

# FastPACS

**Web-Based Radiology Image Review Software**

*User Guide*

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The following symbols are used throughout this document:



**IMPORTANT**  
This symbol indicates a point of particular importance.



**USEFUL INFORMATION**  
This symbol indicates helpful user information.

Due to continual product development, specifications, methods and operations described in this publication are subject to change. Some features described may be platform-dependent or optional. While every effort has been made to ensure accuracy, no responsibility is taken for correctness and completeness of this document.

Screenshots are from Microsoft Windows and Mac OS X systems.

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Patient names displayed are fictitious. Any mention of third-party companies and products is for reference only and not to be construed as an endorsement.

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## System Description

### FastPACS

FastPACS is a system consisting of a DICOM 3.0 Compliant Archiver with integrated web distribution of patient studies. The system is capable of autorouting studies to other DICOM destinations such as third-party Workstations and other archives via configurable routing parameters such as AETitle, modality, time of day, etc. The FastPACS Archive is fully DICOM queriable.

Web Distribution of images is accomplished with the FastPACS Web component and images may be distributed over a local *Intranet* or over wide area external connections via the *Internet*. Multiple users may simultaneously access patient studies and there is no limitation to the number of review locations users can establish. With multi-platform support, rapid image display, and no applications to install or applets to download, *FastPACS* is easily deployed and maintained.

Currently the web interface of *FastPACS* is available in either English or Spanish localizations.

This document describes the use of the Web Distribution interface.

## System Requirements and Features

### Supported Operating Systems and Devices

Microsoft Windows® 2000/XP/Vista, Apple Mac® OS 9, Mac® OS X, Sun Solaris®, Linux®, Apple iPhone®, iPod Touch®. Tablet PC's are fully supported.

### Hardware

For desktop and laptop computers, a minimum of 512 MB of RAM is recommended. Although FastPACS adapts to your computer's display matrix, a minimum display matrix of 1024x768 at millions of colors is generally recommended.

### Network

A network connection is required to retrieve images. This may be with a local-area network connection or broadband connection via the Internet. A dial-up Internet connection is not recommended.

### Recommended Browsers

The following Operating System/Web Browser combinations are recommended:



Check that Javascript is enabled in your Web Browser. This is usually the default setting in most browsers.

#### Microsoft Windows 2000/XP/Vista:

Internet Explorer 6 or 7  
Mozilla Firefox 2.x, 3.x  
Netscape Navigator  
Safari 3.x

#### Mac OS X:

Mozilla Firefox 2.x, 3.x  
Camino 1.6  
Netscape Navigator  
Safari 3.x

#### Mac OS 9:

Internet Explorer 5.2  
Netscape Navigator

#### Sun Solaris:

Mozilla Firefox  
Netscape Navigator

**iPhone** and **iPod Touch** use Mobile Safari as supplied with these devices.

Go to <http://www.precisiondiagnostic.com> and click on Support for the latest info on supported browsers.

### Security

Depending on your particular installation and requirements, *FastPACS* may be set up to communicate using a 128-bit encrypted connection. This helps keep your connection private and secure wherever you are.



It is the responsibility of the Network Administrator at the installation site to design, maintain and enforce appropriate security measures.

## Automatic Updating

Whenever updates are supplied to your *FastPACS Server*, clients immediately take advantage of the update with no installation or download required.

## Installation

There is no client installation or applet download required to view images via *FastPACS* web distribution. This makes it easy to view images on any computer at any time without having to install software. Virtually any computer with a web browser may be used.



**FastPACS Web Distribution is designed for general image review. It is not to be used for final interpretation.**

## Connecting to Your FastPACS Server

1. Launch a supported web browser and navigate to the network address as directed by your site administrator.



Create a "Shortcut" or "Bookmark" to simplify connecting to your server in the future.

2. If your *FastPACS* is set up for *Authentication*, you will be required to enter a Username and Password to connect. Contact your System Administrator if you are prompted for this information and do not know it.



**Any authorized user who is granted access to your server will be permitted to view all patient studies.**

### Query Screen

After connecting to *FastPACS*, you will be presented with a Patient Query screen. The Query Screen is divided into 3 sections: Patient Information, Study Date and Modality.

The screenshot shows the 'Precision FastPACS Server' query interface. It is divided into three main sections: 'Patient Information', 'Study Date', and 'Modality'.  
1. **Patient Information:** Includes a dropdown menu for 'ID' (set to 'Matches'), a text input field, a dropdown for 'and', another dropdown for 'Name' (set to 'Contains'), another text input field, and a 'Find by Patient's info' button.  
2. **Study Date:** Includes 'Month', 'Date', and 'Year' input fields, a 'Today' button, and a 'Find by Study Date' button.  
3. **Modality:** Includes a 'Select Modality' dropdown menu and an 'Enter Modalities' text input field.  
At the bottom, there are 'Clear' and 'Find by combinations' buttons, the version number 'v 1.5.3', a link to '> On-Line Support', and a disclaimer 'Not for primary interpretation'.

## Query Tools

FastPACS has a wide range of ways to refine your patient search and constrain your queries to specific patient info, date ranges, or modalities. **The sections may be used individually or in combination with each other.**

### Query by Patient Name and/or Patient ID

Drop down selections for ID and Name allow filtering results on “Matches”, “Contains”, “Starts With” and “Ends With”. After entering query text in either field, **click “Find by Patient’s Info” if performing a query based only on Patient ID or Name.**

### Query by Date Range

You may freely query by date ranges by filling in a month, day & year (for a specific date); a month and a year (for a specific month); or simply the year to see a list of all studies done in a year. After filling in the appropriate fields, **click “Find by Study Date” if performing a query based only on Date Range.**

**Click the “Today” button then “Find by Study Date” to see all studies done Today.**

### Modality Filter

The Modality Filter may be used in conjunction with either or both of the above query sections to further refine your search. You can select “CR”, “CT” or “MR” with the drop down menu. You may also enter standard DICOM two-letter abbreviations for other modalities in the text entry area to filter for these modalities as well. **By default, the modality filter is not filled in, and all modalities are automatically included in your query.**

### Clear

Click “Clear” to erase all entry areas to prepare for another query.

### On-Line Support

Clicking **On-Line Support** provides pages with quick reference for users (requires Internet access).

### Combining Your Query

Clicking “**Find by Combinations**” will perform a query based on all query parameters inserted in the Patient Name & ID area, the Study Date area, and the Modality Filter area.

## Query Returns

The return of your query is displayed along the left side of the screen in the Study List. Thumbnails of images give useful previews of the studies. *Note that thumbnails are suppressed when there is a large number of returns of your query:*

The screenshot shows the Precision FastPACS Server interface. On the left is the 'Study List' with two entries:

- Entry 1: 2008/01/24 15:27, 1234567, DOE^JANE, CT:221
- Entry 2: 2008/01/24 14:06, 0124202, PATIENT^LUNG, CT:218

On the right is the 'Viewer Area' with search filters:

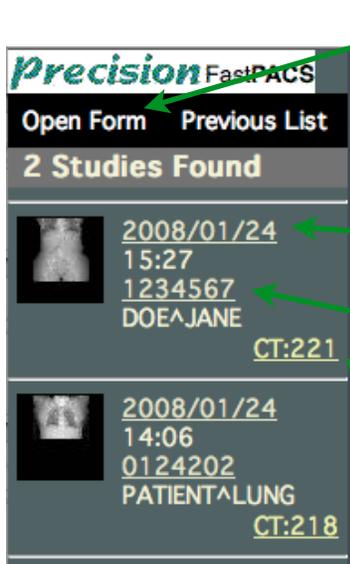
- Patient Information:** ID: Matches, Name: Contains, and, Find by Patient's info
- Study Date:** Month: , Date: , Year: 2008, Today, Find by Study Date
- Select Modality:** , Enter Modalities:
- Buttons: Clear, Find by combinations
- Version: v 1.5.1, > On-Line Support
- Disclaimer: Not for primary interpretation



All mouse clicks described for general user interaction and image review and manipulation are **Left** Mouse Clicks. Right mouse clicks are only used for specialized browser-specific functions as described later in this document.

## Study List

Studies displayed in the Study List have clickable links that allow you to either expand the selected study or to perform a *Nested Query* to quickly locate an entire patient's imaging history.



**Open Form**  
Opens the Patient Query screen to allow another search.

**Previous List**  
Allows you to page back to display results of your previous queries.

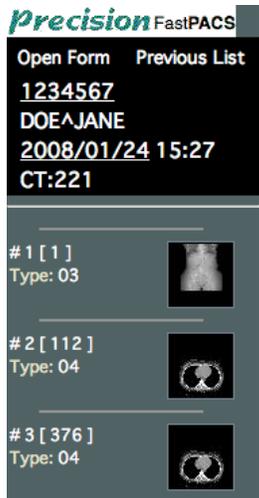
**Study Date Link**  
Clicking the Study Date link **will list all studies performed on that date.**

**Patient ID Link**  
Clicking the Patient ID link will initiate an immediate *Nested Query* based on Patient ID, and **list all studies associated with this Patient ID regardless of date.**

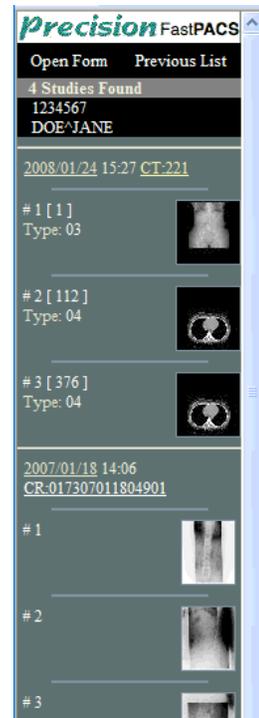
**Study Link**  
Clicking the Study link will expand the chosen study for viewing.



***It is vital that your institution maintain consistent, repeatable Patient ID numbers for all patient exams sent to the PACS.***



Clicking the **Study Link** expands the study to show previews of each individual series.



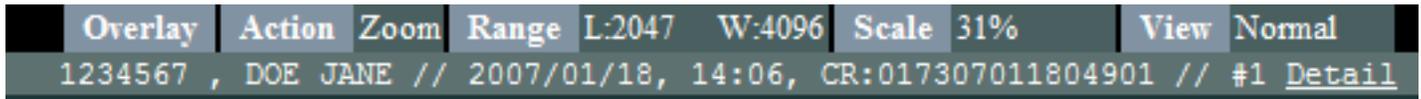
Clicking the **Patient ID Link** performs a *Nested Query* and displays previews of all studies on this patient based on this Patient ID.

## Viewing a Study

After expanding a study, simply click on an image preview to view all images associated with that series. The tools available to you depend upon the modality that generated the images.

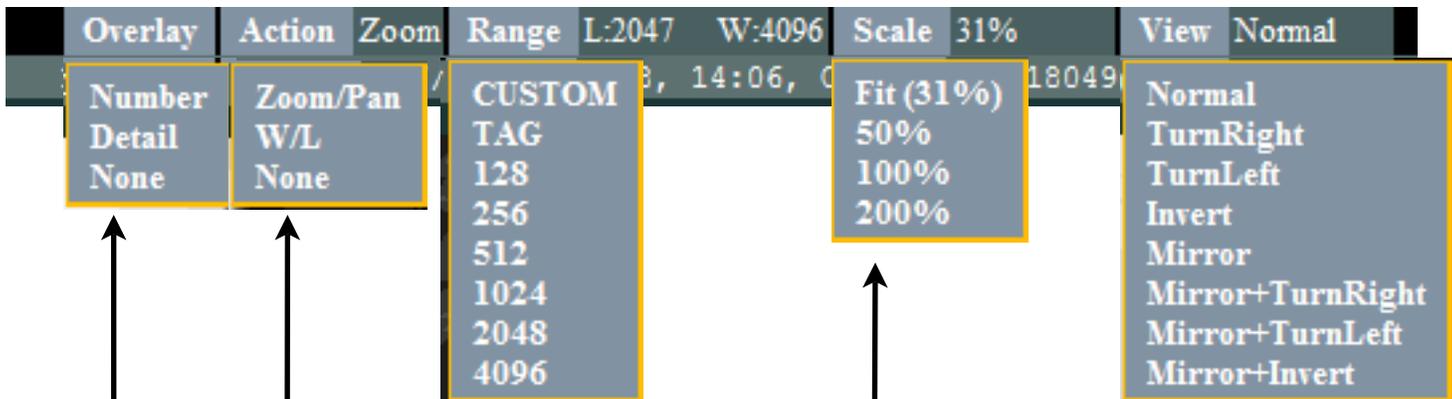
### CR Review Tools

The environment for CR image review is shown below. The Menu Bar selections of **Overlay**, **Action**, **Range**, **Scale** and **View** will expand when a users mouse hovers over them. Beneath the Menu Bar the Patient ID, Patient Name, Date/Time of Exam, Exam Type with identifier, and Series Number are displayed along with the Detail link. Clicking the **Detail** link will open a box at the bottom of the display screen with technical data regarding the currently displayed image.



### CR Expanded Menu

An explanation of the functions of the Menu Bar items for CR image review:



**SCALE** - Selectable magnification factor. **Fit** brings image to a suitable size to be displayed in your browser window.

**VIEW** - Image rotation controls. *Please note the **VIEW** menu is only visible when using Microsoft Internet Explorer 6 or 7.*

**RANGE** - **Custom** allows manual insertion of Window Width/Level values; **Tag** revert image to original DICOM Tag values; 128-4096 selections allows compensation for studies having unusual bit-depths.

**ACTION** - **Zoom** will zoom image on mouse click then change to **Pan** function automatically; **W/L** invokes Window Width and Level action with mouse button held down while moving over image; **None** suppresses all actions. **The currently selected action is displayed to the right of the Action menu.**

**OVERLAY** - Selectable image overlay. **Number** displays only image number; **Detail** displays image number, FOV, graticule; **None** suppresses text overlay

## CR Review Workspace

Study List showing expanded study - Single-click an image to launch it in the viewer.



FastPACS Browser

Precision FastPACS

Open Form Previous List

854967  
CHEST^PATIENT  
2008/06/10 14:54  
CR:173308061007382

# 3

# 4

Overlay Action Zoom Range L:2047 W:4096 Scale 31%

854967, CHEST^PATIENT // 2008/06/10, 14:54, CR:173308061007382 // #3 Detail

LEFT  
FEET

Bits Stored: 12 [0 ..4095]; Spacing: 0.175 x 0.175; Body Part Examined: CHEST; Plate Type: STORAGE; Phosphor Type: 00001636790079; Imager Pixel Spacing: 0.175, 0.175; Sensitivity: 250; Patient's DOB: 19770214; Patient's Age: 031Y; Sex: F; S-Value: 504;

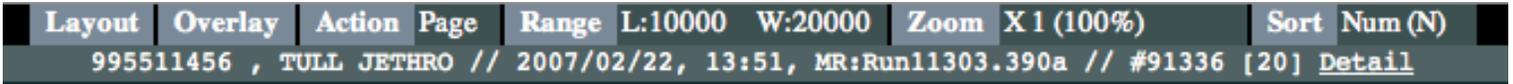
CR Review Workspace



Pop-up window displaying detail of image when **Detail** link is clicked. A second click of the **Detail** link will hide this window.

## CT and MRI Review Tools

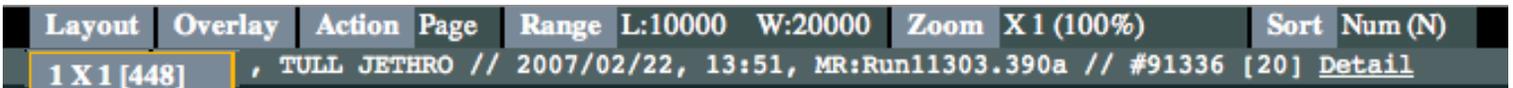
The environment for CT and MR image review is shown below. The Menu Bar selections of **Layout**, **Overlay**, **Action**, **Range**, **Zoom** and **Sort** will expand when a user's mouse hovers over them. **Beneath the Menu Bar, you will see the following displayed:** Patient ID, Patient Name, Date/Time of Exam, Exam Type with identifier, Series Number and number of images in the chosen sequence, along with the Detail link. Clicking the **Detail** link will open a box at the bottom of the display screen with technical data regarding the image.



Multi-frame Ultrasound studies are not currently supported.

## CT and MRI Expanded Menu

An explanation of the functions of the Menu Bar items for CT & MR image review:



- 1 X 1 [448]
- 1 X 2 [224]
- 2 X 1 [448]
- 2 X 2 [224]
- 2 X 3 [224]
- 3 X 2 [224]
- 3 X 3 [224]
- 3 X 4 [112]
- 4 X 3 [224]
- 4 X 4 [112]
- 4 X 5 [112]
- 5 X 4 [112]
- 
- <Scale of 2>
- Fit



**LAYOUT** - Horizontal x Vertical selectable display matrix of image images. Double-clicking on an image when in a multi-frame matrix will automatically change the matrix to a 1x1 and display that image full screen. **Fit** will fit the study to your present browser window. **<Scale of 2>** will reduce the size of an image by a factor of 2. This is desirable to reduce pixelization if viewing an enlarged MR image in a 1x1 matrix on a large display.

**RANGE** - (see below)

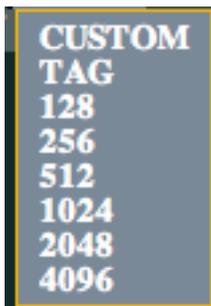
**ZOOM** - Images are magnified by the selected amount.

**SORT** - Change image sort order. **Default sort order is Num (N) (Image Number - Normal)**; Others are Num (R) (Number - Reverse); Time (Normal & Reverse); Z-Axis (Foot-Head)/(Head-Foot); Y-Axis (Posterior-Anterior)/(Anterior-Posterior); X-Axis (Left-Right)/(Right-Left)

**ACTION** - **Page** allows sequential viewing of images by depressing left mouse button and moving mouse in a vertical motion; **W/L** invokes Window Width and Level action with mouse button held down while moving over image; **Zoom** will zoom image on mouse click then change to **Pan** function automatically; **None** suppresses all actions. **The currently selected action is displayed to the right of the Action menu.**

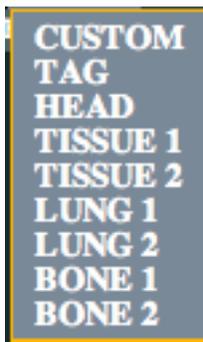
**OVERLAY** - Selectable image overlay. **Number** displays only image number; **Detail** displays image number, FOV, acquisition time, graticule; **None** suppresses text overlay

*The Range Menu has different functions for CT and MRI:*



The **Range** Menu for MRI has similar functions as the menu for CR.

**MR Range Menu**



The **Range** Menu for CT allows quick selection of presets for different body parts. If desired, the names and window width and level settings for these preset values may be customized for this menu after your system installation.

**CT Range Menu**



Window Width and Window Level adjustments are not possible on 8-bit images.

## CT and MRI Review Workspace

**Study List showing expanded study** - Single-click a series to launch it in the viewer.

**Page Forward/Page Back** - Use arrows on side to quickly page forward or back through a study. You may also click on the image preview to jump to that image or grab the yellow box and drag it through the thumbnails of the study.

*MRI with 3x2 display matrix selected*

**Scroll** - When **Page Mode** is selected in the **Action Menu**, you may scroll through a study by positioning the mouse over an image and, while holding down the left mouse button, move the mouse vertically back and forth.

## Saving Images to your Local Computer

FastPACS Web users can save images to their computer as graphic files for inclusion in scientific papers, to email to colleagues, or for other purposes.

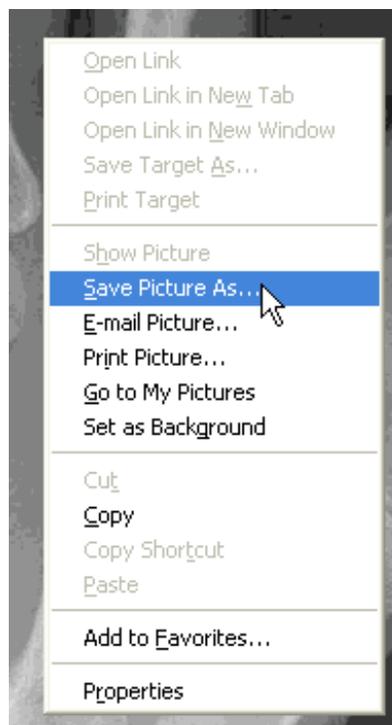
*The method used is dependent on the Operating System and Web Browser you use.*

### Windows Operating System with Internet Explorer 6 or 7

After displaying the desired image and adjusting the window width and window level settings as necessary, go to the **Action Menu** and select **None**.

Then Right-click on the image and select **Save Picture As...**

Give the image a name and save it to an appropriate place on your computer.



### **Mac OS X with Any Browser**

When viewing images with *FastPACS*, browsers on the Mac will attempt to save files as html or Web Archives instead of graphics files. While a Web Archive is a useful medium, it contains links that refer to files on the original server and, when opened, requires you have access to the server for functionality. Thus, a Web Archive file will not work unless you (or the recipient) is connected to the *FastPACS* Server. Assuming an email recipient does not have access to your server, use the following method:

After displaying the desired image and adjusting the window width and window level settings as necessary, depress cmd-shift-4 and the cursor will turn into a cross-hair. While holding down the left mouse button, scribe the area on the screen that includes the displayed image. When you release the mouse button the image will be saved to your desktop as a graphics file. This file can then be sent via email or inserted in documents.