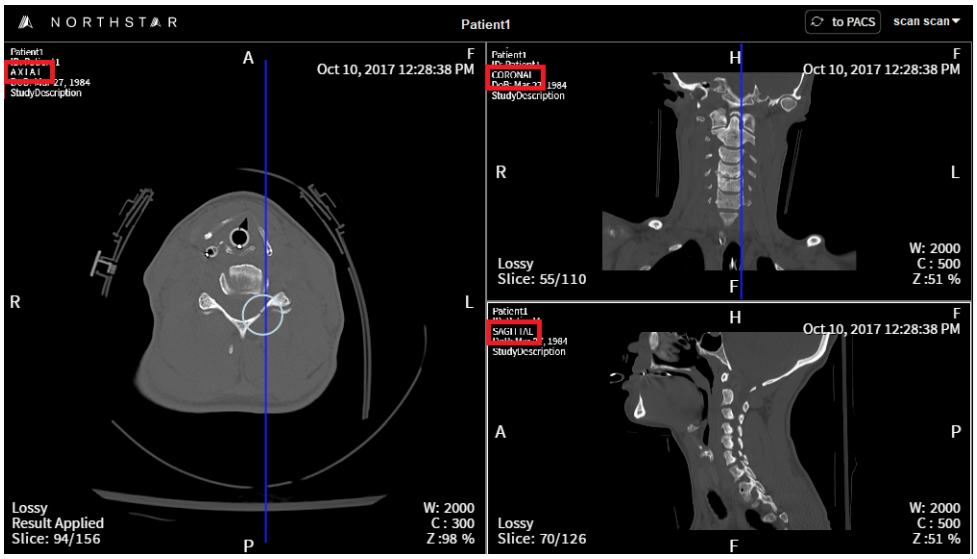


Figure 4-44 Sagittal Image is Active, Localizer Line on Axial and Coronal Images

Triangulation Tool

Depending on how it is accessed, the triangulation tool appears in the viewbox in two different ways:

- From the Radial Menu.
- Using Alt + LMB-click

From the Radial Menu, select the triangulation tool.  See "Radial Menu" on page 4-13 for more information about the Radial menu and other tools.

To use ALT + LMB-click:

- LMB-click and release

  The cross-hair is displayed on the point of interest on each nonactive viewbox. Each of the nonactive related viewboxes displays the cross-hair only if the point of interest is present. The image pans if the point of focus is not in visible from the image. If the image pans, the point of interest is set to the center of the viewbox. The point location (triangulation) is present until the user places another point or selects another tool.

- LMB-click and hold

  The cross hair displays on each viewbox and moves with the LMB-hold mouse until the user releases the LMB. When the LMB is released, the cross-hair continues to display on each viewbox until the user places another point or selects another tool.

Note: The triangulation cross-hair and the localizer line cannot be used together.

WW/WL Synchronization

The recommended WW/WL levels are applied to each image in a viewbox. The WW/WL automatically adjusts for the synchronization image (DICOM only). Synchronization is enabled by default.

Note: Your Administrator can configure synchronization to absolute or relative settings.

Enabling and Disabling Synchronization

By default, synchronization is enabled, but can be toggled on/off using the space bar.

Current Limitations

Synchronization is done only between visible series. If you perform some action (scroll, change window levels) and then change the layout or load results from the Content Selector, the new series is out of synchronization with the rest of the series. If you use the Content Selector to load a series that is already displayed, it resets to the default values whether the synchronization is enabled or not.

Table 4.5: Synchronized Features

Action	Synchronized Behavior
Distance	This setting should not synchronization under any circumstance.
Scroll	To synchronize a slice position: • Get the image position orientation (3D vector) from the image in the active viewbox (the one being scrolled) into the source viewbox. • Looping through each image in the series. • Getting the image position orientation for the image. • Getting the distance from that vector to the vector in the 'active' viewbox. • Synchronizing to the image which gave you the smallest result. The images only synchronize if the distance found is less than the slice thickness. This prevents scrolling on a Sagittal or scout image from resetting the Axial series to the first slice.

Action	Synchronized Behavior
Window Level	There are two modes set in the database: • Absolute - sets identical to WL values in all synced series. • Relative – changes each synced series with the same 'delta'. **Overlay Presets** Using the overlay presets to change the window level triggers a sync event, and regardless of the mode, sets the identical WL value in the active series and all synced series. **Manual Input** Manually inputting a window level triggers a sync event.
Zoom	Sets identical zoom values in all synced series when zoom is done by mouse or manual input. **Overlay Options** Zoom To Fit – Zooms all synced series to their respective 'fit' zoom level. Zoom To 100% - Zooms all synced series to 100%.
Pan	Between series having the same patient orientation. If orientation is unknown, then no sync occurs. Orientation is determined from the tag (0020,0037) and the Image Orientation (Patient) which contains two vectors describing the direction of the image rows and image columns in the reference coordinate system. There are four possible values: • Axial • Sagittal • Coronal • Unknown
Orientation	Orientation is unavailable with synchronization.

Managing Results and Annotations

In addition to the tools listed in this section, you can use the Radial Menu annotation tool to add text to a finding. See "Radial Menu" on page 4-13.

Accept/Reject (A/R) UI Menu

In a DICOM series or when you add shapes and measurements to a series or image, the **A/R UI Menu** appears when you hover the mouse at the bottom of an image. This menu is available for all findings. For information on DICOM RT images, see "Chapter 5", , on page 5-1.

You can use the A/R UI Menu navigation arrows to jump automatically to the next finding.

The A/R UI Menu appears automatically (at anytime) when a finding is selected. If there are no findings, the A/R UI Menu is not available and only the Accept (Check) and the Reject (X) options appear at the bottom of the image.

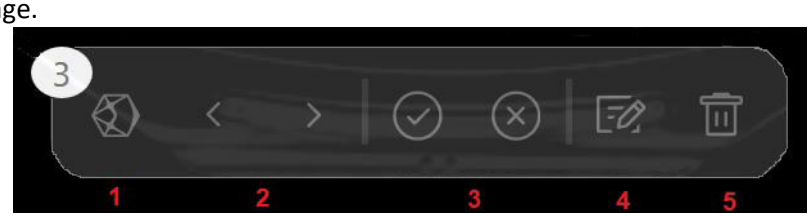


Figure 4-45 Accept/Reject UI Menu Indicating Findings

Table 4.6: Table 4.4: Accept/Reject UI Menu

Menu Icon	Definitions
 1	EnvoyAI icon displays all pending or accepted findings in the current study. LMB-click on the EnvoyAI icon to see the pop-up list of findings. This list includes any DICOM RT with findings. The number is the number of findings in the study.
 2	The arrows **< >** allow navigation through the findings. **Note:** If the next finding is not on the visible area, the viewbox zooms and pans to display the finding in the center of the screen.
 3	**Accept/Reject** selection on findings in the study. By default, all content is considered and marked as accepted. You can click on the check mark to accept a finding and on the X mark to reject a finding. Any of the Accept/Reject edits are saved to the Northstar database. If there are no findings in a study, the Accept/Reject icons are the only available menu at the bottom of an image.
 4	Add a comment under the finding in the image. Or use the ABC tool, see the "Radial Menu Desktop Platform" on page 4-16 for information. **Note:** You can only add a comment to selected findings.
 5	Deletes the finding indicator from the image. See the "Radial Menu Desktop Platform" on page 4-16 for about adding finding indicators. **Note:** You can only delete a user finding. Machine findings are only accepted or rejected and cannot be deleted.

Accept/Reject (A/R) UI Menu on a Mobile Device

The mobile version of the Accept/Reject UI Menu is altered to fit a mobile device screen. It displays only in loaded studies with the 1X1 layout format. If the source series is loaded, this menu does not display unless a finding is added to the source series.

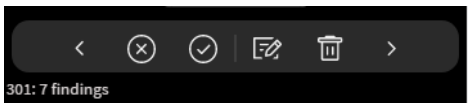


Figure 4-46 Mobile A/R UI Menu

The mobile Accept/Reject UI Menu contains icons for navigating to the previous finding, rejecting a finding, accepting a finding, adding a comment, deleting a finding, and navigating to the next finding.

Using the Accept/Reject UI Menu on the Mobile Platform

- When the user draws an annotation on source series, the A/R menu appears.
- For GSPS/RT/Mammo CAD SR datasets, the menu includes icons for Previous, Reject, Accept, Edit Comment, Delete, and Next.
- When no finding is selected and user taps on accept/reject buttons on A/R toolbar, then “Please select a finding” message is displayed which disappears after few seconds.
- If finding is selected and user taps on accept/reject button, then finding state changes accordingly. This working is similar to that of desktop.
- If user taps on Next or Previous buttons, finding is navigated accordingly. This works like the desktop platform.
- If finding is selected and user taps on Delete button, it will delete selected finding and navigate to next finding. This works like the desktop platform.
- For PDF/SR/Image or DICOM SC, only binary AR toolbar (just accept & reject icons) are displayed.

Navigate through finding shapes using the arrows < > or use a finger to swipe on the A/R UI menu bar. Using a finger, swipe from left to right on the accept-reject toolbar for navigating to next finding. With one finger, swipe from right to left on the accept-reject toolbar for navigating to previous finding.

From this menu, you can tap on the X to reject a finding or the check mark to accept a finding. Tap the comment icon to add or edit a comment on the finding shape. If no finding is shown on the image, you are prompted to select a finding. Navigate to a finding and the text tool panel opens to add a comment. Select the trash icon, to delete a finding.

Adding a Comment in the Mobile Platform

1. Switch to 1x1 layout to get accept-reject toolbar and select the measurement to add a comment.
2. Click on comment button on the toolbar.
3. Text box is displayed with **Ok** and **Cancel** button and a title “Comment”.
4. Type in the comment in the text box displayed and click **Ok**.
5. Text box is closed, and comment is displayed under the measurement center aligned.
6. The change is saved in the result the measurement belongs to.

Editing a Comment in the Mobile Platform

1. Tap on the comment text of the measurement to edit it.
2. Text box is displayed with the existing comment in it and keypad is brought up for user to type in.
3. Edit the comment text and click **Ok**.
4. Text box is closed, and the updated comment is displayed under the measurement center aligned.
5. The change is saved in the result the measurement belongs to.

Adding a Comment to the DICOM-SC Results in the Mobile Platform

Adding comment on DICOM SC result series adds an unformatted text annotation on the series.

1. Switch to 1x1 layout to get accept-reject toolbar and tap on navigate buttons to select the DICOM SC result series.
2. When the DICOM SC result series is selected, measurement display is toggled off.
3. Click on comment button on the toolbar.
4. Text box is displayed with **Ok** and **Cancel** button and a title “Text tool”.
5. Type in the text in the text box displayed and click **Ok**.
6. Text box is closed, and comment is displayed as a new unformatted text annotation.
7. The change is saved in either as a new GSPS result or as a new copy of the currently loaded result.

Note: Editing the text added as a comment to the DICOM SC result series is same as editing an unformatted text annotation.

Image Orientation

Orientation is managed by a tag in a DICOM header. Orientation helps a doctor or technician turn the image to select or find an abnormality in the patient's image.

Note: This tool is available for DICOM images only.

If Orientation has been disabled or cannot be found in the DICOM header, you can adjust the image orientation.

When loading a DICOM image in Northstar, the image orientation annotations are displayed:

- **A** for anterior.
- **F** for feet
- **L** for Left
- **R** for right.

To flip the image horizontally, LMB-click the L or R. To flip the image vertically, LMB-click on A or F.

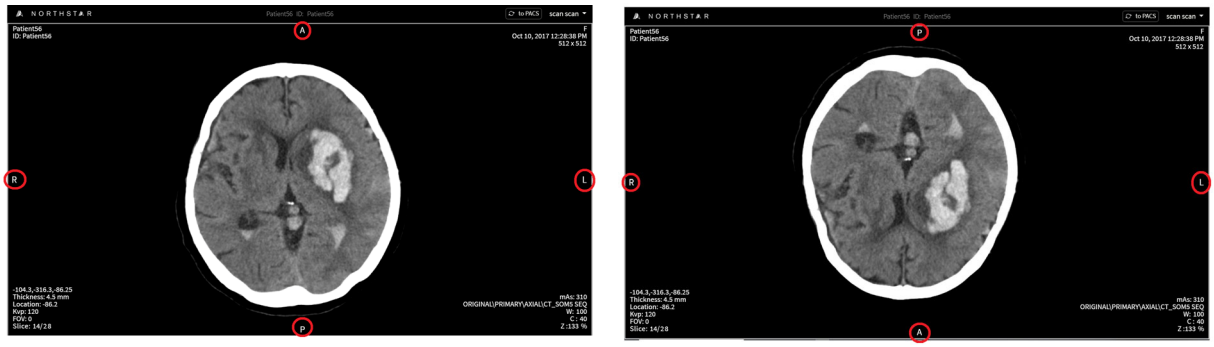
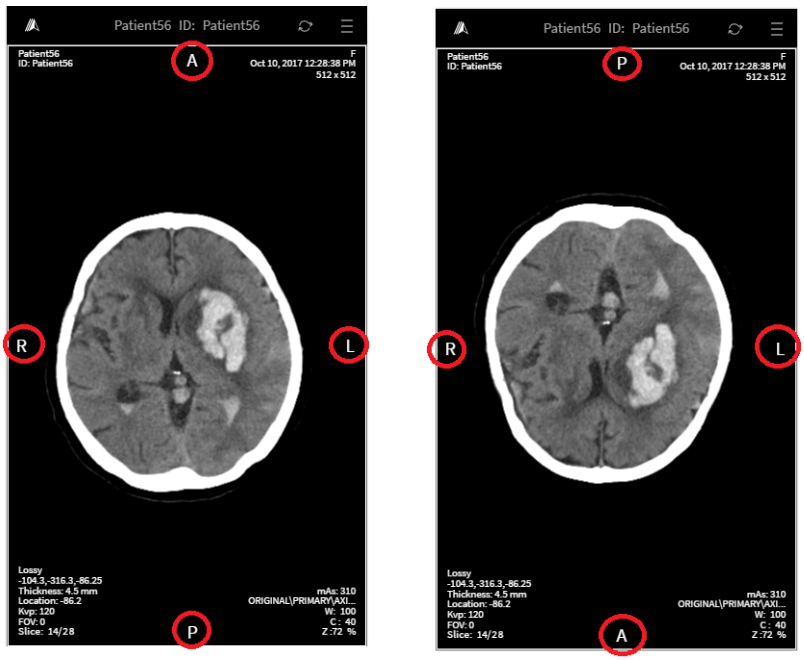


Figure 4-47 Orientation from Switching from Anterior to Posterior

Orientation on a Mobile Device

To change the position of an image on a mobile device, tap the A/P or L/R on the image and its position moves to the opposite placement. The Anterior view turns to Posterior view and Left side flips to the Right side.



In Default Orientation **Orientation switched from Anterior to Posterior**

Figure 4-48 Mobile Device Orientation Icons

Image Rotation

Hover your mouse over an orientation icon (A, P, R, L). Directional arrows appear so that the image can be rotated from any orientation position. (Figure 4-49)

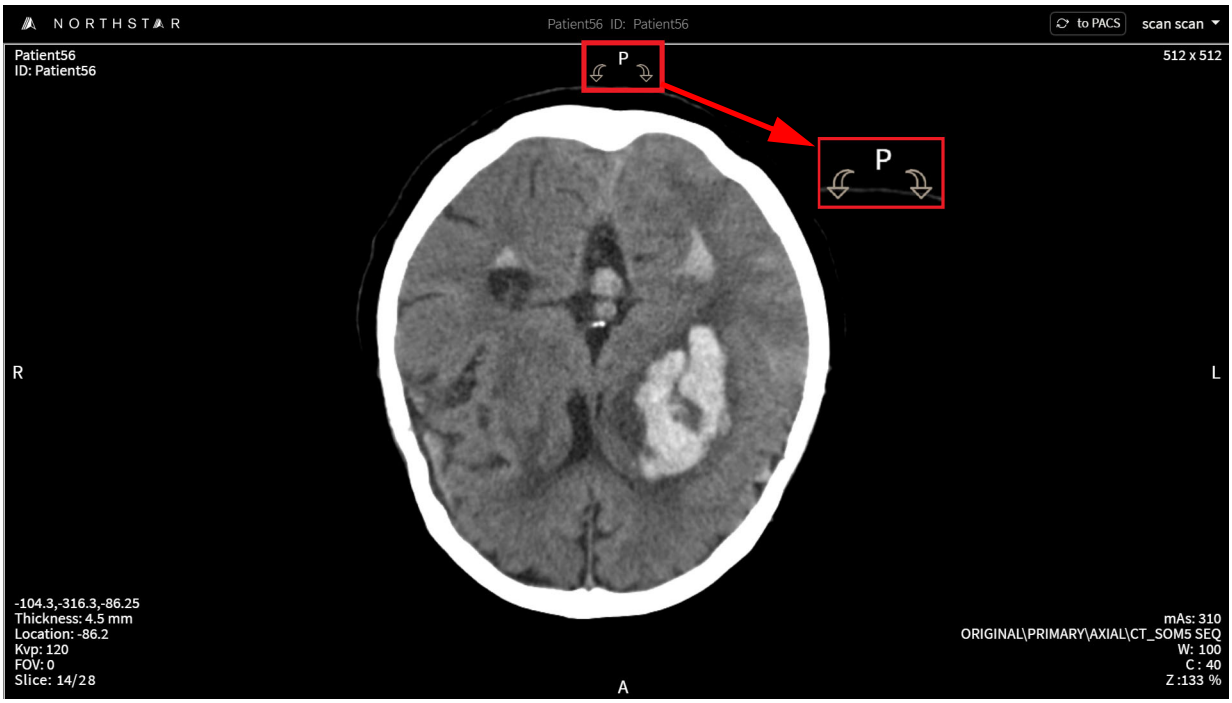


Figure 4-49 Using the Rotation Arrows

Rotating Images on Mobile Devices

On the mobile device image, use two fingers on the image and rotate in a clockwise arc. If you travel more than 90 degrees, the rotate command is triggered. Use two fingers on the image and rotate in a counter-clockwise arc. If you travel more than -90 degrees, the rotate command is triggered.

Lossy

Lossy Compressed

The image transfer from the server to the client is optimized to provide the image as fast as possible to the user. The application may compress the image and provide a Lossy warning. The server will uncompressed the image and display it correctly.

Lossy 1-1 Relationship

The image is displayed on the screen. The relationship is between the number of the screen's pixels and whether it is lower number than the images pixels displayed. Unlike the lossy compressed, the server does not update the image.

Chapter 5 Using DICOM Results

DICOM Radiation Therapy (RT)

Note: When loading DICOM RT in the Northstar Viewer, the first DICOM RT group displays automatically. Also note, you can draw an annotation (GSPS) on top of the DICOM RT but later, you will not be able to load both together. You will have to load one or the other. Multiple results loaded into the same viewbox is not supported at this time.

RT UI Legend

For all studies with an associated DICOM RT result, the RT UI Legend is displayed and lists all the segmentations within that study. A segmentation is a combination of multiple contours (outlines/regions of interest) on multiple slices. The Legend displays a list of segment names with a dot next to each. The color of the dot indicates the finding's state. The color of the name is matched to the contour outline color.

By default, the RT UI Legend appears on the left side of the viewbox.

Note: The RT UI Legend is not currently available on the mobile platform.

Navigating the Legend

Selecting the dot next to the listed segment name navigates to the first slice in the study and displays a highlighted contour in the same color as that segmentation.

- When the dot next to a sequence name is selected, the viewbox jumps to the first contour of the segmentation.
- If you LMB-click on the listed segment name, the contour hides; LMB-click on the name again and the contour displays.

Note: When a user edits an RT image, Northstar automatically creates a copy. All edits are saved to this copy and it can be used later if a comparison is needed

Using the Mouse

- When the mouse is not hovering over the Legend, the Legend is faded out.
- When the mouse is hovering over the Legend, the Legend appears lighter.
- You can change the position of the Legend on the image by LMB-clicking on the Legend title and dragging it to the desired position.
- When there are additional findings that are not displayed in the Legend, you can use the mouse wheel to scroll through the entire list.

Viewing the Segment Contours

If the image view has been zoomed/panned, and the contour does not fit in the viewbox, the contour is centered in the middle of the viewbox, and the zoom/pan is adjusted so that the entire contour is visible. You can draw an annotation (GSPS) on top of the DICOM RT but you cannot load both simultaneously later. You must load either the annotation or the segmentation.

Note: The ability to load multiple results into the same viewbox is not supported at this time.

For information about editing a contour, see Chapter 4, "Polyline Tool" on page 4-23.

Using the A/R UI Menu for RT Images

With RT images, findings listed in the A/R UI Menu bar correspond to the segments listed in the RT UI Legends menu. You can use the A/R UI Menu to move between findings or select segments in the Legend.

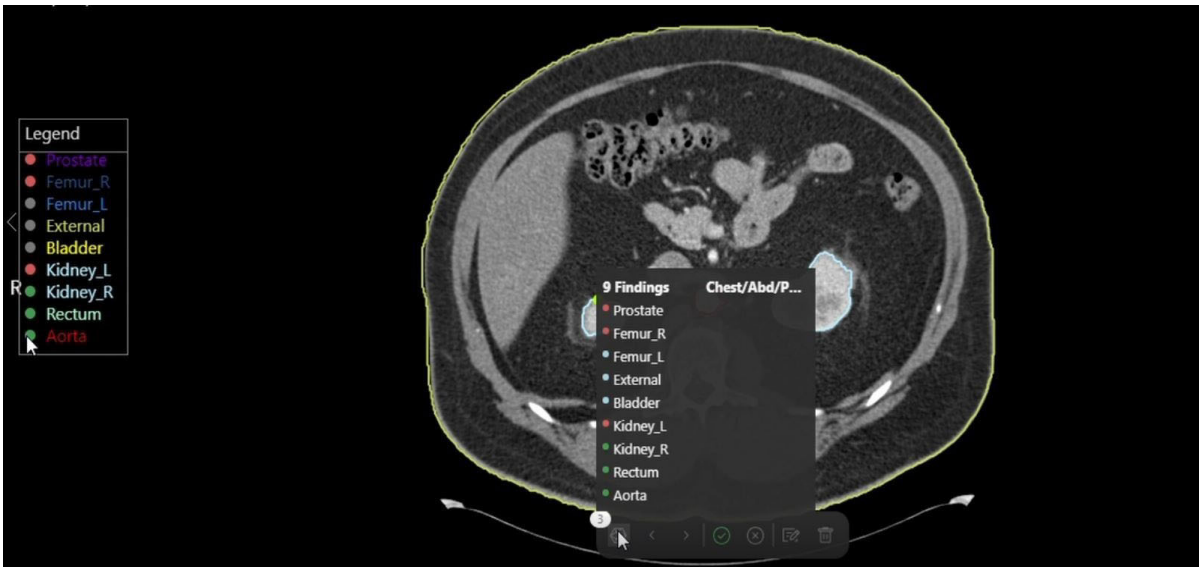


Figure 5-1 Both Finding Segments with Current State are Listed

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Note: The A/R UI Menu is available on the mobile platform. The RT Legend is only available on the desktop platform.

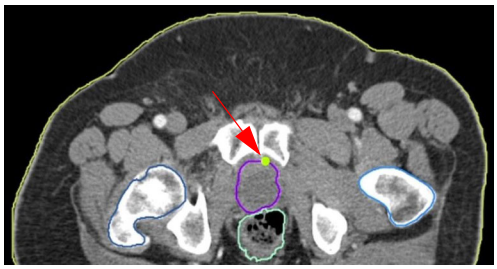
Navigating Segment Findings

You can use the RT UI Legend or the A/R UI Menu to navigate through findings associated with segments, that is, physical areas shown in the RT images.

To use the RT UI Legend:

1. Hover over the Legend and it brightens.
2. Select a segment by LMB-clicking on the dot next to its name.

To use the A/R UI Menu bar:



1. Use the back and forward tools (arrows icons on the A/R UI Menu) to navigate to the next finding. You can also navigate using your keyboard directional arrows.
2. As you navigate back and forth, you will see a highlighted dot on active findings.
3. After accepting or rejecting a finding, the viewbox automatically navigates to the next findings.

For a full description of the A/R UI Menu see "Chapter 4", Accept/Reject (A/R) UI Menu, on page 4-34.

To edit a contour, see the Polyline Freehand option in Chapter 4, "Polyline Tool" on page 4-23.

To hide the contour, click once on the Result Applied text that appears in the lower left, bottom viewbox menu. You can use the keyboard shortcut “g” to toggle contours on and off as well. See Appendix A "Keyboard Shortcuts" for more keyboard shortcut options.

Plain Text in Show Mode **Italicized Text in Hide Mode**

Figure 5-2 Toggling the Show/Hide Option

Note: Navigating segment findings is not available on the mobile platform.

DICOM Structured Report

DICOM Structured Report documents consist of a document header and a document body. The header metadata attribute values are grouped into modules such as “Patient” or “General Study”.

The DICOM Structured Report is indicated in the study List page in the Modality column. (Figure 5-3)

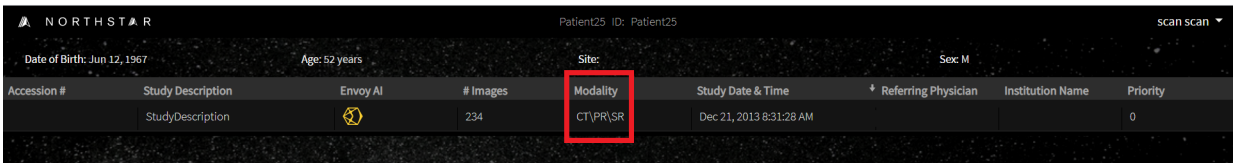


Figure 5-3 DICOM SR shown in the Study List Page

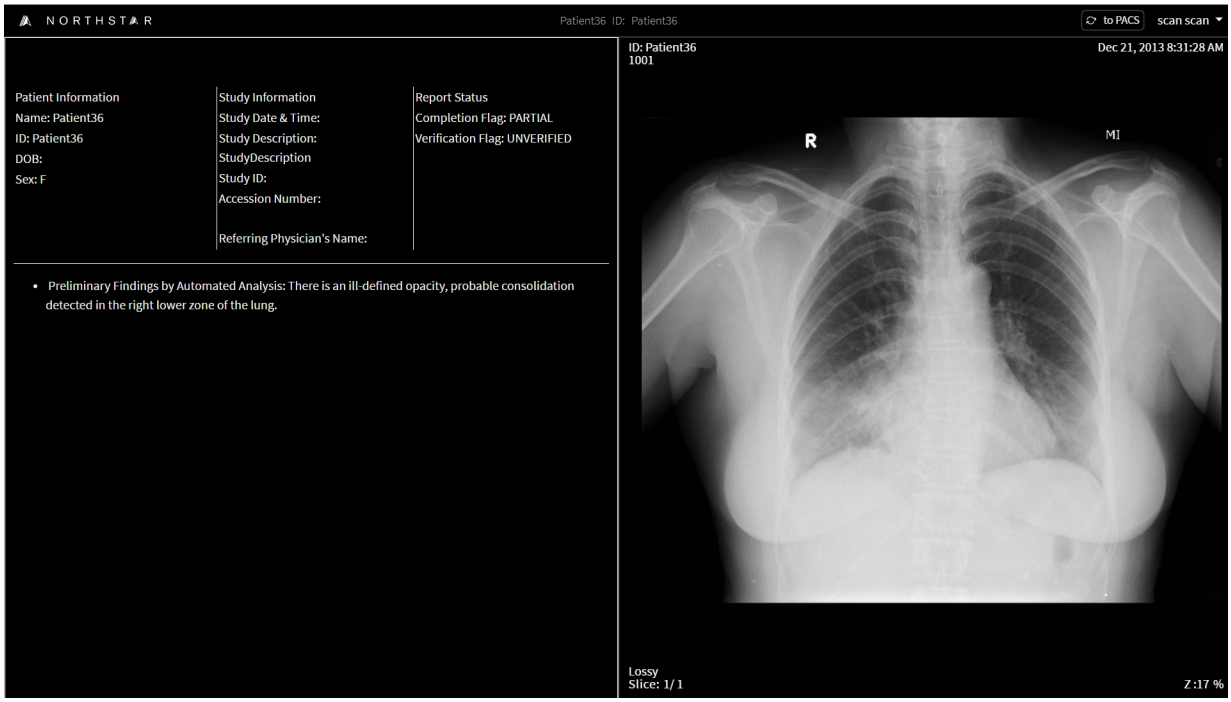


Figure 5-4 DICOM SR in Viewer

If a study instance SOP UID is present in the Viewer, you can LMB-click to navigate to that image. If an SR is available, the user can select it using the Content Selector and the viewbox automatically switches the currently loaded images to the SR image.

Additional functionality includes:

- The A/R UI Menu can be used in the DICOM SR.
- The content of the DICOM SR can be edited.
- If the DICOM SR is too big, a scroll bar should be displayed when you scroll or when you mouse over the right part of the DICOM SR. Scrolling can also be performed using mouse wheel.
- You can send the DICOM SR results to PACS.
- If **Enable user action tracking** is disabled in the Sync to PACS settings, edits to the DICOM SR are not saved unless you send them to PACS.

DICOM SR on Mobile Devices

To open an DICOM SR on your mobile device, use the Search panel and select the SR modality. Then LMB-click the **Search** button. Select the desired study from the results, click in the study list row, and load the study into the Viewer.

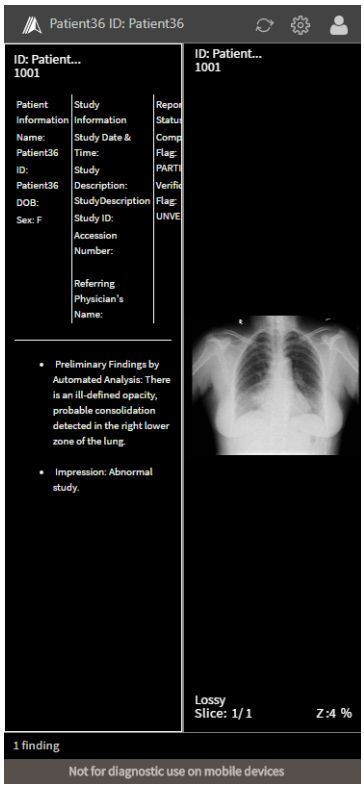


Figure 5-5 Mobile Device View of DICOM SR

Copying Structured Report Content

In a viewbox containing a structured report you can use CTRL + C to copy all content or RMB-click (opening the context menu) to select specific text to copy. This content can be pasted in any location or document.

Context Menu

The RMB-click pop-up context menu for copying content is only available in the SR viewbox. The context menu closes once a menu item is selected.

The copy functionality is available in the following browsers: Chrome, Edge, and Internet Explorer (IE11). When using the context menu function in IE11 for the first time, you may see this dialog warning:

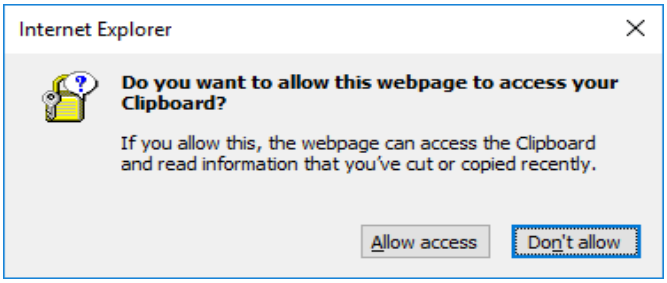


Figure 5-6 Internet Explorer Dialog Window

If you choose **Don't allow**, the context menu does not work. If so, when selecting text and using the context menu to copy it, you see the warning dialog shown in Figure 5-6.

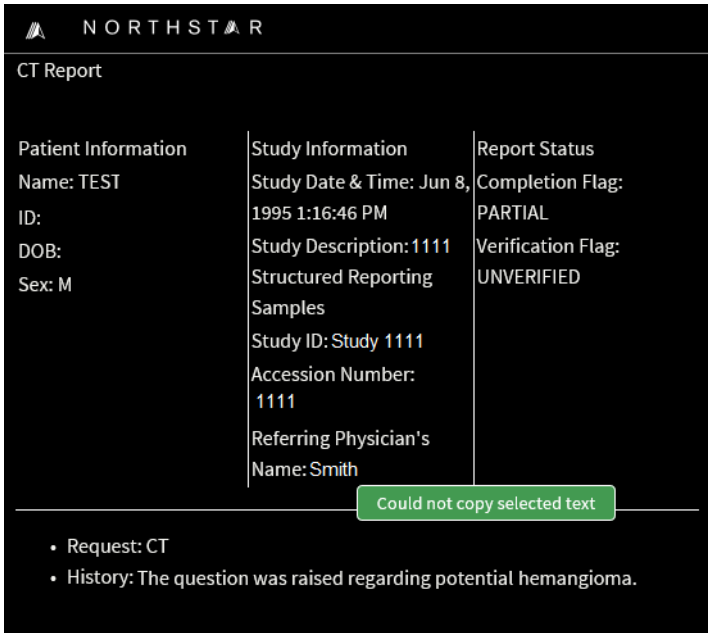


Figure 5-7 Copy Failure

Output Panel

Northstar provides an Output Panel to display a consolidated list, also referred to as a thumbnail, of all findings in one view. The Output Panel allows the user to filter findings by their state — Accepted, Pending, Rejected or any combination of these states. The user can review the thumbnail findings, lookup the history of when findings were created, see what type of annotation indicates a finding, and see which user created that finding.

The Output Panel displays a series description summary, the finding count, the edition date-time, and editor name. The edition date-time value indications the date and time when a finding was edited, accepted, or rejected. It also displays machine/user level filters as sub-buttons for accepting or reject findings. There are filtering tools available in the Output Panel and described in the section, "Output Panel Tools and Operations" on page 5-13.

Supported Formats in the Output Panel

The Output Panel allows the user to review types of formatted findings in a study. Supported formats are:

- DICOM Secondary Capture (SC)
- DICOM-SR
- GSPS
- DICOM RTStruct
- Non-DICOM (PNG/JPG/PDF)
- Mammography CAD SR
- Parametric Map

Note: These formats are also supported in the Output Panel on the mobile platform.

Using the Output Panel

When a study has findings, you can open the Output Panel to view each finding in separate “thumbnails”. (Red box outline, Figure 5-8)

Figure 5-8 Output Panel

To open the Output Panel in the Viewer:

1. Hover your mouse on the right edge of the viewbox about mid-point.
2. A gray circle appears.
3. LMB-click the circle.

4. The Output Panel opens.

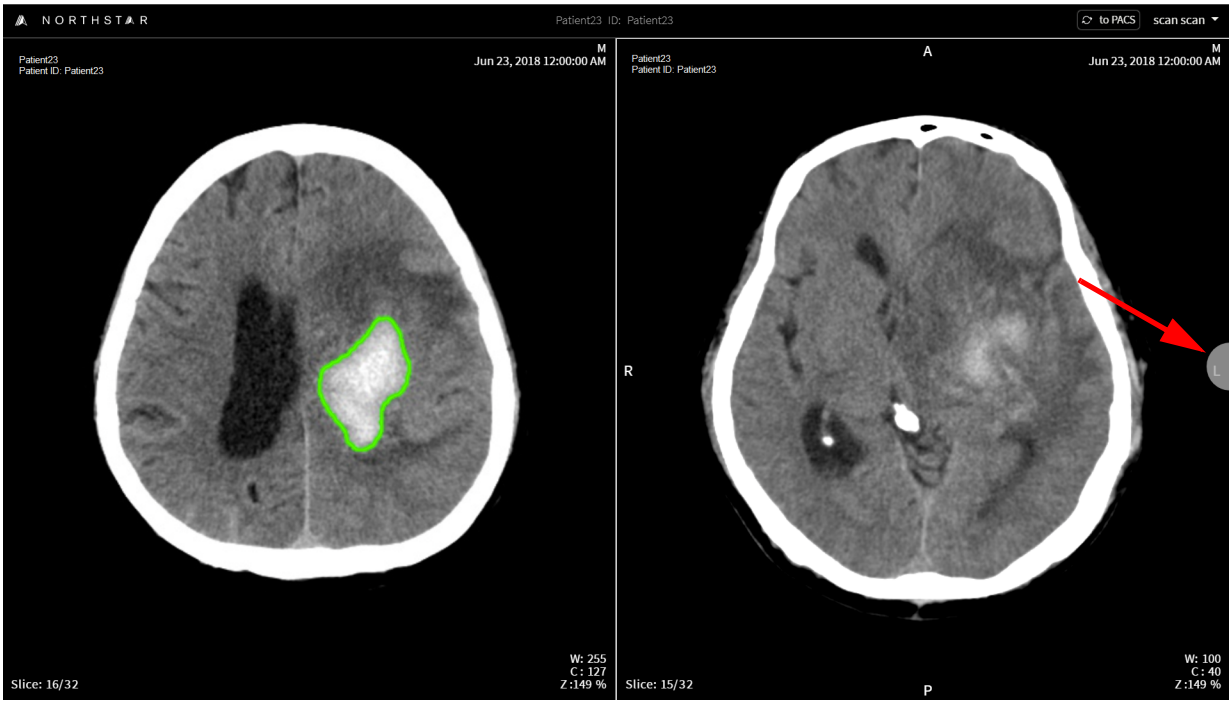


Figure 5-9 Opening the Output Panel

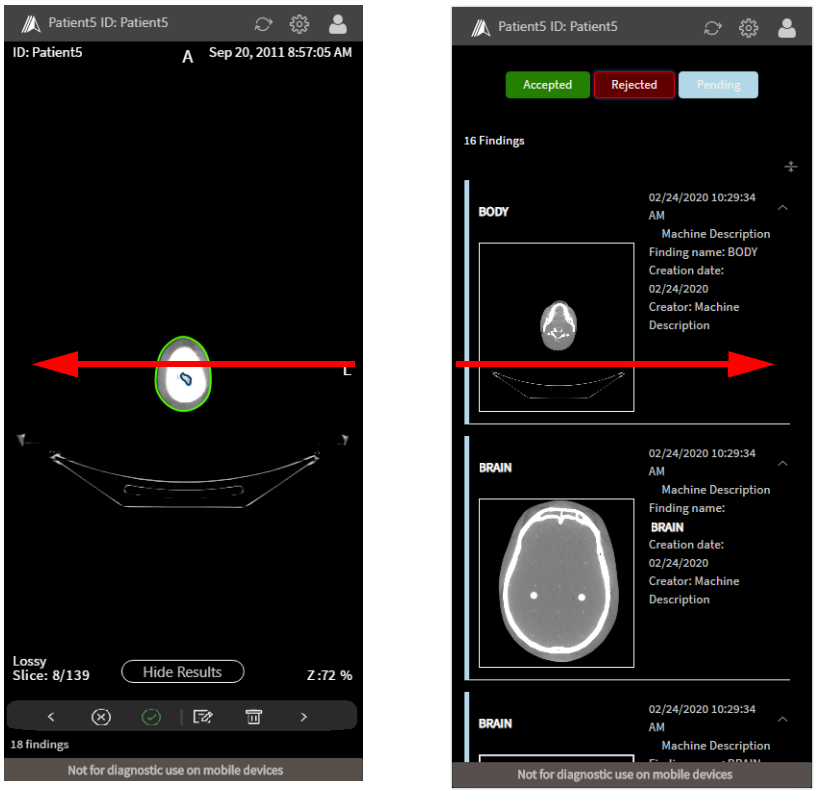
There are two ways to close the Output Panel, either:

1. Hover your mouse around the left side of the Output Panel at mid-point and LMB-click on the gray circle that appears, (Figure 5-10) or;
2. LMB-click anywhere outside of the Output Panel in the Viewer. The Output Panel closes.

Figure 5-10 Half Circle to close the Output Panel

Using the Output Panel in a Mobile Device

To open the Output Panel on a mobile device, in the image slide one finger across the image from the right side to the left side. The Output Panel opens. On a mobile device, only finding thumbnails are viewable. Select a finding state at the top of the Output Panel to filter the thumbnail list. To select one of the findings, tap on the thumbnail image.



Slide Right to Left to open Output Panel **Slide Left to Right to close Output Panel**

Figure 5-11 Mobile Device Output Panel

Filtering Findings in the Output Panel

You can filter through **Accepted**, **Rejected**, or **Pending** findings, or any combination of these states using the buttons at the top of the Output Panel. (For the mobile platform, these same filters are shown in the right side image in Figure 5-11.) The selected buttons are highlighted, and the non-selected buttons remain dark. At least one filter is always active.

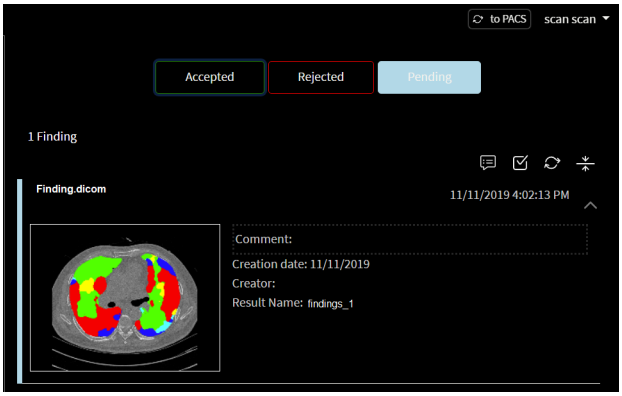


Figure 5-12 Filtered for Pending Findings

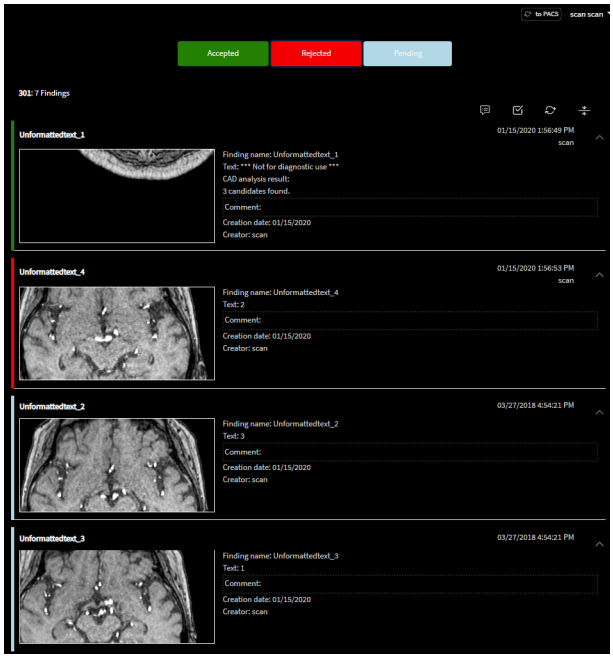


Figure 5-13 All Filters Selected

Jump-to Tool

The jump-to tool allows you to quickly select and open a finding from the thumbnail list. To use the jump-to tool:

1. Hover your mouse over the center of the thumbnail image, the interactive jump-to icon appears.

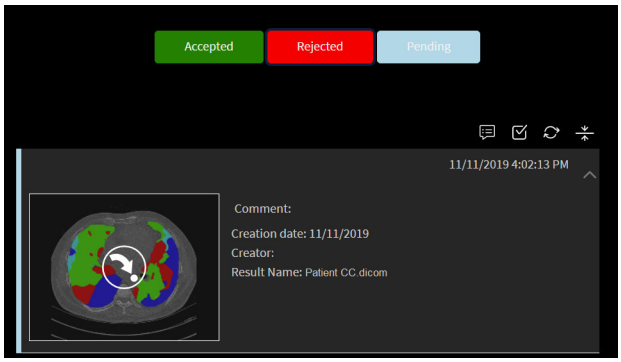


Figure 5-14 Activated Jump-to Arrow and Point

2. To load the results, LMB-click on the jump-to icon.
3. This opens the image with this finding in the Viewer.
4. If the finding can't be loaded, an interactive information banner appears.

Figure 5-15 Interactive Message

Note: This tool can be used with multiphase series.

Opening a Finding on a Mobile Device

On the mobile platform, from the Output Panel, tap the thumbnail image to open the finding in the Viewer. If you tap in the finding list but not on the image, the finding thumbnail collapses. Tap again to expand.

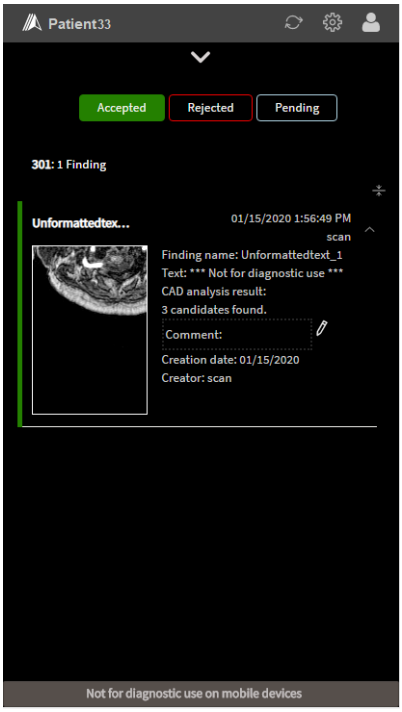


Figure 5-16 Mobile Finding Thumbnail

Grouped Findings

For DICOM series that have grouped GSPS findings, one thumbnail per group is displayed in the Output Panel. The slice that is first displayed on the thumbnail when the Output Panel is opened is the first slice in that group with all the GSPS objects in that slice that belong to a group. If there are multiple unformatted text in the group, all the text is displayed one below the other beside the thumbnail.

Jump-to Tool with Non-DICOM Results

For non-DICOM results such as PDF, JPG, and PNG, when the results are already loaded in the viewbox, they are highlighted in the thumbnail in the Output Panel and stay highlighted as you select the jump-to tool.

Output Panel Tools and Operations

The Output Panel provides tools and filters for organizing Findings information.

Figure 5-17 Machines and Tools/Filters in the Output Panel

Adding Comments in Output Panel Findings

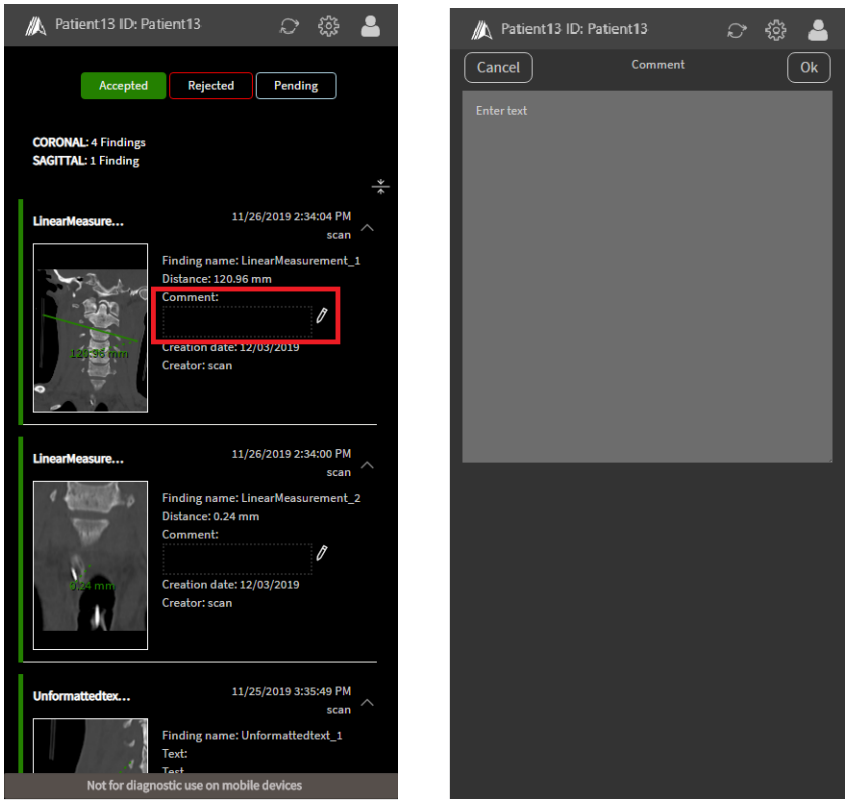
Depending on the study, you can add comments to thumbnails listed in the Output Panel. When you put your cursor into the comment field, the field highlights with a blue outline. Enter the desired comment.

Figure 5-18 Comment Field in the Output Panel

You can also edit or remove any added comments in the thumbnails.

Adding Comments on Mobile Devices

The comment field is available in the thumbnail list on the mobile platform. When you tap the comment field in the thumbnail, the Text panel opens. Enter the comment here and select **Ok** to save the comment or **Cancel** to dismiss the comment.



Tap Pencil Icon **Tap Enter Text to Add Comment**

Figure 5-19 Entering Comments on Thumbnails on the Mobile Platform

Filtering the Comment Field

Comments can be added to any thumbnail in the Output Panel.

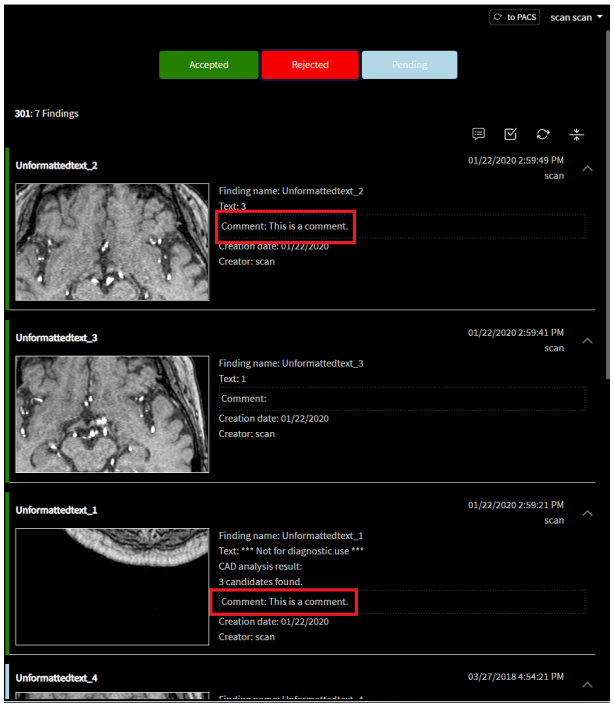


Figure 5-20 Thumbnails with Comments Highlighted

In the Output Panel, to display only thumbnails with text in the comment field (Figure 5-20), select the text filtering icon  . The Output Panel displays only thumbnails with comments. (Figure 5-21)

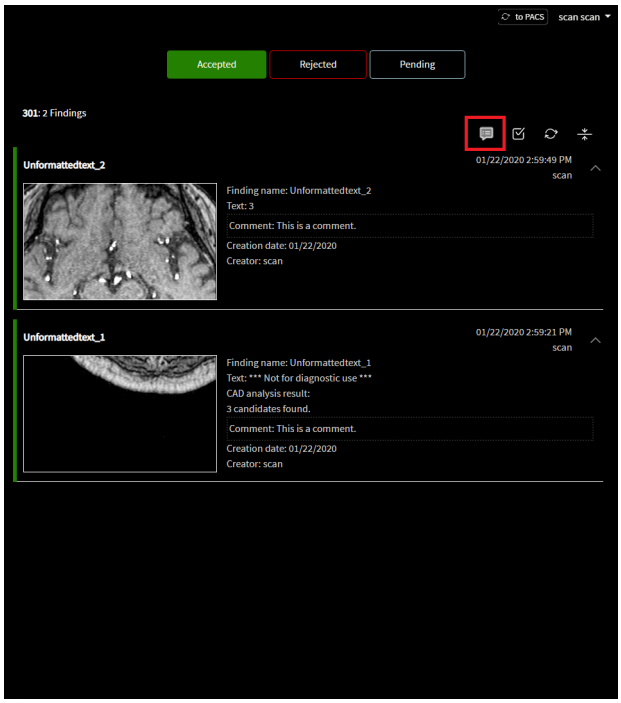


Figure 5-21 Thumbnails Filtered by Comments

Select All

You can select all thumbnail in the Output Panel using the  Select All tool. (Figure 5-22) When selected, the thumbnails highlight with a gray background. To copy the selected findings to a Word document, use Ctrl + C. (Figure 5-23)

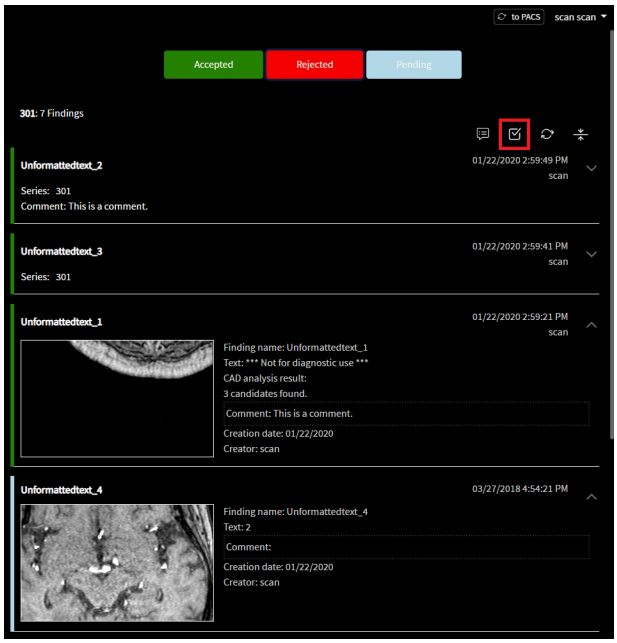


Figure 5-22 Unselected Thumbnails

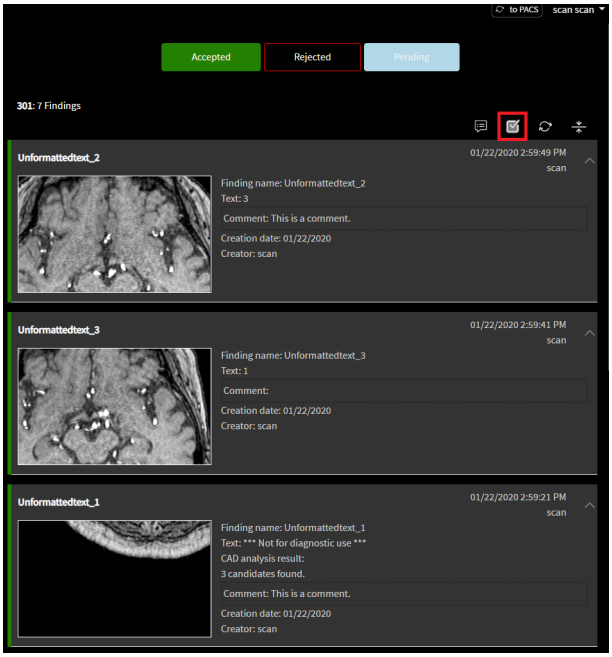


Figure 5-23 Selected and Copied Thumbnails

This opens the Sync AI Preview Window and copies this information to the clipboard.

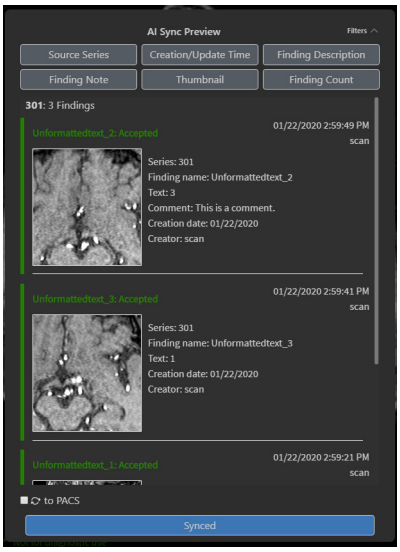
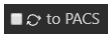


Figure 5-24 Sync AI Preview Window

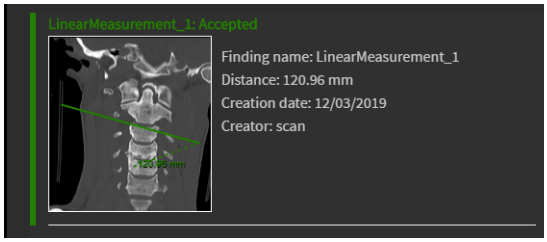
Sync Tool

To sync all findings in the thumbnail listings in the Output Panel, tap or LMB-click on the Sync tool. 

The Sync AI Preview Window opens. (Figure 5-24) The findings in this window automatically copy to the clipboard and can be pasted into a Word document. The Sync AI Preview Window provides filters for showing or hiding finding information. The filters can be collapsed or expanded using 

on the upper right side of the window. Check the box next to 

to send these findings to PACS.



Sync AI Preview Window Finding

Same Finding pasted to a Word document

Figure 5-25 Comparing Finding to Finding in Word Doc

Collapse/Expand All Thumbnails

Thumbnails in the Output Panel can be individually collapsed or expanded. The  tool simultaneously expands or collapses all thumbnail findings in the Output Panel.

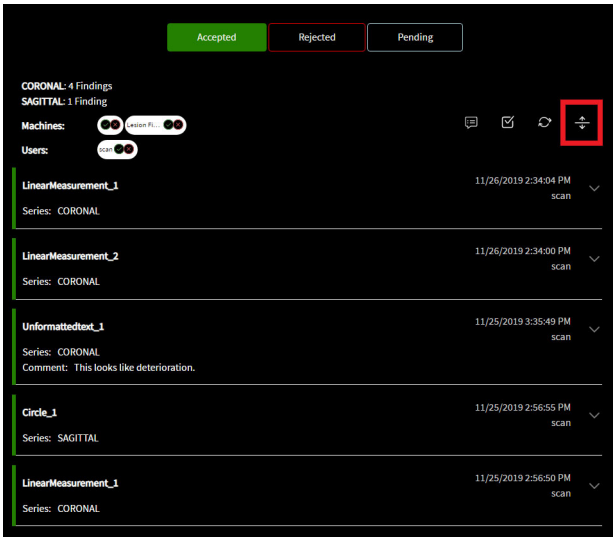


Figure 5-26 Tool to Collapse or Expand All Findings

Output Panel Supported Formats Display

Displaying Thumbnails

Cine

Cine can be performed when you mouse over a thumbnail in the Output Panel if the study that has one or more instances or if it has findings on multiple slices in a group for DICOM series with GSPS and RTStruct.

- Cine starts when the mouse is over the thumbnail.
- Cine stops when:
  - The mouse moves outside the thumbnail, but Output Panel is still open.
  - The mouse is taken over the jump-to tool.
  - The mouse is clicked anywhere on the thumbnail.
  - The latest image rendered is displayed.

Note: Findings listed in the thumbnails can be collapsed or expanded. This selection is saved and displays the next time you open the Output Panel.

Displaying DICOM-SC Results

A DICOM-SC result series can be accepted or rejected and be displayed in the Output Panel. By default, the thumbnail shows the first slice of the series. If the DICOM-SC series has any findings drawn on it, those findings are displayed separately.

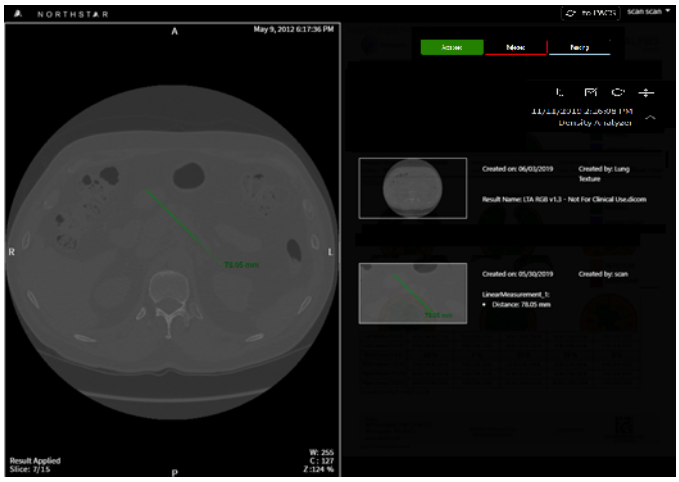


Figure 5-27 DICOM-SC Results in Output Panel

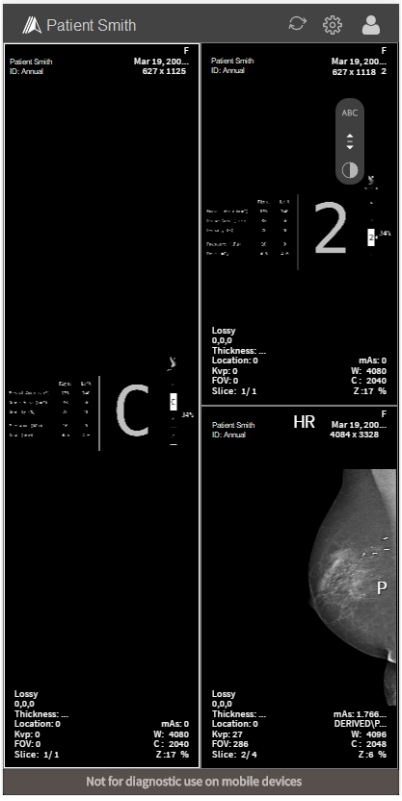


Figure 5-28 Output Panel with DICOM-SC on Mobile Platform

Displaying DICOM-SR Results

DICOM-SR results display with an icon **(2)** in the first thumbnail. Generic information like “created by” and “created on” also display and the series name of the SR Report **(1)** is used as the Result name **(3)** in the Output Panel text content.

Figure 5-29 DICOM-SR Results

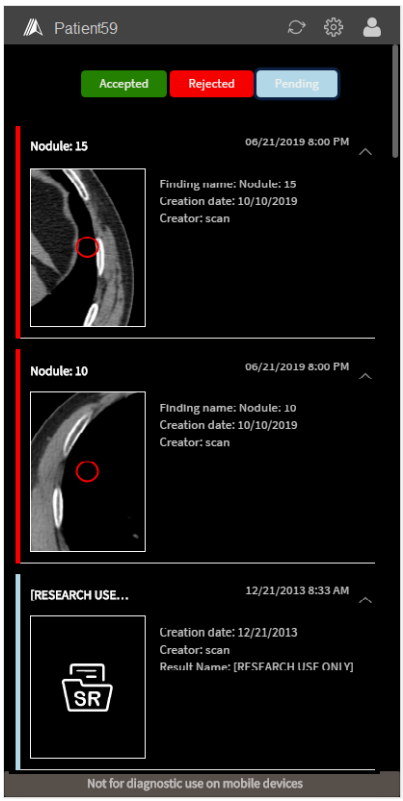


Figure 5-30 Output Panel with DICOM-SR on Mobile Platform

Displaying GSPS Results

When viewing Linear measurements or lines in GSPS Results in the Output Panel, the measurement text and the dotted line on the image adjust to thumbnail size to replicate proportionally the finding, the measurement or line, and the measurement information.

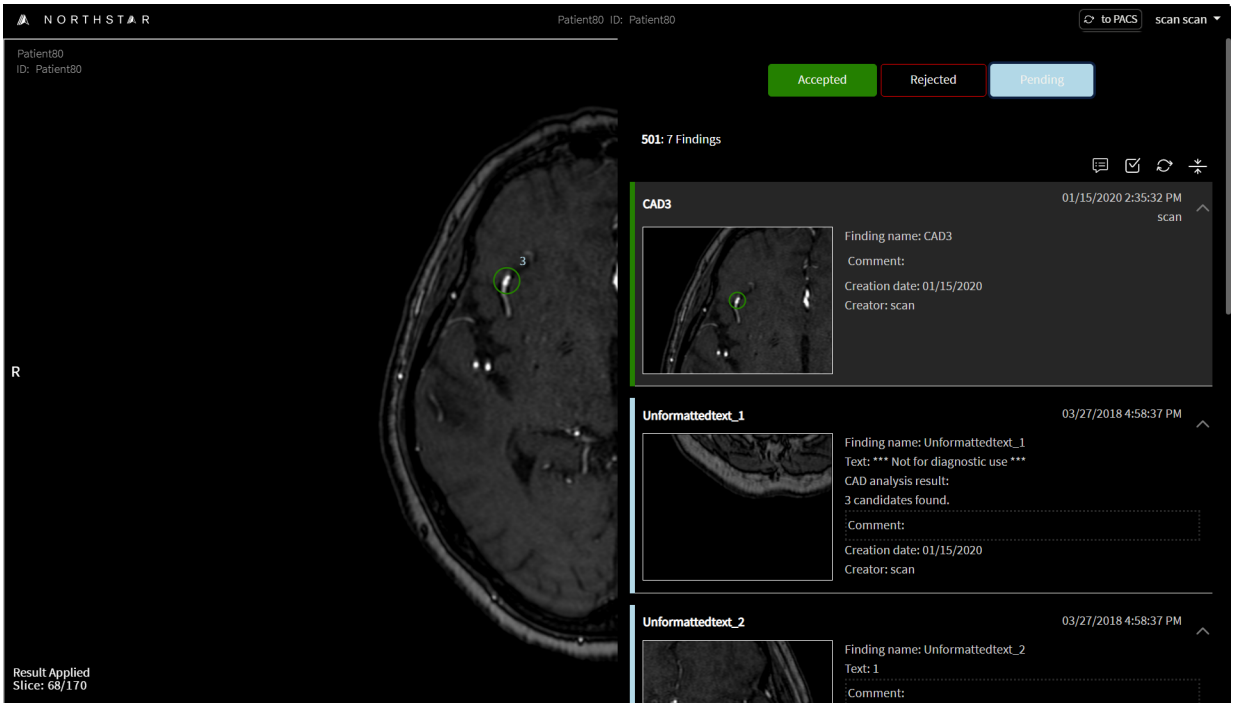


Figure 5-31 GSPS Image with Measurement in the Output Panel

Note: The text comment associated with a GSPS (if any) is not shown on the thumbnail because the text is already displayed in the thumbnail for that finding.

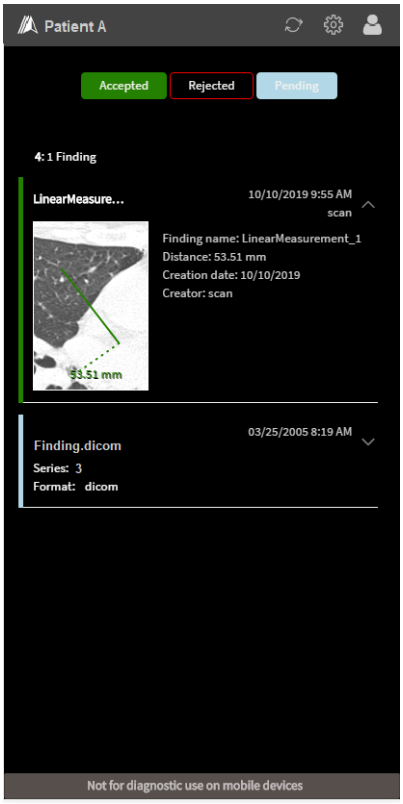


Figure 5-32 Output Panel with GSPS Image on Mobile Platform

Displaying DICOM RTStruct Results

DICOM RTStruct results, like the GSPS format, display the latest user copy or the user copy loaded into Viewer. Details such as the segment name for each contour is displayed in the thumbnail content.

Figure 5-33 RTStruct Results in Output Panel

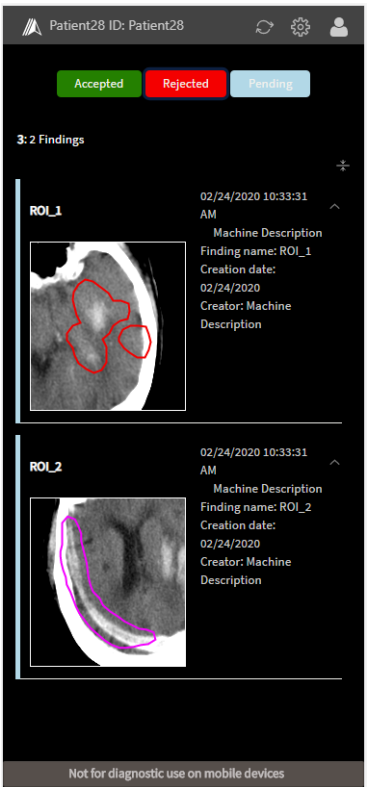


Figure 5-34 Output Panel with RTStruct on Mobile Platform

Displaying PDF Results

For non-DICOM results such as PDF images, details are displayed as text in the thumbnail.

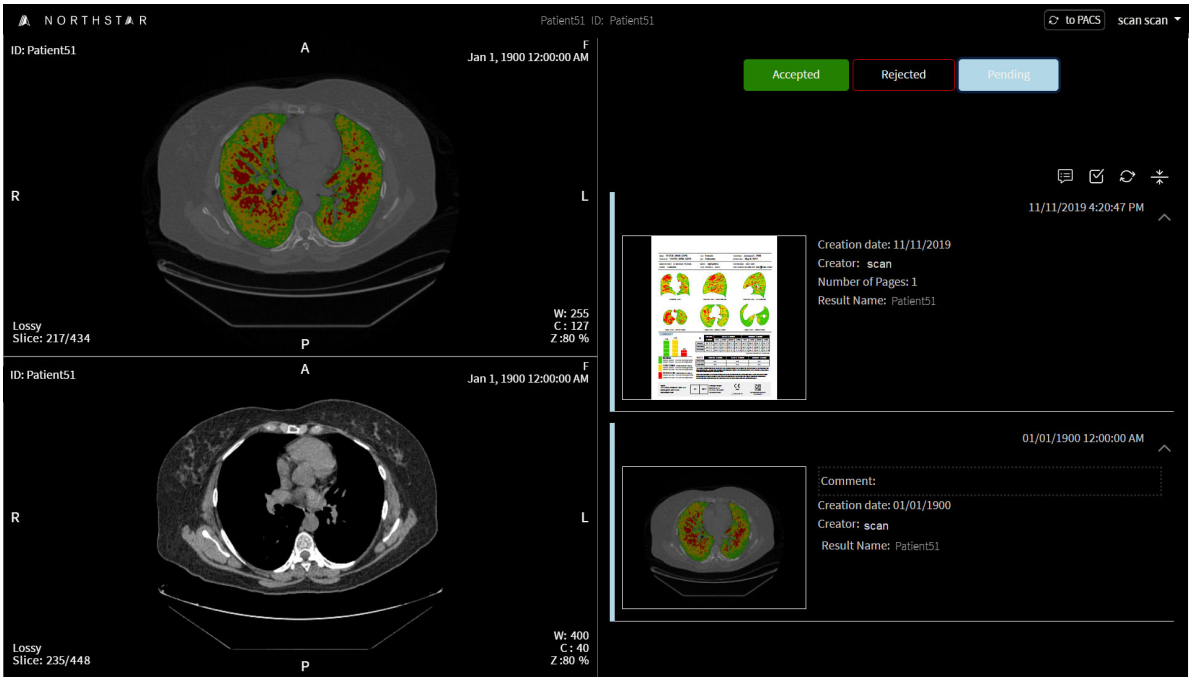


Figure 5-35 PDF Results

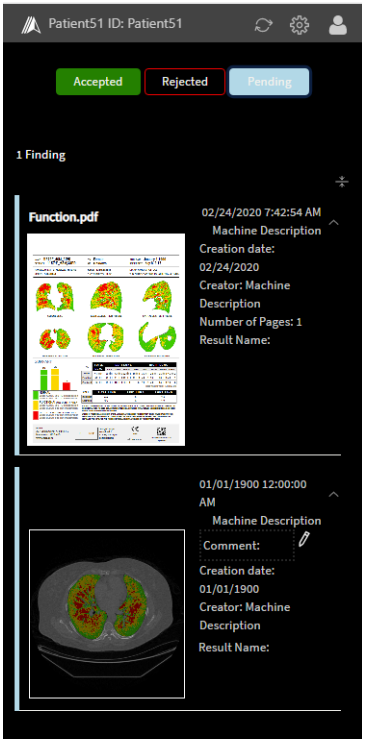


Figure 5-36 Mobile PDF Results

Displaying JPG/PNG Results

For non-DICOM results such as JPG and PNG images, like the PDF display, details are shown as text in the thumbnail.

Figure 5-37 JPG and PNG Results in the Output Panel

Displaying Mammography CAD SR Results

Mammography CAD SR results display each individual finding in the Output Panel.

Note: Unlike a GSPS result, findings in the original Mammography CAD SR results cannot be added to or deleted unless done on your own user copy.

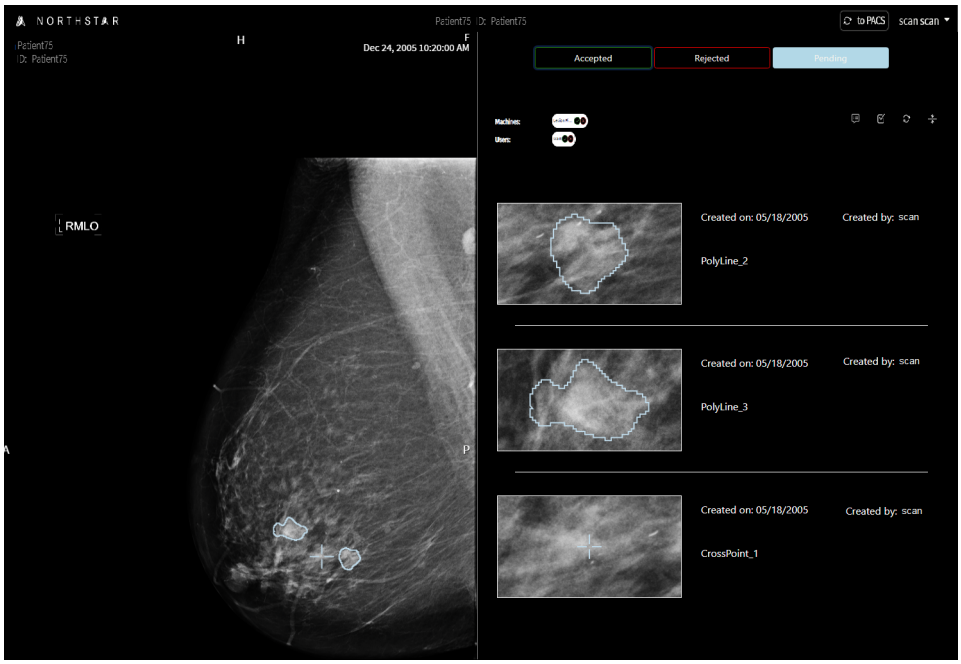


Figure 5-38 Output Panel showing CAD Results

Displaying Parametric Map Results

Studies with parametric map results display a color scale and the image with a correlating overlay.

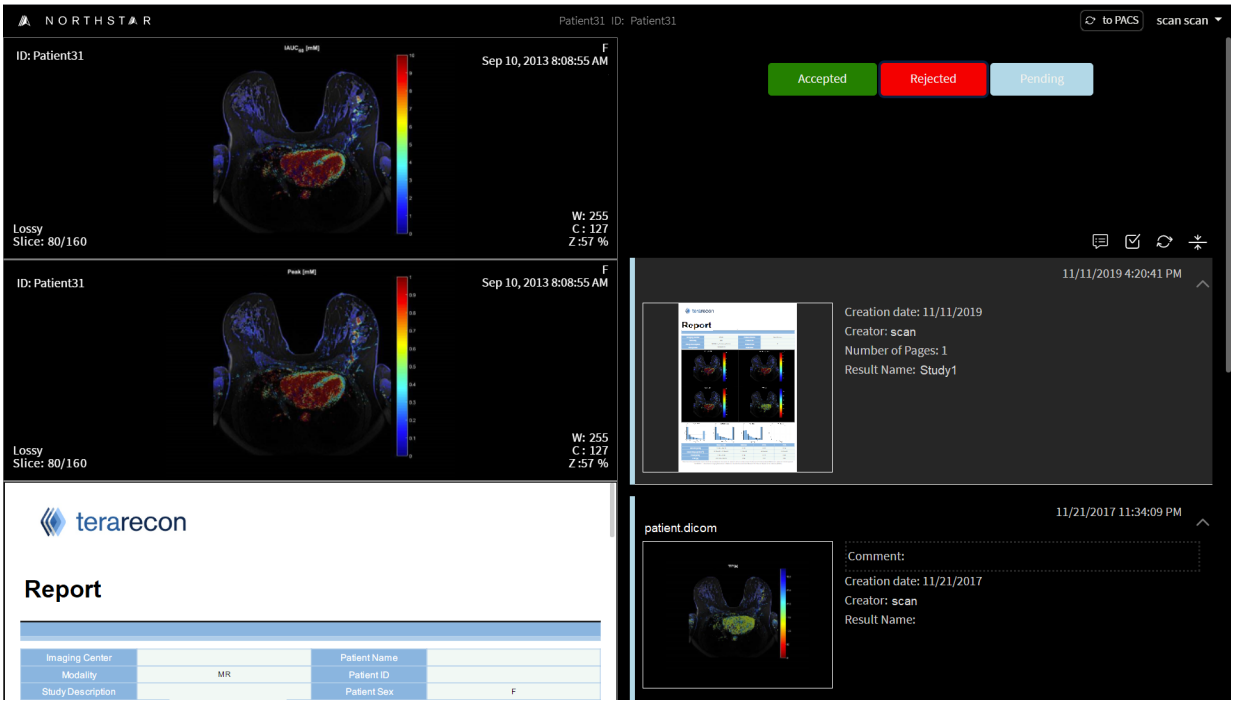


Figure 5-39 9 Parametric Map Results and Findings in the Output Panel

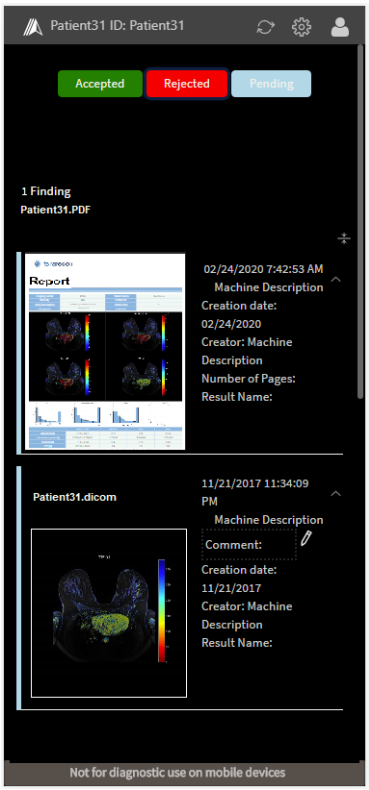


Figure 5-40 Mobile Output Panel with Parametric Map Results

Appendix A Keyboard Shortcuts

Table A.1 Available Keyboard Shortcuts

Key(s)	Action
W	Activate windowing.
C	Play/Stop Cine in active viewbox
D	Draw a linear measurement.
Page Up	Jump to the first annotation present on the previous slice.
Page Down	Jump to the first annotation present on the next slice.
ArrowUp	Scroll reverse.
ArrowDown	Scroll forward.
Left Arrow	Jump to next annotation present on either the same slice or a different slice.
Right Arrow	Jump to previous annotation present on either the same slice or a different slice.
Space bar	Synchronization on/off toggle.
Delete	Delete a measurement.
Ctrl+Delete	Deletes all annotations and sets them to rejected status.
Comma	For series with multiphase data, moves to previous phase image.
Period	For series with multiphase data, moves to next phase image.
g	Toggles contours on an image on and off. (Hide/Show).
SHIFT + ENTER	When creating or editing annotation, starts a new line. (GoToNewLine)
ENTER	Validates the text.
G	Toggles on and off the Parametric map overlay.
>	Jump to the next phase.
<	Jump to the previous phase.

Note: The delete keyboard shortcut on a MAC computer is supported using Fn+Delete (backspace).

Appendix B Page Navigation and Conventions

Page Navigation

To navigation back from any page, select your browser's back arrow.

- From the Viewer, the back button takes you to the Patient Study List; from the Patient Study List, the back button takes you to the Patient List.
- You can use the back button to get back to the Log in window as a way of logging out.

Appendix C Clean Install

HTTP or HTTPS Option

When executing a clean install for Northstar, you have the option to select HTTP, HTTPS, or HTTP and HTTPS. If HTTP or HTTP and HTTPS are selected, a valid certificate and password (if any) are required to proceed.

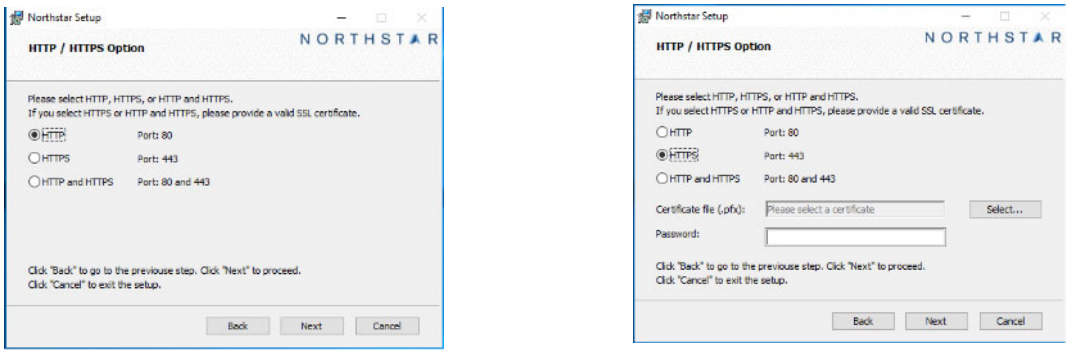


Figure C-1 HTTP Options

If the certificate or password are not valid, a message displays in red, “The specified network password is not correct” in the HTTP/HTTPS option window. The error message does not come from Northstar, it is displayed from the X509Certificate2 library.

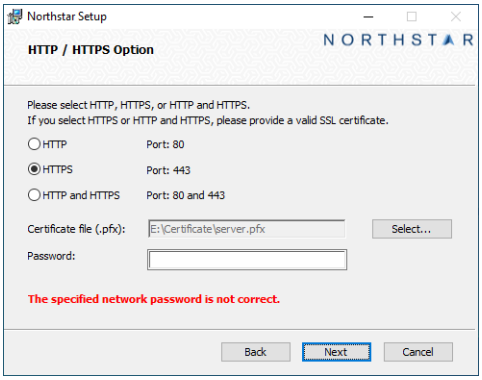


Figure C-2 Warning Message

If certificate does not have private key, the message “Certificate does not contain a private key” is shown. Once the certificate is validated, the installer makes these changes:

Environment Variable

- Set proper value (https://localhost:53784) to CONFIG_SERVICE_HOST.

Update appsettings.json for ConfigService:

- Set proper host (http or https) to “Services”.
- Set proper value for Websocket > Image (wss).

IIS

- Import the certificate to IIS.
- Set proper port to https for each service.
- Bind all services with the certificate.

```
<Custom Action='setEnvironmentVariable' Sequence='6552'><![CDATA[(NOT Installed) AND (NOT
PATCH)]]></Custom>

<Custom Action='addHttpsSites' Sequence='6553'><![CDATA[NOT (PROTOCOL = "http")]]></Custom>

<Custom Action='updateConfigAppsettings' Sequence='6554'><![CDATA[NOT (PROTOCOL = "http")]]></
Custom>
```

When the environment variable is changed, the installer prompts you to restart machine to apply the change.

SSL Certificate

When the SSL certificate is imported, IIS only supports the .pfx file. Since the installer uses an API (certutil.exe) to import the SSL certificate to IIS, the installer also only supports the .pfx file.

The SSL certificate is used only for machines within the terarecon.com domain. If your machine is not in the terarecon.com domain, contact your IT team.

The fully qualified domain name (FQDN) for the SSL certificate is *.dev.terarecon.com. With * being the name of your machine.

If you launch Northstar with HTTP/HTTPS, the URL will be like one of these examples:

- http://RTPDEV7.dev.terarecon.com
- https://RTPDEV7.dev.terarecon.com

The certificate signing request (CSR) was created by using IIS at the ddc1-sai-ns2 machine.

To create the .pfx file:

1. Launch IIS at ddc1-sai-ns2.
2. Click **Create Certificate Request...** to create the CSR text.
3. Send the CSR text IT to get a commercial certificate (STAR_dev_terarecon_com.cer).
4. Launch IIS at ddc1.sai-ns2. (This must be the same machine in which you created CSR).
5. Click **Complete Certificate Request...** (use STAR_dev_terarecon_com.cer).
6. Export the certificate as .pfx with a password.

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