

Merge PACS™

v. 7.3

WORKSTATION USERS GUIDE

Merge Healthcare
900 Walnut Ridge Drive
Hartland, WI 53029

MERGE
An IBM® Company

877.44.MERGE • merge.com

 [@MergeHealthcare](https://twitter.com/MergeHealthcare)

 [linkedin.com/company/merge-healthcare](https://www.linkedin.com/company/merge-healthcare)

 facebook.com/MergeHealthcare

© Copyright 2018 Merge Healthcare Incorporated, an IBM Company.

The content of this document is confidential information of Merge Healthcare Incorporated and its use and disclosure is subject to the terms of the agreement pursuant to which you obtained the software that accompanies the documentation.

Merge Healthcare® is a registered trademark of Merge Healthcare Inc.

The Merge Healthcare logo is a trademark of Merge Healthcare Inc.

All other names are trademarks or registered trademarks of their respective companies.

U.S. GOVERNMENT RESTRICTED RIGHTS:

This product is a “Commercial Item” offered with “Restricted Rights.” The Government’s rights to use, modify, reproduce, release, perform, display or disclose this documentation are subject to the restrictions set forth in Federal Acquisition Regulation (“FAR”) 12.211 and 12.212 for civilian agencies and in DFARS 227.7202-3 for military agencies. Contractor is Merge Healthcare.

INDICATIONS FOR USE:

Merge PACS™ is a Picture Archiving and Communication System (PACS) for multi-modality (CT, MR, PT, US, MG, BTO, CR, DR/DX, NM, XA, RF, secondary capture (SC), and other DICOM-compliant modalities) image processing and display, diagnostic reading and reporting, communication, printing, and storage of medical imaging studies and other patient data. Intended clinical users include radiologists, orthopedic and other surgeons, referring physicians, technologists, and other qualified medical professionals.

Data can be received directly from acquisition modalities, CAD systems, and other image processing systems, or indirectly via importing. Data that is not DICOM-compliant, such as photos, can be converted to DICOM format by Merge PACS.

Merge PACS provides image manipulation tools to enable users to view and compare images such as: linking, MPR, MIP, 3D image fusion/ registration of CT, MR, and PET; as well as CVR (Color Volume Rendering), measurements (linear distances, angles, areas, SUV, etc.), and annotations (for example, outline and label regions of interest, label spinal vertebrae).

The Real Time Worklist (RTWL) displays the real-time status of radiology activity and provides customizable workflow management capabilities. Communication of critical results is facilitated and documented through optional, configurable components.

The Patient Dashboard provides a composite view of patient data, both imaging and non-imaging. The optional Reach component provides clinicians with secure, proactive communication and access to clinical reports and images. Multi-tier patient identity matching provides a comprehensive view even when dealing with multiple disparate patient identities.

Order and report information generated by the HIS/RIS and report creation systems are received and displayed via the transmission of HL7 messaging.

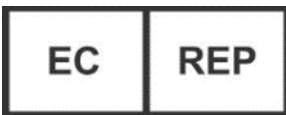
Lossless (reversible) and lossy (irreversible) image compression are supported for viewing, storage and communication. Merge PACS displays full fidelity DICOM images for use in the diagnostic interpretation of mammography using MG or BTO images. Thick slab MIP presentation can be applied to BTO images.

Lossy compressed images and digitized screen film images must not be used for primary diagnosis of mammography studies, and only display monitors that have regulatory clearance for mammography interpretation should be used for the interpretation of mammography studies.

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

CAUTION: Not for diagnostic use on a mobile device such as a smart phone or a tablet.

CANADIAN DEVICE IDENTIFIER: Merge PACS



EMERGO EUROPE
Prinsessegracht 20
2514 AP The Hague
The Netherlands

Australian Sponsor
IBM Australia Limited
Level 13, IBM Centre
601 Pacific Highway
St Leonards, NSW, 2065 Australia
ABN 79 000 024 733
Phone: 1800 117 425



Manufacturer's Address
Merge Healthcare Incorporated
900 Walnut Ridge Drive
Hartland, WI 53029

Part	Date	Revision	Description
PAX-39575	03/30/2018	1	Initial Release for 7.3

Chapter 1. Introduction	17
1.1. Overview	17
1.2. Standalone vs Integrated Mode	17
1.3. Color Scheme	17
1.4. Use within the United Kingdom.....	18
Chapter 2. Getting Started	21
2.1. Downloading and Installing the Merge PACS Workstation	21
2.2. Launching the Merge PACS Workstation	25
Chapter 3. The Workstation Browser	27
3.1. The Workstation Browser Toolbar	28
3.2. RealTime Study List.....	29
3.2.1. Accessing the RealTime Study List	30
3.2.2. Creating and Saving Quick Filter Worklists	31
a. Accessing/Hiding the Quick Filters	31
b. Creating a Quick Filter Worklist.....	32
c. Saving a Quick Filter Worklist.....	36
d. Customizing the Quick Filters.....	37
3.2.3. Available Worklists Panel	40
a. Accessing/Hiding the Available Worklists Panel	40
b. Selecting a Worklist	41
c. Setting a Default Worklist	43
d. Deleting a Saved Teaching or Quick Filter Worklist.....	43
e. Reloading All Worklists.....	44
f. Restoring Column Defaults.....	44
3.2.4. Action Icons	45
3.2.5. Data Columns.....	45
a. In General.....	45
b. Due In Column.....	46
c. Availability Column	47
d. Study Type Groups.....	48
e. Sorting by Data Column	48
f. Searching within a Data Column	49
g. Editing Data Columns.....	50
3.2.6. RealTime Study List Right-click Menus.....	52
a. RealTime Study List Right-click General Menu.....	52
b. Worklist Block Right-click Menu	52
c. RealTime Study List Right-click Study Menu	53
3.2.7. Adding Studies to Worklists via Drag and Drop	54
3.2.8. Changing Between Worklist and Patient List View	55
3.2.9. Viewing Prior Studies	56
3.2.10. Opening Multiple RealTime Study Lists	57
3.2.11. Editing a Worklist.....	58
3.3. RealTime Worklist™	58
3.3.1. Accessing RealTime Worklist.....	59
3.3.2. Selecting a Worklist	59
3.3.3. Worklist Overview	61
3.3.4. Action Icons	62
3.3.5. Data Columns.....	62

a.	<i>In General</i>	62
b.	<i>Due In Column</i>	63
c.	<i>Availability Column</i>	64
d.	<i>Sorting by Data Column</i>	65
e.	<i>Searching within a Data Column</i>	65
f.	<i>Editing Data Columns</i>	66
3.3.6.	Hiding and Revealing Studies and Worklist Blocks.....	68
3.3.7.	Worklist Right-click Menus.....	69
a.	<i>Worklist Right-click General Menu</i>	69
b.	<i>Worklist Block Right-click Menu</i>	70
c.	<i>Worklist Right-click Study Menu</i>	70
3.3.8.	Changing Between Worklist and Patient List View.....	72
3.3.9.	Viewing Prior Studies.....	73
3.3.10.	Using Workflow Accelerator™.....	75
a.	<i>Manually Caching Studies</i>	75
b.	<i>Automatically Caching Studies</i>	76
3.3.11.	Setting a Default Worklist.....	76
3.3.12.	Opening Multiple Worklists.....	77
3.3.13.	Reloading a Worklist.....	77
3.3.14.	Editing a Worklist.....	78
3.4.	Teaching Worklists.....	78
3.4.1.	Accessing Teaching Worklists.....	79
3.4.2.	Selecting a Teaching Worklist.....	79
3.4.3.	Teaching Worklist Overview.....	80
3.4.4.	Action Icons.....	81
3.4.5.	Data Columns.....	81
a.	<i>In General</i>	81
b.	<i>Availability Column</i>	82
c.	<i>Sorting by Data Column</i>	83
d.	<i>Searching within a Data Column</i>	83
e.	<i>Editing Data Columns</i>	84
3.4.6.	Teaching Worklist Right-click Menus.....	86
a.	<i>Teaching Worklist Right-click General Menu</i>	86
b.	<i>Teaching Worklist Right-click Study Menu</i>	87
3.4.7.	Data Masking.....	88
3.4.8.	Worklist View.....	90
3.4.9.	Viewing Prior Studies.....	91
3.4.10.	Setting a Default Teaching Worklist.....	93
3.4.11.	Using Workflow Accelerator™ with Teaching Worklists.....	93
3.4.12.	Opening Multiple Teaching Worklists.....	93
3.4.13.	Reloading a Teaching Worklist.....	94
3.5.	Query Search.....	95
3.5.1.	Entering Search Criteria.....	96
a.	<i>Restricting a Query by Date</i>	96
b.	<i>Searching by Study Criteria</i>	98
c.	<i>Searching By Recently Modified Patients</i>	101
d.	<i>Selecting the Study Criteria Query Fields to Display</i>	102
3.5.2.	Submitting the Query.....	104
3.5.3.	Query Results Page Overview.....	105
3.5.4.	Action Icons.....	106
3.5.5.	Data Columns.....	106
a.	<i>In General</i>	106

b.	<i>Selecting the Data Columns to Display</i>	107
c.	<i>Availability Column</i>	107
d.	<i>Reordering Data Columns</i>	108
e.	<i>Resizing Data Column</i>	108
f.	<i>Sorting Query Results</i>	109
3.5.6.	Opening Multiple Query Pages	109
3.5.7.	Importing from a DICOM Device	109
3.6.	Local Study	110
3.6.1.	Viewing and Importing DICOM Studies	111
a.	<i>Searching for Studies</i>	111
b.	<i>Local Study Search Results Overview</i>	114
c.	<i>Action Icons</i>	115
d.	<i>Data Columns</i>	115
e.	<i>Transferring a Single Study to the Merge PACS Server for Import</i>	116
f.	<i>Transferring Multiple Studies to the Merge PACS Server for Import</i>	121
3.6.2.	Importing Non-DICOM Images	125
a.	<i>Searching for Non-DICOM Images</i>	126
b.	<i>Non-DICOM Image Selection</i>	130
c.	<i>Transferring Non-DICOM Images to the Merge PACS Server</i>	131
3.6.3.	Opening Multiple Local Study Windows	135
3.7.	Recently Viewed Studies	135
3.7.1.	Action Icons	136
3.7.2.	Data Columns	136
a.	<i>Selecting the Data Columns to Display</i>	137
b.	<i>Reordering Data Columns</i>	137
c.	<i>Sorting Recently Viewed Studies</i>	137
3.7.3.	Quickly Selecting a Recently Viewed Study	138
3.8.	Patient Record	138
3.8.1.	Patient Record Navigation Tabs	141
3.8.2.	Patient Record Toolbar	142
a.	<i>Patient Information</i>	142
b.	<i>Available Action Icons</i>	142
3.8.3.	Primary Exam Toolbar	145
a.	<i>Exam Information</i>	145
b.	<i>Available Icons</i>	145
3.8.4.	Primary Exam Series Navigation Thumbnails	146
a.	<i>Thumbnail Right-click Menu</i>	148
b.	<i>Patient Record Right-Click Menu</i>	149
3.8.5.	Prior Exam Control Bars	150
3.8.6.	Prior Exam Toolbar	152
a.	<i>Exam Information</i>	152
b.	<i>Available Action Icons</i>	152
3.8.7.	Prior Exam Series Navigation Thumbnails	154
a.	<i>Thumbnail Right-click Menu</i>	155
b.	<i>Patient Record Right-Click Menu</i>	156
3.8.8.	Displaying Prior Exams in Comprehensive View	157
3.8.9.	Importing Foreign Studies	157
a.	<i>Searching for Foreign Studies</i>	158
b.	<i>Viewing Foreign Studies</i>	164
3.8.10.	Collapsing and Expanding Exam Navigators and Exams	165
3.9.	Workstation Browser Action Icons	165
3.10.	Viewing the Activity Log for an Exam	172

3.11. Accessing the Merge PACS Management Pages	173
3.12. Accessing the Settings Page	173
Chapter 4. The Merge PACS Viewer	175
4.1. Opening Prior Studies within the Viewer	175
4.2. Overview	176
4.2.1. The Viewer Titlebar	178
4.2.2. The Application Toolbar.....	178
a. Available Tools	179
b. Customizing the Application Toolbar.....	179
c. Hiding/Accessing the Application Toolbar	180
4.2.3. Study Toolbar	182
a. Warning / Comments Flag.....	182
b. Study Information	183
c. Available Tools	183
d. Customizing the Study Toolbar	183
4.2.4. Series Navigation Thumbnails.....	184
a. Thumbnail Overview.....	185
b. Thumbnail Right-click Menu	186
c. Study Right-click Menu.....	187
d. Key Image Series Navigation Thumbnail	189
e. Series Navigation Thumbnails for Comparison Studies.....	190
f. Customizing the Display of the Series Navigation Thumbnails.....	192
g. Hiding/Accessing the Series Navigation Thumbnails.....	192
4.2.5. Series Viewports.....	194
a. Series Toolbar	195
b. Image Titlebar.....	196
c. Series Right-click Menu.....	198
4.2.6. Clone Windows.....	203
4.2.7. Available Tools	203
a. General Tools	204
b. Application-Specific Tools	206
c. Study-Specific Tools.....	210
d. Series-Specific Tools.....	212
e. 3D-Specific Tools	213
f. Mammography-Specific Tools.....	215
g. Key Image-Specific Tools.....	215
4.3. Changing the Screen Layout	216
4.3.1. Viewing Multiple Images in a Single Viewport.....	216
4.3.2. Viewing Multiple Series in Separate Viewports.....	218
a. Series Layout Menu.....	218
b. Keyboard Shortcuts	220
4.3.3. Comparing Multiple Studies.....	221
a. Study Layout Menu.....	221
b. Comparison Toggle Button.....	222
c. Keyboard Shortcuts	222
4.4. Navigating through Images, Series and Studies	222
4.4.1. Navigating through Images in a Series	223
a. The Series Navigation Thumbnails	223
b. The Page Images Tool	224
c. The Auto Scroll Tool.....	224
d. Image Navigation Using the Mouse Wheel	225

e.	<i>Skimming</i>	226
f.	<i>The Cine Tool</i>	226
g.	<i>Global Stacking</i>	228
4.4.2.	Navigating Among Different Series.....	228
a.	<i>The Series Navigation Thumbnails</i>	229
b.	<i>The Series Right-click Menu</i>	230
c.	<i>Cross-reference Lines</i>	231
d.	<i>Cutlines</i>	232
e.	<i>Automatic Series Synchronization</i>	233
f.	<i>Manual Series Synchronization</i>	234
g.	<i>3D Cursor</i>	235
h.	<i>Moving a Series from One Viewport to Another</i>	236
i.	<i>Removing a Series from a Viewport</i>	236
4.4.3.	Selecting a Different Study.....	236
a.	<i>Worklist Navigation Buttons</i>	237
b.	<i>Recently Viewed Studies Menu</i>	238
c.	<i>Patient Record</i>	238
d.	<i>Rapid Review</i>	238
4.4.4.	Comparing Multiple Studies.....	239
a.	<i>Selecting a Comparison Study</i>	240
b.	<i>Displayed Field of View (DFOV) Matching</i>	243
c.	<i>Exiting Compare Studies mode</i>	244
4.5.	General Image Manipulation.....	244
4.5.1.	Changing the Window and Level Values of Images.....	244
a.	<i>The Window/Level Mouse Tool</i>	245
b.	<i>The Window Range Tool</i>	246
c.	<i>Window/Level Presets</i>	247
d.	<i>Window/Level Keyboard Shortcuts</i>	248
e.	<i>The Region of Interest Window/Level Tool</i>	248
f.	<i>Manually Setting the Window/Level</i>	249
4.5.2.	Applying a Values of Interest Lookup Table.....	250
4.5.3.	Zooming Images.....	251
a.	<i>The Zoom Tool</i>	251
b.	<i>The Series Right-click Menu</i>	252
4.5.4.	Panning Images.....	253
4.5.5.	The Zoom/Pan Combo Tool.....	253
4.5.6.	The 3-in-1 Mouse Tool.....	254
4.5.7.	Grouping Series.....	255
4.5.8.	Magnifying Images.....	256
4.5.9.	Displaying Standard DICOM Information.....	256
a.	<i>DICOM Overlay</i>	257
b.	<i>DICOM Attributes Viewer</i>	258
4.5.10.	Displaying DICOM 6000 Information.....	259
4.5.11.	Viewing Color Maps.....	260
4.5.12.	Inverting Images.....	261
4.5.13.	Sharpening an Image.....	262
4.5.14.	Changing Image Orientation.....	263
4.5.15.	Annotations and Measurements.....	263
a.	<i>Text Annotation</i>	264
b.	<i>Pointer Text</i>	264
c.	<i>Line Measurements</i>	265
d.	<i>Adding Angle Measurements</i>	267

e.	<i>Adding Cobb Angle Measurements</i>	268
f.	<i>Region of Interest Measurements</i>	270
g.	<i>Circle Annotations and Measurements</i>	272
h.	<i>Circle Tool Preferences Menu</i>	274
i.	<i>Orthopedic Plumb Lines</i>	275
j.	<i>Orthopedic Joint Line Tool</i>	276
k.	<i>Orthopedic Transischial Line Tool</i>	277
l.	<i>Superimposing Measurements</i>	279
m.	<i>Manually Saving Annotations</i>	280
n.	<i>Deleting Annotations</i>	280
o.	<i>Toggling Display of Annotations</i>	281
p.	<i>Ultrasound Regional Measurements</i>	282
q.	<i>Manually Calibrating Line Measurements</i>	282
4.5.16.	<i>The Probe Tool</i>	285
4.5.17.	<i>Setting SUV Parameters (PET Series Only)</i>	287
4.6.	<i>The Spine Labeling Tool</i>	288
4.6.1.	<i>The Spine Label Preferences Menu</i>	289
4.6.2.	<i>Defining the Spinal LabelSets</i>	289
a.	<i>Selecting a Predefined Default LabelSet</i>	290
b.	<i>Manually Defining LabelSet Settings</i>	290
4.6.3.	<i>Labeling a Vertebra</i>	294
4.6.4.	<i>Correcting Mistakes</i>	295
4.6.5.	<i>Associating Spine Labels of Two Different Orientations</i>	296
4.7.	<i>Saving, Printing and Copying Images</i>	296
4.7.1.	<i>Saving images</i>	296
a.	<i>Saving Individual Images</i>	297
b.	<i>Saving Entire Series</i>	298
4.7.2.	<i>Printing Images</i>	299
a.	<i>Standard Image Printing</i>	299
b.	<i>DICOM Printing</i>	300
4.7.3.	<i>Copying and Pasting Images</i>	302
4.8.	<i>3D Rendering Tools</i>	302
4.8.1.	<i>Multi-Planar Reconstruction (MPR) Window</i>	304
a.	<i>Color Coding of MPR Viewports</i>	305
b.	<i>MPR Window Titlebar</i>	306
c.	<i>MPR Window Toolbar</i>	306
d.	<i>Available Mouse Modes</i>	307
e.	<i>Orthogonal MPR Series Toolbars</i>	308
f.	<i>Orthogonal Series Right-click Menu</i>	309
g.	<i>Using the Rotation Controllers</i>	311
h.	<i>Using the Cross-reference Controllers</i>	312
i.	<i>Using the Slab Controllers</i>	312
j.	<i>Creating Oblique Views</i>	313
k.	<i>Rendered Volume Series Toolbar</i>	314
l.	<i>Rendered Volume Series Right-click Menu</i>	315
m.	<i>Rotating the Rendered Volume</i>	318
n.	<i>Panning the Rendered Volume</i>	318
4.8.2.	<i>One-click MPR</i>	319
a.	<i>Displaying a Single MPR View within a Standard Viewport</i>	319
b.	<i>Displaying a Single MPR View in a Separate MIP Viewport</i>	320
c.	<i>The MPR Viewport Toolbar</i>	320
d.	<i>Available Mouse Modes</i>	321

e.	<i>MPR Viewport Right-click Menu</i>	322
f.	<i>MPR Viewport Color Bar</i>	324
4.8.3.	Image Fusion.....	325
a.	<i>Initiating Image Fusion</i>	326
b.	<i>Image Fusion Window/Level Options</i>	327
c.	<i>Image Fusion Blending</i>	328
d.	<i>Image Fusion Registration</i>	328
e.	<i>Selecting Color Maps for Fused Images</i>	328
4.8.4.	One-click MIP	329
a.	<i>Viewing a MIP Rendered Volume within a Standard Viewport</i>	329
b.	<i>Viewing a MIP 3D Rendered Volume in a Separate MIP Viewport</i>	330
c.	<i>The MIP Viewport Toolbar</i>	331
d.	<i>Available Mouse Modes</i>	332
e.	<i>MIP Viewport Right-click Menu</i>	333
4.8.5.	Spinning MIP View (PET and Breast Tomosynthesis Series Only)	335
4.8.6.	3D Cropping	336
4.8.7.	DICOM Overlay in 3D Mode.....	337
4.9.	Viewing Mammography Images	337
4.9.1.	Mammography Thumbnail Viewer.....	338
a.	<i>Mammography Thumbnail Viewer Titlebar</i>	339
b.	<i>Mammography Thumbnail Viewer Toolbar</i>	339
c.	<i>Customizing the Mammography Thumbnail Viewer Toolbar</i>	340
d.	<i>Mammography Thumbnail Viewer Study Infobar</i>	340
e.	<i>Mammography Thumbnail Viewer Navigation Thumbnails</i>	341
4.9.2.	DICOM Overlay for Mammography Images	344
4.9.3.	Paging through Multiple Views	345
4.9.4.	Wall-To-Wall Display of Mammography Images	346
4.9.5.	Mammography Invert Options	346
4.9.6.	Zooming with the Zoom/Pan Combo Tool.....	347
4.9.7.	Intelligent Zoom and Quadrant View	348
4.9.8.	Binocular Tool.....	349
4.9.9.	Hot Light Tool	350
4.9.10.	Dual Link Magnifier	351
4.9.11.	Mammography Prior Studies Stacking Options.....	352
4.9.12.	Displaying CAD Summary	353
4.9.13.	Mass Density Marks	355
4.9.14.	Breast Tomosynthesis Images	355
a.	<i>Thumbnail Images</i>	355
b.	<i>Intelligent Invert and Intelligent Zoom</i>	355
c.	<i>Scrolling</i>	355
d.	<i>Stacked Scrolling</i>	356
e.	<i>Slice Position Indicator</i>	356
f.	<i>Additional System Generated Window/Level Options</i>	357
g.	<i>Aligned MIP and MPR</i>	357
h.	<i>3D Options in Series Right-Click Menu</i>	358
i.	<i>Thin-slice and Thick-slice (“Slab”) Images</i>	359
j.	<i>Background Generation of 3D Volumes</i>	359
k.	<i>Display of Synthetic Images</i>	360
l.	<i>Toggling Between Patient Record and Thumbnail Viewer</i>	360
m.	<i>Image Level Manipulation</i>	361
4.10.	Setting Key Images.....	361
4.10.1.	Setting Key Images from the Series Toolbar.....	362

4.10.2.	Setting Key Images from the Series Right-click Menu	362
4.10.3.	Adding a Key Image with Description.....	363
4.10.4.	Automatically Setting Annotated Images as Key Images.....	363
4.11.	Viewing Key Images	364
4.11.1.	Key Image Viewport Titlebar	365
4.11.2.	Key Image Series Toolbar	365
a.	<i>Available Tools</i>	365
b.	<i>Customizing the Key Image Series Toolbar</i>	366
4.11.3.	Key Image Titlebar	366
4.11.4.	Key Image Series Right-click Menu	367
4.11.5.	Creating a Key Image Collage	369
4.11.6.	Sending Key Images	370
4.11.7.	Adding Study Comments.....	370
4.11.8.	Key Image Indicator.....	371
4.11.9.	Automatically Flagged Key Images	372
4.12.	Hanging Protocols and Study Presentations	372
4.12.1.	Settings Preserved by Hanging Protocols and Study Presentations	373
4.12.2.	Hierarchy of Hanging Protocols and Study Presentation Application	373
4.12.3.	The Hanging Protocol Menu.....	374
4.12.4.	Creating a Study Presentation	377
a.	<i>Creating the First Step for a Study Presentation</i>	377
b.	<i>Updating an Existing Study Presentation</i>	379
4.12.5.	Selecting a Study Presentation Step	381
a.	<i>Selecting a Study Presentation Step from the Hanging Protocol Menu</i>	381
b.	<i>Selecting a Study Presentation Step from the Application Toolbar</i>	381
4.12.6.	Creating a Hanging Protocol	382
a.	<i>General Information</i>	383
b.	<i>Matching Criteria</i>	383
c.	<i>Comparison Studies</i>	387
d.	<i>Presentation Layout</i>	390
e.	<i>Saving the Hanging Protocol</i>	397
4.12.7.	Modifying Current Hanging Protocol	398
4.12.8.	Managing Hanging Protocols	399
4.12.9.	Selecting a Hanging Protocol	400
4.12.10.	Loading the Next or Previous Hanging Protocol Step	401
a.	<i>Selecting a Hanging Protocol Step from the Hanging Protocol Menu</i>	401
b.	<i>Selecting a Hanging Protocol Step from the Application Toolbar</i>	401
c.	<i>Keyboard Shortcuts</i>	401
4.12.11.	Using Modality Layout	402
4.12.12.	Loading by Matching Criteria.....	402
4.12.13.	Loading by Series Order.....	403
4.12.14.	Loading by Sequential Order.....	403
4.12.15.	Managing Anatomical Body Part Mapping Rules	403
4.12.16.	Applying Foreign Presentation States to Individual Studies.....	406
4.13.	Using Orthopedic Templating Toolsets	407
4.14.	Managing Window/Level Presets	409
4.14.1.	Editing Existing Window/Level Presets for a Modality	410
4.14.2.	Defining New Window/Level Presets for a Modality.....	412
4.14.3.	Deleting a Set of Modality Window/Level Presets.....	412
4.15.	Using Lossy Images Instead of Lossless	413

Chapter 5. Viewing Orders and Comments.....	415
5.1. The Order Viewer.....	415
5.1.1. Overview.....	415
5.1.2. Viewing General Patient Information.....	416
5.1.3. Viewing Allergies, Diagnoses, Orders and Questionnaires.....	417
a. Viewing Allergy Information.....	418
b. Viewing Diagnosis Information.....	418
c. Viewing and Printing Orders.....	419
d. Viewing Questionnaires.....	420
5.1.4. Adding, Viewing and Deleting Comments.....	420
a. Adding Comments.....	421
b. Viewing Comments and Warnings.....	422
c. Deleting Comments.....	423
5.1.5. Accessing Jailed Images.....	423
5.2. The Comments Viewer.....	424
5.2.1. Showing and Hiding Information.....	425
5.2.2. Printing from the Comments Viewer.....	425
5.3. Adding DICOM Study Comments.....	426
Chapter 6. Viewing Reports.....	427
6.1. Overview.....	427
6.2. Comparing Two Reports.....	430
6.3. Viewing PDF Reports.....	432
6.4. Changing the Display Font Size.....	433
6.5. Changing the Line Spacing.....	433
6.6. Copying a Report.....	434
6.7. Printing a Report.....	434
Chapter 7. Associating and Dissociating Studies to and from Worklists.....	435
7.1. Associating Studies to a Worklist.....	435
7.2. Removing Studies from a Worklist.....	436
Chapter 8. Assigning a Study to Another User.....	437
Chapter 9. Recording and Listening to Audio Comments.....	439
9.1. Recording Audio Comments with VoiceClip.....	439
9.2. Playing Existing Annotations with VoiceClip.....	443
Chapter 10. Integration with Third-party Applications.....	445
10.1. Types of Integration.....	445
10.1.1. Direct API-based Integration.....	445
10.1.2. XML File-based Integration.....	445
10.2. General Information.....	446
10.3. 3 rd Party Application Synchronization Button.....	447
10.4. 3 rd Party Application Synchronization Menu.....	449
10.4.1. Configuring Individual Applications.....	449
10.4.2. Changing a Password.....	450
10.4.3. Managing Third-party Application Configuration.....	450
Chapter 11. Managing Access to a Study.....	451
11.1. Granting Access to a Study.....	452
11.2. Revoking Access to a Study.....	453

Chapter 12. Changing the Workflow Status and/or HL7 Attributes of a Study	455
12.1. The Change Workflow Status Window	455
12.1.1. Changing the Workflow Status	456
12.1.2. Changing HL7 Attributes	457
12.1.3. Entering and Viewing Comments	458
12.1.4. Saving Your Changes.....	458
12.2. The Update Study Status Window.....	459
12.2.1. Changing the Workflow Status	461
12.2.2. Changing HL7 Attributes	462
12.2.3. Entering and Viewing Comments	463
12.2.4. Saving Your Changes.....	463
Chapter 13. Exporting Studies	465
Chapter 14. Routing Studies to Other Locations	475
Chapter 15. Requesting Studies from a DICOM Archive	479
Chapter 16. Viewing Archived Studies	481
Chapter 17. Viewing Jailed Images	483
Chapter 18. Viewing and Editing Patient and Study Demographics	485
18.1. Study Details Window	485
18.2. Patient Demographics Window.....	487
Chapter 19. The Technologist WorkPanel.....	489
19.1. Viewing Patient and Exam Information.....	490
19.2. Verifying a Study.....	491
19.3. Manually Matching an Order to the Study	492
19.4. Manually Linking Multiple Orders to the Study	494
19.5. Adding Comments to a Study	495
19.6. Setting the Communication and Connection Status for a Study	497
19.7. Viewing Physician Contact Information	497
19.8. Granting Access to a Study/Exam	498
19.9. Setting Exam Acuity.....	499
Chapter 20. The ER WorkPanel	501
Chapter 21. The Communication WorkPanel.....	503
21.1. Viewing Physician Contact Information	504
21.2. Viewing Reports.....	505
21.2.1. Highlighted Reports	506
21.2.2. Customizing the List of Reports	506
a. <i>Changing the Sort Order</i>	506
b. <i>Configuring the Columns to Display</i>	507
21.2.3. Viewing PDF Reports	507
21.3. Entering Comments and Setting Status.....	508
21.4. Viewing Previously Entered Comments.....	509
21.5. Printing the Content of the Communication WorkPanel	510
Chapter 22. The Study Tagging Window.....	511
22.1. Assigning a Study to a Teaching Worklist	512
22.2. Adding Teaching Tags to a Study.....	513
22.3. Saving Tag Information.....	515

Chapter 23. Merge Messenger	517
23.1. Initiating a Conversation	518
23.1.1. Locating a User via the Group Directory	518
23.1.2. Searching for a User	519
23.2. The Merge Messenger Chat Window	520
23.2.1. Changing the Priority of Your Message	520
23.2.2. Sending a Study Link	521
23.2.3. Viewing a Linked Study	522
23.3. Having Conversations with Multiple Users	522
23.4. Ending a Conversation	523
23.5. Manually Changing Your Status	523
23.6. Manually Changing Your Location	525
23.7. The Merge Messenger Alert Balloon	525
Chapter 24. Configuring Custom Viewing Preferences	527
24.1. User Preferences	528
24.1.1. Start-up	528
24.1.2. Shutdown	530
24.1.3. Study	531
a. Study Loading	531
b. Locking	534
c. Comparison Studies	535
d. Presentation State	535
24.1.4. Hanging Protocols	536
24.1.5. Key Images	536
24.1.6. 3D	537
24.1.7. Annotations	539
24.1.8. MG Tools	540
24.1.9. Merge Messenger	541
24.1.10. Display/Mouse/Keyboard	542
a. Mouse	542
b. Keyboard	549
c. Display Height	557
24.1.11. Modality	558
a. Series Layout	558
b. Prior Placement	559
c. Cine Mode	559
d. Other Options	560
24.1.12. Overlays	563
a. Customizing the Lossy Compression Overlay	563
b. Customizing the DICOM Overlay	564
c. Setting the Base Font Size for DICOM Overlay per Screen Resolution	571
24.1.13. PowerScribe	571
24.1.14. Reach	572
24.1.15. XML Integration	573
a. Third-party Event Configuration Preferences	574
b. Third-party Response Configuration Preferences	574
24.1.16. Miscellaneous	576
24.1.17. Worklist Color	579
24.1.18. QC	580
24.1.19. Thumbnail	582
24.1.20. Action Buttons	583

a.	Selecting a Toolbar to Edit	583
b.	Adding a Tool or Macro to the Selected Toolbar.....	585
c.	Removing a Tool or a Macro from the Toolbar.....	588
d.	Editing the Properties of a Tool or Macro.....	588
e.	Configuring When Tools or Macros Should Be Displayed	592
24.2.	Workstation Preferences	593
24.2.1.	Workflow Accelerator Preferences	593
24.2.2.	Closest Server Preferences.....	595
a.	Adding a New Closest Server.....	595
b.	Editing an Existing Closest Server	596
c.	Deleting an Existing Closest Server	596
d.	Changing the Priority of the Closest Servers	597
24.2.3.	Miscellaneous Preferences	597
24.3.	Managing Macros	598
24.3.1.	Creating a New Macro.....	600
24.3.2.	Editing an Existing Macro.....	608
24.3.3.	Deleting an Existing Macro.....	609
24.4.	Export User Preferences	609
24.5.	Import User Preferences.....	611
Chapter 25. Viewing System Information.....		613
25.1.	System Information Tab.....	614
25.2.	Advanced Tab.....	614
25.3.	Additional Tab	615
25.4.	Viewing the Log Directory.....	617
25.5.	Changing Your Password	617
Chapter 26. System Tray Menu		618
Appendix A. Dual Monitor Configuration		619
Appendix B. Standardized Uptake Values (SUV).....		623
B.1.	Requirements for Displaying Standardized Uptake Values.....	624
B.2.	Basic Calculation for Standardized Uptake Value (SUV)	625
Appendix C. Consolidating Patient Information		627
C.1.	Patient Comparison Strategy.....	627
C.2.	Multiple Patient Identity (MPI).....	628
C.3.	Selection of Priors.....	629
Appendix D. Configuring Worklist Blocks.....		631
Appendix E. Installing OrthoView™.....		635

Welcome to the Merge PACS™ Workstation (The “Merge PACS Workstation”). The Merge PACS Workstation is a Java-based diagnostic workstation that has all the tools required by a radiologist to perform primary interpretation of both cross sectional and plain film studies, and can be configured to individual user preferences. The purpose of this guide is to walk you through all the major features of the Merge PACS Workstation, both basic and advanced, and allow you to begin using it. If there is any information that you are unable to find in this manual, please contact your local system administrator or contact Merge Healthcare for assistance.

NOTE: In certain instances, such as for use in a clinical trial, the Merge PACS Workstation can be configured to hide patient, Series and Study-specific information in various places throughout the application. The specific information that is hidden when so configured is customizable on a site-by-site basis.

Chapter 1. Introduction

1.1. Overview

The Merge PACS Workstation consists of the following major components, each of which are described in greater detail throughout this Guide:

Workstation Browser

The Workstation Browser is the launching pad for all non-imaging related data in different views. Depending on your system configuration and login privileges, these may include the **Patient Record**, **RealTime Study List™**, **RealTime Worklist™**, **Query Search**, **Teaching Worklists**, **Recently Viewed Studies** and **Local Study**.

Note that the Browser is launched automatically as a separate window once you have logged into the system.

Merge PACS Viewer

The Merge PACS Viewer, which can be launched from RealTime Worklist, RealTime Study List, the Patient Record, Query Search or Local Study, is the primary application for viewing and manipulating patient images.

Mammography Thumbnail Viewer

When a mammography Study is loaded into the Merge PACS Viewer, the Mammography Thumbnail Viewer will be launched in a separate window. The Mammography Thumbnail Viewer contains a special Toolbar that can be used instead of the standard Application Toolbar to work with mammography images. This toolbar has additional tools available that are specific to Mammography and can be configured to display as many of the standard tools as the user desires.

1.2. Standalone vs Integrated Mode

Merge PACS can either be configured to run in **Integrated** mode (*i.e.*, using Merge iConnect® Enterprise Archive for image storage) or **Standalone** mode (*i.e.*, using Merge PACS for image storage). Some of the features described within this Guide will only be available in one mode or the other, as noted.

1.3. Color Scheme

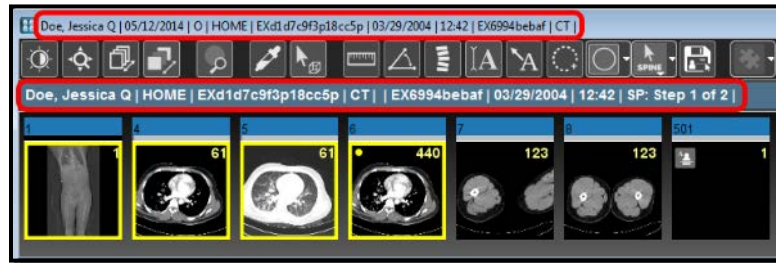
The Workstation Browser will either be displayed with a “light on dark” color scheme or a “dark on light” color scheme. This is configurable on a site-by-site basis.

1.4. Use within the United Kingdom

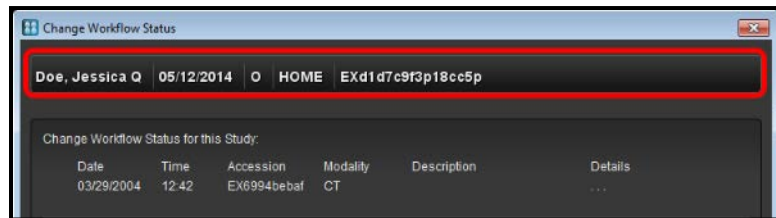
By default, the display of patient demographic information throughout the Merge PACS Workstation differs depending on where the information is displayed, as can be seen in the following examples:



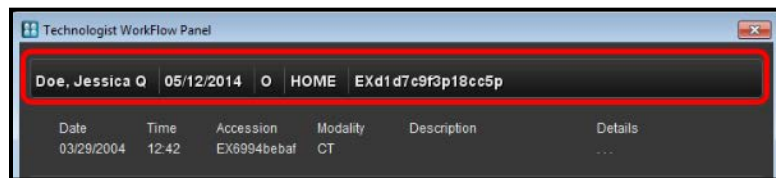
Standard Patient Demographics Display – Patient Record



Standard Patient Demographics Display - Viewer



Standard Patient Demographics Display – Order Viewer



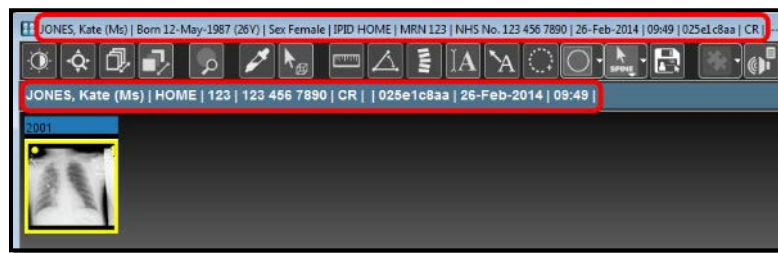
Standard Patient Demographics Display – Technologist Workpanel

Introduction

If, however, Merge PACS has been configured for use within the United Kingdom, a special **Patient Banner** will be displayed instead in a consistent manner throughout the Workstation and in a format designed to meet the NHS requirements, as can be seen in the following examples:



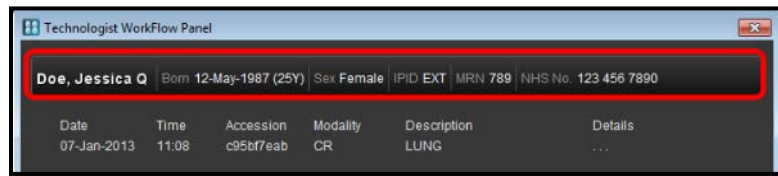
Patient Banner Demographics Display - Patient Record



Patient Banner Demographics Display - Viewer



Patient Banner Demographics Display – Order Viewer



Patient Banner Demographics Display – Technologist Workpanel

In addition, the display/formatting of other items such as telephone numbers, addresses, date/time, etc., will match UK standards and will appear differently than displayed in many of the screen shots within this User Guide.

NOTE: In general, whether patient information shown throughout the Workstation includes the **Local ID** (the patient ID associated directly with the study), the **Master ID** (the patient's NHS number) or both is configurable on a site-by-site basis.

Chapter 2. Getting Started

2.1. Downloading and Installing the Merge PACS Workstation

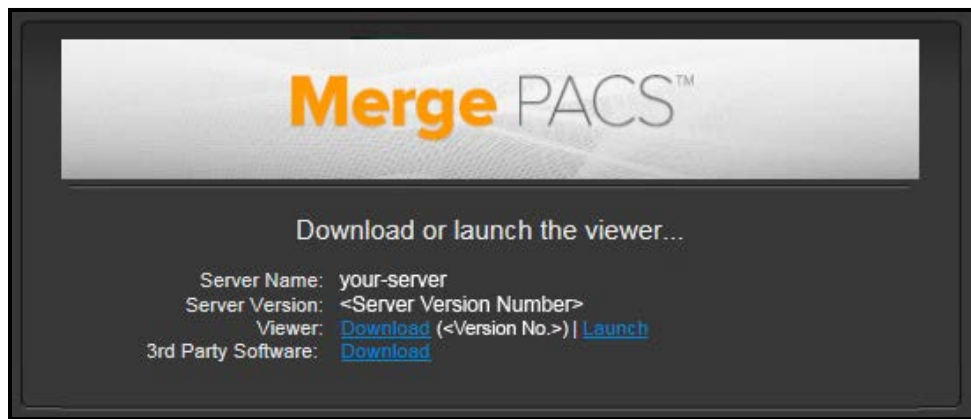
Before the Merge PACS Workstation can be launched, it must be downloaded and installed on your computer. Once the Merge PACS Workstation has been downloaded and installed, it can be accessed either from your site's Merge PACS Server website or from a shortcut on your computer's desktop. In either case, you will be automatically be provided with the latest version of the Workstation.

If you do not currently have a version of the Merge PACS Workstation (v. 7.2 or higher) installed on your computer, you can download and install the latest version from your site's Merge PACS Server's webpage as follows:

To download and install the Merge PACS Workstation:

1. Use a web browser to navigate to your site's Merge PACS Server's webpage.

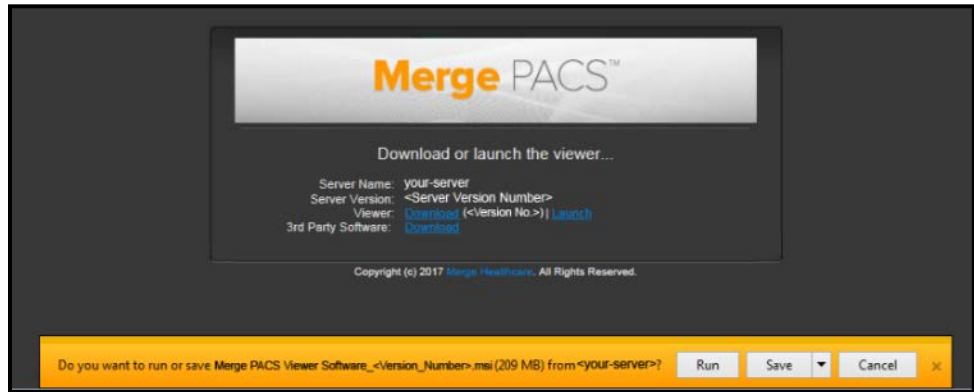
*The **Download and Launch** page will be displayed, as in the following example:*



Merge PACS Workstation Download and Launch Page

2. Click on the Viewer **Download** link to download a copy of the Workstation installer.

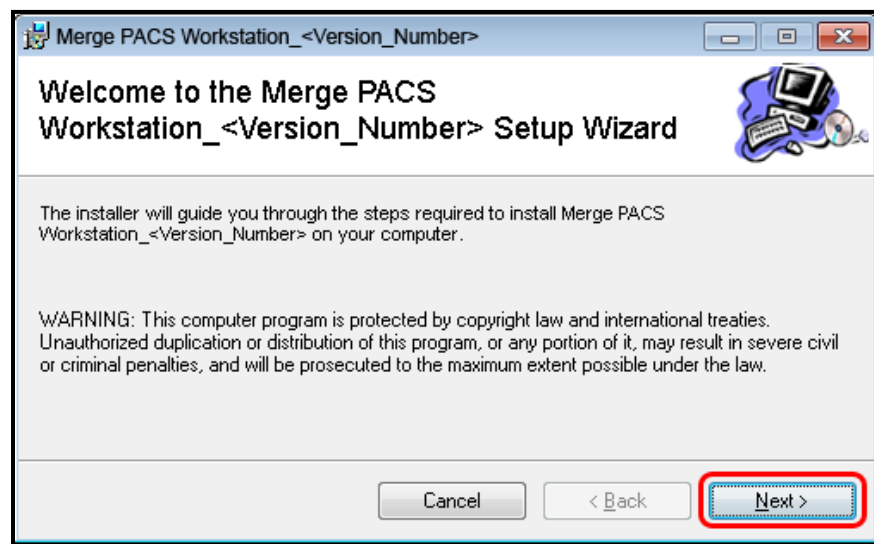
After a brief pause, you will be prompted to either **Run** or **Save** the installer, as in the following example:



Merge PACS Workstation Download and Launch Page – Run or Save

NOTE: If you click the **Save** button, the installer will be saved to your default download directory and you will then be prompted to run it from that directory. You can also click the arrow to the right of the Save button and select whether to “Save As” (e.g., in a custom directory) or “Save and run” (which will automatically run the installer once it has been saved to the default download directory).

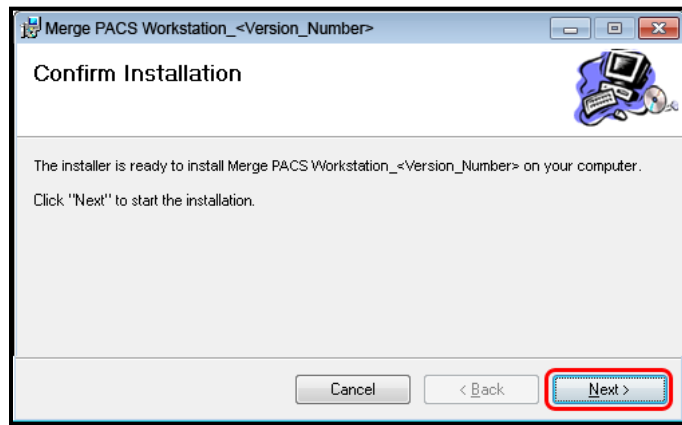
Once the installer is run, the **Merge PACS Workstation Setup Wizard** will be launched, as in the following example:



Merge PACS Workstation Setup Wizard

3. Click **Next** to continue.

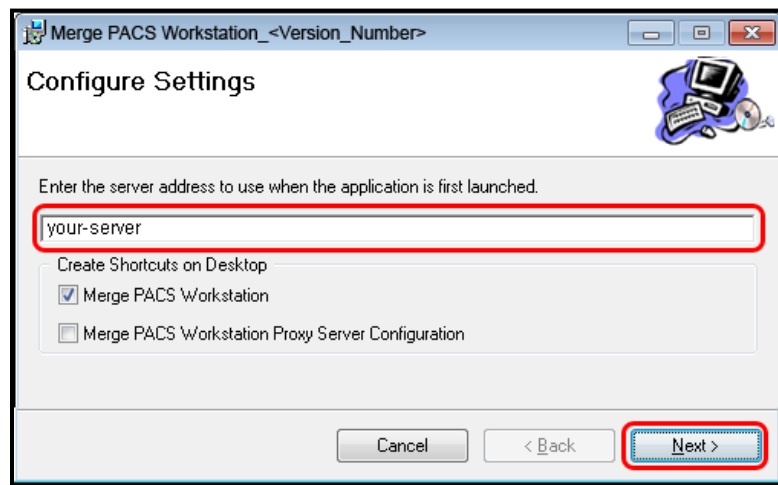
The **Confirm Installation** screen is displayed, as in the following example:



Merge PACS Workstation Setup Wizard – Confirm Installation

- Click **Next** to continue.

The **Configure Settings** screen is displayed, as in the following example:



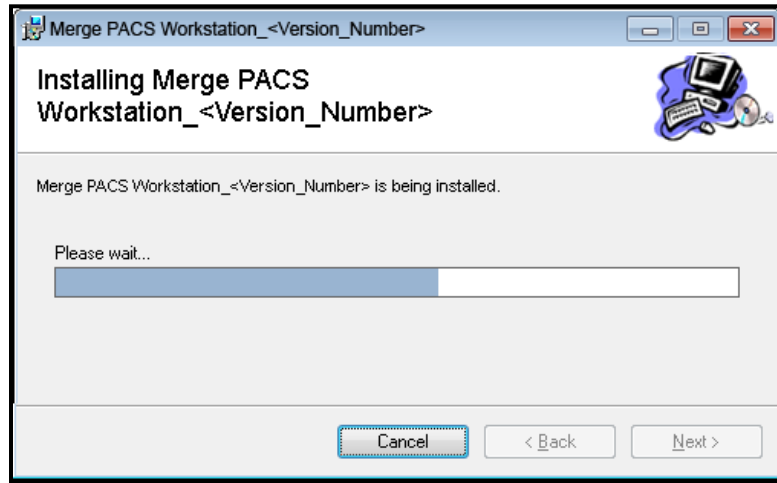
Merge PACS Workstation Setup Wizard – Configure Settings

- Enter the address of your site's Merge PACS Server in the field provided and click **Next** to continue.

NOTE: The server address can be an IP address (e.g., “10.5.22.44”) or a fully qualified domain name (e.g., “mergeradiology.com”) and should **not** include **http** or **www**.

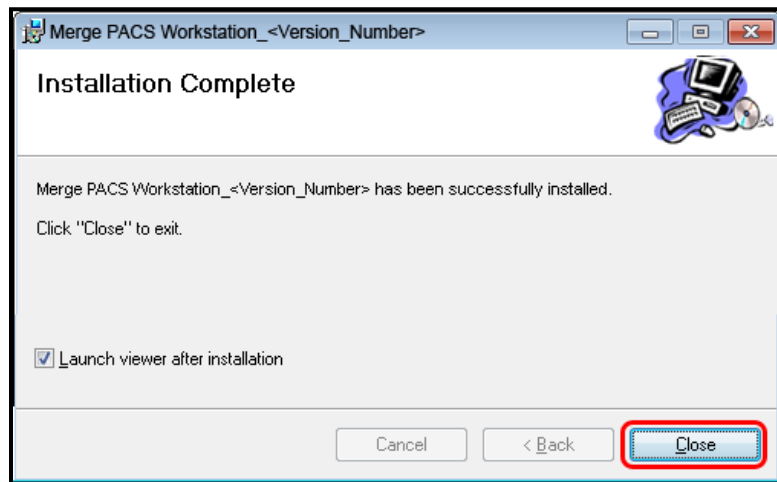
NOTE: If your Merge PACS Workstation needs to connect through a proxy server, you can select the **Merge PACS Workstation Proxy Server Configuration** option in order to be provided with an extra desktop shortcut that will let you enter your proxy settings after the installation process. Proxy Settings can also be configured from the Preferences dialog within the Workstation, as described in Chapter 24 below.

The installation process will proceed and a progress bar will be displayed, as in the following example:



Merge PACS Workstation Setup Wizard – Installation Progress

When the installation process has completed, the **Installation Complete** screen will be displayed, as in the following example:



Merge PACS Workstation Setup Wizard – Installation Complete

6. Make sure "Launch viewer after installation" is selected if you want to run the Workstation now and then click **Close**.

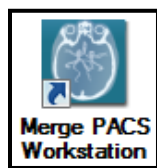
2.2. Launching the Merge PACS Workstation

Once the Merge PACS Workstation (v. 7.2 or above) has been installed on your computer, you can launch it in one of the following ways:

- Click on the Viewer **Launch** link on your Merge PACS Server's **Download and Launch** webpage, as described in Section 2.1 above.

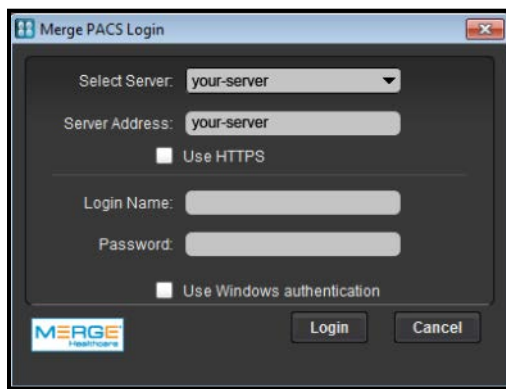
CAUTION: If you do not currently have a version of the Merge PACS Workstation downloaded and installed (v. 7.2 or higher), an error message will be displayed.

- Click on the Merge PACS Workstation desktop shortcut that was automatically created when you installed the Workstation, as in the following example:



Merge PACS Workstation Desktop Shortcut

Regardless of which way you choose, the **Merge PACS Workstation Login Screen** will be displayed, as in the following example:



Merge PACS Workstation Login Screen

- By default, the name and address of the Merge PACS Server you are using should be already be filled in.
 - If you need to access a different Merge PACS Server, select the desired Server from the drop-down **Select Server** menu.

NOTE: You may experience a brief pause while the Workstation attempts to access the selected Server before you will be able to enter your login credentials.

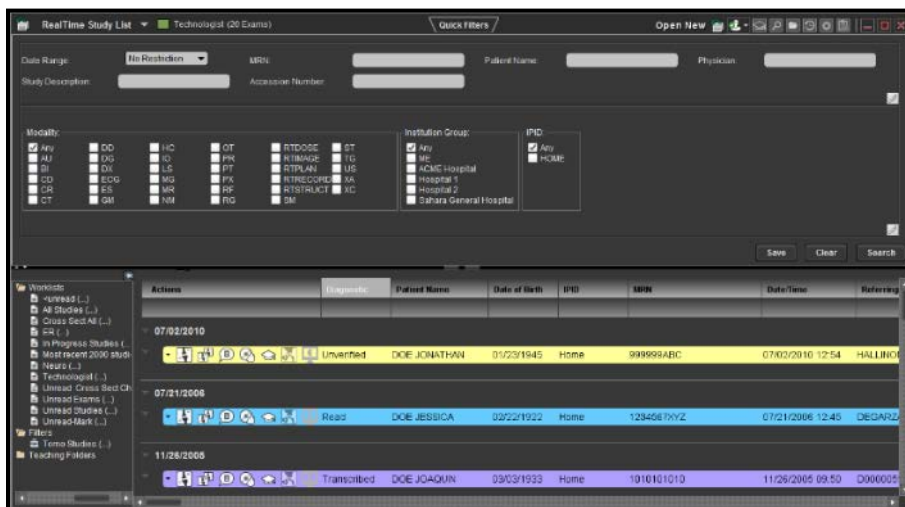
- If the desired Server is not currently listed in the Select Server menu, enter the URL or IP Address of the Server in the **Server Address** field (the next time you access the login screen, this Server will be added to the Select Server menu).
- If the Merge PACS Server you are accessing requires secure communications, make sure the **Use HTTPS** box is selected (ask your PACS Administrator if you are unsure whether secure communications are required or not).
- Enter your **Login Name** and **Password** in the appropriate fields.

NOTE: Your login name will automatically be remembered from your last login session and can be changed if necessary. Your password, however, will not be preserved and will need to be reentered each time.

- If appropriate, select the domain to which you belong.
- If Windows authentication is being used by your site, select the **Use Windows authentication** option.
- Click on the **Login** button to proceed.

If the version of the Merge PACS Workstation currently available on the Server has been installed on the client, the Workstation will be launched; otherwise, the version of the Workstation on the Server will be downloaded, installed and launched.

Chapter 3. The Workstation Browser



The Workstation Browser

The Workstation Browser provides six separate ways to access patient exams, depending on your login privileges:

Method	Description
RealTime Study List (RTSL)	Combined interface that allows you to view and manage RTWL worklists and Teaching Worklists on the same page, as well as create and save special Quick Filter Worklists on the fly. Note that you can either have RealTime Study List or RealTime Worklist enabled, but not both at the same time.
RealTime Worklist™ (RTWL)	Allows you to view and manage one or more lists of patient studies (“worklists”) that have been assigned to you.
Teaching Worklists	Allows you to view and manage one or more lists of patient studies that you have tagged for teaching and/or conferencing purposes.
Query Search	Allows you to search for a particular patient based on such criteria as patient name, physician’s name, modality type, etc.
Local Study	Allows you to open studies that have been previously saved to your local workstation or on a network accessible drive.
Recently Viewed Studies	Allows you to quickly access a list of studies that you have recently viewed.

Method	Description
Patient Record	Once a Study has been opened, the Patient Record displays Series Navigation thumbnails for that Study as well as any prior studies for the same patient. These Series Navigation thumbnails can be used to open the Study into the Merge PACS Viewer or into a separate pop-up Series Viewport window.

3.1. The Workstation Browser Toolbar




The top of the Workstation Browser includes a selection of tools that can be used at any time, as shown in the following example:



Workstation Browser Toolbar

The following tools may be available, depending on your login privileges:

Tool	Name	General Description
	Open New RTSL / Open New RTWL	Displays a menu that allows you to select a new RealTime Study List or RealTime Worklist (depending on how your system is configured) to be opened in a separate window, as described in subsection 3.3.11 below.
	Merge Messenger	Launches the Merge Messenger window to send and receive instant messages to other users who are currently online, as described in Chapter 23 below. Note that the appearance of the icon will depend on your current Messenger status.
	Merge Messenger Status Menu	Displays a menu that allows you to manually change your Merge Messenger status (e.g., from online to busy), as described in Chapter 23 below. Note that the appearance of the icon will depend on your current Messenger status.
	Open New Teaching Worklist	Displays a menu that allows you to select a teaching worklist to be opened in a separate window, as described in subsection 3.4.12 below.
	Open New Query Page	Launches a Query Search Page in a separate window, as described in subsection 3.5.6 below.
	Open New Local Study Search Page	Launches a Local Study Search Page in a separate window, as described in subsection 3.6.3 below.

Tool	Name	General Description
	Recently Viewed Study Quick Select	Displays a menu that allows you to quickly select a recently viewed Study to be opened in a Secondary Merge PACS Viewer window, as described in subsection 3.7.3 below.
	Merge PACS Management Pages	Launches the Merge PACS Management Pages in a separate window, as described in Section 3.11 below.
	Settings	Launches the Settings dialog that lets authorized users manage site, group and user privileges and preferences as well as templates and worklists, as described in Section 3.12 below.

3.2. RealTime Study List

The RealTime Study List is a combined interface that allows you to view RealTime Worklist (RTWL) worklists and Teaching Worklists on the same page, along with special Quick Filter Worklists that can be created and saved on the fly, as in the following example:

RealTime Study List

If you use the Windows docking feature to dock the RTSL to the left or right half of a monitor (i.e., by clicking on the page's titlebar and dragging it all the way to the left or right of the screen), RTSL will be displayed similar to the following example:



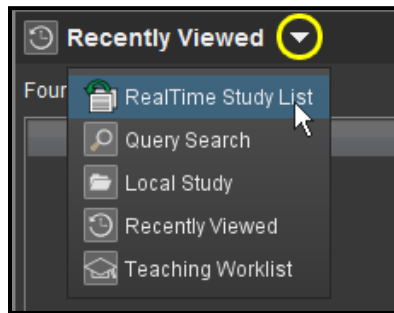
RTSL with Half Screen Docking

3.2.1. Accessing the RealTime Study List

When the RealTime Study List is enabled, it takes the place of RealTime Worklist entirely. You can select whether you want to have it or RealTime Worklist appear from the Merge PACS Preferences dialog, as described in Chapter 24 below.

CAUTION: In order to avoid delay of treatment, alert your PACS Administrator immediately if you notice unintended patients on your worklists.

The top of the Workstation Browser includes a drop-down menu that displays the various functions that can be shown within the Browser, as in the following example:



Workstation Browser Options

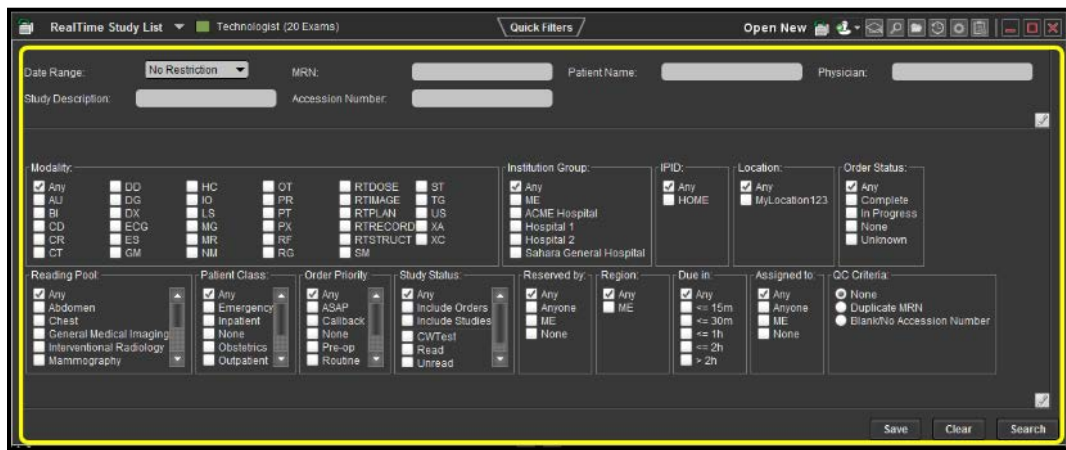
By default, if you have the login privileges to access the RealTime Study List and your workstation is configured to display it, as described in Chapter 24 below, the RealTime Study List should be activated when you first access the Workstation Browser. You can access it at any time by selecting the **RealTime Study List** option from this menu, however.

3.2.2. Creating and Saving Quick Filter Worklists

A Quick Filter Worklist is simply a saved set of search criteria that will generate a matching list of studies each time it is accessed. Once created and saved, you can access the Quick Filter Worklist directly to see the list of matching studies without needing to rerun the query.

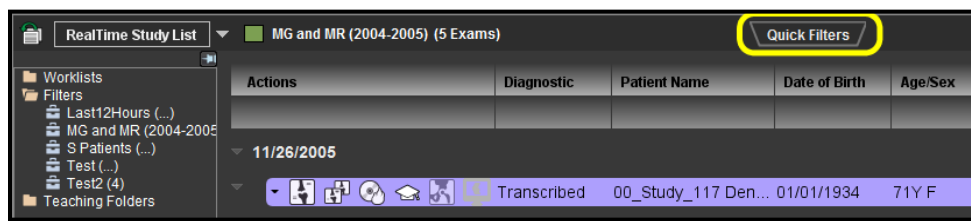
a. Accessing/Hiding the Quick Filters

Quick Filter Worklists are created using the Quick Filters in the top panel of the RealTime Study List, as in the following example:



RealTime Study List – Quick Filters Panel

If the Quick Filters panel is not currently displayed, you can access it by clicking on the **Quick Filters** button at the top of the screen, as in the following example:

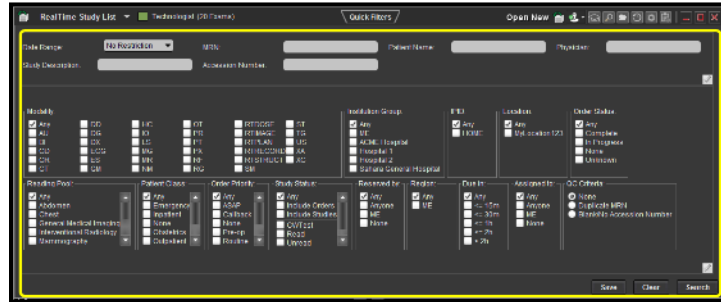


Quick Filters Button

NOTE: Clicking the Quick Filters button repeatedly will toggle the display of the Quick Filters panel on and off.

b. Creating a Quick Filter Worklist

Quick Filter Worklists are created using the Quick Filter search criteria in the top panel of the RealTime Study List, as in the following example:



RealTime Study List – Quick Filter Search Criteria

The list of search criteria that appear in the RealTime Study List may include one or more of the following options, depending on how your site is configured and which options you have chosen to display, as described in Paragraph d below:

- Date Range
- Date of birth
- MRN
- IPID
- Patient Name
- Accession Number
- Station Name
- Study Description
- Physician
- Modality
- Institution Group
- Location
- Patient Class
- Order Status
- Reading Pool
- Study Status
- Order Priority
- Reserved By
- Region
- Locked By
- Due In
- Assigned To
- QC Search Criteria
- Custom Tags 1-10

Enter or select search criteria in one or more of the available fields, bearing the following in mind:

- If you selected **Custom** from the drop-down **Date Range** menu, additional fields will be displayed to allow you to enter a start and/or an end date, as in the following example:

Entering a Date Restriction

- Dates should be entered in whatever format is currently configured for your site. Contact your PACS Administrator to find out what format is being used.
- You can also click on the calendar icon to the right of either date field to bring up a calendar window that will allow you to select the desired date instead of manually typing it in.

- Any alphanumeric characters can be entered for **Patient Name**, **MRN**, **Physician**, **Accession Number** and **Study Description** fields. In addition, you can use * as a wildcard character in these fields to fill in for letters or numbers you are unsure of. For example:
 - “**B*K**” would find “Black, John” as well as “Beckman, Timothy” and “Brown, Kelly.”
 - “***SMITH**” would find both “Goldsmith, David” and “DrSmith, Robert J.”
 - “***B*G**” would find both “Goldberg, Benjamin” and “Cable, George.”

NOTE: You can also use % as a wildcard character for the **Patient Name** field, but only to replace characters **after** the wildcard (e.g., "GOLD%" would find both "Goldberg, Barry" and "Goldsmith, Bernice", but you cannot use "%SMITH" or "B%G").

- If searching by **MRN**, **Patient Name** or **Physician**, bear in mind that the search will match based on the “normalized” (i.e., with non alpha-numeric characters removed) versions of the data. As a result, a search for an MRN of “21260” will locate a patient with an MRN of 21260 as well as a patient with an MRN of 2126.0, since the search will ignore the period. Similarly, a search for a Patient Name of “Gold-Smith” will also locate a patient with the name Goldsmith. Note, however, that the search results will display the original values so you can verify that the correct patient is selected, as in the following example:

The screenshot shows a search interface with the following fields: Date Range (No Restriction), Study Criteria, MRN (21260), Patient Name (gold-smith), Patient Code, Accession Number, Study Description, and Physician. Below the search criteria, it says "Found 7 studies." and displays a table of results:

Actions	MRN	Name	Date & Time	DOB
[Icons]	21260	Goldsmith Jessica P	03/29/2004 15:44	05/12/2014
[Icons]	2126.0	Gold-Smith Jonathan Q	11/30/2003 13:52	05/12/2014

Searching with Normalized Data

- If searching by **Patient Name**, you can enter the name you are searching for in the format “**last name, first name**” or simply enter the **last name** to find all people with that last name.
 - An “**implicit wildcard**” is automatically added to the **end** of your query, meaning that “**BL**” would find “Black, John” as well as “Blake, James” and “**B**” would find all people whose last name begins with the letter “B.”
 - You can also manually insert one or more asterisks [*] as wildcard characters to fill in for letters you are unsure of at the beginning or middle of a name, as described above.

- Names are stored in the Merge PACS database in whatever format they arrive from the DICOM modality and/or the HIS/RIS. Typically, this format is **last name, first name, middle name (or initial), prefix, suffix**, meaning that “Dr. John Q. Smith” would be stored as “SmithJohnQDr.” This practice can vary from site to site, however, and may affect how wildcard searches work for you. Some sites, for example, may append the **prefix** at the beginning of the name (e.g., “DrSmithJohnQ”). If you have any questions about how names are stored at your site, talk to your Merge PACS Administrator.
- An “implicit wildcard” is also automatically added to the **start** and **end** of **Study Description** queries, meaning that “**Chest CT**” would find “Chest CT,” “Chest CT w/Contrast” and “Chest CT w/o Contrast” and “**CT**” would find both “CT” and “Chest CT.”
- By default, the following fields are **case-sensitive** (although this can be changed on a site-by-site basis):
 - **Accession Number**
 - **Study Description**
 - **Institution Name**

NOTE: For example, if the Study description is L-SPINE, the Study won't be returned if you search for a Study Description of "spine" or "Spine."

- The **Study Status** field includes the following options with regard to whether an exam has an order or Study associated with it:

Option	General Description
Any	Include exams with all statuses, including those without orders or studies associated with them.
Include Orders	Only include exams with orders associated with them but no studies.
Include Studies	Only Include exams with studies associated with them, whether or not there are also orders.

- If your site has configured **Licensure Regions** for individual users, you will likely only be able to view exams for the licensure region(s) assigned to you (in which case the **Region** filter will have the “ME” option enabled and you will not be able to change it). If your PACS Admin has granted you the user privilege to allow creation of worklists that include any region or institution, however, you can use the **Region** options to select whether you wish to search among all exams (“Any”) or just among those that are within the licensure region(s) associated with you (“ME”).
- Similarly, if your site has configured **Credentialing** for individual users, you will likely only be able to view exams for the institution groups assigned to you (in which case the **Institution Group** filter will have the “ME” option enabled and you will not be able to change it). If your PACS Admin has granted you the user privilege to allow creation of worklists that include any region or institution, however, you can use the **Institution Group** options to select whether you wish to search among all exams (“Any”), among specific institution groups or just among those that are within the institution group(s) associated with you (“ME”).

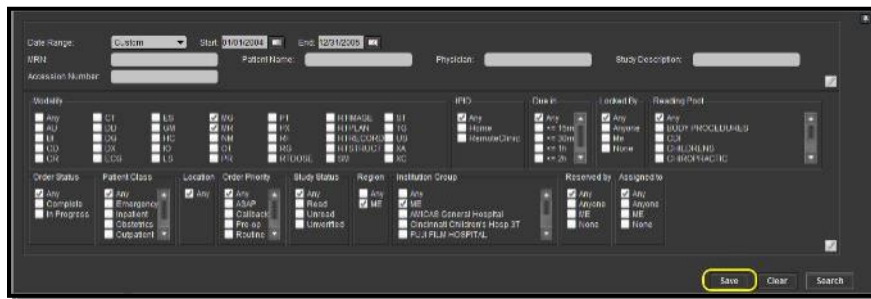
NOTE: In general, if fewer results than expected are returned, you should consider using fewer search criteria. However, in some cases you may need to **add** criteria to your search rather than remove them to help in situations where the search results are being truncated (either because the device is capping its results, or because the device does not support open-ended queries and is returning no results).

NOTE: If Merge PACS is configured with an extended query node, additional studies may be displayed in the search results (after some delay) that do not appear within standard worklists. However, if only series-level search criteria are specified, only local results will be included and a “partial results” warning message will be displayed.

NOTE: If Merge PACS is configured to run in **Integrated** mode with **Multiple Patient Identities (MPI)** enabled and you search based on IPID and the exact MRN of a patient, the search results will include studies that are associated with other IPIDs and MRNs for this person based on the linking of identities in MPI. For more information on MPI support, refer to Appendix C.2 below.

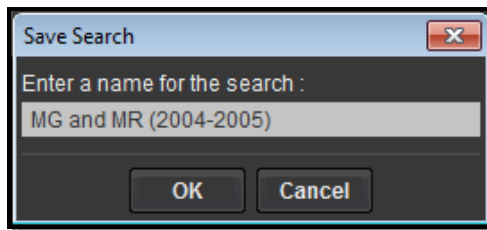
c. Saving a Quick Filter Worklist

Once you have created a Quick Filter Worklist, you can save it to your list of available worklists for future use by clicking on the **Save** button at the bottom right of the Search Criteria section, as in the following example:



Running the Query Search

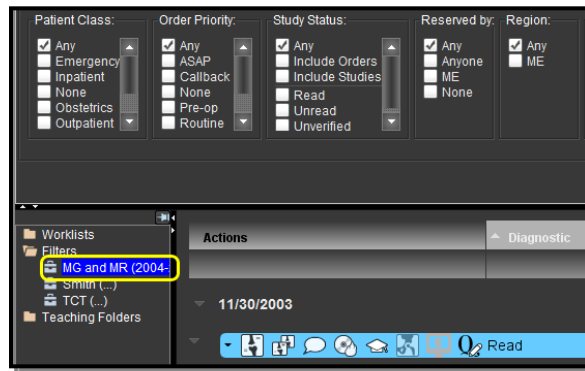
The **Save Search** window is displayed, as in the following example:



Save Search Window

Enter a name for this Quick Filter Worklist in the field provided and click on the **OK** button.

The newly created Quick Filter Worklist will now be included in the **Filters** folder of the **Available Worklist** section of the RealTime Study List, as in the following example:



Newly Saved Quick Filter Worklist

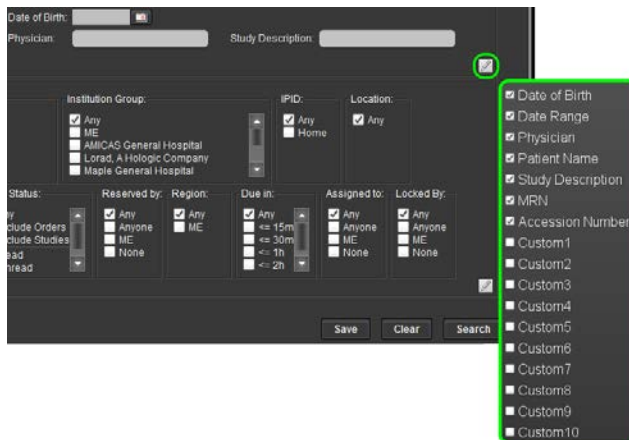
NOTE: You may need to click on the Filters folder in order to display the worklists contained within that folder.

d. Customizing the Quick Filters

If desired, you can customize the Quick Filters panel to add or remove various query fields as well as to determine which modalities are available for selection.

NOTE: The list of available options in the following menu is configurable on a site-by-site basis.

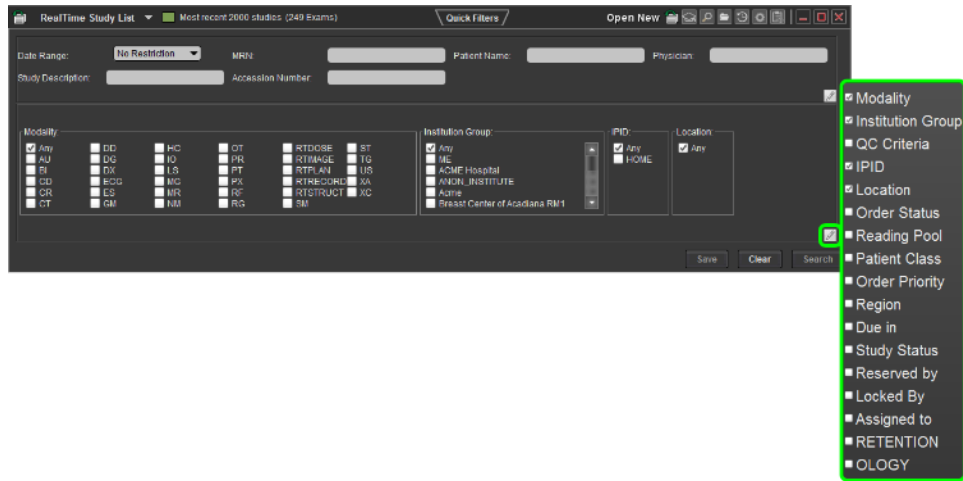
- Click on the pencil icon in the top section of the Quick Filters panel to add or remove query fields from that section, as in the following example:



Upper Quick Filters Selection Menu

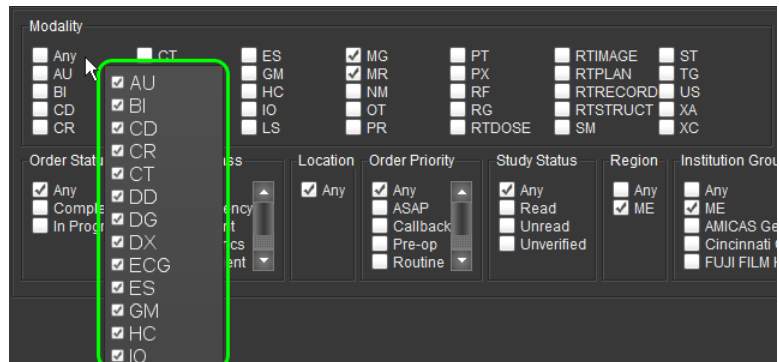
Check the box next to the field you would like to add, or uncheck the box next to a field you would like to remove.

- Click on the pencil icon in the bottom section of the Quick Filters panel to add or remove query fields from that section, as in the following example:



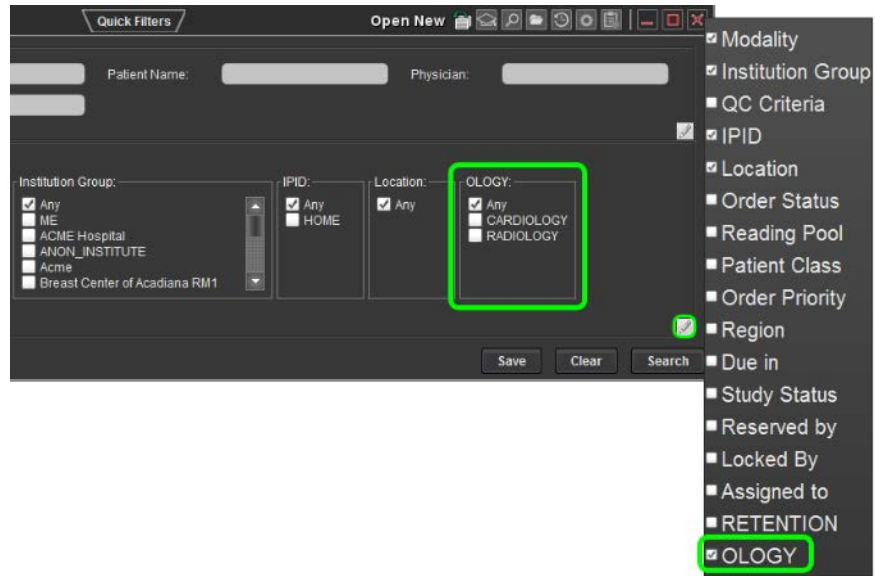
Lower Quick Filters Selection Menu

- If **Modality** is selected as an option for the bottom section of the Quick Filters panel, **right-click** anywhere on the list of available modalities to add or remove modalities from the list, as in the following example:



Modality Selection Menu

- If Merge PACS is configured to run in **Integrated** mode, the attached iCEA Server can be set up to tag studies according to Study Type (e.g., Cardiology, Radiology, Neurology, etc.) with multiple study types associated with one or more **Study Type Groups** (e.g., an “**OLOGY**” group that would include the aforementioned Cardiology, Radiology and Neurology study types). Any such study type groups will be available to be added as a query field with the associated study types included as options, as in the following example:

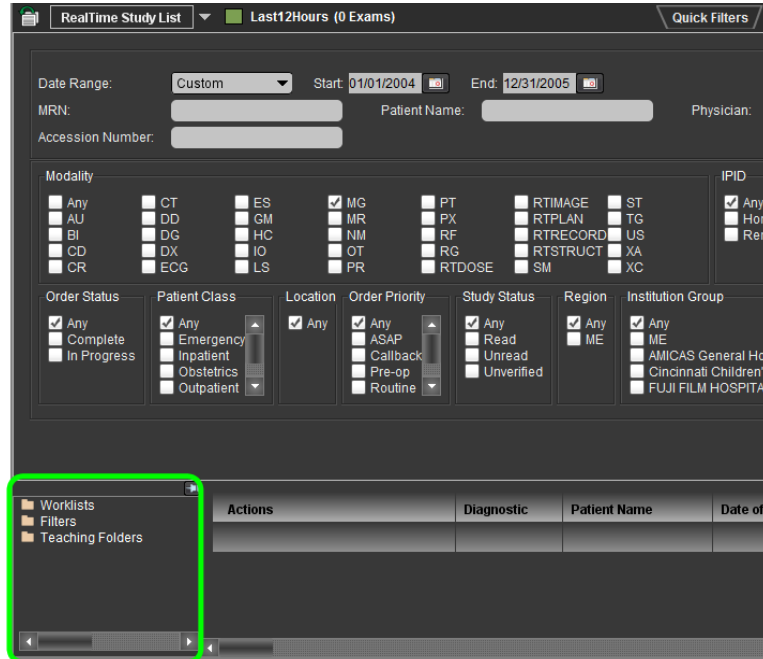


“OLGY” Study Type Group Selected as a Query Field

NOTE: Although an “OLGY” group is the most common study type group that would typically be used with Merge PACS, any number of other study type groups can be configured, such as a “RETENTION” group that would describe how the data for each study type is retained.

3.2.3. Available Worklists Panel

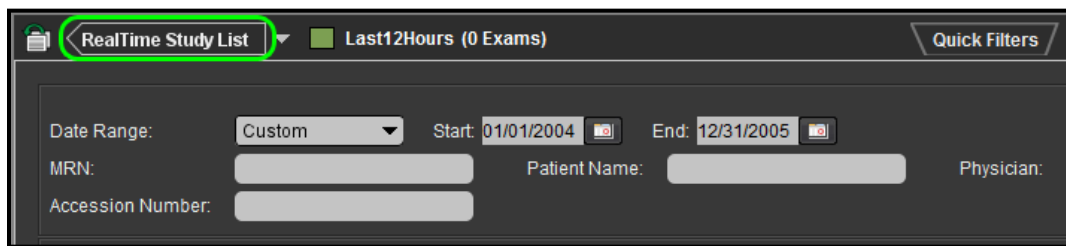
The Available Worklists panel lists all worklists that are currently available to you, including RTWL worklists (“Worklists”), saved Quick Filter Worklists (“Filters”) and saved Teaching worklists (“Teaching Folders”), as in the following example:



RealTime Study List – Available Worklists Panel

a. Accessing/Hiding the Available Worklists Panel

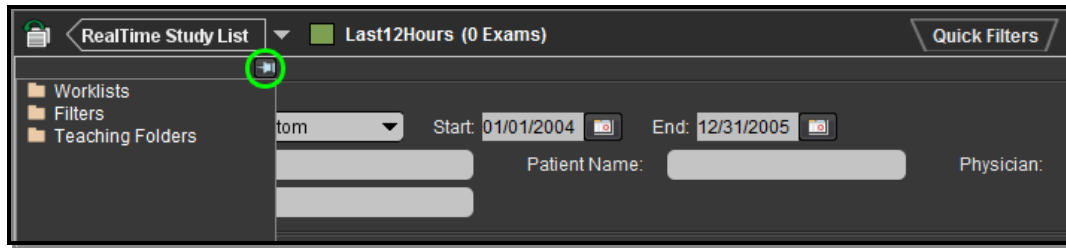
If the Available Worklists panel is not currently displayed, you can access it by clicking on the **RealTime Study List** button at the top-left of the screen, as in the following example:



RealTime Study List Button

NOTE: Clicking the RealTime Study List button repeatedly will toggle the display of the Available Worklists panel on and off, unless the panel has been pinned in place, as described below.

Once the Available Worklists panel is displayed, you can pin it in place so that it cannot be hidden by clicking on the Available Worklists pushpin icon in the upper-right corner of the panel, as in the following example:



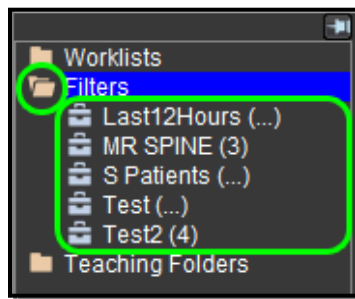
Available Worklists Pushpin

NOTE: Once the Available Worklists panel is pinned, it will be moved down to the bottom-left of the RealTime Study List screen.

NOTE: Clicking on the pushpin icon a second time will unpin the Available Worklists panel and cause it to be hidden until you click on the RealTime Study List button described above.

b. Selecting a Worklist

Clicking on any of the folders listed in the Available Worklists panel will cause all the worklists within that folder to be displayed, as in the following example:



Expanded Folder of Worklists

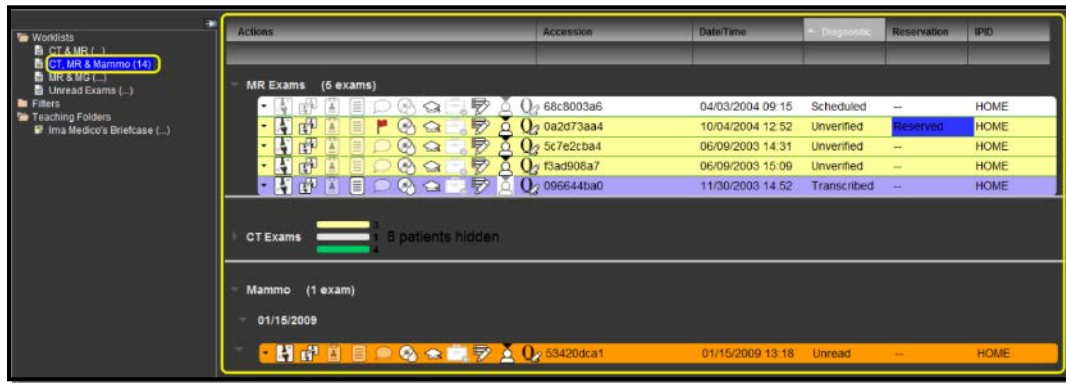
The Available Worklists panel includes the following three folders:

Folder	Description
Worklists	Holds all RTWL worklists available for your use, as described in Section 3.3 below.
Filters	Holds all Quick Filter worklists you have saved, as described in subsection 3.2.2 above.
Teaching Folders	Holds all Teaching worklists that you have created, as described in Section 3.4 below (including your default Briefcase worklist, if applicable).

NOTE: The number in parentheses after a worklist's name indicates how many studies are currently in that worklist. By default, this number will only be displayed for worklists that are currently being viewed by any user, but individual worklists can also be configured so that their Study count is always displayed.

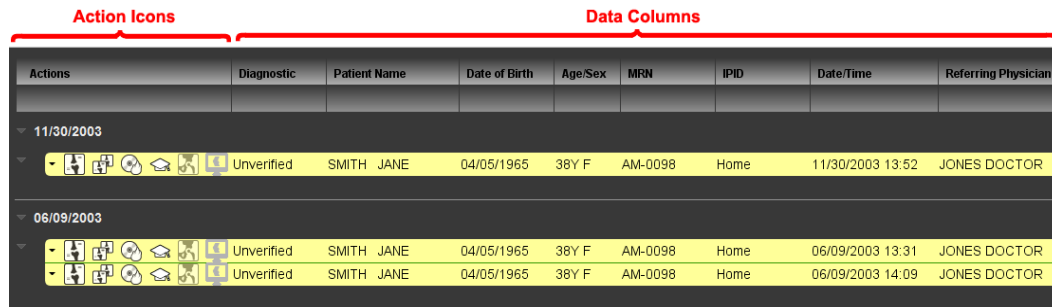
NOTE: If your site has the “**Briefcase**” option enabled, a default teaching worklist will be automatically created for you in the Teaching Folders folder called “<username>'s briefcase” (this worklist will initially be empty until you add studies to it).

Clicking on a worklist will cause it to be displayed in the Search Results section of the RealTime Study List, as in the following example:



RealTime Study List – Selected Worklist

Each worklist entry contains a set of **action icons** on the left that you can click on to perform different tasks, and **data columns** on the right that display information about each Study/order on the worklist, as shown in the following example:



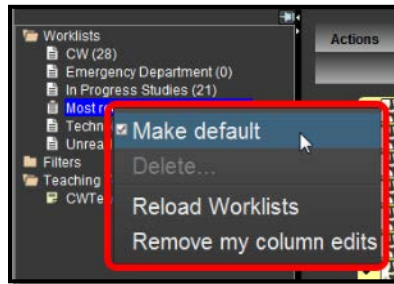
Action Icons and Data Columns

NOTE: The actual action icons and data columns, the order the columns appear and the names of the possible worklist status options are all customizable by an Administrator and may also vary from one worklist to another and one type of worklist to another.

By default, any RTWL worklists will be displayed in Patient List View, which shows all the studies in the current worklist without them being grouped by day. This can be switched to standard Worklist View, however, as described in subsection 3.2.8 below.

c. Setting a Default Worklist

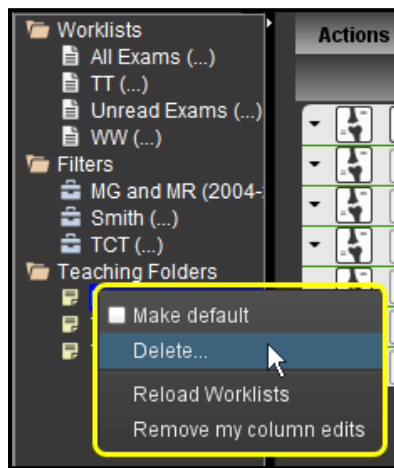
If you have multiple worklists available to you, you can select one worklist to be launched by default when you first access the RealTime Study List. To do this, right-click on the desired worklist in the Available Worklists panel and select **Make Default** from the pop-up **Available Worklists Right-click Menu**, as shown in the following example:



Setting the Default Worklist

d. Deleting a Saved Teaching or Quick Filter Worklist

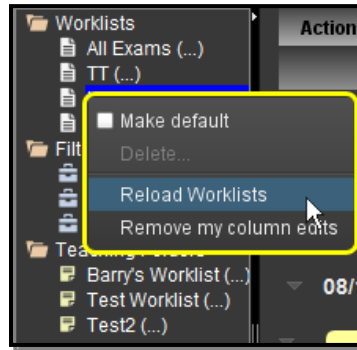
You can delete any Teaching Worklist (including your Briefcase) or Quick Filter Worklist so that it no longer is displayed in your list of available worklists. To do this, right-click on the desired worklist in the Available Worklists panel and select **Delete** from the pop-up **Available Worklist Right-click Menu**, as shown in the following example:



Deleting a Teaching or Quick Filter Worklist

e. Reloading All Worklists

If desired, you can manually refresh all worklist available to you. To do this, right-click on any folder or individual worklist in the Available Worklists panel and select **Reload Worklists** from the pop-up menu, as shown in the following example:



Reloading All Worklists

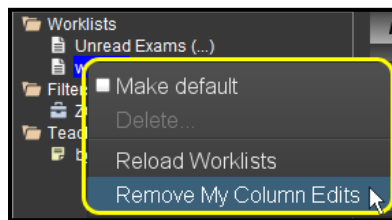
NOTE: You can also reload all worklists from the RealTime Study List Right-click General Menu, as described in subsection 3.2.6 below.

f. Restoring Column Defaults

If you have edited the data columns for any worklists, as described in subsection 3.2.5 below, those changes will be automatically saved to your user preferences. For RTWL and Teaching worklists, this means that the settings will be preserved the next time you access those worklists. For Quick Filter worklists, it means that these settings will be applied by default to any future Quick Filter searches you perform (regardless of whether or not you save that search as a Quick Filter worklist).

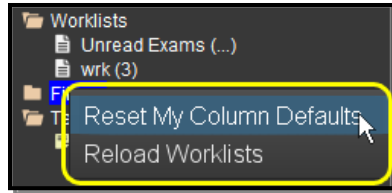
If desired, you can reset the display of worklist columns to the default values defined for your Merge PACS. For RTWL and Teaching worklists, this can be done for individual worklists. For Quick Filter worklists, you can restore the default column settings that will be used for the current display of Quick Filter search results and any future Quick Filter searches (previously saved Quick Filter worklists will not be affected, however).

To restore the column defaults for individual **RTWL** or **Teaching** worklists, right-click on the desired worklist and select **Remove My Column Edits** from the pop-up menu, as in the following example:



Reloading Column Defaults for a Worklist

To restore the column defaults for the current and future **Quick Filter** searches, right-click on the **Filters** folder and select **Reset My Column Defaults** from the pop-up menu, as in the following example:



Reloading Column Defaults for Quick Filter Searches

3.2.4. Action Icons

The actual action icons available on any given worklist will depend on the type of worklist, how that particular worklist is configured and your login privileges. For a complete list of possible action icons, refer to Section 3.9 below.

3.2.5. Data Columns

a. In General

The following general data columns may be available on your worklist, depending on how your system is configured:

- Accession
- Acuity *
- Age/Sex
- Assignment Status
- Availability
- Connection Status
- Communication Status
- Date/Time
- Date of Birth
- Description / Procedure
- Diagnostic Status
- Due In
- End Date/Time
- ER Status
- Image Transfer Status
- Images
- Institution Group
- Institution Name
- IPID (Issuer of Patient ID)
- Last Action
- Licensure Region
- Modality
- Objects
- Order Match Status
- Order Priority
- Order Status
- Patient Class
- Patient ID
- Patient Location
- Patient Name
- Prefetch
- Priors
- QC Exception
- Reading Physician
- Reading Pool
- Referring Physician
- Reservation Status
- Series with Images
- Station Name
- Study Locking Status
- Update Order Status
- Custom Study Type Groups (if any) **
- Custom Columns (if any)

* **Acuity** may be displayed if the optional Merge RadStream™ feature is enabled.

** One or more **Study Type Groups** may be displayed if Merge PACS is configured to run in **Integrated** mode and the attached iCEA Server is set up to tag studies according to Study Type with multiple study types associated with one or more Study Type Groups (e.g., an “**OLOGY**” group that would include Cardiology, Radiology and Neurology study types).

NOTE: Additional custom data columns may be configured on a site-by-site basis

NOTE: Column headers for the various status dimensions (Communication, Connection, Reservation, Image Transfer, Study Locking and ER) may be displayed as text or as an icon, depending on how the worklist is configured. If the column header is configured to display as an icon, the values for that column will also be displayed as an icon, if set.

NOTE: Additional “Parameter” columns for the various status dimensions may be included to display the current value for a particular status (e.g., the **Reservation Status** column might indicate that a Study has a status of “Reserved” and the **Reservation Parameter** column might display the name of the user who has reserved the Study).

NOTE: If a Study has been edited in the Quality Control Editor after being imported to change the station name associated with that Study, both the original and the new station name may appear in the Station Name column.

NOTE: The prior count displayed in the **Priors** column is an approximated value and may not reflect the actual number of priors that are displayed if you choose to show priors for the study, as described in subsection 3.2.9 below.

NOTE: **End Date/Time** is pulled from the Order Complete HL7 message associated with the exam. Therefore, this information will disappear if and when the order is purged from the system. When this happens, the End Date/Time column will show as empty for the exam.

b. Due In Column

If your site’s workflow includes deadline tracking due to **Service Level Agreements (SLAs)**, the **Due In** column will allow you to keep track of studies that are required to be read within a certain deadline.

Depending on how your site is configured, up to four separate threshold limits (in minutes), each with its own display color, may be tracked in the Due In column. For example, if the SLA is set to 30 minutes, the Due In column might display a **GREEN** background when 10 minutes are remaining, a **YELLOW** background when 5 minutes are remaining and a **RED** background when 1 minute is remaining.

In addition to the configured color and the amount of time remaining until due (or time past due), the Due In column will display the following information as “hover” text when the mouse cursor is placed over it:

Value	Description
Arrived	The time the last image was received for the Study plus the Inactivity Timeout period configured for your site.

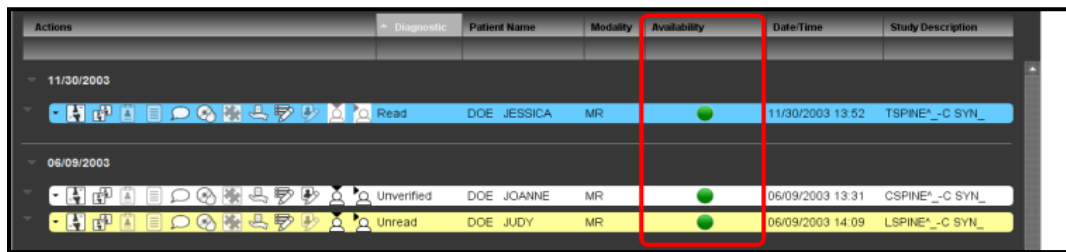
Value	Description
Due By	The "Arrived" time plus the SLA value defined for the Study's Priority.
Completed	The time the Study was transitioned to (or past) the diagnostic status configured for your site to indicate completion.

Note the following:

- If there is no order associated with a Study, the Study will be considered "Routine" priority and the SLA will be whatever is currently configured for the Routine priority.
- If a new or updated order is associated with a Study and that order contains a priority, the Study Due In time will be updated.
- If a new image is received for a Study that is not yet complete, the "Arrived" and "Due By" times will be updated.
- If a new Presentation State or Key Object is received for a Study that is not yet complete, the "Arrived" and "Due By" times will be not be updated.
- Depending on how your site is configured, the "Arrived", "Due By" and "Study Completion" times will be not updated may or may not be updated if a new image arrives for a Study that is complete.
- If a new PR or KO arrives for a Study that is complete, the "Arrived" and "Due By" times will be not updated and the Study Complete value will not be cleared.

c. Availability Column


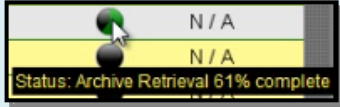



Individual worklists can be configured to include an **Availability** column, as in the following example:



Availability Column

The Availability column shows an availability status indicator for each Study. The appearance of the indicator indicates the availability of the Study as follows:

Indicator	Color	Description
	Green	The Study is available online for viewing.
	Black	The Study is currently offline and not available for viewing.
	Blue	A request to retrieve the Study has been submitted, but the retrieval process has not yet started.

Indicator	Color	Description
	Black / Green	The Study is currently being retrieved. Note that the percentage of green shown will change to indicate the progress of the retrieval process. Hovering your mouse cursor over the indicator will cause the exact percentage to be shown in a tool-tip window, as in the following example: 
	Orange	Images for this Study are currently being imported for the first time or additional images are currently being added to an existing Study.
	Red	Retrieval of the Study has completed, but with errors (either fewer images were received than expected or all images failed compression)
	Gray	The availability of the Study is currently unknown (this may occur during timeout or error scenarios). Clicking the Availability icon will refresh the data.

Retrieval Progress

d. Study Type Groups

When Merge PACS is configured to run in **Integrated** mode, the attached iCEA Server can be set up to tag studies according to Study Type (e.g., Cardiology, Radiology, Neurology, etc.). In addition, multiple Study Types can be placed together into a **Study Type Group** (e.g., an “OLOGY” group that would include the aforementioned Cardiology, Radiology and Neurology study types).

NOTE: Although an “OLOGY” group is the most common study type group that would typically be used with Merge PACS, any number of other study type groups can be configured, such as a “RETENTION” group that would describe how the data for each study type is retained.

Any Study Group Type that has been configured in iCEA can be added as a data column to any worklist, as described in Paragraph g below.

e. Sorting by Data Column

You can sort a worklist by clicking on any of the data column headings. Clicking on the column heading a second time will reverse the direction of sorting

NOTE: If the worklist is displayed in Worklist View as opposed to Patient List View, as described in 3.2.8 below, the data will be sorted separately within each status group and for each day and not for the entire worklist.

f. Searching within a Data Column

You can temporarily narrow the entries in a given worklist by entering text to be matched in the fields beneath one or more of the column headings, as in the following example:

Actions	Diagnostic	Patient Name	Date of Birth	IPID
Clear Filter		smith		home
11/30/2003				
Unverified	SMITH JANE	04/05/1965	Home	
05/28/2001				
Unread	Smith Betty		Home	

Searching within Data Columns

- Filtering will occur as you enter the text; there is no need to press the **Enter** key.
- The search will match any part of the word or words in the column (e.g., “smith” will match both “Goldsmith” and “Smithfield”).
- In general, the search will match the actual text in the column. For example, if dates are displayed in mm/dd/yyyy format and you want to filter the results by June 29, you will have to enter “06/29” instead of “June 29”.
- The search does, however, support word separation (e.g., entering “J Doe” and “Doe J” will both work to display “Jane Doe”, “Jessica Doe” and “Jonathan Doe”).
- You can filter by multiple columns at the same time by entering text in more than one fields, as in the example shown above.
- Filtering a worklist will cause the worklist count in the window titlebar to be updated to match the number of studies currently being displayed.
- Once you have filtered on one or more columns, a new **Clear Filter** link will be displayed that will let you remove all filters and return to the original worklist display, as in the following example:

Actions	Diagnostic	IPID	MRN	Patient Name
Clear Filter				ABC
08/20/2013				
Unverified	HOME	d1d7c9f3p18...	ABC FIRST	

Clear Filter Link

g. Editing Data Columns

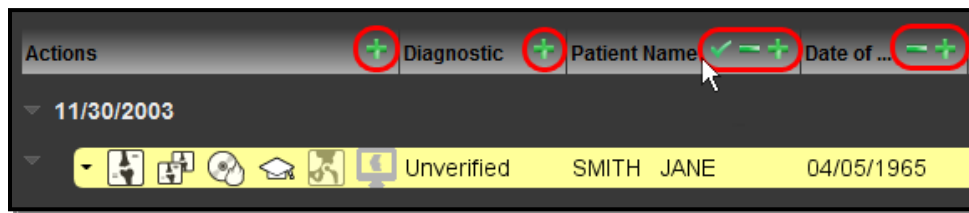
If desired, you can edit the display of any worklist to add or remove data columns, change the order in which the columns appear and/or change the width of one or more columns.

NOTE: Any change made to a **RTWL** or **Teaching** worklist will only affect your view of that worklist and will not affect how other users view the same worklist. In addition, any future changes made to the underlying worklist by a PACS Administrator will not be reflected in your view of that worklist once you have made changes to it.

NOTE: Any changes made to a **Quick Filter Worklist** will change the actual definition of that worklist and will also be used by default for any Quick Filter searches you perform in the future.

NOTE: Default column settings can be restored from the **Available Worklist Panel**, as described in subsection 3.2.3 above.

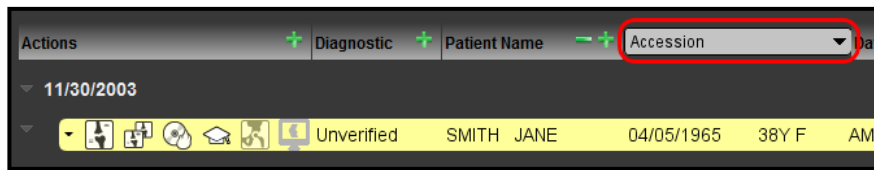
To enable editing of the data columns, **right-click** on any column heading to activate the column editing controls for all columns, as in the following example:



Column Editing Controls

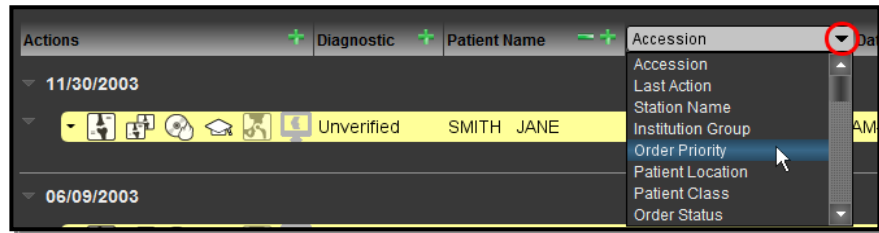
Once column editing has been enabled, you can do the following:

- To **remove** a column from the worklist display, click on the **Remove Column** icon, as displayed to the left, on that column's header. Note that the **Actions** and **Diagnostic** columns cannot be removed.
- To **add** a new column to the right of an existing column, click on the **Add Column** icon, as displayed to the left, on the column header to the left of where you would like the new column to appear. This will cause a new column to be displayed with a drop-down menu as a header, as in the following example:



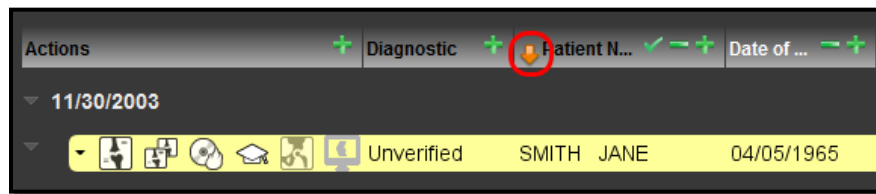
Newly Added Data Column

Click on the drop-down menu and select the desired column header, as in the following example:



Selecting Data Column to Add

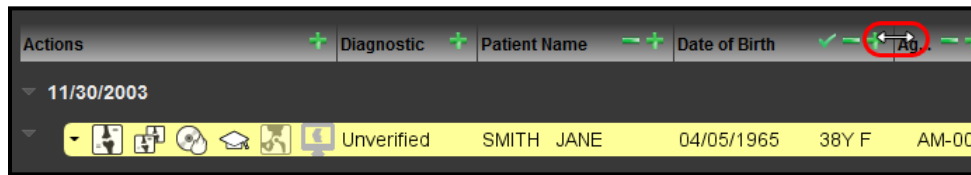
- To **move** a column to a different location, **left-click** on the column header and drag it to the desired location. As you are dragging the column header, its current location will be indicated by an orange arrow, as in the following example:




Moving a Column

When you release the mouse button, the column will be moved to the location indicated by the orange arrow.

- To **resize** a column, hover your mouse over the left or right edge of the column header until your mouse cursor changes to a special resize icon and then drag and drop the edge as desired, as in the following example:



Resizing a Column

-  To save all changes that have been made to all columns, click on the **Commit Changes** icon, as displayed to the left, on any column header.

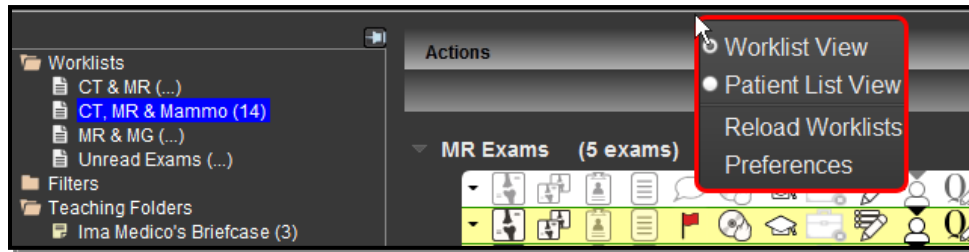
NOTE: If you want to cancel any changes that you have made before committing them, you can temporarily select a different worklist from the **Available Worklists** panel, click on an exam in the search results or choose to reload all worklists, as described in paragraph 3.2.3.e above.

3.2.6. RealTime Study List Right-click Menus

In addition to the Available Worklists Right-Click Menu described in subsection 3.2.3 above, there are three other right-click menus available from within the RealTime Study List.

a. RealTime Study List Right-click General Menu

The **RealTime Study List Right-click General Menu** displays a number of options that apply to RealTime Study List in general and is accessible by clicking anywhere directly above the Data Column headers, as in the following example:



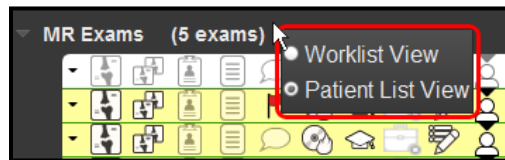
RealTime Study List Right-click General Menu

The RealTime Study List Right-click General Menu will display one or more of the following options, depending on your login privileges:

Option	General Description
Worklist View	Displays the entire current worklist in Worklist View mode, as described in subsection 3.2.7 below.
Patient List View	Displays the entire current worklist in Patient List View mode, as described in subsection 3.2.7 below.
Reload Worklists	Reloads all worklists available to you, as described in subsection 3.2.3.e above.
Preferences	Allow you to set your personal Viewer preferences, as described in Chapter 24 below.

b. Worklist Block Right-click Menu

When viewing a RTWL worklist, the **Worklist Block Right-click General Menu** displays a number of options that apply to a specific worklist block and is accessible by clicking anywhere to the right of that block's name with the **right** mouse button, as in the following example:



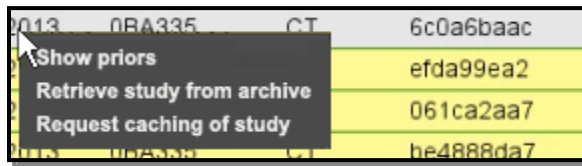
Worklist Right-click General Menu

The Worklist Block Right-click Menu displays the following options:

Option	General Description
Worklist View	Displays the worklist block in Worklist View mode, as described in subsection 3.2.8 below.
Patient List View	Displays the worklist block in Patient List View mode, as described in subsection 3.2.8 below

c. RealTime Study List Right-click Study Menu

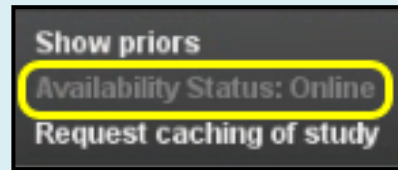
The **RealTime Study List Right-click Study Menu** displays options that apply to a specific exam or Study and is accessible by right-clicking anywhere on the worklist entry for that exam or Study, as in the following example:



Worklist Right-click Study Menu

The RealTime Study List Right-click Study Menu will display one or more of the following options, depending on your login privileges and how your system is configured:

Option	General Description
Show [Hide] Priors	Displays [or hides] prior exams, if any, for the selected Study, as described in subsection 3.2.9 below.
Retrieve Study from archive [Availability Status]	<p>If Merge PACS is configured to retrieve studies and the primary Study is currently not available online, submit a retrieval request for this Study.</p> <p>Note the following:</p> <ul style="list-style-type: none"> This action is equivalent to clicking the Retrieve action icon, as described in Section 3.9 below and would typically only be used if the Retrieve action icon is not enabled for a particular worklist. If the Study is currently online, the option will be grayed out and will read "Availability Status: Online", as in the following example:



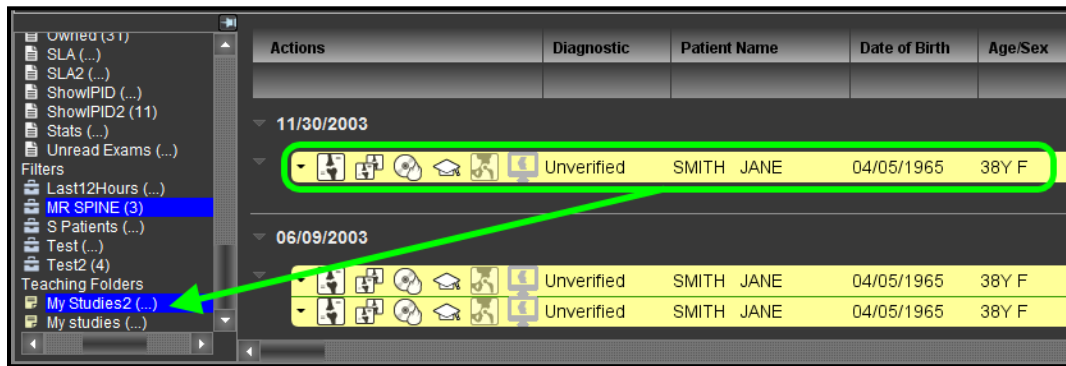
Study Is Online

Option	General Description
	<ul style="list-style-type: none"> If a retrieval request has been submitted but not yet completed, the option will be grayed out and will display the current status of the retrieval process, as in the following example: <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Show priors Availability Status: Archive Retrieval Queued Request caching of study</p> <hr/> <p>Show priors Availability Status: Archive Retrieval 2% complete Request caching of study</p> </div> <p style="text-align: center; color: red;">Retrieval Status</p>

Request caching of Study Manually request caching of the selected Study's images if caching has been enabled for this worklist, as described in subsection 3.3.10 below. Note that this option will only be available for RTWL worklists.

3.2.7. Adding Studies to Worklists via Drag and Drop

You can quickly add a Study from any worklist to any other worklist by clicking on the desired Study's entry in the source worklist and dragging and dropping it to the target worklist in the Saved Worklist window, as in the following example:



Dragging and Dropping to Another Worklist

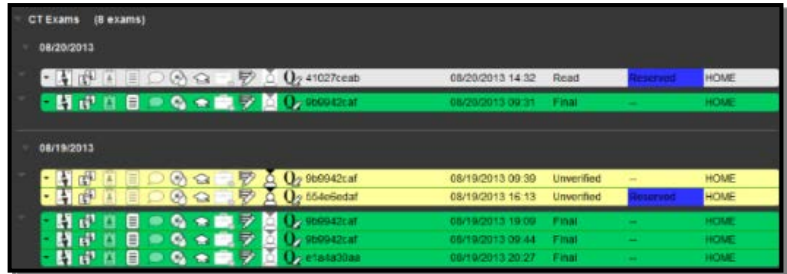
In the example above, the Study for the patient "SMITH JANE" is being dragged and dropped from a Quick Filter Worklist called "MR SPINE" to the a Teaching Worklist called "My Studies2."

3.2.8. Changing Between Worklist and Patient List View

Depending on the type of worklist being viewed and how it has been configured, it will be displayed either in **Worklist View** mode or **Patient List View** mode:

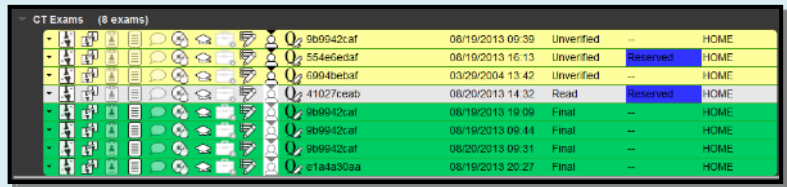
View Mode	Description
-----------	-------------

Worklist View Divides each worklist or worklist block into separate sections for each day with color-coding for various statuses, as in the following example:



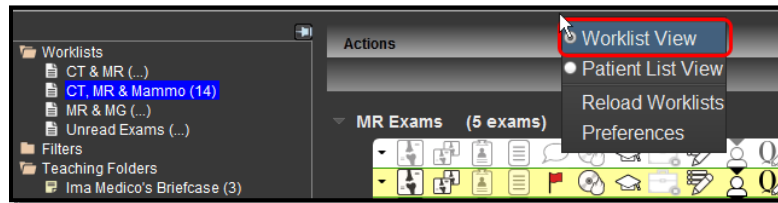
Worklist View

Patient List View Shows all the studies in the current worklist or worklist block without them being grouped by day, as in the following example:



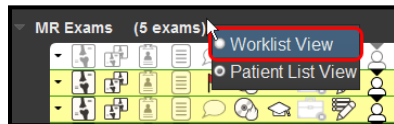
Patient List View

Regardless of how a worklist or worklist block is displayed by default, however, you can change the view mode for an entire worklist at any time from the **RealTime Study List Right-click General Menu**, as in the following example:



Selecting Worklist View for the Entire Worklist

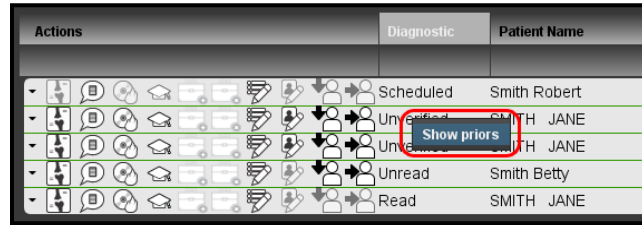
In addition, if you are viewing a RTWL worklist, you can set the view mode for a particular worklist block from the **Worklist Block Right-click Menu**, as in the following example:



Selecting Worklist List View for a Worklist Block

3.2.9. Viewing Prior Studies

If a particular Study on a worklist has prior studies associated with it, you can add those prior studies to the worklist. This is done by clicking on the desired Study with the **right mouse button** and then selecting the **Show Priors** option from the **Worklist Right-click Study Menu**, as shown in the following example:



Adding Prior Studies to Worklist

NOTE: The Show Priors option will be grayed out if there are no available priors that can be displayed.

The prior studies will then be listed below the current Study in the worklist, as shown in the example below:

[Icons]	Unverified	Smith Joe	11/11/2011	0D M	PID000T1
[Icons]	-PRIOR-	+ Baker Joe	11/11/2011	0D M	PID000T1
[Icons]	-PRIOR-	+ Baker Joe	11/11/1911	29Y F	PID000T1
[Icons]	-PRIOR-	Smith Joe	11/11/1911	29Y F	PID000T1

Prior Studies in the Worklist

The list of prior studies is determined by the **Patient Comparison Strategy** and the **“Selection of Priors”** option configured for your site, as well as Multiple Patient Identity (if MPI is enabled for your site), as described in Appendix C below. Studies will be added to the list of prior studies **dynamically** as they are determined to be priors instead of waiting for all priors to be discovered before displaying the list. While the list of priors is being created, a status indicator will be displayed to let you know that the list is not yet complete, as in the following example:

[Icons]	Final		14-Feb-2016 15:44	JONES, Katherine
[Icons]	Unverified		26-Feb-2014 09:49	JONES, Kate
[Icons]	-PRIOR-		29-Mar-2017 12:42	JONES, Kate
[Icons]	-PRIOR-		14-Feb-2016 15:44	+ JONES, Katherine

List of Prior Studies In Progress

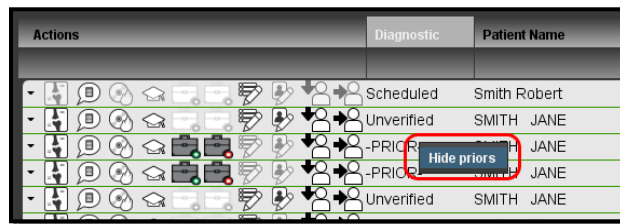
NOTE: You can choose to display priors for multiple studies at the same time and each study will have its own separate status indicator.

NOTE: If Merge PACS is configured with an extended query node, additional prior studies may be displayed that do not appear within the worklist proper.

NOTE: Individual RTWL worklists and Teaching Worklists can be configured by an Administrator to “automatically display priors.” When this feature is enabled, all prior studies for a selected Study will be displayed in the worklist when that Study is opened into the Merge PACS Viewer, as described in Chapter 4 below.

CAUTION: The list of priors will be current as of the time the “Show priors” option is selected, but will not automatically be updated in real time if the information changes (e.g., if priors are in the process of being “pre-fetched” and have not yet been added to the list). Any changes to the list of priors will only be displayed if you hide the list of priors and then show it again.

You can remove the prior studies from the worklist by clicking the **right** mouse button and selecting the **Hide Priors** option from the **Right-Click Worklist Menu**:



Hiding Prior Studies

NOTE: If a prior list is in the process of being assembled for a particular study (i.e., the status indicator is displayed), selecting “Hide Priors” will cancel the operation.

3.2.10. Opening Multiple RealTime Study Lists

If desired, you can open additional RealTime Study Lists in their own separate windows. To do so, click on the **Open New RealTime Study List** icon at the top right of the Workstation Browser, as in the following example:

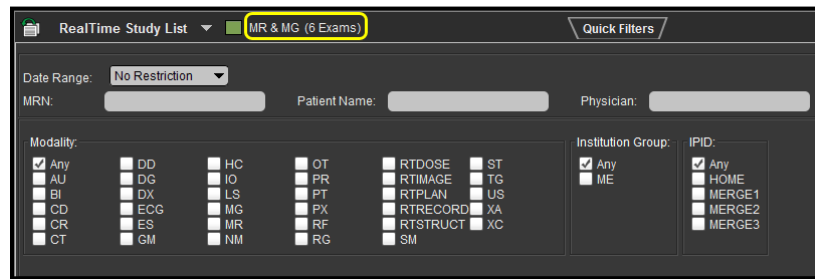


Opening a RealTime Study List in a New Window

NOTE: When you open a Study from a secondary RealTime Study List in the primary Viewer window, the content of the secondary RealTime Study List will be displayed within the Workstation Browser instead of the original RealTime Study List as long as that Study is open. Once the Study is closed in the primary Viewer window, the original RealTime Study List will once again display in the Workstation Browser.

3.2.11. Editing a Worklist

If you have privileges to edit worklists, the title of the currently displayed worklist will be a clickable link, as in the following example:



Name of Currently Displayed Worklist

Clicking on this link will launch a Worklist Editor dialog that will allow you to edit some or all of the following for this worklist, depending on your privileges:

- **General Properties**
- **Columns**
- **Actions**
- **Worklist Blocks**
- **Caching Options**
- **Associated Groups**

Refer to Appendix D below for information on configuring the worklist blocks that are part of a specific worklist.

Please refer to the *Merge PACS 7.3 Administration Guide* for more information on all other aspects of editing Worklists.

3.3. RealTime Worklist™

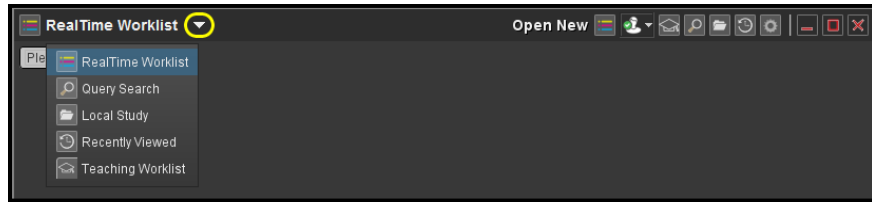
RealTime Worklist (RTWL) is a powerful and flexible feature that allows you to view and manage one or more lists (or “worklists”) of studies that have been assigned to you. In addition to studies, a worklist may also include stand-alone orders and/or reports for which there are currently no images available within Merge PACS.

CAUTION: In order to avoid delay of treatment, alert your PACS Administrator immediately if you notice unintended patients on your worklists.

3.3.1. Accessing RealTime Worklist

When the RealTime Worklist List is enabled, it takes the place of RealTime Study List entirely. You can select whether you want to have it or RealTime Study List appear from the Merge PACS Preferences dialog, as described in Chapter 24 below.

The top of the Workstation Browser includes a drop-down menu that displays the various functions that can be shown within the Browser, as in the following example:



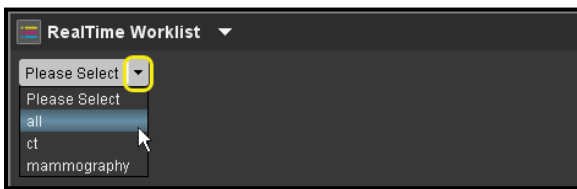
Workstation Browser Options

By default, if RealTime Worklist is enabled, it should be activated when you first access the Workstation Browser, but you can access it at any time by selecting **RealTime Worklist** from this menu.

3.3.2. Selecting a Worklist

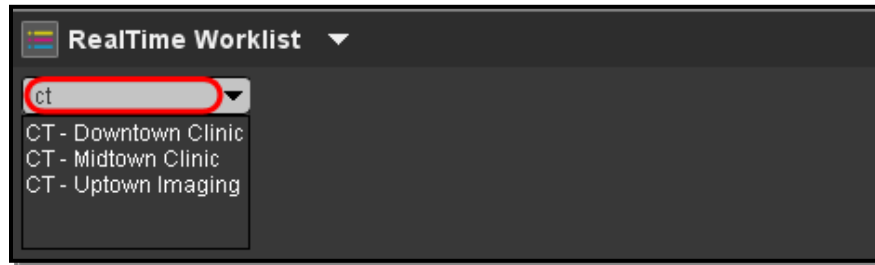
Once you have selected RealTime Worklist, select the desired worklist from the drop-down menu of available worklists in one of the following ways:

- Click on the down arrow to display a list of all available worklists, as in the following example, and then click on the desired worklist:



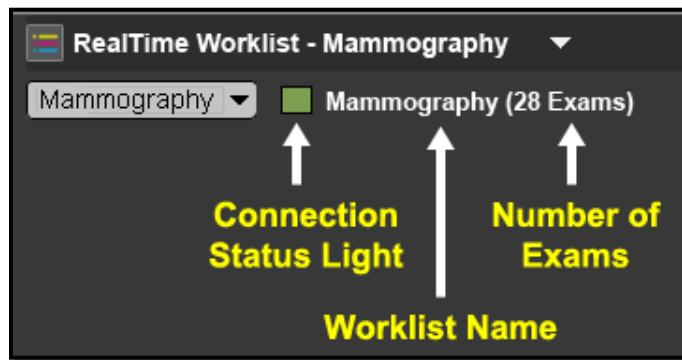
Displaying All Available Worklists

- If the list of available worklists is large, you can filter it to display only those worklists whose names contain certain characters by clicking on the field to the left to the drop-down menu arrow and entering one or more characters, as in the following example:



Filtering the Menu of Available Worklists

Once you have selected a worklist, the name of the worklist will be displayed near the top of the screen, together with a connection status light, as shown in the following example:



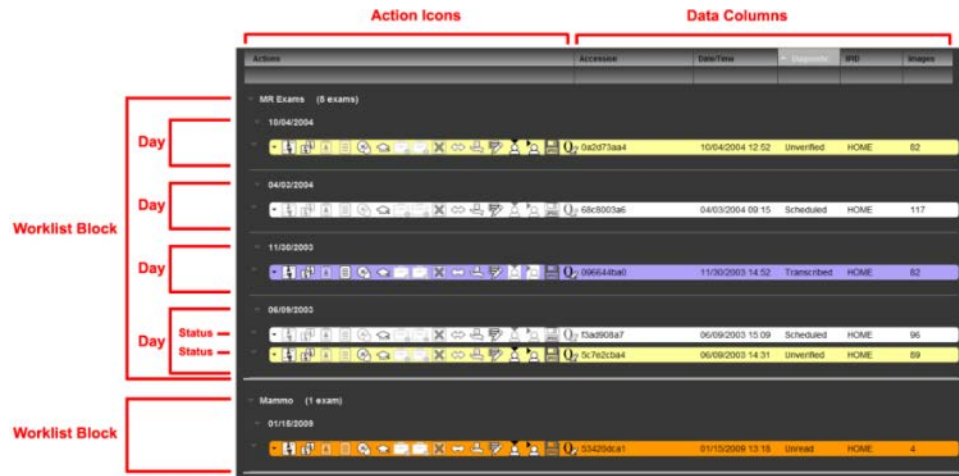
Worklist Connection Status

The color of the connection status light indicates the following:

Color	Meaning
Red	Not yet connected to RealTime Worklist
Green	Connected to RealTime Worklist

3.3.3. Worklist Overview

Once you have selected a worklist from the menu, the chosen worklist will be displayed as shown in the example below:



Viewing a Worklist

- Each worklist contains one or more individual **worklist blocks**, with each block separately configured to display exams that match a specific set of criteria (e.g., exams from specified modalities, exams for specific procedures, etc.) and to display them in a specific way (e.g., in worklist view or patient list view, expanded or collapsed by default, etc.). In the example above, there is one block called **MR Exams** and one block called **Mammo**.

NOTE: Since exams might match the criteria set for multiple worklist blocks, it is possible for some exams to be displayed within multiple blocks on the same worklist.

- Each worklist block is divided by default into separate sections for each day. The studies for each day are, in turn, divided by default into separate groups according to their current status.

NOTE: Individual blocks may be configured to display exams in **Patient List View**, as described in subsection 3.3.8 below, in which case the studies in that block will not be grouped by day.

- Each worklist entry contains a set of **action icons** on the left that you can click on to perform different tasks, and **data columns** on the right that display information about each Study/order on the worklist.

NOTE: The actual action icons and data columns, the order the columns appear and the names and display colors of the possible worklist status options are all customizable by an Administrator and will vary from one worklist to another and one site to another.

3.3.4. Action Icons

The actual action icons available on any given worklist will depend on how that particular worklist is configured and your login privileges. For a complete list of possible action icons, refer to Section 3.9 below.

3.3.5. Data Columns

a. In General

The following general data columns may be available on your worklist, depending on how your system is configured:

- Accession
- Acuity *
- Age/Sex
- Assignment Status
- Availability
- Connection Status
- Communication Status
- Date/Time
- Date of Birth
- Description / Procedure
- Diagnostic Status
- Due In
- End Date/Time
- ER Status
- Image Transfer Status
- Images
- Institution Group
- Institution Name
- IPID (Issuer of Patient ID)
- Last Action
- Licensure Region
- Modality
- Objects
- Order Match Status
- Order Priority
- Order Status
- Patient Class
- Patient ID
- Patient Location
- Patient Name
- Prefetch
- Priors
- QC Exception
- Reading Physician
- Reading Pool
- Referring Physician
- Reservation Status
- Series with Images
- Station Name
- Study Locking Status
- Update Order Status
- Custom Study Type Groups (if any) **
- Custom Columns (if any)

* **Acuity** may be displayed if the optional Merge RadStream™ feature is enabled.

** One or more **Study Type Groups** may be displayed if Merge PACS is configured to run in **Integrated** mode and the attached iCEA Server is set up to tag studies according to Study Type with multiple study types associated with one or more Study Type Groups (e.g., an "OLOGY" group that would include Cardiology, Radiology and Neurology study types).

NOTE: Additional custom data columns may be configured on a site-by-site basis.

NOTE: Column headers for the various status dimensions (**Communication, Connection, Reservation, Image Transfer, Study Locking** and **ER**) may be displayed as text or as an icon, depending on how the worklist is configured. If the column header is configured to display as an icon, the values for that column will also be displayed as an icon, if set.

- NOTE:** Additional “Parameter” columns for the various status dimensions may be included to display the current value for a particular status (e.g., the **Reservation Status** column might indicate that a Study has a status of “Reserved” and the **Reservation Parameter** column might display the name of the user who has reserved the Study).
- NOTE:** If a Study has been edited in the Quality Control Editor after being imported to change the station name associated with that Study, both the original and the new station name may appear in the Station Name column.
- NOTE:** The prior count displayed in the **Priors** column is based on MRN and IPID and is not affected by Prior Selection Criteria and Patient Comparison Strategy configured for your site. As a result, the count may not reflect the actual number of priors that are displayed if you choose to show priors for the study, as described in subsection 3.3.9 below.
- NOTE:** The **Images** column displays the number of currently cached images as well as the total number of images for the study (e.g., “2 / 9” indicates that two of nine total images have been cached). If the **Load “For Processing” Images** user preference for mammography studies, as described in subsection 24.1.11 below, is not enabled, the “for processing” images will not be cached but will still be included in the total count.
- NOTE:** **End Date/Time** is pulled from the Order Complete HL7 message associated with the exam. Therefore, this information will disappear if and when the order is purged from the system. When this happens, the End Date/Time column will show as empty for the exam.

b. Due In Column

If your site’s workflow includes deadline tracking due to **Service Level Agreements (SLAs)**, the **Due In** column will allow you to keep track of studies that are required to be read within a certain deadline.

Depending on how your site is configured, up to four separate threshold limits (in minutes), each with its own display color, may be tracked in the Due In column. For example, if the SLA is set to 30 minutes, the Due In column might display a **GREEN** background when 10 minutes are remaining, a **YELLOW** background when 5 minutes are remaining and a **RED** background when 1 minute is remaining.

In addition to the configured color and the amount of time remaining until due (or time past due), the Due In column will display the following information as “hover” text when the mouse cursor is placed over it:

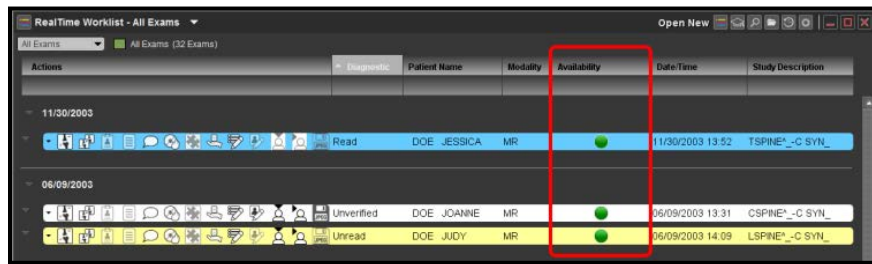
Value	Description
Arrived	The time the last image was received for the Study plus the Inactivity Timeout period configured for your site.
Due By	The “Arrived” time plus the SLA value defined for the Study’s Priority.
Completed	The time the Study was transitioned to (or past) the diagnostic status configured for your site to indicate completion.

Note the following:

- If there is no order associated with a Study, the Study will be considered "Routine" priority and the SLA will be whatever is currently configured for the Routine priority.
- If a new or updated order is associated with a Study and that order contains a priority, the Study Due In time will be updated.
- If a new image is received for a Study that is not yet complete, the "Arrived" and "Due By" times will be updated.
- If a new Presentation State or Key Object is received for a Study that is not yet complete, the "Arrived" and "Due By" times will be not be updated.
- Depending on how your site is configured, the "Arrived", "Due By" and "Study Completion" times will be not updated may or may not be updated if a new image arrives for a Study that is complete.
- If a new PR or KO arrives for a Study that is complete, the "Arrived" and "Due By" times will be not updated and the Study Complete value will not be cleared.




c. Availability Column


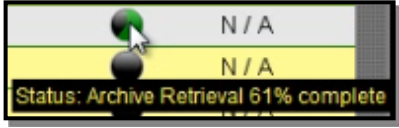



Individual worklists can be configured to include an **Availability** column, as in the following example:



Availability Column

The Availability column shows an availability status indicator for each Study. The appearance of the indicator indicates the availability of the Study as follows:

Indicator	Color	Description
	Green	The Study is available online for viewing.
	Black	The Study is currently offline and not available for viewing.
	Blue	A request to retrieve the Study has been submitted, but the retrieval process has not yet started.

Indicator	Color	Description
	Black / Green	The Study is currently being retrieved. Note that the percentage of green shown will change to indicate the progress of the retrieval process. Hovering your mouse cursor over the indicator will cause the exact percentage to be shown in a tool-tip window, as in the following example:
 <p>Retrieval Progress</p>		
	Orange	Images for this Study are currently being imported for the first time or additional images are currently being added to an existing Study.
	Red	Retrieval of the Study has completed, but with errors (either fewer images were received than expected or all images failed compression)
	Gray	The availability of the Study is currently unknown (this may occur during timeout or error scenarios). Clicking the Availability icon will refresh the data.

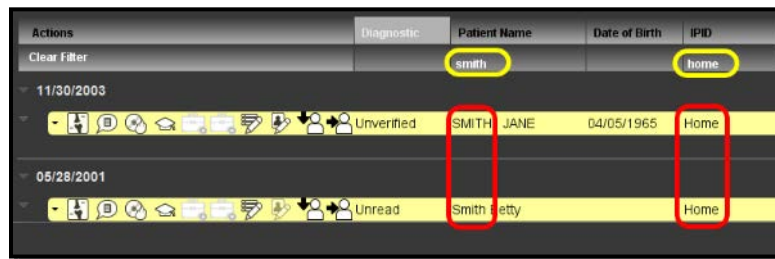
d. Sorting by Data Column

You can sort a worklist by clicking on any of the data column headings. Clicking on the column heading a second time will reverse the direction of sorting

NOTE: If the worklist is displayed in Worklist View as opposed to Patient List View, as described in 3.3.8 below, the data will be sorted separately within each status group and for each day and not for the entire worklist.

e. Searching within a Data Column

You can temporarily narrow the entries in a given worklist by entering text to be matched in the fields beneath one or more of the column headings, as in the following example:



Searching within Data Columns

- Filtering will occur as you enter the text; there is no need to press the **Enter** key.

- The search will match any part of the word or words in the column (e.g., “smith” will match both “Goldsmith” and “Smithfield”).
- In general, the search will match the actual text in the column. For example, if dates are displayed in mm/dd/yyyy format and you want to filter the results by June 29, you will have to enter “06/29” instead of “June 29”.
- The search does, however, support word separation (e.g., entering “J Doe” and “Doe J” will both work to display “Jane Doe”, “Jessica Doe” and “Jonathan Doe”).
- You can filter by multiple columns at the same time by entering text in more than one fields, as in the example shown above.
- Filtering a worklist will cause the worklist count in the window titlebar to be updated to match the number of studies currently being displayed.
- Once you have filtered on one or more columns, a new **Clear Filter** link will be displayed that will let you remove all filters and return to the original worklist display, as in the following example:



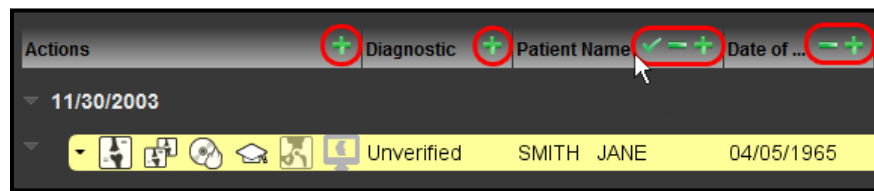
Clear Filter Link

f. Editing Data Columns

If desired, you can edit the display of any worklist to add or remove data columns, change the order in which the columns appear and/or change the width of one or more columns.

NOTE: Any change made to a worklist will only affect your view of that worklist and will not affect how other users view the same worklist. In addition, any future changes made to the underlying worklist by a PACS Administrator will not be reflected in your view of that worklist once you have made changes to it.

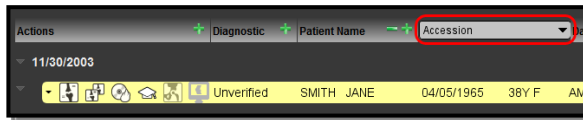
To enable editing of the data columns, **right-click** on any column heading to activate the column editing controls for all columns, as in the following example:



Column Editing Controls

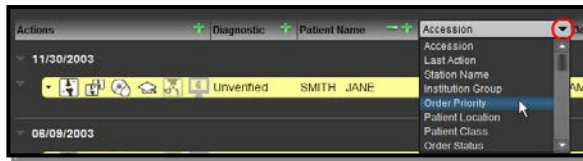
Once column editing has been enabled, you can do the following:

- ➔ To **remove** a column from the worklist display, click on the **Remove Column** icon, as displayed to the left, on that column's header. Note that the **Actions** and **Diagnostic** columns cannot be removed.
- ➕ To **add** a new column to the right of an existing column, click on the **Add Column** icon, as displayed to the left, on the column header to the left of where you would like the new column to appear. This will cause a new column to be displayed with a drop-down menu as a header, as in the following example:



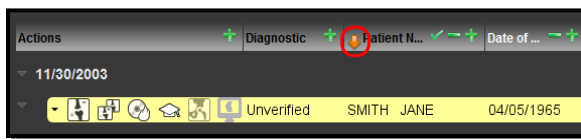
Newly Added Data Column

Click on the drop-down menu and select the desired column header, as in the following example:



Selecting Data Column to Add

- To **move** a column to a different location, **left-click** on the column header and drag it to the desired location. As you are dragging the column header, its current location will be indicated by an orange arrow, as in the following example:



Moving a Column

When you release the mouse button, the column will be moved to the location indicated by the orange arrow.

- To **resize** a column, hover your mouse over the left or right edge of the column header until your mouse cursor changes to a special resize icon and then drag and drop the edge as desired, as in the following example:



Resizing a Column

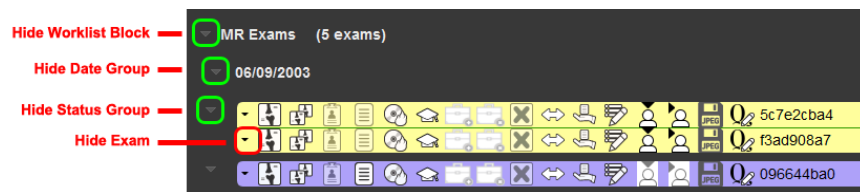
- ✔ To **save** all changes that have been made to all columns, click on the **Commit Changes** icon, as displayed to the left, on any column header.

NOTE: If you want to cancel any changes that you have made before committing them, you can temporarily select a different worklist or choose to reload all worklists, as described in paragraph 3.3.13 below.

NOTE: You can reset the default column settings for all worklists at any time from the **Worklist Right-click General Menu**, as described in subsection 3.3.7 below.

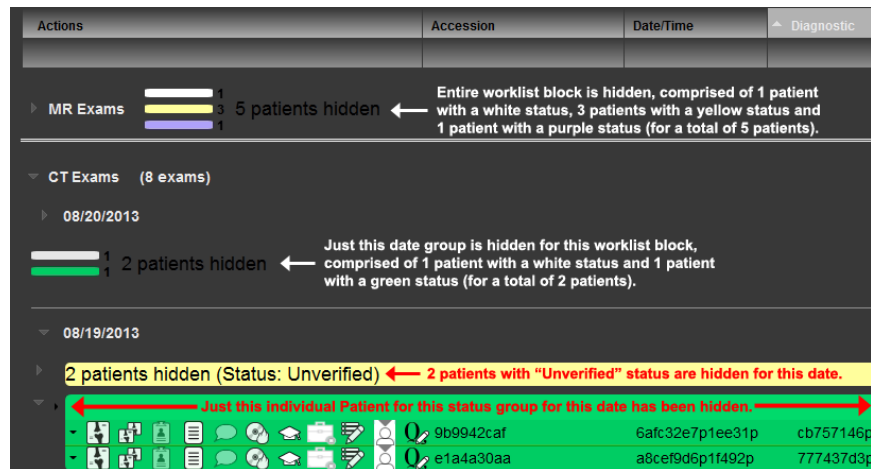
3.3.6. Hiding and Revealing Studies and Worklist Blocks

You can temporarily hide selected portions of a worklist by clicking on the small triangles on the left-hand side of the screen. Clicking on these triangles allows you to hide an individual Study, a status group for a given date, an entire date's worth of studies within a worklist block, or an entire worklist block, as shown in the example below:



Hiding Parts of a Worklist

When a section of a worklist is hidden, only summary information will be displayed for that block, day or status group, while no information will be displayed for a hidden Study, as in the following example:



Hiding Parts of a Worklist

NOTE: You cannot hide days or status groups when the worklist block is being displayed in Patient List View, as described in subsection 3.3.8 below.

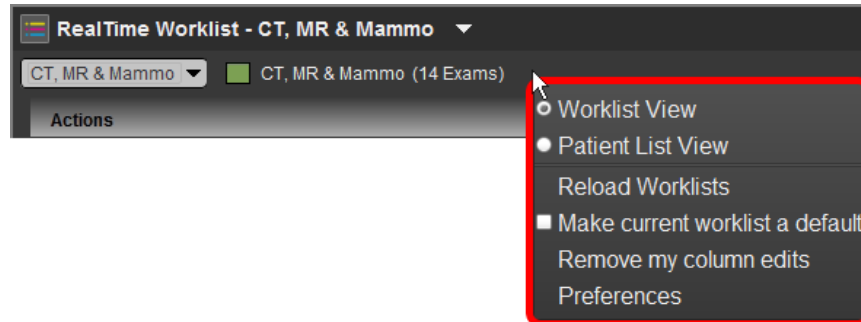
Click on the appropriate triangle a second time to reveal a Study or group of studies that has been hidden.

3.3.7. Worklist Right-click Menus

There are three right-click menus available from within RealTime Worklist.

a. Worklist Right-click General Menu

The **Worklist Right-click General Menu** displays a number of options that apply to RealTime Worklist in general and is accessible by clicking anywhere above the currently displayed worklist with the **right** mouse button, as in the following example:



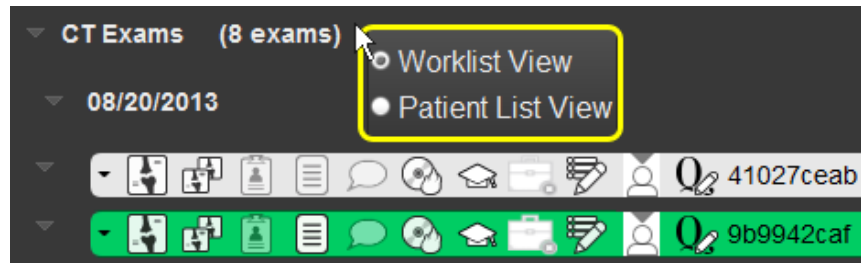
Worklist Right-click General Menu

The Worklist Right-click General Menu will display one or more of the following options, depending on your login privileges:

Option	General Description
Worklist View	Displays the entire worklist in Worklist View mode, as described in subsection 3.3.8, below.
Patient List View	Displays the entire worklist in Patient List View mode, as described in subsection 3.3.8, below.
Reload Worklists	Reloads the currently displayed worklist, as described in subsection 3.3.13, below.
Make Current Worklist a Default	Sets the currently displayed worklist as the default worklist, as described in subsection 3.3.11 below.
Remove my column edits	Restores the display of all worklists to their default column settings (visibility, order, width).
Preferences	Allow you to set your personal User and Workstation preferences, as described in Chapter 24 below.

b. Worklist Block Right-click Menu

The **Worklist Block Right-click General Menu** displays a number of options that apply to a specific worklist block and is accessible by clicking anywhere to the right of that block's name with the **right** mouse button, as in the following example:



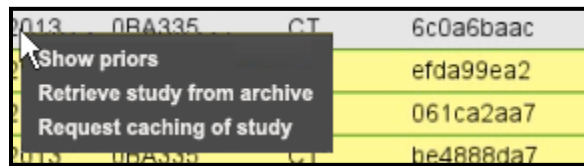
Worklist Right-click General Menu

The Worklist Block Right-click Menu displays the following options:

Option	General Description
Worklist View	Displays the worklist block in Worklist View mode, as described in subsection 3.3.8, below.
Patient List View	Displays the worklist block in Patient List View mode, as described in subsection 3.3.8, below.

c. Worklist Right-click Study Menu

The **Worklist Right-click Study Menu** displays options that apply to a specific exam or Study and is accessible by right-clicking anywhere on the worklist entry for that exam or Study, as in the following example:



Worklist Right-click Study Menu

The Worklist Right-click Study Menu will display one or more of the following options, depending on your login privileges and how your system is configured:

Option	General Description
<p>Show [Hide] priors</p>	<p>Displays [or hides] prior exams, if any, for the selected Study, as described in subsection 3.3.9, below.</p>
<p>Retrieve Study from archive [Availability Status]</p>	<p>If the study is not available online and if Merge PACS is configured to retrieve studies, submit a retrieval request for this Study.</p> <p>Note the following:</p> <ul style="list-style-type: none"> • This action is equivalent to clicking the Retrieve action icon, as described in subsection 3.3.4 above and would typically only be used if the Retrieve action icon is not enabled for a particular worklist. • If the Study is currently online, the option will be grayed out and will read “Availability Status: Online”, as in the following example: <div> </div> <p style="text-align: center;">Study Is Online</p> <ul style="list-style-type: none"> • If a retrieval request has been submitted but not yet completed, the option will be grayed out and will display the current status of the retrieval process, as in the following example: <div> </div> <p style="text-align: center;">Retrieval Status</p>
<p>Request caching of Study</p>	<p>Manually request caching of the selected Study's images, as described in subsection 3.3.10 below.</p>

3.3.8. Changing Between Worklist and Patient List View

Depending on the type of worklist block being viewed and how it has been configured, it will be displayed either in **Worklist View** mode or **Patient List View** mode:

View Mode	Description
-----------	-------------

Worklist View

Divides each worklist block into separate sections for each day with color-coding for various statuses, as in the following example:

CT Exams (8 exams)							
08/20/2013							
Q	41027ceab	08/20/2013 14:32	Read	reserved	HOME		
Q	9b9942caf	08/20/2013 09:31	Final		HOME		
08/19/2013							
Q	9b9942caf	08/19/2013 09:39	Unverified		HOME		
Q	554e6edaf	08/19/2013 16:13	Unverified	reserved	HOME		
Q	9b9942caf	08/19/2013 19:09	Final		HOME		
Q	9b9942caf	08/19/2013 09:44	Final		HOME		
Q	e1a4a30aa	08/19/2013 20:27	Final		HOME		

Worklist View

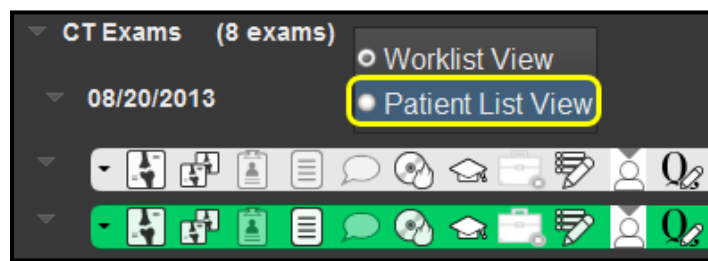
Patient List View

Shows all the studies in the current worklist block without them being grouped by day, as in the following example:

CT Exams (8 exams)							
Q	9b9942caf	08/19/2013 09:39	Unverified		HOME		
Q	554e6edaf	08/19/2013 16:13	Unverified	reserved	HOME		
Q	6994beba	03/29/2004 13:42	Unverified		HOME		
Q	41027ceab	08/20/2013 14:32	Read	reserved	HOME		
Q	9b9942caf	08/19/2013 19:09	Final		HOME		
Q	9b9942caf	08/19/2013 09:44	Final		HOME		
Q	9b9942caf	08/20/2013 09:31	Final		HOME		
Q	e1a4a30aa	08/19/2013 20:27	Final		HOME		

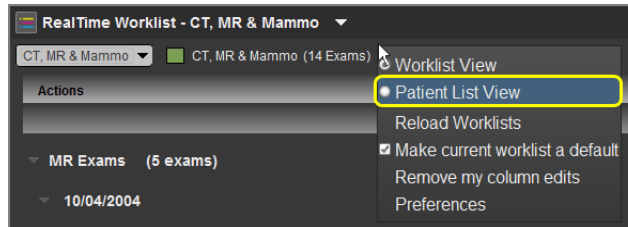
Patient List View

Regardless of how a worklist block is displayed by default, however, you can change the view mode for that block at any time from the **Worklist Block Right-click Menu**, as in the following example:



Selecting Patient List View for a Worklist Block

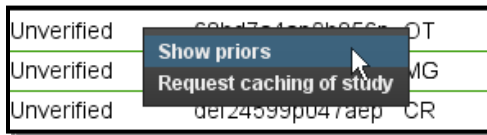
In addition, you can set the view mode for the entire worklist at any time from the **RealTime Worklist Right-click General Menu**, as in the following example:



Selecting Patient List View for the Entire Worklist

3.3.9. Viewing Prior Studies

If a particular Study on a worklist has prior studies associated with it, you can add those prior studies to the worklist. This is done by clicking on the desired Study with the **right** mouse button and then selecting the **Show Priors** option from the **Worklist Right-click Study Menu**, as shown in the following example:



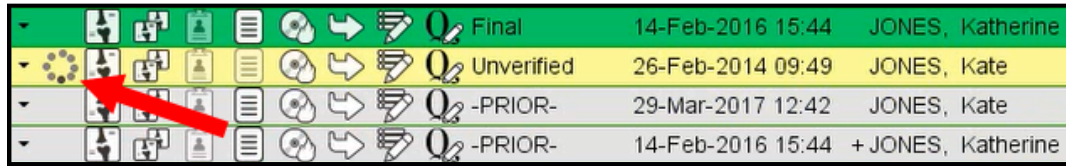
Adding Prior Studies to Worklist

The prior studies, if any, will then be listed below the current Study in the worklist, as shown in the example below:

Unverified	Doe Jessica	11/11/1911	PID000T1	CT	A000T11
Q ₂ -PRIOR-	+ Doe Joanne	11/11/2011	PID000T1	CT	A000T16
Q ₂ -PRIOR-	+ Doe Jill	11/11/2011	PID000T1	CT	A000T14
Q ₂ -PRIOR-	Doe Jessica	11/11/2011	PID000T1	CT	A000T12
Q ₂ -PRIOR-	+ Doe Jill	11/11/1911	PID000T1	CT	A000T13
Q ₂ -PRIOR-	+ Doe Joanne	11/11/1911	PID000T1	CT	A000T15
Unverified	Doe Jonathan	11/11/1911	PID000T1	CT	A000T15
Unverified	Doe Julie	11/11/1911	PID000T1	CT	A000T13

Prior Studies in the Worklist

The list of prior studies is determined by the **Patient Comparison Strategy** and the **“Selection of Priors”** option configured for your site, as well as Multiple Patient Identity (if MPI is enabled for your site), as described in Appendix C below. Studies will be added to the list of prior studies **dynamically** as they are determined to be priors instead of waiting for all priors to be discovered before displaying the list. While the list of priors is being created, a status indicator will be displayed to let you know that the list is not yet complete, as in the following example:



Final	14-Feb-2016 15:44	JONES, Katherine
Unverified	26-Feb-2014 09:49	JONES, Kate
-PRIOR-	29-Mar-2017 12:42	JONES, Kate
-PRIOR-	14-Feb-2016 15:44	+ JONES, Katherine

List of Prior Studies In Progress

NOTE: You can choose to display priors for multiple studies at the same time and each study will have its own separate status indicator.

NOTE: Individual worklists can be configured by an Administrator to “automatically display priors.” When this feature is enabled, all prior studies for a selected Study will be displayed in the worklist when that Study is opened into the Merge PACS Viewer, as described in Chapter 4 below.

NOTE: If Merge PACS is configured with an extended query node, additional prior studies may be displayed that do not appear within the worklist proper.

CAUTION: The list of priors will be current as of the time the “Show priors” option is selected, but will not automatically be updated in real time if the information changes (e.g., if priors are in the process of being “pre-fetched” and have not yet been added to the list). Any changes to the list of priors will only be displayed if you hide the list of priors and then show it again.

You can remove the prior studies from the worklist by clicking on one of the priors with the **right** mouse button and selecting the **Hide Priors** option from the **Right-Click Worklist Menu**:



Hiding Prior Studies

NOTE: If a prior list is in the process of being assembled for a particular study (i.e., the status indicator is displayed), selecting “Hide Priors” will cancel the operation.

3.3.10. Using Workflow Accelerator™

RealTime Worklist includes an optional feature called Workflow Accelerator™ that allows studies to be copied to and stored (“cached”) on your computer’s hard drive before you launch the Study in the Merge PACS Viewer. This is especially beneficial in situations where network bandwidth is limited, such as when a user is reading studies from home with a cable or DSL connection.

If your particular worklist has the Workflow Accelerator option enabled, you can manually select to cache the images for a particular Study prior to launching the Merge PACS Viewer. You can also configure your system to cache images automatically.

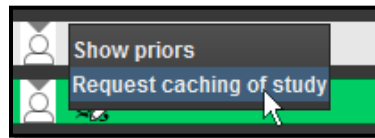
For users who are in a “spoke and hub” setup (*i.e.*, where patient images are sent from multiple “spoke” sites to a central “hub” and are then redistributed to the necessary locations for reading), the automatic caching option can be configured to first attempt to download the images from a nearby spoke site instead of waiting for the images to arrive at the hub.

NOTE: When automatic caching is enabled, Workflow Accelerator will not necessarily cache all studies on your worklist. Instead, it will only cache those studies that have a particular status type (or types) that is defined as part of your worklist. This is typically “unread” studies, but it can be custom configured by the Administrator who sets up your worklist.

CAUTION: Studies that are hidden, as described in subsection 3.3.6 above, will not be cached.

a. Manually Caching Studies

If your particular worklist has the Workflow Accelerator option enabled, the **Right-Click Worklist Menu** will include an option to **Request Caching of Study** when you **right-click** on a specific Study, as shown in the following example:



Manually Caching a Study's Images

If your worklist is configured to show the number of images in each Study (*i.e.*, there is an “Images” column), the progress of the caching process will be displayed as shown in the following example:

Accession	Modality	Procedure	Images
RWMG01	US	US FA 2 3 TRI SNG ...	25 / 57

Caching Progress

In the example above, 25 out of 57 images for this Study have been saved to the workstation's hard drive. When the count reaches 57/57, all images will have been cached.

b. Automatically Caching Studies

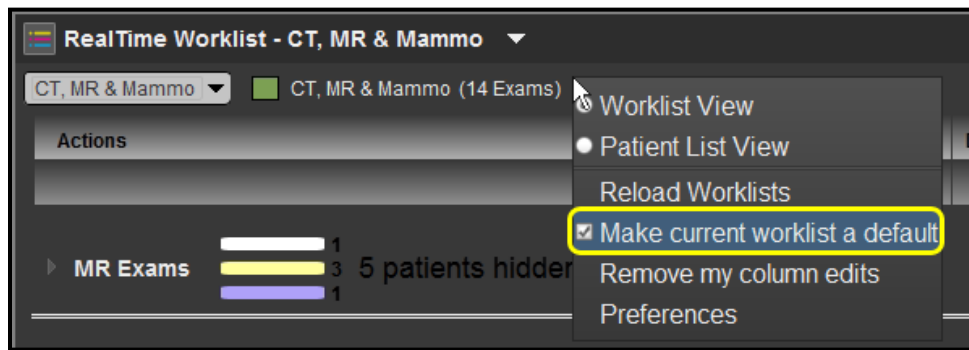
If your worklist includes the Workflow Accelerator option and you have the appropriate login privileges, you can enable and configure auto-caching from the Merge PACS Preferences dialog, as described in subsection 24.2.1 below. Once enabled, if your worklist is configured to show the number of images in each Study (*i.e.*, there is an "Images" column), the progress of the caching process will now be displayed for each applicable Study as shown in the following example:

Accession	Modality	Procedure	Images
RWWMG01	US	US FA 2 3 TRI SNG ...	25 / 57

7 Automatically Caching Studies

3.3.11. Setting a Default Worklist

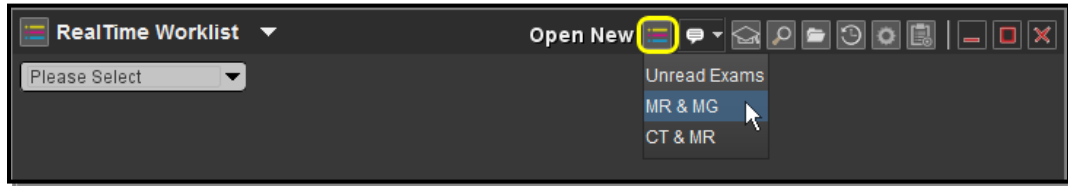
If you have multiple worklists available to you, you can select one worklist to be launched by default when you first access RealTime Worklist. To do this, first select the desired worklist from the drop-down menu of available worklists (as described in subsection 3.3.2 above), then click anywhere above the worklist with the **right** mouse button and then select **Make current worklist a default** from the **Worklist Right-Click Menu**, as shown in the following example:



Setting the Current Worklist as the Default

3.3.12. Opening Multiple Worklists

If desired, you can open additional worklists in their own separate windows. To do so, click on the **Open New Worklist** icon at the top right of the Workstation Browser and select the desired worklist from the drop-down menu, as in the following example:

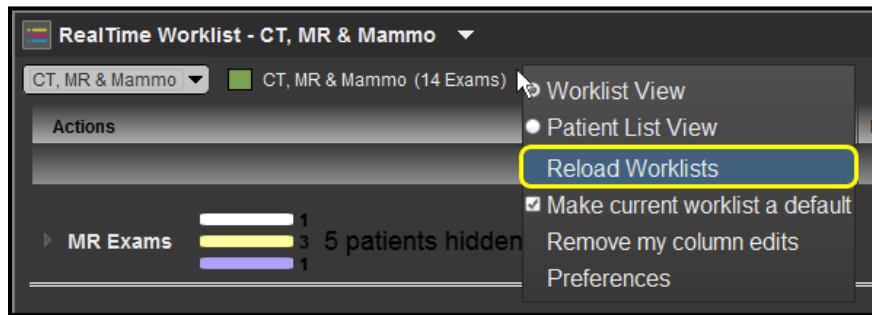


Opening a Worklist in a New Window

NOTE: When you open a Study from a secondary worklist in the primary Viewer window, the content of the secondary worklist will be displayed within the Workstation Browser instead of the original worklist as long as that Study is open. Once the Study is closed in the primary Viewer window, the original worklist will once again display in the Workstation Browser.

3.3.13. Reloading a Worklist

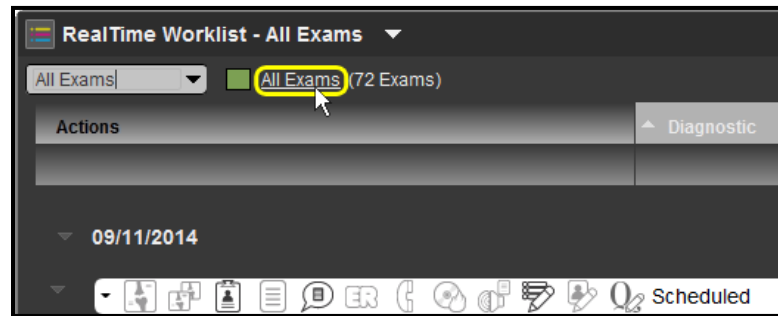
If desired, you can manually refresh the worklist currently being viewed. To do so, click anywhere above the worklist with the **right** mouse button and then select **Reload Worklist** from the **Right-Click Worklist Menu**, as shown in the following example:



Reloading a Worklist

3.3.14. Editing a Worklist

If you have privileges to edit worklists, the title of the currently displayed worklist will be a clickable link, as in the following example:



Name of Currently Displayed Worklist

Clicking on this link will launch a Worklist Editor dialog that will allow you to edit some or all of the following for this worklist, depending on your privileges:

- **General Properties**
- **Columns**
- **Actions**
- **Worklist Blocks**
- **Caching Options**
- **Associated Groups**

Refer to Appendix D below for information on configuring the worklist blocks that are part of a specific worklist.

Please refer to the *Merge PACS 7.3 Administration Guide* for more information on all other aspects of editing Worklists.

3.4. Teaching Worklists

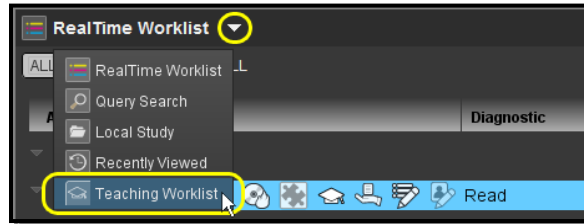
As described in Chapter 22 below, the optional Teaching Files feature allows you to tag studies for later reference for teaching and/or conferencing purposes. These tagged studies can be located from the Query Search page, as described in Section 3.5 below, by searching on any of the Study criteria or the special teaching tags that have been associated with those studies.

In addition, however, tagged studies can be associated with one or more “teaching” worklists that function like the RTWL worklists described in Section 3.2 above. These allow you to quickly access tagged studies without needing to search for them.

NOTE: If your site has the “Briefcase” option enabled, a default teaching worklist will be created for you automatically called “<username>’s briefcase” (the formatting of the actual name is configurable on a site-by-site basis). This worklist will initially be empty until you add studies to it and may not be visible in the list of Teaching Folders until you first add a study to it and then reload all worklists as described in subsection 3.4.13 below.

3.4.1. Accessing Teaching Worklists

If you have the login privileges to access the Teaching Files feature, you can access the individual teaching worklists that are available to you by selecting **Teaching Worklist** from the drop-down menu at the top of the Workstation Browser, as in the following example:



Accessing Teaching Files

The Teaching Worklist screen will then be displayed within the Browser, as in the following example:

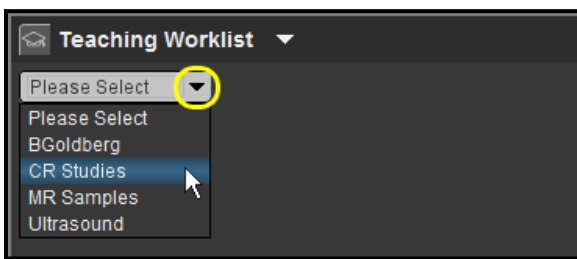


Teaching Worklist Screen

3.4.2. Selecting a Teaching Worklist

At the Teaching Worklist screen you can select a particular teaching worklist from the drop-down menu of available worklists in one of the following ways:

- Click on the down arrow to display a list of all available worklists, as in the following example, and then click on the desired worklist:



Displaying All Available Worklists

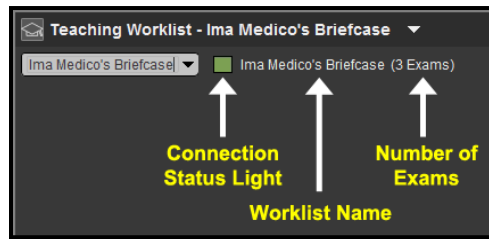
- If the list of available worklists is large, you can filter it to display only those worklists whose names contain certain characters by clicking on the field to the left to the drop-down menu arrow and entering one or more characters, as in the following example:



Filtering the Menu of Available Worklists

NOTE: If your site has the “Briefcase” option enabled, a default teaching worklist will be created for you automatically called “<username>’s briefcase.” This worklist will initially be empty until you add studies to it.

Once you have selected a worklist, the name of the worklist will be displayed near the top of the screen, together with a connection status light, as shown in the following example:



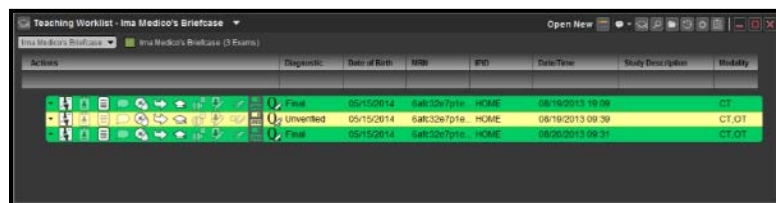
Worklist Connection Status

The color of the connection status light indicates the following:

Color	Meaning
Red	Not yet connected to the selected teaching worklist
Green	Connected to the selected teaching worklist

3.4.3. Teaching Worklist Overview

Once you have selected a teaching worklist from the menu, the chosen worklist will be displayed as shown in the example below:



Viewing a Worklist

- By default, teaching worklists display studies in “Patient List” view, which is a combined list of patients that shows all the studies in the worklist without grouping them by day. This can be changed, however, as described in subsection 3.4.7 below.
- Each worklist entry contains a set of **action icons** on the left that you can click on to perform different tasks, and **data columns** on the right that display information about each Study/order on the worklist, as shown in the following example:

Action Icons		Data Columns					
Actions	Diagnostic	Patient Name	Date of Birth	MRN	Accession	Date/Time	Procedure
[-] [+] [i] [c] [d] [e] [f] [g] [h] [i] [j] [k] [l] [m] [n] [o] [p] [q] [r] [s] [t] [u] [v] [w] [x] [y] [z] [aa] [ab] [ac] [ad] [ae] [af] [ag] [ah] [ai] [aj] [ak] [al] [am] [an] [ao] [ap] [aq] [ar] [as] [at] [au] [av] [aw] [ax] [ay] [az] [ba] [bb] [bc] [bd] [be] [bf] [bg] [bh] [bi] [bj] [bk] [bl] [bm] [bn] [bo]	Final	ZONA ANTHONY	07/13/1921	2700253	5773060	05/04/2000 08:13	580/NE
[-] [+] [i] [c] [d] [e] [f] [g] [h] [i] [j] [k] [l] [m] [n] [o] [p] [q] [r] [s] [t] [u] [v] [w] [x] [y] [z] [aa] [ab] [ac] [ad] [ae] [af] [ag] [ah] [ai] [aj] [ak] [al] [am] [an] [ao] [ap] [aq] [ar] [as] [at] [au] [av] [aw] [ax] [ay] [az] [ba] [bb] [bc] [bd] [be] [bf] [bg] [bh] [bi] [bj] [bk] [bl] [bm] [bn] [bo]	Final	GAN YACMAN	09/18/1926	3388359	5785844	05/05/2000 22:16	580/NE
[-] [+] [i] [c] [d] [e] [f] [g] [h] [i] [j] [k] [l] [m] [n] [o] [p] [q] [r] [s] [t] [u] [v] [w] [x] [y] [z] [aa] [ab] [ac] [ad] [ae] [af] [ag] [ah] [ai] [aj] [ak] [al] [am] [an] [ao] [ap] [aq] [ar] [as] [at] [au] [av] [aw] [ax] [ay] [az] [ba] [bb] [bc] [bd] [be] [bf] [bg] [bh] [bi] [bj] [bk] [bl] [bm] [bn] [bo]	Final	DEBELLA LOUIS	01/10/1926	752921	5786164	05/06/2000 14:07	603EL/BO

Action Icons and Data Columns

NOTE: The actual action icons and data columns, the order the columns appear and the names of the possible diagnostic status options are all customizable by an Administrator and may vary from one worklist to another and one site to another.

3.4.4. Action Icons

The actual action icons available on a teaching worklist will depend on how your system is configured and your login privileges. For a complete list of possible action icons, refer to Section 3.9 below.

3.4.5. Data Columns

a. In General

The following data columns are displayed on teaching worklists by default:

- Diagnostic
- Patient Name
- Date of Birth
- Age/Sex
- MRN
- IPID
- Date/Time
- Referring Physician
- Study Description
- Modality
- Institution
- Priors
- Images
- Locked By
- Due In

NOTE: Any other action data column available for standard RTWL worklists may optionally be displayed on a teaching worklist, depending on how your system is configured. For more information on these columns, refer to subsection 3.3.5 above.

NOTE: By default, teaching worklists are displayed in reverse chronological order, based on Study Date/Time.

b. Availability Column

Teaching worklists can be configured to include an **Availability** data column, as in the following example:

Actions	MRN	Name	Date & Time	Availability	DOB	Sex	Patient Age
[Icons]	AM-0098	SMITH PATIENT	11/30/2003 13:52	●	04/05/1965	F	039Y
[Icons]	AM-0098	SMITH PATIENT	06/09/2003 14:09	●	04/05/1965	F	039Y
[Icons]	AM-0098	SMITH PATIENT	06/09/2003 13:31	●	04/05/1965	F	039Y

Availability Column

The Availability column shows an availability status indicator for each Study. The appearance of the indicator indicates the availability of the Study as follows:

Indicator	Color	Description
●	Green	The Study is available online for viewing.
●	Black	The Study is currently offline and not available for viewing.
●	Blue	A request to retrieve the Study has been submitted, but the retrieval process has not yet started.
●	Black / Green	The Study is currently being retrieved. Note that the percentage of green shown will change to indicate the progress of the retrieval process. Hovering your mouse cursor over the indicator will cause the exact percentage to be shown in a tool-tip window, as in the following example:
●	Orange	Images for this Study are currently being imported for the first time or additional images are currently being added to an existing Study.
●	Red	Retrieval of the Study has completed, but with errors (either fewer images were received than expected or all images failed compression)
●	Gray	The availability of the Study is currently unknown (this may occur during timeout or error scenarios). Clicking the Availability icon will refresh the data.

Retrieval Progress

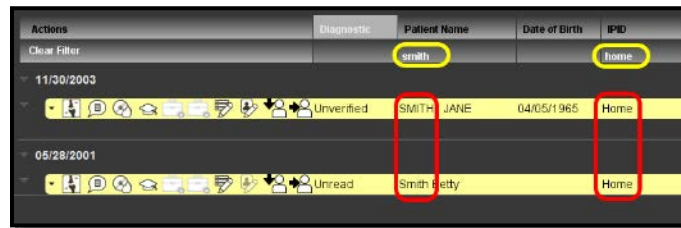
c. Sorting by Data Column

You can sort a worklist by clicking on any of the data column headings. Clicking on the column heading a second time will reverse the direction of sorting

NOTE: If the worklist is displayed in Worklist View as opposed to Patient List View, as described in 3.4.8 below, the data will be sorted separately within each status group and for each day and not for the entire worklist.

d. Searching within a Data Column

You can temporarily narrow the entries in a given worklist by entering text to be matched in the fields beneath one or more of the column headings, as in the following example:



Searching within Data Columns

- Filtering will occur as you enter the text; there is no need to press the **Enter** key.
- The search will match any part of the word or words in the column (e.g., “smith” will match both “Goldsmith” and “Smithfield”).
- In general, the search will match the actual text in the column. For example, if dates are displayed in mm/dd/yyyy format and you want to filter the results by June 29, you will have to enter “06/29” instead of “June 29”.
- The search does, however, support word separation (e.g., entering “J Doe” and “Doe J” will both work to display “Jane Doe”, “Jessica Doe” and “Jonathan Doe”).
- You can filter by multiple columns at the same time by entering text in more than one fields, as in the example shown above.
- Filtering a worklist will cause the worklist count in the window titlebar to be updated to match the number of studies currently being displayed.
- Once you have filtered on one or more columns, a new **Clear Filter** link will be displayed that will let you remove all filters and return to the original worklist display, as in the following example:



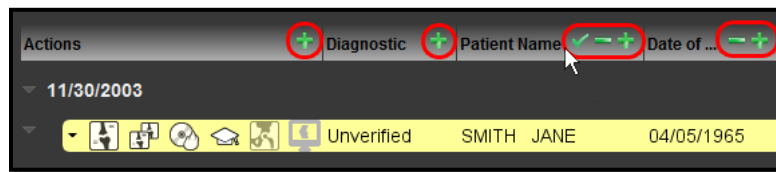
Clear Filter Link

e. Editing Data Columns

If desired, you can edit the display of any worklist to add or remove data columns, change the order in which the columns appear and/or change the width of one or more columns.

NOTE: Any change made to a Teaching worklist will only affect your view of that worklist and will not affect how other users view the same worklist. In addition, any future changes made to the underlying worklist by a PACS Administrator will not be reflected in your view of that worklist once you have made changes to it.

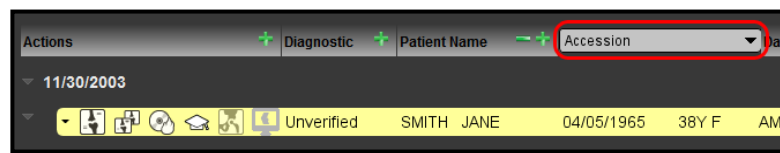
To enable editing of the data columns, **right-click** on any column heading to activate the column editing controls for all columns, as in the following example:



Column Editing Controls

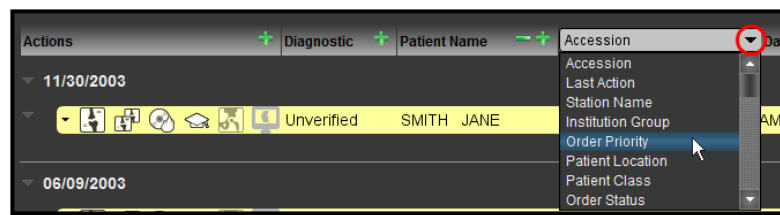
Once column editing has been enabled, you can do the following:

- To **remove** a column from the worklist display, click on the **Remove Column** icon, as displayed to the left, on that column's header. Note that the **Actions** and **Diagnostic** columns cannot be removed.
- To **add** a new column to the right of an existing column, click on the **Add Column** icon, as displayed to the left, on the column header to the left of where you would like the new column to appear. This will cause a new column to be displayed with a drop-down menu as a header, as in the following example:



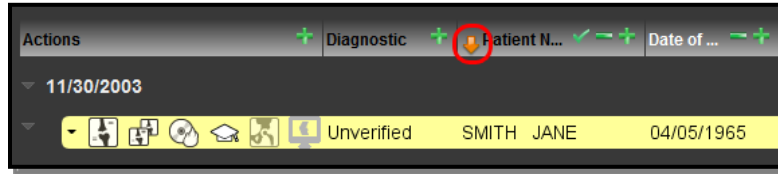
Newly Added Data Column

Click on the drop-down menu and select the desired column header, as in the following example:



Selecting Data Column to Add

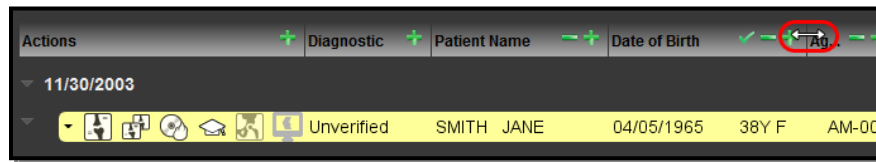
- To **move** a column to a different location, **left-click** on the column header and drag it to the desired location. As you are dragging the column header, its current location will be indicated by an orange arrow, as in the following example:



Moving a Column

When you release the mouse button, the column will be moved to the location indicated by the orange arrow.

- To **resize** a column, hover your mouse over the left or right edge of the column header until your mouse cursor changes to a special resize icon and then drag and drop the edge as desired, as in the following example:



Resizing a Column

- ✓ To save all changes that have been made to all columns, click on the **Commit Changes** icon, as displayed to the left, on any column header.

NOTE: If you want to cancel any changes that you have made before committing them, you can temporarily select a different worklist or choose to reload all worklists, as described in paragraph 3.3.13 above.

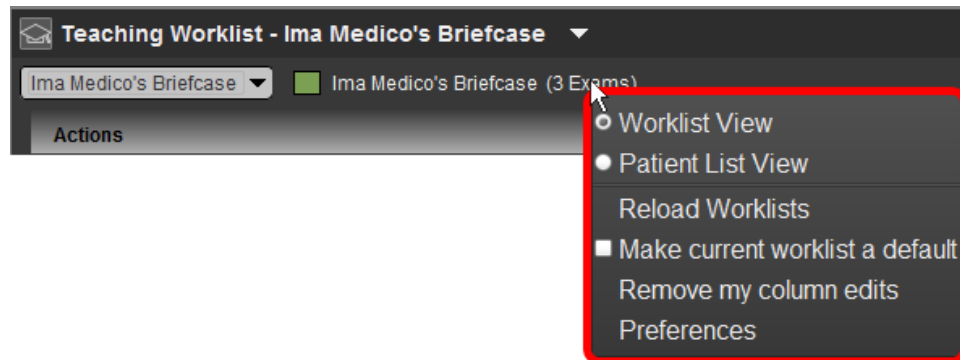
NOTE: You can reset the default column settings for all worklists at any time from the **Teaching Worklist Right-click General Menu**, as described in subsection 3.4.6 below.

3.4.6. Teaching Worklist Right-click Menus

There are two right-click menus available from within Teaching Worklists.

a. Teaching Worklist Right-click General Menu

The **Teaching Worklist Right-click General Menu** displays a number of options that apply to Teaching Worklists in general and is accessible by clicking anywhere above the currently displayed worklist with the **right** mouse button, as in the following example:



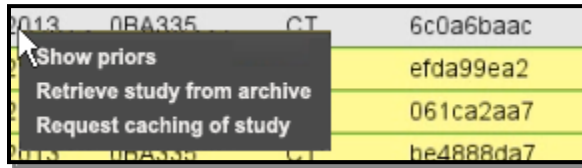
Teaching Worklist Right-click General Menu

The Teaching Worklist Right-click General Menu will display one or more of the following options, depending on your login privileges:

Option	General Description
Worklist View	Displays the worklist in default Worklist View mode, as described in subsection 3.4.7 below.
Patient List View	Displays the worklist in Patient List View mode, as described in subsection 3.4.7 below.
Reload Worklists	Reloads the currently displayed worklist, as described in subsection 3.4.13 below. Also updates the list of teaching worklists in the drop-down menu, as described in subsection 3.4.2 above.
Make Current Worklist a Default	Sets the currently displayed worklist as the default teaching worklist, as described in subsection .
Remove my column edits	Restores the display of all worklists to their default column settings (visibility, order, width).
Preferences	Allow you to set your personal User and Workstation preferences, as described in Chapter 24 below.

b. Teaching Worklist Right-click Study Menu

The **Teaching Worklist Right-click Study Menu** displays options that apply to a specific exam or Study and is accessible by right-clicking anywhere on the entry for that exam or Study, as in the following example:



Teaching Worklist Right-click Study Menu

The Teaching Worklist Right-click Study Menu will display one or more of the following options, depending on your login privileges and how the worklist is configured:

Option	General Description
Show [Hide] priors	Displays [or hides] prior exams, if any, for the selected Study, as described in subsection 3.4.9 below.
Retrieve Study from archive [Availability Status]	<p>If Merge PACS is configured to retrieve studies and the primary Study is currently not available online, submit a retrieval request for this Study. Note the following:</p> <ul style="list-style-type: none"> This action is equivalent to clicking the Retrieve action icon, as described in subsection 3.4.4 above and would typically only be used if the Retrieve action icon is not enabled for a particular worklist. If the Study is currently online, the option will be grayed out and will read “Availability Status: Online”, as in the following example: <div> <p>A screenshot of the 'Retrieve Study from archive' menu item. The text 'Availability Status: Online' is highlighted with a yellow circle.</p> </div> <p style="text-align: center;">Study Is Online</p> <ul style="list-style-type: none"> If a retrieval request has been submitted but not yet completed, the option will be grayed out and will display the current status of the retrieval process, as in the following example: <div> <p>A screenshot of the 'Retrieve Study from archive' menu item. Two instances of the menu item are shown. The first has 'Availability Status: Archive Retrieval Queued' highlighted with a yellow circle. The second has 'Availability Status: Archive Retrieval 2% complete' highlighted with a yellow circle.</p> </div> <p style="text-align: center;">Retrieval Status</p>
Request caching of Study	Manually request caching of the selected Study’s images, as described in subsection 3.3.10 above.

3.4.7. Data Masking

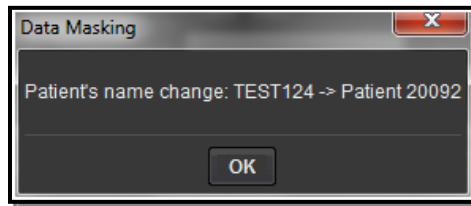


Once a Study has been added to a Teaching Worklist, you can create a copy of that study with certain personally identifiable Protected Health Information (PHI) about the study (including Patient Name, MRN, Accession Number) replaced with randomized data by clicking on the **Data Masking** icon on the Teaching Worklist, as illustrated to the left.

CAUTION: This data masking tool/action should not be considered a full de-identification tool as per HIPAA rules.

When you click on the Data Masking Study icon for a particular Study on a Teaching Worklist, the following things will occur:

- The original Study is removed from the Teaching Worklist and a masked copy of the Study is created and saved to the Teaching Worklist in its place.
- A confirmation window will be displayed, as in the following example:



Data Masking Confirmation

NOTE: The original Study on the originating worklist is not affected.

NOTE: Any saved comments (including VoiceClips) associated with the original study will not be transferred to the masked copy.

NOTE: The masked copy will be treated by Merge PACS just like any other Study, meaning that it can be found via the Query Page, included in RTSL search results and qualify for archiving. Removing the Study from the associated Teaching Worklist will not delete it from the system.

The following patient information will be masked (*i.e.*, replaced with non-identifiable information):

- | | | |
|--------------------------------|-----------------------|-----------------------------|
| • Study Instance UID | • Institution Name | • Series Time |
| • Series Instance UID | • Referring Physician | • Study Date |
| • SOP Instance UID | • Patient Name | • Study Time |
| • Accession Number | • Patient ID | • Content Date |
| • Issuer of Patient ID (IPID) | • Patient Birth Date | • Content Time |
| • Referenced SOP Instance UID | • Series Date | • Viewer Layout Information |
| • Study Presentation Step Info | • Spine Label Set | |

NOTE: Date values will be shifted so that the relationship between them will remain constant.

NOTE: By default, anonymized IPID values will be set to “ANONIPID”, but this can be changed on a site-by-site basis if desired.

CAUTION: Although any Presentation States in the Study will also be masked, this does not include the content of text annotations.

In addition, the following patient information will be removed entirely:

- Institution Address
- Physicians Of Record
- Physicians Of Record ID Sequence
- Performing Physician Name
- Performing Physician ID Sequence
- Name Of Physician Reading Study
- Physician Reading Study ID Sequence
- Other Patient IDs
- Other Patient Names
- Other Patient IDs Sequence
- Patient Birth Name
- Patient Address
- Insurance Plan Identification
- Patient Mother Birth Name
- Responsible Person
- Acquisition Date
- Acquisition Time
- Admitting Date
- Admitting Time
- Overlay Date
- Overlay Time
- Performed Procedure Step Date
- Performed Procedure Step Time
- Scheduled Procedure Step Start Date
- Scheduled Procedure Step Start Time
- Scheduled Procedure Step End Date
- Scheduled Procedure Step End Time
- Reports (including basic text and PDF)

CAUTION: There are standard locations for patient information in the DICOM header of images and the Data Masking tool supports these standard locations. However, patient information may also frequently be hidden in non-standard locations or private tags as well as burned into the pixel data by the modality device or other systems. It is the user’s responsibility to inspect, scrutinize and verify the newly masked images in the image area as well as the DICOM headers including both “public”/ standard tags as well as “private”/non-standard tags.

NOTE: Additional patient information may also be masked or deleted depending on how your system has been configured.

NOTE: When using the Data Masking tool on a study that has key images defined, the key images may not be preserved and the navigation thumbnail for the key images will be displayed with a warning icon when the study is later opened in the primary Viewer, as in the following example:



Warning Icon for Data Masked Key Image

3.4.8. Worklist View

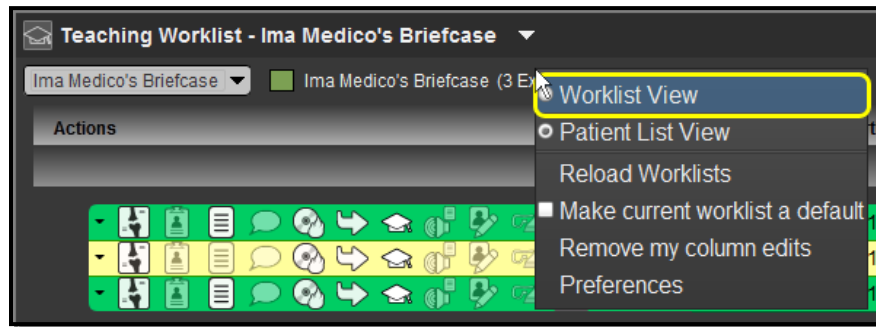
In addition to the default Patient List view, you can also choose to display a teaching worklist in Worklist View, as in the following example:

Actions	Diagnostic	Patient Name	Date of Birth	IPID
11/30/2003				
[Icons]	Unverified	SMITH JANE	04/05/1965	Home
06/09/2003				
[Icons]	Unverified	SMITH JANE	04/05/1965	Home
[Icons]	Read	SMITH JANE	04/05/1965	Home

Worklist View

Worklist View divides studies into separate sections for each day. The studies for each day are, in turn, divided into separate groups according to their current status.

- To display a Teaching Worklist in Worklist View, select the **Worklist View** option from the **Teaching Worklist Right-Click Menu**, as in the following example:

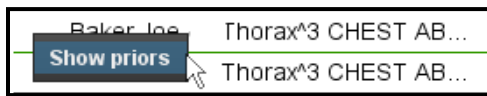


Selecting Worklist View

- To return to Patient List View, select **Patient List View** from the **Right-Click Teaching Worklist Menu**.

3.4.9. Viewing Prior Studies

If a particular Study on a teaching worklist has prior studies associated with it, you can add those prior studies to the worklist. This is done by clicking on the desired Study with the **right** mouse button and then selecting the **Show Priors** option from the **Teaching Worklist Right-click Study Menu**, as shown in the following example:



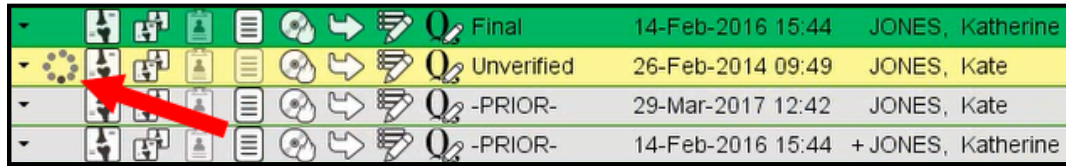
Adding Prior Studies to Worklist

The prior studies, if any, will then be listed below the current Study in the worklist, as shown in the example below:

Q	PID000T1	Baker Joe	Thorax^3 CHEST AB...	●	11/11/2011 12:12	A000T14
Q	PID000T1	+ Smith Joe	Thorax^3 CHEST AB...	●	11/11/2011 12:12	A000T12
Q	PID000T1	Baker Joe	Thorax^3 CHEST AB...	●	01/01/1941 11:11	A000T13
Q	PID000T1	+ Smith Joe	Thorax^3 CHEST AB...	●	01/01/1941 11:11	A000T11

Prior Studies in the Teaching Worklist

The list of prior studies is determined by the **Patient Comparison Strategy** and the **“Selection of Priors”** option configured for your site, as well as Multiple Patient Identity (if MPI is enabled for your site), as described in Appendix C below. Studies will be added to the list of prior studies **dynamically** as they are determined to be priors instead of waiting for all priors to be discovered before displaying the list. While the list of priors is being created, a status indicator will be displayed to let you know that the list is not yet complete, as in the following example:



Final	14-Feb-2016 15:44	JONES, Katherine
Unverified	26-Feb-2014 09:49	JONES, Kate
-PRIOR-	29-Mar-2017 12:42	JONES, Kate
-PRIOR-	14-Feb-2016 15:44	+ JONES, Katherine

List of Prior Studies In Progress

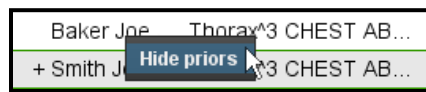
NOTE: You can choose to display priors for multiple studies at the same time and each study will have its own separate status indicator.

NOTE: Individual worklists can be configured by an Administrator to “automatically display priors.” When this feature is enabled, all prior studies for a selected Study will be displayed in the worklist when that Study is opened into the Merge PACS Viewer, as described in Chapter 4 below.

NOTE: If Merge PACS is configured with an extended query node, additional prior studies may be displayed that do not appear within the worklist proper.

CAUTION: The list of priors will be current as of the time the “Show priors” option is selected, but will not automatically be updated in real time if the information changes (e.g., if priors are in the process of being “pre-fetched” and have not yet been added to the list). Any changes to the list of priors will only be displayed if you hide the list of priors and then show it again.

You can remove the prior studies from the worklist by clicking the **right** mouse button and selecting the **Hide Priors** option from the **Right-Click Worklist Menu**:

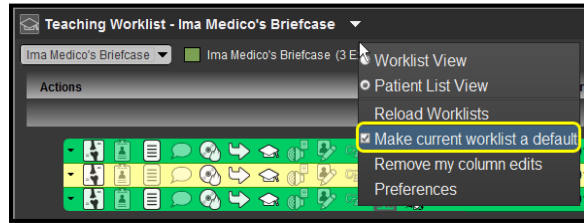


Hiding Prior Studies

NOTE: If a prior list is in the process of being assembled for a particular study (i.e., the status indicator is displayed), selecting “Hide Priors” will cancel the operation.

3.4.10. Setting a Default Teaching Worklist

If you have multiple teaching worklists available to you, you can select one worklist to be launched by default when you first access the Teaching Worklist screen. To do this, first select the desired worklist from the drop-down menu of available worklists (as described in subsection 3.4.2 above), then click anywhere above the worklist with the **right** mouse button and select **Make current worklist a default** from the **Teaching Worklist Right-Click Menu**, as shown in the following example:



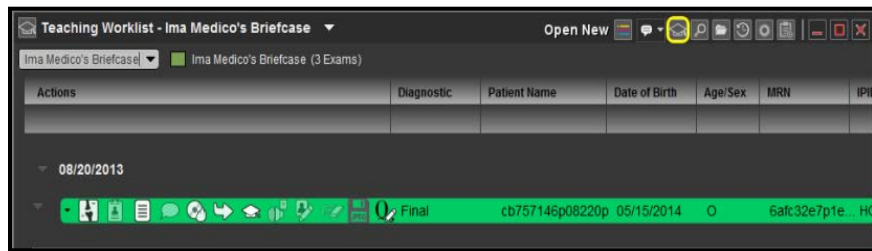
Setting the Current Worklist as the Default

3.4.11. Using Workflow Accelerator™ with Teaching Worklists

Workflow Accelerator works with teaching worklists exactly the same way as it does with RTWL worklists. For detailed information, refer to subsection 3.3.10 above.

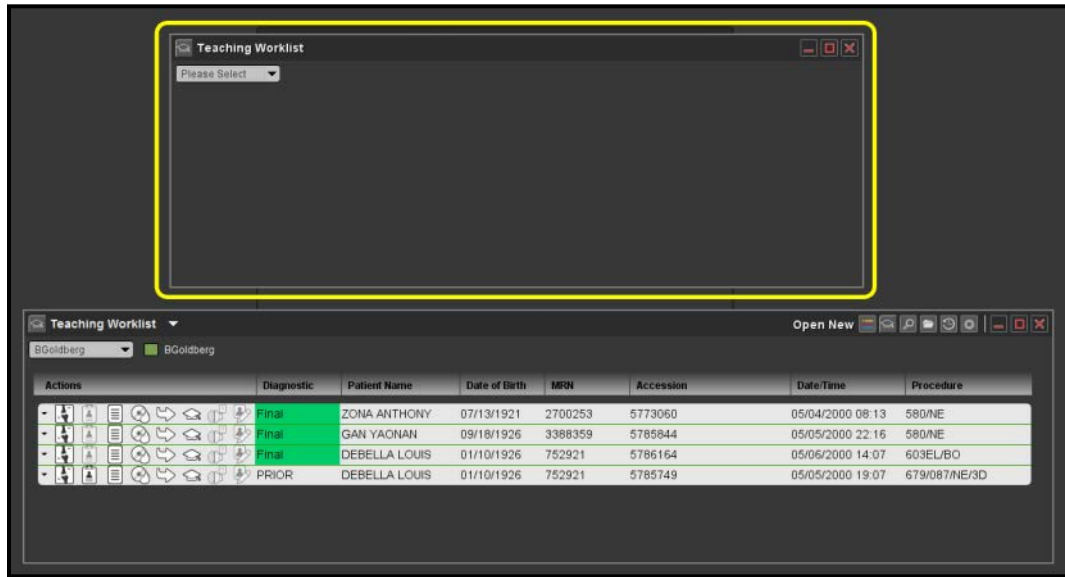
3.4.12. Opening Multiple Teaching Worklists

If desired, you can open additional teaching worklists in their own separate windows. To do so, click on the **Open New Teaching Worklist** icon at the top right of the Workstation Browser, as in the following example:



Opening a Teaching Worklist in a New Window

This will cause a separate Teaching Worklist screen to appear in a separate window, as in the following example:

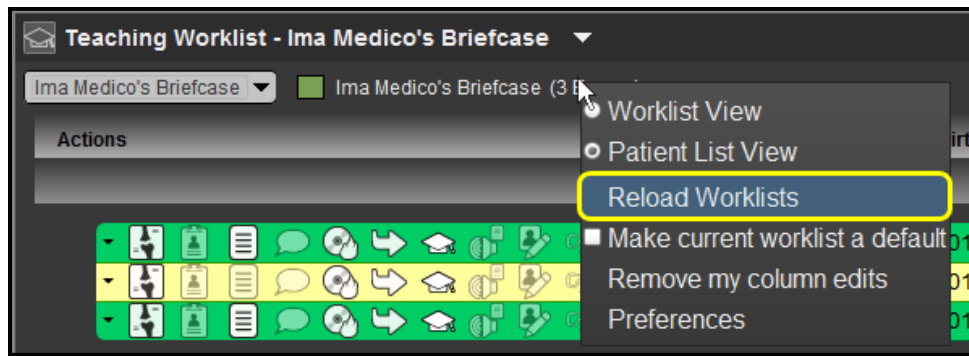


Separate Teaching Worklist Window

At the new window you can select the desired worklist from the drop-down menu as with the main Teaching Worklist screen.

3.4.13. Reloading a Teaching Worklist

If desired, you can manually refresh the worklist currently being viewed. To do so, click anywhere above the worklist with the **right** mouse button and then select **Reload Worklists** from the **Right-Click Worklist Menu**, as shown in the following example:



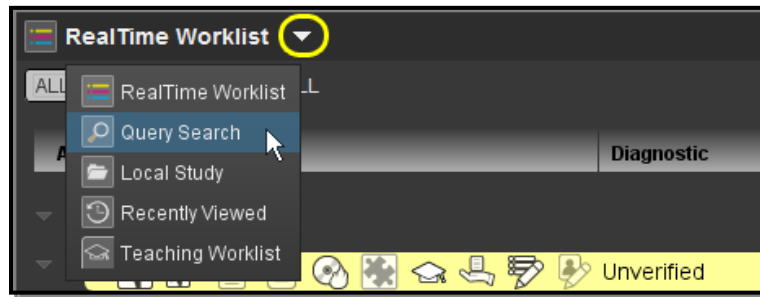
Reloading a Worklist

3.5. Query Search

The Merge PACS Query Search feature allows you to enter a variety of search parameters, including patient name, Study accession number, referring physician, most recent studies sent to the system, etc. Once you have entered the desired search parameter, you will then be shown a list of matching studies and can then select the particular Study you wish to view.

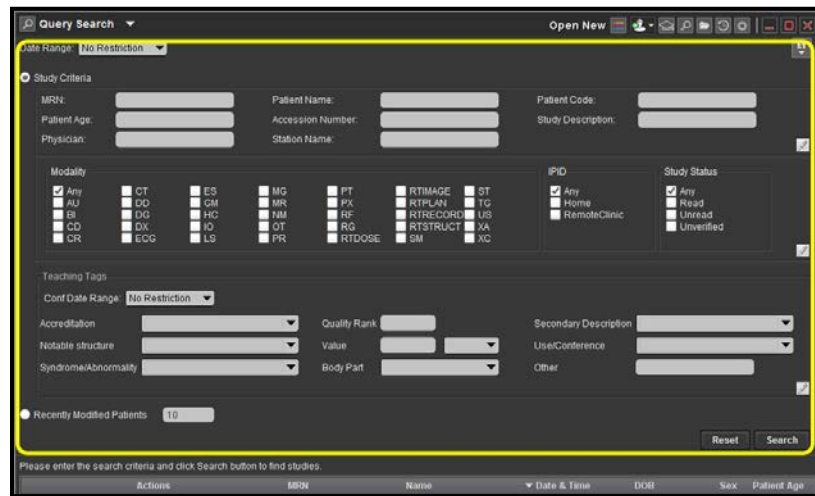
If your system includes the optional Merge Archive component, you can also use Query Search to locate patient images that are no longer currently stored on Merge PACS but that have been moved offline to tape storage for backup or disaster recovery purposes.

Query Search is accessible from the Merge PACS Browser by selecting **Query Search** from the drop-down menu at the top of the Workstation Browser, as in the following example:



Accessing the Query Search

The Query Search fields will then be displayed at the top of the Browser window, as in the following example:



Query Search Fields

NOTE: The actual appearance of the Query Search page will vary, based on the way your site is configured, the fields you have personally configured to be displayed (as described in paragraph d below) and whether you have privileges to access optional features.

If you use the Windows docking feature to dock the Query Search page to the left or right half of a monitor (*i.e.*, by clicking on the page's titlebar and dragging it all the way to the left or right of the screen), the Query Search page will be displayed similar to the following example:



Query Search Page with Half Screen Docking

3.5.1. Entering Search Criteria

The following types of search criteria can be entered at the Query Search Page in order to locate a particular patient:

- **Date Range**
- **Study Criteria** (including **Teaching Tags**, if available)
- **Recently Modified Patients**

You can also specify which of the available Study Criteria query fields you want to display.

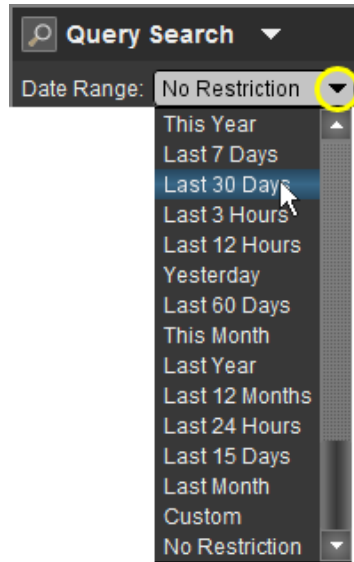
a. Restricting a Query by Date

Once you have entered one or more search criteria, as described above, you can optionally restrict your query to particular time frame using the **Date Range** fields at the top of the query Search Page, as shown below:



Date Range Restriction

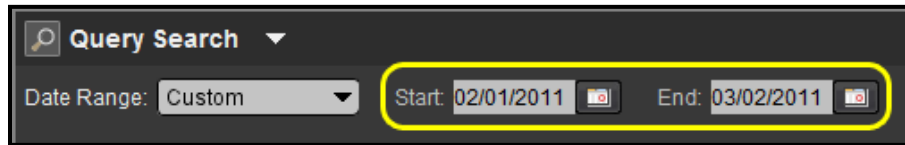
- Select an item from the drop-down “Date Range” menu:



Entering a Date Restriction

NOTE: The actual values that appear in the Date Range menu are configurable on a site-by-site basis.

- If you selected **Custom**, you can then enter a start and/or an end date, as in the following example:



Entering a Date Restriction

- Dates should be entered in whatever format is currently configured for your site. Contact your PACS Administrator to find out what format is being used.
- You can also click on the calendar icon to the right of either date field to bring up a calendar window that will allow you to select the desired date instead of manually typing it in.

b. Searching by Study Criteria

The middle section of the Query Search Page contains fields that can be used to narrow your search according to a variety of different Study attributes, as in the following example:

Study Criteria Search Fields

- The actual fields that appear in the Study Criteria section are configurable on a site-by-site basis and can also be personally configured, as described in subsection d below.
- The various **Teaching Tags** fields allow you to search for studies that have been tagged as teaching files (as described in Chapter 22 below) and will only be available if you have the login privileges to access the optional Teaching Files feature.
- To use the Study Criteria fields, the **Study Criteria** radio button must be selected, as shown below:

Enabling Study Criteria Search Fields

NOTE: You cannot use this option in conjunction with the **Recently Modified Patients** option described below.

- Any alphanumeric characters can be entered for **Patient Name**, **MRN**, **Physician**, **Accession Number**, **Study Description**, and **Station Name** fields. In addition, you can use * or % as wildcard characters in these fields to fill in for letters or numbers you are unsure of. For example:
 - “**B*K**” would find “Black, John” as well as “Beckman, Timothy” and “Brown, Kelly.”
 - “***SMITH**” would find both “Goldsmith, David” and “DrSmith, Robert J.”
 - “***B*G**” would find both “Goldberg, Benjamin” and “Cable, George.”
- If searching by **MRN**, **Patient Name** or **Physician**, bear in mind that the search will match based on the “normalized” (*i.e.*, with non alpha-numeric characters removed) versions of the data. As a result, a search for an MRN of “21260” will locate a patient with an MRN of 21260 as well as a patient with an MRN of 2126.0, since the search will ignore the period. Similarly, a search for a Patient Name of “Gold-Smith” will also locate a patient with the name Goldsmith. Note, however, that the search results will display the original values so you can verify that the correct patient is selected, as in the following example:

The screenshot shows a search interface with a 'Date Range' dropdown set to 'No Restriction'. Under 'Study Criteria', the 'MRN' field contains '21260' and the 'Patient Name' field contains 'gold-smith'. Below the search criteria, a table displays 'Found 7 studies' with columns for Actions, MRN, Name, Date & Time, and DOB. Two rows are highlighted with yellow boxes: one for MRN 21260 (Goldsmith Jessica P) and one for MRN 2126.0 (Gold-Smith Jonathan Q).

Actions	MRN	Name	Date & Time	DOB
[Icons]	21260	Goldsmith Jessica P	03/29/2004 15:44	05/12/2014
[Icons]	2126.0	Gold-Smith Jonathan Q	11/30/2003 13:52	05/12/2014

Searching with Normalized Data

- If searching by **Patient Name** or **Physician**, you can enter the name you are searching for in the format “**last name, first name**” or simply enter the **last name** to find all people with that last name.
 - An “**implicit wildcard**” is automatically added to the **end** of your query, meaning that “**BL**” would find “Black, John” as well as “Blake, James” and “**B**” would find all people whose last name begins with the letter “B.”
 - You can also manually insert one or more asterisks [*] as wildcard characters to fill in for letters you are unsure of at the beginning or middle of a name, as described above.
 - Names are stored in the Merge PACS database in whatever format they arrive from the DICOM modality and/or the HIS/RIS. Typically, this format is **last name, first name, middle name (or initial), prefix, suffix**, meaning that “Dr. John Q. Smith” would be stored as “SmithJohnQDr.” This practice can vary from site to site, however, and may affect how wildcard searches work for you. Some sites, for example, may append the **prefix** at the beginning of the name (*e.g.*, “DrSmithJohnQ”). If you have any questions about how names are stored at your site, talk to your Merge PACS Administrator.
- An “implicit wildcard” is also automatically added to the **start and end** of **Study Description** queries, meaning that “**Chest CT**” would find “Chest CT,” “Chest CT w/Contrast” and “Chest CT w/o Contrast” and “**CT**” would find both “CT” and “Chest CT.”

- If searching by **Patient Age**, you can enter a simple number (e.g., "42"), a number with units (e.g., "42Y"), or a range (e.g., "40-45" or "40Y-45Y"). The valid units are "D" (days), "W" (weeks), "M" (months), and "Y" (years) [these are all **case-sensitive**].
- You can use * or % as wildcard characters in any of the following **Teaching Tag** fields: **Accreditation, Quality Rank, Notable Structure, Syndrome/Abnormality, Use/Conference, Secondary Description, Other**. In addition, an "implicit wildcard" is also added automatically to the start and end **Secondary Description** and **Other** queries.

NOTE: The names of the various Teaching Tags are configurable on a site-by-site basis and may differ from the list described above.

- If searching by **Body Part** (in the "Teaching Tags" section), the search will display results matching the specified body part as well as any body parts associated with that body part that are lower in hierarchical order.
 - For example, searching on "**Lower Extremity**" would display studies tagged with "Lower Extremity" as well as those tagged with "**Hip Joint,**" "**Femur,**" "**Knee,**" "**Lower Leg,**" "**Ankle,**" "**Foot,**" "**Patella,**" or "**Toe,**" since all are contained within "Lower Extremity."
 - Searching on "**Knee,**" however, would only display studies tagged with "Knee" or "**Patella,**" since "Lower Leg," "Ankle," "Foot" and "Toe" are not contained within "Knee."
- By default, the following fields are **case-sensitive** (although this can be changed on a site-by-site basis):

○ Patient Age (with regard to units)	○ Accession Number
○ Study Description	○ Station Name
○ Accreditation	○ Notable Structure
○ Syndrome/Abnormality	○ Secondary Description
○ Use/Conference	○ Other

NOTE: For example, if the Study description is L-SPINE, the Study won't be returned if you search for a Study Description of "spine" or "Spine."

- If you need to locate a report that is not associated with a Study or an order but has an accession number associated with it, you can enter the exact accession number in the **Accession Number** field.

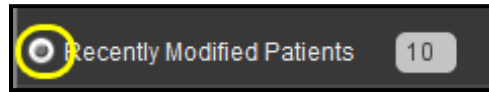
c. Searching By Recently Modified Patients

The bottom section of the Query Search Page allows you to narrow your search by displaying a list of recently modified patients, as shown below:

The screenshot shows the 'Query Search' window with various search criteria. At the bottom, the 'Recently Modified Patients' radio button is selected and highlighted with a yellow circle, with the number '10' in a text box next to it. Other search criteria include Date Range (No Restriction), Study Criteria (MRN, Patient Name, Patient Code, etc.), Modality (Any, CT, ES, etc.), IPID (Any, Home, RemoteClinic), Study Status (Any, Read, Unread, Unverified), Teaching Tags (Conf Date Range, Accreditation, Quality Rank, etc.), and a 'Search' button.

Recently Modified Patients Search Option

- To use this option, the **Recently Modified Patients** radio button must be selected, as shown below:



Enabling Recently Modified Patients Search Option

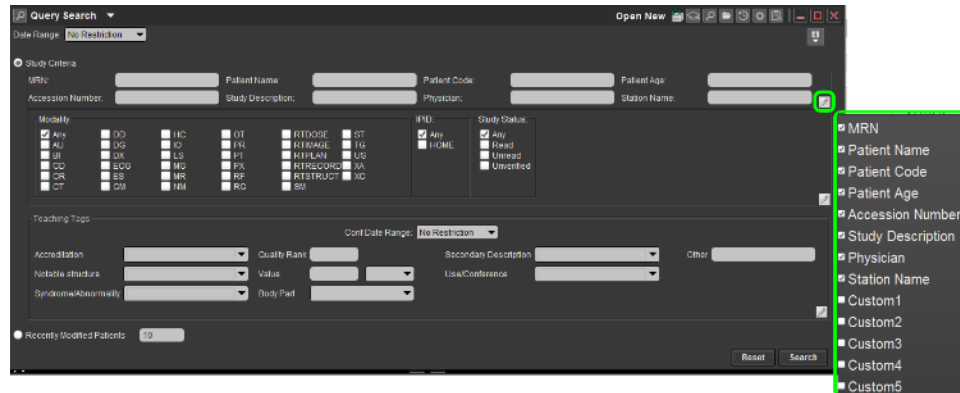
NOTE: You cannot use this option in conjunction with the **Study Criteria** options described above.

- Enter the number of most recent studies sent to the system you want to display (the default is the last 10 patients).

d. Selecting the Study Criteria Query Fields to Display

If desired, you can customize the Study Criteria area to add or remove various query fields as well as to determine which modalities are available for selection.

- Click on the pencil icon in the top section of the Study Criteria area to add or remove query fields from that section, as in the following example:

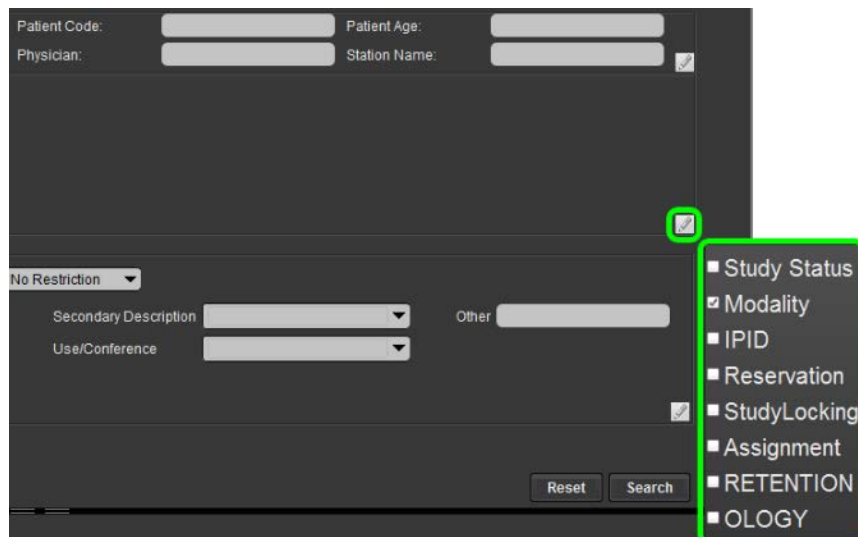


Upper Study Criteria Query Fields Selection Menu

Check the box next to the field you would like to add, or uncheck the box next to a field you would like to remove.

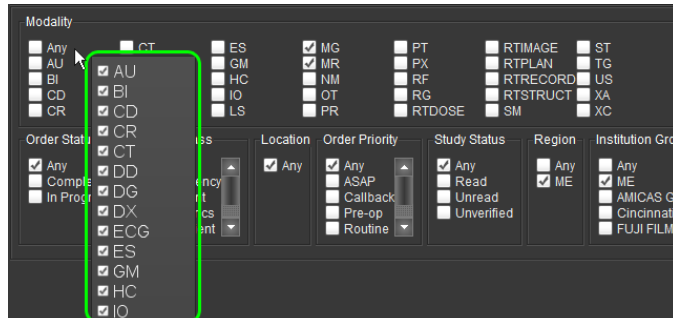
NOTE: The list of available options in this menu is configurable on a site-by-site basis.

- Click on the pencil icon in the middle section of the Study Criteria area to add or remove query fields from that section, as in the following example:



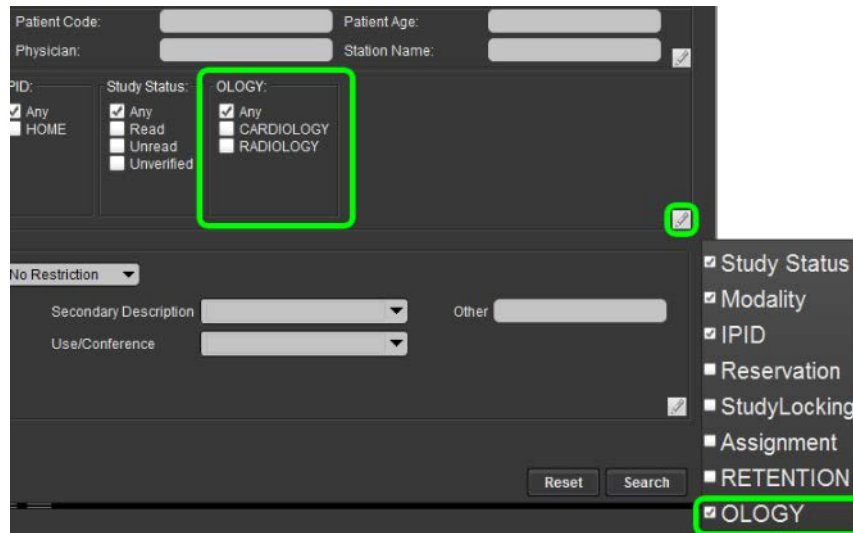
Middle Study Criteria Query Fields Selection Menu

- If **Modality** is selected as an option for the middle section of the Study Criteria area, **right-click** anywhere on the list of available modalities to add or remove modalities from the list, as in the following example:



Modality Selection Menu

- If Merge PACS is configured to run in **Integrated** mode, the attached iCEA Server can be set up to tag studies according to Study Type (e.g., Cardiology, Radiology, Neurology, etc.) with multiple study types associated with one or more **Study Type Groups** (e.g., an “**OLGY**” group that would include the aforementioned Cardiology, Radiology and Neurology study types). Any such study type groups will be available to be added as a query field with the associated study types included as options, as in the following example:



“OLGY” Study Type Group Selected as a Query Field

NOTE: Although an “**OLGY**” group is the most common study type group that would typically be used with Merge PACS, any number of other study type groups can be configured, such as a “**RETENTION**” group that would describe how the data for each study type is retained.

- Click on the pencil icon in the Teaching Tags section of the Study Criteria area to add or remove Teaching Tag related query fields, as in the following example:

The screenshot shows the 'Teaching Tags' configuration panel. It includes a 'Conf Date Range' dropdown set to 'No Restriction'. Below are several rows of fields: 'Accreditation', 'Quality Rank', 'Secondary Description', 'Notable structure', 'Value', 'Use/Conference', 'Syndrome/Abnormality', 'Body Part', and 'Other'. At the bottom left, there is a 'Recently Modified Patients' field with the value '10'. A 'Reset' and 'Search' button are at the bottom right. A pencil icon is circled in green, and a dropdown menu is open, listing the same fields with checkboxes.

Teaching Tag Query Fields Selection Menu

NOTE: Query fields related to the optional Teaching Files feature will only be available if you have the login privileges to access those tools.

3.5.2. Submitting the Query

When you have entered the desired search parameters, press the **“Search”** button at the bottom of the search criteria to begin the search. This may take a little time, depending on the speed of your system and the number of patients listed. The query results will then be displayed as described in the following subsection.

NOTE: The maximum number of results returned from a query is configurable on a site-by-site basis. If your search would exceed the defined maximum, you will be shown a warning asking you to please refine your search criteria and resubmit the query.

3.5.3. Query Results Page Overview

Once you have run a query by entering the desired criteria and clicking on the **Search** button, the results of that query will be displayed below the query fields as shown in the example below:

The screenshot shows a 'Query Search' window with various search criteria fields. The 'Study Criteria' section includes fields for MRN, Patient Name (SMITH), Patient Code, Patient App, Accession Number, Study Description (SPPNE), Physician, and Station Name. There are also checkboxes for Modality (CT, DC, DM, MC, MR, PT, RTHAGE, RTPLAN, ST, AI, AD, CM, HC, NM, RF, RTRECORD, US, CD, DL, IO, OT, RC, RSTRUCT, XA, CR, EGG, LB, PR, RTDOSE, SM, XC) and Study Status (Any, Read, Unread, Unverified, Home, RemoteClinic). Below this is a 'Teaching Tags' section with fields for Cert Date Range, Accreditation, Quality Rank, Secondary Description, Notable structure, Value, Use/Conference, Syndrome/Abnormality, Body Part, and Other. A 'Recently Modified Patients' section shows a count of 10. At the bottom, a table displays 'Found 3 studies' with columns for Actions, MRN, Name, Date & Time, Availability, DOB, Sex, and Patient Age. The table contains three rows of data for patient SMITH, JANE.

Actions	MRN	Name	Date & Time	Availability	DOB	Sex	Patient Age
[Icons]	AB-0098	SMITH, JANE	11/00/2003 13:52	Green	04/05/1965	F	33Y
[Icons]	AB-0098	SMITH, JANE	06/09/2003 14:09	Grey	04/05/1965	F	33Y
[Icons]	AB-0098	SMITH, JANE	06/09/2003 13:31	Green	04/05/1965	F	33Y

Query Results

NOTE: In general, if fewer results than expected are returned, you should consider using fewer search criteria. However, in some cases you may need to **add** criteria to your search rather than remove them to help in situations where the search results are being truncated (either because the device is capping its results, or because the device does not support open-ended queries and is returning no results).

NOTE: If Merge PACS is configured with an extended query node, additional studies may be displayed in the Query Search results (after some delay) that do not appear within worklists. However, if only series-level search criteria are specified, only local results will be included and a “partial results” warning message will be displayed.

NOTE: If Merge PACS is configured to run in **Integrated** mode with **Multiple Patient Identities (MPI)** enabled and you search based on IPID and the exact MRN of a patient, the search results will include studies that are associated with other IPIDs and MRNs for this person based on the linking of identities in MPI. For more information on MPI support, refer to Appendix C.2 below.

Note that each patient may have one or more Series listed per Study, and may also have more than one Study listed.

Each entry on the Query Results Page contains a set of **action icons** on the left that you can click on to perform different tasks, and **data columns** on the right that display information about each Study, as shown in the following example:

Action Icons										Data Columns						
Actions										MRN	Name	Date & Time	Availability	DOB	Sex	Patient Age
[Action Icons]										AM-0098	SMITH PATIENT	11/30/2003 13:52	●	04/05/1965	F	039Y
[Action Icons]										AM-0098	SMITH PATIENT	06/09/2003 14:09	●	04/05/1965	F	039Y
[Action Icons]										AM-0098	SMITH PATIENT	06/09/2003 13:31	●	04/05/1965	F	039Y

Action Icons and Data Columns

3.5.4. Action Icons

The actual action icons available on the Query Results Page will depend on the Study, how your system is configured and your login privileges. For a complete list of possible action icons, refer to Section 3.9 below.

3.5.5. Data Columns

a. In General

The following general data columns can be displayed on the Query Results Page:

- Patient Name
- MRN
- IPID (Issuer of Patient ID)
- Date of Birth
- Age
- Sex
- Accession Number
- Study Date/Time
- Modality
- Study Description
- Image Count per Series
- Objects
- Status
- Availability
- Station Name
- Institution
- Reading Physician
- Referring Physician

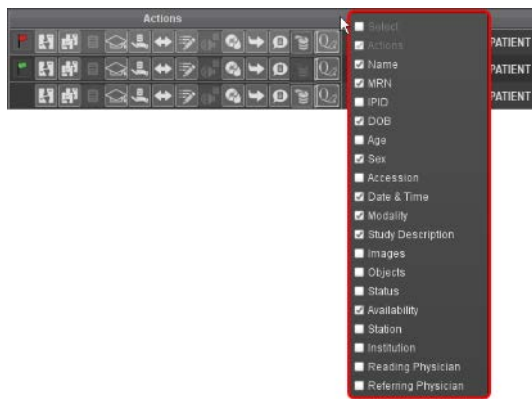
NOTE: There may also be one or more custom data columns available, depending on how your site is configured.

In addition, if you have the login privileges to access the optional Teaching Files feature, the following data columns can also be displayed:

- Accreditation
- Body Part
- Quality Rank
- Secondary Description
- Syndrome/Abnormality
- Use/Conference
- Conference Date
- Value
- Notable Structure
- Other

b. Selecting the Data Columns to Display

To add or remove a data column from the Query Results Page, click on any of the column headings once with the **right** mouse button to cause the Data Column Selection Menu to be displayed, as in the following example:



The Query Results Display Column Selection Menu

Check the box next to the column you would like to add, or uncheck the box next to a column you would like to remove.









c. Availability Column

The Query Results Page can be configured to include an **Availability** data column, as in the following example:

MRN	Name	Date & Time	Availability	DOB	Sex	Patient Age
AM-0098	SMITH PATIENT	11/30/2003 13:52	●	04/05/1965	F	039Y
AM-0098	SMITH PATIENT	06/09/2003 14:09	●	04/05/1965	F	039Y
AM-0098	SMITH PATIENT	06/09/2003 13:31	●	04/05/1965	F	039Y

Availability Column

The Availability column shows an availability status indicator for each Study. The appearance of the indicator indicates the availability of the Study as follows:

Indicator	Color	Description
	Green	The Study is available online for viewing.
	Black	The Study is currently offline and not available for viewing.
	Blue	A request to retrieve the Study has been submitted, but the retrieval process has not yet started.
	Black / Green	The Study is currently being retrieved. Note that the percentage of green shown will change to indicate the progress of the retrieval process. Hovering your mouse cursor over the indicator will cause the exact percentage to be shown in a tool-tip window, as in the following example: <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">  04/05/1965 F 039Y Status: Archive Retrieval 61% complete 139Y </div>
	Orange	Images for this Study are currently being imported for the first time or additional images are currently being added to an existing Study.
	Red	Retrieval of the Study has completed, but with errors (either fewer images were received than expected or all images failed compression)
	Gray	The availability of the Study is currently unknown (this may occur during timeout or error scenarios). Clicking the Availability icon will refresh the data.

Retrieval Progress

d. Reordering Data Columns

You can change the order in which the various data columns are displayed on the Query Results Page by clicking on a particular column's heading with the **left** mouse button and dragging the column to the desired location.

e. Resizing Data Column

You can resize any data column by hovering your mouse between the heading of the column whose size you wish to change and the column heading to its right until your cursor changes to a resizing arrow, as in the following example:

▼ Name	MRN	
DOE, JONATHAN Q	123456789	01/10/1926
DOE, JOANNE W	987654321	02/03/1945

The Resizing Cursor

Once the resizing arrow cursor appears, click with the **left** mouse button and drag the edge of the column to the left or right as desired.

CAUTION: If you attempt to resize a column when the resizing arrow cursor is not displayed, you will move the column to a new location as described above.

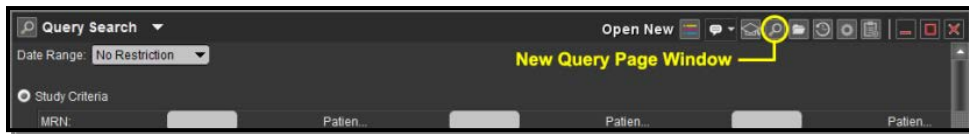
NOTE: Some columns, such as **Name**, **MRN**, **DOB**, **Sex** and **Time**, have a minimum display width.

f. Sorting Query Results

You can sort the data on the Query Results Page by clicking on any of the column headings at the top of the screen except for Image Count.

3.5.6. Opening Multiple Query Pages

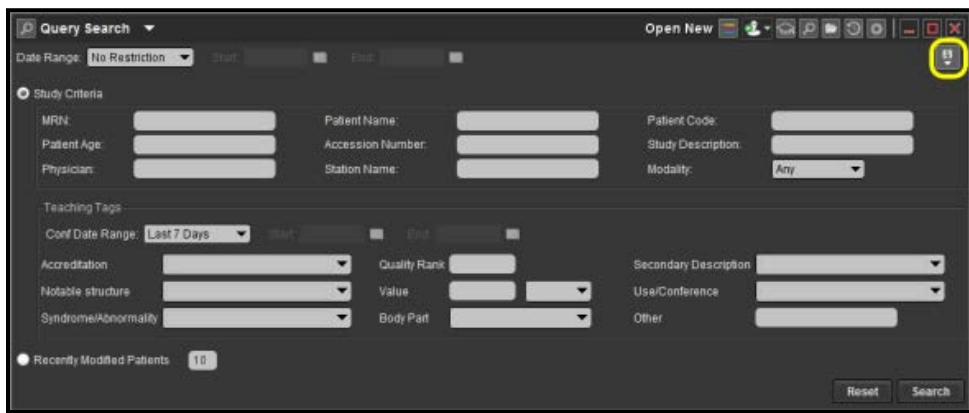
If desired, you can open additional Query Pages in their own separate windows. To do so, click on the **Open New Query Page** icon at the top right of the Workstation Browser, as shown below:



Opening a Query Page in a New Window

3.5.7. Importing from a DICOM Device

You can request one or more images from a separate DICOM Archive at any time, if available, by clicking on the **Import from DICOM Device** icon displayed at the top-right of the Query Search Page, as in the following example:



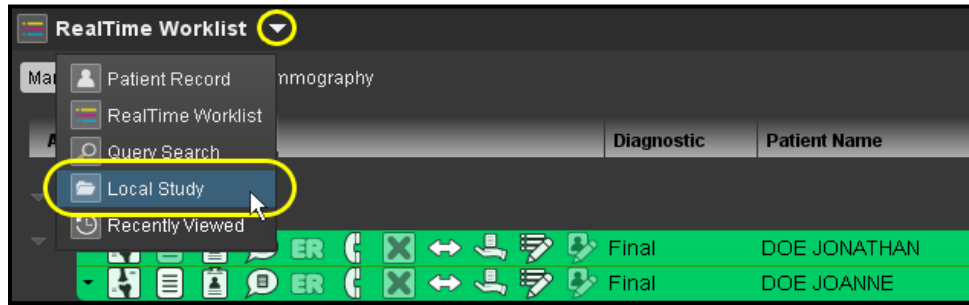
Import from DICOM Device Icon

For details on importing images from a DICOM device, see Chapter 15 below.

3.6. Local Study

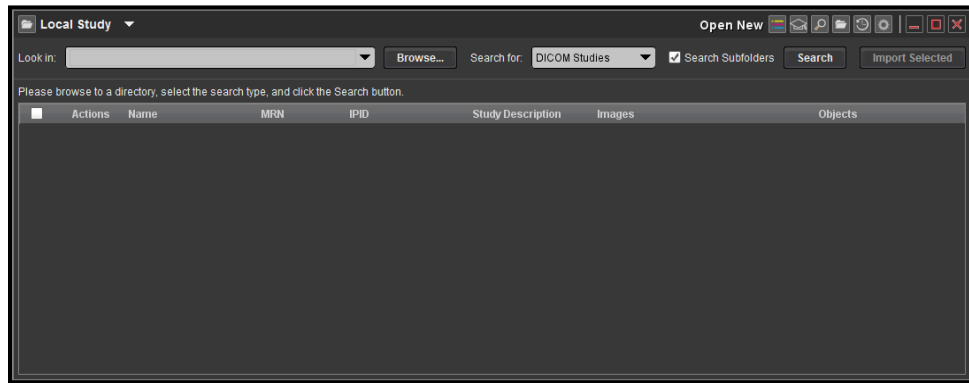
The Local Study feature allows you to search for and open studies that have been saved to your local Workstation, a CD/DVD, or a network accessible drive. Depending on your user privileges, you can choose to have these local studies imported into the Merge PACS Server as well as search for non-DICOM images that can be imported into the Merge PACS Server as a new Study.

Local Study is accessible from the Merge PACS Browser by selecting **Local Study** from the drop-down menu at the top of the Workstation Browser, as in the following example:



Accessing Local Study

The Local Study screen will then be displayed within the Browser, as in the following example:



Local Study Screen

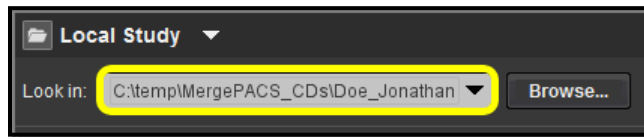
3.6.1. Viewing and Importing DICOM Studies

a. Searching for Studies

NOTE: Depending on how your system is configured, the Merge PACS Workstation may automatically search the CD drive for a CD containing studies when you first access the Local Study screen.

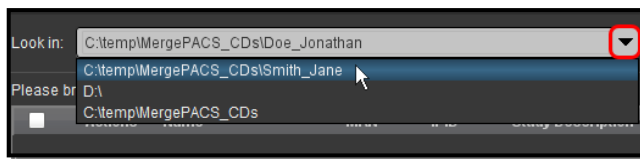
There are two ways to search for studies from the Local Study screen:

- The **Look In Folder** option allows you to specify the location where the desired Study is stored, as follows:
 - If you know the exact name of the folder, you can enter it directly in the **Look in** field, as in the following example:



Entering the Specific Folder

You can also select from a list of recently opened folders that contained studies from the drop-down **Look in** menu, as in the following example:



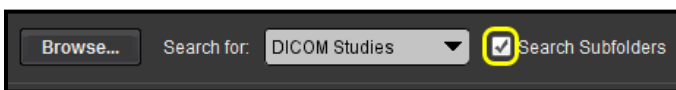
Listing for Specified Study

- Make sure that the **DICOM Studies** option is selected from the drop-down **Search for** menu, as in the following example:



Selecting What to Search For

- If you want to search for all studies contained in subfolders within the main folder entered in the **Look In** field, click the **Search Subfolders** option, as in the following example:



Search Subfolders

- Click the **Search** button to start the search.
- The **Browse to Folder** option allows you to navigate to the location where the desired Study is stored:
 - From the main Local Study screen, make sure that the **DICOM Studies** option is selected from the drop-down **Search for** menu, as in the following example:



Search For DICOM Studies

- If you want to search for all studies/images contained in subfolders within the main folder entered in the **Look In** field, click the **Search Subfolders** option, as in the following example:



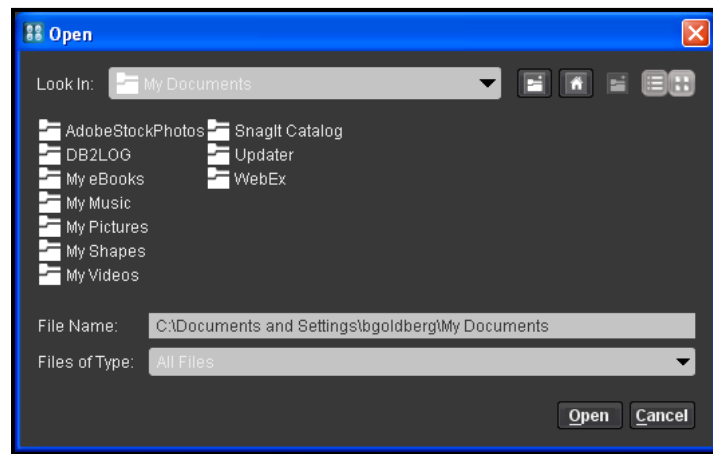
Search Subfolders

- Click on the **Browse** button, as shown below:



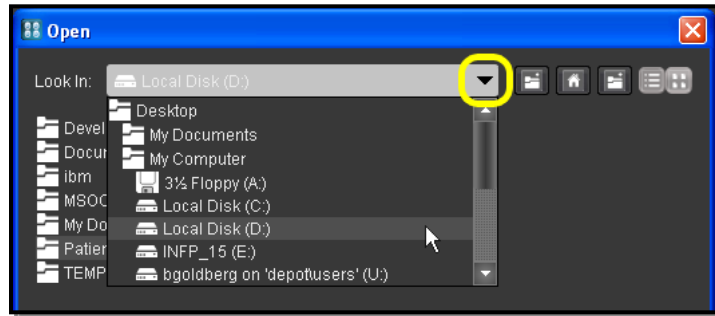
The Browse Button

This will cause the File Browser to be displayed in a separate pop-up window, as in the following example:



The File Browser Window

- From the drop-down **Look In** menu, select the drive where the desired Study is located, as in the following example:



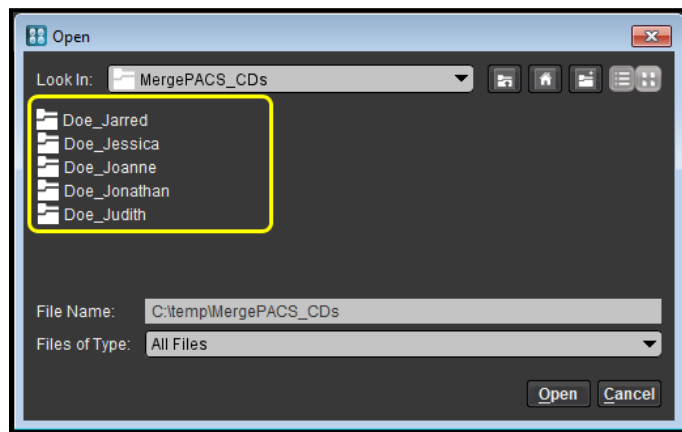
Selecting a Drive

- Once you selected a drive, the folders on that drive will be displayed in the main portion of the File Browser window, as in the following example:



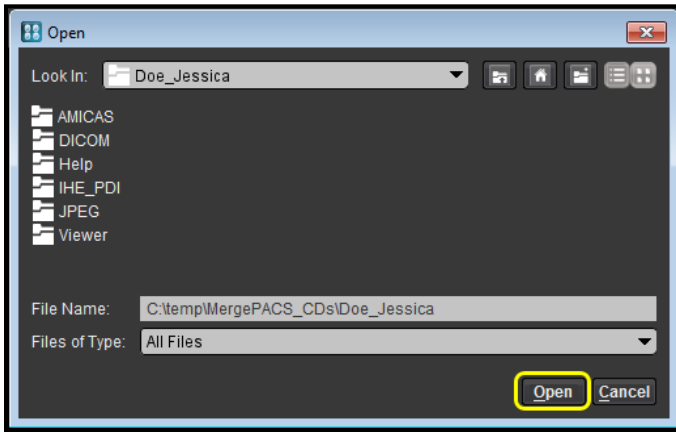
Folders on the Selected Drive

- Double-click on any folder to display the subfolders within that folder, as in the following example:



Subfolders on the Selected Drive

- When you are inside the folder containing the desired DICOM Study or studies, click the **Open** button, as in the following example:



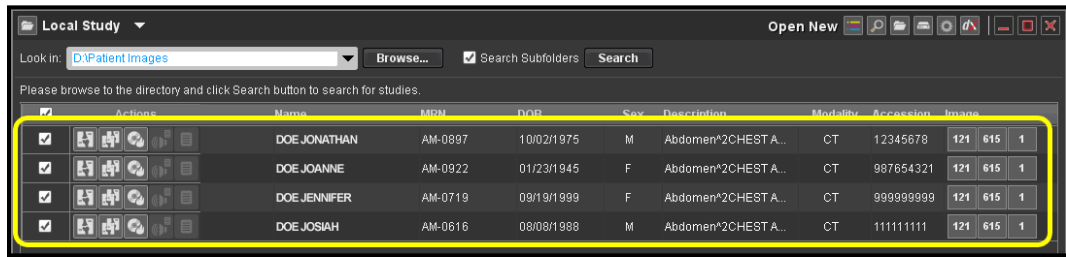
Opening the Selected Study

NOTE: If you selected the **Search Subfolders** option before browsing, you only need to open the top-level folder containing the subfolder(s) where the DICOM studies reside.

NOTE: You can also enter a directory name manually in the **File Name** field. If entering a directory network drive, however, the drive must be to a mapped letter drive.

b. Local Study Search Results Overview

Once you have searched for and located one or more local studies, the results of that search will be displayed in the Local Study screen as shown in the example below:



Search Results for Local Studies

Note that each patient may have one or more Series listed per Study, and may also have more than one Study listed.

Each entry on the Local Study screen contains a set of **action icons** on the left that you can click on to perform different tasks, and **data columns** on the right that display information about each Study, as shown in the following example:

Action Icons		Data Columns							
✓	Actions	Name	MRN	DOB	Sex	Description	Modality	Accession ...	Image
✓		DOE.JONATHAN	AM-0897	10/02/1975	M	Abdomen*2CHEST A...	CT	12345678	121 615 1
✓		DOE.JOANNE	AM-0922	01/23/1945	F	Abdomen*2CHEST A...	CT	987654321	121 615 1
✓		DOE.JENNIFER	AM-0719	09/19/1999	F	Abdomen*2CHEST A...	CT	999999999	121 615 1
✓		DOE.JOSIAH	AM-0616	08/08/1988	M	Abdomen*2CHEST A...	CT	111111111	121 615 1

Action Icons and Data Columns

c. Action Icons

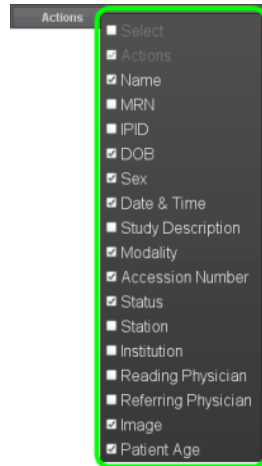
The actual action icons available on the Local Study screen will depend on the Study, how your system is configured and your login privileges. For a complete list of possible action icons, refer to Section 3.9 below.

d. Data Columns

The following general data columns can be displayed on the Local Study Search Results Page:

- Patient Name
- Date of Birth
- Accession Number
- Study Description
- Status
- Reading Physician
- Medical Record Number (MRN)
- Age
- Study Date/Time
- Image Count per Series
- Station Name
- Referring Physician
- Issuer of Patient ID (IPID)
- Sex
- Modality
- Objects
- Institution

- You can **add or remove a data column** from the Local Study Search Results Page by clicking on any of the column headings once with the **right** mouse button to cause the Data Column Selection Menu to be displayed, as in the following example:



The Local Study Data Column Selection Menu

Check the box next to the column you would like to add, or uncheck the box next to a column you would like to remove.

- You can **reorder** the various data columns that are displayed on the Local Study Search Results Page by clicking on a particular column's heading with the **left** mouse button and dragging the column to the desired location.
- You can **sort** the data on the Local Study Search Results Page by clicking on any of the column headings at the top of the screen except for Image Count.

e. Transferring a Single Study to the Merge PACS Server for Import

If you have the login privileges to import studies from a local source and the feature is enabled for your site, you can send studies one at a time to the Merge PACS Server for import.

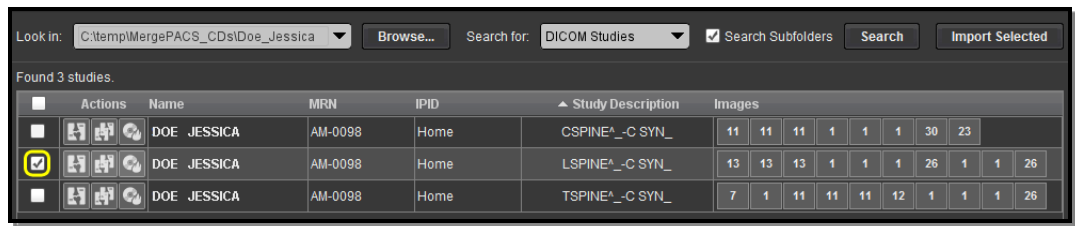
CAUTION: If importing from a CD/DVD, the CD/DVD containing the Study must still be in the CD/DVD drive in order to import the Study, even if it is displayed in the Search Results section.

CAUTION: While you can import additional studies for a patient who already exists on the Merge PACS Server, you cannot import a Study that already exists.

NOTE: You can also transfer multiple studies at once, as described in paragraph 3.6.1.f below.

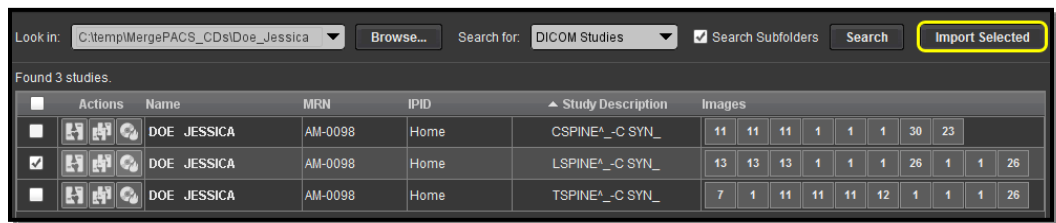
To import a single Study into the Merge PACS Server:

1. Select a Study from the Search Results section of the Local Study screen by clicking the checkbox next to the Study you want to import, as in the following example:



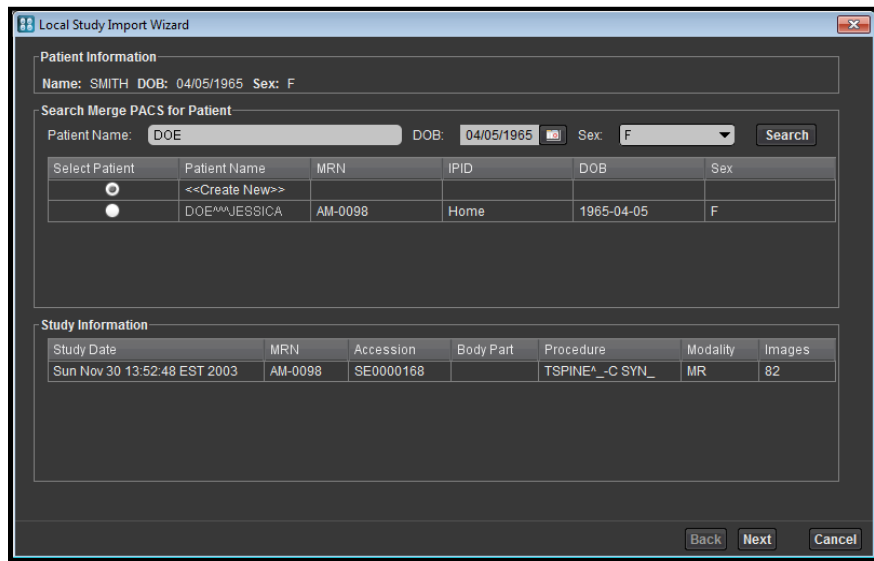
Selecting a Study for Import

- All studies will be selected by default.
 - You can deselect all listed studies by clicking on the checkbox to the left of the **Actions** column.
2. Click the **Import Selected** button, as in the following example:



Import Selected

The **Local Study Import Wizard** dialog is shown in a separate pop-up window, as in the following example:



Local Study Import Wizard – Single Study

The Local Study Import Wizard will automatically search the Merge PACS Server to see if a patient already exists with the same **Name**, **Date of Birth** and **Sex** as the selected Study. If one or more matches are found, they will be listed as in the following example:

Patient Information
Name: SMITH DOB: 04/05/1965 Sex: F

Search Merge PACS for Patient
Patient Name: DOE DOB: 04/05/1965 Sex: F Search

Select Patient	Patient Name	MRN	IPID	DOB	Sex
<input type="radio"/>	<<Create New>>				
<input checked="" type="radio"/>	DOE^^JENNIFER	AM-0098	Home	1965-04-05	F

Existing Patient on the Merge PACS Server

- If no match is found automatically, or if the wrong patient is listed, you can use the query fields at the top of the screen to search for a different patient, as in the following example:

Patient Information
Name: SMITH DOB: 04/05/1965 Sex: F

Search Merge PACS for Patient
Patient Name: doe,jessica DOB: 04/05/1965 Sex: F Search

Select Patient	Patient Name	MRN	IPID	DOB	Sex
<input type="radio"/>	<<Create New>>				
<input checked="" type="radio"/>	DOE^^JESSICA	PID000T1	Home	1965-04-05	F

Searching for a Patient on the Merge PACS Server

- If this patient does not already exist on the Merge PACS Server, leave the default <<Create New>> option selected in the **Select Patient** column; otherwise, select the desired patient from the list by clicking the radio button for that patient in the **Select Patient** column.
- When finished, click on the **Next** button at the bottom of the window.

The **Patient and Study Attributes** screen will be displayed, as in the following example:

Patient and Study Attributes

Last Name: DOE First Name: Jessica Middle Name: Prefix: Suffix:

MRN: AM-0098 IPID: Home Sex: F DOB: 04/05/1965

Accession: 20030609140949 Physician: JONES^DOCTOR Institution: AMICAS General Hospital

Include MRN Prefix "EX" Include Accession Prefix "EX" Ensure Unique Accession

Study Information

Study Date	MRN	Accession	Body Part	Procedure	Modality	Images
Mon Jun 09 14:09:49 EDT 2003	EXAM-0098	EX20030609140949		LSPINE^_-C SYN_	MR	96

Back Next Cancel

Local Study Import Wizard – Patient and Study Attributes

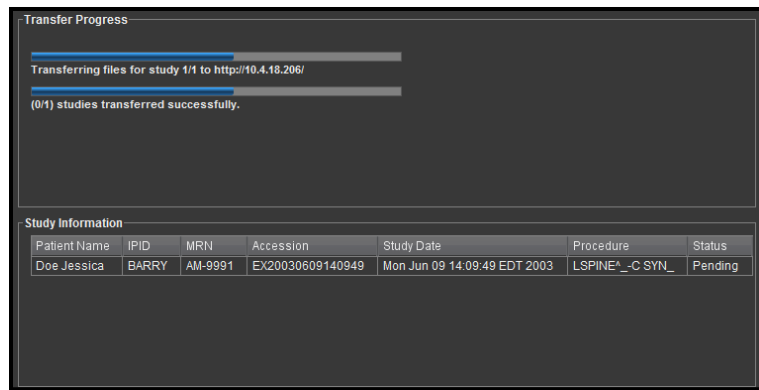
Enter as much information for this patient as possible, keeping the following in mind:

- One or more of the fields will be populated based on the local Study information (if <<Create New>> was selected) or based on the information for this patient already on the Merge PACS Server (if an existing patient was selected).
- If necessary, the various demographic fields should be edited to match your internal records or system.
- If this patient exists on the Merge PACS Server, only the **Physician**, **Institution** and **Accession** fields are editable.
- The **IPID** and **Accession** fields may not be visible, depending on how Merge PACS is configured for your site.
- The following information is required:
 - The **patient name (Last Name + First Name + Middle Name + Prefix + Suffix)** cannot be completely empty and the combined fields cannot exceed 64 characters.
 - **MRN** (excluding prefix) cannot be empty and cannot exceed 64 characters (including prefix).
 - If included, **IPID** cannot be empty.
 - If included, **Accession** (excluding prefix) cannot be empty and cannot exceed 16 characters (including prefix).
 - For a new patient, the **MRN** plus **IPID** (if included) cannot match an existing patient on the Merge PACS Server.
- Depending on how Merge PACS is configured for your site, you may be able to select to include a specific prefix to the beginning of the **MRN** and/or to include a prefix to the beginning of the **Accession Number**. Note the following:
 - The **Include MRN Prefix** option will never be available for patients that already exist on the Merge PACS Server.
 - Your selections will be saved as the defaults for the next time you access the Local Study Import Wizard.
- Depending on how Merge PACS is configured for your site, you may be able to select the **Ensure Unique Accession** option.
 - If this option is selected, Merge PACS will determine the accession number for the imported Study as follows:
 - If the local Study's accession number, with or without prefix, does not match an existing accession number on the Merge PACS Server, that accession number will be used.
 - If the local Study's accession number does match an existing accession number on the Merge PACS Server, Merge PACS will attempt to use the Study's date/time value as the accession number, in the format `yyyymmddhhmmss`.
 - If the accession number based on the Study's date/time already exists on the Merge PACS Server, the first two digits of the year will be replaced with two random uppercase letters until a unique accession number is found.
 - The **Accession** field will no longer be editable.

NOTE: If the **Ensure Unique Accession** option is not available, it will be enabled automatically behind the scenes and the **Accession** field will not be editable.

6. When finished, click on the **Next** button at the bottom of the window.

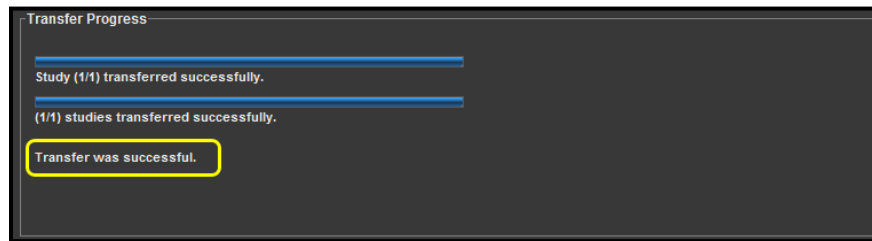
The transfer process will begin and the progress of the transfer will be shown, as in the following example:



Local Study Import Wizard – Transfer Progress

NOTE: The attribute information for the Study, including any modifications made, is shown in the **Study Information** panel at the bottom of the screen.

Once the transfer is complete, a message will be displayed indicating this fact, as in the following example:



Local Study Import Wizard – Transfer Progress

NOTE: If the transfer was not successful, an error message will be shown instead and you can click on the **Back** button at the bottom of the screen to return to the previous screen and fix any problems.

NOTE: A successful transfer of a Study to the Merge PACS Server does not necessarily mean that the Study will be successfully imported. If there is a problem with the Study (e.g., the images match those of a Study with a different accession number already in the system), the Study may be jailed, as described in Chapter 17 below. If you do not see your studies after transferring them to the Merge PACS Server, contact your PACS Administrator to see if the problem can be fixed with the Problem Study Tool (if Merge PACS is configured to run in Standalone Mode) or by reviewing the errors in the Sender queue and dealing with them on a case-by-case basis (if Merge PACS is configured to run in Integrated Mode).

7. Click the **Finish** button at the bottom of the screen to exit the Local Study Import Wizard.

f. Transferring Multiple Studies to the Merge PACS Server for Import

If you have the login privileges to import studies from a local source and the feature is enabled for your site, you can send multiple studies at once to the Merge PACS Server for import.

CAUTION: If importing from a CD, the CD containing the Study must still be in the CD drive in order to import the Study, even if it is displayed in the Search Results section.

CAUTION: While you can import additional studies for a patient who already exists on the Merge PACS Server, you cannot import a Study that already exists.

CAUTION: All selected studies will be imported under the same patient, even if they have different attributes.

To import multiple studies into the Merge PACS Server:

1. Select multiple studies from the Search Results section of the Local Study screen by clicking the checkbox next to each Study you want to import, as in the following example:

Look in: C:\temp\MergePACS_CDs\IDoe_Jessica Browse... Search for: DICOM Studies Search Subfolders Search Import Selected

Found 3 studies.

Actions	Name	MRN	IPID	Study Description	Images
<input checked="" type="checkbox"/>	DOE_JESSICA	AM-0098	Home	CSPINE^_C SYN_	11 11 11 1 1 1 30 23
<input checked="" type="checkbox"/>	DOE_JESSICA	AM-0098	Home	LSPINE^_C SYN_	13 13 13 1 1 1 26 1 1 26
<input checked="" type="checkbox"/>	DOE_JESSICA	AM-0098	Home	TSPINE^_C SYN_	7 1 11 11 11 12 1 1 1 26

Selecting Studies for Import

- All studies will be selected by default.
 - You can select/deselect all listed studies by clicking on the checkbox to the left of the **Actions** column.
2. Click the **Import Selected** button, as in the following example:

Look in: C:\temp\MergePACS_CDs\IDoe_Jessica Browse... Search for: DICOM Studies Search Subfolders Search Import Selected

Found 3 studies.

Actions	Name	MRN	IPID	Study Description	Images
<input checked="" type="checkbox"/>	DOE_JESSICA	AM-0098	Home	CSPINE^_C SYN_	11 11 11 1 1 1 30 23
<input type="checkbox"/>	DOE_JESSICA	AM-0098	Home	LSPINE^_C SYN_	13 13 13 1 1 1 26 1 1 26
<input checked="" type="checkbox"/>	DOE_JESSICA	AM-0098	Home	TSPINE^_C SYN_	7 1 11 11 11 12 1 1 1 26

Import Selected

The **Local Study Import Wizard** dialog is shown in a separate pop-up window, as in the following example:

Local Study Import Wizard

Patient Information
Name: SMITH DOB: 04/05/1965 Sex: F

Search Merge PACS for Patient
Patient Name: DOE DOB: 04/05/1965 Sex: F Search

Select Patient	Patient Name	MRN	IPID	DOB	Sex
<input type="radio"/>	<<Create New>>				
<input checked="" type="radio"/>	DOE^^JESSICA	AM-0098	Home	1965-04-05	F

Study Information

Study Date	MRN	Accession	Body Part	Procedure	Modality	Images
Mon Jun 09 13:31:34 EDT 2003	AM-0098	SE0000166		CSPINE^_-C SYN_	MR	89
Sun Nov 30 13:52:48 EST 2003	AM-0098	SE0000168		TSPINE^_-C SYN_	MR	82

Back Next Cancel

Local Study Import Wizard – Multiple Studies

The **Local Study Import Wizard** will automatically search the Merge PACS Server to see if a patient already exists with the same **Name, Date of Birth** and **Sex** as the first selected Study (i.e., the Study highest in the Search Results section). If a match is found, it will be listed as in the following example:

Local Study Import Wizard

Patient Information
Name: SMITH DOB: 04/05/1965 Sex: F

Search Merge PACS for Patient
Patient Name: DOE DOB: 04/05/1965 Sex: F Search

Select Patient	Patient Name	MRN	IPID	DOB	Sex
<input type="radio"/>	<<Create New>>				
<input checked="" type="radio"/>	DOE^^JENNIFER	AM-0098	Home	1965-04-05	F

Existing Patient on the Merge PACS Server

- If no match is found automatically, or if the wrong patient is listed, you can use the query fields at the top of the screen to search for a different patient, as in the following example:

Local Study Import Wizard

Patient Information
Name: SMITH DOB: 04/05/1965 Sex: F

Search Merge PACS for Patient
Patient Name: doe,jessica DOB: 04/05/1965 Sex: F Search

Select Patient	Patient Name	MRN	IPID	DOB	Sex
<input type="radio"/>	<<Create New>>				
<input checked="" type="radio"/>	DOE^^JESSICA	PID000T1	Home	1965-04-05	F

Searching for a Patient on the Merge PACS Server

4. If none of the patients already exist on the Merge PACS Server, leave the default **<<Create New>>** option selected in the **Select Patient** column; otherwise, select the desired patient from the list by clicking the radio button for that patient in the **Select Patient** column.
5. When finished, click on the **Next** button at the bottom of the window.

The **Patient and Study Attributes** screen will be displayed, as in the following example:

Study Information						
Study Date	MRN	Accession	Body Part	Procedure	Modality	Images
Sun Nov 30 13:52:48 EST 2003	AM-0098	EX20031130135248		TSPINE*_C SYN_	MR	82
Mon Jun 09 14:09:49 EDT 2003	AM-0098	EX20030609140949		LSPINE*_C SYN_	MR	96

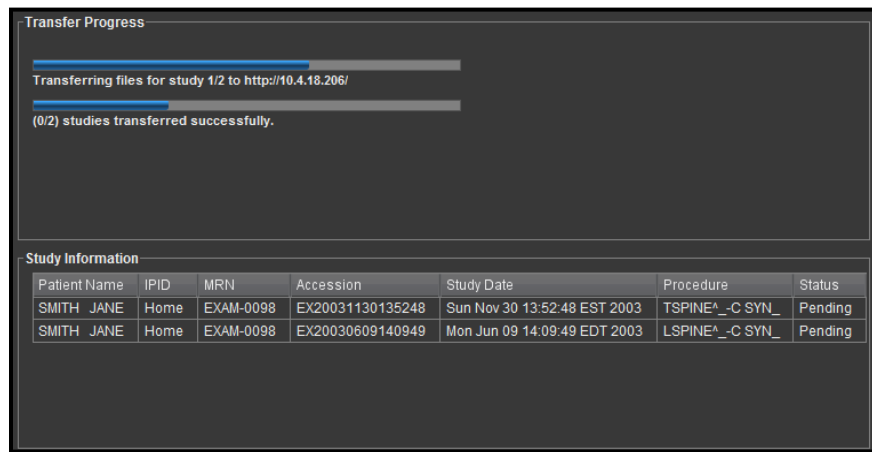
Local Study Import Wizard – Patient Attributes

Enter as much information for this patient as possible, keeping the following in mind:

- One or more of the fields will be populated based on the local Study information (if **<<Create New>>** was selected) or based on the information for this patient already on the Merge PACS Server (if an existing patient was selected).
- If you are creating a new patient, the various demographic fields should be edited to match your internal records or system (none of the fields will be editable if the patient already exists on the Merge PACS Server).
- The **IPID** field may not be visible, depending on how Merge PACS is configured for your site.
- The following information is required:
 - The **patient name (Last Name + First Name + Middle Name + Prefix + Suffix)** cannot be completely empty and the combined fields cannot exceed 64 characters.
 - **MRN** (excluding prefix) cannot be empty and cannot exceed 64 characters (including prefix).
 - If included, **IPID** cannot be empty.
 - For a new patient, the **MRN plus IPID** (if included) cannot match an existing patient on the Merge PACS Server.

- Depending on how Merge PACS is configured for your site, you may be able to select to include a specific prefix to the beginning of the **MRN** and/or to include a prefix to the beginning of the **Accession Number**. Note the following:
 - The **Include MRN Prefix** option will never be available for patients that already exist on the Merge PACS Server.
 - Your selections will be saved as the defaults for the next time you access the Local Study Import Wizard.
 - Merge PACS will automatically determine the accession number for the imported Study as follows:
 - If the local Study's accession number, with or without prefix, does not match an existing accession number on the Merge PACS Server, that accession number will be used.
 - If the local Study's accession number does match an existing accession number on the Merge PACS Server, Merge PACS will attempt to use the Study's date/time value as the accession number, in the format `yyyymmddhhmmss`.
 - If the accession number based on the Study's date/time already exists on the Merge PACS Server, the first two digits of the year will be replaced with two random uppercase letters until a unique accession number is found.
6. When finished, click on the **Next** button at the bottom of the window.

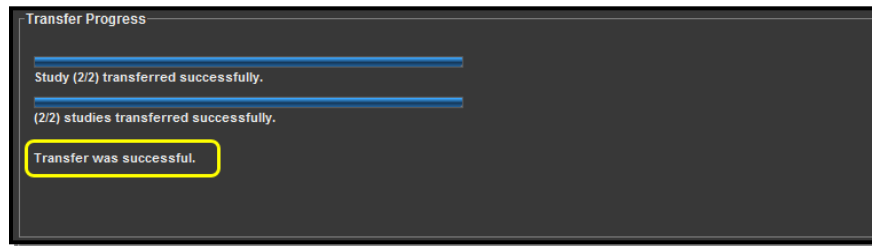
The Study import process will begin and the transfer progress will be shown, as in the following example:



Local Study Import Wizard – Transfer Progress

NOTE: The attribute information for the Study, including any modifications made, is shown in the **Study Information** panel at the bottom of the screen.

Once the transfer is complete, a message will be displayed indicating this fact, as in the following example:



Local Study Import Wizard – Transfer Progress

NOTE: If the transfer was not successful for one of the studies, you will be given the option to abort or proceed with the other studies. If you choose to proceed, you can then click on the **Back** button at the bottom of the screen after the other studies have successfully been transferred to return to the previous screen and fix any problems with the one Study.

NOTE: A successful transfer of a Study to the Merge PACS Server does not necessarily mean that the Study will be successfully imported. If there is a problem with the Study (e.g., the images match those of a Study with a different accession number already in the system), the Study will be jailed, as described in Chapter 17 below

7. Click the **Finish** button at the bottom of the screen to exit the Local Study Import Wizard.

3.6.2. Importing Non-DICOM Images

The Local Study page allows you to search for non-DICOM images that can be imported into the Merge PACS Server as a new Study. Note, however, that it is important to analyze your workflow and assess the risk of having multiple patient photos on a given piece of media.

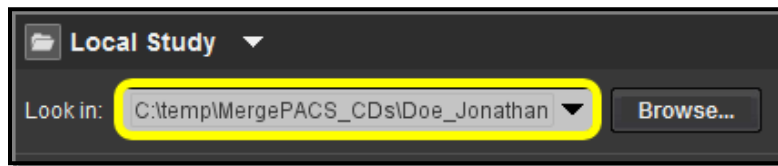
Keep in mind the following:

- Placing non-dicom photos or documents of multiple patients on a single piece of media is inherently risky due to the lack of integral demographic data within the images.
- While naming of files on the source system could help, it is typically not practical with most cameras. In the absence of the ability to firmly name the images, it is recommended that your image capture protocol reduce the likelihood of mismatches. While there are many possible approaches, the following two approaches are commonly used:
 - Have an printed tag in the field of view of the photo. This would contain the demographics. This is often possible with external images.
 - Capture photos of the name plate tag separately before and after the sequence for the patient. For example image 6032.jpg would be the nameplate, images 6033-6040 would be patient images and image 6041 would be another nameplate. Then during the import process you would verify the nameplate images versus the demographics being added to the image.

a. Searching for Non-DICOM Images

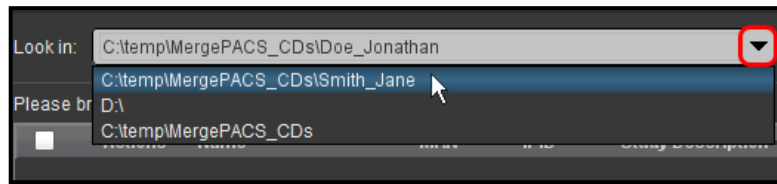
There are two ways to search for non-DICOM images from the Local Study screen:

- The **Look in Folder** option allows you to specify the location where the desired images are stored:
 - If you know the exact name of the folder, you can enter it directly in the **Look in** field, as in the following example:



Entering the Specific Folder

You can also select from a list of recently opened folders that contained studies from the drop-down **Look in** menu, as in the following example:



Listing for Specified Study

- From the main Local Study screen, make sure that the **Non-DICOM Images** option is selected from the drop-down **Search for** menu, as in the following example:



Selecting What to Search For

The following non-DICOM image formats can be searched for (all other types will be ignored):

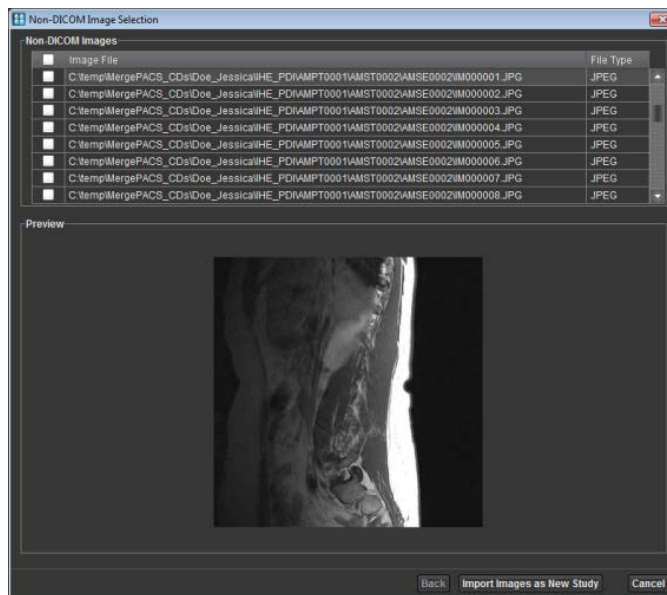
- **.jpg** • **.jpeg** • **.jp2** • **.jpe** • **.jfif** • **.jif**
- If you want to search for all images contained in subfolders within the main folder entered in the **Look In** field, click the **Search Subfolders** option, as in the following example:



Search Subfolders

- Click the **Search** button to start the search.

*The eligible non-DICOM images in the selected folder(s) are shown in a pop-up **Non-DICOM Image Selection** dialog, as in the following example:*



Non-DICOM Image Selection

Proceed to subsection 3.6.2.b below.

- The **Browse to Folder** option allows you to navigate to the location where the desired Study is stored:
 - From the main Local Study screen, make sure that the **Non-DICOM Images** option is selected from the drop-down **Search for** menu, as in the following example:



Search For DICOM Studies

The following non-DICOM image formats can be searched for (all other types will be ignored):

- .jpg
- .jpeg
- .jp2
- .jpe
- .jfif
- .jif

- If you want to search for all images contained in subfolders within the main folder entered in the **Look In** field, click the **Search Subfolders** option, as in the following example:



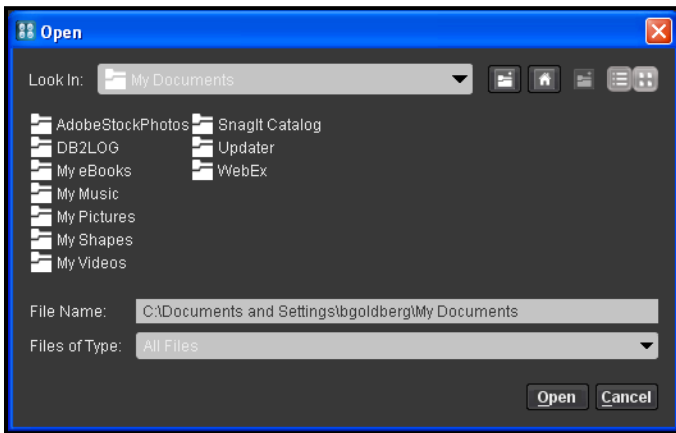
Search Subfolders

- Click on the **Browse** button, as shown below:



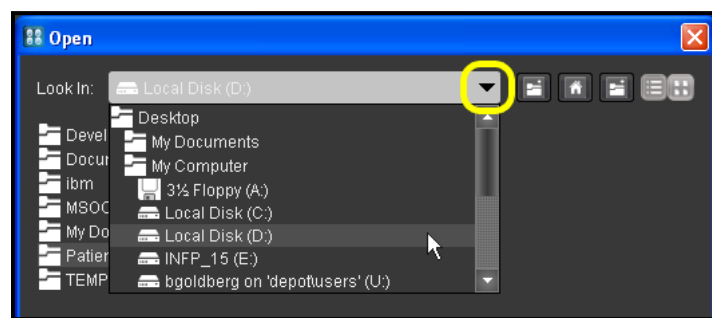
The Browse Button

- This will cause the File Browser to be displayed in a separate pop-up window, as in the following example:



The File Browser Window

- From the drop-down **Look In** menu, select the drive where the desired images are located, as in the following example:



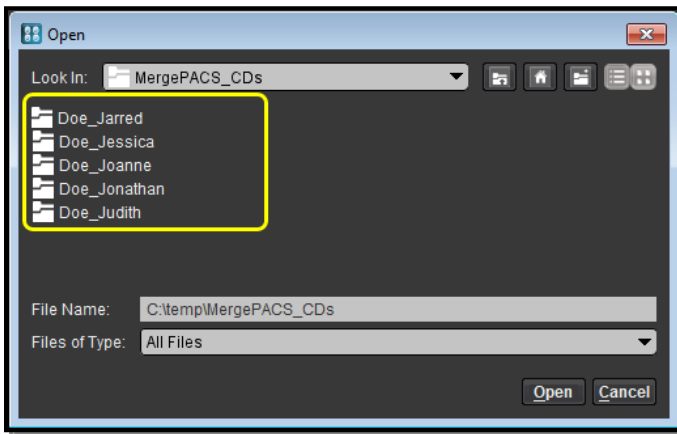
Selecting a Drive

- Once you selected a drive, the folders on that drive will be displayed in the main portion of the File Browser window, as in the following example:



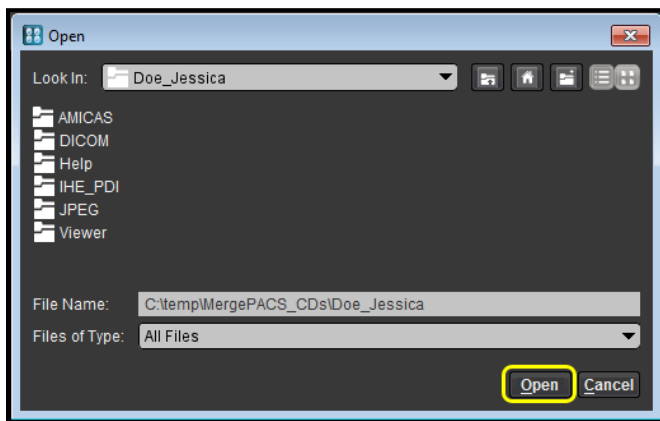
Folders on the Selected Drive

- Double-click on any folder to display the subfolders within that folder, as in the following example:



SubFolders on the Selected Drive

- When you are inside the folder containing the desired non-DICOM images, click the **Open** button, as in the following example:

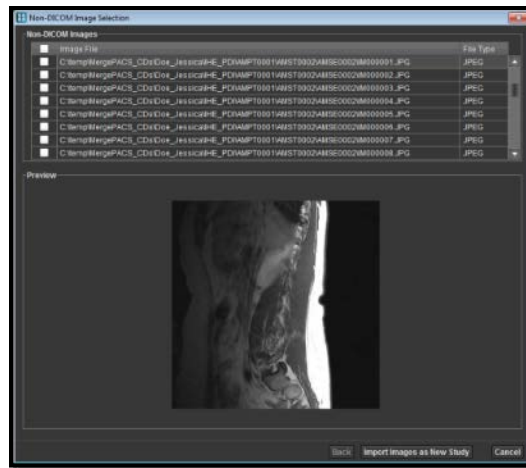


Opening the Selected Study

NOTE: If you selected the **Search Subfolders** option before browsing, you only need to open the top-level folder containing the subfolder(s) where the non-DICOM images reside.

NOTE: You can also enter a directory name manually in the **File Name** field. If entering a directory network drive, however, the drive must be to a mapped letter drive.

*The eligible non-DICOM images in the selected folder(s) are shown in a pop-up **Non-DICOM Image Selection** dialog, as in the following example:*

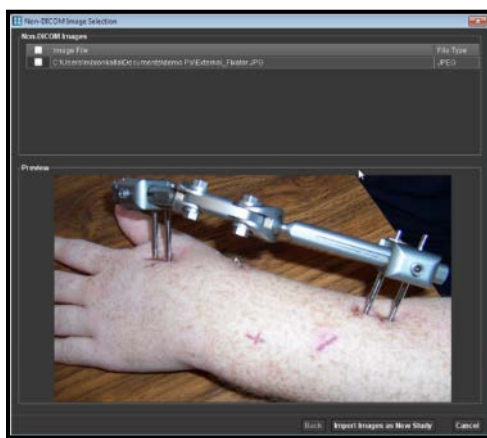


Non-DICOM Image Selection

Proceed to subsection 3.6.2.b below.

b. Non-DICOM Image Selection

The **Non-DICOM Image Selection** dialog displays all eligible non-DICOM images located in the specified folder(s), as in the following example:



Non-DICOM Image Selection

The **Preview** pane at the bottom of the dialog will show a preview of the image currently highlighted in the list of images.

- If an image is larger than the preview area, it will be scaled down to fit (with the aspect ratio of the image being preserved).
- Image previews are not available for JPEG 2000 (.jp2) files, but the images can still be imported.
- If an image is identified as invalid for any reason, a preview will not be available and a message will be shown in the Preview pane stating that the image cannot be imported.

Select an image for previewing by either clicking on it with your mouse or using the keyboard arrow keys to move to it.

c. Transferring Non-DICOM Images to the Merge PACS Server

If you have the login privileges to import studies from a local source and the feature is enabled for your site, you can send a group of non-DICOM images to the Merge PACS Server for import as a new Study.

CAUTION: If importing from a CD, the CD containing the Study must still be in the CD drive in order to import the Study, even if it is displayed in the Search Results section.

To transfer non-DICOM images to the Merge PACS Server:

1. Select one or more images for transferring to the Merge PACS Server by either clicking the checkbox next to each image or by highlighting the image and pressing the keyboard SPACE bar.
2. Once you have selected all the images you wish to import, click the **Import Images as New Study** button at the bottom of the dialog.

The system will convert the selected images to .dcm format (SOPClassUID = "Secondary Capture", Modality = "OT", with each image in its own series) and store them in a new study that is created in a temporary location on the workstation's hard drive. When the

conversion process is complete, the **Local Study Import Wizard** will be displayed, as in the following example:

Local Study Import Wizard – Non-DICOM Images

- To import the new Study under an existing patient on the Merge PACS Server, use the query fields at the top of the screen to locate the desired patient and then click on the radio button for that patient in the search results section, as in the following example:

Local Study Import Wizard – Selecting an Existing patient

- To create a new patient on the Merge PACS Server to import the new Study under, leave the search fields blank and select the **<<Create New>>** radio button.

5. When finished, click on the **Next** button at the bottom of the window.

The **Patient and Study Attributes** screen will be displayed, as in the following example:

Patient and Study Attributes

Last Name: First Name: Middle Name: Prefix: Suffix:

MRN: IPID: Sex: DOB:

Accession: Physician: Institution:

Include MRN Prefix "EX" Include Accession Prefix "EX" Ensure Unique Accession

Study Information

Study Date	MRN	Accession	Body Part	Procedure	Modality	Images
Mon Jun 09 14:09:49 EDT 2003	EXAM-0098	EX20030609140949		LSPINE^_C SYN_	MR	96

Back Next Cancel

Local Study Import Wizard – Patient and Study Attributes

Enter as much information for this patient as possible, keeping the following in mind:

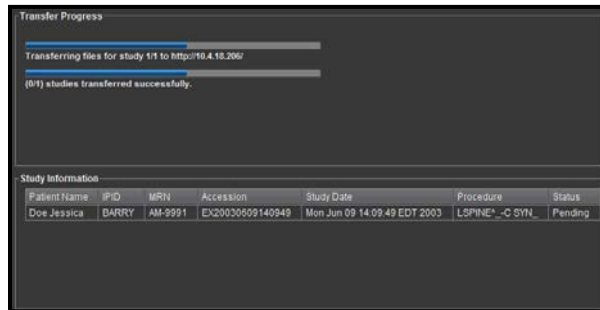
- One or more of the fields will be populated based on the local Study information (if <<Create New>> was selected) or based on the information for this patient already on the Merge PACS Server (if an existing patient was selected).
- If necessary, the various demographic fields should be edited to match your internal records or system.
- If this patient exists on the Merge PACS Server, only the **Physician**, **Institution** and **Accession** fields are editable.
- The **IPID** and **Accession** fields may not be visible, depending on how Merge PACS is configured for your site.
- The following information is required:
 - The **patient name (Last Name + First Name + Middle Name + Prefix + Suffix)** cannot be completely empty and the combined fields cannot exceed 64 characters.
 - **MRN** (excluding prefix) cannot be empty and cannot exceed 64 characters (including prefix).
 - If included, **IPID** cannot be empty.
 - If included, **Accession** (excluding prefix) cannot be empty and cannot exceed 16 characters (including prefix).
 - For a new patient, the **MRN** plus **IPID** (if included) cannot match an existing patient on the Merge PACS Server.

- Depending on how Merge PACS is configured for your site, you may be able to select to include a specific prefix to the beginning of the **MRN** and/or to include a prefix to the beginning of the **Accession Number**. Note the following:
 - The **Include MRN Prefix** option will never be available for patients that already exist on the Merge PACS Server.
 - Your selections will be saved as the defaults for the next time you access the Local Study Import Wizard.
- Depending on how Merge PACS is configured for your site, you may be able to select the **Ensure Unique Accession** option.
 - If this option is selected, Merge PACS will create a unique accession number for the new Study and the **Accession** field will not be editable.
 - If this option is not selected, you will need to enter information in the **Accession** field manually.

NOTE: If the **Ensure Unique Accession** option is not available, it will be enabled automatically behind the scenes and the **Accession** field will not be editable.

6. When finished, click on the **Next** button at the bottom of the window.

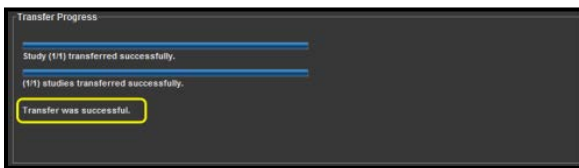
The Study import process will begin and the transfer progress will be shown, as in the following example:



Local Study Import Wizard – Transfer Progress

NOTE: The attribute information for the Study, including any modifications made, is shown in the **Study Information** panel at the bottom of the screen.

Once the transfer is complete, a message will be displayed indicating this fact, as in the following example:

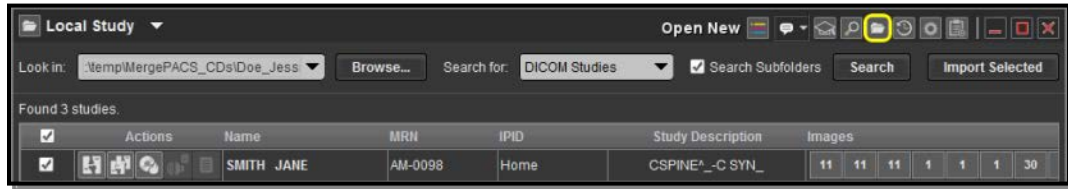


Local Study Import Wizard – Transfer Progress

7. Click the **Finish** button at the bottom of the screen to exit the Local Study Import Wizard.

3.6.3. Opening Multiple Local Study Windows

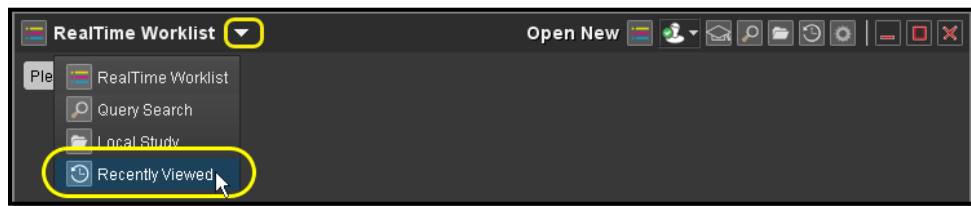
If desired, you can open additional Local Study screens in their own separate windows. To do so, click on the **Open New Local Study** icon at the top right of the Workstation Browser, as shown below:



Opening a Local Study Query Page in a New Window

3.7. Recently Viewed Studies

The Recently Viewed Study feature allows you to quickly access a list of studies that you have recently viewed. It is accessible from the Merge PACS Browser by selecting **Recently Viewed** from the drop-down menu at the top of the Workstation Browser, as in the following example:



Accessing Recently Viewed Studies

The list of recently viewed studies will then be displayed, as in the following example:

The screenshot shows the 'Recently Viewed' window. It displays a table with columns for Actions, Name, MRN, DOB, Sex, Date/Time, Description, and Viewed. The table contains 8 rows of study data.

Actions	Name	MRN	DOB	Sex	Date/Time	Description	Viewed
[Icons]	DOE, JONATHAN	204507	1935-01-29	M	2000-08-11/16:55:05	LIVER	2009-08-27/16:55:04
[Icons]	DOE, JOSEPH	000109949	1923-10-07	M	2001-04-11/07:02:14		2009-08-27/16:45:00
[Icons]	DOE, JARED	12345678901...	1991-01-01	M	1994-10-09/08:57:00	SKULL LATERAL	2009-08-27/16:42:58
[Icons]	DOE, JOANNE	0549161		F	1999-01-14/17:02:53		2009-08-27/16:40:09
[Icons]	DOE, JOSHUA	P-650363290...	1966-07-07	O	1954-08-16/11:51:55	Study description pre...	2009-08-27/16:32:32
[Icons]	DOE, JENNIFER	1		O	1994-06-14/18:15:37	CHEST AP	2009-08-27/16:30:22
[Icons]	DOE, JOLENE	000271518	1961-04-15	F	2007-02-22/11:05:10	ESOPHAGRAM	2009-08-27/16:20:04
[Icons]	DOE, JEZEBEL	3310276		F	1999-06-22/23:13:46	R/O APPENDICITIS	2009-08-27/16:10:14
[Icons]	DOE, JESSICA	3660358	1971-08-13	F	1999-09-28/09:36:06	260A2	2009-08-27/16:08:13

List of Recently Viewed Studies

Note that each patient may have one or more Series listed per Study, and may also have more than one Study listed.

Each entry on the Recently Viewed Page contains a set of **action icons** on the left that you can click on to perform different tasks, and **data columns** on the right that display information about each Study, as shown in the following example:

Action Icons		Data Columns					
Actions	Name	MRN	DOB	Sex	Date/Time	Description	Viewed
	DOE, JONATHAN	204507	1935-01-29	M	2000-08-11/16:55:05	LIVER	2009-08-27/16:55:04
	DOE, JOSEPH	000109949	1923-10-07	M	2001-04-11/07:02:14		2009-08-27/16:45:00
	DOE, JARED	12345678901...	1991-01-01	M	1994-10-09/08:57:00	SKULL LATERAL	2009-08-27/16:42:56
	DOE, JOANNE	0549161		F	1999-01-14/17:02:53		2009-08-27/16:40:09

Action Icons and Data Columns

3.7.1. Action Icons

The actual action icons available on the Recently Viewed Page will depend on the Study, how your system is configured and your login privileges. For a complete list of possible action icons, refer to Section 3.9 below.

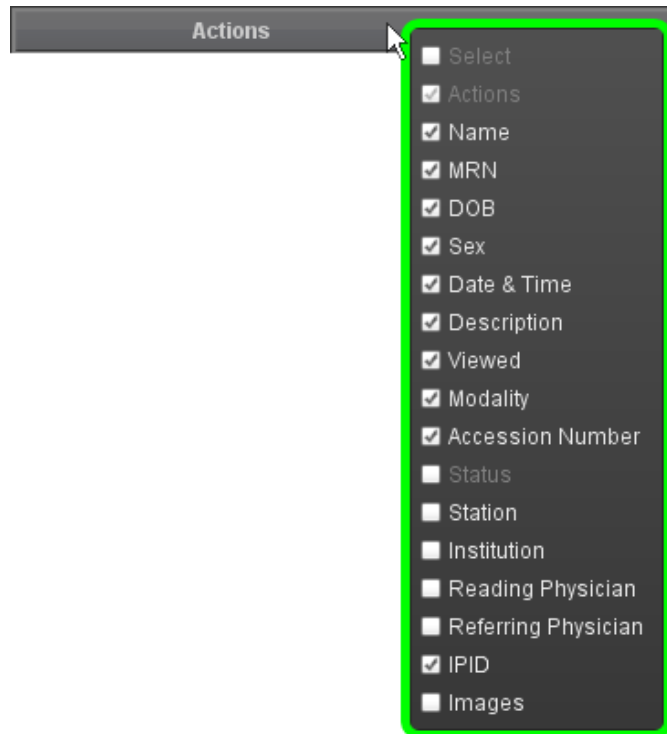
3.7.2. Data Columns

The following general data columns can be displayed on the Recently Viewed Page:

- Patient Name
- Date of Birth
- Study Description
- Status
- Reading Physician
- Viewed
- Medical Record Number (MRN)
- Sex
- Modality
- Station Name
- Referring Physician
- Issuer of Patient ID (IPID)
- Study Date/Time
- Accession Number
- Institution
- Image Count per Series

a. Selecting the Data Columns to Display

To add or remove a data column from the Recently Viewed Page, **right-click** on any of the column headings to cause the **Data Column Selection Menu** to be displayed, as in the following example:



The Recently Viewed Column Selection Menu

Check the box next to the column you would like to add, or uncheck the box next to a column you would like to remove.

b. Reordering Data Columns

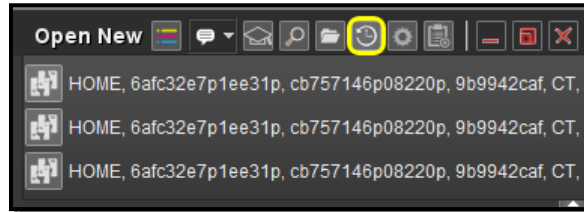
You can change the order in which the various data columns are displayed on the Recently Viewed Page by clicking on a particular column's heading with the **left** mouse button and dragging the column to the desired location.

c. Sorting Recently Viewed Studies

You can sort the data on the Recently Viewed Page by clicking on any of the column headings at the top of the screen except for Image Count.

3.7.3. Quickly Selecting a Recently Viewed Study

In addition to the Recently Viewed Page described above, you can also quickly select a recently viewed Study via the **Recently Viewed Study** icon at the top right of the Workstation Browser. Clicking on this icon will cause a drop-down menu to appear that will contain up to the 20 most recently viewed studies, as in the following example:



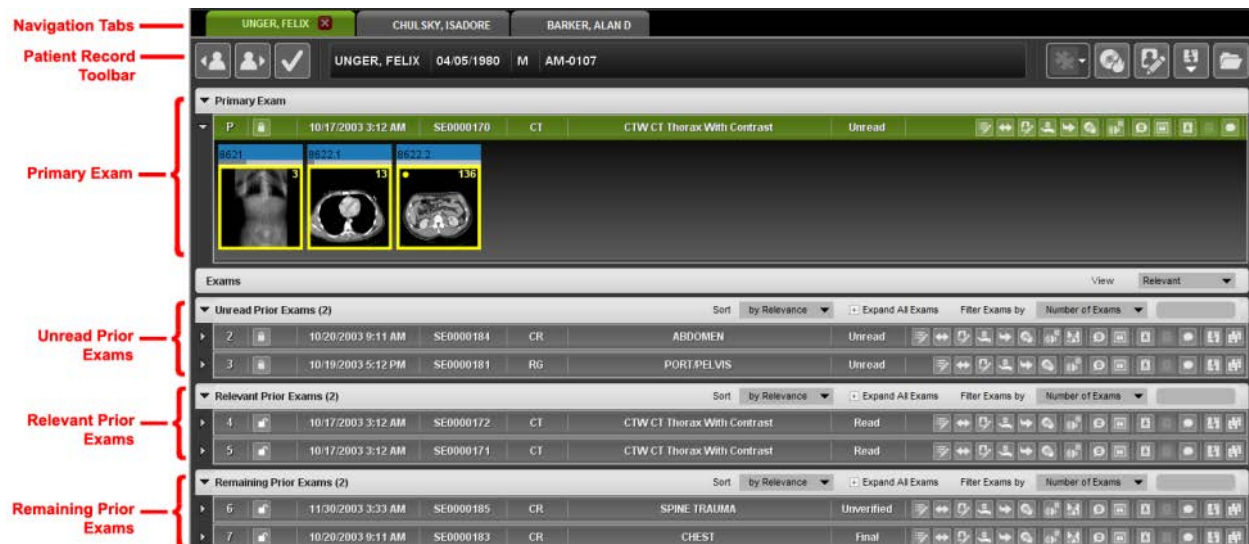
Selecting from a List of Recently Viewed Studies

Clicking on a Study in the menu will open the Study in a Secondary Merge PACS Viewer window.

3.8. Patient Record

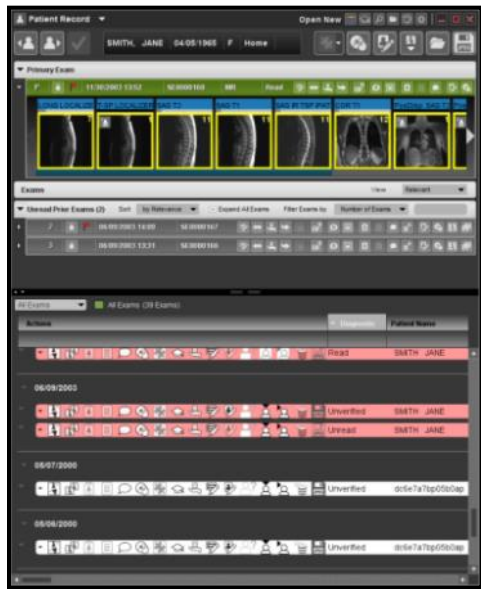
The Patient Record displays Series Navigation thumbnails for that Study as well as any prior studies for the same patient. These Series Navigation thumbnails can be used to open the Study into the Merge PACS Viewer or into a separate pop-up Series Viewport window.

Once a Study has been launched in the Merge PACS Viewer, whether from RealTime Study List, RealTime Worklist or the Query Page, the Patient Record for that patient will automatically be displayed at the top of the Workstation Browser, as shown in the following example:

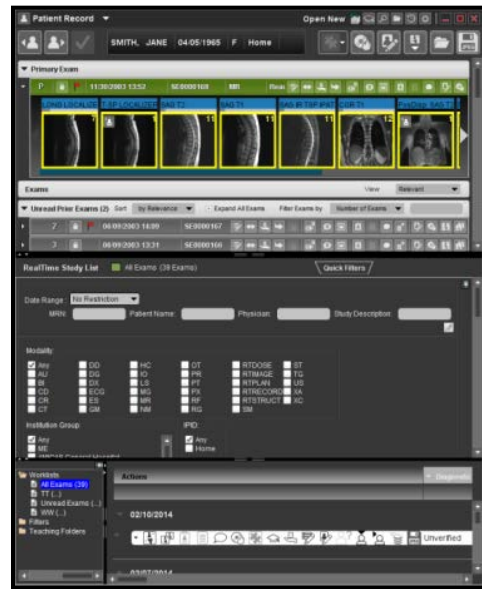


The Patient Record

If you use the Windows docking feature to dock the Patient Record to the left or right half of a monitor (*i.e.*, by clicking on the page's titlebar and dragging it all the way to the left or right of the screen), the Patient Record will be displayed similar to one of following examples, depending on whether you have RealTime Worklist or Real Time Study List enabled:



Patient Record with Half Screen Docking (RTWL)



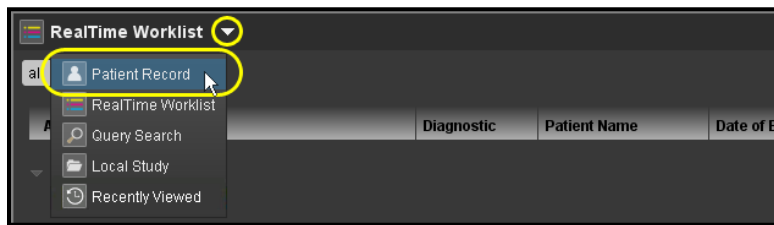
Patient Record with Half Screen Docking (RTSL)

The Patient Record has the following sections:

Section	Description
Navigation Tabs	Allows you to navigate between the Study open in the Primary Viewer and those, if any, open in one or more Secondary Viewers. Note that these tabs will only be displayed if there is a Study currently open in a Secondary Viewer.
Patient Record Toolbar	Displays information about this patient, as well as tools that apply to that patient's studies.
Primary Exam	Displays information about the Study currently being viewed in the Merge PACS Viewer for this patient, as well as tools that apply to that Study.
Unread Prior Exams	Displays information about all prior studies for this patient that have an Unread status (whether relevant or not), as well as tools that apply to those studies.
Relevant Prior Exams	Displays information about all relevant prior studies for this patient (determined based on body part and, if applicable, the Anatomical Body Part mapping rules defined for your system) that have a status other than Unread, as well as tools that apply to those studies.
Remaining Prior Exams	Displays information about all non-relevant prior studies for this patient that have a status other than Unread, as well as tools that apply to those studies.

- NOTE:** The various **Prior Exam** sections will only be displayed if there actually are any unread, relevant and/or remaining (e.g., non-relevant) prior exams for the primary Study.
- NOTE:** If the **Consider All Unverified as Unread Studies** user preference has been selected, as described in Chapter 24 below, the “Unread Prior Exams” section will include both Unread and Unverified prior studies.
- NOTE:** By default, the Prior Exams section is divided up into separate sections (Unread Prior Exams, Relevant Prior Exams and Remaining Prior Exams). However, this can be changed to display all prior exams in a single section, as described in subsection 3.8.8 below.
- NOTE:** If Merge PACS is configured with an extended query node, additional prior exams may be displayed in the Patient Record that do not appear within worklists.
- NOTE:** If a prior exam has the same accession number as the primary exam, it will be listed as part of the primary exam instead of as a separate prior exam.
- NOTE:** The worklists displayed on the bottom part of the Patient Records are independent, meaning that any modification on a worklist will not affect other worklists on other Patient Records. When closing multiple Patient Records, the worklist on the last Patient Record will be selected as the main worklist.

Once a Study has been launched in the Merge PACS Viewer, you can also access the Patient Record by selecting **Patient Record** from the drop-down menu at the top of the Workstation Browser, as in the following example:



Accessing Patient Record

3.8.1. Patient Record Navigation Tabs

As mentioned in subsections 3.3.4, 3.5.4 and 3.6.1.c, above, after opening a primary Study within the Merge PACS Viewer you can choose to view additional studies within separate “Secondary Viewer” windows. Once you have opened a Study within the Secondary Viewer, the Patient Record will display a separate navigation tab at the top of the screen for each open Study, as in the following example:



Multiple Study Tabs

- Clicking on a tab will cause the Viewer window for the Study associated with that tab to be brought forward to the front of the other Viewer windows.
- The tab for the Study currently being viewed will be highlighted in green.

NOTE: This assumes that you are viewing the Study that was either last selected (*i.e.*, from a worklist, the Query Page or Local Study Open) or whose navigation tab you most recently clicked on. If you manually bring another Viewer window forward (*e.g.*, by clicking on the window with your mouse or pressing **Alt+Tab**), the highlighting of the navigation tabs will not automatically be updated to match. If this happens, clicking on the appropriate navigation tab will resynchronize the highlighting with the Study.



If your system is configured for integration with one or more third-party applications, such as PowerScribe, the navigation tab for the Study that is currently synchronized with the third-party applications will contain an integration icon.

- Clicking on the red **[X]** on the highlighted tab will close the Viewer window associated with the tab.

3.8.2. Patient Record Toolbar

The Patient Record Toolbar is located at the top of the Patient Record and displays information about the patient whose studies are currently open as well as action icons that apply to that patient's studies, as shown in the following example:



Patient Record Toolbar




a. Patient Information

The center section of the Patient Record Toolbar displays the following information about the patient being viewed:

- **Patient Name**
- **Patient Date of Birth**
- **Patient Sex**
- **Issuer of Patient ID (IPID)**
- **Patient Medical Record Number (MRN)**

b. Available Action Icons

The left and right sides of the Patient Record Toolbar display the available action icons that apply to the Patient Record. Note that the actual action icons that appear will depend on your login privileges.

Tool	Name	General Description
	Open Previous Study	Open the previous candidate Study on the applicable worklist.
	Open Next Study	Open the next candidate Study on the applicable worklist.
	Mark Study Read	Allows you to open the next candidate Study and mark the current Study as "Read" (this button is only available if the status of the current Study is "Unread" and will).




NOTE: A "candidate" Study is one that has viewable images, is not currently hidden (either by itself, as part of a hidden status group or as part of a hidden date group, but not just when within a hidden worklist block) and is neither locked nor reserved by another user.


Tool	Name	General Description
------	------	---------------------

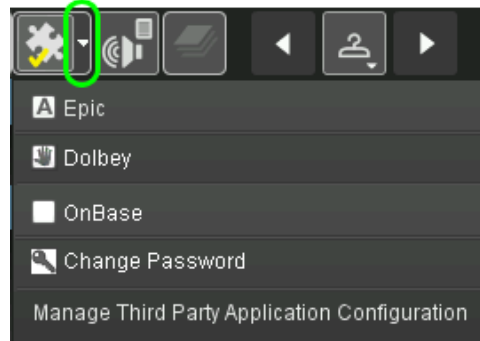
NOTE: What constitutes the “next” Study is controlled by the **Get Next Study By Precedence** and **Load Next Study Based on Acuity Score** user preferences, as described in subsection 24.1.3 below.

NOTE: If the optional **Merge RadStream** component is enabled, **Load Next Study Based on Acuity Score** is selected as a user preference and **Get Next Study By Precedence** is set to **None**, the **Open Previous Study** button will not be displayed and both the **Open Next Study** and **Mark Study Read** buttons will be displayed with red borders.

NOTE: The **Mark Study Read** button will be only be displayed if the status of the current Study is “Unread.”

	Convey Result	If optional RadStream component has been enabled for your system, this sets the communication dimension status of the selected Study to Convey Results (or the equivalent status used by your site).
	Talk to MD	If optional RadStream component has been enabled for your system, this sets the connection dimension status of the selected Study to Talk to MD (or the equivalent status used by your site).
	3rd-party App Sync	<p>If your system has been configured for integration with one or more third-party applications (e.g., for dictation, report, document management, etc.), the 3rd-party Application Synchronization button will allow you to synchronize the application(s) with the selected Study.</p> <p>Clicking this button will synchronize the Study with all applications, except those you have specified should not be synched, as described below.</p> <p>For additional information on using the 3rd-party Application Synchronization feature, refer to Note: below and the user documentation specific to the third-party application being used.</p>






Tool	Name	General Description
	3rd-party App Sync Menu	This allows you to define whether and how each application should be synched by clicking on the triangle to the right of the button and then clicking on the desired application(s) from the drop-down menu, as in the following example:



The 3rd-party Application Synchronization Menu

In addition, this allows you to change your user name and password for integration with PowerScribe360 or Epic Hyperspace and configure the integration between Merge PACS and third-party applications.

For additional information on using the 3rd-party Application Synchronization Menu, refer to Note: below.

	Burn CD/DVD	<p>Add the selected Study (together with any priors) to the Burn CD/DVD dialog's Study List. Note that multiple studies from multiple patients can be added to the same Burn CD/DVD Study List.</p> <p>For details on burning patient images onto a CD/DVD, see Chapter 13 below.</p>
	Patient Demographics	<p>Launch the Patient Demographics window in a separate pop-up window that allows you to view and edit patient demographic information for the selected patient.</p> <p>For additional information on viewing and editing patient demographics, refer to Chapter 18 below.</p>
	Import from DICOM Device	<p>Request images from a separate DICOM Archive, if available.</p> <p>For details on importing images from a DICOM device, see Chapter 15 below.</p>
	Import Foreign Studies	<p>Open additional studies for this or other patients into the Patient Dashboard.</p> <p>For details on importing foreign studies, see subsection 3.8.9 below.</p>
	Save Series	<p>Save images from one or more Series for this Study in a variety of available image formats for inclusion in a document or an e-mail message.</p> <p>For more information on saving a Series, refer to subsection 4.7.1 below.</p>

3.8.3. Primary Exam Toolbar

The Primary Exam Toolbar is located at the top of the Primary Exam section and displays information about the Study currently being viewed in the Merge PACS Viewer as well as action icons that apply to that Study, as in the following example:



Primary Exam Toolbar

a. Exam Information

The center section of the Primary Exam Toolbar displays the following information about the exam:

- Study Exam Date/Time
- Accession Number
- Modality
- Diagnostic Status
- Study Description

b. Available Icons

The far left side of the Primary Exam Toolbar may display one or more of the following action icons:

Tool	Name	General Description
	Lock/Unlock Exam	Indicates whether the primary exam is currently locked or unlocked. Clicking on the icon will toggle between the locked and unlocked state.
	Warning/Comments	<p>Launch the Comment Viewer for the selected Study in a separate pop-up window to view system generated warnings and/or comments. Note that the appearance of the flag icon will change as follows:</p> <ul style="list-style-type: none"> The Study has one or more jailed images (Standalone mode only). The Study has no jailed images but the most recent comment has either been manually flagged by the commenter or was entered at the ER WorkPanel. <p>Hovering your mouse over this icon will display the text of the most recent warning or comment as a pop-up tool tip.</p> <p>For details on using the Comments Viewer, refer to Chapter 5 below.</p> <p>For details on viewing jailed images, refer to Chapter 17 below.</p>

If Merge PACS is configured to retrieve studies, the center of the Primary Exam Toolbar will include the **Availability Status** indicator for the Study, as in the following example:



Primary Exam Toolbar

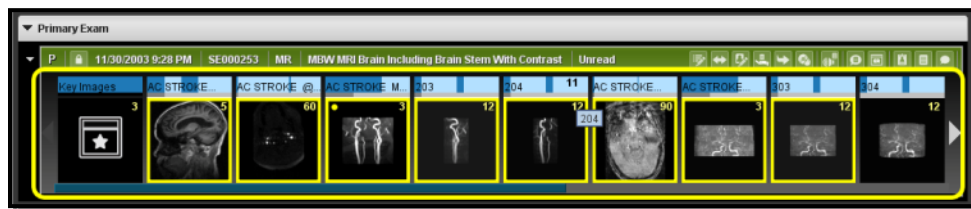
NOTE: Since the Primary Exam Toolbar is for the Study currently being viewed, this icon should always appear green to indicate that the Study is available for viewing.

The right side of the Primary Exam Toolbar displays the available action icons that apply to the exam. The actual action icons available will depend on the exam, how your system is configured and your login privileges. For a complete list of possible action icons, refer to Section 3.9 below.

NOTE: You can also open the primary exam as a Comparison Study within the Primary Viewer by **double-clicking** anywhere on the Primary Exam Toolbar other than on an action icon.

3.8.4. Primary Exam Series Navigation Thumbnails

The Primary Exam Series Navigation Thumbnails are located below the Primary Exam Toolbar and can be used to open one or more Series into the Merge PACS Viewer or into a separate pop-up Series Viewport window, as in the following example:



Primary Exam Series Navigation Thumbnails

NOTE: If there are too many thumbnail images to fit the width of the screen, arrows will appear to the left and/or right of the thumbnail images that you can click on to view the rest of the thumbnails. In addition, a scrollbar will be displayed directly below the thumbnail images.

NOTE: The Series Navigation Thumbnails can be hidden or displayed, as described in subsection 3.8.10 below.

- To open a particular Series into the Merge PACS Viewer, click on the Navigation Thumbnail for that Series and drag and drop it into a Series Viewport within the Merge PACS Viewer.
- Double-clicking on a Navigation Thumbnail will open the Series in a separate pop-up “clone” window, as described in subsection 4.2.6 below. By default, there can only be one clone window open at a time; if you want to open additional Series in separate clone windows (as opposed to reusing the currently open clone window), hold down the **Shift** key while double-clicking.
- If there are any key images that have been flagged for this exam, the first Navigation Thumbnail will be a special Key Image Series Navigation Thumbnail, as in the following example:



Key Image Navigation Thumbnail

- You can **drag** this Thumbnail into an existing Series Viewport within the Merge PACS Viewer to view all key images in that Series Viewport.
- You can **double-click** on this Thumbnail to open a separate Key Image Viewport, as described in Section 4.11, below.
- You can also **right-click** on this Thumbnail and select **Open Key Image Viewport** from the Right-click Menu to open a separate Key Image Viewport, as described in Section 4.11, below.

a. Thumbnail Right-click Menu



The Thumbnail Right-click Menu

Right-clicking on an individual Series Navigation Thumbnail will immediately cause the **Series Navigation Thumbnail Right-click Menu** to pop-up, as shown in the example on the left.

Note that, depending on the type of image and your login preferences, one or more of these options may not be available.

The Series Navigation Thumbnail Right-click Menu contains some or all of the following options, depending on the type of image and your login preferences:

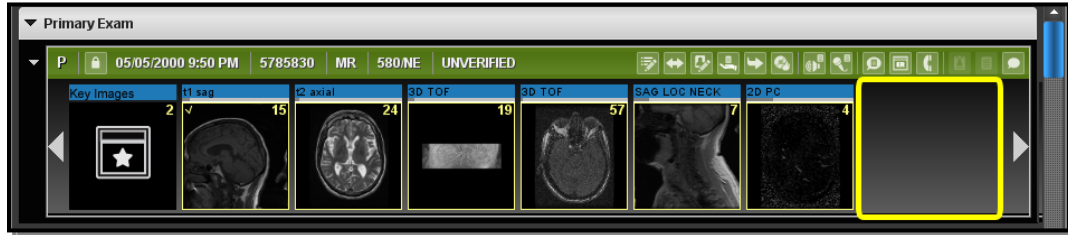
Option	General Description
Open in Window	Open the Series in a separate pop-up “clone” window, as described in subsection 4.2.6 below.
Axial MIP	Display this Series as a single Axial MIP 3D view, as described in Chapter 4.8 below.
Sagittal MIP	Display this Series as a single Sagittal MIP 3D view, as described in Chapter 4.8 below.
Coronal MIP	Display this Series as a single Coronal MIP 3D view, as described in Chapter 4.8 below.
3D Volume	Display this Series as a single Color Volume Rendering (CVR) 3D view, as described in Chapter 4.8 below.
Axial MPR	Display this Series as a single Axial MPR 3D view, as described in Chapter 4.8 below.
Sagittal MPR	Display this Series as a single Sagittal MPR 3D view, as described in Chapter 4.8 below.
Coronal MPR	Display this Series as a single Coronal MPR 3D view, as described in Chapter 4.8 below.
MPR Viewport	Create a 2x2 Multi-Planar Reconstruction (MPR) Window for this Series, as described in Chapter 4.8 below.

NOTE: If this Series needs to be split before it can be displayed and you have disabled automatic splitting of CT and/or MR Series, as described in Chapter 24 below, clicking on any of the 3D related options described above will display a set of thumbnail images that will allow you to choose the image set you want to be displayed.

Thumbnail Size	Change the size of the Series Navigation Thumbnails.
-----------------------	--

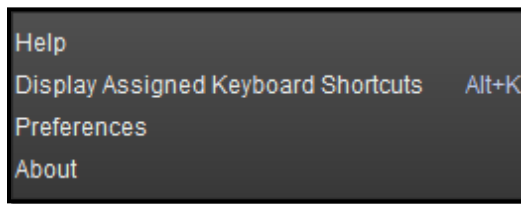
b. Patient Record Right-Click Menu

The Series Navigation Thumbnails area includes a blank space at the far right, as in the following example:



Accessing the Patient Record Right-click Menu

Right-clicking on the blank space will immediately cause the **Patient Record Right-click Menu** to pop-up, as shown in the example below:



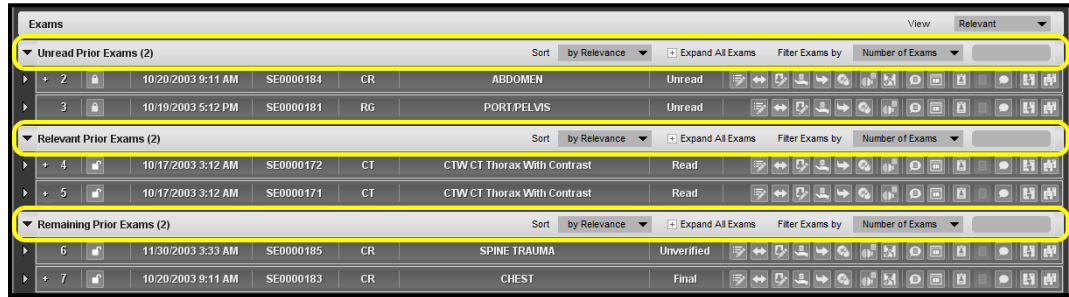
The Patient Record Right-click Menu

The Patient Record Right-click Menu has the following possible options:

Option	General Description
Help	Launches this User Guide in PDF format.
Display Assigned Keyboard Shortcuts	Displays a printable list of currently assigned keyboard shortcuts in a separate pop-up window.
Preferences	Allow you to set your personal Viewer preferences as described in Chapter 24 below.
About	Displays system information, including the current version of the Merge PACS Workstation you are using, your Windows operating system and username, memory and disk usage, etc. For more information, refer to Chapter 25 below.

3.8.5. Prior Exam Control Bars

By default, the Prior Exams section of the Patient Record is divided up into separate sections (Unread Prior Exams, Relevant Prior Exams and Remaining Prior Exams), each of which displays a separate Prior Exam Control Bar that allows you to sort, collapse and/or filter the exams within the section, as in the following example:



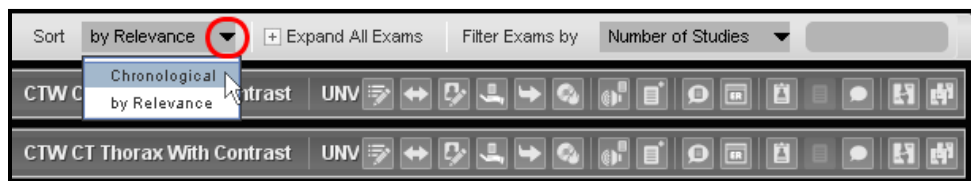
Prior Exam Control Bars

NOTE: The various **Prior Exam** sections will only be displayed if there actually are any unread, relevant and/or remaining (e.g., non-relevant) prior exams for the primary Study.

NOTE: If the **Consider All Unverified as Unread Studies** user preference has been selected, as described in Chapter 24 below, the “Unread Prior Exams” section will include both Unread and Unverified prior studies.

NOTE: The list of prior studies is determined by the Patient Comparison Strategy and “Selection of Priors” option configured for your site, as well as Multiple Patient Identity (if MPI is enabled for your site), as described in Appendix C below.

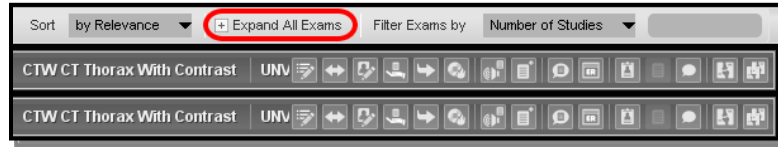
- To change the order in which the exams in a particular Prior Exam Navigator are displayed, select **by Relevance** or **Chronological** from the pull down **Sort** menu, as in the following example:



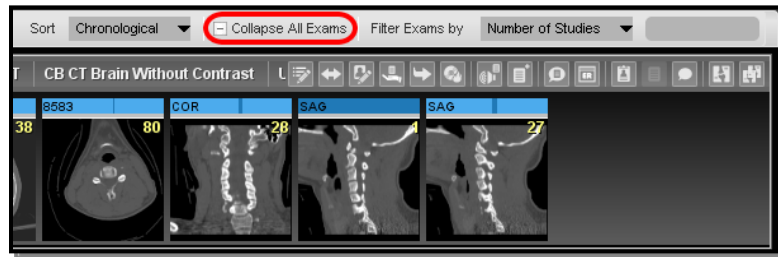
Changing the Sort Order

NOTE: Selecting “Chronological” will initially result in exams being presented in reverse chronological order (newest exam at the top, oldest at the bottom). Selecting this option again will toggle between chronological and reverse chronological order.

- To display or hide the Series Navigation Thumbnails for all exams within a Prior Exam Navigator, click on the **Expand All Exams / Collapse All Exams** toggle, as in the following examples:



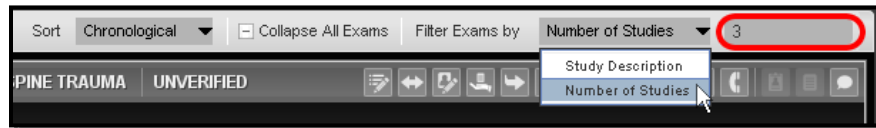
Expanding All Exams



Collapsing All Exams

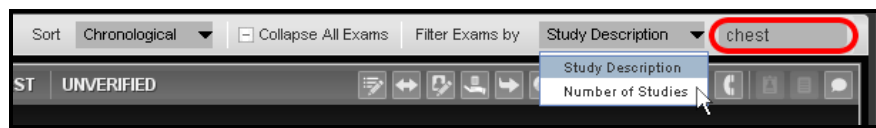
NOTE: You can also collapse and expand individual exams, as described in subsection 3.8.10 below.

- You can limit the number of studies that appear in a Prior Exam Navigator by using the **Filter Exams by** fields:
 - To set the maximum number of studies that will be displayed in the Navigator, select **Number of Studies** from the drop-down **Filter Exams by** menu and enter the desired number in the field to the right of the menu, as in the following example:



Filtering By Number of Studies

- To filter the list of studies according to Study description, select **Study Description** from the drop-down **Filter Exams by** menu and enter the text you want to match in the field to the right of the menu, as in the following example:



Filtering By Study Description

NOTE: Studies will be considered a match if any part of the Study description contains the text entered into the field described above.

3.8.6. Prior Exam Toolbar

Each exam listed in either of the Prior Exam sections is represented by a Prior Exam Toolbar that displays information about the exam as well as action icons that apply to that exam, as in the following example:



Prior Exam Toolbars

a. Exam Information

The left side of each Prior Exam Toolbar displays the following information about the exam:

- **Study exam date/time**
- **Accession number**
- **Modality**
- **Diagnostic status**
- **Study description**

b. Available Action Icons

The far left side of the each Prior Exam Toolbar may display one or more of the following action icons:

Tool	Name	General Description
	Lock/Unlock Exam	Indicates whether the prior exam is currently locked or unlocked. Clicking on the icon will toggle between the locked and unlocked state.
	Warning/Comments	<p>Launch the Comment Viewer for the selected Study in a separate pop-up window to view system generated warnings and/or comments. Note that the appearance of the flag icon will change as follows:</p> <ul style="list-style-type: none"> The Study has one or more jailed images (Standalone mode only). The Study has no jailed images but the most recent comment has either been manually flagged by the commenter or was entered at the ER WorkPanel. <p>Hovering your mouse over this icon will display the text of the most recent warning or comment as a pop-up tool tip. For details on using the Comments Viewer, refer to Chapter 5 below. For details on viewing jailed images, refer to Chapter 17 below.</p>

If Merge PACS is configured to retrieve studies, the center of the Prior Exam Toolbar will include the **Availability Status** indicator for the Study, as in the following example:



Availability Status Indicator

The appearance of the indicator indicates the availability of the Study as follows:

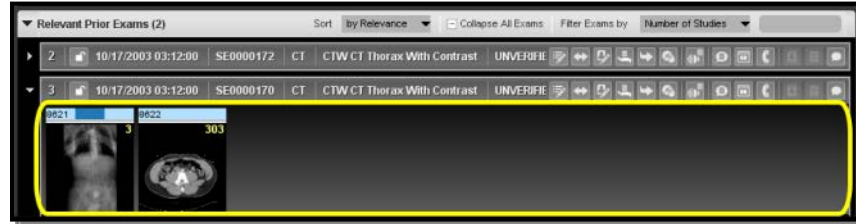
Indicator	Color	Description
	Green	The Study is available online for viewing.
	Black	The Study is currently offline and not available for viewing.
	Blue	A request to retrieve the Study has been submitted, but the retrieval process has not yet started.
	Black / Green	The Study is currently being retrieved. Note that the percentage of green shown will change to indicate the progress of the retrieval process. Hovering your mouse cursor over the indicator will cause the exact percentage to be shown in a tool-tip window, as in the following example:
	Orange	Images for this Study are currently being imported for the first time or additional images are currently being added to an existing Study.
	Red	Retrieval of the Study has completed, but with errors (either fewer images were received than expected or all images failed compression)
	Gray	The availability of the Study is currently unknown (this may occur during timeout or error scenarios).

Retrieval Progress

The right side of each Prior Exam Toolbar displays the available action icons that apply to the exam. The actual action icons available will depend on the exam, how your system is configured and your login privileges. For a complete list of possible action icons, refer to Section 3.9 below.

3.8.7. Prior Exam Series Navigation Thumbnails

The Prior Exam Series Navigation Thumbnails are located below each Prior Exam Toolbar and can be used to open one or more Series into the Merge PACS Viewer or into a separate pop-up Series Viewport window, as in the following example:



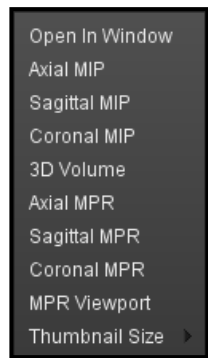
Prior Exam Series Navigation Thumbnails

NOTE: If there are too many thumbnail images to fit the width of the screen, arrows will appear to the left and/or right of the thumbnail images that you can click on to view the rest of the thumbnails.

NOTE: The Series Navigation Thumbnails for each exam can be individually hidden or displayed, as described in subsection 3.8.10 below.

- To open a particular Series into the Merge PACS Viewer, click on the Navigation Thumbnail for that Series and drag and drop it into a Series Viewport within the Merge PACS Viewer.
- Double-clicking on a Navigation Thumbnail will open the Series in a separate pop-up “clone” window, as described in subsection 4.2.6 below. By default, there can only be one clone window open at a time; if you want to open additional Series in separate clone windows (as opposed to reusing the currently open clone window), hold down the **Shift** key while double-clicking.
- If there is currently a comparison Study window open in the Merge PACS Viewer, as described in subsection 4.3.3 below, you can load the entire prior exam into that window by clicking on the blank space to the right of the Navigation Thumbnails and dragging and dropping the prior exam into that window. If there is currently another Study displayed in the comparison window, it will be replaced with the prior exam.

a. Thumbnail Right-click Menu



The Thumbnail Right-click Menu

Right-clicking on an individual Series Navigation Thumbnail will immediately cause the **Series Navigation Thumbnail Right-click Menu** to pop-up, as shown in the example on the left.

Note that, depending on the type of image and your login preferences, one or more of these options may not be available.

The Series Navigation Thumbnail Right-click Menu contains some or all of the following options, depending on the type of image and your login preferences:

Option	General Description
Open in Window	Open the Series in a separate pop-up “clone” window, as described in subsection 4.2.6 below.
Axial MIP	Display this Series as a single Axial MIP 3D view, as described in Chapter 4.8 below.
Sagittal MIP	Display this Series as a single Sagittal MIP 3D view, as described in Chapter 4.8 below.
Coronal MIP	Display this Series as a single Coronal MIP 3D view, as described in Chapter 4.8 below.
3D Volume	Display this Series as a single Color Volume Rendering (CVR) 3D view, as described in Chapter 4.8 below.
Axial MPR	Display this Series as a single Axial MPR 3D view, as described in Chapter 4.8 below.
Sagittal MPR	Display this Series as a single Sagittal MPR 3D view, as described in Chapter 4.8 below.
Coronal MPR	Display this Series as a single Coronal MPR 3D view, as described in Chapter 4.8 below.
MPR Viewport	Create a 2x2 Multi-Planar Reconstruction (MPR) Window for this Series, as described in Chapter 4.8 below.

NOTE: If this Series needs to be split before it can be displayed and you have disabled automatic splitting of CT and/or MR Series, as described in Chapter 24 below, clicking on any of the 3D-related options described above will display a set of thumbnail images that will allow you to choose the image set you want to be displayed.

Thumbnail Size	Change the size of the Series Navigation Thumbnails.
-----------------------	--

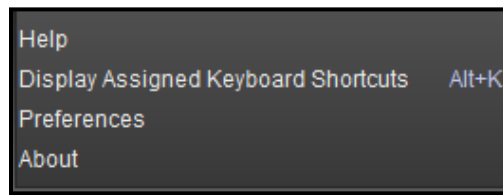
b. Patient Record Right-Click Menu

The Series Navigation Thumbnails area includes a blank space at the far right, as in the following example:



Accessing the Patient Record Right-click Menu

Right-clicking on the blank space will immediately cause the **Patient Record Right-click Menu** to pop-up, as shown in the example below:



The Patient Record Right-click Menu

The Patient Record Right-click Menu has the following possible options:

Option	General Description
Help	Launches this User Guide in PDF format.
Display Assigned Keyboard Shortcuts	Displays a printable list of currently assigned keyboard shortcuts in a separate pop-up window.
Preferences	Allow you to set your personal Viewer preferences as described in Chapter 24 below.
About	Displays system information, including the current version of the Merge PACS Workstation you are using, your Windows operating system and username, memory and disk usage, etc. For more information, refer to Chapter 25 below.

3.8.8. Displaying Prior Exams in Comprehensive View

By default, the Prior Exams section of the Patient Record is divided up into separate sections (Unread Prior Exams, Relevant Prior Exams and Remaining Prior Exams). If desired, however, you can choose to display all prior exams together in one section by selecting **Comprehensive** from the **View** menu at the top of the Prior Exams section, as shown below:



Selecting Comprehensive View

Once Comprehensive view is selected, all priors will be displayed together as in the following example:

	Date/Time	Accession	Modality	Description	Status
2	10/19/2003 5:12 PM	SE0000181	RG	PORT PELVIS	Unread
3	10/17/2003 3:36 AM	SE0000174	CR	PELVIS TRAUMA	Unread
4	10/17/2003 3:11 AM	SE0000173	CT	CB CT Brain Without Contrast	Unread
5	10/17/2003 3:12 AM	SE0000172	CT	CTW CT Thorax With Contrast	Read
6	10/17/2003 3:12 AM	SE0000171	CT	CTW CT Thorax With Contrast	Read
7	11/30/2003 3:33 AM	SE0000185	CR	SPINE TRAUMA	Read

Displaying Prior Exams in Comprehensive View

NOTE: There is no Prior Exam Control bar in Comprehensive view, so you do not have the options to sort by relevance or chronological order, expand all exams or filter exams. You can, however, sort the list by clicking on any of the column headers.

NOTE: To return to the standard way of displaying prior exams, select **Relevant** from the View menu.

3.8.9. Importing Foreign Studies



As described in subsection 3.8.1 above, clicking the **Import Foreign Studies** icon on the **Patient Record Toolbar**, as illustrated to the left, will allow you to search for and open additional studies for this or other patients that are not considered prior studies. These may include studies with a different patient identity, studies stored on your local file system or studies imported from a CD.

Clicking on the Import Foreign Studies icon will cause the **Open Study Control** window to be displayed in a separate pop-up window, as in the following example:

The Open Study Control Window

a. Searching for Foreign Studies

At the Open Study Control window you can either perform a Query Search on the Merge PACS Server or else search for a Study that has been saved to your local Workstation, a CD/DVD, or a network accessible drive.

To perform a Query Search on the Merge PACS Server:

1. Click on the **PACS Server** tab at the top of the Open Study Control window (this will be selected by default when you first open the Open Study Control window).
2. If desired, select an item from the drop-down **Date Range** menu to restrict your query to a particular time frame:

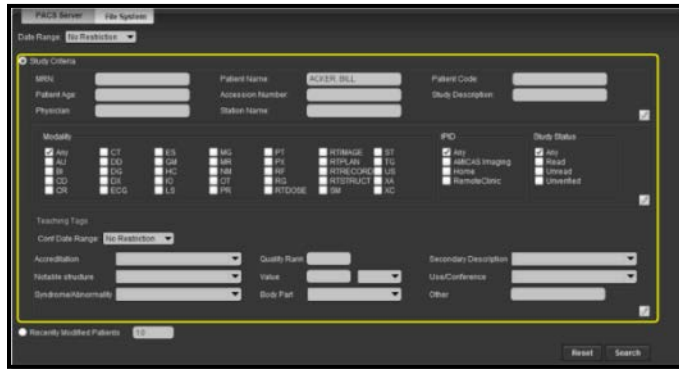
Selecting a Date Range

If you select the **Custom** option, you will be presented with additional fields to enter the start and end date for your search, as in the following example:



Custom Date Range Fields

- If you want to filter the search results according to a variety of different Study attributes, click on the **Study Criteria** radio button to use the query fields in the middle section of the screen, as in the following example:

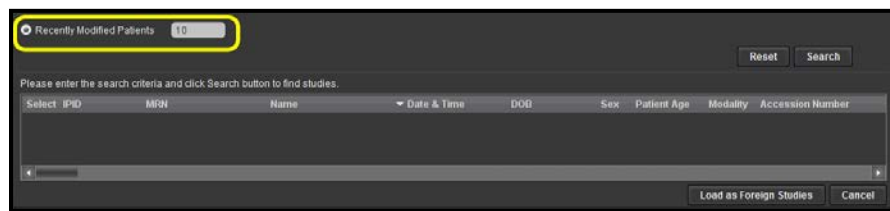


Study Criteria Search Fields

NOTE: You cannot use this option in conjunction with the **Recently Modified Patients** option described below.

NOTE: The various **Teaching Tags** fields allow you to search for studies that have been tagged as teaching files (as described in Chapter 22 below) and will only be available if you have the login privileges to access the optional Teaching Files feature

- Alternatively, you can narrow your search by displaying a list of recently modified patients by clicking on the **Recently Modified Patients** radio button at the bottom of the screen and entering the number of most recent studies sent to the system you want to display (the default is the last 10 patients), as in the following example:



Enabling Recently Modified Patients Search Option

NOTE: You cannot use this option in conjunction with the **Study Criteria** options described above.

- Click on the **Search** button at the bottom of the query fields to generate a list of matching studies, as in the following example:

The screenshot shows a search interface with the following fields and options:

- Date Range:** No Restriction
- Study Criteria:**
 - MRN: []
 - Patient Name: ACKER, BILL
 - Patient Code: []
 - Patient Age: []
 - Accession Number: []
 - Study Description: []
 - Physician: []
 - Station Name: []
- Modality:**
 - Any [x]
 - AJ []
 - BI []
 - CD []
 - CR []
 - CT []
 - DD []
 - DG []
 - DX []
 - ECG []
 - EB []
 - EM []
 - HC []
 - IO []
 - LS []
 - MG []
 - MR []
 - NC []
 - NO []
 - OT []
 - PN []
 - PT []
 - PX []
 - RF []
 - RTDOSE []
 - RTIMAGE []
 - RTPLAN []
 - RTRECORD []
 - RTSTRUCT []
 - SM []
 - ST []
 - TG []
 - US []
 - XA []
 - XC []
- IPID:**
 - Any [x]
 - AMCAS Imaging []
 - Home []
 - RamoteClass []
- Study Status:**
 - Any []
 - Read []
 - Unread []
 - Unverified []
- Teaching Tags:**
 - Card Date Range: No Restriction
 - Accreditation: []
 - Quality Rank: []
 - Secondary Description: []
 - Notable structure: []
 - Value: []
 - Use/Conference: []
 - Syndrom/Abnormality: []
 - Body Part: []
 - Other: []
- Recently Modified Patients:** 10
- Buttons:** Reset, Search (highlighted)

The Search Button

A list of studies matching your query will be displayed at the bottom of the screen, as in the following example:

Found 3 studies

Select	IPID	MRN	Name	Date & Time	DOB	Sex	Patient Age	Modality	Accession Number
<input type="checkbox"/>	Home	AM-0098	SMITH JANE	11/30/2003 13:52	04/05/1965	F	039Y	MR	SE0000168
<input type="checkbox"/>	Home	AM-0098	SMITH JANE	06/09/2003 14:09	04/05/1965	F	039Y	MR	SE0000167
<input type="checkbox"/>	Home	AM-0098	SMITH JANE	06/09/2003 13:31	04/05/1965	F	039Y	MR	SE0000166

Buttons: Load as Foreign Studies, Cancel

Search Results

- Click on the checkbox of each Study you want to load as a foreign Study and then click on the **Load as Foreign Studies** button at the bottom of the window, as in the following example:

Found 3 studies

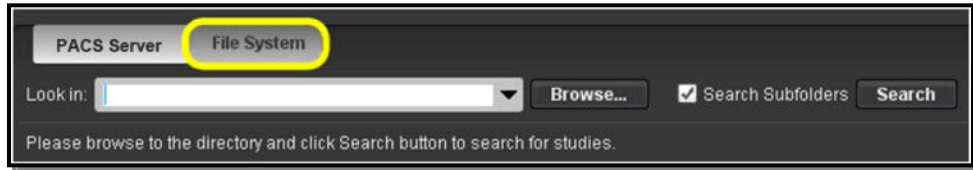
Select	IPID	MRN	Name	Date & Time	DOB	Sex	Patient Age	Modality	Accession Number
<input checked="" type="checkbox"/>	Home	AM-0098	SMITH JANE	11/30/2003 13:52	04/05/1965	F	039Y	MR	SE0000168
<input checked="" type="checkbox"/>	Home	AM-0098	SMITH JANE	06/09/2003 14:09	04/05/1965	F	039Y	MR	SE0000167
<input type="checkbox"/>	Home	AM-0098	SMITH JANE	06/09/2003 13:31	04/05/1965	F	039Y	MR	SE0000166

Buttons: Load as Foreign Studies (highlighted), Cancel

Selecting Studies to be Imported

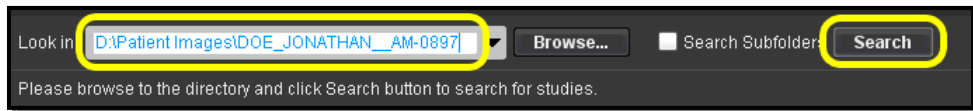
To search your local Workstation, a CD/DVD, or a network accessible drive:

1. Click on the **File System** tab at the top of the Open Study Control window:



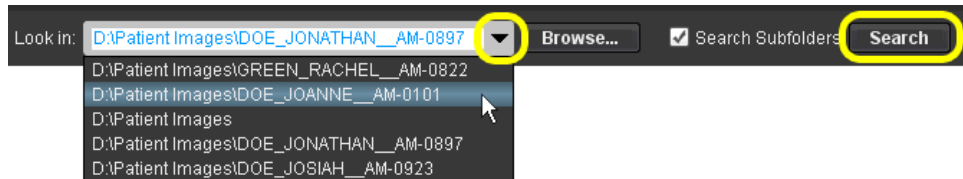
The File System Tab

2. If you know the exact name of the folder where the desired Study is located, you can enter it directly in the **Look in** field and then click the **Search** button, as in the following example:



Entering the Specific Folder

- You can display all studies contained in subfolders within a higher level folder by entering the exact name of the higher level folder, clicking the **Search Subfolders** option and then clicking the **Search** button.
- You can also select from a list of recently opened folders that contained studies from the drop-down **Look in** menu, as in the following example:



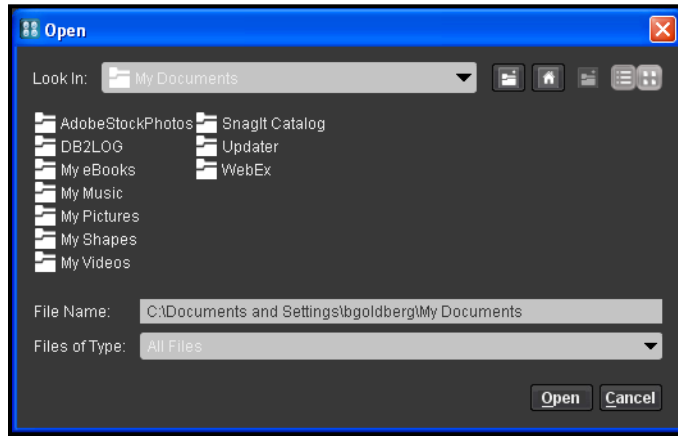
Entering the Specific Folder

3. If you don't know the exact name of the folder where the desired Study is located, click on the **Browse** button:



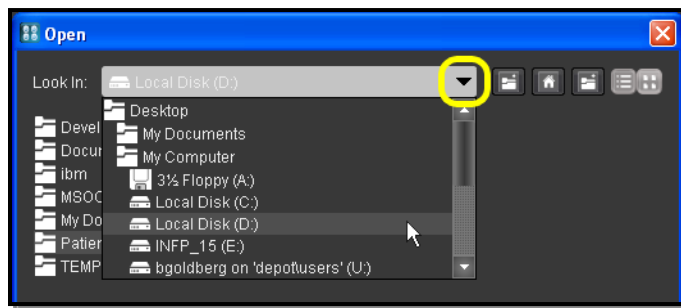
The Browse Button

This will cause the **File Browser Window** to be displayed in a separate pop-up window, as in the following example:



The File Browser Window

- From the drop-down **Look In** menu, select the drive where the desired Study is located, as in the following example:



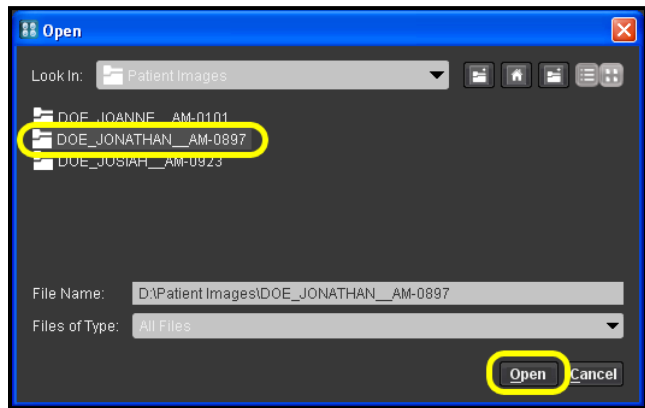
Selecting a Drive

- Once you selected a drive, the folders on that drive will be displayed in the main portion of the File Browser window, as in the following example:



Folders on the Selected Drive

- Click on the folder containing the desired Study images and then click the **Open** button, as in the following example:

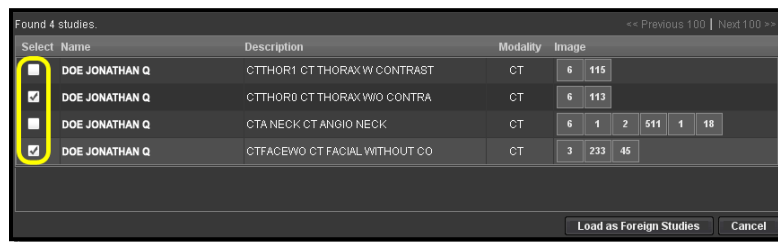


Opening the Selected Study

- If necessary, you can double-click on any folder to view the subfolders within.

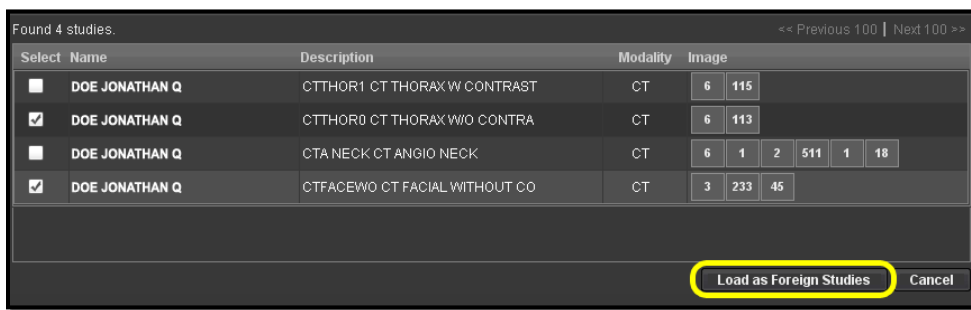
NOTE: If you click the **Search Subfolders** option before opening the File Browser window, you can open all studies within a folder by clicking on that folder and then clicking the **Open** button.

- Click on the checkbox of each Study you want to load as a foreign Study:



Selecting Studies to be Imported

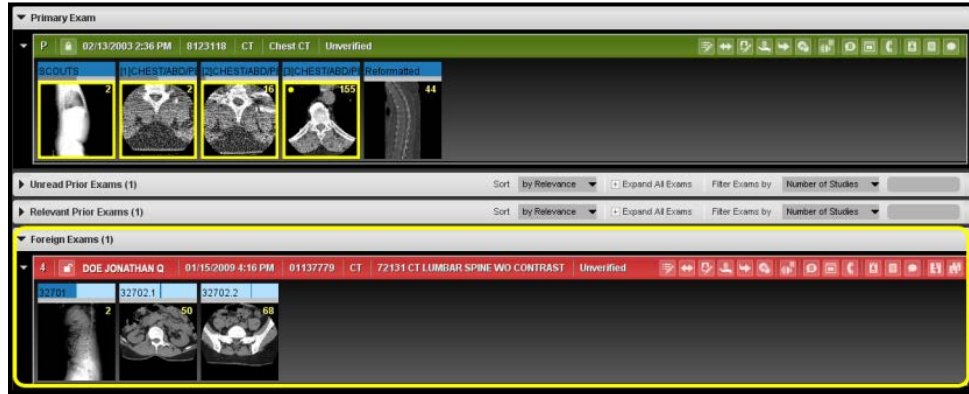
- Click on the **Load as Foreign Studies** button at the bottom of the window:



Loading the Selected Study or Studies

b. Viewing Foreign Studies

Studies that have been loaded as foreign studies will be displayed in the Patient Record in a special section below the Prior Exams with a red Toolbar, as in the following example:



Foreign Study in the Patient Record

- The **Foreign Exam Toolbar** has the same options as the **Prior Exam Toolbar**, described in subsection 3.8.6 above.
- The **Foreign Exam Series Navigation Thumbnails** operate the same as the **Prior Exam Series Navigation Thumbnails**, described in subsection 3.8.7 above.
- If you open a Series from a foreign Study into the Merge PACS Viewer, it will be displayed with a large red warning icon, as in the following example:

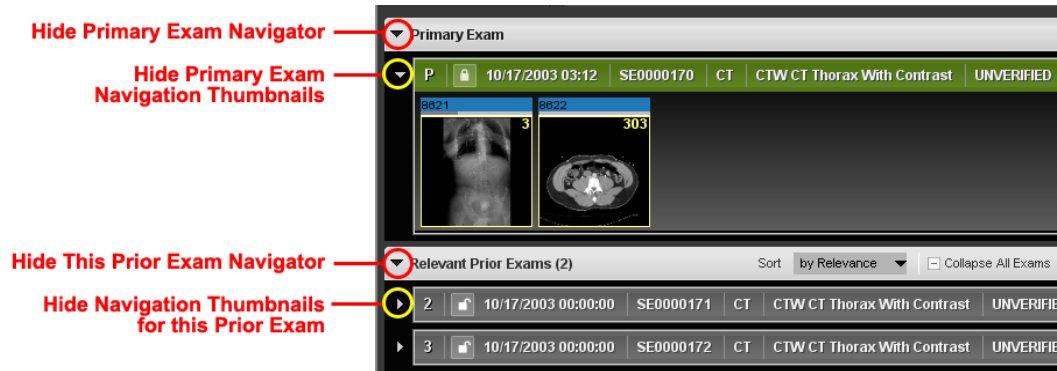


Viewing a Series from a Foreign Study

NOTE: Foreign Studies can be viewed as comparison studies within the PACS Viewer, as described in Section 4.4.4 below, but their display as a comparison study cannot be saved as part of a Hanging Protocol, as described in Section 4.12 below.

3.8.10. Collapsing and Expanding Exam Navigators and Exams

You can temporarily hide selected portions of the Patient Record by clicking on the small triangles on the left-hand side of the screen. Clicking on these triangles allows you to hide an entire Navigator and/or the Series Navigation Thumbnails for one or more individual exams within a Navigator, as shown in the example below:





Hiding Parts of the Patient Record

Click on the appropriate triangle a second time to reveal the Navigator or Series Navigation Thumbnails.

3.9. Workstation Browser Action Icons

The following action icons may be available on the various components of the Workstation Browser, depending on how the specific component is configured, how the particular worklist is configured, your login privileges, etc.:

Icon	Name	General Description
	View Study	<p>Load the selected Study into the Merge PACS Viewer, as described in Chapter 4 below.</p> <p>You can also load a Study into the Merge PACS Viewer by double-clicking anywhere in the Data Columns section of the worklist for a particular Study.</p> <p>Note the following:</p> <ul style="list-style-type: none"> Once a Study has been opened, its status on the Worklist will be changed to "In Use" and it will change color to alert other users that it is currently open by somebody else. If Merge PACS is configured to retrieve studies and the Study is currently offline, attempting to view a Study will automatically trigger a retrieval request, as described in Chapter 16 below.

Icon	Name	General Description
	View Study in Secondary Viewer	<p>If you are already viewing a Study in the Merge PACS Viewer and want to view another Study without exiting the first one, click on the View Study in Separate Viewer icon to load the selected Study into a separate Merge PACS Viewer.</p> <p>Note the following:</p> <ul style="list-style-type: none"> • By default, studies displayed in the Secondary Viewer will be read-only (they will not be locked and you will be unable to change the workflow status). This default behavior can be changed, however, from the User Preference menu, as described in Chapter 24 below. • This method can be used to open any number of simultaneous viewer windows. However, keep in mind that each open window will consume additional memory, and this may have an adverse effect on your system's performance if too many windows are kept open at the same time. • Each currently open Study will have a separate navigation tab associated with it within the Patient Record, as described in subsection 3.8.1, below. • Use cases for multiple-instance viewer windows include the following examples: <ul style="list-style-type: none"> ○ While reading one patient's Study, the user is asked to look at another patient's Study. The user does not want to exit the first Study, but wants to be able to view the Study in a second window while leaving the first Study open. ○ If a comparison Study for a patient has a different patient name or MRN associated with it, that Study will not be available from the list of available comparison studies for that patient from within the Primary Viewer. The user can load that Study into the secondary Viewer, however, to compare the two studies side by side in separate viewer windows. ○ The user might prefer to view the same Study in the secondary Viewer to keep the layout of the Primary Viewer unchanged. For example, 3D images can be viewed in the secondary Viewer while the Primary Viewer displays the Study in standard 2D layout. ○ The user might prefer to run the secondary Viewer on a color monitor in order to display data in color, including 3D color volume rendering, color US images, color maps applied to US or PT or NM monochrome images, etc. • If the study is not available online and Merge PACS is configured to retrieve studies, attempting to view a Study in a Secondary Viewer will automatically trigger a retrieval request, as described in Chapter 16 below.

Icon	Name	General Description
------	------	---------------------



View Orders and/or Comments

Launch the Order Viewer as a separate pop-up window with any orders and/or comments displayed. Note that the appearance of the icon will change depending on whether there is just an order associated with this Study, just comments, or both:



There is an order associated with this Study.



The most recent comment for this Study was manually flagged by the commenter.



There is an order associated with this Study and the most recent comment for this Study was manually flagged by the commenter.

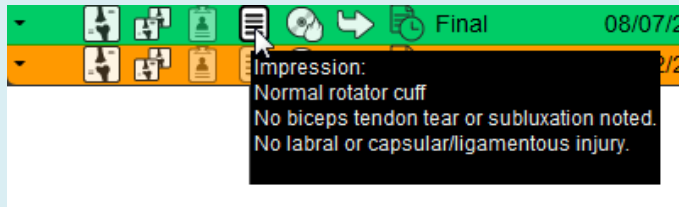
For more information on using the Order Viewer to view orders and view and/or enter comments, refer to Chapter 5 below.

NOTE: If there is no order or comment currently associated with this Study, the Orders and Comments icon will be disabled. If you need to add a comment, you can do so from the **Technologist WorkPanel** or the **Comments Viewer**, depending on your login privileges.












Launch Report Viewer









Launch the Report Viewer as a separate pop-up window. Depending on how your system is configured, for HTML-formatted HL7 text reports that are not addendums you may also be able to hover your mouse over the Launch Report Viewer icon to display a summary for the most recent report associated with the exam, as in the following example:


















Report Summary

For more information on using the Report Viewer, refer to Chapter 6 below.

Icon	Name	General Description
	Launch Comment Viewer	<p>Launch the Comment Viewer as a separate pop-up window with any comments displayed. Note that the appearance of the icon will change as follows:</p> <ul style="list-style-type: none">  The Study has one or more jailed images (Standalone mode only).  The Study has no jailed images but the most recent comment has either been manually flagged by the commenter or was entered at the ER WorkPanel.  The Study has no jailed images and the most recent comment (if any) was neither manually flagged nor entered at the ER WorkPanel. This is the default icon. <p>Hovering your mouse over this icon will display the text of the most recent warning or comment as a pop-up tool tip.</p> <p>For more information on using the Comments Viewer, refer to Chapter 5 below.</p> <p>For details on viewing jailed images, refer to Chapter 17 below.</p>
	Technologist WorkPanel	<p>Launch the Technologist WorkPanel for the selected Study in a separate pop-up window. The Technologist WorkPanel provides a number of different tools commonly used by Technologists in a single window.</p> <p>For details on the Technologist WorkPanel, refer to Chapter 19 below.</p>
	ER WorkPanel	<p>Launch the ER WorkPanel for the selected Study in a separate pop-up window. The ER WorkPanel provides a number of different tools commonly used by Emergency Room Physicians in a single window and enables a status-driven workflow between ER physicians and radiologists.</p> <p>For details on the ER WorkPanel, refer to Chapter 20 below.</p>
	Burn CD/DVD	<p>Add the selected Study (together with any priors) to the Burn CD/DVD dialog's Study List. Note that multiple studies from multiple patients can be added to the same Burn CD/DVD Study List.</p> <p>For details on burning patient images onto a CD/DVD, see Chapter 13 below.</p>
	Route Study	<p>Send the selected Study to another available Merge PACS location (<i>i.e.</i>, a different Merge PACS Server or a local DICOM device).</p> <p>For details on routing studies, see Chapter 14 below.</p>
	3rd-party App Sync	<p>If your system has been configured for direct ("API-based") integration with a third-party dictation/report applications such as Dictaphone's PowerScribe™, clicking on the Third-party Application Synchronization icon will launch the application with the Study's accession number and the patient MRN prepopulated.</p> <p>For additional information on using the 3rd-party Application Synchronization feature, refer to Note: below and the user documentation specific to the third-party dictation/report application being used.</p>

Icon	Name	General Description
		<p>NOTE: The Merge PACS Workstation also provides indirect (“XML file-based”) integration with a number of third-party applications including dictation/report applications (such as PowerScribe or Epic), document management applications (such as OnBase), and any other application that supports XML file-based integration. You do not need to click on the Third-party Application Synchronization icon for this type of integration, as those applications can be configured to launch automatically when you open a Study for viewing.</p>
	Study Tagging	<p>If you have the login privileges to access the optional Teaching Files feature, this will launch the Study Tagging window.</p> <p>For more information on tagging studies, refer to Chapter 22 below.</p>
	Data Masking	<p>For studies that are on a Teaching Worklist, creates a copy of the study with certain personally identifiable Protected Health Information (PHI) about the study (including Patient Name, MRN, Accession Number) replaced with randomized data.</p> <p>For details on data masking studies on a Teaching Worklist, refer to subsection 3.4.7 above.</p>
	Quick Add to Default Teaching Worklist	<p>If you have the login privileges to access the optional Teaching Files feature, add this Study to whichever Teaching Worklist (including Briefcase) is currently configured as your default Teaching Worklist.</p>
	Quick Remove from Current Worklist	<p>Remove a Study that was manually associated with this worklist. Note that removal will be instantaneous and will not cause the Associate/Dissociate Study pop-up window to be displayed.</p>
	Remove Associated Study	<p>Launch the Associate/Dissociate Study pop-up window to remove a Study that was manually added to this RTWL worklist, whether via the Associate Study icon or the Drag and Drop feature described in subsection 3.2.7 above.</p> <p>For details on the Associate/Dissociate Study window, see Chapter 7 below.</p>
	Associate Study	<p>Launch the Associate/Dissociate Study pop-up window to add the selected Study to another RTWL worklist to which you have access.</p> <p>For details on the Associate/Dissociate Study window, see Chapter 7 below.</p>
	VoiceClip	<p>Listen to the audio annotation, if any, that has been recorded for this Study.</p> <p>For details on using VoiceClip to listen to audio annotations, refer to Chapter 9 below.</p>
	Access Control	<p>Grant one or more users or groups access to this Study/exam.</p> <p>For details on Access Control, see Chapter 11 below.</p>

Icon	Name	General Description
	OrthoLink	View the selected CR Study within the Merge PACS Viewer and launch the orthopedic templating toolset installed on your workstation, such as OrthoView or Merge OrthoCase. For details on using OrthoLink, see Chapter 4.13 below and the user documentation specific to your orthopedic templating toolset software.
	Change Status	Change the workflow status and/or selected HL7 attributes for a particular Study directly from the Worklist without opening the Study within the Merge PACS Viewer. For details on changing status and/or selected HL7 attributes, see Chapter 12 below.
	Study Demographics	Launch the Study Demographics window in a separate pop-up window that allows you to view and edit patient and Study demographic information for the selected Study. For additional information on viewing and editing patient and Study demographics, refer to Chapter 18 below.
	Communication WorkPanel	If the optional Merge RadStream™ component has been enabled, launch the Communication WorkPanel for the selected Study in a separate pop-up window. The Communication WorkPanel provides a number of different tools commonly used by Merge RadStream Operators in a single window. For details on the Communication WorkPanel, refer to Chapter 21 below.
	Change Status to MD Connected	Sets the connection dimension status of the selected Study to MD Connected (or the equivalent status used by your site).
	Change Status to Talk to MD	Sets the connection dimension status of the selected Study to Talk to MD (or the equivalent status used by your site).
	View Study in Web Viewer	If your system is configured to provide access to the iConnect® Access viewer, display the selected Study within iConnect Access. For information on using iConnect Access, refer to the iConnect Access user documentation.
	Reserve Study	Flag this Study as reserved to you. If a worklist containing this Study has been configured to include the Reservation display column, as described in subsection 3.3.5 above, the Reservation status will be displayed in that column.
	Assign Study	Flag this Study to be assigned to another user. If that user has access to a worklist configured to display studies assigned to him, this Study will appear on that worklist. For information on assigning studies to other users, refer to Chapter 8 below.

Icon	Name	General Description
	Retrieve Study	<p>If Merge PACS is configured to retrieve studies and this Study is currently offline, submit a retrieval request for this Study.</p> <p>Note the following:</p> <ul style="list-style-type: none"> • Once a retrieval request has been submitted, the progress can be tracked from the Availability data column, as described in subsection 3.3.5.c above. • You can submit a retrieval request for multiple studies at the same time by clicking on the Retrieve icon for each Study. The retrieval requests will be processed in the order it they were submitted. • If Merge PACS is configured to retrieve studies, but the Retrieve action icon is not enabled for this worklist, you can still submit a retrieval request from the Worklist Right-click Study Menu, as described in subsection 3.3.7 above, or by clicking on the View Study or View Study in Secondary Viewer action icons for a Study that is currently offline, as described in Chapter 16 below.
	Retrieve Comparison Studies	<p>Submits a retrieval request for all comparison studies for the selected study so that they will be available for comparison when you load the primary study in the Viewer.</p> <hr/> <p>NOTE: Depending on how your system is configured, a maximum number of comparison studies to be retrieved for any one study may exist.</p>
	Save Series	<p>Save images from one or more Series for this Study in a variety of available image formats for inclusion in a document or an e-mail message.</p> <p>For more information on saving a Series, refer to subsection 4.7.1 below.</p>
	Open Study in QC Editor	<p>Open the Study within the Quality Control Editor. Refer to the <i>Merge PACS 7.3 Quality Control Editor Users Guide</i> for more information.</p> <hr/> <p>NOTE: If there is insufficient study information available to view the study in the QC Editor, the QC Editor will not be launched and retrieval of the full study information will be automatically initiated instead.</p>
	Open Study in Patient Synopsis™	<p>If your system is configured to provide access to Patient Synopsis™, display the selected Study within Patient Synopsis.</p> <p>For information on using Patient Synopsis, refer to the Patient Synopsis user documentation.</p>
	Activity Log	<p>Launch the Activity Log as a separate pop-up window with a list of events displayed.</p> <p>For more information on viewing the Activity log for an exam, refer to Section 3.10 below.</p>

3.10. Viewing the Activity Log for an Exam



The **Activity Log** action icon on a worklist, as illustrated to the left, allows you to view an activity log of a specific exam in a separate pop-up window, as in the following example:

The screenshot shows a window titled 'Activity Log' with a header bar containing user information: 'Doe, Jessica Q', '05/12/2014', 'O', 'HOME', and 'EXd1d7c9f3p18cc5p'. Below the header is a 'Study Details' section with a table:

Date	Time	Accession	Modality	Description	Details
03/29/2004	12:42	EX8994bebaf	CT		...

Below the study details is a main table with columns: Event Time, Event Type, User Name, and Operation Description.

Event Time	Event Type	User Name	Operation Description
2018-02-21 09:50:44 EST	study cached on client	Barry Goldberg	
2018-02-21 09:50:11 EST	study viewed	Barry Goldberg	
2018-02-21 09:50:10 EST	workflow status changed to Locked	Barry Goldberg	(UNSET)
2018-02-21 09:34:57 EST	workflow status changed to Locked	Barry Goldberg	barry@GOLDBERG-B-IBM
2018-02-21 09:34:56 EST	starting viewer	Barry Goldberg	
2018-02-21 09:27:58 EST	study cached on client	Barry Goldberg	
2018-02-20 10:00:43 EST	online DICOM images deleted		
2018-02-20 10:00:24 EST	study closed		
2018-02-20 09:58:51 EST	delete series/images started		Cleanup old latest annotation series
2018-02-20 09:58:51 EST	QC operation DeleteImages		SOPInstanceUID: 1.2.840.113837.2812636417.20141104115942.2

The window includes a 'Close' button at the bottom right.

Activity Log Window

The Activity Log window displays the following information for each event associated with the exam:

- The **time and date** the event occurred
- The **type** of event
- The **user** who performed the event, when applicable
- A detailed **description** of the event, when applicable

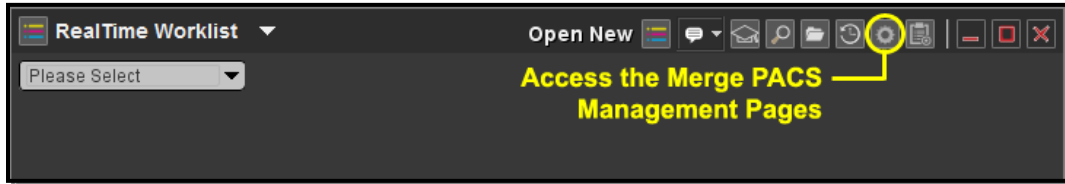
One possible workflow for use of the Activity Log would be a Technologist who needs to correct an error within a study (e.g., to delete an incorrect image) and needs to know who has already seen and possibly acted upon the study.

NOTE: If all columns are not visible when the Activity Log window is opened, you can either use the scroll bar at the bottom of the window or use your mouse to expand the size of the window. If you use your mouse to resize the window, the new size will be retained the next time the Activity Log is accessed.

NOTE: The events for the study will be listed in reverse chronological order by default, but you can sort the list and/or change the sort direction by clicking on any column header.

3.11. Accessing the Merge PACS Management Pages

If you have access rights to the Merge PACS Management Pages, you can access them directly from the Workstation Browser by clicking on the **Merge PACS Management Pages** icon at the top right of the Workstation Browser, as in the following example:



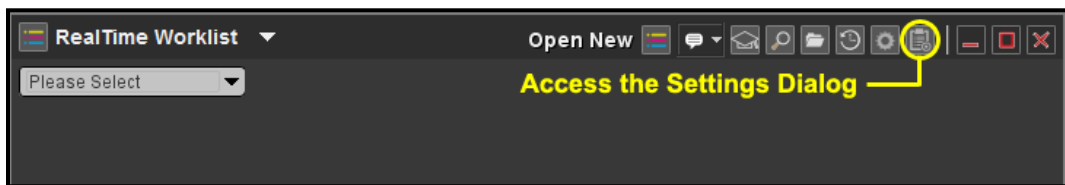
Accessing the Merge PACS Management Pages

NOTE: The system will use the login name and password you entered to log into the Merge PACS Workstation when accessing the Management Pages.

Refer to the *Merge PACS 7.3 Administration Manual* for detailed information on the Merge PACS Management Pages.

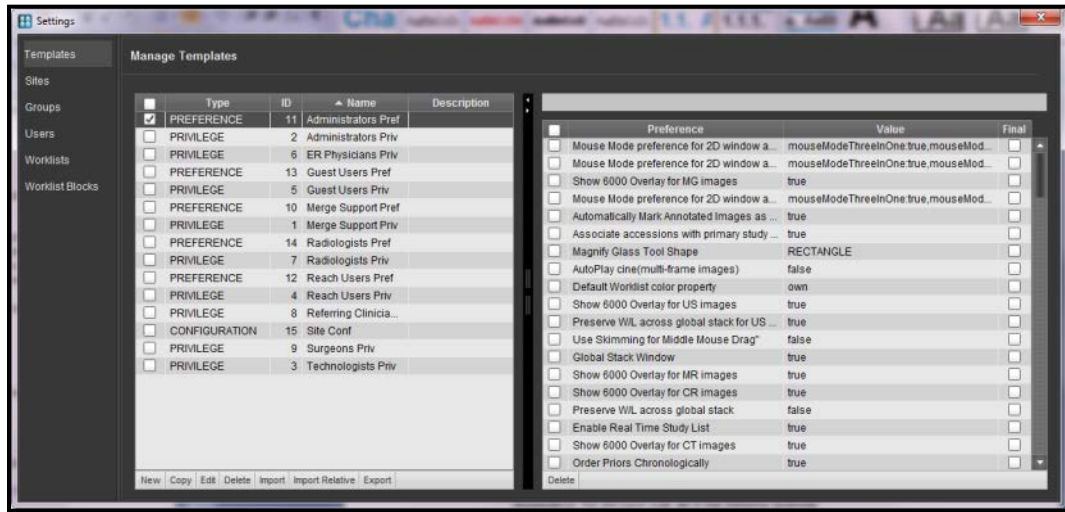
3.12. Accessing the Settings Page

If you have login privileges to manage site, group and user privileges and preferences as well as templates and worklists, you can perform these tasks by clicking on the **Settings** icon at the top right of the Workstation Browser, as in the following example:



Accessing the Settings Dialog

The **Settings** dialog is displayed, as in the following example:



The Settings Dialog

Refer to the *Merge PACS 7.3 Administration Manual* for detailed information on the various options that can be configured from the Settings dialog.

Chapter 4. The Merge PACS Viewer

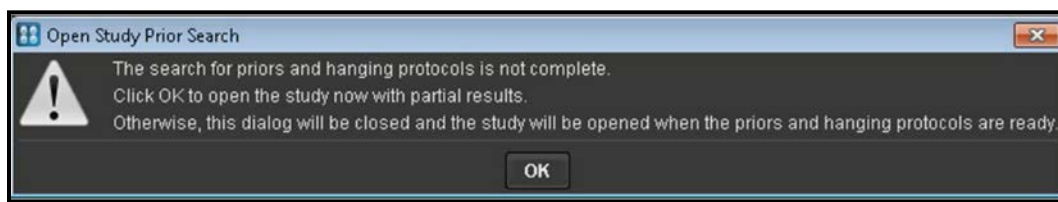
The Merge PACS Viewer is the primary application for viewing and manipulating images within the Merge PACS Workstation. This chapter covers the following topics:

- **Opening Prior Studies within the Viewer**
- **Overview**
- **Changing the Screen Layout**
- **Navigating through Images, Series and Studies**
- **General Image Manipulation**
- **The Spine Labeling Tool**
- **Saving, Printing and Copying Images**
- **3D Rendering Tools**
- **Viewing Mammography Images**
- **Setting Key Images**
- **Viewing Key Images**
- **Hanging Protocols and Study Presentations**
- **Using Orthopedic Templating Toolsets**
- **Managing Window/Level Presets**
- **Using Lossy Images Instead of Lossless**

NOTE: Depending on how your system is configured, you may also be able to view images within the iConnect® Access viewer. For information on using iConnect Access, refer to the iConnect Access user documentation.

4.1. Opening Prior Studies within the Viewer

When you first attempt to open a study within the Merge PACS Viewer, the system will begin the process of identifying all prior/comparison studies for the selected study so that they will all be available as needed and so that the correct Hanging Protocol, if applicable, is applied. If the system is not able to identify all the priors within a configurable time period (typically three seconds), a warning message such as the following will be displayed:



Open Study Prior Search Warning

If you do not want to wait any longer for all priors to be identified, click **OK** to open the study immediately; otherwise, you can wait and the warning dialog will automatically close once the process is complete.

If you choose to open the study immediately, note the following:

- Once the priors are fully identified, you will be notified via an alert in your Windows system tray, as in the following example:

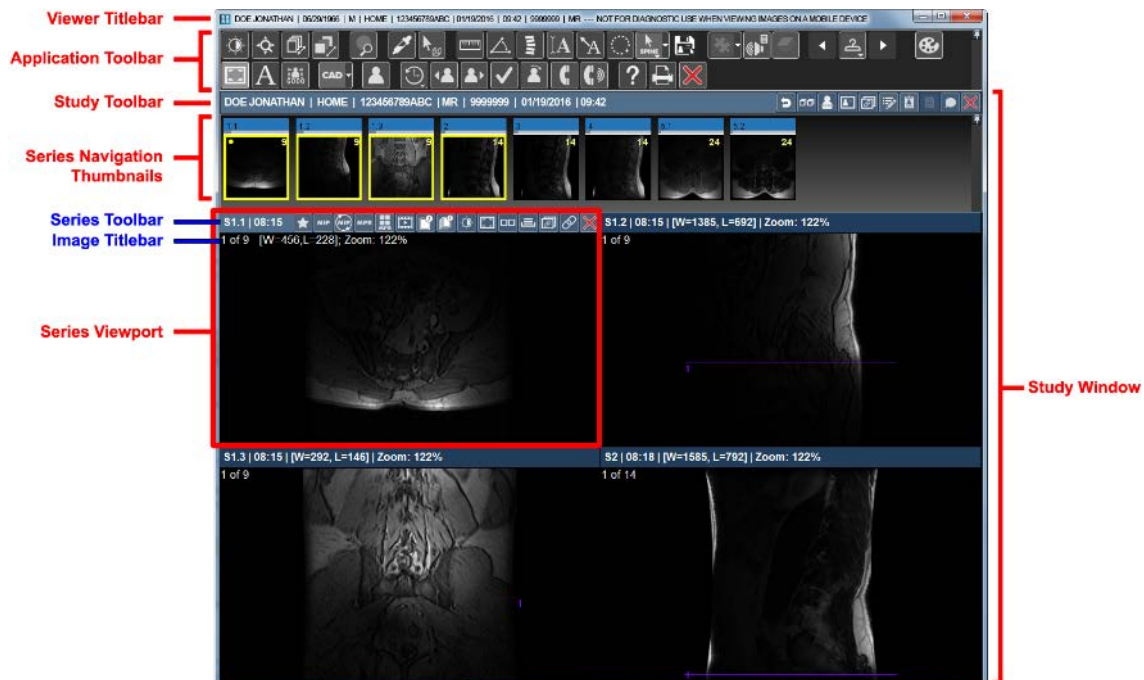


Prior Search Is Complete

- Once the priors are fully identified, they will be included in all lists of priors throughout the application.
- If a Hanging Protocol was unable to be fully applied due to missing prior information, you will need to manually rehang that Hanging Protocol once all priors are fully identified, as described in subsection 4.12.9 below.

4.2. Overview

When you select a Study to open, the Study images will be displayed in a separate Merge PACS Viewer window, as shown in the example below:



The Merge PACS Viewer

If you are using a multi-screen monitor, you can position this window where you like it by clicking on the Titlebar with your mouse and dragging it to where it needs to go.

The number and layout of the images displayed in the Merge PACS Viewer depends on the type of images being displayed, what screen layout you have selected using the various layout tools, whether there is a Hanging Protocol or Study Presentation associated with this Study, and how the default layout preferences have been configured.

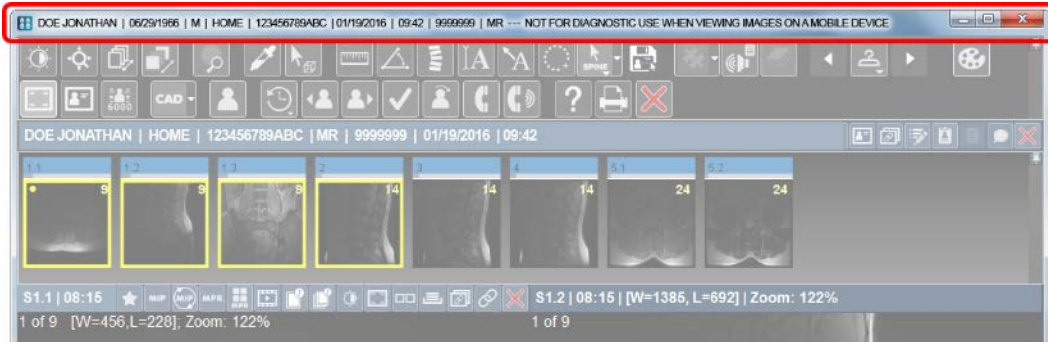
The Merge PACS Viewer consists of the following general components, most of which are configurable:

Component	Description
Viewer Titlebar	Displays information about the patient and the primary Study.
Application Toolbar	Displays various tools that apply to the Merge PACS Viewer as a whole.
Study Toolbar	Displays Study information (Study description, Study exam date/time, accession number and modality) as well as various tools that apply to the selected Study.
Series Navigation Thumbnails	Allow you to drag and drop a Series into a Series Viewport.
Series Viewports	Each Series Viewport displays images and information relating to a single Series.
Series Toolbar	Displays information for the Series in a particular Series Viewport as well as various tools that apply to that Series Viewport.
Image Titlebar	Displays information about the image currently being displayed in a Series Viewport, including image number, lossy compression ratio (if applicable), window and level, and zoom.
Right-click Menus	Each component listed above (except for the Viewer Titlebar) has an associated menu of options that can be accessed by clicking and holding the right-mouse button on that component. Depending on the component, the menu may include additional tools, preferences, and/or the ability to hide or display tools.

Each of these components is described briefly below, and the individual tools and functions are described in greater detail in the following Sections.

4.2.1. The Viewer Titlebar

At the very top of the Merge PACS Viewer is the **Viewer Titlebar**, as in the following example:



The Viewer Titlebar

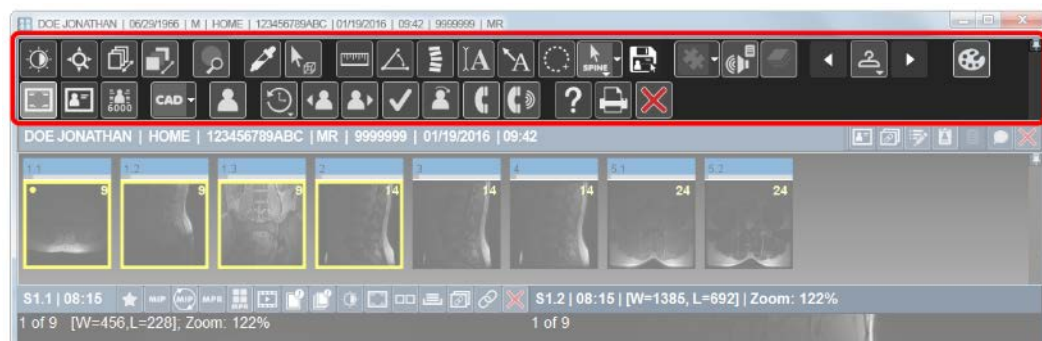
The Viewer Titlebar displays the following information about the patient and primary Study being viewed:

- Name
- Issuer of Patient ID (IPID)
- Accession Number
- Date of Birth
- Medical Record Number (MRN)
- Modality
- Sex
- Study Time/Date
- Primary Study Description

NOTE: If Merge PACS is running in Integrated mode and **Multiple Patient Identity (MPI)** is enabled, **Master IPID** and/or **Master MRN** may be displayed instead of or in addition to the local IPID and MRN. See Appendix C.2 below for information on Multiple Patient Identity support.

4.2.2. The Application Toolbar

Below the Viewer Titlebar is the **Application Toolbar**, as shown in the following example:



The Application Toolbar

a. Available Tools

The Application Toolbar displays various tools that apply to the Merge PACS Viewer as a whole. The actual tools available on the toolbar will depend on your login privileges and how you have configured the Toolbar (as described in Chapter 24 below). For a complete list of possible tools, refer to subsection 4.2.7 below.

By default, repeatedly right-clicking on an image will toggle the cursor among a variety of commonly used mouse modes specific to the type of image being viewed.

NOTE: The available mouse modes, as well as the order in which they appear, can be customized for different modalities, as described in Chapter 24 below.

NOTE: This feature can be disabled by **deselecting** the **Delayed Right Click** option in the Merge PACS Preferences dialog, as described in Chapter 24 below. If the feature is disabled (or if you hold down the right mouse button on an image instead of briefly clicking), the **Series Right-click Menu** will be displayed instead, as described in subsection 4.2.5, below.

NOTE: The ability to cycle between different mouse modes will not operate if you have custom configured your mouse button actions, as described in Chapter 24 below.

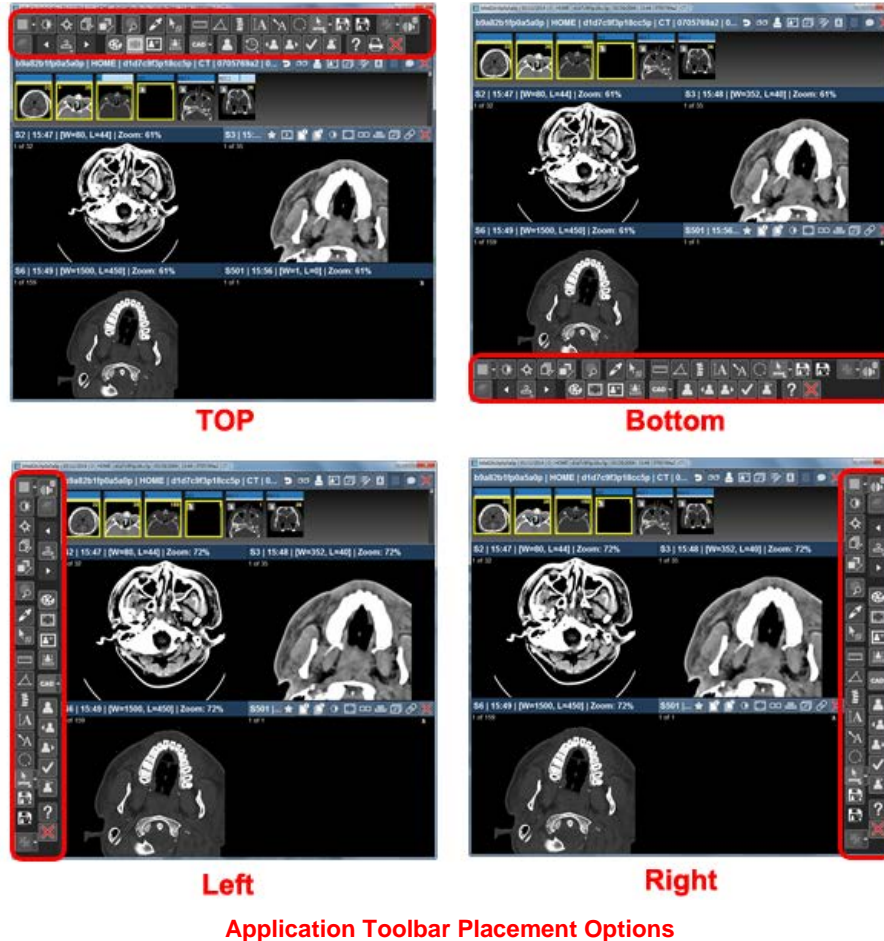
b. Customizing the Application Toolbar

Right-clicking on any blank space on the Application Toolbar will immediately cause a **Preferences** link to be displayed, as in the following example:



Application Toolbar Preferences Link

Clicking the Preferences link will take you directly to the **Application Toolbar** section of the **Merge PACS Preferences** dialog, as described in subsection 24.1.20 below, where you can customize the set of tools that appear on the Application Toolbar itself in a variety of different modes. In addition, you can configure whether the toolbar is visible or hidden by default and change the location of the toolbar so that it is displayed at the top, bottom, left or right of the Viewer window, as in the following example:



c. Hiding/Accessing the Application Toolbar

By default, the Application Toolbar will be visible at all times. If desired, however, you can “unpin” the toolbar so that it will be hidden by default instead. This is done by clicking on the pushpin at the upper-right corner of the toolbar, as in the following example:



Pushpin Icon

Once you have uninned the toolbar, hovering your mouse cursor near any of the edges of the Viewer Window will cause a special **Access Toolbar** icon to appear near where the toolbar is located, as in the following example:



Access Toolbar Icon

NOTE: If desired, you can click and drag the Access Toolbar icon to the left or right (or up and down, as applicable) to improve visibility.

Clicking on the Access Toolbar icon will cause the Application Toolbar to be temporarily displayed, as in the following example:



Temporary Display of Application Toolbar While Hidden by Default

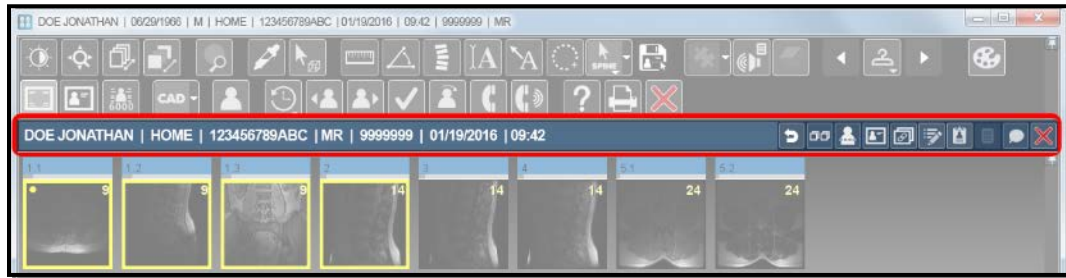
- Clicking on the Access Toolbar icon again or clicking anywhere else in the Viewer Window will cause the Application Toolbar to be hidden again.
- Once temporarily displayed, the Application Toolbar can be pinned back into place (*i.e.*, so that it is displayed by default) by clicking on the pushpin icon again.

NOTE: Manually pinning and unpinning the toolbar will automatically toggle the selection of the **Show Application Toolbar** user preference, as described in subsection 24.1.16 below.

NOTE: When the toolbar is uninned and you click the Access Toolbar icon to display it temporarily, the toolbar will be displayed over top of the content in the window. If you then pin it, the content of the window is resized to fit it in.

4.2.3. Study Toolbar

Below the Application Toolbar is the **Study Toolbar**, as shown in the following example:



Study Toolbar

The Study Toolbar displays information about the currently open Study as well as tools that apply to that Study.

NOTE: If you are currently viewing multiple studies at once, as described in subsection 4.3.3 below, each study will have its own Study Toolbar.

a. Warning / Comments Flag



If there is a system-generated warning (e.g., with regard to jailed images) associated with this Study and/or a comment that has either been manually flagged by the commenter or entered at the ER WorkPanel, a red or green warning flag as illustrated to the left will be displayed at the far left of the Study Toolbar. The appearance of the flag will change as follows:



The Study has one or more jailed images (**Standalone** mode only).



The Study has no jailed images but the most recent comment has either been manually flagged by the commenter or was entered at the ER WorkPanel.

Note the following:

- If there is both a system-generated warning and a user comment, only the red flag will be displayed.
- Hovering your mouse over this icon will display the text of the warning (or the most recent comment if there is no warning) as a pop-up tool tip.
- Clicking on this icon will launch the **Comment Viewer** as a separate pop-up window with comments and warnings displayed, as described in Chapter 5 below.
- For details on viewing jailed images, refer to Chapter 17 below.

b. Study Information

The left side of the Study Toolbar displays the following information about the Study being viewed:

- Patient Name
- Issuer of Patient ID (IPID)
- Medical Record Number (MRN)
- Modality
- Study Description
- Accession Number
- Study Date/Time
- Current Hanging Protocol/Study Presentation (If Any)

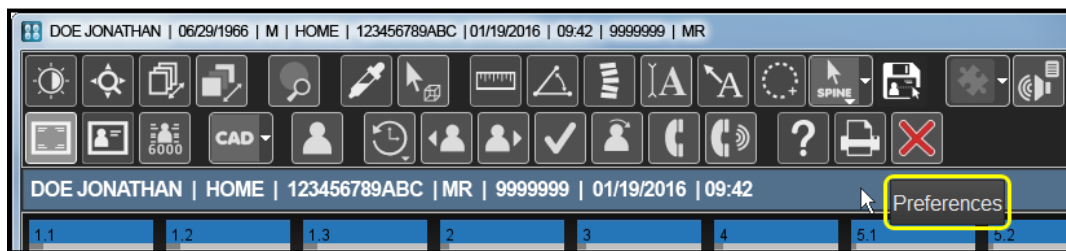
NOTE: If Merge PACS is running in Integrated mode and **Multiple Patient Identity (MPI)** is enabled, **Master IPID** and/or **Master MRN** may be displayed instead of or in addition to the local IPID and MRN. See Appendix C.2 below for information on Multiple Patient Identity support.

c. Available Tools

The right side of the Study Toolbar displays the available tools that apply to the selected Study. The actual tools that appear will depend on your login privileges and how you have configured the Toolbar (as described in paragraph d below). For a complete list of possible tools, refer to subsection 4.2.7 below.

d. Customizing the Study Toolbar

Right-clicking anywhere on the Study Toolbar will immediately cause a **Preferences** link to be displayed, as in the following example:



Study Toolbar Preferences Link

Clicking the Preferences link will take you directly to the **Study Toolbar** section of the **Merge PACS Preferences** dialog, as described in subsection 24.1.20 below, where you can customize the set of tools that appear on the Study Toolbar itself as well as configure when the tools should be displayed.

4.2.4. Series Navigation Thumbnails

Below the Study Toolbar are the **Series Navigation Thumbnails**, as shown in the following example:



Series Navigation Thumbnails

Each Series consists of one or more related images. In most cases, a Series will be equivalent to a DICOM Series sent from the modality. However, the Merge PACS Viewer has a built-in “Intelligent Ordering” feature that can arrange the images into more logical sets of images in cases such as the following:

- Multiple multi-frame images are grouped together in one Series
- Multiple echo sequences are grouped together in one Series
- Separate dual proton density images (T1 and T2) are grouped together in one Series
- Multiple CR/MG images are grouped together in one Series
- CT axial Series with overlap or scout views are grouped together in one Series

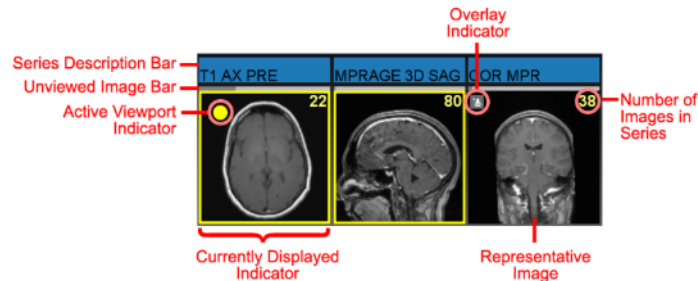
NOTE: If there are too many thumbnail images to fit the width of the screen, arrows will appear to the left and right (or top and bottom, as applicable) of the thumbnail images that you can click on to view the rest of the thumbnails. In addition, a scrollbar will be displayed directly below the thumbnail images.

NOTE: If the **Automatically Stack/Scroll MG Priors** modality preference is selected, as described in Section 24.1.11 below, any relevant prior mammography studies will automatically be loaded into the Viewer along with the primary Study and the Navigation Thumbnails for the prior studies will be displayed with the primary Study’s Navigation Thumbnails.

NOTE: If the **Show Thumbnails for Comparison Studies** user preference is selected, as described in subsection 24.1.19 below, Series Navigation Thumbnail bars for each available (“online”) relevant comparison study will automatically be displayed beside the primary study’s Series Navigation Thumbnail bar when the primary study is loaded into the Viewer, as described in Paragraph e below.

a. Thumbnail Overview

Each Series Navigation Thumbnail can display a variety of information, as illustrated in the following example:



Series Navigation Thumbnails Overview

- The **Series Description Bar** has the following features:
 - Displays the Series description associated with the Series.
 - Changes color progressively to indicate the progress of image caching from light blue (uncached) to dark blue (cached). Note that if image precaching is enabled, as described in paragraph c, below, all images will automatically begin to be cached as soon as the Series is loaded into the Merge PACS Viewer. Otherwise, individual images will be cached only when are actually viewed.
 - Allows you to select a particular image from the Series to view, as described in subsection 4.4.1, below.
- The **Unviewed Image Bar** changes color progressively to indicate how many of the images within the Series you have viewed from light gray (unviewed) to dark gray (viewed).
- A **representative image** from the Series (typically the middle image) is displayed as the body of the thumbnail.
- The **number of images** within the Series is displayed in the upper-right corner.
- An **Overlay Indicator** icon is displayed if the Series has DICOM 6000 or CAD Structured Report overlays associated with it. Note that the icon will change depending on the type of overlay.
- A **yellow border** indicates that the Series is currently displayed within a Series Viewport, as described in subsection 4.2.5, below.
- A **yellow dot** indicates that the Series is displayed in the active Series Viewport, as described in subsection 4.2.5, below.

b. Thumbnail Right-click Menu



The Thumbnail Right-click Menu

Right-clicking on an individual Series Navigation Thumbnail will immediately cause the **Series Navigation Thumbnail Right-click Menu** to pop-up, as shown in the example on the left.

Note that, depending on the type of image and your login preferences, one or more of these options may not be available.

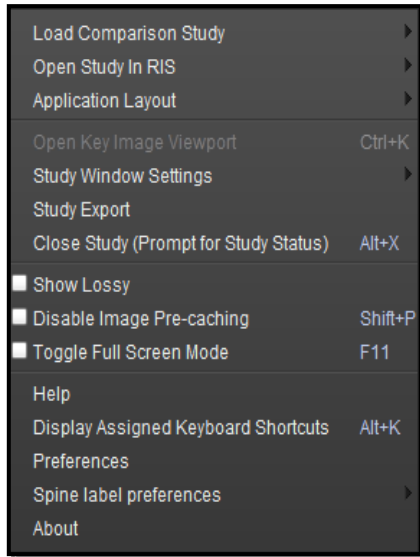
The Series Navigation Thumbnail Right-click Menu has the following possible options:

Option	General Description
Open in Window	Open the Series in a separate pop-up “clone” window, as described in subsection 4.2.6 below.
Axial MIP	Display this Series as a single Axial MIP 3D view, as described in Chapter 4.8 below.
Sagittal MIP	Display this Series as a single Sagittal MIP 3D view, as described in Chapter 4.8 below.
Coronal MIP	Display this Series as a single Coronal MIP 3D view, as described in Chapter 4.8 below.
3D Volume	Display this Series as a single Color Volume Rendering (CVR) 3D view, as described in Chapter 4.8 below.
Axial MPR	Display this Series as a single Axial MPR 3D view, as described in Chapter 4.8 below.
Sagittal MPR	Display this Series as a single Sagittal MPR 3D view, as described in Chapter 4.8 below.
Coronal MPR	Display this Series as a single Coronal MPR 3D view, as described in Chapter 4.8 below.
MPR Viewport	Create a 2x2 Multi-Planar Reconstruction (MPR) Window for this Series, as described in Chapter 4.8 below.

NOTE: If this Series needs to be split before it can be displayed and you have disabled automatic splitting of CT and/ MR Series, as described in Chapter 24 below, clicking on any of the 3D-related options described above will display a set of thumbnail images that will allow you to choose the image set you want to be displayed.

Thumbnail Size	Change the size of the Series Navigation Thumbnails.
-----------------------	--

c. Study Right-click Menu



The Study Right-click Menu

The Series Navigation Thumbnails area includes a blank space at the far right, as in the following example:



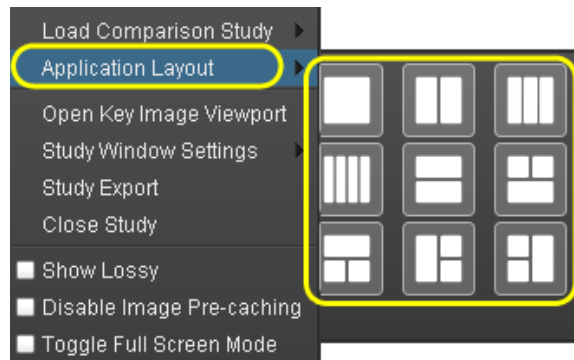
Accessing the Study Right-click Menu

Right-clicking on the blank space will immediately cause the **Study Right-click Menu** to pop-up, as shown in the example on the left.

Note that, depending on the Study and the type of modality involved, your login privileges, and your general system configuration, one or more of these options may not be available.

The Study Right-click Menu has the following possible options:

Option	General Description
Load Comparison Study	Select from a list of available comparison studies that can be opened within the Merge PACS Viewer alongside the currently open Study or studies, as described in subsection 4.4.4 below.
Open Study in RIS	If your system is configured to provide Bi-directional XML Integration with a 3 rd -party RIS with the "When opening a Prior study in RIS" option enabled, this option allows you to select from a list of available prior studies, if any, that can be added to the current Study that is being dictated within the RIS, if the RIS supports this feature.
Application Layout	Select the general layout for viewing multiple studies:



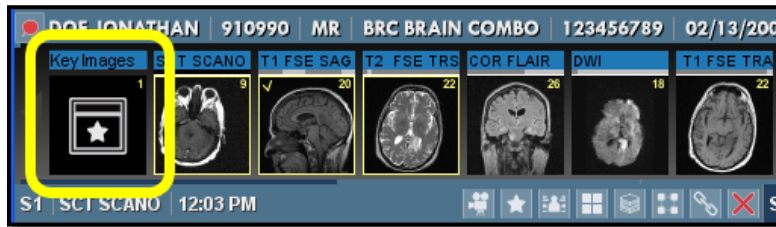
Selecting the Application Layout

Option	General Description														
Open Key Image Viewport	Displays all key images for this Study in a separate pop-up Key Image Viewport window, as described in Section 4.11 below.														
Study Window Settings	Change any of the following Study-level settings: <table border="1"> <thead> <tr> <th>Option</th> <th>General Description</th> </tr> </thead> <tbody> <tr> <td>DICOM Overlay Toggle Study Level</td> <td>Toggles on and off the DICOM Overlay for all Series Viewports for this Study described in subsection 4.5.9 below.</td> </tr> <tr> <td>Show Hide 2D Annotations</td> <td>Toggles on and off the display of annotations for all 2D Series Viewports for this Study</td> </tr> <tr> <td>Show Cross-reference Lines</td> <td>Toggles on and off the display of reference lines for all Series Viewports for this Study described in subsection 4.4.2.c below</td> </tr> <tr> <td>Study Invert Toggle</td> <td>Reverse the black and white pixels of images in the all Series Viewports for this Study described in subsection 4.5.12 below</td> </tr> <tr> <td>Slice Position Indicator Toggle</td> <td>Toggles on and off display of the slice position indicator for breast tomosynthesis images in all Series Viewports for this Study, as described in subsection 4.9.14 below. Note that this option is only available when viewing breast tomosynthesis images.</td> </tr> <tr> <td>Study Window Layout</td> <td>Allows you to set the Series layout for this Study as described in subsection 4.3.2.a below</td> </tr> </tbody> </table>	Option	General Description	DICOM Overlay Toggle Study Level	Toggles on and off the DICOM Overlay for all Series Viewports for this Study described in subsection 4.5.9 below.	Show Hide 2D Annotations	Toggles on and off the display of annotations for all 2D Series Viewports for this Study	Show Cross-reference Lines	Toggles on and off the display of reference lines for all Series Viewports for this Study described in subsection 4.4.2.c below	Study Invert Toggle	Reverse the black and white pixels of images in the all Series Viewports for this Study described in subsection 4.5.12 below	Slice Position Indicator Toggle	Toggles on and off display of the slice position indicator for breast tomosynthesis images in all Series Viewports for this Study, as described in subsection 4.9.14 below. Note that this option is only available when viewing breast tomosynthesis images.	Study Window Layout	Allows you to set the Series layout for this Study as described in subsection 4.3.2.a below
Option	General Description														
DICOM Overlay Toggle Study Level	Toggles on and off the DICOM Overlay for all Series Viewports for this Study described in subsection 4.5.9 below.														
Show Hide 2D Annotations	Toggles on and off the display of annotations for all 2D Series Viewports for this Study														
Show Cross-reference Lines	Toggles on and off the display of reference lines for all Series Viewports for this Study described in subsection 4.4.2.c below														
Study Invert Toggle	Reverse the black and white pixels of images in the all Series Viewports for this Study described in subsection 4.5.12 below														
Slice Position Indicator Toggle	Toggles on and off display of the slice position indicator for breast tomosynthesis images in all Series Viewports for this Study, as described in subsection 4.9.14 below. Note that this option is only available when viewing breast tomosynthesis images.														
Study Window Layout	Allows you to set the Series layout for this Study as described in subsection 4.3.2.a below														
Study Export	Add the selected Study (together with any priors) to the Burn CD/DVD dialog's Study List. Note that multiple studies from multiple patients can be added to the same Burn CD/DVD Study List. For details on burning patient images onto a CD/DVD, see Chapter 13 below.														
Close Study	Close the current Study.														
Show Lossy	If you have the login privilege to view lossless images, selecting this option will temporarily stop additional lossless images from being downloaded and will cause lossy-compressed images to be downloaded instead. Note that any change to this option will be effective for the duration of your current Merge PACS Workstation session (<i>i.e.</i> , until you log out and log back in). For details on using lossy vs. lossless images, see Section 4.15 below.														
Disable Image Pre-caching	If you have the login privilege to allow background caching, selecting this option will temporarily stop additional images from being cached in the background. Selecting it again will cause background caching to resume. Note that any change to this option will be effective for the duration of your current Merge PACS Workstation session (<i>i.e.</i> , until you log out and log back in).														
Toggle Full Screen Mode	Display the current Study in full-screen display mode with all non-image details hidden.														

Option	General Description
Help	Launches this User Guide in PDF format.
Display Assigned Keyboard Shortcuts	Displays a printable list of currently assigned keyboard shortcuts in a separate pop-up window.
Launch Thumbnail Viewer	Opens the Mammography Thumbnail Viewer in a separate pop-up window (mammography images only). For details on using the Thumbnail Viewer, see Chapter 4.9 below.
Preferences	Allow you to set your personal Viewer preferences as described in Chapter 24 below.
About	Displays system information, including the current version of the Merge PACS Workstation you are using, your Windows operating system and username, memory and disk usage, etc. For more information, refer to Chapter 25 below.

d. Key Image Series Navigation Thumbnail

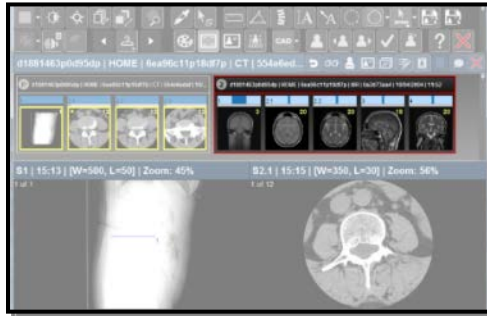
If there are any key images that have been flagged for this exam, the first Navigation Thumbnail will be a special Key Image Series Navigation Thumbnail, as in the following example:



Key Image Navigation Thumbnail

e. Series Navigation Thumbnails for Comparison Studies

If the **Show Thumbnails for Comparison Studies** user preference is selected, as described in subsection 24.1.19 below, Series Navigation Thumbnail bars for each available (“online”) relevant comparison study will automatically be displayed beside the primary study’s Series Navigation Thumbnail bar when the primary study is loaded into the Viewer, as in the following example:



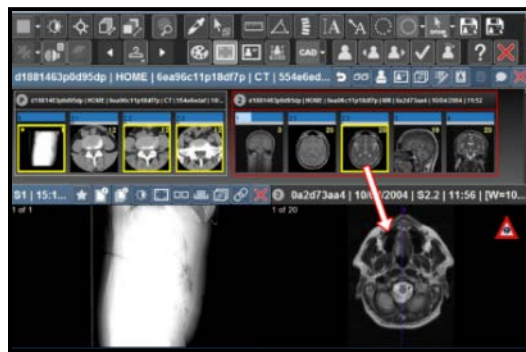
Series Navigation Thumbnail Bar for a Comparison Study

NOTE: The thumbnail bars for any prior studies will be bordered in red.

NOTE: The order in which the comparison studies are displayed is controlled by the **Show Unread Studies First** preference, as described in subsection 24.1.19 below.

NOTE: The determination of whether a study qualifies as a comparison study is based on the Patient Comparison Strategy and “Selection of Priors” option configured for your site, as well as Multiple Patient Identity (if MPI is enabled for your site), as described in Appendix C below.

- This will allow you to drag a thumbnail from a comparison study into an available viewport without needing to change the study layout first, as in the following example:



Series Navigation Thumbnails for a Comparison Study

NOTE: Series from comparison studies will be displayed with a red warning triangle, as in the example above, to indicate that they are not part of the primary study.

- When the **Show Thumbnails for Comparison Studies** user preference is selected, each thumbnail bar (including those for the primary study) will include a **Thumbnail Titlebar** that will contain study and series demographic information, as in the following example:



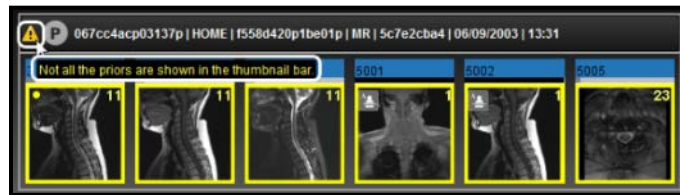
Series Navigation Thumbnail Titlebars

- The actual demographic information displayed on the Thumbnail Titlebar is configurable as a user preference on a modality-by-modality basis, as described in subsection 24.1.12 below.
- If there is too much information to fit on the Thumbnail Titlebar, you can hover your mouse cursor over the Titlebar to display the information as pop-up text, as in the following example:



Series Navigation Thumbnail Demographic Pop-up Information

- The thumbnails for comparison studies operate exactly the same as those for the primary study (e.g., you can double-click to display the series in a separate pop-up window and right-click to display a Thumbnail Right-click Menu).
- If there are too many thumbnail bars to be displayed on the screen at once, they will automatically scroll to display the thumbnails that apply to the active viewport.
- By default, Series Navigation Thumbnails for up to ten comparison studies can be displayed at once, but this number is configurable on a site-by-site basis. If there are additional comparison studies whose thumbnails are not currently displayed, a special warning icon will appear on the primary study's Thumbnail Titlebar, as in the following example:

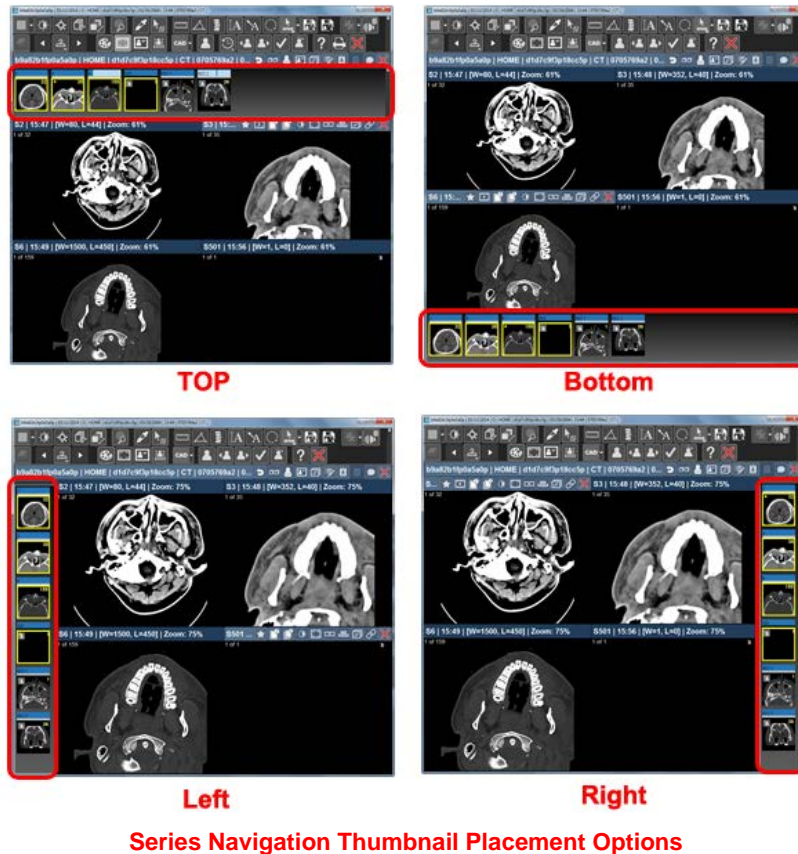


Not All the Priors Are Shown in the Thumbnail Bar

Hovering your mouse cursor over the warning icon will display the text, "Not all the priors are shown in the thumbnail bar," as in the example above.

f. Customizing the Display of the Series Navigation Thumbnails

You can configure whether the Series Navigation Thumbnails are visible or hidden by default from the Merge PACS Preferences dialog, as described in subsection 24.1.19 below, as well as configure the whether they appear at the top, bottom, left or right of the Viewer window, as in the following example:



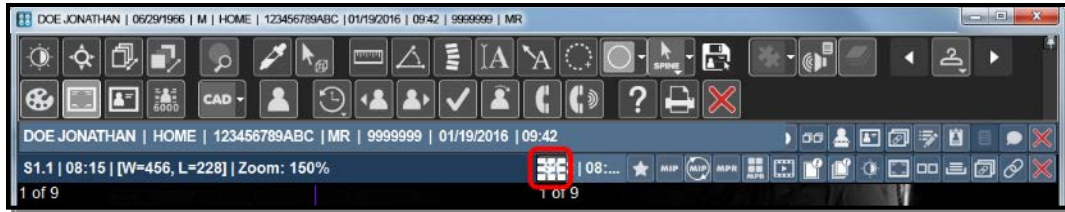
g. Hiding/Accessing the Series Navigation Thumbnails

By default, the Series Navigation Thumbnails will be visible at all times. If desired, however, you can “unpin” the thumbnails so that they will be hidden by default instead. This is done by clicking on the pushpin at the upper-right corner of the Series Navigation Thumbnails section, as in the following example:



Pushpin Icon

Once you have uninned the thumbnails, hovering your mouse cursor near any of the edges of the Viewer Window will cause a special **Access Thumbnails** icon to appear near where the thumbnails are located, as in the following example:



Access Thumbnails Icon

NOTE: If desired, you can click and drag the Access Thumbnails icon to the left or right (or up and down, as applicable) to improve visibility.

Clicking on the Access Thumbnails icon will cause the Series Navigation Thumbnails to be temporarily displayed, as in the following example:



Temporary Display of the Series Navigation Thumbnails While Hidden by Default

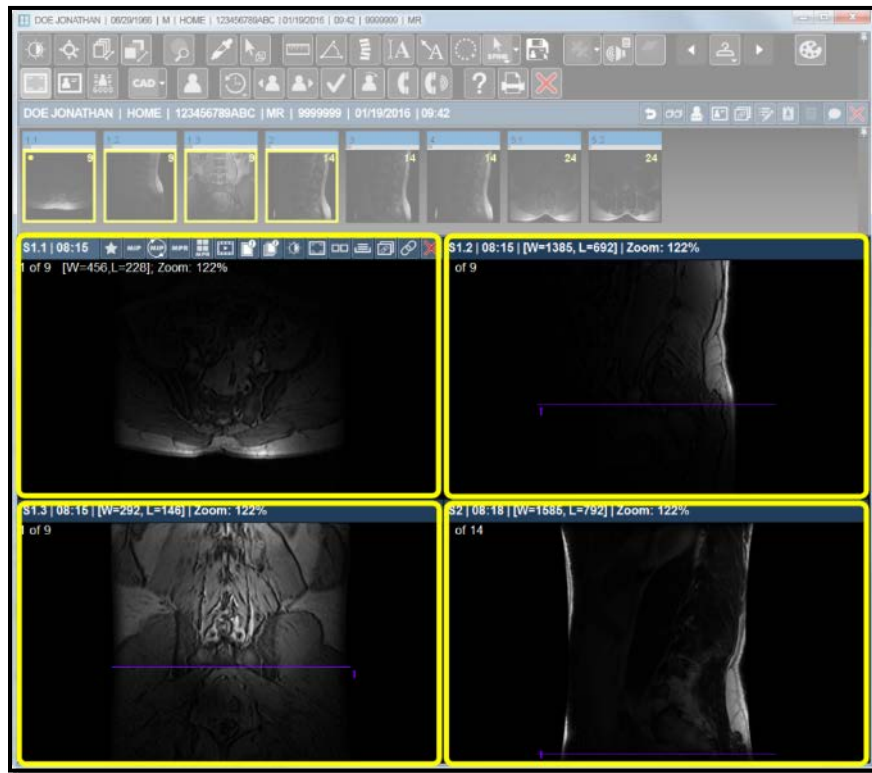
- Clicking on the Access Thumbnails icon again or clicking anywhere else in the Viewer Window will cause the Series Navigation Thumbnails to be hidden again.
- Once temporarily displayed, the Series Navigation Thumbnails can be pinned back into place (*i.e.*, so that they are displayed by default) by clicking on the pushpin icon again.

NOTE: Manually pinning and unpinning the thumbnails will automatically toggle the selection of the **Show Thumbnails** user preference, as described in subsection 24.1.19 below.

NOTE: When the thumbnails are uninned and you click the Access Thumbnails icon to display it temporarily, the thumbnails will be displayed over top of the content in the window. If you then pin them, the content of the window is resized to fit in.

4.2.5. Series Viewports

The Merge PACS Viewer can be divided into a number of individual viewing windows called “Series Viewports,” as shown in the following example:



Series Viewports

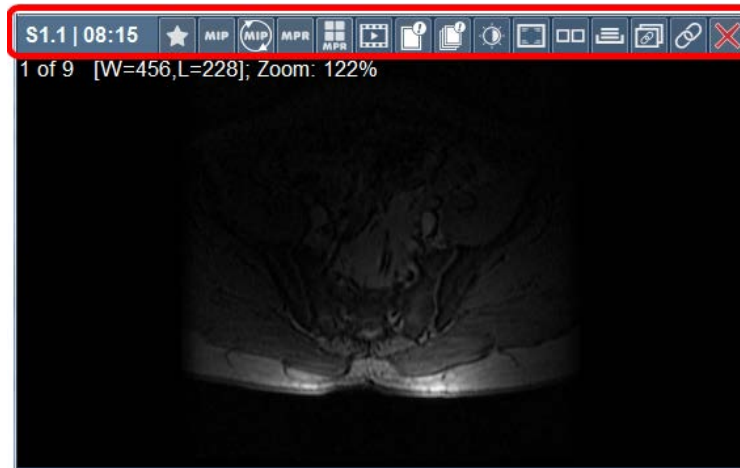
Each Series Viewport can display a separate Series, and the same Series can be displayed in multiple Series Viewports (e.g., to see the same Series with different window/level values).

The number and layout of the Series Viewports that are displayed when a Study is first opened depends on what screen layout you have selected using the various layout tools, whether there is a Hanging Protocol or Study Presentation associated with this Study, and how the default layout preferences have been configured.

If you have multiple Series Viewports open, many of the available image manipulation tools will only affect the images in the **active Series Viewport** (i.e., the Series Viewport where the mouse cursor is currently located). The active Series Viewport will have its toolbar, as described below, highlighted.

a. Series Toolbar

At the top of each Series Viewport is the **Series Toolbar**, as shown in the following example:

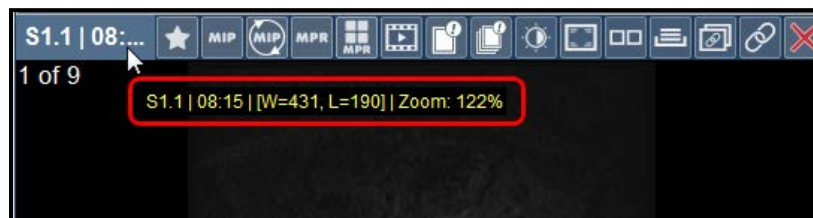


Series Toolbar

The Series Toolbar displays information for the Series in the Series Viewport as well as various tools that apply to that Series Viewport:

- By default, the left side of the Series Toolbar displays the following information about the Series:
 - **Series Number**
 - **Series Description**
 - **Series Time**
 - **Window/Level**
 - **Zoom Factor**

If the size of the viewport is too small to include all the information described above, it can still be viewed as a “tool tip” by hovering your mouse briefly over the Series Toolbar without clicking, as in the following example:



Series Toolbar Tool Tip

NOTE: If the **Image-level Manipulation** option has been enabled for this Series Viewport from the **Series Right-click Menu**, as described in paragraph c below, Window/Level and Zoom factor will be displayed in the **Image Titlebar** instead, as described in paragraph b below.

- The right side of the Series Toolbar displays the available tools that apply to the Series currently being displayed in that Series Viewport. The actual tools that appear will depend on the type of image, your login privileges and how you have configured the Toolbar (as described below). For a complete list of possible tools, refer to subsection 4.2.7 below.
- Right-clicking on the Series Information section of the Series Toolbar will immediately cause a **Preferences** link to be displayed, as in the following example:

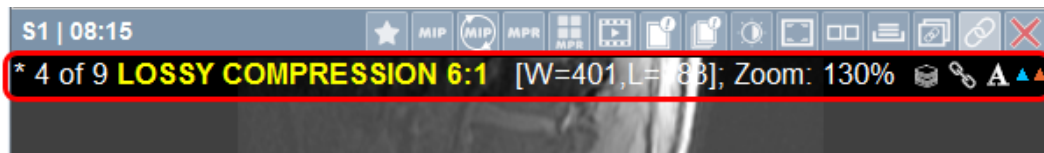


Series Toolbar Preferences Link

Clicking the Preferences link will take you directly to the **Series Toolbar** section of the **Merge PACS Preferences** dialog, as described in subsection 24.1.20 below, where you can customize the set of tools that appear on the Series Toolbar itself in a variety of different modes as well as configure when the tools should be displayed.

b. Image Titlebar

The top section of the Series Viewport displays information about the image currently showing in the Series Viewport, as in the following example:










The Image Titlebar

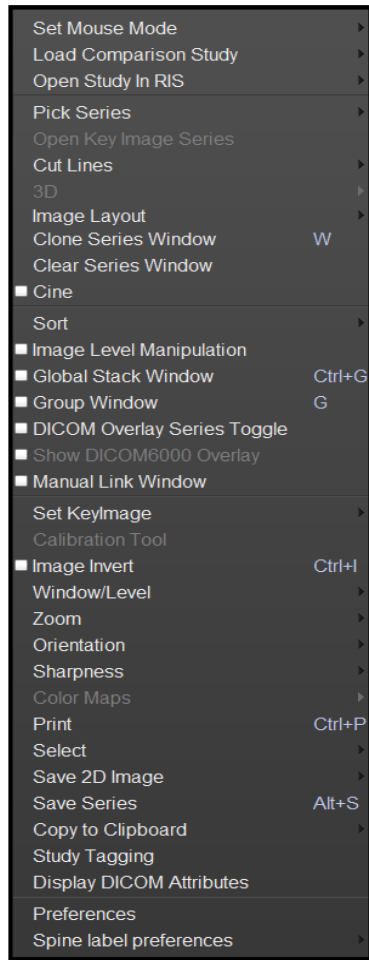
By default, the left side of the Image Titlebar will just show the image number and the compression ratio (if the image has been lossy compressed). If the Image-level Manipulation option has been enabled for this Viewport from the **Series Right-click Menu**, as described in paragraph c below, Window/Level and Zoom factor will also be displayed here.

NOTE: If an image has been compressed multiple times (“recompressed”), the highest compression ratio used will be displayed. If the highest compression ratio cannot be determined, “[LOSSY/RATIO/LOSSY COMPRESSION] UNSPECIFIED” will be displayed instead, with the actual text determined by the **Lossy Compression Overlay Text** user preference described in subsection 24.1.12 below.

The right side of the Image Titlebar will display any one or more of the following image-specific flags that apply to the image:

Flag	Name	General Description
	Global Stack	Indicates that this image is part of a series that has been globally stacked with other series, as described in subsection 4.4.1.g below.
	Linked Image	Indicates that this image is part of a series that has been manually linked with another series in the same plane for navigational purposes, as described in subsection 4.4.2.f below.
	Annotations	Indicates that this image has one or more annotations that are currently hidden, as described in subsection 4.5.15.o below.
	Key Image	Indicates that this image has been flagged as a Key Image, as described in subsection 4.9.14.h below.
	Selected Image	Indicates that this image has been selected for DICOM printing, as described in subsection 4.7.2 below.
	DFOV Matching Not Supported	Indicates that Displayed Field of View Match, as described in subsection 4.4.4.b below, cannot be applied to this image (when the DFOV Match tool is enabled) because pixel spacing information is not available.
	Calibrated Image	Indicates that this image has been manually calibrated, as described in subsection 4.5.15.q below.

c. Series Right-click Menu



The Series Right-click Menu

Right-clicking on a Series Viewport and holding the mouse button down for a few seconds will bring up the **Series Right-click Menu**, as shown in the example to the left.

The Series Right-click Menu contains a variety of additional navigation, layout, and image manipulation options, as well as the ability to save and print an image. Some of the options available on the Series Right-click Menu are also available elsewhere in the Merge PACS Viewer, and are included here for your convenience.

































Note the following:

- Depending on the Study and the type of modality involved, your login privileges, and your general system configuration, one or more of these options may not be available, in which case they will appear "grayed out" in the menu.
- If you right-click on a Series Viewport that is currently empty, the Series Right-click menu will only contain options to **Pick Study** and **Pick Series**, as in the following example:



Menu in Empty Viewport

The Series Right-click Menu has the following possible options:

Option	General Description
Set Mouse Mode	Allows you to select one of the following tools (note that your mouse cursor will change to reflect the chosen tool):
	3-in-1 Mouse Tool
	Window/Level
	Zoom/Pan Combo
	Page
	Zoom
	Pan
	Vertical Plumb Line
	Horizontal Plumb Line
	Transischial Line
	Joint Line
	Line Measurement
	Angle Measurement
	Magnify
	Dual Link Magnifier
	Binoculars
	Hot Light
	Probe
	3D Cursor
	Cobb Angle
	Calibrate
	Text Annotation
	Pointer Text
	ROI
	Circle Measurement
	Circle
	Spine Label
	Cine
	Auto Scroll
	Mask Tool*
	Free Text*
	Skimming
	ROI Window/Level

NOTE: *The **Mask Tool** and **Free Text Tool** options are for use with the **QC Editor** and will not produce annotations that can be saved when used within the Viewer. For more information, refer to the *Merge PACS 7.3 QC Editor Users Guide*.

Load Comparison Study / Pick Study

Allows you to select from a list of available comparison studies that can be opened within the Merge PACS Viewer alongside the currently open Study or studies, as described in subsection 4.4.4 below. Note that if you right-click on a Series Viewport that is currently empty, the option will be called Pick Study.

Option	General Description
Open Study in RIS	If your system is configured to provide Bi-directional XML Integration with a 3 rd -party RIS with the "When opening a Prior study in RIS" option enabled, this option allows you to select from a list of available prior studies, if any, that can be added to the current Study that is being dictated within the RIS, if the RIS supports this feature.
Pick Series	Allows you to pick a Series to be viewed in the selected Series Viewport, including Series from prior exams.
Open Key Image Series	Opens all key images for this Study as a separate Series within this Series Viewport.
3D	If applicable to this Series, allows you to select one of the following 3D options: <ul style="list-style-type: none"> • Aligned MIP (Breast Tomosynthesis Series only) • Axial MIP • Sagittal MIP • Coronal MIP • Spinning MIP (PET and Breast Tomosynthesis Series only) • 3D Volume • Axial MPR • Sagittal MPR • Coronal MPR • MPR Viewport • Crop MPR Viewport
<p>NOTE: If this Series needs to be split before it can be displayed and you have disabled automatic splitting of CT and/ MR Series, as described in Chapter 24 below, clicking on any of the options described above (except Open in Window) will display a set of thumbnail images that will allow you to choose the image set you want to be displayed.</p>	
Image Layout	Allows you to change the number of images that can be displayed simultaneously within this Series Viewport.
Clone Series Window	Display the contents of the active Series Viewport in a new pop-up Series Viewport window, as described in subsection 4.2.6 below.
Clear Series Window	Removes the Series being displayed in the selected Series Viewport
Cine	Turns on the Cine feature to rapidly page through images in a Series

Option	General Description
Sort	<p>Allows you to change the order of the images displayed in the Series Viewport according to one of the following options:</p> <ul style="list-style-type: none"> • Image Number Ascending • Image Number Descending • Image Position Ascending • Image Position Descending • Image Acquisition Time Ascending • Image Acquisition Time Descending • Image Echo Number Ascending • Image Echo Number Descending
Image Level Manipulation	<p>When selected, various image manipulation tools (Window/Level, Pan, Zoom, etc.) will only apply to the image currently displayed and will not affect other images in the Series. Also, when selected, the Viewport Title will display the Window/Level and Zoom factor for each image.</p>
Global Stack	<p>Allows you to page from the end of one Series to the beginning of the next one. See subsection 4.4.1.g below for more information.</p>
Group Window	<p>Allows you to manually link multiple Series Viewports together for display purposes. See subsection 4.5.7 below for more information.</p>
DICOM Overlay Series Toggle	<p>Turns on the DICOM Overlay display for the selected Series Viewport. See subsection 4.5.9 below for more information.</p>
Show DICOM6000 Overlay	<p>Turns on the DICOM6000 Overlay display for the selected Series Viewport. See subsection 4.5.10 below for more information.</p>
Show Slice Position Indicator	<p>Turns on the Slice Position Indicator for the selected Series Viewport (only applies to Breast Tomosynthesis images). See subsection 4.9.14 below for more information.</p>
CAD Markings	<p>Shows the DICOM structured report for the selected Series Viewport (only applies to Mammography images). See subsection 4.9.12 below for more information.</p>
Manual Link Window	<p>Allows you to link Series that are in different frames of reference (whether in the same Study or between two studies in Compare Studies Mode, as described in subsection 4.4.4 below). The Manual Linking feature can also be used if you want to link only certain related Series instead of all of them.</p> <p>See subsection 4.4.2.f below for more information on manual linking of series.</p>
Set Key Image	<p>Allows you to mark the image currently displayed in the Series Viewport as a key image (with or without a description) and launches the Key Image Viewport in a separate pop-up window.</p> <p>See Section 4.9.14.h below for more information.</p>
Calibration Tool	<p>Allows you to manually calibrate the various measurement annotations for DICOM images that do not have valid pixel spacing information associated with them when they are sent from the modality. See subsection 4.5.15 below for more information.</p>
Invert	<p>Reverse the black and white pixels of the images in the selected Series Viewport. See subsection 4.5.12 below for more information.</p>

Option	General Description
Window/Level	Choose a window/level option for the selected Series Viewport, as well as manage your personal Window/Level presets. See subsection 4.5.1 below for more information.
VOI LUT	If an image has one or more Values of Interest Lookup Tables associated with it, allows you to select the VOI LUT you wish to apply. See subsection 4.5.2 below for more information.
Zoom	Selects a magnification level for the images in the selected Series Viewport. See subsection 4.5.3 below 4.9.14.h below for more information.
Orientation	Temporarily change the orientation of the selected image (flip, rotate, etc.). See subsection 4.5.14 below for more information.
Sharpness	Applies a filter that improves the edges of certain structures within an image. See subsection 4.5.13 below for more information.
Color Maps	Choose a color mapping option, if available, for the selected Series Viewport. See subsection 4.5.11 below for more information.
Print	Send the selected image, together with any user annotations, to a printer. See subsection 4.7.2 below for more information.
Select	Select/deselect this image or Series to be sent to a DICOM printer, if available. Refer to subsection 4.7.2 below for information on DICOM printing.
Save 2D Image	Save the selected image, together with any user annotations, to your hard drive in a variety of available image formats, as described in subsection 4.7.1 below.
Save Series	Save the entire Series, together with any user annotations, to your hard drive in a variety of available image formats, as described in subsection 4.7.1 below.
Copy to Clipboard	Temporarily copies the currently displayed image to your computer's memory so that it can be pasted into another application (e.g., by pressing Ctrl-V while inside that application).
Study Tagging	Launch the Study Tagging window to add this Study to a teaching worklist, as described in Chapter 22 below.
Display DICOM Attributes	View the complete set of DICOM attributes for the selected image. See subsection 4.5.9 below for more information.
SUV Parameters	Allows you to define any missing parameters that are required to calculate SUV values (PET Series only). See subsection 4.5.17 below for more information.
Preferences	Allows you to set various personalized viewing preferences, as described in Chapter 24 below.
Spine Label Preferences	Allows you to access the Spine Label Preferences Menu , as described in Section 4.6 below.

If the **Use Toolbox Series Right-click Menu** option has been selected from the Merge PACS Preferences dialog, as described in subsection 24.1.16 below, the Series Right-Click Menu will instead contain only the active tools that are present in the mouse cycle mode for the modality from which the menu was invoked, as in the following example:



Toolbox Series Right-Click Menu

The actual tools that are included on the menu can be configured from the **Customize Mouse-Cycle Modes/Toolbox** window, as described in subsection 24.1.10 below

NOTE: When cycling through the mouse mode cycle list, the **Page** tool will only be shown if the current series window contains at least two images, regardless of how you have customized the mouse cycle modes.

4.2.6. Clone Windows

Clone windows are stand-alone Series Viewports that are displayed as separate pop-up windows. A typical use case scenario would be to position the clone window on a color monitor so as to easily view color images on that monitor when needed.

Clone windows can be invoked in two ways:











- From within an **existing Series Viewport**, by selecting the **Clone Series Window** option from the **Series Right-click Menu** for that Viewport. If invoked this way, the clone window will display the contents of that Series Viewport and preserve all the current settings of that Series Viewport (Window/Level, Zoom, etc.).
- From a **Navigation Thumbnail**, either by double-clicking on the Thumbnail or by selecting the **Open in Window** option from the **Thumbnail Right-click Menu** for that Thumbnail. Note that if you want to open additional Series in separate clone windows (as opposed to reusing the currently open clone window), hold down the **Shift** key while double-clicking.









4.2.7. Available Tools



The following tools may be available on the various toolbars within the Merge PACS Viewer, depending on the specific toolbar, how your system is configured, your login privileges and how you have configured the Toolbar (as described in Chapter 24 below).

a. General Tools

The following tools may be available on one or more toolbars:






Tool	Name	General Description
	Window/Level	Allows you to adjust the Window and Level [contrast and brightness] of an image "on the fly" by dragging the mouse cursor over the image. See subsection 4.5.1 below for more information.
	Zoom/Pan Combo	Allows you to simultaneously pan an image with the mouse cursor and resize it using the mouse center wheel. See subsection 4.5.5 below for more information.
<p>NOTE: When using the mouse center wheel to enlarge a mammography image, the image will automatically be panned so that the chest wall is against the viewport wall at all times instead of zooming in from the center of the Viewport.</p>		
	Page Images	Allows you to page sequentially ("scroll") through the images in a Series Viewport by clicking and dragging the mouse cursor up or down. See subsection 4.4.1 below for more information.
	Line Measurement	Allows you to use the mouse cursor to measure in millimeters the actual (as opposed to the displayed) distance between two points on an image, as well as mark the image with an appropriate annotation. See subsection 4.5.15 below for more information.
	Angle Measurement	Allows you to use the mouse cursor to add an angle measurement to an image. See subsection 4.5.15 below for more information.
	Cobb Angle Measurement	Allows you to use the mouse cursor to add a Cobb angle (or "Cobb's angle") measurement to an image. See subsection 4.5.15 below for more information.
	Text Annotation	Allows you to use the mouse cursor to add annotated text to an image. See subsection 4.5.15 below for more information.
	Pointer Text	Allows you to use the mouse cursor to add a labeled arrow to an image. See subsection 4.5.15 below for more information.
	ROI Measurement	Allows you to use the mouse cursor to add a statistics and area measurement display for a specified area of an image. The tool displays the minimum and maximum pixel intensity values for a selected area of an image, the average pixel value and the standard deviation for the selected region and a measurement of the selected region's area. See subsection 4.5.15 below for more information.
	VoiceClip	Launches the VoiceClip dialog that allows you to listen to, record and/or overwrite brief audio annotations that can be associated with the particular Study. Refer to Chapter 9 below for more information.















Tool	Name	General Description
	Hanging Protocol	Displays the Hanging Protocol Menu, as described in Section 4.12 below. Note that if a Hanging Protocol or Study Presentation is currently loaded, the icon will change to reflect that.
	DICOM Overlay Toggle	On the Application Toolbar , turns the DICOM Overlay display off for all Series Viewports that currently have images displayed in them. On the Study Toolbar , turns the DICOM Overlay display off for all Series Viewports in this Study that have images displayed in them. See subsection 4.5.9 below for more information.
	Toggle Annotations	Toggles the display of any existing annotations on and off. See subsection 4.5.15 below for more information.
	Toggle DICOM 6000 Overlay	Toggles the display of DICOM 6000 Overlays, if available, on and off for all Series Viewports that currently have images displayed in them. See subsection 4.5.10 below for more information.
	Toggle CADSR Overlay	Toggles the display of Computer Aided Detection Structured Reports, if available, on and off for Mammography images. See Section 4.9 below for more information.
<p>NOTE: You can also toggle the CADSR Overlay from the Series Right-click Menu, as described in subsection 4.2.5 above.</p>		
	Toggle CADSR Overlay Menu	Allows you to select one or both of the following items to display when the CADSR Overlay is enabled: <ul style="list-style-type: none"> • Show CAD Marking • Show CAD Summary If Show CAD Marking is selected and Show CAD Summary is not selected, a special icon will be displayed on the image to allow you to view the CAD Summary information, as described in subsection 4.9.12 below.
	Toggle DICOM 6000/CADSR Overlay	Default macro that toggles both the DICOM 6000 overlay and the CADSR overlay on and off for all Series Viewports that currently have images displayed in them with a single click.
<p>NOTE: Since this is a macro, the actual appearance of the icon can be customized on a site-by-site basis, as described in subsection 24.1.20 below.</p>		
	Patient Record	Toggles the display of the Patient Record off and on, as described in Section 3.7 above.






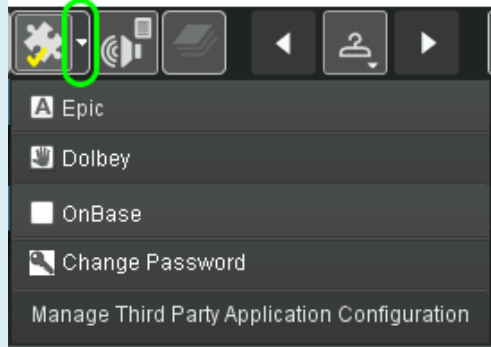
Tool	Name	General Description
		<p>NOTE: When viewing Mammography images, the Patient Record tool can also be configured to toggle display of the Mammography Thumbnail Viewer, described in subsection 4.9.1 below. The configuration is done via a user preference, as described in subsection 24.1.11 below.</p>
	Help	Launches this User Guide in PDF format.
	Exit/Close/Clear	<p>When displayed on the Application Toolbar, exits the Merge PACS Viewer.</p> <p>When displayed on the Study Toolbar, closes the Study currently being viewed and prompts you to set Study status (if applicable)</p> <p>When displayed on a Series Toolbar, removes the currently displayed Series from the Series Viewport. Note that this icon will not be available from a stand-alone Clone window, as described in subsection 4.2.6 above, nor the pop-up Rendered Volume Viewport, as described in subsection 4.8.4 below.</p>










b. Application-Specific Tools







The following tools are only available for use with the main **Application Toolbar**, as described in subsection Note: above:

Tool	Name	General Description
	ROI Window/Level	Allows you to select an area of an image for automatic Window/Level optimization. See subsection 4.5.1 below for more information.
	3-in-1 Mouse Tool	Allows you to simultaneously change the Window/Level of an image with the left mouse button, resize it with the right mouse button and pan it with the center scroll wheel. See subsection 4.5.6 below for more information.
	Zoom	Allows you to resize an image using the mouse cursor. See subsection 4.5.3 below for more information.
	Pan	Allows you to use the mouse cursor to move an image that is too big to fit entirely in the Series Viewport at the current viewing resolution. See subsection 4.5.4 below for more information.
	Auto Scroll	Allows you to page sequentially ("scroll") through the images in a Series Viewport simply by moving the mouse cursor over an image without needing to click on the mouse button. See subsection 4.4.1 below for more information.

Tool	Name	General Description
	Skim	Allows you to use the mouse cursor to rapidly scroll through all images in a Series Viewport, skipping over some images in the process if the Series contains a large number of images. See subsection 4.4.1 below for more information.
	Magnify	Allows you to enlarge selected portions of an image with the mouse cursor. See subsection 4.5.8 below for more information.
	Probe	Allows you to use the mouse cursor to determine the intensity value for a selected pixel of an image in a Series Viewport. See subsection 4.5.16 below for more information.
	3D Cursor	Allows you to click any part of an image displayed in one Series Viewport with the mouse cursor and have the images displayed in the other Series Viewports (containing orthogonal or other planes) be updated based upon the position of the cursor. See subsection 4.4.2 below for more information.
	Orthopedic Plumb Line	Allows you to add a vertical or horizontal plumb line anywhere on an image. See subsection 4.5.15 below for more information.
	Orthopedic Plumb Line Menu	Allows you to toggle between adding a horizontal or vertical plumb line. See subsection 4.5.15 below for more information.
	Orthopedic Joint Line Measurement	Allows you to measure joint angles with the assistance of a line perpendicular to the base of the angle. See subsection 4.5.15 below for more information.
	Orthopedic Transischial Line Measurement	Allows you to compare trochanted positions in images to measure and assess differential leg lengths. See subsection 4.5.15 below for more information.
	Circle Tool	For standard images, allows you to use the mouse cursor to draw a circle (either plain or measured) to an image. See subsection 4.5.15 below for more information on using the Circle and Circle Measurement tool with standard images.
	Circle Tool Preferences	Allows you to select whether the Circle Tool will draw a plain or measured circle. See subsection 4.5.15 below for more information.
	Manual Calibration	Allows you to manually calibrate the pixel spacing used by the Line Measurement Tool for a particular image. See subsection 4.5.15 below for more information.
	Spine Labeling	Allows you to use the mouse cursor to manually label vertebrae in sagittal slices and have the corresponding axial slices be automatically labeled. See Section 4.6 below for more information.
	Spine Label Menu	Allows you to access the Spine Label Preferences Menu , as described in Section 4.6 below. See Section 4.6 below for more information.
	Save Annotations	Allows you to manually save any annotations that have been added to images during the current session. See subsection 4.5.15 below for more information.





Tool	Name	General Description
	Study Layout Menu	Allows you to determine the screen layout for use when multiple studies are being displayed at the same time. See subsection 4.3.3 below for more information.
	Comparison Toggle	Once you have selected a screen layout from the Study Layout Menu, allows you to toggle between the default layout and the last selected layout. See subsection 4.3.3 below for more information.
	Displayed FOV Match	When multiple studies are being viewed simultaneously (or multiple series within a single study), allows you to link the magnification of the patient anatomy in both the primary and the comparison studies (or among the various series) so that a visual comparison of relative size of anatomical structures is possible. See subsection 4.4.4 below for more information.
	3rd-party App Sync	<p>If your system has been configured for integration with one or more third-party applications (e.g., for dictation, report, document management, etc.), the 3rd-party Application Synchronization button will allow you to synchronize the application(s) with the selected Study.</p> <p>Clicking this button will synchronize the Study with all applications, except those you have specified should not be synched, as described below.</p> <p>For additional information on using the 3rd-party Application Synchronization feature, refer to Note: below and the user documentation specific to the third-party application being used.</p>
	3rd-party App Sync Menu	<p>This allows you to define whether and how each application should be synched by clicking on the triangle to the right of the button and then clicking on the desired application(s) from the drop-down menu, as in the following example:</p>  <p style="text-align: center;">The 3rd-party Application Synchronization Menu</p> <p>In addition, this allows you to change your user name and password for integration with PowerScribe360 or Epic Hyperspace and configure the integration between Merge PACS and third-party applications.</p> <p>For additional information on using the 3rd-party Application Synchronization Menu, refer to Note: below.</p>










Tool	Name	General Description
	Previous Step	Displays the previous step of the currently applied Hanging Protocol or Study presentation, if any, as described in Section 4.12 below.
	Next Step	Displays the next step of the currently applied Hanging Protocol or Study presentation, if any, as described in Section 4.12 below.
	Toggle Color Bar	Toggles the display of the MPR Viewport Color Bar on and off, as described in subsection 4.8.2 below. Note that, when not in an MPR Viewport, a grayscale color bar will be displayed on the right side of the main Viewer in all cases, even if a color mapping option has been selected.
	Toggle DICOM 6000/CADSR Overlay	Default macro that toggles both the DICOM 6000 overlay and the CADSR overlay on and off for all Series Viewports that currently have images displayed in them with a single click.
<p>NOTE: Since this is a macro, the actual appearance of the icon can be customized on a site-by-site basis, as described in subsection 24.1.20 below.</p>		
	Merge Messenger	Launches the Merge Messenger window to send and receive instant messages to other users who are currently online, as described in Chapter 23 below. Note that the appearance of the icon will depend on your current Messenger status.
	Merge Messenger Status Menu	Displays a menu that allows you to manually change your Merge Messenger status (e.g., from online to busy), as described in Chapter 23 below. Note that the appearance of the icon will depend on your current Messenger status.
	Recently Viewed Studies	Displays a menu containing up to the 20 most recently viewed studies. Clicking on a Study will open it in a secondary Merge PACS Viewer window in read-only mode. See subsection 4.4.3 below for more information.
	Open Previous Study	Opens the previous Study on the worklist. Note that this button will not be displayed if the optional Merge RadStream component is enabled and Load Next Study Based on Acuity Score is selected as a user preference, as described in Section 21.1 below.
	Open Next Study	Opens the next Study on the worklist and prompts you to set the status of the currently open Study. Note that this button will be displayed with a red border if the optional Merge RadStream component is enabled and Load Next Study Based on Acuity Score is selected as a user preference, as described in Section 21.1 below.


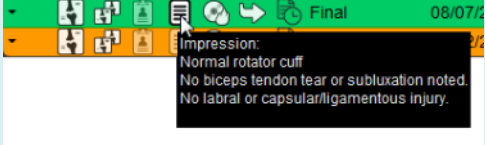


Tool	Name	General Description
	Mark Study Read	Allows you to open the next Study and mark the current Study as "Read" (this button is only available if the status of the current Study is "Unread"). Note that this button will displayed with a red border if the optional Merge RadStream component is enabled and Load Next Study Based on Acuity Score is selected as a user preference, as described in Section 21.1 below.
	Skip Study	Opens the next Study on the worklist without setting or prompting you to set the status of the currently open Study. Note that this button will not be displayed if the optional Merge RadStream component is enabled and Load Next Study Based on Acuity Score is selected as a user preference, as described in Section 21.1 below.
	Convey Results	If optional RadStream component has been enabled for your system, this sets the communication dimension status of the selected Study to Convey Results (or the equivalent status used by your site).
	Talk to MD	If optional RadStream component has been enabled for your system, this sets the connection dimension status of the selected Study to Talk to MD (or the equivalent status used by your site).
	Print DICOM	Sends selected images and/or Series to an available DICOM printer, as described in subsection 4.7.2 below.
	Help	Launches this User Guide in PDF format.

c. Study-Specific Tools

The following tools are only available for use with the main **Study Toolbar**, as described in subsection 4.2.3 above:





Tool	Name	General Description
	Reset Presentation	Resets all parameters (W/L, zoom, pan, etc.) to default values.
	Series Layout	Displays the Series Tiling Menu that allows you to select a preset Series tiling layout or enter a manual layout. This determines the number and layout of Series Viewports on the screen for this Study. See subsection 4.3.2.a below for more information.
	Cross-reference Lines	Toggles on and off the display of reference lines for all Series Viewports for this Study, as described in subsection 4.4.2.c below.
	Show Hide Annotations	Toggles the display of any annotations on and off for the entire study, as described in subsection 4.5.15.o below.






Tool	Name	General Description
	Auto Series Synchronization	Toggles Series synchronization on and off. When enabled, this will link together all Series in the same plane for navigational purposes. Thus, if you have three axial Series displayed in different Series Viewports and turn on Auto Series Synchronization, paging through the images in one of the axial Series will cause the images in the other axial Series to page as well. See subsection 4.4.2.e below for more information.
	Study Tagging	If you have the login privileges to access the optional Teaching Files feature, this will launch the Study Tagging window. See Chapter 22 below for more information.
	Associate/Dissociate Study	Allows you to add the selected Study to or remove the selected Study from a specified worklist to which you have access. See Chapter 7 below for more information.
	Set Status	Allows you to set the workflow status for the Study. See Chapter 12 below for more information.
	Access Control	Allows you to grant one or more users or groups access to the Study. See Chapter 11 below for more information.
	Order Viewer	Launch the Order Viewer in a separate pop-up window. See Chapter 5 below for more information.
	ER WorkPanel	Launch the ER WorkPanel for the selected Study in a separate pop-up window. The ER WorkPanel provides a number of different tools commonly used by Emergency Room Physicians in a single window and enables a status-driven workflow between ER physicians and radiologists. See Chapter 20 below for more information.
	Technologist WorkPanel	Launches the Technologist WorkPanel for the selected Study in a separate pop-up window. The Technologist WorkPanel provides a number of different tools commonly used by Technologists in a single window. See Chapter 19 below for more information.
	Communication WorkPanel	Launches the Communication WorkPanel for the selected Study in a separate pop-up window. The Communication WorkPanel provides a number of different tools commonly used by a Merge RadStream Operator in a single window. See Chapter 21 below for more information.

Tool	Name	General Description
	Report Viewer	<p>Launch the Report Viewer as a separate pop-up window. Depending on how your system is configured, for HTML-formatted HL7 text reports that are not addendums you may also be able to hover your mouse over the Launch Report Viewer icon to display a summary for the most recent report associated with the exam, as in the following example:</p>  <p style="text-align: center;">Report Summary</p> <p>See Chapter 6 below for more information on using the Report Viewer.</p>
	Add Study Comment	Allows you to add comments that will be associated with a study's actual images, including key images, as described in Section 5.3 below.
	Launch Comment Viewer	<p>Launch the Comment Viewer as a separate pop-up window with any comments displayed.</p> <p>See to Chapter 5 below for more information.</p>
	Apply Presentation State	<p>Allows you to select among any available foreign presentation states to be applied to the Study, without also applying any relevant Hanging Protocols or Study Presentations.</p> <p>See subsection 4.12.16 below for more information.</p>

d. Series-Specific Tools

The following tools are only available for use with the main **Series Toolbar**, as described in subsection 4.2.5 above:


Tool	Name	General Description
	Cine	Rapidly pages through the images in this Series, as described in subsection 4.4.1.f below.
	Select Image	Select/Deselect this image for use with DICOM printing, as described in subsection 4.7.2.b below.
	Select Series	Select/Deselect this Series for use with DICOM printing, as described in subsection 4.7.2.b below.
	Set Key Image	Allows you to mark the image currently displayed in the Series Viewport as a key image (with or without a description) and launches the Key Image Viewport in a separate pop-up window, as described in Section 4.9.14.h below.















Tool	Name	General Description
	Series Level DICOM Overlay Toggle	Toggles DICOM Overlay display for this Series Viewport on and off, as described in subsection 4.5.9 below.
	Image Layout	Allows you to change the number of images that can be displayed simultaneously within this Series Viewport, as described in subsection 4.3.1 below.
	Global Stack	Allows you to page from the end of one Series to the beginning of the next one, as described in subsection 4.4.1.g below.
	Grouping	Allows you to group together multiple Series Viewports so that various tools (Window/Level, Pan, Zoom, etc.) will be applied to all selected Series Viewports when applied to one, as described in subsection 4.5.7 below.
	Manual Linking	<p>Allows you to link Series that are in different frames of reference (whether in the same Study or between two studies in Compare Studies Mode, as described in subsection 4.4.4 below). The Manual Linking feature can also be used if you want to link only certain related Series instead of all of them.</p> <p>See subsection 4.4.2.f below for more information on manual linking of series.</p>

NOTE: This tool has a different function when displayed on 3D-Related Toolbars, as described in Paragraph e below.

e. 3D-Specific Tools






The following tools are only available for use with the various 3D-related toolbars, as described in Section 4.8 below:

Tool	Name	General Description
	Link to 3D	<p>When accessed via the MPR Viewer Toolbar, as described in subsection 4.8.1 below, allows you to link/unlink this Series Viewport with the Rendered Volume Viewport. When this tool is selected, transformations made to this Series Viewport (e.g., by rotating the Series in this Viewport or changing the slab thickness of the Series in the other two orthogonal Series Viewports) will affect the rendered MPR volume in the 3D Viewport.</p> <p>When accessed via the Rendered Volume Series Toolbar, as described in subsection 4.8.1 below, allows you to link this Series Viewport with the three Orthogonal Viewports. When this tool is selected, rotating the Series in this Viewport will cause the Series in the three Orthogonal Viewports to rotate in a corresponding fashion.</p>

Tool	Name	General Description
	Show MIP	Displays the rendered volume as a Maximum Intensity Projection (MIP).
	Spinning MIP	Displays the Series as a rotating Maximum Intensity Projection rendered volume in a head-to-foot orientation, as described in subsection 4.8.5 below (PET and Breast Tomosynthesis series only). Note that for Breast Tomosynthesis series, the images will be displayed in aligned view, as described in subsection 4.9.14 below.
	Show CVR	Displays the rendered volume using Color Volume rendering (CVR).
	Slab Toggle	Toggles slab mode on and off. When turned on, slab controllers that allow you to change the slab thickness with the mouse are displayed in the orthogonal Series Viewports corresponding to the orientations not currently displayed in the Rendered Volume Viewport (e.g., if the Rendered Volume Viewport is currently displaying an Axial orientation, the slab controllers will be enabled in the Sagittal and Coronal orthogonal Series Viewports).
	Increase Slab Thickness	Decreases the width of the slab currently displayed in the MPR or Rendered Volume Viewport by a small increment.
	Decrease Slab Thickness	Increases the width of the slab currently displayed in the MPR or Rendered Volume Viewport by a small increment.
	Axial Orientation	Changes the rendered volume in the MPR or Rendered Volume Viewport to an Axial orientation.
	Sagittal Orientation	Changes the rendered volume in the MPR or Rendered Volume Viewport to a Sagittal orientation.
	Coronal Orientation	Changes the rendered volume in the MPR or Rendered Volume Viewport to a Coronal orientation.
	Registration Toggle	When performing Image Fusion, as described in subsection 4.8.3 below, allows you to manually align the Series displayed in a fused MPR Viewport.
	2D Mode	Reset the view to standard 2D mode.
	Color Map Select	Displays a drop-down list of available color map options that can be applied to this Series.
	3D Create MPR Slab View	Creates a separate Multi-Planar Reconstruction (MPR) Series Viewport for this Series.
	Reset	Resets this Series Viewport to its default settings.



f. Mammography-Specific Tools


The following tools are available specifically for use with Mammography images (including Breast Tomosynthesis images), as described in Section 4.9 below:

Tool	Name	General Description
	Binocular Tool	Allows you to use the mouse cursor to display only the part of the image within the tool's viewing area for a pair of related side-by-side mammography images; the rest of the images will be shuttered/remain hidden. Note that this tool can be added to both the Mammography Thumbnail Viewer Toolbar and the main Application Toolbar . See subsection 4.9.8 below for more information.
	Hot Light	Allows you to use the mouse cursor to display the part of the image within the tool's viewing area with a percentage increase in intensity; the rest of the image will be displayed with the original Window/Level values. Note that this tool can be added to both the Mammography Thumbnail Viewer Toolbar and the main Application Toolbar . See subsection 4.9.9 below for more information.
	Dual Link Magnifier	Allows you to use the mouse cursor to simultaneously magnify a selected region of a pair of related side-by-side mammography images. Note that this tool can be added to both the Mammography Thumbnail Viewer Toolbar and the main Application Toolbar . See subsection 4.9.10 below for more information.
	Dual Link Magnifier Preferences	Allows you to select whether you want the Dual Link Magnifier to display in Normal or Invert mode by default. See subsection 4.9.10 below for more information.
	Paired Invert	Apply Intelligent Invert to paired mammography images, as described in subsection 4.9.5 below. Note that this tool can only be added to the Series Toolbar .

g. Key Image-Specific Tools

The following tools are only available for use with the **Key Image Series Toolbar**, as described in Section 4.11 below:

Tool	Name	General Description
	Create Key Image Collage	Create a new key image showing the existing key images combined into a single collage image, as described in subsection 4.11.5 below.
	Send Key Images	Sends all key images to an available DICOM device, as described in subsection 4.11.6 below.

Tool	Name	General Description
	Add Study Comments	Allows you to add comments that will be associated with all of a study's images, including key images, as described in subsection 4.11.7 below.

4.3. Changing the Screen Layout

From within the Merge PACS Viewer you can view:

- Multiple images in a Series simultaneously in a single Series Viewport
- Multiple Series from one or more studies simultaneously in multiple Series Viewports (or one Series in multiple Series Viewports)
- Multiple studies side-by-side in separate Study Windows.

NOTE: Once you have opened multiple Series Viewports, you can choose a different Series to appear in each Series Viewport by using the navigation tools described in Section 4.4 below.

4.3.1. Viewing Multiple Images in a Single Viewport

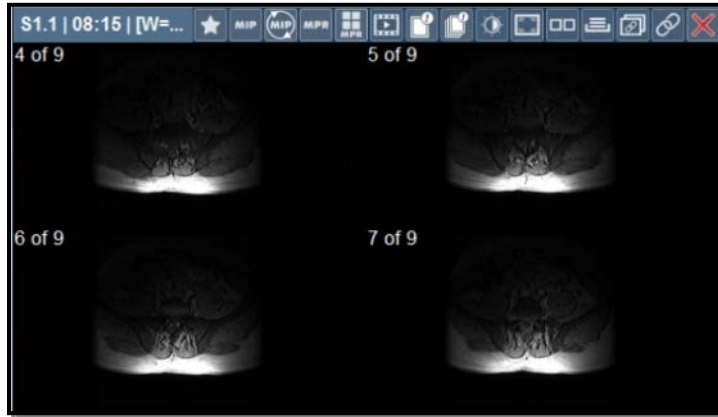


Clicking on the **Image Layout** button on the **Series Toolbar**, as shown on the left, will cause a drop-down **Image Layout Menu** to appear, similar to the figure below:



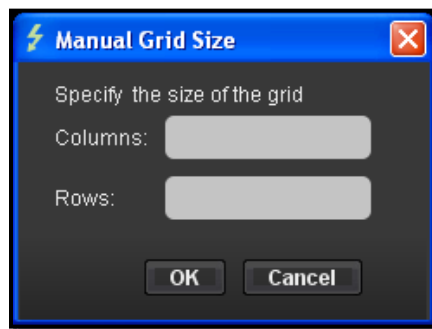
The Image Layout Menu

- Selecting a layout option other than 1x1 will cause multiple Series images, if there is more than one, to be displayed within the Series Viewport, as in the following example:



Multiple Image Layout

- For each option in the Image Layout Menu, the numbers indicate the number of images displayed per column and row. For example, 3x3 would indicate a layout of three columns and three rows, and 7x6 would indicate a layout of seven columns and six rows.
- Clicking on the **Manual** option in the Image Layout Menu will bring up the following window that will allow you to specify a particular image layout other than one listed in the menu:



Manually Setting an Image Layout

4.3.2. Viewing Multiple Series in Separate Viewports

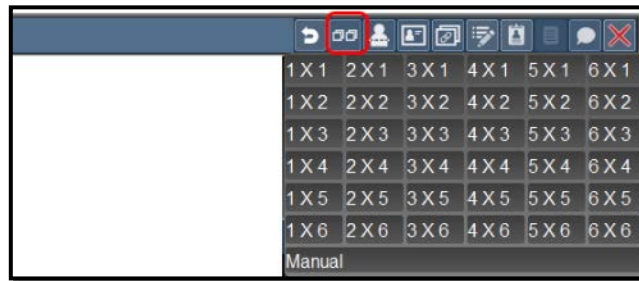
You can divide the main Merge PACS Viewer into multiple Series display windows or “Series Viewports.” If you are viewing a Study with more than one Series of images, this will allow you to view some or all of the Series simultaneously. You can also view the same Series in multiple Series Viewports (e.g., to see the same Series with different window/level values).

Only one Series Viewport at a time can be “active” (i.e., can be affected by the various image manipulation and display tools), but any changes you make to the images in one Series Viewport will be preserved when you move to another Series Viewport. This means that each Series Viewport can have a different Window/Level setting, image layout, etc.

a. Series Layout Menu



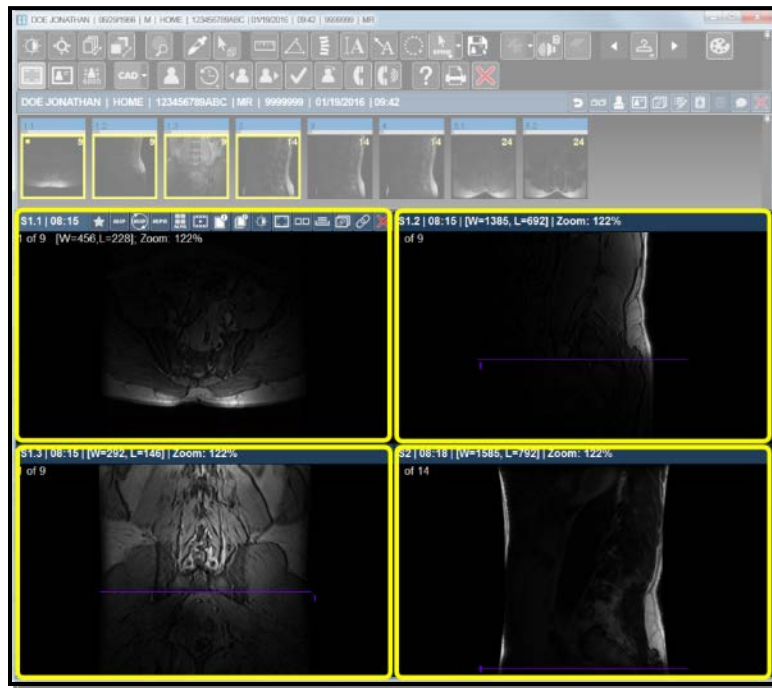
Clicking on the **Series Layout** button on the **Study Toolbar**, as shown on the left, will bring down a **Series Layout Menu** that allows you to select a custom Series tiling layout:



Series Layout Menu

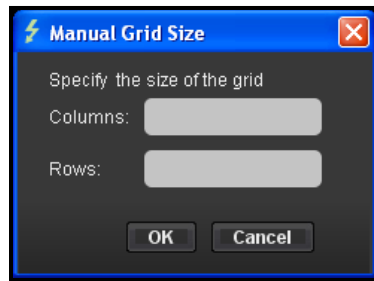
NOTE: The number of options available from the Series Layout Menu is configurable from the Merge PACS Preferences dialog, as described in subsection 24.1.16 below

- Selecting a layout option other than 1x1 will cause multiple Series Viewports to be displayed within the main Study Window, as in the following example:



Multiple Viewports

- For each option in the Series Layout Menu, the numbers indicate the number of Series Viewports displayed per column and row. For example, 2x2 would indicate a layout of two columns and two rows, and 4x4 would indicate a layout of four columns and three rows.
- Clicking on the **Manual** option in the Image Layout Menu will bring up the following window that will allow you to specify a particular image layout other than one listed in the menu:



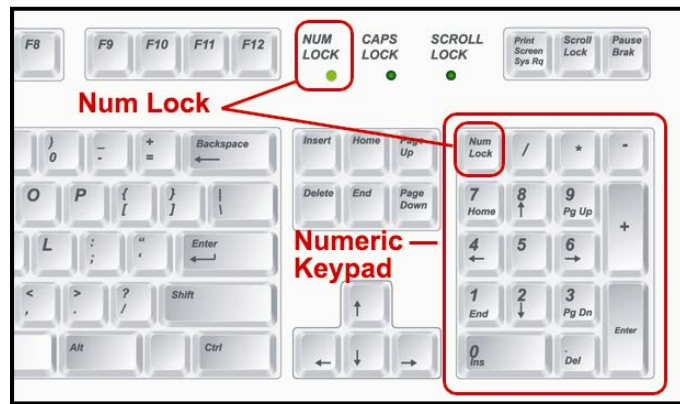
Manually Setting an Image Layout

- Double-clicking on a Series Viewport with the left mouse button will cause it to expand to fill the entire image viewing area. Double-clicking a second time will return the display to the previously selected Series layout.

NOTE: You can also set the Series Layout for the current Study from the **Study Right-click Menu** by selecting **Study Window Settings → Study Window Layout**, as described in 4.2.4.c above.

b. Keyboard Shortcuts

You can also use the **numeric keypad** (typically on the right side of your keyboard) to select among various preset Series layouts, as described below. Keep in mind that these shortcuts are only available from the numeric keypad (the regular keyboard numbers are used for Window/Level presets) and that the **Num Lock** button on your keyboard must be engaged, as shown in the following example:



The Numeric Keypad and the Num Lock Key

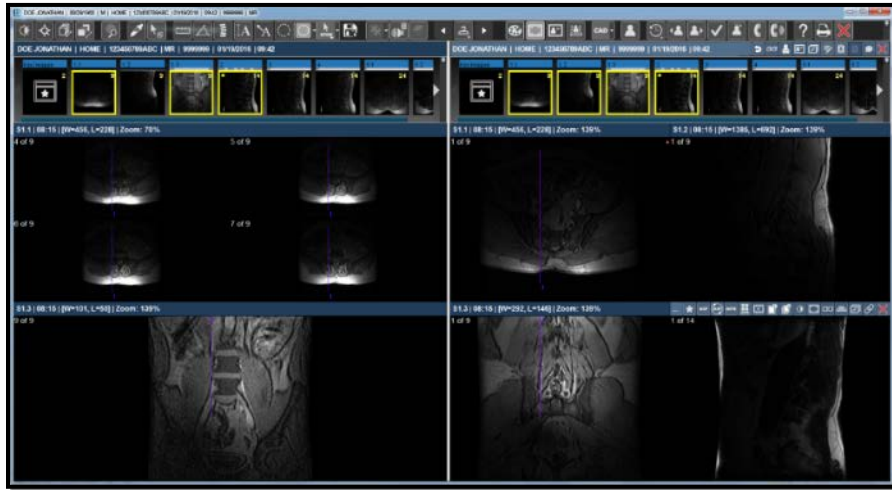
The available shortcuts from the numeric keypad are as follows:

Keystroke	Layout
1	Columns = 1; Rows = 1 (1x1)
2	Columns = 2; Rows = 1 (2x1)
3	Columns = 3; Rows = 1 (3x1)
4	Columns = 2; Rows = 2 (2x2)
5,6	Columns = 3; Rows = 2 (3x2)
7,8	Columns = 4; Rows = 2 (4x2)
9	Columns = 3; Rows = 3 (3x3)
0	Columns = 4; Rows = 3 (4x3)

NOTE: In order for the keyboard shortcuts to work, your mouse cursor must be over a Series Viewport that is not empty.

4.3.3. Comparing Multiple Studies

The Merge PACS Viewer can display two or more different studies for the same patient in multiple viewing panels within the main Image Viewing Window, as in the following example:



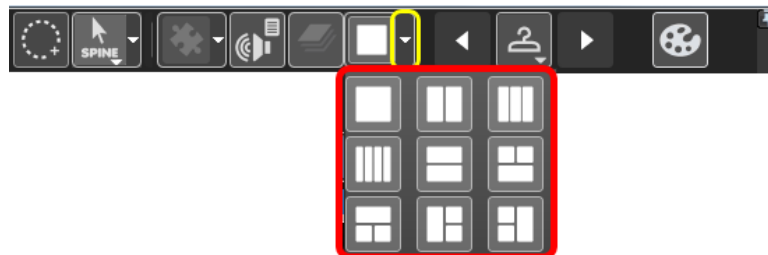
Two Studies Compared Side-by-Side

Each Study can be displayed with its own Window/Level setting, image layout, Series layout, etc. You can also open multiple instances of a single Study, and each instance can have its own display settings as well.

NOTE: You can also load individual series from comparison studies into individual viewports, as described in subsection 4.4.2.b below.

a. Study Layout Menu

Clicking on the **Study Layout** arrow to the right of the **Comparison Toggle** button on the **Application Toolbar**, as shown on the left, will cause a drop-down **Study Layout Menu** to appear, similar to the figure below:



The Study Layout Menu

Each icon on the Study Layout Menu represents how the individual Study panels will be displayed. Once you have chosen a layout, you can select the studies for each panel as described in subsection 4.4.4 below.

NOTE: You do not have to select a Study layout before selecting a comparison Study. If you select a comparison Study (as described in subsection 4.4.4 below), the layout will automatically default to a side-by-side layout.

b. Comparison Toggle Button



Once you have selected a Study layout from the **Study Layout Menu**, as described in the preceding paragraph, clicking on the **Comparison Toggle** button on the **Application Toolbar**, as shown on the left, will allow you to switch between the last selected layout and the default single-Study layout.

c. Keyboard Shortcuts

You can also use the **numeric keypad** to select among various preset Study layouts, as described below. The available shortcuts from the numeric keypad are as follows:

Keystroke	Layout	Keystroke	Layout	Keystroke	Layout
Alt+0,1		Alt+2		Alt+3	
Alt+4		Alt+5		Alt+6	
Alt+7		Alt+8		Alt+9	

NOTE: In order for the keyboard shortcuts to work, your mouse cursor must be over a Series Viewport that is not empty.

4.4. Navigating through Images, Series and Studies

The Merge PACS Viewer has a number of different methods for navigating among a patient's images. You can move from one image in a particular Series to another, move from one Series of images in a Study to another, and move from one whole Study to another Study if there are multiple studies available for a patient. This is especially useful if you want to display multiple Series side-by-side or compare two different studies in separate display windows.

4.4.1. Navigating through Images in a Series

There are a variety of different ways to navigate between multiple images in a Series, each of which is described in detail below:

- **Series Navigation Thumbnails**
- **Page Images Tool**
- **Auto Scroll Tool**
- **Mouse Wheel**
- **Skimming**
- **Cine Tool**

In addition, you can also use the **Global Stacking** feature to control whether you can move directly from the images in one Series to the images in the next Series.

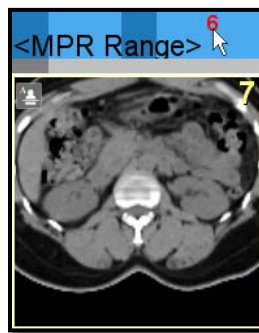
a. The Series Navigation Thumbnails

As described in subsection 4.2.4, above, each Series has a **Series Navigation Thumbnail** associated with it that is located at the top of the Merge PACS Viewer, as shown in the following example:



Series Navigation Thumbnails

By default, the first image in the Series will be initially displayed in the Viewport. To display a different image, hover your mouse over the Series Description bar and move the mouse right or left until you see a red number corresponding to the desired image, as in the following example:



Selecting an Image

You can then click on that number and drag and drop it into the desired Series Viewport.

b. The Page Images Tool



The Page Images tool, located on the **Application Toolbar** and illustrated to the left, is used to page sequentially ("scroll") through a Series of images in a particular Series. Once you have selected the Page Images tool, your mouse pointer will change to match the icon for this tool. You can then move through the Series forwards or backwards by positioning your mouse pointer over any image in a Series, clicking and holding down the left mouse button, and moving the pointer up and down.

- You can move forwards through a Series by moving the mouse from top to bottom, and you can go backwards through a Series by moving the mouse from bottom to top.
- By default, horizontal movement of the mouse is ignored. This can be changed, however, from the Merge PACS Preferences dialog, as described in Chapter 24 below. If you select to not ignore horizontal motion, you will also be able to go forwards through a Series by moving the mouse from left to right and go backwards by moving the mouse from right to left.
- This tool is also available by placing your pointer over an image and then clicking the right mouse button repeatedly until the pointer changes to the Page Images icon.
- As you use the Page Images tool to scroll through a Series, every consecutive image is displayed. For large Series, this means that you may need to release the mouse button and reposition the pointer several times to get through the entire Series. If you want to scroll rapidly through an entire Series without worrying about whether every consecutive image is displayed, use the **Skimming** feature described in paragraph e below.

NOTE: Keyboard Shortcut: When using a tool other than the various annotation tools, you can temporarily switch to the Page Images tool by pressing and holding the **Shift** key. When you release the Shift key, your cursor will return to the tool you were using previously.

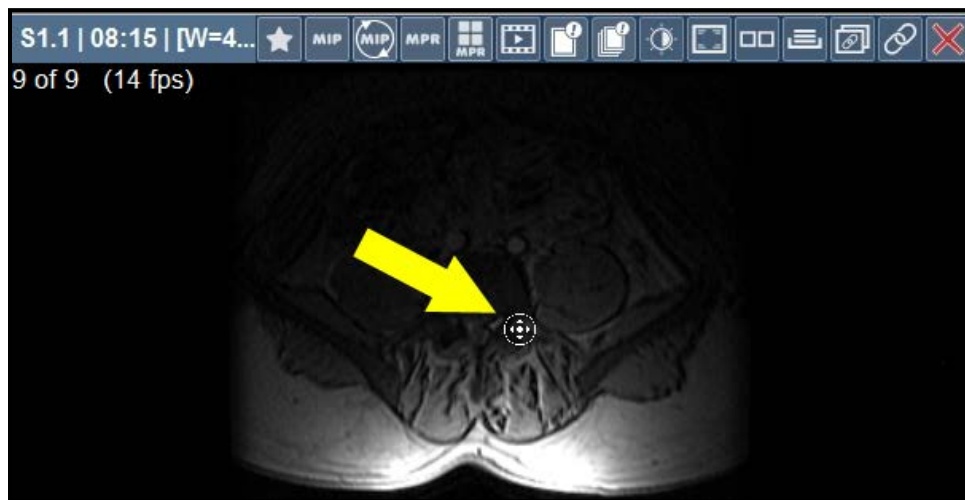
c. The Auto Scroll Tool



The Auto Scroll tool, located on the **Application Toolbar** and illustrated to the left, is used to page sequentially ("scroll") through a Series of images in a particular Series simply by moving the mouse cursor over an image without needing to hold down the mouse button. Once you have selected the Auto Scroll tool, your mouse pointer will change to match the icon for this tool. You can then move through the Series forwards or backwards by positioning your mouse pointer over any image in a Series, clicking once to activate the tool and then moving the pointer up and down.

- You can move forwards through a Series by moving the mouse from top to bottom, and you can go backwards through a Series by moving the mouse from bottom to top.

- When you first click on an image to activate the Auto Scroll tool, a marker icon is displayed on the image at the location clicked, as in the following example:



Auto Scroll Tool Marker

- As you use the Auto Scroll tool to scroll through a Series, every consecutive image is displayed. For large Series, this may take too long. If you want to scroll rapidly through an entire Series without worrying about whether every consecutive image is displayed, use the **Skimming** feature described in paragraph Note: below.

NOTE: **Shortcut:** If your mouse has a center wheel, you can activate the **Auto Scroll** feature by pressing and holding the center wheel while any other tool except for **Skimming** or **Magnify** is in use.

d. Image Navigation Using the Mouse Wheel

If your mouse is equipped with a center wheel, you can also page through the images in a Series by using that wheel. This will work regardless of what tool is currently selected, except for the following tools which have special uses for the center wheel:

- **Zoom/Pan Combo**
- **Skimming**
- **Magnify**

NOTE: Depending on your mouse, you may be able to adjust the speed at which images page by changing the properties of your mouse. From your computer's **Start Menu**, select **Control Panel** and then click on the **Mouse** option. If the Mouse Properties window includes a tab labeled "Wheel," you can change the number of lines (or images) that will be scrolled (or paged) for each notch of the wheel you roll.

e. Skimming



The Skimming tool, located on the **Application Toolbar** and illustrated to the left, allows you to use the mouse cursor to rapidly scroll through all images in a Series Viewport, skipping over some images in the process if the Series contains a large number of images. Once you have selected the Skimming tool, your mouse pointer will change to match the icon for this tool.

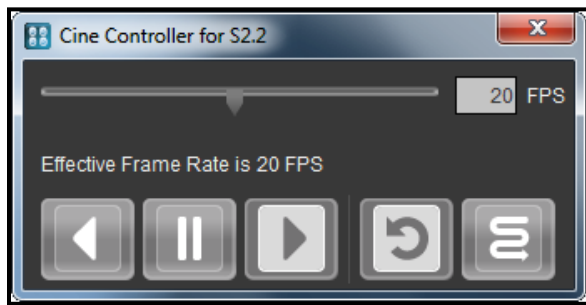
- As mentioned above, the Page Images tool displays every consecutive image in a Series, which can prove tedious when trying to scroll through Series with large numbers of images. The Skimming tool, on the other hand, can be used to rapidly scroll through all images in a Series, skipping over some images in the process if the Series contains a large number of images.
- To use the Skimming tool, position your mouse pointer at the very top or bottom of a Series Viewport click the left mouse button, and then move the mouse from to the opposite side of the Series Viewport to. You can move forwards through a Series by moving the mouse from top to bottom, and you can go backwards through a Series by moving the mouse from bottom to top.
- Depending on how your user preferences are set, as described in Chapter 24 below, you may also be able to activate the Skimming feature by pressing and holding the center wheel button on your mouse as you move the cursor across a Series Viewport, regardless of the tool that is currently selected.

f. The Cine Tool









The Cine tool, located on the **Series Toolbar** and illustrated to the left, allows you to automatically cycle through all the images in a particular Series without having to manually use the Page Images tool. Clicking the tool the first time will start cycling the images, and clicking on it a second time will stop the cycling process. Note that the speed of the cycling can be also controlled by dragging the mouse cursor up (faster) and down (slower) within the Series Viewport.

- If desired, you can press the **CTRL** button your keyboard while clicking on the Cine icon to cause a pop-up **Cine Controller** to be displayed on the screen, as in the following example:

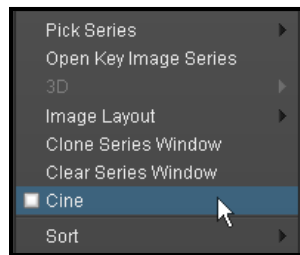


The Cine Controller

- The slide bar at the top of the controller allows you to manually set the relative speed at which the images cycle. The actual speed will depend on such factors as the size of the images in the Series, the speed of your connection to the Merge PACS server, etc.
- The Cine Controller has the following buttons available:

Button	Name	Description
	Reverse	Click to make the images cycle backwards.
	Pause	Click to temporarily stop the Cine feature without exiting it altogether.
	Forward	Click to make the images cycle forwards.
	Loop	Click to cause the images in the Series to continually cycle, starting over again at the first image after the last image is displayed.
	Bounce	Click to cause the images in the Series to continually cycle, reversing direction after the first or last image is displayed.
	Exit	Click to close the Cine Controller. Note that if you exit the Cine Controller while the images are cycling, they will continue to cycle until you click on the Cine tool again.

- The Cine Tool is also available from the **Series Right-click Menu**, as seen in the following example:



Selecting the Cine Tool from the Right-click Menu

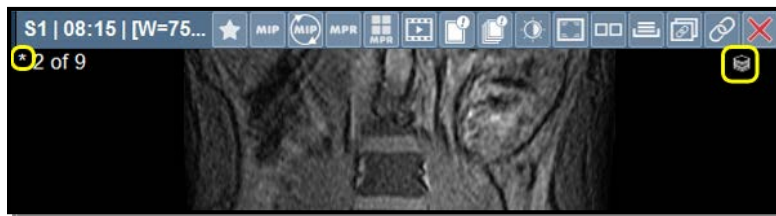
NOTE: If you select the Cine option from the Series Right-click Menu, the Cine Controller described above will automatically be displayed.

g. Global Stacking



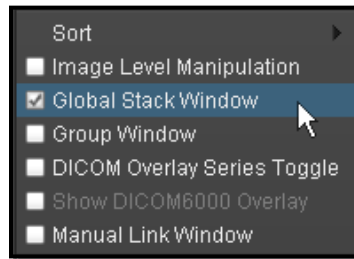
By default, when using keyboard shortcuts or the mouse wheel (as described in the preceding paragraphs) to page through images in a Series, you can only page through one Series at a time; when you reach the last image in a particular Series the arrow and page keys will have no further effect in that direction. If you would like to be able to move from the last image of one Series directly to the first image of the next Series, you can do so by selecting the Global Stacking Tool from the **Series Toolbar**.

- The Global Stack option only applies to the Series Viewport in which it was activated, and this Series Viewport will display both an asterisk to the left of the number of images and a small Global Stacking icon, as shown in the following example:



Global Stacking Enabled for this Viewport

- Global Stacking is also available by selecting the **Global Stack Window** option from the **Series Right-click Menu**, as shown in the following example:



Selecting “Global Stack Window” from the Right-click Menu

4.4.2. Navigating Among Different Series

There are a variety of different ways to navigate between multiple images in a Series, each of which is described in detail below:

- Series Navigation Thumbnails**
- The Series Right-click Menu**
- Cross-reference Lines**
- Cutlines**
- Automatic and Manual Synchronization**
- Grouping**

You can also move a Series from one image Series Viewport to another and clear a Series from a Series Viewport.

a. The Series Navigation Thumbnails

As described in subsection 4.2.4, above, each Series has a Series Navigation Thumbnail associated with it that is located at the top of the Merge PACS Viewer, as shown in the following example:



Series Navigation Thumbnails

You can use the Navigation Thumbnails to load a particular Series into a Series Viewport in any of the following ways:

- Use the left mouse button to drag and drop a Series into an existing Series Viewport.
- Double-click on a Thumbnail to open a Series in a separate pop-up “clone” window, as described in subsection 4.2.6 above. Note that, by default, there can only be one clone window open at a time; if you want to open additional Series in separate clone windows (as opposed to reusing the currently open clone window), hold down the **Shift** key while double-clicking.
- Right-click on a Thumbnail and select **Open in Window** from the **Thumbnail Right-click Menu** to open the Series in a separate pop-up “clone” window, as described in subsection 4.2.6 above.

Note the following:

- The thumbnail for each Series that is currently being displayed in a Series Viewport will be outlined with a thin yellow border.
- The thumbnail image for the Series in the currently active Series Viewport will be outlined with a thick yellow border.
- The display of Series thumbnail images can be toggled on and off from the Merge PACS Preferences dialog, as described in Chapter 24 below.

b. The Series Right-click Menu

From the Series Right-click Menu you can select a Series to be displayed in the active Series Viewport as shown in the following example:



Picking a Series from the Series Right-click Menu

- You can select a Series from the primary Study (marked with a “P”) or from any available Prior Study (marked with a number).
- When you place the mouse cursor over the desired Study, a sub-menu will appear to the right of that Study to display the individual Series.

NOTE: The list of prior studies is determined by the Patient Comparison Strategy and “Selection of Priors” option configured for your site, as well as Multiple Patient Identity (if MPI is enabled for your site), as described in Appendix C below.

NOTE: Only Series for studies that are currently online will appear in the Pick Series menu.

- If you select a Series from a prior Study, it will be displayed with a red warning triangle to indicate that it is not part of the primary Study, as in the following example:



Prior/Comparison Series Displayed in Viewport

NOTE: If some or all of the DICOM information for a Series was not correctly entered, the description for that Series may contain question marks. This does not indicate a problem with the images in the Series, however.

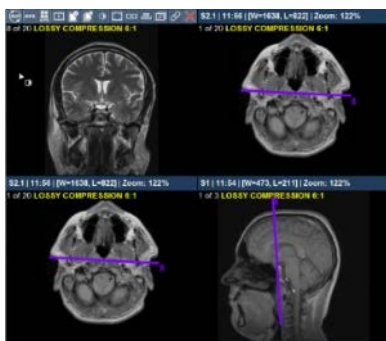
NOTE: **Dual proton density** Series (*i.e.*, MR Series where some images have one echo number and some images have another echo number) will be split into two separate Series within the Merge PACS Viewer, even though they appear as a single Series on the Query Page. Each Series will be listed on the Right-click Menu and will have the same Series description, but will be preceded by [1] and [2].

c. Cross-reference Lines

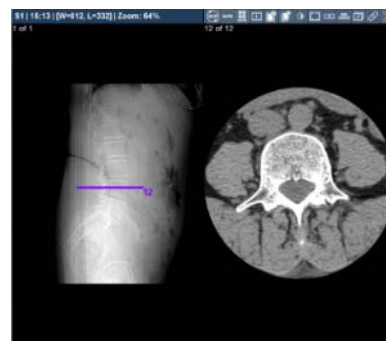


Clicking on the **Cross-reference Lines** button on the **Study Toolbar**, as shown on the left, will toggle the display of any available reference lines on and off when you are viewing multiple Series. This feature is used primarily for CT and MR images where there are sequential "slices". With CT studies, there is typically a master or "scout" image against which the images of a second Series, are referenced. With MR studies, on the other hand, there are typically multiple viewing angles of the same set of images, and the references lines will show the relationship between the linked Series.

- When the Cross-references feature is enabled, a bright purple (light gray, if using a grayscale monitor) line will appear on those Series that reference the Series in the "active" Viewport, as shown in the examples below (lines exaggerated for illustration purpose):



Reference Lines on an MR Study



Reference Lines on a CT Study

- As you page through the Series in the active Series Viewport, the reference line or lines in the other Series Viewports will move to show the corresponding position on the other images.

NOTE: You can also toggle cross-reference lines on and off from the Study Right-click Menu, as described in subsection 4.2.4.c above.

NOTE: Only those Series that reference the Series in the active Series Viewport will have a reference line displayed. If a Series does not reference the Series in the active Series Viewport, no line will be displayed.

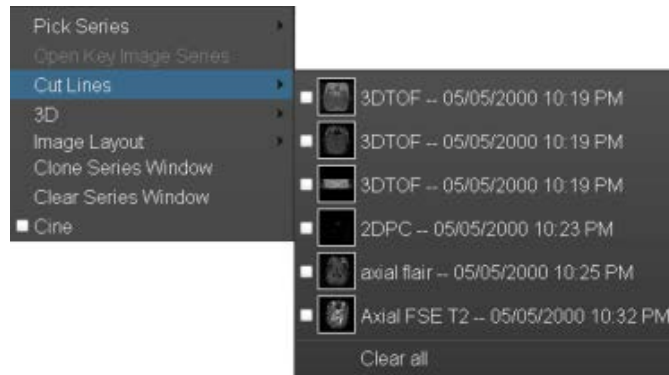
NOTE: Note that the reference lines will be always displayed in whichever Series Viewports are **not** currently active.

NOTE: By default, the "active" Viewport for the purpose of cross-reference lines is whichever Viewport the mouse cursor is currently hovering over, regardless of whether you have actually clicked on that Viewport. This behavior can be changed from the **Merge PACS Preferences dialog**, as described Chapter 24 below, however, so that you must actually click on a Viewport to make it "active" for the purpose of cross-reference lines.

d. Cutlines

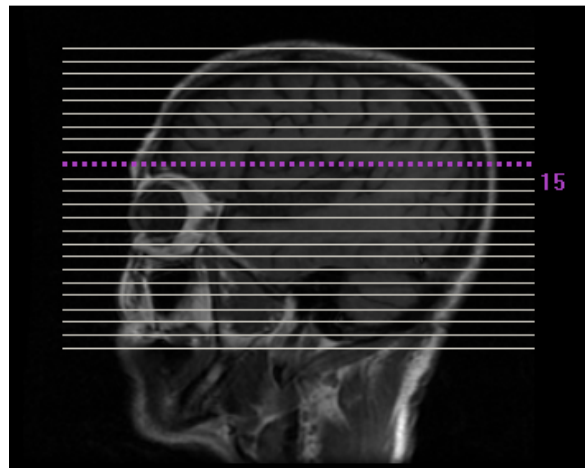
The optional Cutlines feature is similar to the Reference Lines feature described above, except that it allows you to display all the reference lines of one or more Series on a single image of another Series. As with standard Reference Lines, this feature is used primarily for CT and MR images where there are sequential "slices". With CT studies, there is typically a master or "scout" image against which the images of a second Series are referenced. With MR studies, on the other hand, there are typically multiple viewing angles of the same set of images, and the references lines will show the relationship between the linked Series.

- If the Cutlines feature has been enabled for your site it will be available via the **Series Right-click Menu**, as shown in the following example:



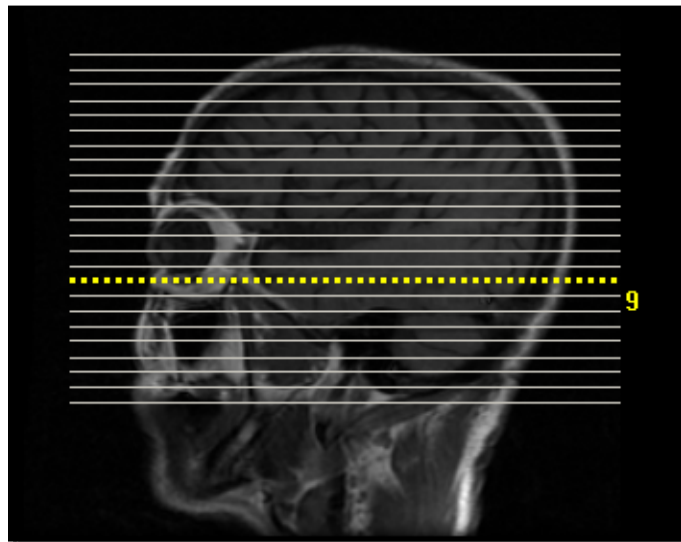
Accessing the Cutlines Feature

- To enable the Cutlines feature for the image in the active viewport, select the desired Series whose reference lines you want to display. Note that you can return to this menu and select additional Series, if available, to be shown simultaneously. Once a Series has been selected, the reference for that Series will be displayed, as in the following example:



Displaying Reference Lines for an Entire Series

- The purple dotted line acts with the mouse cursor to allow you to select a different slice. As you move your mouse over the image, the purple line will move with the mouse cursor and display the slice number. Click with the left mouse button to move to the slice currently highlighted in purple.
- Once you have selected a slice by clicking on one of the reference lines, that line will be highlighted in yellow, as in the following example:



Selected Slice

- To turn off the Cutlines feature for the image in the active viewport, deselect the Series whose reference lines you no longer wish to display. You can also select the **Clear All** option to remove the reference lines for all Series at once.

e. Automatic Series Synchronization



Clicking on the **Auto Series Synchronization** button on the **Study Toolbar**, as shown on the left, will link together all Series in the same plane for navigational purposes. Thus, if you have three axial Series displayed in different Series Viewports and turn on Auto Series Synchronization, paging through the images in one of the axial Series will cause the images in the other axial Series to page as well.

- Linked Series will page together according to their relative slice thickness. So, for example, if one linked Series has slices twice as thick as those of another linked Series, two images in the second Series will page for every one image in the first Series.
- Differences in table position among Series may also cause one linked Series to have a number of images that don't correspond to those of other linked Series. When this is the case, paging through those images will not affect the display of the other Series until you reach a common table position.
- Clicking on the **Auto Series Synchronization** button a second time will turn this feature off.

- The Auto Series Synchronization tool will only link those Series that share a common geometric frame of reference. If you need to link Series that are in different frames of reference (whether in the same Study or between two studies in Compare Studies Mode, as described in subsection 4.4.4 below), you can use the **Manual Series Synchronization** feature described in the following Paragraph. The Manual Series Synchronization feature can also be used if you want to link only certain related Series instead of all of them.

f. Manual Series Synchronization



You can manually link multiple Series that are in the same plane for navigational purposes by selecting the **Manual Link Window** from the **Series Right-click Menu** or by clicking on the **Manual Series Synchronization** button on the **Series Toolbar**, as shown on the left. Once these Series are linked, paging through the images in one linked Series will cause the images in the other linked Series to page as well.

- To link multiple Series together, click on the **Manual Series Synchronization** button for each Series. Clicking this checkbox a second time will unsynchronize the Series. Note that you can create up to three sets of synchronization links at once, one for each of the available planes.
- Once a Series has selected for manual synchronization, a special synchronization icon will be displayed in the upper right corner of the Series Viewport for that Series, as in the following example:



Manual Series Synchronization Enabled

- Manual Series Synchronization is useful for linking together Series that are in the same plane but which do not share a common geometric frame of reference, as is often the case when the patient was repositioned between Series or between studies. This is especially common when viewing two studies side-by-side in Compare Studies Mode, as described in subsection 4.4.4 below.
- A typical use case scenario would be to have two studies for a patient displayed in Compare Studies mode. You would first use the **Manual Series Synchronization** feature to link the desired pairs of axial, coronal and/or sagittal images between the two studies. You would then click on the **Auto Series Synchronization** button, as described in the preceding Paragraph, to link the rest of the Series within each Study. The result would be complete synchronization for all Series in both studies.

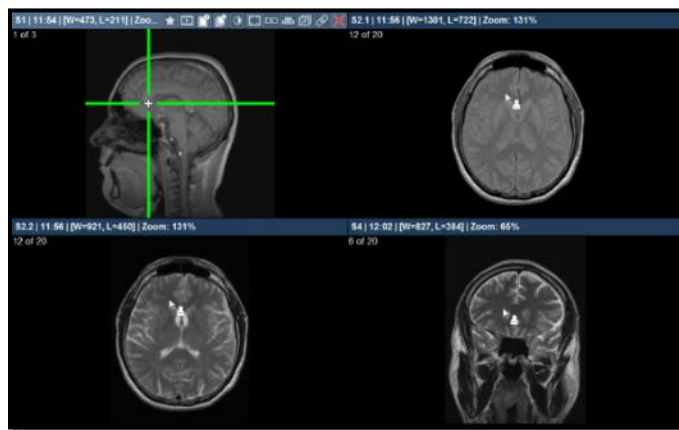
g. 3D Cursor



Clicking on the **3D Cursor** button on the **Application Toolbar**, as shown on the left, converts the mouse cursor to a special 3D cursor icon. When you click any part of an image displayed in one Series Viewport with this cursor, the images displayed in the other Series Viewports (containing orthogonal or other planes) will automatically be updated based upon the position of the cursor.

For example, in the case of a multi-Series MR Study, when the user picks a point on an axial image the location of that point in the sagittal and coronal planes will be displayed instantaneously. In addition, a marker will appear in those other Series Viewports to show the spatial relationship between the various images.

The following image shows an example of the 3D cursor being used (lines exaggerated for illustration purpose):



Using the 3D Cursor

Note that the upper left Series Viewport shows the position of the 3D cursor, while in the other three Series Viewports a special marker indicates the relative position on each image.

The 3D Cursor tool provides the following benefits:

- **Primary Function/Benefit** – Most importantly, the 3D Cursor tool can be used to set **all** planes (axial, sagittal, and coronal) to the same point that 3D cursor is placed at. When you click the left mouse button on any image, all the other planes “line up.” The 3D Cursor tool is therefore especially useful for **MRIs** with multiple slices in multiple planes.
- **Navigate quickly to area of interest** – With the 3D Cursor tool the user can click on the scout image to update the axial to the exact location of interest. For example, if you are looking at a large whole body CT for trauma and want to see the pelvic area, you can click on the pelvis/lower abdomen with the 3D Cursor tool and the axial view of this area will be updated. This eliminates using wheel/arrow/scroll tool to move through 1,000 slices to get to the area of interest.
- **Navigate by scrolling scout image** – You can also use the 3D Cursor tool as a **paging/scrolling** tool. Simply click on the 3D Cursor tool and move up/down on the scout image while holding down the left mouse button to scroll through the axial views.

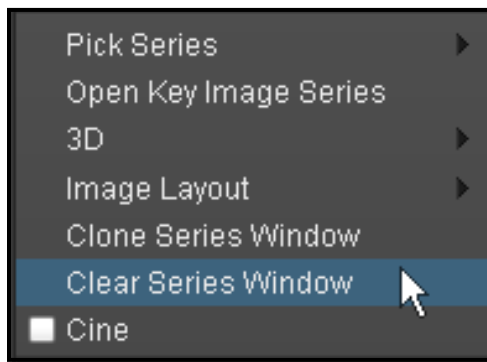
NOTE: The 3D Cursor tool is only applicable only for use in 2D viewports and not for in-place 3D viewports.

h. Moving a Series from One Viewport to Another

You can move a Series from one Series Viewport to another by clicking on the **Series Toolbar** of the Series you wish to move and, while holding the left mouse button down, moving your cursor to the Series Viewport where you wish to put the Series.

i. Removing a Series from a Viewport

At any time, you can remove the Series that is currently being displayed within a Series Viewport. This is done by selecting the **Clear Series Window** option from the Series Right-click Menu, as shown in the following example:



Clearing a Viewport

4.4.3. Selecting a Different Study





There are a variety of different ways to navigate between multiple studies within the Merge PACS Viewer, each of which is described in detail below:

- **Worklist Navigation Buttons**
- **Recently Viewed Studies Menu**
- **Patient Record**
- **Rapid Review**

NOTE: You can also compare multiple studies simultaneously, as described in subsection 4.4.4 below.

a. Worklist Navigation Buttons

If you accessed the Merge PACS Viewer via the RealTime Worklist as described in Section 3.2 above, the **Application Toolbar** will contain the following additional buttons that will allow you to navigate between studies on your Worklist:

Tool	Name	General Description
	Open Previous Study	Opens the previous candidate Study on the worklist.
	Open Next Study	Opens the next candidate Study on the worklist and prompts you to set the status of the currently open Study.
	Mark Study Read	Allows you to open the next candidate Study and mark the current Study as "Read" (this button is only available if the status of the current Study is "Unread").
	Skip Study	Opens the next candidate Study on the worklist without setting or prompting you to set the status of the currently open Study.

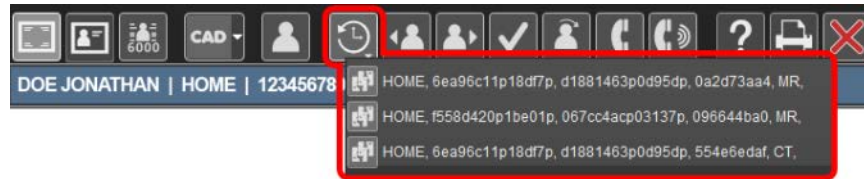
Note the following:

- A "candidate" Study is one that has viewable images, is not currently hidden (either by itself, as part of a hidden status group or as part of a hidden date group, but not just when within a hidden worklist block) and is neither locked nor reserved by another user.
- What constitutes the "next" Study is controlled by the **Get Next Study By Precedence** and **Load Next Study Based on Acuity Score** user preferences, as described in subsection 24.1.3 below.
- If the optional **Merge RadStream** component is enabled, **Load Next Study Based on Acuity Score** is selected as a user preference and **Get Next Study By Precedence** is set to **None**, the **Open Previous Study** button will not be displayed and both the **Open Next Study** and **Mark Study Read** buttons will be displayed with red borders.
- The **Mark Study Read** button will be disabled ("grayed out") if you do not have privileges to change Study status.
- If the Next or Previous Study on the worklist is currently offline, a retrieval request will be submitted as soon as you click the button. Once the retrieval process is complete, the Study will automatically open within the Viewer if no other Study was opened during the retrieval process. If another Study is opened in the Viewer while the Study is being retrieved, the previously offline Study will need to be manually opened once it is fully online.

b. Recently Viewed Studies Menu



Clicking on the **Recently Viewed Studies** icon, located on the Application Toolbar and illustrated to the left, displays a menu containing up to the 20 most recently viewed studies, as in the following example:



Recently Viewed Studies

Clicking on a Study on this menu will open that Study in a secondary Merge PACS Viewer window in **read-only** mode.

c. Patient Record



Clicking on the Patient Record icon, located on the Application Toolbar and illustrated to the left, causes the Patient Record to be displayed if it is not currently showing in the Workstation Browser. From there, you can select another Study to be displayed, as described in Section 3.7 above.

d. Rapid Review

The Rapid Review feature allows you to quickly navigate among a patient's relevant and unread prior studies by pressing the Plus and Minus (+ and -) keys on the **numeric keypad** as follows:

NOTE: The actual keys used for Rapid Review functionality (Open Next Prior and Open Previous Prior) can be configured from the Merge PACS Preferences dialog, as described in Chapter 24 below.

- When viewing two studies in **comparison mode** (as described in subsection 4.4.4 below):
 - The comparison viewport in which the Next or Previous action was executed upon will cycle first through the unread studies and then any relevant priors.
 - If the Next or Previous command was executed upon the Primary Study's viewport, the last (left-most or bottom-most) comparison study viewport is cycled.
 - If the Viewer is already in comparison mode, the Rapid Review function will be disabled in the Primary Study viewport.
 - If the Study Layout contains an empty Study Window, that empty Study window will be used for Rapid Review.

- When viewing a Study in **standard** (non-comparison) mode:
 - Invoking the **Previous** command will launch the Viewer into Comparison Mode and display the most **recent relevant** prior in the Comparison Viewport.
 - Invoking the **Next** command will launch the Viewer into Comparison Mode and display the **oldest relevant** prior in the Comparison Viewport.
- Note the following:
 - The **Previous** command will move the Study back in time through unread studies followed by prior studies as displayed in Right-Click prior menu (note that this behavior can be changed from the **Merge PACS Preferences dialog**, as described in Chapter 24 below). The selected prior will move down the list of Studies available in the Right-Click prior menu and each click will move the user one Study back in time in reverse order. The key will stop once the user has reached the last relevant prior in the right-click menu.
 - The **Next** command will move the Study forward in time and will allow the user to view unread studies and relevant comparison studies obtained after the Primary Study (note that this behavior can be changed from the **Merge PACS Preferences dialog**, as described in Chapter 24 below). The selected prior will move UP the list of Studies available in the Right-Click prior menu and each click will move the user one study forward in time, relative to the date of the study loaded in the comparison screen. The key will stop once the user has reached the most recent relevant study.
 - Rapid Review will skip over the Primary Study or any currently displayed Comparison Study and will never effect the study loaded as the Primary Study.

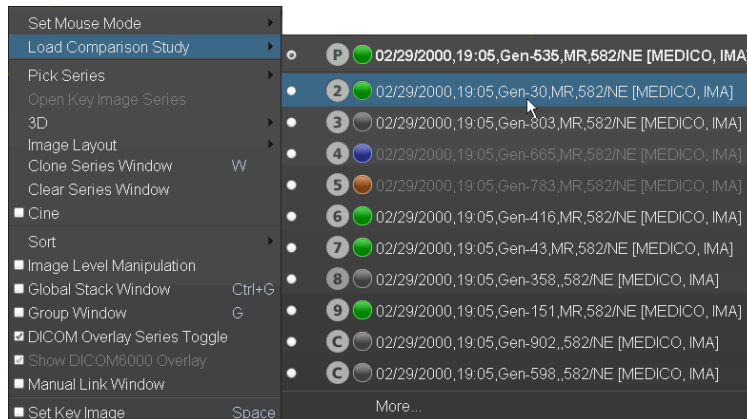
4.4.4. Comparing Multiple Studies

As described in subsection 4.3.3 above, the Merge PACS Viewer can display two or more different studies for the same patient in multiple viewing panels within the main Image Viewing Window. Each Study can be displayed with its own Window/Level setting, image layout, Series layout, etc. You can also open multiple instances of a single Study, and each instance can have its own display settings as well.

NOTE: You can also load individual series from comparison studies into individual viewports, as described in subsection 4.4.2.b above.

a. Selecting a Comparison Study

You can select a comparison Study from the **Study Right-click Menu** and the **Series Right-click Menu** by clicking on the **Load Comparison Study** option and then selecting a specific Study from the sub-menu, as seen in the following example:

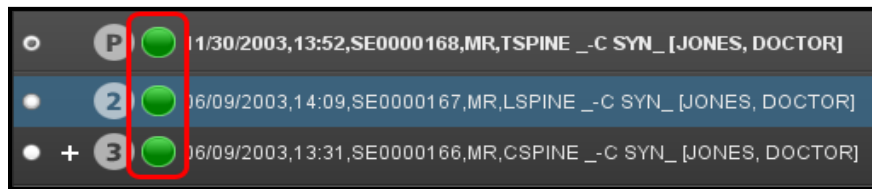


Selecting a Comparison Study

NOTE: The list of prior studies is determined by the Patient Comparison Strategy and “Selection of Priors” option configured for your site, as well as Multiple Patient Identity (if MPI is enabled for your site), as described in Appendix C below.








NOTE: If Merge PACS is configured with an extended query node, additional studies may be displayed in the list of prior studies that do not appear within worklists.

- If you are currently viewing a Study in a single-Study layout, selecting a comparison Study from a Series Right-click Menu will open a new Study panel to the right of the current Study window with the selected Study displayed within.
- If you have already selected a multiple-Study layout, as described in subsection 4.3.3 above, you can right-click on any Study panel and select the comparison Study to be loaded in that panel from the **Series Right-click Menu**. If the Study panel is currently empty, the only menu option available will be **Pick Study**.
- The dividing lines between each Study panel can be moved by clicking on them with your mouse and dragging them.
- The list of available comparison studies includes an **Availability Status** indicator for each Study, as in the following example:



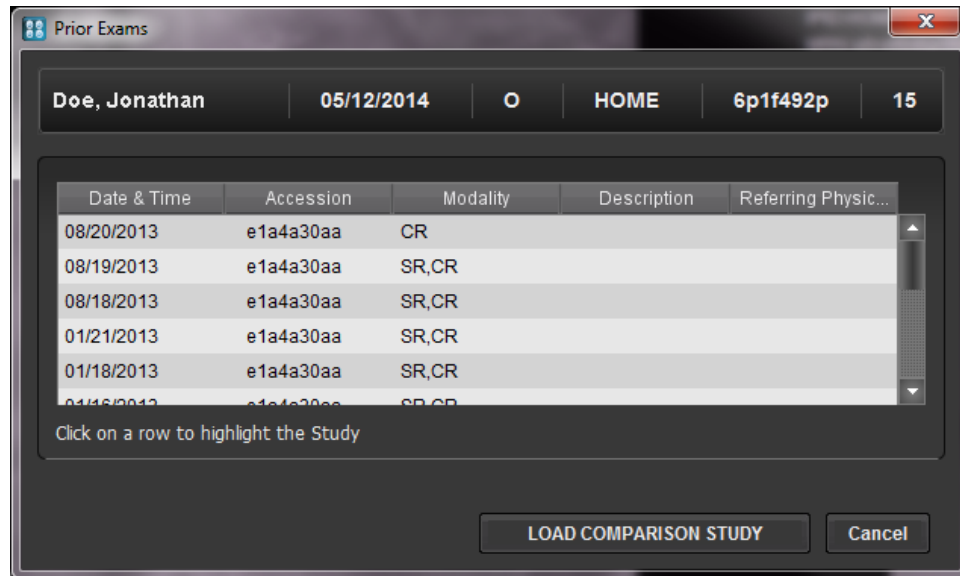
Availability Status Indicator

The appearance of the indicator shows the availability of the Study as follows:

Indicator	Color	Description
	Green	The Study is available online for viewing.
	Black	The Study is currently offline and not available for viewing.
	Blue	A request to retrieve the Study has been submitted, but the retrieval process has not yet started.
	Black / Green	The Study is currently being retrieved. Note that the percentage of green shown will change to indicate the progress of the retrieval process.
	Orange	Images for this Study are currently being imported for the first time or additional images are currently being added to an existing Study.
	Red	Retrieval of the Study has completed, but with errors (either fewer images were received than expected or all images failed compression)
	Gray	The availability of the Study is currently unknown (this may occur during timeout or error scenarios).

- If a particular Study is currently online (green status), selecting the Study will cause it to be loaded in the Viewer.
- If a particular Study is currently offline (black status), selecting the Study will automatically trigger a retrieval request, as described in Chapter 16 below.
- If a particular Study is in the process of being retrieved or imported (blue, black/green or orange status), you will not be able to select the Study. If you need to load the Study in its current state, locate it from **RTWL**, **RTSL**, the **Patient Record** or the **Query Page** and load it in the Primary or Secondary Viewer directly rather than as a prior comparison.

- If there are too many prior studies to be displayed in this sub-menu (the maximum number is configurable on a site-by-site basis), a “More” button will be included that will launch a complete list of available priors in a separate window, as in the following example:



All Prior Exams for this Patient

- Select the Study you wish to load and click the **LOAD COMPARISON STUDY** button.
- Note the following:
 - If a particular Study is currently online, selecting the Study will cause it to be loaded in the Viewer.
 - If Merge PACS server is configured to retrieve studies and if a particular Study is currently offline, the “LOAD COMPARISON STUDY” button will be labeled “RETRIEVE COMPARISON STUDY” instead and clicking the button will automatically trigger a retrieval request, as described in Chapter 16 below.
 - If Merge PACS server is configured to retrieve studies and if a particular Study is in the process of being retrieved or imported, the button will be disabled. If you need to load the Study in its current state, locate it from **RTWL**, **RTSL**, the **Patient Record** or the **Query Page** and load it in the Primary or Secondary Viewer directly rather than as a prior comparison.

NOTE: If the "Automatically Apply Presentation State" user preference is enabled, as described in subsection 24.1.3 below, the latest foreign PR for each affected study will be automatically applied when you load a comparison study via the **Load Comparison Study** menu.

b. Displayed Field of View (DFOV) Matching



Clicking on the **Displayed FOV Match** icon, located on the Application Toolbar and illustrated to the left, links the magnification of the patient anatomy in both the primary and the comparison Studies so that a visual comparison of relative size of anatomical structures is possible. This is useful in cases such as where the acquisition parameters were different for the two different studies so that the anatomy is displayed as different sizes on the screen even though the size may not have actually changed in real life, and is especially important when evaluating studies for growth, such as pediatrics or oncology tumor growth.

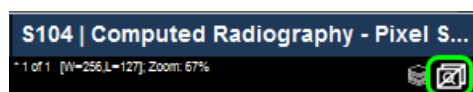
NOTE: The Displayed FOV Match feature can also be used to link the magnification of multiple series within the same study.

NOTE: Use of the various measurement tools described in subsection 4.5.15 below will allow you to determine the actual sizes of the anatomy being compared, but the Displayed FOV Match feature will allow you to quickly compare the actual sizes without needing to use those tools.

Once you have clicked the **Displayed FOV Match** icon to toggle the feature on, magnification of all non-scout and non-key images displayed in the Viewer will be linked to that of a “reference” image within the primary Study. The “reference” image will be the first non-scout non-key image in the primary Study window.

Note the following:

- The feature will link the magnification among all non-scout and non-key images displayed in the Viewer, regardless of whether you are viewing studies in separate study panels, viewing a comparison series in a Viewport of the primary Study, etc.
- The feature will only affect the current Viewer window (e.g., it will not apply across a primary and secondary Viewer window).
- Typically, the feature is disabled by default and must be manually enabled by clicking on the **Displayed FOV Match** icon. This can be changed, however, by selecting the **Viewer Defaults to use Displayed FOV Match** user preference, as described in subsection 24.1.16 below, in which case the feature will be enabled by default and can be temporarily disabled by clicking on the icon.
- When determining the “reference” image, the rule used to determine what is and is not a scout image can be customized on a site by site basis.
- If the study has a Study Presentation, Hanging Protocol or Foreign Presentation State associated with it, as described in Section 4.12 below, the settings of the Study Presentation, Hanging Protocol or Foreign Presentation State will be maintained when the DFOV Matching feature is enabled, but the DFOV-calculated zoom values will be applied on top of those settings and will override any magnification settings.
- If pixel spacing information is not available for one or more images, a special icon will be displayed in the Image Titlebar for those images, as in the following example:



DFOV Match Not Available

- If a study includes a scout image and the Group Window option has been selected for each series, as described in subsection 4.5.7 below, the DFOV feature will link the panning of each series but not the zoom.

c. Exiting Compare Studies mode



To exit Compare Studies Mode, click on the **Comparison Toggle** button on the **Application Toolbar**, as shown on the left to return to the default Study layout.

4.5. General Image Manipulation

The Merge PACS Viewer includes a wide variety of tools to manipulate the appearance of the images being viewed. These tools, which are described in this Section, allow you to do the following:

- Change the **Window and Level** settings for all images in a Series
- **Zoom** an image
- **Magnify** a portion of an image
- **Pan** an image across a Series Viewport
- **Group** multiple Series together for display purposes
- Display **DICOM** information for an image.
- View various **Color Maps** for an image, if available
- Temporarily **Invert** images being viewed
- **Sharpen** an image
- Change the **Orientation** of an image on the screen
- Add or remove **Annotations** to an image
- **Probe** to view the intensity value for a selected pixel of the image being viewed

NOTE: The Merge PACS Viewer also includes some optional advanced image manipulation features, including **3D Rendering**, **Spine Labeling**, **Mammography Support** and **OrthoLink**, that are described in the following Sections.

4.5.1. Changing the Window and Level Values of Images

The Merge PACS Viewer provides a number of ways of adjusting the **Window** and **Level** [otherwise known as brightness and contrast] values of the image being viewed, including an interactive mouse tool, a menu of preset Window and Level options, a “Region of Interest” Window and Level tool, and a Manual Window/Level option.

Window/Level values for one Series can be linked to those of other Series by using the **Grouping** option described in subsection 4.5.7 below.

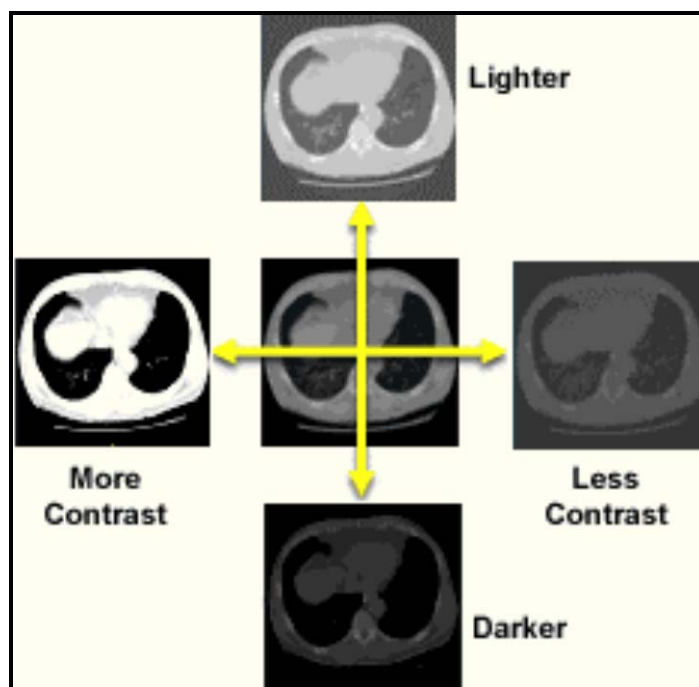
a. The Window/Level Mouse Tool



Clicking on the **Window/Level** button on the **Application Toolbar**, as shown on the left, converts the mouse cursor to a special Window/Level cursor icon. Once selected, you can use your mouse to adjust the Window and Level [contrast and brightness] of an image “on the fly” by clicking and dragging your mouse pointer over an image.

NOTE: Keyboard shortcut: When using any other tool, you can **temporarily** switch to the Window/Level tool by pressing the **Alt** key. When you release the key, your cursor will return to whichever tool you were using before.

The following figure illustrates the use of the Window/Level tool:



Using the Window/Level Tool

- To adjust **Window**, hold down the left mouse button and move your mouse pointer **left or right** over the image until the desired Window setting is reached.
- To adjust **Level**, hold down left mouse button and move your mouse pointer **up or down** over the image until the desired Level setting is reached.
- Adjusting the Window and Level values for one image in a Series will affect the values for all the images in that Series for the duration of the current viewing session. If you exit the Viewer, the Window and Level for the Series will return to their default values the next time that Series is viewed.

- By default, adjusting the Window and Level values for one image in a Series will **not** affect the values for other Series. The Window/Level values for one Series can be linked to those of other Series, however, by using the **Grouping** option described in subsection 4.5.7 below.
- The Window/Level tool is also available by placing your pointer over an image and then clicking the right mouse button repeatedly until the pointer changes to the Window/Level icon.

NOTE: By default, the Window/Level tool only affects grayscale images. A site may choose to enable window and leveling for color images, however. If window/leveling of color images has been enabled, using the Window/Level tool on color images will actually change the color of those images (as opposed to only changing the gray portions of the images). Be aware that some types of images, such as those that use particular colors to represent specific metabolic information, will therefore be **clinically incorrect** and this feature should be used with caution.

b. The Window Range Tool



If the **Use Window Range Instead of Level** User Modality Preference is selected for the modality in a viewport, as described in Section 24.1.11 below, the Window/Level tool will appear as a special **Window Range** cursor, as shown on the left.

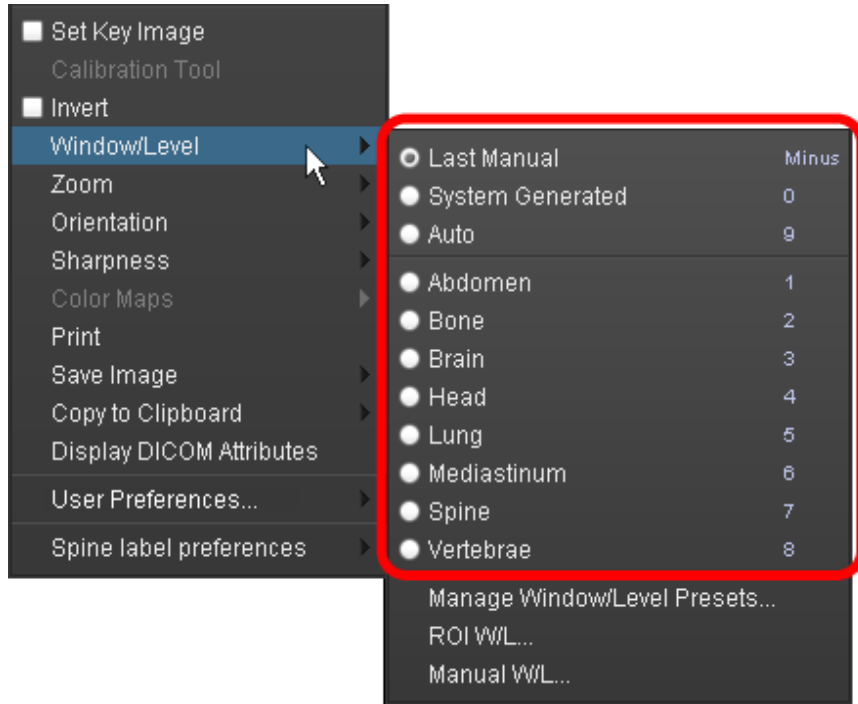
Once this tool has been selected, moving the cursor up and down adjusts the lower end of the window and moving it left and right adjusts the upper end of the window.

In addition, the standard “W=xxxx, L=xxxx” text that is displayed in the Image Titlebar and on the images themselves will be displayed as “L=xxxx, U=xxxx” and the Manual W/L Settings dialog, described in Paragraph 4.5.1.f below, will allow you to enter Lower and Upper instead of Window and Level.

NOTE: This option is selected by default for **NM** and **PT** modalities.

c. Window/Level Presets

From the **Series Right-click Menu** you can select from a variety of available Window/Level presets, as in the following example:



Window/Level Presets



The menu of Window/Level presets is also available by clicking on the **Window/Level** icon on the **Series Toolbar**, as illustrated to the left

The menu of presets includes the following options:

Option	Description
Last Manual	Returns the Window and Level to the last values you set with the Window/Level tool. If you have not yet used the tool, this option will be grayed out.
System Generated	Automatically sets the Window and Level to an optimal average setting for the entire Series.
Auto	Automatically sets the Window and Level to an optimal setting for the image currently being viewed.
Modality-specific Presets	Depending on the image modality involved, the menu of presets may also include a number of additional preset Window and Level settings that are optimized for specific body parts.

NOTE: The various W/L presets are also available by pressing keys 1 through 0 and – on your keyboard, as described in paragraph d below.

NOTE: The various presets can be custom configured for each major modality type, as described in Chapter 4.14 below.

d. Window/Level Keyboard Shortcuts

You can make use the keyboard to select among any available window/level presets that have been defined for the specific modality being viewed:

Keystroke	Description
1 - 8	W/L Presets 1 - 8
9	Auto Preset
0	System Generated
–	Last Manual

e. The Region of Interest Window/Level Tool

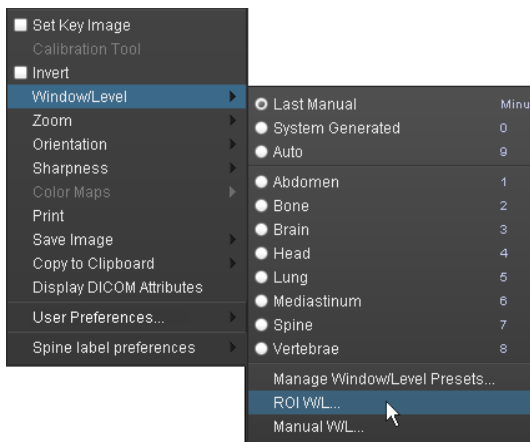


Clicking on the **ROI Window/Level** button on the **Application Toolbar**, as shown on the left, converts the mouse cursor to a special **Region of Interest Window/Level** cursor icon that will allow you to select an area of an image for automatic Window/Level optimization.



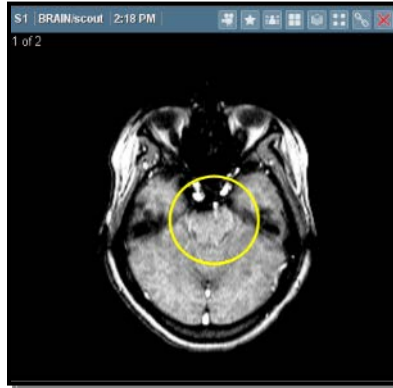
The Region of Interest Window/Level tool is also available by clicking on the **Window/Level** icon on the **Series Toolbar**, as illustrated to the left, and selecting the ROI W/L option.

The **Region of Interest Window/Level** tool is also available from the **Series Right-click Menu**, as in the following example:



Accessing the ROI Window/Level Tool

- Once you have selected the W/L ROI tool, your mouse pointer will change to a special ROI W/L cursor. You can then place your pointer at one corner of the area you want to optimize, click the left mouse button, drag the pointer to the opposite corner, and then release the mouse button.
- As you are dragging the cursor, a yellow circle indicating the selected region will temporarily be displayed as shown in the example below:

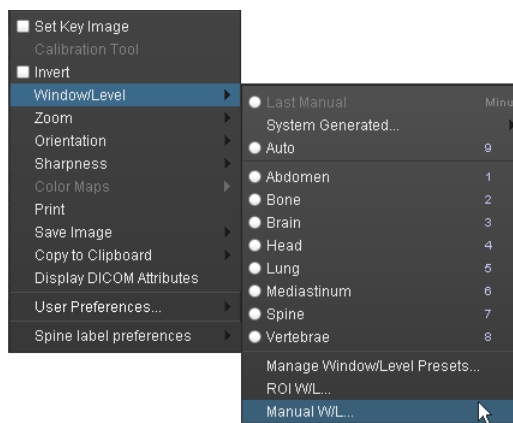


Using the ROI Window/Level Tool

- Note that the Window and Level values for the entire image -- not just the selected area -- will be set to the optimized values for the selected area.
- As with any Window/Level adjustment, using the Window/Level Region of Interest tool to change the Window and Level values for one image in a Series will affect the values for all the images in that Series.

f. Manually Setting the Window/Level

If you know the specific Window and Level values you wish to use for a certain Series, you can manually enter those values and apply them to the Series being viewed. To do this, select the **Manual W/L** option from the **Window/Level** sub-menu of the **Series Right-click Menu**, as in the following example:

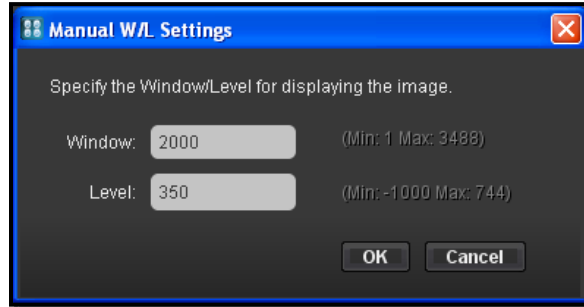


Accessing the Manual W/L Option



The Manual Window/Level option is also available by clicking on the **Window/Level** icon on the **Series Toolbar**, as illustrated to the left.

- When you select this option, the **Manual W/L Settings** window will be displayed as a separate pop-up window, as in the following example:



Accessing the Manual W/L Option

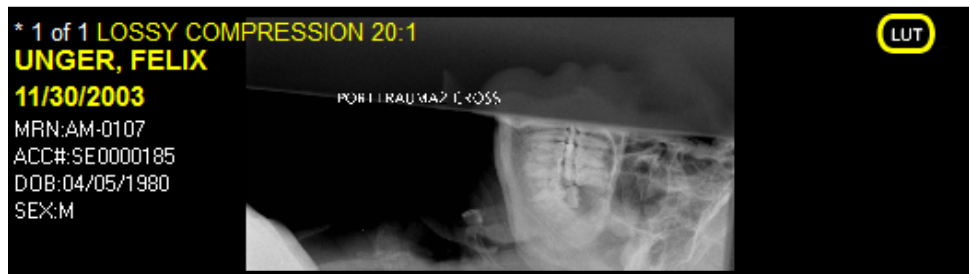
- Enter the desired window and level settings and then click the **OK** button.

NOTE: If the **Use Window Range Instead of Level** User Modality Preference is selected for the modality in a viewport, as described in Section 24.1.11 below, you will be able to specify Lower and Upper ranges instead of Window and Level.

4.5.2. Applying a Values of Interest Lookup Table

Some images may have one or more Values of Interest Lookup Tables (VOI LUT) associated with them. A VOI LUT defines the attributes that describe the transformation of the pixel values generated by the modality that produced the image into pixel values that are meaningful for print, display, etc. This includes such things as Window and Level values as well as Window Width and Window Center.

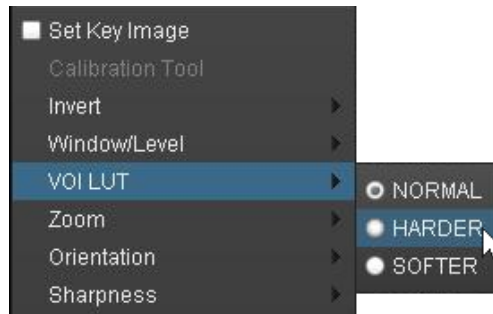
If an image has VOI LUT information associated with it, a special LUT icon will be displayed in the upper right corner of the Series Viewport, as in the following example:



VOI LUT Icon

The VOI LUT will be applied by default when the image is first displayed, but can be overridden by manually adjusting the W/L settings or selecting a W/L preset. If the VOI LUT is not currently being applied to the image, the icon shown above will appear grayed out.

If an image has one or more VOI LUTs associated with it, the **Series Right-click Menu** will contain a special **VOI LUT** option, as in the following example:



Accessing the VOI LUT Option

This option can be used to re-apply a VOI LUT that was overridden and also to select a different VOI LUT in cases where multiple ones are available.

NOTE: The selection of a VOI LUT will not be preserved when creating a Hanging Protocol.

4.5.3. Zooming Images

The Merge PACS Viewer provides you with the ability to increase or decrease the display size of an entire Series. This can be done either by using the Zoom tool or by selecting a zoom level from the Series Right-click Menu, as described below.

NOTE: You can also change the display size by using the **Zoom/Pan Combo** tool, described in subsection 4.5.5 below.

NOTE: The zoom level for one Series can be linked to those of other Series by using the **Grouping** option described in subsection 4.5.7 below.

NOTE: If the zoomed image is too large to entirely fit within the current Viewport and the DICOM Overlay feature described in subsection 4.5.9 below is enabled, the Zoom level displayed in the overlay will include the word "CLIPPED."

a. The Zoom Tool



Clicking the **Zoom** button on the **Application Toolbar**, as illustrated to the left, allows you to resize an image. Once you have selected the Zoom tool, your mouse pointer will change to match the icon for this tool. You can then increase or decrease the size of an image by positioning the icon over the image, holding down the left mouse button, and moving the cursor up to enlarge and down to shrink.

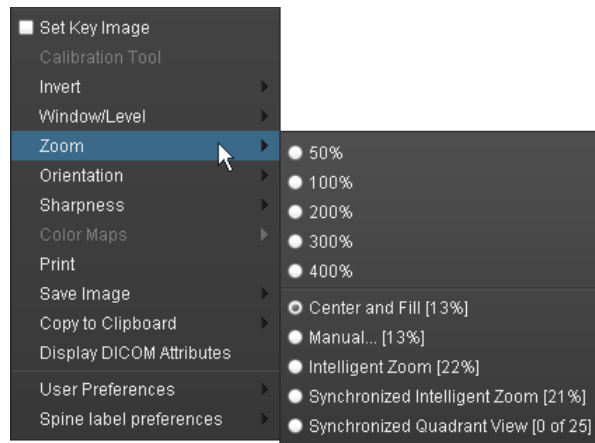
NOTE: The Zoom effect will be centered on the point where you first clicked the left mouse button.

NOTE: Changing the zoom level affects every image in a Series.

NOTE: Keyboard shortcut: When using any of the annotation tools described in 4.5.15 below, you can **temporarily** switch to the Zoom tool by pressing the **Shift** key.

b. The Series Right-click Menu

The **Series Right Click Menu** provides a sub-menu of zoom options, as in the following example:



Series Right-click Menu Zoom Options

From the Zoom sub-menu, you can perform the following:

- Select a preset zoom level from 50% to 400%
- Let the Merge PACS Viewer calculate the optimal zoom level that will center the image and have it fill the Series Viewport.
- Enter a manual zoom level

NOTE: When viewing mammography images, a number of other options will be available, as described in Section 4.9.6 below.

NOTE: Hanging Protocols cannot preserve Zoom levels when set to a specific percentage or manual amount. If you wish to preserve Zoom levels with HP, you should only select the “Center and Fill” Zoom option.

4.5.4. Panning Images



Clicking the **Pan Images** button on the **Application Toolbar**, as illustrated to the left, allows you to move an image within a Series Viewport (e.g., in cases where the image is currently displayed too large to fit within the Series Viewport).

- Once you have selected the Pan Image tool, your mouse pointer will change to match the icon for this tool. You can then pan an image by positioning the icon over the image, holding down the left mouse button, and dragging the image into the desired position.
- The pan offset will be applied to every image in the Series being viewed, so that as you page through the images in the Series, each image will appear in the same location.
- The pan offset for one Series can be linked to those of other Series by using the **Grouping** option described in subsection 4.5.7 below.

NOTE: If any portion of the panned image is outside the boundaries of the Viewport and the DICOM Overlay feature described in subsection 4.5.9 below is enabled, the Zoom level displayed in the overlay will include the word “CLIPPED.”

NOTE: Keyboard shortcut: When using any other tool, you can **temporarily** switch to the Pan tool by pressing the **Ctrl** key. When you release the Ctrl key, your cursor will return to whichever tool you were using before.

4.5.5. The Zoom/Pan Combo Tool



If your mouse has a center scroll wheel, clicking the **Zoom/Pan Combo** button on the **Application Toolbar**, as illustrated to the left, allows you to both increase or decrease the display size of an image (Zoom) as well as move it within a Series Viewport (Pan).

- Once you have selected the Zoom/Pan Combo tool, your mouse pointer will change to match the icon for this tool.
- With the tool activated, you can **pan** an image by positioning the icon over the image, holding down the **left** mouse button, and dragging the image into the desired position.
- With the tool activated, you can **increase or decrease** the display size of an image by positioning the icon over the image and using the center wheel on your mouse to scroll up or down. Scrolling down will enlarge the image, while scrolling up will shrink it.
- The pan offset and zoom level will be applied to every image in the Series being viewed, so that as you page through the images in the Series, each image will appear in the same location at the same magnification.
- The pan offset and zoom level for one Series can be linked to those of other Series by using the **Grouping** option described in subsection 4.5.7 below.

NOTE: In general, the zoom effect will radiate from the center of the viewport. When using the mouse center wheel to enlarge a **mammography** image, however, the image will instead automatically be panned so that the chest wall is against the viewport wall at all times.

NOTE: If any portion of the image is outside the boundaries of the Viewport, whether due to panning or zooming, and the DICOM Overlay feature described in subsection 4.5.9 below is enabled, the Zoom level displayed in the overlay will include the word “CLIPPED.”

4.5.6. The 3-in-1 Mouse Tool



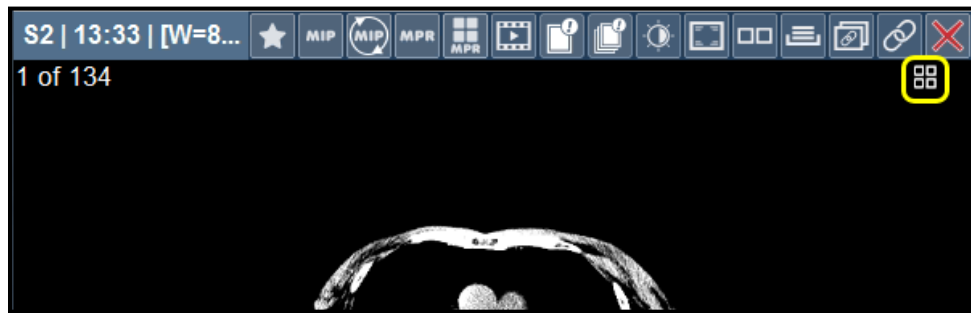
If your mouse has a center scroll wheel, clicking the **3-in-1 Mouse Tool** button on the **Application Toolbar**, as illustrated to the left, allows you to increase or decrease the display size of an image (**Zoom**), move it within a Series Viewport (**Pan**) and adjust the Window/Level of the Series displayed within the Viewport.

- Once you have selected the 3-in-1 Mouse tool, your mouse pointer will change to match the icon for this tool.
- With the tool activated, you can do the following:
 - Click and hold the **left** mouse button to adjust the **Window and Level** as you move the mouse cursor. Moving the cursor **left or right** over the image will adjust **Window** and moving it **up or down** will adjust **Level**.
 - Click and hold the **right** mouse button to adjust the display size (**Zoom**) of the image as you move the mouse cursor. Moving the cursor **up** will **increase** the zoom level and moving it **down** will **decrease** the zoom level.
 - Click and hold the **center wheel** mouse button to move the image (**Pan**) as you move the mouse cursor.
- The pan offset, zoom level and Window/Level settings will be applied to every image in the Series being viewed, so that as you page through the images in the Series, each image will appear in the same location at the same magnification with the same Window/Level.
- The pan offset, zoom level and Window/Level settings for one Series can be linked to those of other Series by using the **Grouping** option described in subsection 4.5.7 below.

4.5.7. Grouping Series

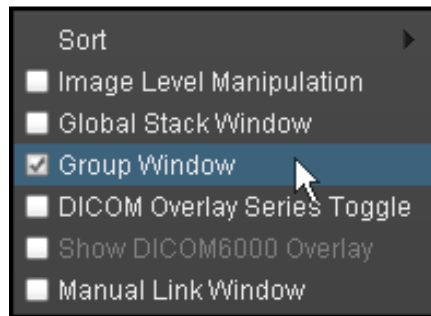
By default, using the various **Window/Level** tools, the **Zoom** tool, the **Pan Images** tool and the **Zoom/Pan Combo** tool to change the way images are displayed only affects the Series in the active Series Viewport. You can choose, however, to **group** multiple Series together so that these tools will apply to all of them at the same time.

Once a Series has been grouped, a special “grouping” icon will appear in the Titlebar of the Series’ Series Viewport, as shown in the following example:



The Grouping Icon

To group multiple Series together for display purposes, select the **Group Window** option from the **Series Right-click Menu**, as shown in the example below:



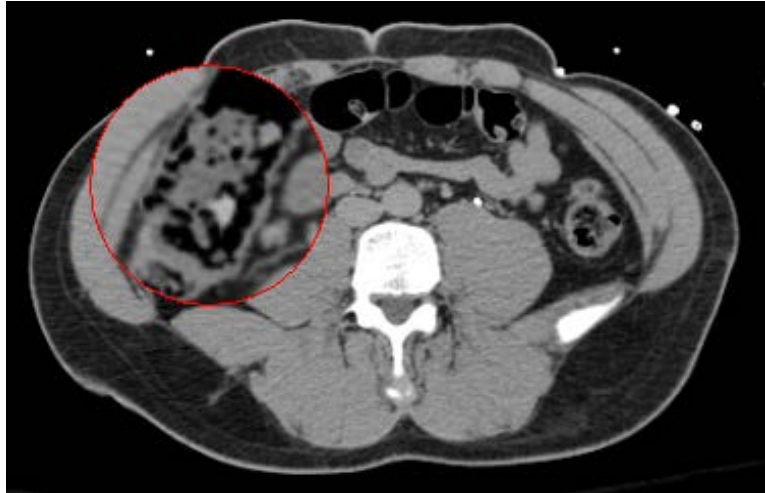
Grouping Series Together

- Repeat this step for each Series you wish to group with the first one.
- To ungroup a Series, simply deselect the **Grouping** option from the **Series Right-click**.

4.5.8. Magnifying Images



Clicking the **Magnify** button on the **Application Toolbar**, as illustrated to the left, allows you to enlarge selected portions of an image. Once you have selected the Magnify tool, your mouse pointer will change to match the icon for this tool. You can then enlarge a section of an image by positioning the icon over the image and pressing the left mouse button, as shown below:



Using the Magnification Tool

While holding the left mouse button down, you can increase and decrease the magnification by using the center wheel of your mouse.

4.5.9. Displaying Standard DICOM Information

The Merge PACS Viewer can display standard DICOM information in the following ways:

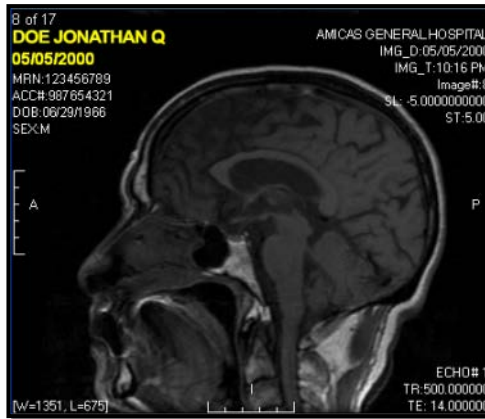
- Overlaid directly on the images themselves
- Within a separate DICOM information window

NOTE: Mammography images have their own special set of DICOM tags overlaid on them, as described in subsection 4.9.1 below.

a. DICOM Overlay



Clicking the **DICOM Overlay Toggle** button on the **Application Toolbar**, the **Study Toolbar** or the **Series Toolbar**, as illustrated to the left, will toggle the display of patient and Series information directly on the images themselves, as shown in the following example:



DICOM Overlay Enabled

- Clicking on the DICOM Overlay button from the **Application Toolbar** will toggle the DICOM Overlay display for all images in all Series Viewports and in all studies currently being displayed.
- Clicking on the DICOM Overlay button from the **Study Toolbar** will toggle the DICOM Overlay display for all images and all Series Viewports currently being displayed for the selected Study.
- Clicking on the DICOM Overlay button from the **Series Toolbar** will toggle the DICOM Overlay display for all images within the active Series Viewport.
- You can also turn the DICOM Overlay on and off for a **particular Series Viewport** by selecting or deselecting the **DICOM Overlay Series Toggle** option from the **Series Right-click Menu**, as shown in the following example:

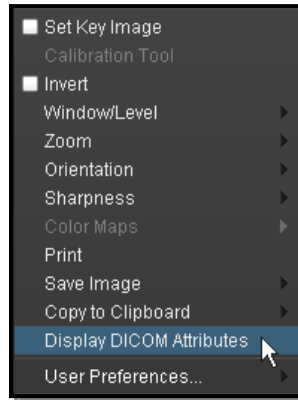


Toggling DICOM Overlay for this Viewport

NOTE: The actual information displayed in the DICOM overlay is configurable on a site-by-site basis and may vary depending on the type of image as well as the user group(s) you belong to, if any.

b. DICOM Attributes Viewer

You can view all the DICOM attributes associated with a particular image by selecting the **Display DICOM Attributes** option from the **Series Right-click Menu**, as shown in the following example:



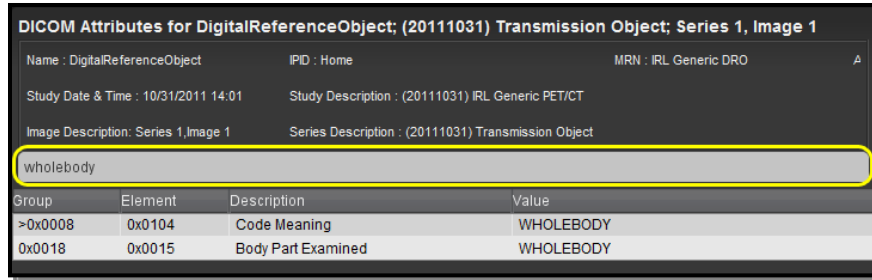
Viewing DICOM Attributes

Selecting this option will cause a separate DICOM Attributes pop-up window to be displayed with information for this image, as shown in the following example:

Group	Element	Description	Value
0x0008	0x0005	Specific Character Set	ISO_IR 100
0x0008	0x0008	Image Type	ORIGINALPRIMARYAXIAL
0x0008	0x0016	SOP Class UID	"1.2.840.10008.5.1.4.1.1.2" (CT Image Storage)
0x0008	0x0018	SOP Instance UID	1.3.6.1.4.1.150.2.1.1.20111102115723.1.1
0x0008	0x0020	Study Date	20111031
0x0008	0x0021	Series Date	20111031
0x0008	0x0022	Acquisition Date	20111031
0x0008	0x0030	Study Time	140100.000000
0x0008	0x0031	Series Time	140100.000000
0x0008	0x0032	Acquisition Time	140100.000000
0x0008	0x0050	Accession Number	
0x0008	0x0060	Modality	CT
0x0008	0x0070	Manufacturer	IRL Generic DRO (20111031)
0x0008	0x0080	Institution Name	University of Washington
0x0008	0x0090	Referring Physician's Name	Imaging Research Laboratory*
0x0008	0x1030	Study Description	(20111031) IRL Generic PET/CT
0x0008	0x103e	Series Description	(20111031) Transmission Object
0x0008	0x2218	Anatomic Region Sequence	(null)
>0x0008	0x0100	Code Value	T-D0010
>0x0008	0x0102	Coding Scheme Designator	SRT
>0x0008	0x0104	Code Meaning	WHOLEBODY
0x0010	0x0010	Patient's Name	DigitalReferenceObject*
0x0010	0x0020	Patient's ID	IRL Generic DRO
0x0010	0x0021	Issuer of Patient's ID	Home
0x0010	0x0030	Patient's Birth Date	19731112

DICOM Attributes Viewer

If desired, you can use the search field at the top of the viewer to display one or more specific attributes by entering some or all of the attribute’s Group, Element, Description or Value, as in the following example:



DICOM Attributes Viewer Search

NOTE: The search function works automatically as soon as you begin to type characters.

CAUTION: Make sure you exit the DICOM Attribute Viewer before attempting to close the study being viewed. Otherwise, depending on your privileges and preferences, the “Set Status” dialog may appear behind the DICOM Attribute Viewer and be inaccessible.

4.5.10. Displaying DICOM 6000 Information

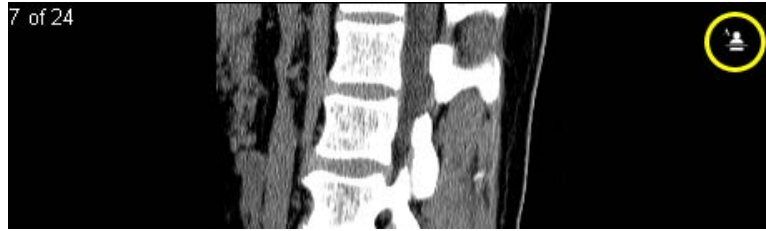


If one or more Series have DICOM 6000 information associated with it, clicking the **Toggle DICOM 6000 Overlay** button on the **Application Toolbar**, will toggle the display of that information for all applicable images, Series Viewports and studies currently being displayed within the Merge PACS Viewer, as shown in the following example:



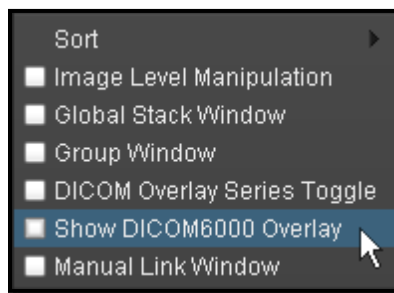
DICOM 6000 Overlay Enabled

If a Series has DICOM 6000 information associated with it that is not currently being displayed, a special DICOM 6000 icon will be displayed in the upper right corner of the Series Viewport, as in the following example:



DICOM 6000 Information Available

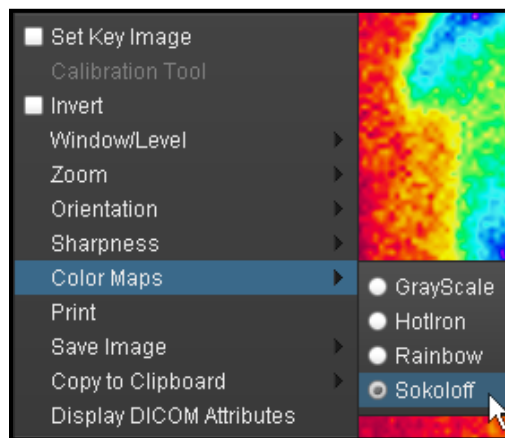
You can also toggle the DICOM 6000 Overlay display for all Series by selecting the **Show DICOM6000 Overlay** option from any **Series Right-click Menu**, as in the following example:



Toggle DICOM 6000 Overlay Display

4.5.11. Viewing Color Maps

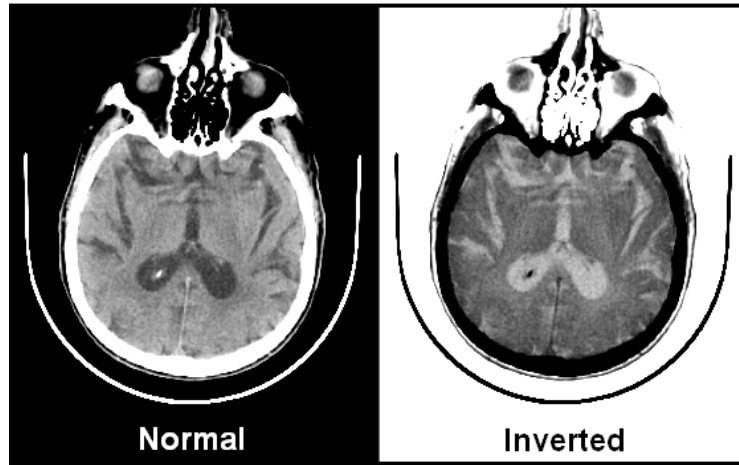
The Merge PACS Viewer provides you with a selection of color mapping options for Ultrasound (US), Nuclear Medicine (NM) and Positron Emission Tomography (PT or PET) images, where available, similar to those found on dedicated NM, US, or PET workstations. These are available from the **Series Right-click Menu**, as seen in the following example:



Selecting a Color Mapping Option

4.5.12. Inverting Images

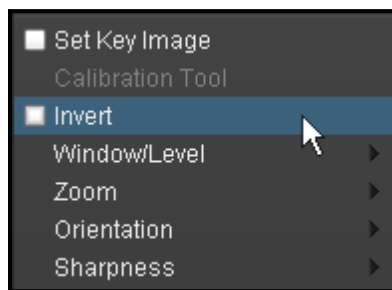
The Merge PACS Viewer provides you with the option of temporarily reversing the black and white pixels for all images in the Series currently being viewed, as shown in the example below:



Inverting an Image

- Selecting the Invert option a second time will return all images in the Series to normal.
- Note that this change is temporary for viewing purposes only and does not permanently affect the images.

This option is available from the **Series Right-click Menu**, as seen in the following example:



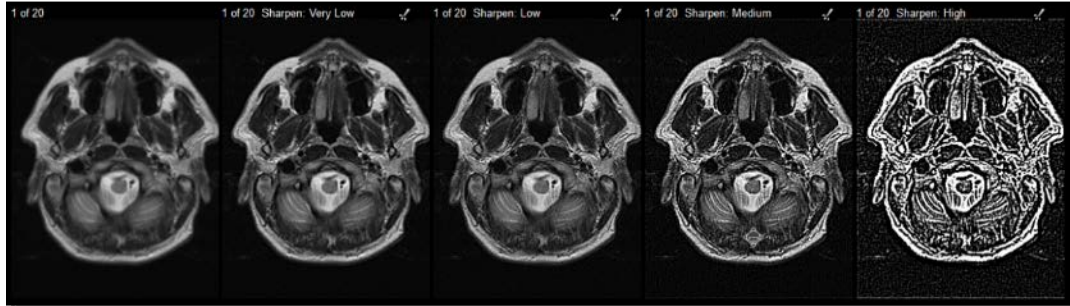
Selecting “Invert” from the Series Right-click Menu

In addition, you can choose to invert all images for all Series in the Study currently being viewed from the **Study Right-click Menu** by selecting **Study Window Settings** → **Study Invert Toggle**, as described in 4.2.4.c above.

NOTE: When viewing mammography images, a sub-menu of mammography-specific options will be displayed instead of a single Invert option, as described in subsection 4.9.5 below.

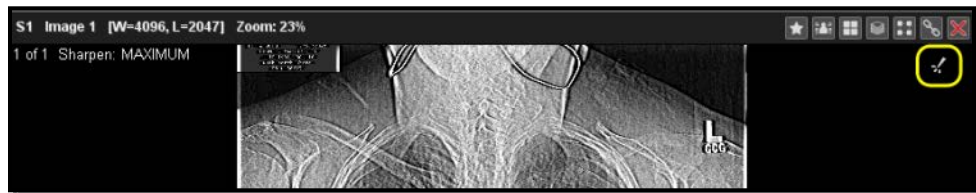
4.5.13. Sharpening an Image

The Merge PACS Viewer allows you to apply a filter that improves the edges of certain structures within an image. The various degrees of sharpness available are illustrated in the following examples:



Sharpness Options from None to High

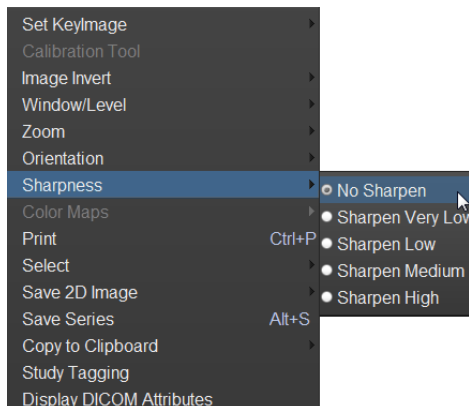
- Once an image has been sharpened, a special icon will be displayed in the upper right-hand corner as in the following example:



The Sharpness Indicator

- Sharpening one image in a Series will apply the same level of sharpening to all images in that Series.
- This change is temporary for viewing purposes only and does not permanently affect the images.

The sharpening feature is available from the **Series Right-click Menu**, as seen in the following example:

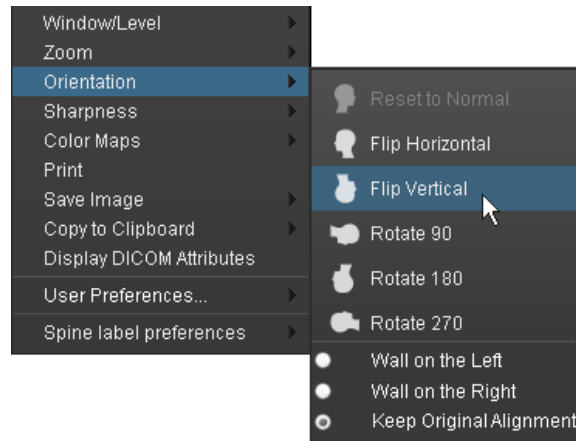


Selecting a Sharpness Option

4.5.14. Changing Image Orientation

The Merge PACS Viewer allows you to temporarily change the orientation of an image on the screen, rotating it 90, 180 or 270 degrees, as well as flipping it horizontally or vertically. Note that these actions will only affect how the image currently appears on your screen and are not permanent – the next time you view the image it will be oriented to its original position.

This option is available from the **Series Right-click Menu**, as seen in the following example:



Choosing an Orientation Option from the Right-click Menu

- The icons in the Orientation sub-menu indicate the options relative to the **current** orientation and will change as the orientation is changed.
- The **Reset to Normal** option will restore the image to its original orientation.
- The **Wall on the Left/Right** and **Keep Original Alignment** options will only be visible when viewing mammography images, as described in Chapter 4.9 below.

NOTE: Any changes to orientation should be done prior to adding any annotations or measurements, as described in 4.5.15 below.

4.5.15. Annotations and Measurements

The Merge PACS Viewer allows you to add various annotations to an image, including measurements, text, angles, and “region of interest” statistics. You can also manually calibrate the measurement ruler for images that do not have valid pixel spacing information associated with them, as is often the case with ultrasound images.

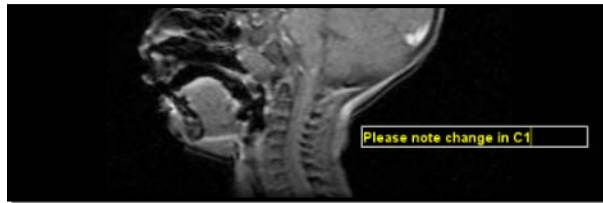
If you have the appropriate login privileges, these annotation can be saved with the Study so that it will be visible the next time you or somebody else views the Study; otherwise, they will be purely temporary for the purposes of reference printing or saving and will not be permanently stored with the image. If you have the rights to save annotations, you can also set whether or not the annotations should be saved automatically when you exit a Study. This is done from the Merge PACS Preferences dialog, as described in Chapter 24 below.

a. Text Annotation



You can add annotated text to an image by selecting the **Text Annotation** tool from the **Application Toolbar**, as shown on the left. Once you have selected the Text Annotation tool, your mouse pointer will change to match the icon for this tool.

Once you have selected the Text Annotation tool, you can position your pointer to the spot on the image where you would like to begin adding text, click with the left mouse button, and begin typing:



Using the Text Annotation Tool

- If you make a mistake before you have finished, you can use the **Backspace** key to back up or press the **Esc** key to delete the entire annotation.
- Once you have finished adding the text, press the **Enter** key to finalize the annotation. You can then move, edit or delete the annotation by clicking once it with the mouse while in any of the annotation modes:
 - To **move** the text, click directly on the text with the left mouse button and, while holding the left mouse button down, drag the mouse to reposition the text.
 - To **edit** the text, double-click directly on the text with the left mouse button to turn on the editing mode. You can then enter the desired changes.

b. Pointer Text



You can add one or more labeled arrows to an image by selecting the **Pointer Text** tool from the **Application Toolbar**, as shown on the left. Once you have selected the Pointer Text tool, your mouse pointer will change to match the icon for this tool.

Once you have selected the Pointer Text tool, click and hold the left mouse button where you want the tip of the arrowhead to appear and then drag the mouse to draw the pointer line. When you are satisfied with the length and direction of the pointer line, release the mouse button. A text box will then appear in which you can enter the label for the arrow, as shown in the following example:



Using the Pointer Text Tool

Once you have finished entering the desired text, press the **Enter** key to finalize the annotation. Note that while you are drawing the arrow, a yellow box will be displayed to indicate where the text will appear once you have finalized the annotation.

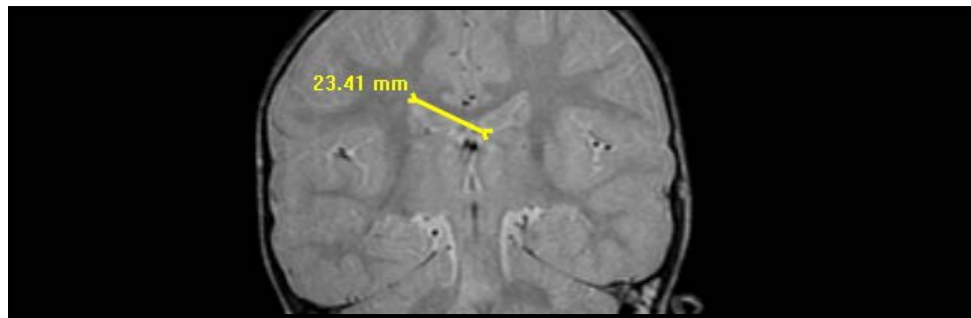
- If you make a mistake before you have finished, you can use the **Backspace** key to back up or press the **Esc** key to delete the entire annotation.
- To **move** the **entire annotation**, click on the body of the arrow with the left mouse button and, while holding the left mouse button down, drag the mouse to reposition the annotation.
- To **move** and/or **resize** just the **arrow**, click on the point of the arrow with the left mouse button and, while holding the left mouse button down, drag the point of the arrow to the desired location.
- To **move** just the **text**, click on the text with the left mouse button and, while holding the left mouse button down, drag the text to the desired location.
- To **edit** the **text**, click once on the text with the left mouse button to turn on the editing mode. You can then enter the desired changes.

c. Line Measurements



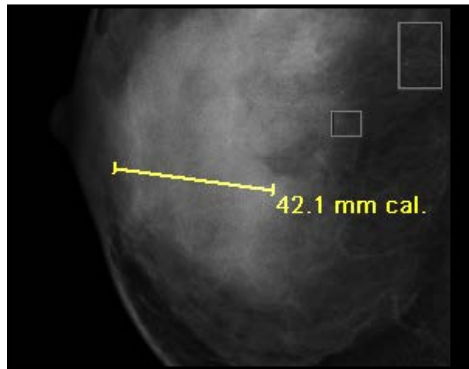
You can measure in millimeters the actual (as opposed to the displayed) distance between two points on an image, as well as mark the image with an appropriate annotation, by selecting the **Line Measurement** tool on the **Application Toolbar**, as shown on the left. Once you have selected the Line Measurement tool, your mouse pointer will change to match the icon for this tool.

Once you have selected the Line Measurement tool, you can measure the distance between any two points on an image by placing your mouse cursor over the point where you want to start measuring, holding down the left mouse button, and releasing it when you have moved the pointer to the point where you want to stop measuring, as in the following example:



Using the Line Measurement Tool

- If the image is an **X-ray, Mammography, X-Ray Radiofluoroscopic, CR, DX, Digital Intra Oral X-Ray Image Storage For Presentation or Secondary Capture** image, a special suffix will be appended to the measurement, as in the following example:



Line Measurement with Suffix

The available suffices are as follows:

Suffix	Description
det.	Indicates that the pixel spacing for the measurement came directly from the detector/modality and was not calibrated by Merge PACS.
cal.	Indicates that the pixel spacing for the measurement was calibrated by Merge PACS, either by using the provided Estimated Radiographic Magnification Factor (ERMF) or else by using other correction factors provided by the modality.
Cal PS.	Indicates that the pixel spacing for the measurement was manually calibrated using the Manual Calibration Tool, as described in paragraph q below.

- Depending on the type of calibration performed, one of the following indicators may also be displayed:

Indicator	Description
FIDUCIAL	Indicates that the pixel spacing values have been calibrated by the operator or image processing software by measurement of an object (fiducial) that is visible in the pixel data and is of known size and is located close to the central ray (e.g. a catheter).
GEOMETRY	Indicates that the pixel spacing values account for assumed or known geometric magnification effects and correspond to some unspecified depth within the patient.

Indicator	Description
ERMF	<p>The Estimated Radiographic Magnification Factor provides the ratio of Source Image Receptor Distance (SID) over Source Object Distance (SOD):</p> <ul style="list-style-type: none"> • SID – the distance between the source of x-ray and the front face of the detector • SOD – the distance between the source of X-ray and the surface where the body part is resting (for Mammography, where the breast is resting) <p>In case of a normal view the ERMF is unity, while in case of a magnified view the body part gets closer to the source of radiation and ERMF becomes > 1.</p> <ul style="list-style-type: none"> • With the Line Measurement Tool as your cursor, you can make the following adjustments to the annotation once you have created it: <ul style="list-style-type: none"> ○ To move the entire annotation, click on the drawn line and drag the entire annotation to a new location. ○ To move the accompanying text, click on the text and drag it to a new location. ○ To resize the annotation, click on either end of the line and drag the endpoint to a new location.

NOTE: If the image to which you are trying to add a line measurement annotation does not have valid pixel spacing information associated with it, you will be prompted to calibrate the Line Measurement tool, as described in paragraph q below.

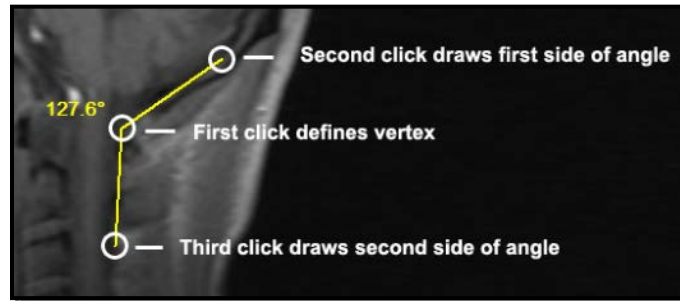
NOTE: For Ultrasound images with multiple regions, the Line Measurement tool will be calibrated according to the specific region where it is applied, as described in paragraph p, below.

d. Adding Angle Measurements



You can add an angle measurement to an image by selecting the **Angle Measurement** tool on the **Application Toolbar**, as shown on the left. Once you have selected the Angle Measurement tool, your mouse pointer will change to match the icon for this tool.

Once you have selected the Angle Measurement tool, you can then define an angle by clicking three times with the left mouse button – first, to position of the **vertex** of the angle; second, to define the end of the angle's **first side**; and third, to define the end of the angle's **second side**, as in the following example:



Creating an Angle Measurement

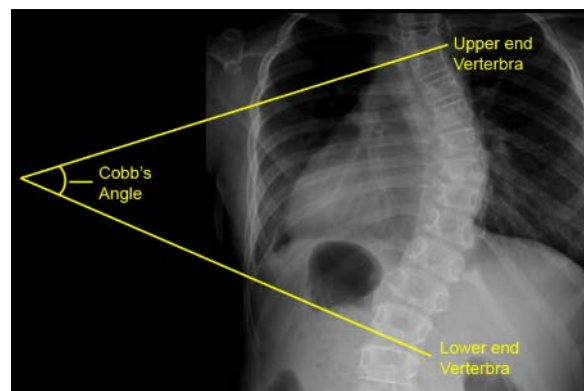
- To **move** the **entire annotation**, click on the body of the drawn angle and drag the entire annotation to a new location.
- To **move** the accompanying **text**, click on the text and drag it to a new location.
- To **resize** the annotation, click on the endpoint of either line and drag it to a new location.

e. Adding Cobb Angle Measurements



You can add a Cobb angle (or “Cobb’s angle”) measurement to an image by selecting the **Cobb Angle Measurement** tool from the **Application Toolbar**, as shown on the left. Once you have selected the Add Cobb Angle tool, your mouse pointer will change to match the icon for this tool.

A Cobb angle measures the curvature of the spine (e.g., of a patient with scoliosis) and is formed by drawing one line the superior end plate of the superior end vertebra and a second line along the inferior end plate of the inferior end vertebra. As shown in the example below, the angle between these two lines (or lines drawn perpendicular to them) is measured as the Cobb angle:

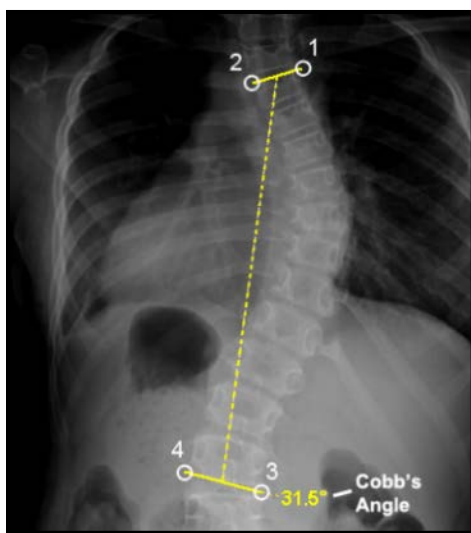


Example of a Cobb Angle

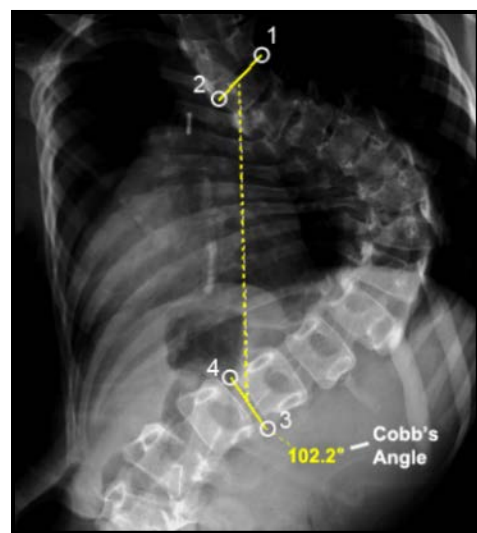
Once you have selected the Add Cobb Angle tool, you can measure a Cobb angle by performing the following steps (refer to illustration below for an example):

1. Click once with the left mouse button where you want to define the starting position of one of the angle measurement lines.
2. Click a second time with the left mouse button where you want to define the end position of the first angle measurement line.
3. Click a third time with the left mouse button where you want to define the starting position of the second angle measurement line.
4. Click a fourth time with the left mouse button where you want to define the end position of the second angle measurement line.

When you have finished, your Cobb angle measurement should look similar to the following examples (white text added for illustration purposes only):



Measured Cobb Angle (< 90 °)



Measured Cobb Angle (> 90°)

- To **resize** the annotation, click on the body of either of the two yellow lines and drag the line to a new location.
- To **change** the measured angle, click on one of the endpoints of either line and drag it to a new location.
- To **move** the accompanying **text**, click on the text and drag it to a new location.

NOTE: Merge PACS implementation of Cobb Angles can calculate the complementary angles (angles totaling 90 degrees) as well as the supplementary angles (angles totaling 180 degrees).

NOTE: You do not need to draw either line of the angle completely; as long as you define a starting and end point for each line, The Merge PACS Viewer will extrapolate the lines until they intersect.

NOTE: It does not matter if the lines are drawn left-to-right, right-to-left, or a combination of the two.

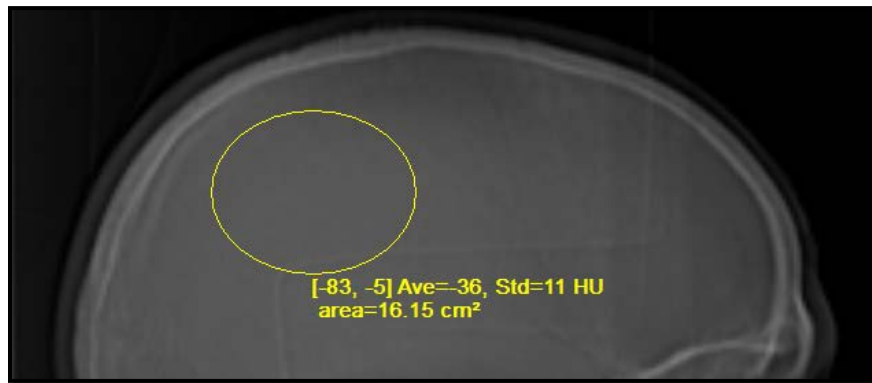
f. Region of Interest Measurements



You can add a statistics display for a specified area of an image by selecting the **ROI Measurement** tool from the **Application Toolbar**, as shown on the left. This tool displays the minimum and maximum pixel intensity values for a selected area of an image, the average pixel value and the standard deviation for the selected region and a measurement of the selected region's area.

Once you have selected the Region of Interest tool, your mouse pointer will change to match the icon for this tool. You can then place your pointer at one corner of the area you want to optimize, click the left mouse button and drag the pointer to the opposite corner.

The relevant information will be displayed above the selected area, as in the example below:



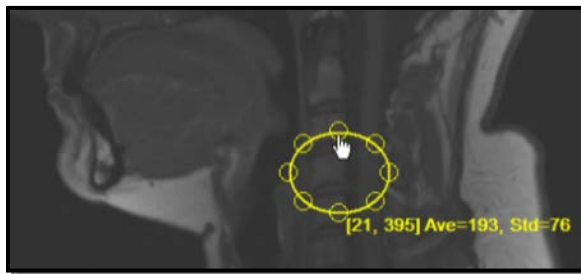
Using the Region of Interest Measurement Tool

- This tool measures the intensity of the pixel in the **original image**, regardless of what the current Window and Level viewing values are set to.
- For all the supported modalities except PET and CT, the units provided by the modality will be displayed. If no units are provided by the modality, no units will be displayed.
- The **area** of the defined region will either be displayed in square centimeters (**cm²**) or square millimeters (**mm²**), depending on how Merge PACS is configured for your site.
- For **CT** images, if no units are provided by the modality the units will be assumed to be **Hounsfield Units (HU)**.
- For **PET** images (**2D** only), the following units will be available:

Unit	Description	Unit	Description
NONE	unitless	MLG	milliliter/gram
CNTS	counts	1CM	1/centimeter
CM2	centimeter ²	UMOLML	micromole/milliliter
CM2ML	centimeter ² / milliliter	PROPCNTS	proportional to counts
PCNT	percent	PROPCPS	proportional to counts/sec
CPS	counts/second	MLMINML	milliliter/minute/milliliter
BQML	Becquerels/milliliter	MLML	milliliter/milliliter

Unit	Description	Unit	Description
MGMINML	milligram/minute/milliliter	GML	grams/milliliter
UMOLMINML	micromole/minute/milliliter	STDDEV	standard deviations
MLMING	milliliter/minute/gram		

- If the units are in **BQML**, **GML**, or **CM2ML**, the ROI tool will display **Standardized Uptake Values (SUV)** that represent the absorption of an injected isotope in body tissue.
- There are four different types of SUVs that can be displayed, if available:
 - **Body Weight (BW)**
 - **Lean Body Mass (LBM)**
 - **Body Surface Area (BSA)**
 - **Ideal Body Weight (IBW)**
- You can configure which types of SUVs you want to be displayed (if any) from the Merge PACS Preferences dialog, as described in Chapter 24 below.
- If there is insufficient information available to calculate one or more types of SUV values, you can manually enter the missing parameters, as described in subsection 4.5.17 below.
- Refer to Appendix B below for detailed information regarding how SUVs are calculated.
- To **move** the **entire annotation**, click anywhere on the yellow line and drag the entire annotation to the desired location.
- To **move** just the **text** to a new location, click on the text and drag the text to the desired location.
- To **resize** the annotation, hover your mouse cursor over any of the eight “hot spot” regions along the edges of the circle to display the activator circles, as shown in the following example:



Activators

Then, click on the desired activator and drag it to the desired location.

NOTE: Holding down the **Shift** key while using the ROI Measurement tool will convert it into the Circle Measurement tool, as described in Paragraph 4.5.15.g below.

g. Circle Annotations and Measurements



You can add a plain or measured circle annotation anywhere on an image by selecting the **Circle** tool from the **Application Toolbar**, as shown on the left. Whether the tool draws a plain or a measured circle is determined by the option last selected from the Circle Tool Preferences menu, as described below.

Once you have selected the Circle tool, your mouse pointer will change to match the icon for this tool. You can then place your pointer at one corner of the area where you want to draw the circle, click the left mouse button to define one edge of the circle and drag the pointer to the other edge of the circle. When you release the left mouse button, the circle will be displayed as in the following examples:

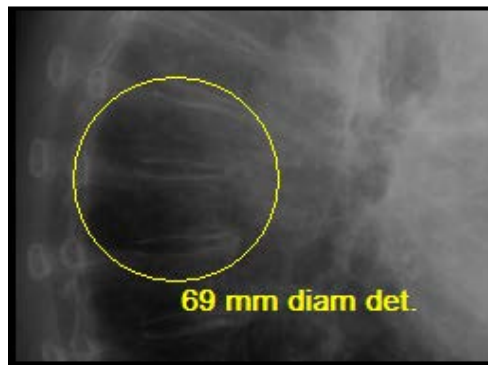


Plain Circle



Measured Circle (mm in diameter)

- As with the Line Measurement tool described in paragraph c above, if you are creating a Measured Circle annotation on an **X-ray, Mammography, X-Ray Radiofluoroscopic, CR, DX, Digital Intra Oral X-Ray Image Storage For Presentation or Secondary Capture** image, a special suffix will be appended to the measurement, as in the following example:



Line Measurement with Suffix

The available suffices are as follows:

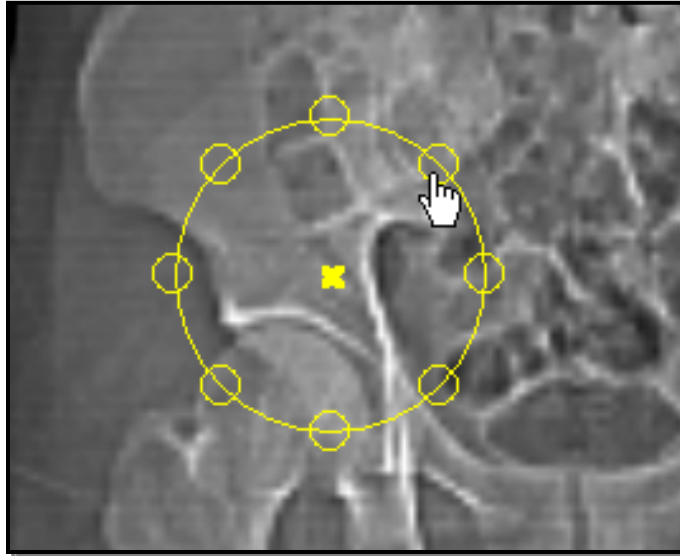
Suffix	Description
det.	Indicates that the pixel spacing for the measurement came directly from the detector/modality and was not calibrated by Merge PACS.
cal.	Indicates that the pixel spacing for the measurement was calibrated by Merge PACS, either by using the provided Estimated Radiographic Magnification Factor (ERMF) or else by using other correction factors provided by the modality.
Cal PS.	Indicates that the pixel spacing for the measurement was manually calibrated using the Manual Calibration Tool, as described in paragraph q below.

- In addition, depending on the type of calibration performed, one of the following indicators may also be displayed:

Indicator	Description
FIDUCIAL	Indicates that the pixel spacing values have been calibrated by the operator or image processing software by measurement of an object (fiducial) that is visible in the pixel data and is of known size and is located close to the central ray (e.g. a catheter).
GEOMETRY	Indicates that the pixel spacing values account for assumed or known geometric magnification effects and correspond to some unspecified depth within the patient.
ERMF	<p>The Estimated Radiographic Magnification Factor provides the ratio of Source Image Receptor Distance (SID) over Source Object Distance (SOD):</p> <ul style="list-style-type: none"> SID – the distance between the source of x-ray and the front face of the detector SOD – the distance between the source of X-ray and the surface where the body part is resting (for Mammography, where the breast is resting) <p>In case of a normal view the ERMF is unity, while in case of a magnified view the body part gets closer to the source of radiation and ERMF becomes > 1.</p>

- To **move** the **entire annotation**, click anywhere within the annotation and drag the entire annotation to the desired location.
- To **move** just the **text** to a new location (in the case of a measured circle), click on the text and drag the text to the desired location.

- To **resize** the annotation, hover your mouse cursor over any of the eight “hot spot” regions along the edges of the circle to display the activator circles, as shown in the following example:



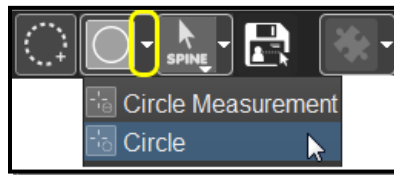
Activators

Then, click on the desired activator and drag it to the desired location.

h. Circle Tool Preferences Menu



You can configure whether the Circle tool, described above, will produce a plain or a measured circle by clicking on the **Circle Tool Preferences** icon from the Application Toolbar, as shown on the left. When you click on the preferences icon, the **Circle Tool Preferences** menu will be displayed immediately below the icon, as in the following example:




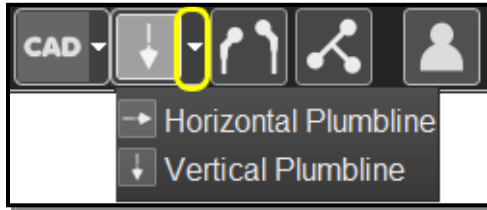
Circle Tool Preferences

Once you have selected an option from the Circle Tool Preferences menu, the Circle tool will default to the selected type of circle until you select a different option from the menu.

NOTE: You can temporarily access the Circle Measurement tool by holding down the **Shift** key while using the ROI Measurement tool, described in Paragraph 4.5.15.f above.

i. Orthopedic Plumb Lines

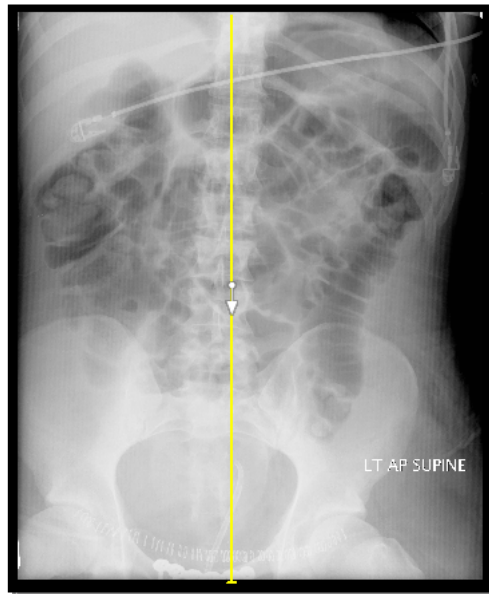
 You can add a vertical or horizontal plumb line anywhere on an image by selecting the Orthopedic Plumb Line Menu option from the Application Toolbar, as shown on the left. When you click on the Menu icon, the Orthopedic Plumb Line Menu will be displayed immediately below the icon, as in the following example:



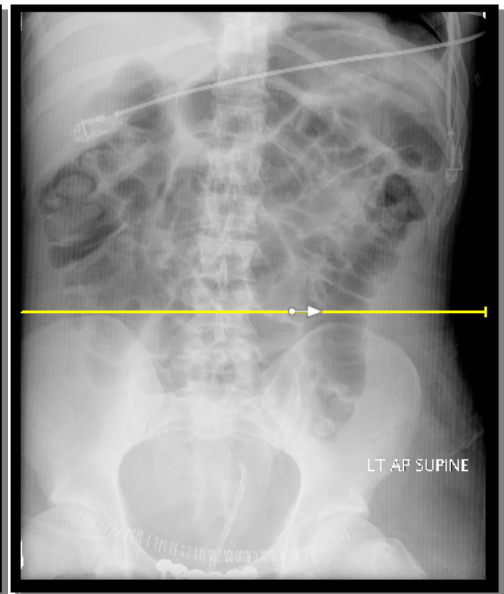
Orthopedic Plumb Line Menu

Select whether you want to draw a Horizontal or Vertical Plumb Line. Once you have made your selection, your mouse pointer will change to match the icon for this tool.

- Click anywhere on the image to draw the plumb line horizontally or vertically across the entire image intersecting the location of the mouse pointer, as in the following examples:



Vertical Plumb Line



Horizontal Plumb Line

- If desired, you can move an existing line by clicking anywhere along it and dragging it to a new location.



You can also click on the main Orthopedic Plumb Line tool, as shown on the left, to draw the same type of line as last selected from the Orthopedic Plumb Line Menu. For example, if you previously drew a vertical plumb line and then switched to the Window/Level tool, clicking on the main Orthopedic Plumb Line tool will allow you to draw another vertical line without needing to select it from the Orthopedic Plumb Line Menu.

j. Orthopedic Joint Line Tool

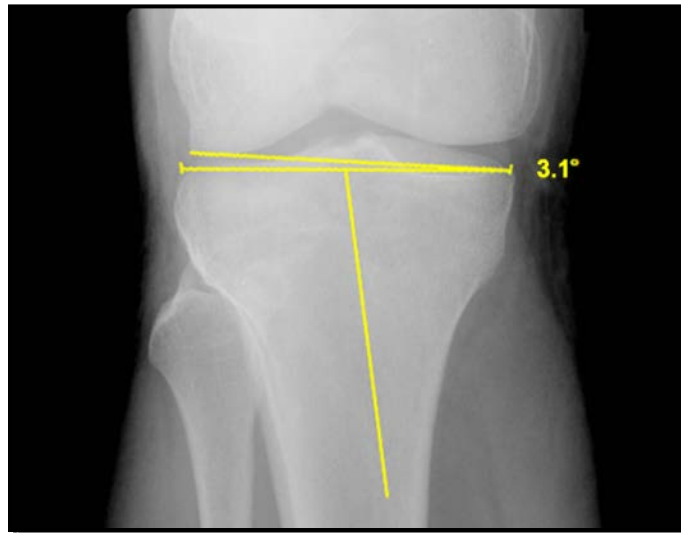


You can measure angles for metatarsal osteotomies with the assistance of a line perpendicular to the base of the angle by selecting the **Orthopedic Joint Line** tool from the **Application Toolbar**, as shown on the left. Once you have selected the Orthopedic Joint Line tool, your mouse pointer will change to match the icon for this tool.

Once you have selected the Orthopedic Joint Line tool, you can measure a joint angle by performing the following steps:

1. Click once with the left mouse button where you wish to begin drawing the first line.
2. Click a second time with the left mouse button where you want to define the end position of the first line.
3. Click a third time with the left mouse button where you want to complete the angle.

When you have finished, the angle will be placed and the angle measurement will appear at the intersection point, as in the following example:



Measured Joint Angle

With the Orthopedic Joint Line Tool as your cursor, you can make the following adjustments to the annotation once you have created it:

- To **move** the **entire annotation**, click on the any of the drawn lines and drag the entire annotation to a new location.
- To **move** the location of the **perpendicular**, click on the line's endpoint and drag it to a new location.
- To **move** the accompanying **text**, click on the text and drag it to a new location.
- To **change** the **angle**, click on any line's endpoint and drag it to a new location.

k. Orthopedic Transischial Line Tool

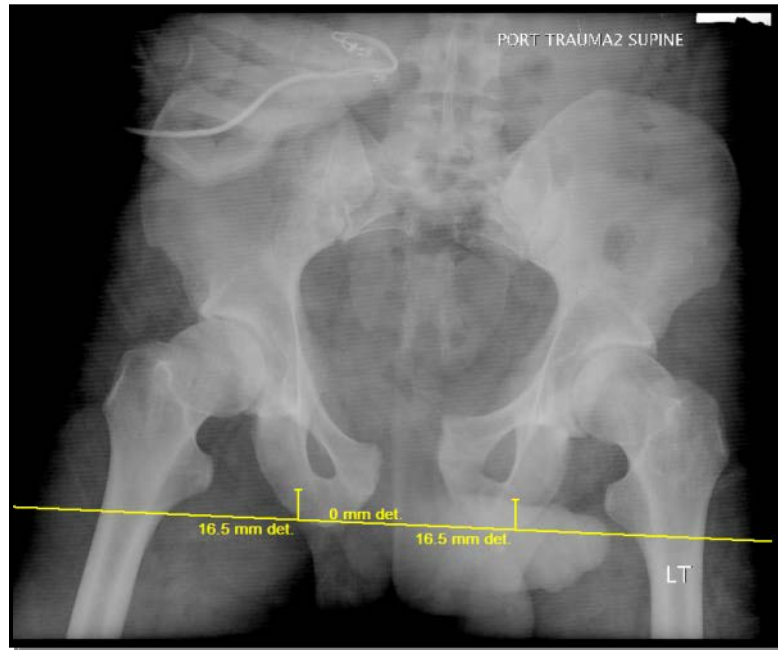


You can compare trochanted positions in images to measure and assess differential leg lengths by selecting the **Orthopedic Transischial Line** tool from the **Application Toolbar**, as shown on the left. Once you have selected the Orthopedic Transischial Line tool, your mouse pointer will change to match the icon for this tool.

Once you have selected the Orthopedic Transischial Line tool, you can place a transischial line by performing the following steps:

1. Click and hold down the left mouse button (do not release the button) to place the first line in the desired location.
2. While continuing to hold down the button, move the mouse to the location of the second point, and release the button
3. Click a third time with the left mouse button where you want to complete the angle.

When you have finished, the angle will be placed and the angle measurement will appear at the intersection point, as in the following example:



Transischial Line

With the Transischial Joint Line Tool as your cursor, you can make the following adjustments to the annotation once you have created it:

- To **move** the **entire annotation**, click on the drawn line and drag the entire annotation to a new location.
- To **move** any of the accompanying **text**, click on the text and drag it to a new location.
- To **resize** any of the measurement lines, click on the endpoint of the desired line and drag it to a new location.
- To **modify** the **angle** of the connecting line, do the following:
 - Hover your cursor over one of the two intersection points until a circle appears around the intersection point, as in the following example:

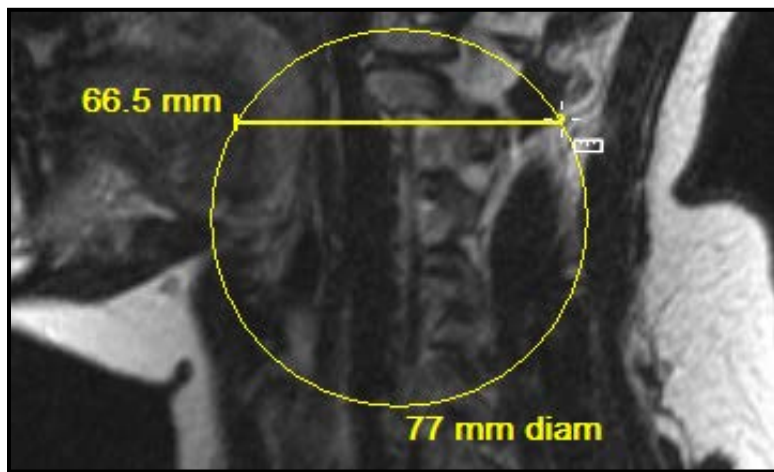


Intersection points

- Click and drag the point to its new location, noting that the angle of the line moves accordingly, and release the mouse button. Using the points on the connecting line, you can rotate it a full 360°.

I. Superimposing Measurements

In general, when you hover your mouse cursor over the yellow line of a measurement annotation, the annotation becomes selected and you can then click and drag to move the annotation. If you want to superimpose a measurement on top of an existing measurement, however, you can do so by clicking on the yellow line of the existing annotation and holding the mouse button down until the cursor changes to the selected measurement tool. You can then use the annotation tool as normal to draw the new measurement, as in the following example:



Superimposing a Line Measurement on a Circle Measurement

The following types of measurement annotations can be superimposed on other annotations in 2D and 3D mode:

- **2D Mode:**
 - Line Measurement
 - Cobb Angle
 - Angle Measurement
 - ROI Measurement
 - Joint Line Tool
 - Transischial Line Tool
 - Pointer Text
 - Pixel Masking (QC Editor Only)
- **3D Mode:**
 - Line Measurement
 - Cobb Angle
 - Angle Measurement
 - ROI Measurement
 - Pointer Text

NOTE: By default, you need to hold the mouse button down for half a second in order to activate superimposition mode and you cannot move the cursor more than three pixels in any direction during that period. Both the time required to activate and the movement tolerance can be configured on a site-by-site basis, however.

m. Manually Saving Annotations



If you have the privilege to save annotations manually, you can do so by selecting the **Save Annotations** tool from the **Application Toolbar** or **Study Toolbar**, as shown on the left. Otherwise, this tool will be disabled and either your annotations will be automatically saved upon exiting the study or you will be prompted to save them upon exiting the study, depending on whether the **Automatically Save Annotations on Exit** user preference is enabled, as described in subsection 24.1.2 below.

NOTE: If you are currently viewing one or more prior studies and have made annotations on those studies, selecting the **Save Annotations** tool will save those annotations as well.

NOTE: The **Save Annotations** tool will only operate on studies with a status of "Read" or greater if you have the "Allow user to add, edit, or delete annotations after study is read" user privilege.

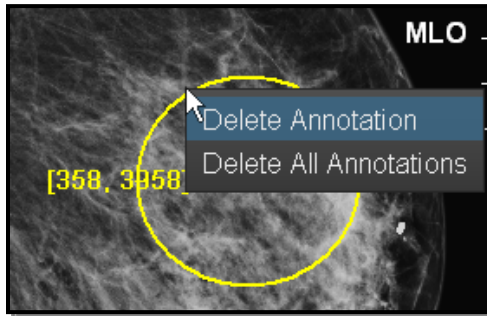
CAUTION: If you have access to the **Save Annotations** tool, the only way to save annotations will be to use that tool and you will not be able to enable the "Automatically Save Annotations on Exit" user preference described in subsection 24.1.2 below.

n. Deleting Annotations

Annotations can be deleted in one of the following ways:

- Hover your mouse cursor over the yellow line or text of the annotation you wish to delete and then press the **Delete** button on your keyboard.
- If you have multiple annotations on a single image and want to delete them all, press **Ctrl-A** on your keyboard to select all annotations and then press the **Delete** button to remove them.

- Right-click on the yellow line or text of the annotation you wish to delete and select an option from the pop-up **Annotation Deletion Menu**, as in the following example:



Annotation Deletion Menu

o. Toggling Display of Annotations



Once annotations have been applied to one or more images in a Study, you can toggle the display of those annotations on and off by selecting the **Toggle Annotations** tool from the **Application Toolbar** or **Study Toolbar**, as shown on the left.

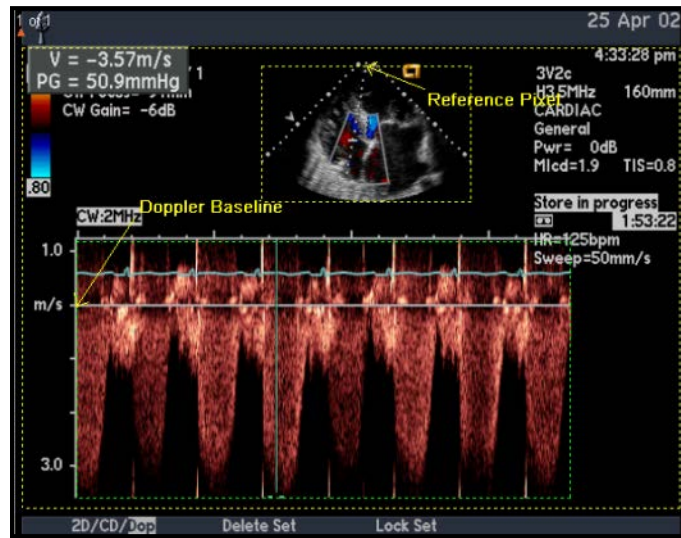
If the display has been toggled off, any image that has annotations will include an **A** in its image information, as in the following example:



This Image Has Hidden Annotations

p. Ultrasound Regional Measurements

If more than one region is included in an Ultrasound image, each region will be displayed with a separate dotted yellow line border when the Line Measurement tool is selected, as in the following example:



Multiple Ultrasound Regions

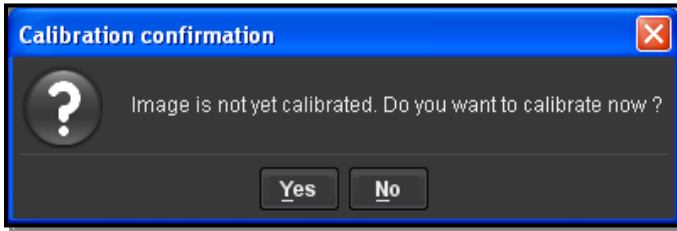
When using the Line Measurement tool, the tool will be calibrated according to the specific region where it is applied.

q. Manually Calibrating Line Measurements

Some DICOM images, such as ultrasound images, do not always have valid pixel spacing information associated with them when they are sent from the modality. For such images, the **Line Measurement** tool described above cannot display lengths in millimeters. The Merge PACS Viewer, however, allows you to manually calibrate the Line Measurement tool by measuring something in the image of a known length and telling the system that length in millimeters.

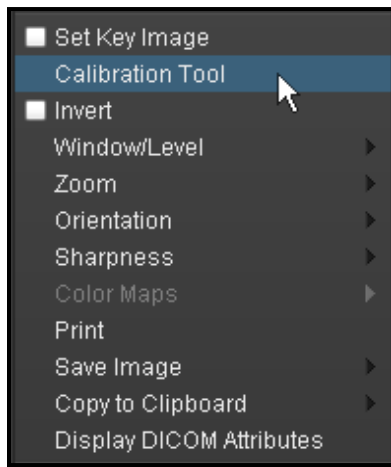
You can also manually calibrate the Line Measurement tool images that do have valid pixel spacing information associated with them, except for modalities that support volumetric reconstruction (MR, CT, NM and PET).

- Manual Calibration can be initiated in the following three ways:
 - If you try to use the Line Measurement tool on an image with no valid pixel spacing information, a **Calibration Confirmation** window will be displayed, as in the following example:



Calibration Confirmation

- If you need to calibrate (or recalibrate) an image that requires calibration, you can select the **Calibration Tool** option from the **Series Right-click Menu**, as shown in the following example:



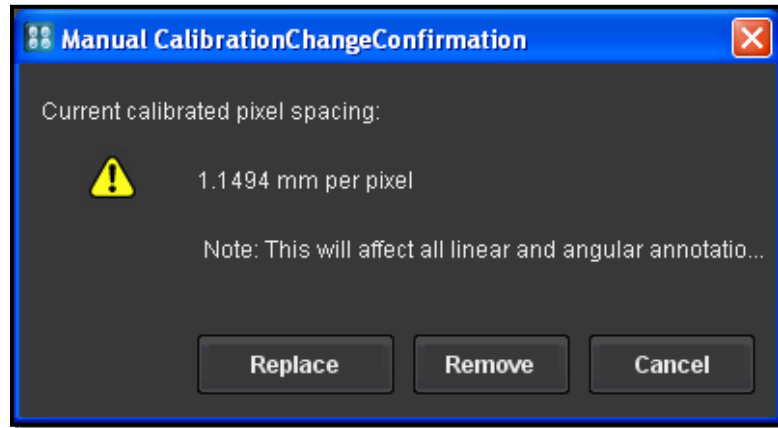
Calibration Tool Option

NOTE: The Calibration Tool option will only be enabled if the image requires calibration.



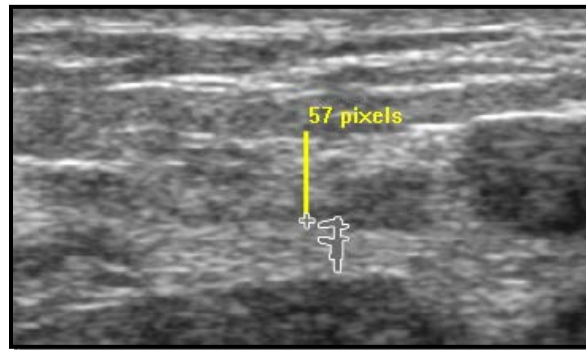
If you want to manually calibrate an image that does not automatically require calibration, click on the **Manual Calibration** icon on the **Application Toolbar**, as shown on the left.

- Once Manual Calibration has been initiated, your cursor will change to a special calibration icon. In addition, if manual calibration has already been performed for this image, a confirmation window similar to the following will be displayed:



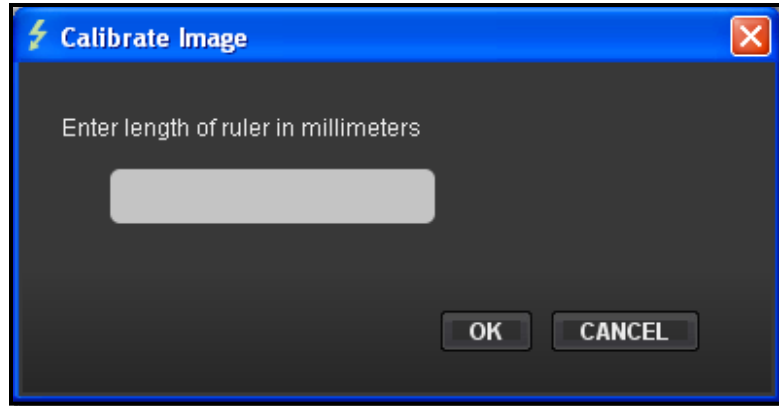
Manual Calibration Change Confirmation Window

- Click the **Remove** button to undo any manual calibration that was previously saved.
 - Click the **Replace** button to recalibrate the image, after which you can manually calibrate the image as described above.
- Once you see the Manual Calibration cursor, perform the following steps to manually calibrate line measurements for the image:
 - Click and hold the left mouse button where you want to define the starting position of the calibration ruler.
 - While holding the left mouse button down, move the mouse until you reach the end point of the area you are measuring, as in the example below:



Using the Calibration Tool

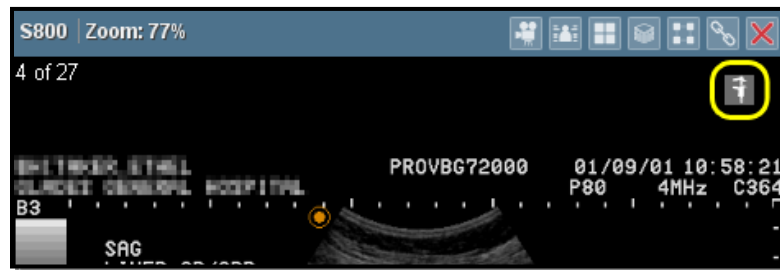
- When you reach the end point of the area you are measuring, release the left mouse button. The **Calibrate Image** dialog box will be displayed, as in the following example:



The Calibrate Image Dialog Box

- Enter the length of the measured area, in millimeters, in the space provided and press the **OK** button. Note that only whole numbers are permitted.

Once an image has been manually calibrated, a small calibration icon will be displayed in the Image Titlebar for that image, as shown in the following example:



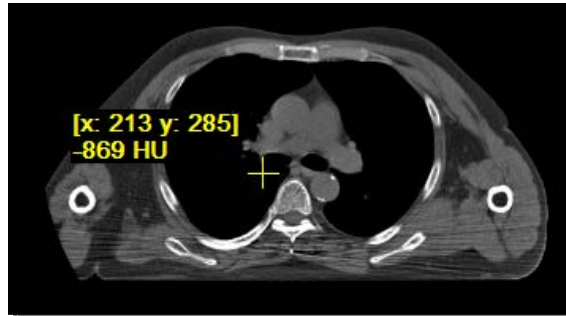
Calibration Marker

4.5.16. The Probe Tool



The Merge PACS Viewer provides you with the ability to determine the intensity value for each selected pixel of the image being viewed by selecting the **Probe** tool from the **Application Toolbar**, as shown on the left. Once you have selected the Probe tool, your mouse pointer will change to match the icon for this tool.

Once you have selected the Probe tool, you can then place your pointer over the pixel you want to probe and click with your left mouse button. As long as you hold down the left mouse button, the pixel intensity will be displayed above the pointer, as in the example below:



Using the Probe Tool

- The Probe tool measures the intensity of the pixel in the **original image**, regardless of what the current setting of the Window and Level viewing values.
- For all the supported modalities except PET and CT, the units provided by the modality will be displayed. If no units are provided by the modality, no units will be displayed.
- For **CT** images, if no units are provided by the modality the units will be assumed to be **Hounsfield Units (HU)**. For all other image types (except PET), unspecified units will be displayed as **US**.
- For **PET** images (**2D** only), the following units will be available:

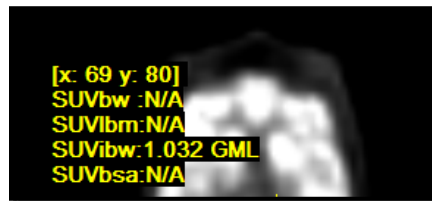
Unit	Description	Unit	Description
NONE	unitless	MLG	milliliter/gram
CNTS	counts	1CM	1/centimeter
CM2	centimeter ²	UMOLML	micromole/milliliter
CM2ML	centimeter ² / milliliter	PROPCNTS	proportional to counts
PCNT	percent	PROPCPS	proportional to counts/sec
CPS	counts/second	MLMINML	milliliter/minute/milliliter
BQML	Becquerels/milliliter	MLML	milliliter/milliliter
MGMINML	milligram/minute/milliliter	GML	grams/milliliter
UMOLMINML	micromole/minute/milliliter	STDDEV	standard deviations
MLMING	milliliter/minute/gram		

- If the units are in **BQML**, **GML**, or **CM2ML**, the Probe tool will display **Standardized Uptake Values (SUV)** that represent the absorption of an injected isotope in body tissue.
- There are four different types of SUVs that can be displayed, if available:
 - **Body Weight (BW)**
 - **Lean Body Mass (LBM)**
 - **Body Surface Area (BSA)**
 - **Ideal Body Weight (IBW)**

- You can configure which types of SUVs you want to be displayed (if any) from the Merge PACS Preferences dialog, as described in Chapter 24 below.
- If there is insufficient information available to calculate one or more types of SUV values, you can manually enter the missing parameters, as described in subsection 4.5.17 below.
- Refer to Appendix B below for detailed information regarding how SUVs are calculated.

4.5.17. Setting SUV Parameters (PET Series Only)

As described in subsections 4.5.15 and 4.5.16 above, the ROI Measurement and Probe tools can display various **Standardized Uptake Values (SUV)** that represent the absorption of an injected isotope in body tissue. If you have selected to display a particular type of SUV from the Merge PACS Preferences dialog, as described in Chapter 24 below, and there is insufficient information available to calculate that type SUV value, the value will be displayed as N/A, as in the following example:



Undefined SUV Values

If desired, you can manually enter the missing information by selecting the **SUV Parameters** option from either the **Series Right-click Menu** or the **MIP Viewport Right-click Menu** while viewing a PET Series within a Viewport.

When you select the SUV Parameters option, the **SUV Parameters** window will be displayed, as in the following example:

SUV Parameters Window

The following fields can be edited as necessary:

- **Gender**
- **Weight**
- **Height**
- **Total Dose Units** (MBq or bCi)

Enter the missing information and click on the **Save Changes** button to record your changes and close the SUV Parameters window.

NOTE: This information will be saved with the Study itself, so it will not need to be re-entered the next time it is viewed. It will also be included when the Study is archived or transferred.

4.6. The Spine Labeling Tool



The Merge PACS Viewer includes the ability to intelligently label vertebrae by clicking on the **Spine Labeling** button on the **Application Toolbar**, as shown on the left. This “intelligent labeling” means that the user can manually label the vertebrae in sagittal slices and have the corresponding axial slices automatically labeled for them. It also means that the Merge PACS Viewer can remember the last label assigned and automatically increment the label for the next vertebra.

Below is an example of spine labeling in action:



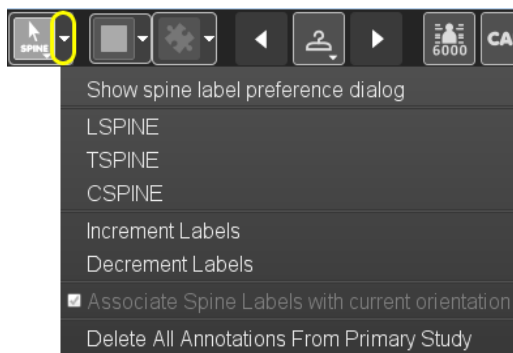
Example of Spine Labeling

NOTE: In order to see spine labels in external systems, including iConnect Access, they must be first saved as key images, as described in Section 4.9.14.h below.

4.6.1. The Spine Label Preferences Menu



The Spine Labeling Tool is configured via the **Spine Label Preferences Menu**, which is accessed by clicking on the triangle to the right of the **Spine Labeling** button on the **Application Toolbar**, as shown on the left. When you click on this triangle, the Spine Label Preferences Menu will be displayed, as in the following example:



The Spine Label Preference Menu

NOTE: The Spine Label Preferences Menu is also available from the **Series Right-click Menu**, as described in subsection 4.2.5 above.

4.6.2. Defining the Spinal LabelSets

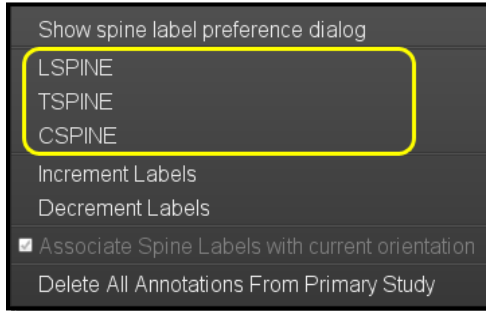
A related group of spine labels is called a “LabelSet.” Before you can begin creating a LabelSet, you need to define the LabelSet preferences. The LabelSet preferences tell the Merge PACS Viewer such things as where you plan to begin labeling, whether you want the labels to increment in ascending or descending order, and whether you want the Merge PACS Viewer to automatically label the vertebra on the axial views when you manually label the vertebrae on the sagittal views.

There are two ways that the preferences can be defined for a particular LabelSet:

- Predefined LabelSet preferences can be selected from the **Series Right-click Menu**.
- LabelSet Preferences can be manually defined from the **Spine Label Preference Dialog**.

a. Selecting a Predefined Default LabelSet

If you have not already started adding labels to a Study, you can select predefined LabelSet preferences from the **Spine Label Preferences Menu**, as shown in the following example:



Selecting a Predefined Set of LabelSet Preferences

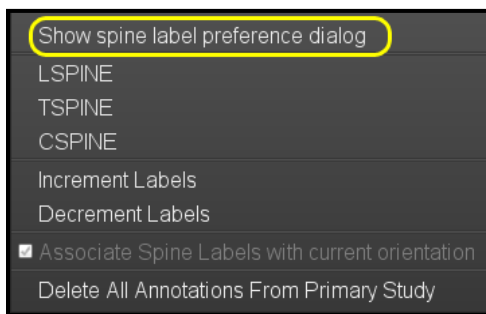
By default, the following three preferences are available:

Preference	Description
LSPINE	Creates automatic labeling starting at S1 and descending .
TSPINE	Creates automatic labeling starting at T1 and ascending .
CSPINE	Creates automatic labeling starting at C2 and ascending .

NOTE: With each of the default preferences described above, the Merge PACS Viewer will automatically label the vertebrae on the **axial** views when you manually label the vertebrae on the **sagittal** views.

b. Manually Defining LabelSet Settings

If a Study does not already have any LabelSets associated with it, or if you want to edit information for an existing LabelSet, you can access the **Spine Label Preference Dialog** from the main **Spine Label Preferences Menu**, as in the following example:



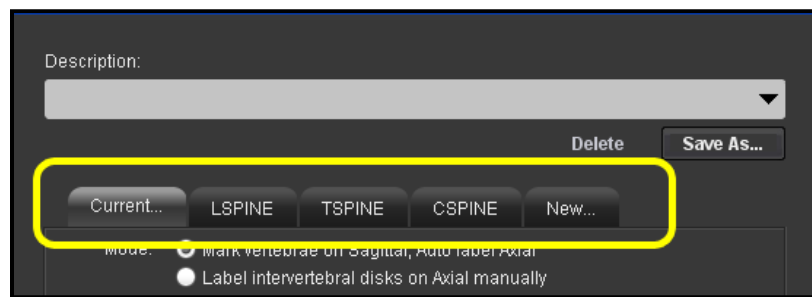
Accessing the Spine Label Preference Dialog

This will cause the **Spine Label Preference Dialog** to be displayed in a separate pop-up window, as in the following example:



The Spine Label Preference Dialog

The top section of the Spine Label Preferences Dialog has a number of tabs, as shown in the following example:



Spine Label preference Dialog Tabs

The tabs allow you to do the following:

- Temporarily set the preferences for current use.
- Edit an existing predefined set of preferences.
- Create a new set of preferences that can be saved for display in the Series Right-click Menu.

Once you have selected the desired tab, the following information can be entered for this set of preferences:

Option	Description
Mode	Select whether you want The Merge PACS Viewer to automatically label the vertebra on the axial views when you manually label the vertebrae on the sagittal views ("Mark vertebrae on Sagittal, auto label Axial"), or whether you want to manually label the vertebrae on the axial views as well ("Label intervertebral disks on Axial manually").
Start at	Select where you want to begin labeling. The Merge PACS Viewer will automatically increment the labels numbers for you as you mark each vertebrae, freeing you from having to type out each label manually
Direction	Select whether you want the labels to increment in ascending (e.g., C2, C3, C4, etc.) order or descending (e.g., C6, C5, C4, etc.) order.
Label L6 between L5 and S1	Select this if you want the labeling to include a L6 label between L5 and S1.
Align Axial Labels	Click this button if you want to customize how axial labels will be aligned. A small pop-up window will be displayed, as in the following example:



Aligning Axial Labels

Use your mouse to move the **Label** icon to the desired position and then click on the red **X** to save your change and close the window.

To save your changes, do one of the following:

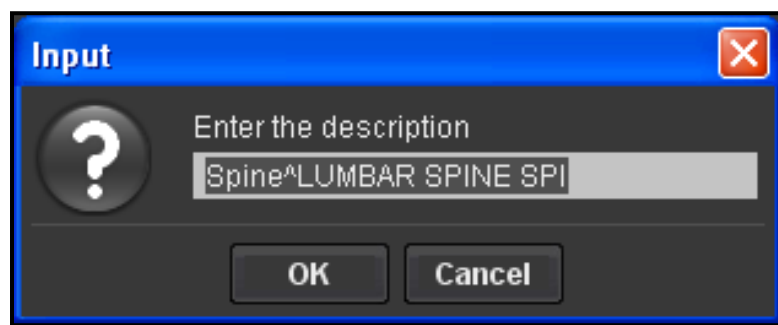
- If you are setting preferences for current use or have edited an existing predefined set of preferences, click on the **OK** button at the bottom of the window to save your changes and return to the Merge PACS Viewer.

CAUTION: If you make changes to an existing predefined set of preferences, clicking the **OK** button will automatically update the predefined set of preferences with your changes. Therefore, do not hit **OK** if you only want to temporarily make a change to that set of preferences. If you are creating a new set of preferences and want to have them appear as an option in the Series Right-click Menu, click on the **Save As...** button at the top of the window, as in the following example:



Saving a New Set of LabelSet Preferences

- Clicking the **Save As...** button will cause a small **Input** dialog box to be displayed, as in the following example:



New LabelSet Preferences Input Dialog

- In the **Description** field, enter the text you want to match in the Study's description. By default, this field will contain the description of the currently open Study, but it can be changed to anything you want. Note that the description does not need to be case sensitive and the use of wildcard characters is currently **not** supported. When finished, click the **OK** button to save your changes.

4.6.3. Labeling a Vertebra

Once LabelSet settings have been defined, clicking on Spine Label button on the Toolbar will cause the mouse cursor to appear as the special Spine Label cursor, as shown in the following example:



The Spine Labeling Cursor

The cursor will remain this way until you exit Spine Labeling mode (whether by selecting another tool from the Toolbar or clicking with your right mouse button to cycle through the standard mouse modes). If you accidentally exit Spine Labeling mode, you will need to click on the Spine Labeling tool on the Toolbar once again to re-enter it.

To label a vertebra, do the following:

1. Position the Spine Labeling cursor over the desired vertebra and depress the left mouse button.
2. While holding the left mouse button down, move the cursor to where you want the label to appear. While you are moving the cursor, a thin dotted line will be displayed to indicate the relationship between the spot being marked and the location of the label.
3. When the label is where you want it, release the mouse button. There will now appear a small "x" at the point where you first clicked on the image (the "marker"), and the label will have a small arrow pointing to that spot, as in the following example:



First Labeled Vertebra

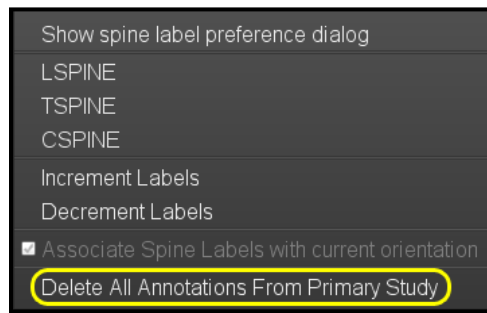
4. Repeat steps 1-3 as desired to label additional vertebrae. The Merge PACS Viewer will automatically increment the labels as you do so.

NOTE: Spine labels applied to one sagittal view in a Study will automatically be applied to all other sagittal views in the same frame of reference and orientation for that Study, whether or not that view is currently being displayed in a Series Viewport. If the view you are currently labeling is not clear enough to allow you to label all the desired vertebrae, at any time you can switch to a different view and continue the labeling process there.

4.6.4. Correcting Mistakes

The Merge PACS Viewer allows you to correct mistakes made while using the Spine Labeling tool in the following ways:

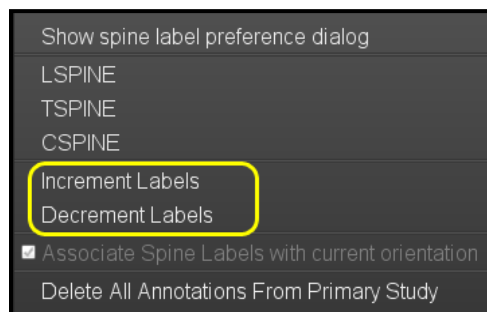
- If you want to **reposition** the location of a **marker**, click on it with the left mouse button and drag it to the desired location.
- If you want to **reposition** the location of a **label**, click on the base of the arrow associated with that label with the left mouse button and drag it to the desired location.
- If you want to **delete** the **last created** spine label entirely, press **Ctrl+Z** on your keyboard. If you have created multiple spine labels, pressing **Ctrl+Z** repeatedly will delete each spine label in the reverse order in which it was created.
- If you want to **delete all** spine labels from the primary Study, select **Delete All Annotations from Primary Study** from the **Spine Label Preferences Menu**, as in the following example:



Deleting All Spine Labels

- If you started the labeling at the wrong place, you can increase or decrease the entire range of labels by increments. For example, if your set of labels goes from T1 to T6 and you realize that what you labeled as T1 is actually C7, you can **decrement** the set of labels so that they range from C7 to T5 instead of T1 to T6. Conversely, if you realized that what you labeled as T6 is really T7, you can **increment** the labels so that they range from T2 to T6.

To increment or decrement the current set of labels, select the desired option from the **Spine Label Preferences Menu**, as in the following example:

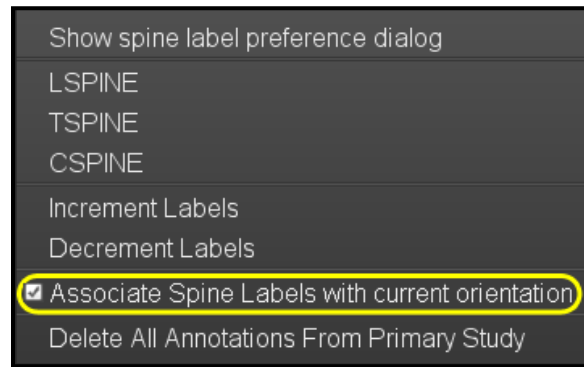


Incrementing or Decrementing Labels

4.6.5. Associating Spine Labels of Two Different Orientations

If two different sagittal images share the same DICOM Frame of Reference but different orientations, the Merge PACS Viewer allows you to associate spine labels defined using images of one orientation with a different orientation. In this way, the labels will display on all images with the associated orientation.

To associate all spine labels with the currently viewed orientation, select **Associate Spine Labels with current orientation** from the **Spine Label Preferences Menu**, as in the following example:



Associating Spine Labels with Current Orientation

At any time, you can also disassociate the spine labels from different orientations by deselecting the **Associate Spine Labels with current orientation** option.

4.7. Saving, Printing and Copying Images

The Merge PACS Viewer allows you to do the following:

- **Save Images in a variety of different formats**
- **Print Images**
- **Copy and Paste Images into Another Application**

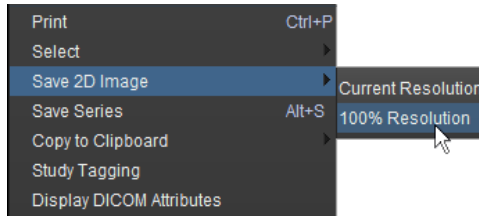
4.7.1. Saving images

You can save individual Study images or an entire Series of images in a variety of available image formats for inclusion in a document or an e-mail message.

CAUTION: Saved images are intended for inclusion in other documents, not for diagnostic purposes.

a. Saving Individual Images

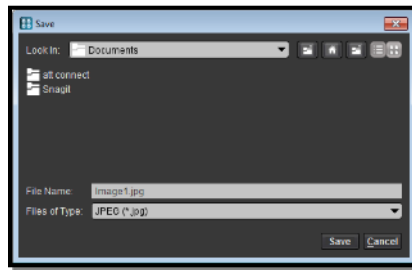
To save an individual image, select one of the available **Save 2D Image** options from the **Series Right-click Menu**, as shown in the following example:



Saving an Image

You can choose whether to save the image at the zoom factor currently being displayed in the viewport or at 100% resolution.

When you select a Save Image option, the **Save Image** dialog window will be displayed, as in the following example:



Save Image Dialog

- By default, the images will be saved to the Windows Documents folder associated with your login account. If necessary, use the **Look In** drop-down menu to select another location.
- If desired, change the default name of the image in the **File Name** field.
- If desired, select a different file type for this image from the drop-down **Files of Type** menu. The following image formats are currently supported:
 - JPEG (*.jpg)
 - PNG (*.png)
 - BMP (*.bmp)
 - JPEG (*.jpeg)

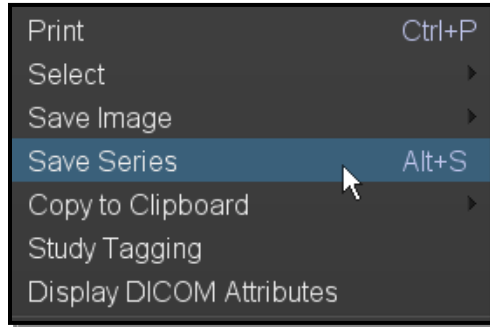
NOTE: PNG images are lossless compressed and BMP images are uncompressed. These image formats should be used when saving images for use in a publication as they will provide better image quality than the lossy JPEG formats. If in doubt about the size of the image to submit, it is generally best to save at 100% resolution so that image scaling / interpolation is only applied once in the final publication.

- When finished, click on the **Save** button at the bottom of the window.

b. Saving Entire Series

To save all images from one or more Series, do one of the following:

- Select the **Save Series** option from the **Series Right-click Menu**, as shown in the following example:

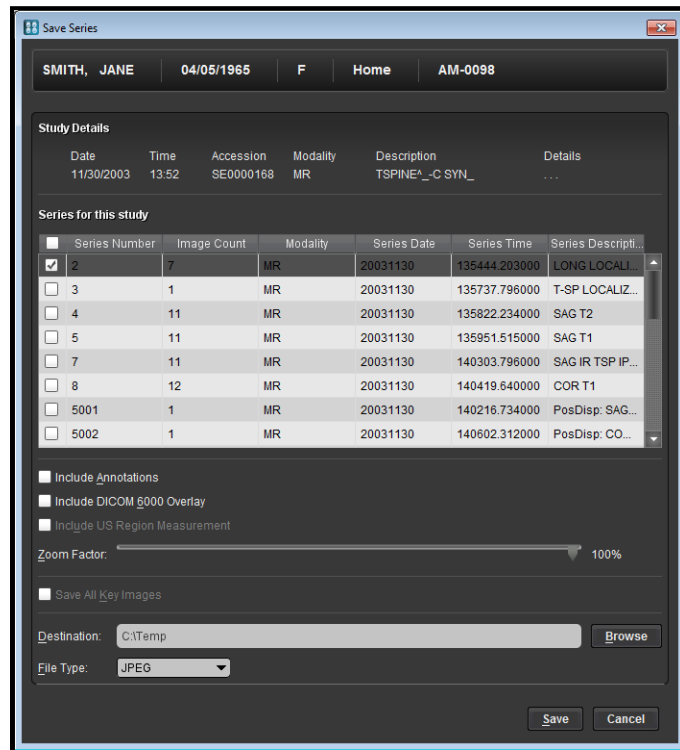


Saving a Series



Select the **Save Series** icon from the **RTWL** or the **Patient Record Toolbar**, as illustrated to the left.

When you select the Save Series option or icon, the **Save Series** dialog window will be displayed, as in the following example:



Save Series Dialog

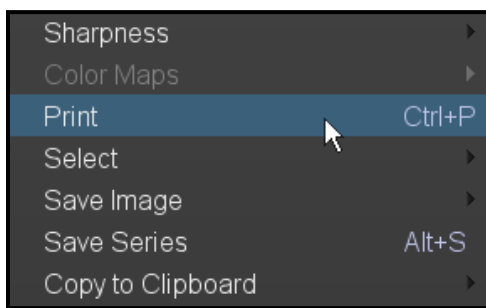
- If there are multiple Series associated with this Study, you can select one or more Series to be saved from the **Series for this Study** panel.
- Depending on the type of Series, you can optionally select to save one or more of the following using the checkboxes provided:
 - **Annotations**
 - **DICOM 6000 Overlay** information
 - **US Region Measurements** (Ultrasound Series only)
 - **Key Image** (only if key images have been flagged)
- By default, all images will be saved at 100% resolution. If desired, you can choose a smaller resolution using the **Zoom Factor** slide bar.
- Click on the **Browse** button to select a different location to save the images, if necessary.
- If desired, select a different file type for this image from the drop-down **Files of Type** menu. The following image formats are currently supported:
 - JPEG (*.jpg)
 - PNG (*.png)
 - BMP (*.bmp)
 - JPEG (*.jpeg)
- When finished, click on the **Save** button at the bottom of the window.

4.7.2. Printing Images

If your machine is connected to a printer, either locally or over a network, you can print the image displayed in the **active Series Viewport**. In addition, if your site has been configured with one or more DICOM printers, you can send individual images or entire Series to one of those DICOM printers.

a. Standard Image Printing

To send the image currently displayed in a viewport to a standard printer, select the **Print Image** option from the **Series Right-click Menu**, as shown in the following example:



Printing an Image

A standard print dialog will be displayed that will allow you to select the desired printer, the number of copies, etc.

Note the following:

- Your printer's driver must support Postscript.
- The image will be printed one image per page, regardless of the tiling settings on the screen.
- Depending on how Merge PACS is configured, the printed image may or may not include a header with Patient, Study and Series information.
- Depending on how Merge PACS is configured, the image will either be printed as shown or else it will be resized and cropped to fill the entire page, as in the following example:



Normal Printing



Full-Page Printing

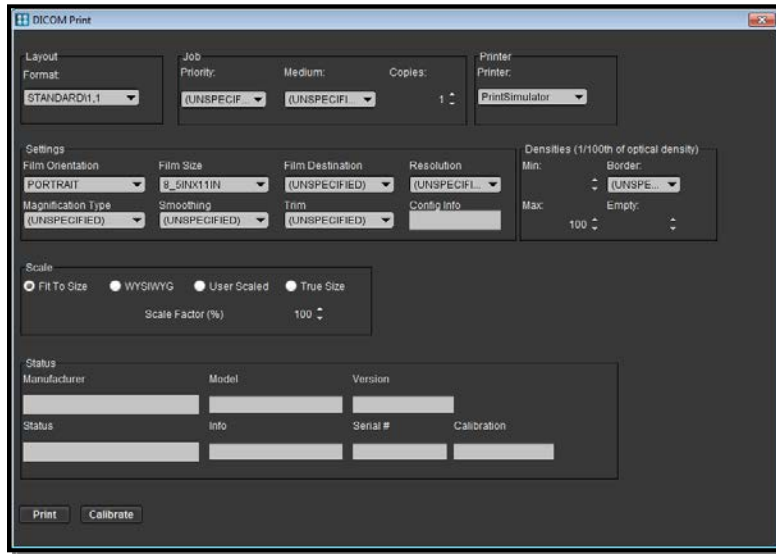
b. DICOM Printing



If Merge PACS has been configured for DICOM printing and you have the login privilege to send studies to a DICOM printer, once you have selected one or more images and/or Series for DICOM printing, either from the **Series Toolbar** or from the **Series Right-click Menu** (as described in subsection 4.2.5 above), you can send them to an available DICOM printer by clicking on the Print DICOM icon on the Application Toolbar, as shown on the left.

You can also send all key images to an available DICOM printer by selecting the **DICOM Print Key Images** option from the **Key Image Series Right-click Menu**, as described in subsection 4.11.4 below.

When you click on the Print DICOM icon (or select DICOM Print Key Images), the DICOM Print dialog window will be displayed, as shown in the following example:



DICOM Print Dialog

- If necessary, select the desired printer from the list of available DICOM printers, as in the following example:



Selecting a DICOM Printer

NOTE: Your printer selection will be automatically stored with your workstation preferences, so you should not need to select it each time you print.

- The remaining fields will automatically be filled in with the configured default settings for the selected printer. You can change any of the settings for this particular print job as desired, however, such as the **Format**, **Film Orientation**, **Film Size** and **Scale**.
- When ready to print, click on the **Print** button at the bottom of the window.

CAUTION: Only the overlay text currently shown in the viewport will be printed on the image when it is sent to a DICOM printer. If the image is being printed for diagnostic purposes, DICOM Overlays should be toggled on so that identifying patient information is included. If the image is being printed for use with Teaching Files, any overlay text that contains patient information should be disabled.

CAUTION: True Size should not be selected as a Scale option unless the Film Size is large enough to fit the image.

CAUTION: For uncalibrated images, it is important to redo measurements on a printout by calibrating a ruler with an embedded marker in the image, if available.

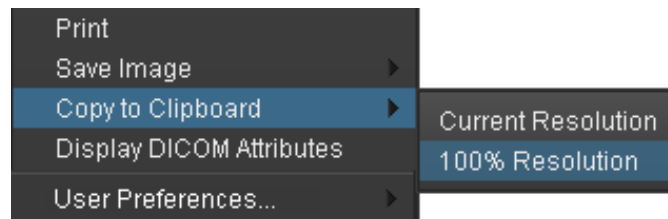
NOTE: Printed images will include a caliper representing 5 cm. If you have selected **True Size** for the scale, it is recommended to match the caliper on printout with a ruler to verify the scale.

NOTE: DICOM overlay text displayed as Bold Highlighted on screen (with yellow text) will be printed out as white text.

4.7.3. Copying and Pasting Images

You can temporarily copy the image currently displayed in the **active Series Viewport** to your computer's memory. You can then paste the image directly into another application, such as an e-mail message or a word processing document, by pressing **Ctrl-V** within that application.

To copy an image into memory, select one of the **Copy to Clipboard** options from the **Series Right-click Menu**, as shown in the following example:



Copying an Image to the Clipboard

4.8. 3D Rendering Tools

The Merge PACS Viewer provides inherent 3D support directly within the application, which allows you to seamlessly navigate between 2D and 3D/MPR views. The majority of functionality available to 2D views is equally available to 3D/MPR views, including toolbar commands, menus, mouse modes, mouse cycle modes, and keyboard shortcuts.

MPR and 3D viewports can be loaded directly "in-place" into the main Merge PACS Viewer window (*i.e.*, replacing an existing 2D view), or displayed within a separate 2x2 Grouped 3D Viewing frame where you can manipulate the Axial, Sagittal, and Coronal MPR Series Viewports to create the desired reconstruction in the 4th window (for rendered volume or slab).

In addition, you can drag and drop any window (2D, MPR, or CVR) and exchange it with another window as well as persistence of any Series Viewport so it can be recreated at a later time.

With regard to “in-place” 3D viewports, note the following:

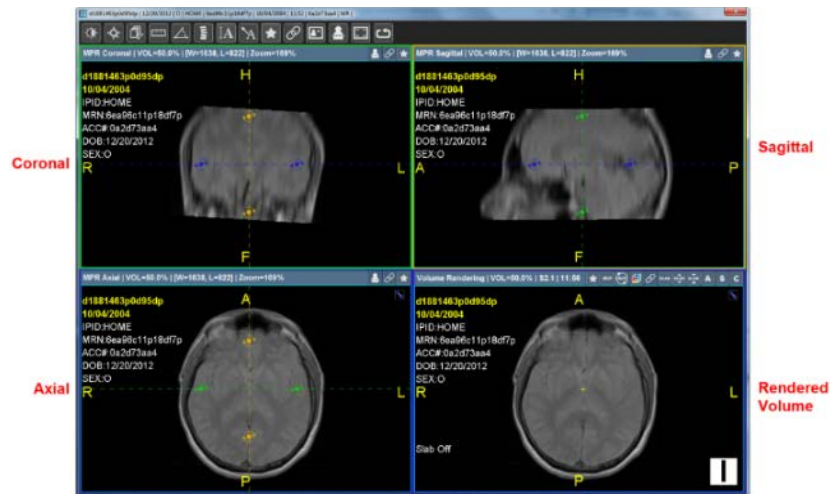
- The tools on the main Application Toolbar will be active only for 2D viewports and will not be active for in-place 3D viewports.
- For the in-place 3D viewports, use the right-click menu item to cycle through the mouse modes or use any of the available options from the Series Right-click menu to change the mouse mode.

The following terms are specific to 3D Rendering:

Term	Description
MPR	Multi-Planar Reconstruction (MPR) allows image data to be displayed as three standard orthogonal views corresponding to the Transverse, Coronal and Sagittal axes, reconstructing two of the planes when applied to a single plane. MPR thus allows you to view the image data from any viewpoint without having to re-scan the patient.
MPR Oblique	As with standard MPR, MPR Oblique allows image data to be displayed as three standard orthogonal views corresponding to the Transverse, Coronal and Sagittal axes, reconstructing two of the planes when applied to a single plane. In addition, though, you can specify single or double oblique planes within the volume, if required.
MIP	Maximum Intensity Projection (MIP) is typically used with contrast-enhanced images to maximize the visualization of vasculature. A MIP is created by combining a Series of slices with display of the brightest pixel on any slice at each location.
CVR	Color Volume Rendering (CVR) adds a color dimension to a 3D rendered image. Typically used to better define the pathology.
Aligned MIP	A special rendered view for use with Breast Tomosynthesis images that is parallel to the stack of images you have acquired (<i>i.e.</i> , it represents a view direction that is perpendicular to the breast tomosynthesis image plane, and rotated and/or flipped so that the image has the standard mammography hanging orientation). For more information, refer to subsection 4.9.14.g below.

4.8.1. Multi-Planar Reconstruction (MPR) Window

Multi-Planar Reconstruction (MPR) Series can be displayed in a special MPR Window that has its own Toolbar and Right-click Menu. The MPR Window displays three standard orthogonal views corresponding to the Axial, Coronal and Sagittal axes, as well as a rendered 3D volume within a special Rendered Volume Viewport, as shown in the following example:



MPR Window

The Rendered Volume can be generated according to one of the following methods:

Method	Description
Maximum Intensity Projection (MIP)	Grayscale method that emphasizes tissue with the highest pixel values, such as bone and vasculature.
Minimum Intensity Projection	Grayscale method that emphasizes tissue with the lowest pixel values, such as air-filled structures.
Average Intensity Projection	Grayscale method that displays tissue with average pixel values, similar to a standard CT or MR image.
Faded MIP	Standard MIP shows 100% white at each point of intersection and 0% white otherwise. Faded MIP, on the other hand, shows an alpha value based on how far the ray goes through and therefore provides greater detail.
CVR	Color Volume Rendering (adds a color dimension to a 3D rendered image).

By default, the rendered MPR volume in the Rendered Volume Viewport will be displayed as a MIP in an Axial view, but this default behavior can be changed from the Merge PACS Preferences dialog, as described in Chapter 24 below.

NOTE: Image Fusion, described in subsection 4.8.3 below, cannot be performed within the MPR Window and must be performed within a single-view MPR Viewport, as described in subsection 4.8.2 below.

The MPR Window can be launched in any of the following ways:

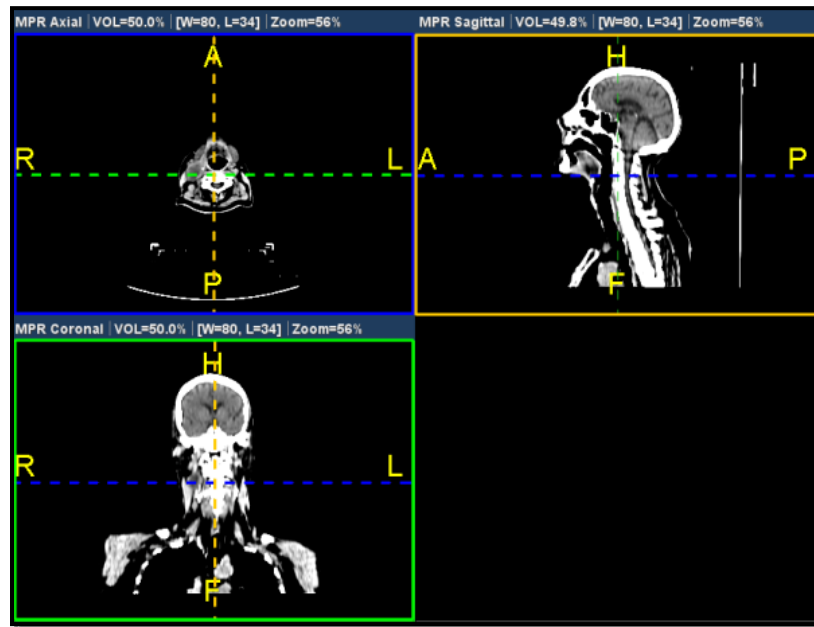


Clicking on the **Create 3D MPR Slab View** icon on the **Series Toolbar**, as described in subsection 4.2.5, above, and shown on the left.

- Selecting **Open MPR Viewport** from the Primary and Prior Exam **Series Navigation Thumbnail Right-click Menus** at the **Patient Record**, as described in subsections 3.8.4 and 3.8.7 above.
- Selecting **Open MPR Viewport** from the **Series Thumbnail Right-Click Menu**, as described in subsection 4.2.4 above.
- Selecting **3D → MPR Viewport** from the **Series Right-click Menu**, as described in subsection 4.2.5, above.

a. Color Coding of MPR Viewports

Each MPR Viewport will have a colored border that indicates what type of view (Axial, Sagittal or Coronal) is displayed within that Viewport, as shown in the following example (colors exaggerated for emphasis):

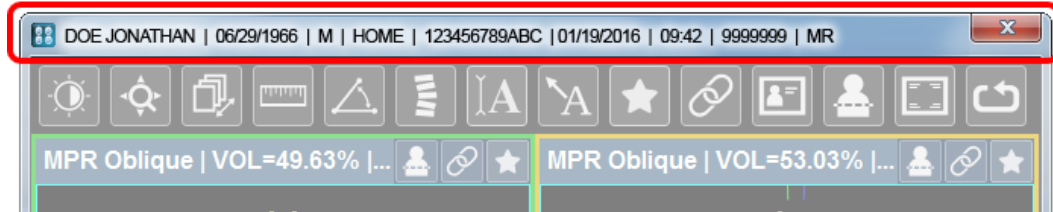


Color-coded MPR Viewports

Note that cross reference lines, if any, will also be color-coded to match the viewport to which they are referencing.

b. MPR Window Titlebar

At the very top of the MPR Window is the **MPR Window Titlebar**, as in the following example:



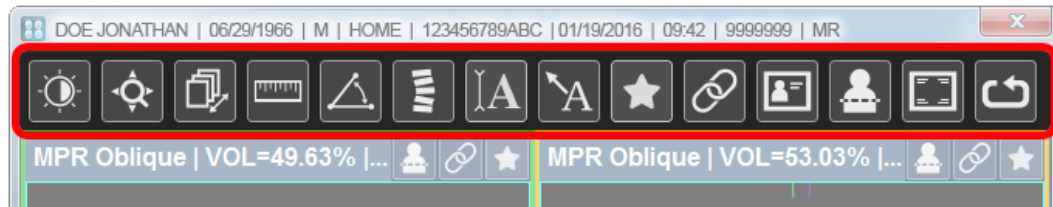
The MPR Window Titlebar

The MPR Window Titlebar displays the following information about the patient Study being viewed:

- Name
- Date of Birth
- Sex
- Medical Record Number (MRN)
- Issuer of Patient ID (IPID)
- Study Time/Date
- Accession Number
- Modality
- Primary Study Description

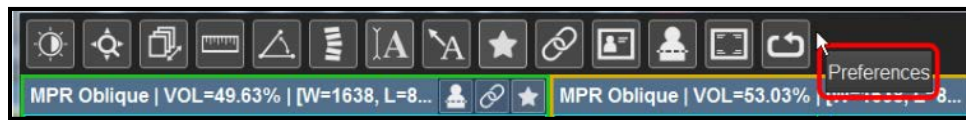
c. MPR Window Toolbar

Below the MPR Window Titlebar is the main **MPR Window Toolbar**, as in the following example:



The MPR Window Toolbar

- The MPR Window Toolbar displays various tools that apply to the MPR Window as a whole. The actual tools available on the toolbar will depend on your login privileges and how you have configured the Toolbar (as described in Chapter 24 below). For a complete list of possible tools, refer to subsection 4.2.7 above.
- Right-clicking on any blank space on the MPR Windows Toolbar will immediately cause a **Preferences** link to be displayed, as in the following example:



MPR Window Toolbar Preferences Link

Clicking the Preferences link will take you directly to the **Application Toolbar** section of the **Merge PACS Preferences** dialog, as described in subsection 24.1.20 below, where you can customize the set of tools that appear on the **3D Window** Application Toolbar.

d. Available Mouse Modes

Repeatedly right-clicking on an image will toggle the cursor among the following commonly used 3D mouse modes:



Rotate



Zoom/Pan Combo



Page (except for **CVR**)



Line Measurement



Window/Level

NOTE: The available mouse modes, as well as the order in which they appear, can be customized for different modalities, as described in Chapter 24 below.

NOTE: This feature can be disabled by **deselecting** the **Delayed Right Click** option in the Merge PACS Preferences dialog, as described in Chapter 24 below. If the feature is disabled (or if you hold down the right mouse button on an image instead of briefly clicking), the **Series Right-click Menu** will be displayed instead, as described in paragraphs f and l, below.

NOTE: The ability to cycle between different mouse modes will not operate if you have custom configured your mouse button actions, as described in Chapter 24 below.

These mouse modes are also available, along with additional mouse modes, via the various 3D Right-click Menus, as described in paragraphs f and l, below.

e. Orthogonal MPR Series Toolbars

At the top of each of the three standard orthogonal MPR Series Viewports is an **Orthogonal MPR Series Toolbar**, as shown in the following example:

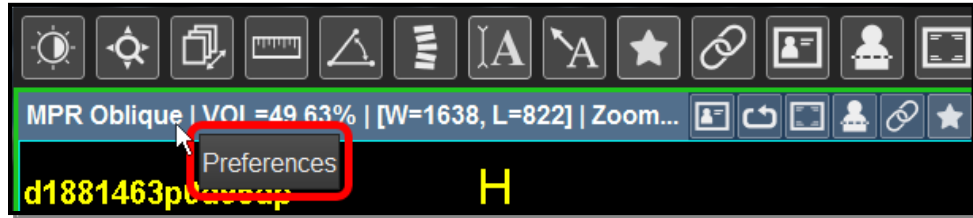


Orthogonal MPR Series Toolbars

The Orthogonal MPR Series Toolbars display information for the Series in the Series Viewport as well as various tools that apply to that Series Viewport:

- By default, the left side of each Orthogonal MPR Series Toolbar displays the following information about the Series within that Series Viewport:
 - **Orientation (Coronal, Sagittal or Axial)**
 - **Percentage through the Volume**
 - **Window/Level**
 - **Zoom Factor**
- The right side of each Orthogonal MPR Series Toolbar displays the available tools that apply to that Series Viewport. The actual tools that appear will depend on how you have configured the Toolbar, as described below. For a complete list of possible tools, refer to subsection 4.2.7 above.

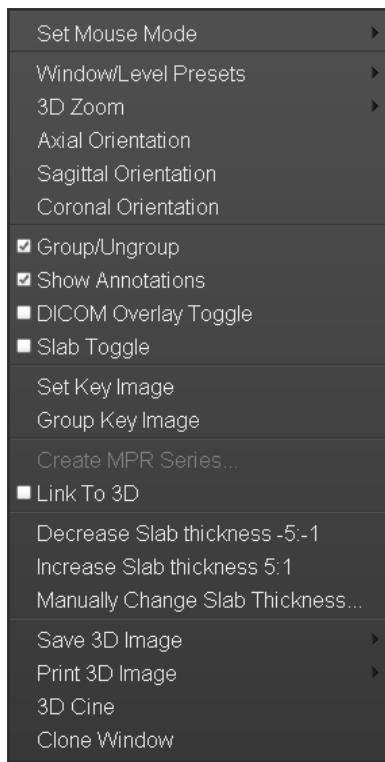
- Right-clicking on the Series Information section of an Orthogonal MPR Series Toolbar will immediately cause a **Preferences** link to be displayed, as in the following example:



Orthogonal MPR Series Toolbar Preferences Link

Clicking the Preferences link will take you directly to the **Series Toolbar** section of the **Merge PACS Preferences** dialog, as described in subsection 24.1.20 below, where you can customize the set of tools that appear on the **3D MPR Window** Series Toolbars as well as configure when the tools should be displayed.

f. Orthogonal Series Right-click Menu



The Orthogonal Viewport Right-click Menu











































Right-clicking on one of the Orthogonal Series Viewports and holding the mouse button down for a few seconds will bring up the **Orthogonal Series Right-click Menu**, as shown in the example to the left.

The Orthogonal Series Right-click Menu contains a variety of additional navigation, layout, and image manipulation options, as well as the ability to save and print an image. Some of the options available on the Right-click Menu are also available elsewhere in the MPR Window and are included here for your convenience.

The options in the Orthogonal Series Right-click Menu apply to all Orthogonal Series Viewports and not just the one your cursor was in when you accessed it.

Note that, depending on the Study and the type of modality involved, as well as the orientation of the Series being displayed in the Series Viewport, one or more of these options may not be available, in which case they will appear "grayed out" in the menu.

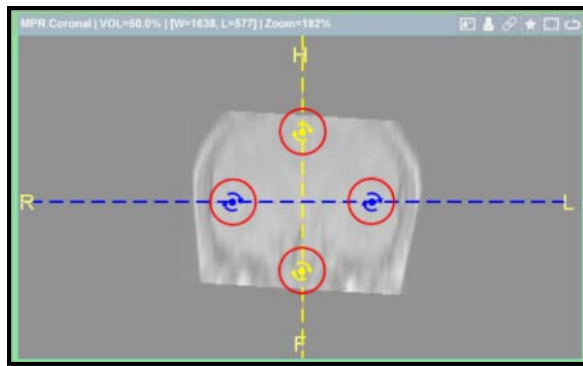
Each Orthogonal Series Right-click Menu has the following possible options:

Option	General Description														
Set Mouse Mode	Allows you to select one of the following tools (note that your mouse cursor will change to reflect the chosen tool): <table border="0" style="width: 100%; margin-top: 10px;"> <tr> <td style="text-align: center;"> Page</td> <td style="text-align: center;"> Probe</td> </tr> <tr> <td style="text-align: center;"> Window/Level</td> <td style="text-align: center;"> ROI</td> </tr> <tr> <td style="text-align: center;"> MPR Slab</td> <td style="text-align: center;"> Line Measurement</td> </tr> <tr> <td style="text-align: center;"> Zoom/Pan Combo</td> <td style="text-align: center;"> Angle Measurement</td> </tr> <tr> <td style="text-align: center;"> Pan</td> <td style="text-align: center;"> Cobb Angle</td> </tr> <tr> <td style="text-align: center;"> Zoom</td> <td style="text-align: center;"> Text Annotation</td> </tr> <tr> <td style="text-align: center;"> Auto Skim</td> <td style="text-align: center;"> Pointer Text</td> </tr> </table>	 Page	 Probe	 Window/Level	 ROI	 MPR Slab	 Line Measurement	 Zoom/Pan Combo	 Angle Measurement	 Pan	 Cobb Angle	 Zoom	 Text Annotation	 Auto Skim	 Pointer Text
 Page	 Probe														
 Window/Level	 ROI														
 MPR Slab	 Line Measurement														
 Zoom/Pan Combo	 Angle Measurement														
 Pan	 Cobb Angle														
 Zoom	 Text Annotation														
 Auto Skim	 Pointer Text														
Zoom	Selects a magnification level for the images in the selected Series Viewport, including “center and fill.”														
Axial Orientation	Change the orientation of the image in the MIP/CVR viewport to Axial and links it to the corresponding MPR window.														
Sagittal Orientation	Change the orientation of the image in the MIP/CVR viewport to Sagittal and links it to the corresponding MPR window.														
Coronal Orientation	Change the orientation of the image in the MIP/CVR viewport to Coronal and links it to the corresponding MPR window.														
Group/Ungroup	Allows you to manually link multiple Series Viewports together for display purposes.														
Show Hide Annotations	Toggles the display of any existing annotations on and off for this Series Viewport.														
DICOM Overlay Toggle	Toggles the DICOM Overlay display on and off for this Series Viewport.														
Slab Toggle	Toggles display of slab controllers, if any, on and off. Refer to Paragraph 4.8.1.i below for information on defining and using slab controllers.														
Set Key Image	Flag the selected image as a “key image” for later reference.														
Group Key Image	Saves all images currently displayed in each of the 4 MPR Series Viewports as a single key image.														
Create MPR Series	Allows you to create a physical set of DICOM images that represent the MPR images displayed in the Viewport (this option will only be available for Series Viewports that are currently linked to the Rendered Volume Viewport). A dialog window will appear that will allow you to crop the size of the region to be saved, if desired. The saved MPR Series will then be available from within the Patient Record and the Merge PACS Viewer as a separate Series.														

Option	General Description
Link to 3D	Toggles the Link to 3D tool, described in paragraph e above, on and off for this viewport.
Decrease Slab Thickness	Decreases the width of the slab currently displayed in the Rendered Volume Viewport by a small increment.
Increase Slab Thickness	Increases the width of the slab currently displayed in the Rendered Volume Viewport by a small increment.
Manually Change Slab Thickness	Allows you to manually enter a value for the slab thickness, in millimeters.
Save3D Image	Save the image currently displayed in the Series Viewport, together with any user annotations, to your hard drive as a standard jpeg file.
Print 3D Image	Send the image currently displayed in the Series Viewport, together with any user annotations, to a printer.
3D Cine	Turns on the Cine feature to rapidly page through images in a Series
Clone Window	Display the contents of the Series Viewport in a new pop-up Series Viewport window.

g. Using the Rotation Controllers

Each of the three orthogonal Series Viewports displays special rotation controllers that allow you to rotate the axes with regard to the other two orthogonal Series Viewports, as in the following example (lines exaggerated for illustration purpose):

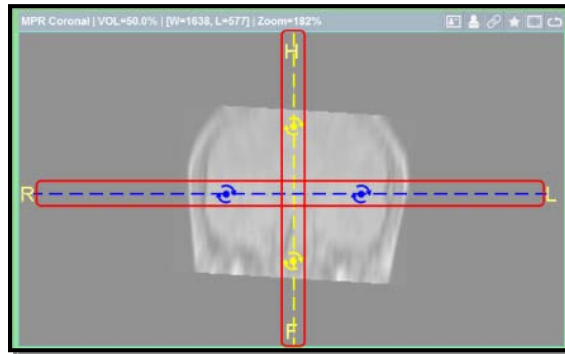


Rotation Controllers

When you place your mouse over one of the controllers, the cursor will change to the Rotation Tool. You can then click and drag the controller to rotate the axes.

h. Using the Cross-reference Controllers

Each of the three orthogonal Series Viewports displays special dotted lines to represent the cross-reference points with the other orthogonal views as well as the 3D rendered volume, as in the following example (lines exaggerated for illustration purpose):



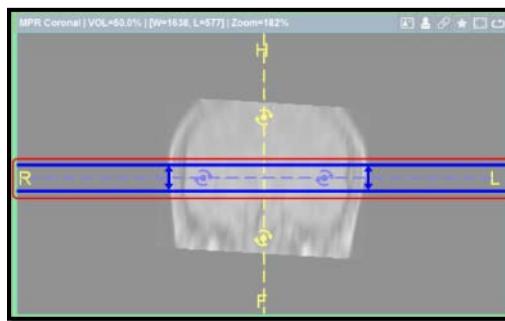
Cross-reference Controllers

You can place your mouse directly over any of the lines and then drag the line to a new location. This will update the corresponding views in the other Series Viewports.

NOTE: You can click on the 3D Viewport while holding the **Shift** key to shoot a ray into the volume, and the target will be the new 3D point with all cross-reference lines updated to this point.

i. Using the Slab Controllers

Once you have defined a slab, either by selecting the **Increase Slab Thickness** or **Manually Change Slab Thickness** option from the **Orthogonal Series Right-click Menu**, or by clicking on the **Increase Slab Thickness** icon on the **Rendered Volume Series Toolbar**, as described in Paragraph 4.8.1.k below, slab controllers will be displayed as in the following example:



Slab Controllers

The Slab controllers allow you to change the slab thickness with the mouse and are displayed in the orthogonal Series Viewports corresponding to the orientations not currently displayed in the Rendered Volume Viewport (e.g., if the Rendered Volume Viewport is currently displaying an Axial orientation, the slab controllers will be enabled in the Sagittal and Coronal orthogonal Series Viewports).

You can place your mouse directly over either of the two solid lines that make up the controller and then drag the line to increase or decrease the width of the slab.

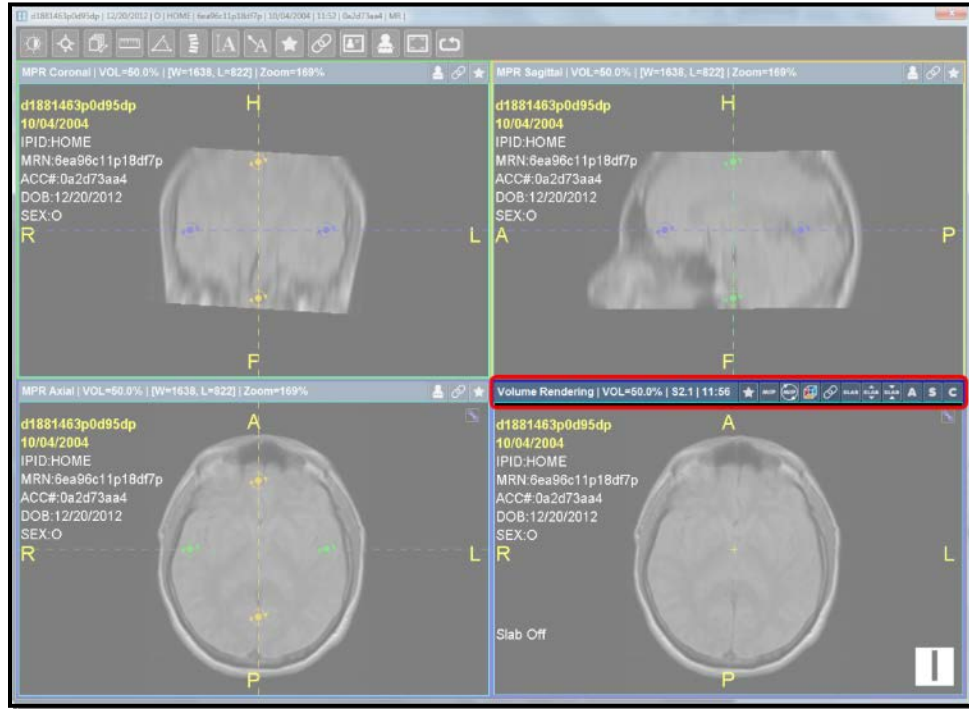
j. Creating Oblique Views

The standard orthogonal views (Axial, Sagittal and Coronal) are each 90 degrees from the original Series along one axis. A non-orthogonal view (*i.e.*, one that is not 90 degrees from the original) is known as an **oblique** view and can be created in one of two ways:

Type of Oblique	Description
Single Oblique	A single oblique is a standard plane that is rotated around one axis. It is created by manipulating a plane in only one of the orthogonal Series Viewports, thus directly affecting the reconstruction in the other Series Viewports. The Rendered Volume Viewport will also show the corresponding reconstruction of the same view, but using MIP or CVR display mode.
Double Oblique	A double oblique is a standard plane that is rotated around two axes. It is created by first manipulating a plane in one orthogonal Series Viewport and then selecting a separate plane on another orthogonal Series Viewport. The third orthogonal Series Viewport will then be reconstructed based on the manipulation of the first two. The Rendered Volume Viewport will also show the corresponding reconstruction of the same view, but using MIP or CVR display mode.

k. Rendered Volume Series Toolbar

At the top of the **Rendered Volume Viewport** is the **Rendered Volume Series Toolbar**, as shown in the following example:

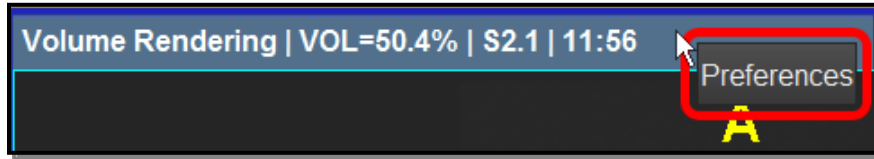


Rendered Volume Series Toolbar

The Rendered Volume Series Toolbar displays information for the Series in the Rendered Volume Viewport as well as various tools that apply to that Viewport:

- The left side of the Rendered Volume Series Toolbar displays the following information about the Series within the Rendered Volume Viewport, where available:
 - **Percentage through the Volume** (except for **CVR**)
 - **Series Number**
 - **Series Description**
 - **Series Time**
- The right side of the Rendered Volume Series Toolbar displays the available tools that apply to the Rendered Volume Viewport. The actual tools that appear will depend on how you have configured the Toolbar, as described below. For a complete list of possible tools, refer to subsection 4.2.7 above.

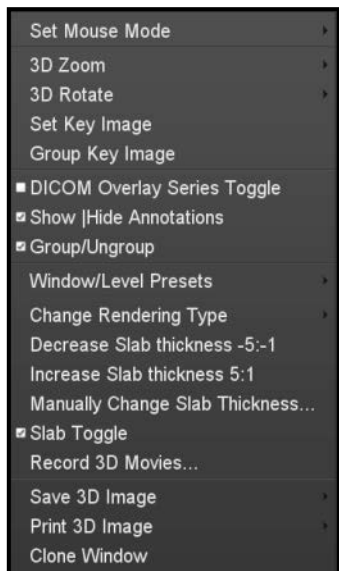
- Right-clicking on the Series Information section of the Rendered Volume Series Toolbar will immediately cause a **Preferences** link to be displayed, as in the following example:



Rendered Volume Series Toolbar Preferences Link

Clicking the Preferences link will take you directly to the **Series Toolbar** section of the **Merge PACS Preferences** dialog, as described in subsection 24.1.20 below, where you can customize the set of tools that appear on the **3D Floatable Window** Series Toolbar as well as configure when the tools should be displayed.

I. Rendered Volume Series Right-click Menu













































The Rendered Volume Series Right-click Menu

Right-clicking on the Rendered Volume Viewport and holding the mouse button down for a few seconds will bring up the **Rendered Volume Series Right-click Menu**, as shown in the example to the left.

The Rendered Volume Series Right-click Menu contains a variety of additional navigation, layout, and image manipulation options, as well as the ability to save and print an image. Some of the options available on the Right-click Menu are also available elsewhere in the Rendered Volume Viewport and are included here for your convenience.

The Rendered Volume Series Right-click Menu has the following possible options:

Option	General Description																												
Set Mouse Mode	<p>Allows you to select one of the following tools (note that your mouse cursor will change to reflect the chosen tool):</p> <table border="0"> <tr> <td></td> <td>Rotate</td> <td></td> <td>Probe</td> </tr> <tr> <td></td> <td>Page</td> <td></td> <td>ROI</td> </tr> <tr> <td></td> <td>Window/Level</td> <td></td> <td>Line Measurement</td> </tr> <tr> <td></td> <td>Zoom/Pan Combo</td> <td></td> <td>Angle Measurement</td> </tr> <tr> <td></td> <td>Pan</td> <td></td> <td>Cobb Angle</td> </tr> <tr> <td></td> <td>Zoom</td> <td></td> <td>Text Annotation</td> </tr> <tr> <td></td> <td>Auto Skim</td> <td></td> <td>Pointer Text</td> </tr> </table>		Rotate		Probe		Page		ROI		Window/Level		Line Measurement		Zoom/Pan Combo		Angle Measurement		Pan		Cobb Angle		Zoom		Text Annotation		Auto Skim		Pointer Text
	Rotate		Probe																										
	Page		ROI																										
	Window/Level		Line Measurement																										
	Zoom/Pan Combo		Angle Measurement																										
	Pan		Cobb Angle																										
	Zoom		Text Annotation																										
	Auto Skim		Pointer Text																										
Zoom	Selects a magnification level for the images in the selected Series Viewport, including "center and fill."																												
3D Orientation	<p>Temporarily change the orientation of the selected image (flip horizontal, flip vertical, rotate 90 degrees, etc.)</p> <hr/> <p>NOTE: If you attempt to flip an image horizontally or vertically that contains a pointer text annotation, the text associated with that annotation will not flip together with the arrow. Therefore, any flips should be performed prior to adding pointer text annotations.</p> <hr/>																												
Set Key Image	Flag the selected image as a "key image" for later reference and launches the Key Image Viewport in a separate pop-up window.																												
Group Key Image	Saves all images currently displayed in each of the 4 MPR Series Viewports as a single key image.																												
DICOM Overlay Toggle	Toggles the DICOM Overlay display on and off for this Series Viewport.																												
Show Hide Annotations	Toggles the display of any existing annotations on and off for this Series Viewport.																												
Slab Toggle	Toggles slab mode on and off. When turned on, slab controllers that allow you to change the slab thickness with the mouse are displayed in the orthogonal Series Viewports corresponding to the orientations not currently displayed in the Rendered Volume Viewport (e.g., if the Rendered Volume Viewport is currently displaying an Axial orientation, the slab controllers will be enabled in the Sagittal and Coronal orthogonal Series Viewports).																												
Group/Ungroup	Allows you to manually link multiple Series Viewports together for display purposes.																												

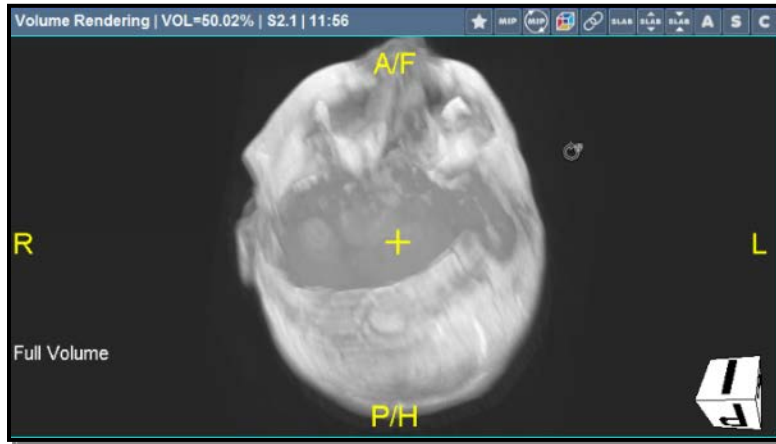
Option	General Description
Show Full MIP Volume	Sets the current MIP mode to full volume mode. This will display and allow you to rotate the entire volume instead of just a plane within the volume. Note that this option will automatically be turned off if you manually turn on slab mode (either from the right-click menu or the toolbar) or enter CVR mode .
Window/Level Presets (Color Presets)	Choose a window/level option, if available, for the rendered volume. Note that if Color Volume Rendering is in use, this option will allow you to select from a variety of color presets instead.
Change Rendering Type	Allows you to change how the rendered volume in the Rendered Volume Viewport is generated. The following options are available: <ul style="list-style-type: none"> • CVR • MIP • Spinning MIP (PET and Breast Tomosynthesis Series Only) • Average Intensity Projection • Faded MIP • Minimum Intensity Projection
Decrease Slab Thickness	Decreases the width of the slab currently displayed in the Rendered Volume Viewport by a small increment.
Increase Slab Thickness	Increases the width of the slab currently displayed in the Rendered Volume Viewport by a small increment.
Manually Change Slab Thickness	Allows you to manually enter a value for the slab thickness, in millimeters.
Record 3D Movies	Allows you to record a sequence of steps that includes the transformation and Series Viewport settings for each frame. When this option is selected a special Record 3D Movies dialog will be displayed. You can then transform the Series displayed in the Rendered Volume Viewport with the various available tools. When finished, click the Stop icon within the Record 3D Movies dialog and then click the Save icon to save the sequence. Once saved, the 3D movie will be available from within the Patient Record and the Merge PACS Viewer as a separate Series.
Create MPR Series	Allows you to create a physical set of DICOM images that represent the MPR images displayed in the Viewport. A dialog window will appear that will allow you to crop the size of the region to be saved, if desired. The saved MPR Series will then be available from within the Patient Record and the Merge PACS Viewer as a separate Series.
Save Image	Save the image currently displayed in the Series Viewport, together with any user annotations, to your hard drive as a standard jpeg file.
Print Image	Send the image currently displayed in the Series Viewport, together with any user annotations, to a printer.
Clone Window	Display the contents of the Series Viewport in a new pop-up Series Viewport window.

m. Rotating the Rendered Volume



Unlike the three orthogonal Series Viewports that have special rotation controllers displayed on the screen, rotation of the Rendered Volume is done via the **Rotate** mouse mode. When selected, your mouse cursor will change to the rotate icon displayed on the left.

Once you have selected the Rotate mouse mode, click and drag the mouse cursor in any direction over the rendered volume to rotate the volume along and of the three axes. Note that center of rotation will always be the center of the viewport, which is indicated by small yellow crosshairs, as in the following example (exaggerated for visibility):

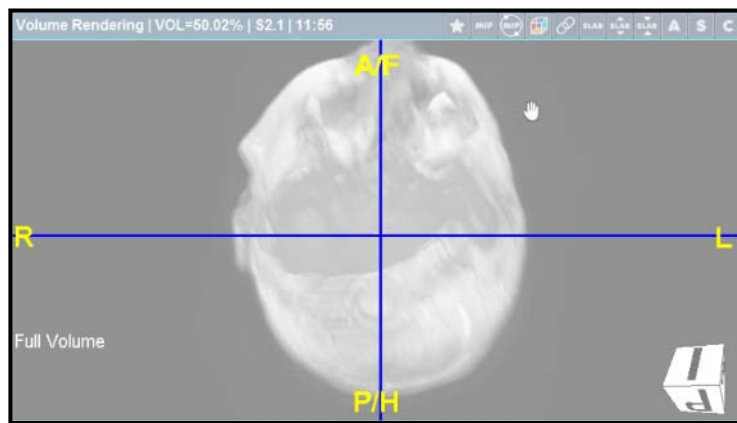


Center of Rotation / Viewport

n. Panning the Rendered Volume



When using the Zoom/Pan Combo tool (as shown on the left) to pan the rendered volume, thin blue crosshairs will be displayed while panning to show the center of the viewport, as in the following example (exaggerated for visibility):



Panning Crosshairs

4.8.2. One-click MPR

Multi-Planar Reconstruction (MPR) Series can also be displayed within the standard viewports as opposed to a separate stand-alone MPR window. When this feature is activated, each available view (Axial, Coronal or Sagittal) can be displayed separately in its own MPR Viewport. This single-view MPR can be displayed either within an existing standard viewport or as a separate pop-up single-view MPR Viewport.

NOTE: Image Fusion, described in subsection 4.8.3 below, can only be performed within a single-view MPR Viewport.

a. Displaying a Single MPR View within a Standard Viewport

A single MPR view can be displayed within the Merge PACS Viewer by converting a standard Series Viewport into a special MPR Viewport, as in the following example:



MPR Viewport

This special MPR Viewport can be invoked in any of the following ways:



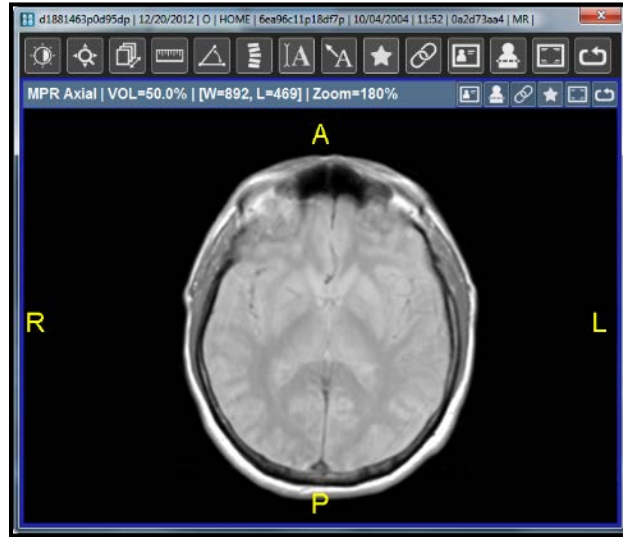
Clicking on the **One-click MPR** icon on the **Series Toolbar**, as described in subsection 4.2.5, above, and shown on the left.

NOTE: When you click on the One-click MPR icon, The Merge PACS Viewer will automatically determine what view (Axial, Coronal or Sagittal) should be displayed by default, but the view can be changed with toolbar buttons described below.

- Selecting **Axial MPR**, **Sagittal MPR**, or **Coronal MPR** from the **3D** sub-menu of the **Series Right-click Menu**, as described in subsection 4.2.5, above.

b. Displaying a Single MPR View in a Separate MIP Viewport

A single MPR view can also be displayed in a separate stand-alone pop-up 3D window, as in the following example:



Stand-alone MPR Viewport

This pop-up single MPR Viewport can be invoked in any of the following ways:

- Selecting **Axial MPR**, **Sagittal MPR**, or **Coronal MPR** from the Primary and Prior Exam **Series Navigation Thumbnail Right-click Menus** at the **Patient Record**, as described in subsections Note: and 3.8.7 above.
- Selecting **Axial MPR**, **Sagittal MPR**, or **Coronal MPR** from the **Series Thumbnail Right-Click Menu**, as described in subsection 4.2.4 above.

c. The MPR Viewport Toolbar

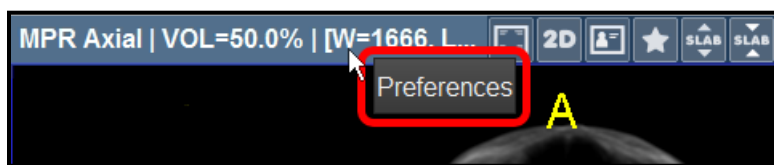
At the top of the MPR Viewport is the **MPR Viewport Toolbar**, as shown in the following example:



MPR Viewport Toolbar

The **MPR Viewport Toolbar** displays information for the Series in the MPR Viewport as well as various tools that apply to that Viewport:

- The left side of the MPR Viewport Toolbar displays the following information about the Series within the Viewport, where available:
 - **Type of View**
 - **Percentage through the Volume**
 - **Window/Level**
 - **Zoom Factor**
- The right side of the MPR Viewport Toolbar displays the available tools that apply to the Viewport. The actual tools that appear will depend on how you have configured the Toolbar, as described below. For a complete list of possible tools, refer to subsection 4.2.7 above.
- Right-clicking on the Series Information section of the MPR Viewport Toolbar will immediately cause a **Preferences** link to be displayed, as in the following example:



MPR Viewport Toolbar Preferences Link

Clicking the Preferences link will take you directly to the **Series Toolbar** section of the **Merge PACS Preferences** dialog, as described in subsection 24.1.20 below, where you can customize the set of tools that appear on the **3D MPR Window** Series Toolbars as well as configure when the tools should be displayed.

d. Available Mouse Modes

Repeatedly right-clicking on an image within the MPR Viewport will toggle the cursor among the following commonly used 3D mouse modes:

	Page		Window/Level (Except for Image Fusion)
	Line Measurement		Base Window/Level (Image Fusion Only)
	Pan/Zoom		Overlay Window/Level (Image Fusion Only)
	Rotate		Fusion Blending (Image Fusion Only)

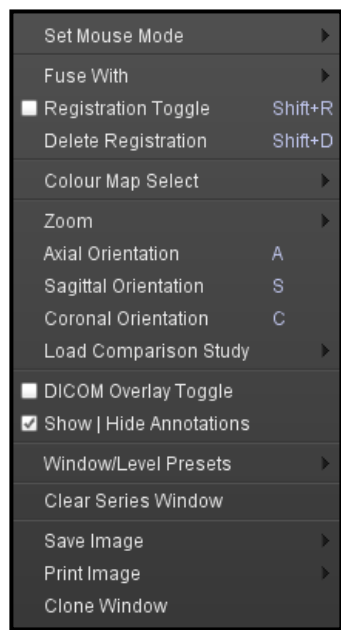
NOTE: The available mouse modes, as well as the order in which they appear, can be customized for different modalities, as described in Chapter 24 below.

NOTE: This feature can be disabled by **deselecting** the **Delayed Right Click** option in the Merge PACS Preferences dialog, as described in Chapter 24 below. If the feature is disabled (or if you hold down the right mouse button on an image instead of briefly clicking), the **MPR Viewport Right-click Menu** will be displayed instead, as described in paragraph e below.

NOTE: The ability to cycle between different mouse modes will not operate if you have custom configured your mouse button actions, as described in Chapter 24 below.

These mouse modes are also available, along with additional mouse modes, via the MPR Viewport Right-click Menu, as described in paragraph 4.8.2.e below.

e. MPR Viewport Right-click Menu






















































MPR Viewport Right-click Menu

Right-clicking on the MPR Viewport and holding the mouse button down for a few seconds will bring up the **MPR Viewport Right-click Menu**, as shown in the example to the left.

The MPR Viewport Right-click Menu contains a variety of additional navigation, layout, and image manipulation options, as well as the ability to save and print an image. Some of the options available on the Right-click Menu are also available elsewhere in the MPR Viewport and are included here for your convenience.

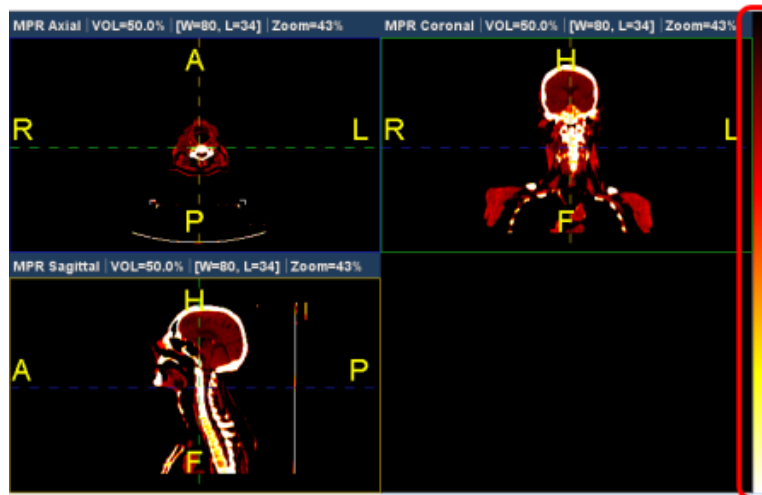
The MPR Viewport Right-click Menu has the following possible options:

Option	General Description																																				
Set Mouse Mode	<p>Allows you to select one of the following tools (note that your mouse cursor will change to reflect the chosen tool):</p> <table border="0"> <tr> <td></td> <td>Page</td> <td></td> <td>Auto Skim</td> </tr> <tr> <td></td> <td>Window/Level</td> <td></td> <td>Probe</td> </tr> <tr> <td></td> <td>Base W/L (Image Fusion Only)</td> <td></td> <td>ROI</td> </tr> <tr> <td></td> <td>Overlay W/L (Image Fusion Only)</td> <td></td> <td>Line Measurement</td> </tr> <tr> <td></td> <td>Zoom/Pan Combo</td> <td></td> <td>Angle Measurement</td> </tr> <tr> <td></td> <td>Pan</td> <td></td> <td>Cobb Angle</td> </tr> <tr> <td></td> <td>Zoom</td> <td></td> <td>Text Annotation</td> </tr> <tr> <td></td> <td>Rotate</td> <td></td> <td>Pointer Text</td> </tr> <tr> <td></td> <td>Fusion Blending (Image Fusion Only)</td> <td></td> <td></td> </tr> </table>		Page		Auto Skim		Window/Level		Probe		Base W/L (Image Fusion Only)		ROI		Overlay W/L (Image Fusion Only)		Line Measurement		Zoom/Pan Combo		Angle Measurement		Pan		Cobb Angle		Zoom		Text Annotation		Rotate		Pointer Text		Fusion Blending (Image Fusion Only)		
	Page		Auto Skim																																		
	Window/Level		Probe																																		
	Base W/L (Image Fusion Only)		ROI																																		
	Overlay W/L (Image Fusion Only)		Line Measurement																																		
	Zoom/Pan Combo		Angle Measurement																																		
	Pan		Cobb Angle																																		
	Zoom		Text Annotation																																		
	Rotate		Pointer Text																																		
	Fusion Blending (Image Fusion Only)																																				
Fuse With	Allows you to select from a list of available Series that can be fused with this Series. See subsection subsection 4.8.3 below for more information.																																				
Registration Toggle	Allows you to manually align fused Series. See subsection 4.8.3 below for more information.																																				
Delete Registration	Allows you to undo any manual alignment of fused Series and revert to the default alignment. See subsection 4.8.3 below for more information.																																				
Color Map Select	Allows you to select from a list of color mapping options for the selected Series.																																				
Zoom	Selects a magnification level for the images in the selected Series Viewport, including “center and fill.”																																				
3D Orientation	Temporarily change the orientation of the selected image (flip horizontal, flip vertical, rotate 90 degrees, etc.)																																				
Axial Orientation	Allows you to manually select to display the axial orientation view of the Series in this Viewport.																																				
Sagittal Orientation	Allows you to manually select to display the sagittal orientation view of the Series in this Viewport.																																				
Coronal Orientation	Allows you to manually select to display the coronal orientation view of the Series in this Viewport.																																				
Load Comparison Study	Allows you to select from a list of available comparison studies that can be opened within the Merge PACS Viewer alongside the currently open Study or studies.																																				

Option	General Description
DICOM Overlay Series Toggle	Toggles the DICOM Overlay display on and off for this Series Viewport.
Show Hide Annotations	Toggles the display of any existing annotations on and off for this Series Viewport.
Window/Level Presets	Choose a window/level option, if available.
Clear Series Window	Clears this Series Viewport completely.
Save Image	Saves the image currently displayed in the Series Viewport, together with any user annotations, to your hard drive as a standard jpeg file.
Print Image	Sends the image currently displayed in the Series Viewport, together with any user annotations, to a printer.
Clone Window	Displays the contents of the Series Viewport in a new pop-up Series Viewport window. Note that this feature is not available with Image Fusion.

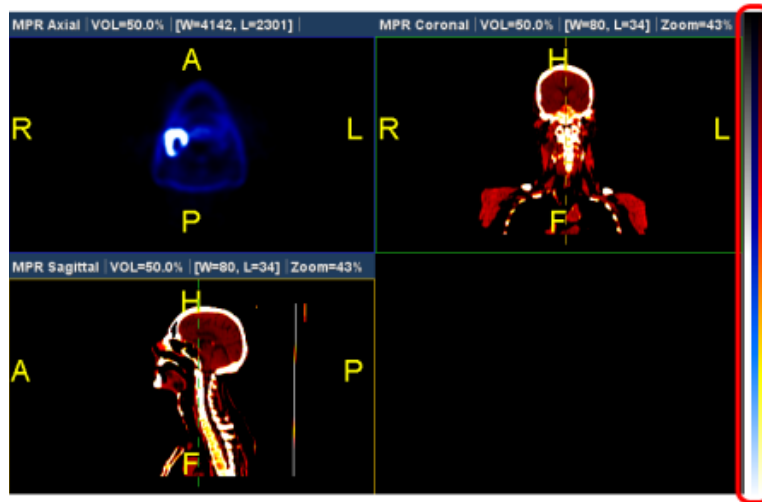
f. MPR Viewport Color Bar

When you select a Color Mapping option for one or more MPR Viewports from the MPR Viewport Toolbar or the MPR Viewport Right-click Menu, a special Color Bar will be shown at the far right side of the main Viewer window that will display the unique color maps (including grayscale) currently being used in all viewports, as in the following example:



MPR Viewport Color Bar

Note that if different MPR Viewports have different color map settings, a separate Color Bar will be displayed for each color map, as in the following example:



MPR Viewport Color Bars



Clicking the **Toggle Color Bar** button on the main **Application Toolbar**, as illustrated to the left, will turn the display of the color bars on and off.

NOTE: By default, CT and MR images will be displayed as grayscale (no color map) and PET images will be displayed with a Reverse Grayscale color map.

NOTE: The color bars will show and hide automatically based on whether any non-grayscale color maps are being displayed. When the "Toggle Color Bar" button is activated, however, the color bars will remain shown or hidden until the button is deactivated again and will not go back to the automatic mode until a new Study is loaded.

4.8.3. Image Fusion

Image Fusion provides you with a way to overlay/blend two image objects. The primary use is with 3D image sets such as those from CT, PET and MR modalities. The fused images may be of the same or different modality types. The most commonly cited and simplest example is that of PET-CT fusion.

The fused images may come from a common frame of reference where they are gathered in a single Study on a single machine (such as PET-CT) or they may be from a non-common frame of reference where they were performed as two separate studies at different times.

With Image Fusion, the Series that was originally in the viewport is referred to as the "Base" Series and the Series added to the viewport is referred to as the "Overlay" Series.

Image Fusion can only be performed within a single-view MPR Viewport, as described in subsection 4.8.2 above and there are certain features and tools that are only available during Image Fusion.

NOTE: When the base and overlay series are from different studies, the DICOM overlay of the fused viewport shall include information about both studies. Similarly, when the base and overlay series are from different patients, the DICOM overlay of the fused viewport shall include information about both patients.

a. Initiating Image Fusion

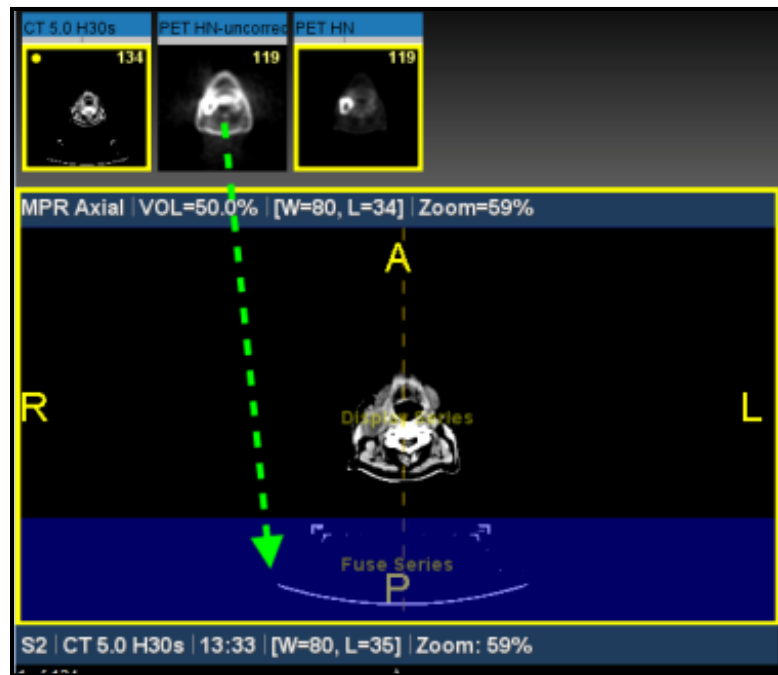
Once you have loaded a Series into a single-view MPR Viewport, as described in subsection 4.8.2 above, you can fuse another Series into that viewport in one of three ways:

- Select **Fuse With** from the MPR Viewport Right-click Menu, as described in subsection 4.8.2 above, and select the Series from the list of available options, as in the following example:



Selecting a Series to Fuse With

- Drag and drop the **Series Navigation Thumbnail** for the desired Series into the **bottom** section of the MPR Viewport, as in the following example:



Selecting a Series to Fuse With

- If you drag the Thumbnail into the top section, it will simply replace the Series currently displayed with the new Series.
- When dragging, be sure to click on the **central** portion of the Thumbnail, as shown above, and not the status bar at the top of the Thumbnail.
- Drag and drop the desired Series from another Series Viewport into the MPR Viewport, as in the following example:





Selecting a Series to Fuse With

- You can drag and drop the Series into **any** part of the MPR Viewport.
- When dragging, be sure to click on the **Series Toolbar** portion, as shown above.

b. Image Fusion Window/Level Options

While in Image Fusion Mode, two special window/level mouse modes will be available, both from the **MPR Viewport Right-click Menu** and by repeatedly right-clicking on an image to cycle through the available mouse modes:

Mode	Name	General Description
	Base Window/Level	Allows you to adjust the Window and Level of the base Series.
	Overlay Window/Level	Allows you to adjust the Window and Level of the overlay Series.

NOTE: Press and hold the **Alt** key while using one of the two W/L mouse modes to temporarily switch to the other W/L mouse mode until the Alt key is released.

NOTE: The ability to cycle between different mouse modes will not operate if you have custom configured your mouse button actions, as described in Chapter 24 below.

Any Window/Level changes made to the base or overlay Series in the fused MPR Viewport will apply to the modified Series in any other MPR viewport that contains the Series that was changed.

Similarly, any Window/Level changes made to a Series in another MPR Viewport will apply to the modified Series within the fused MPR Viewport.

c. Image Fusion Blending



By default, both the base Series and the overlay Series in a fused MPR Viewport are displayed at 50% opacity. This can be adjusted, however, by selecting the **Fusion Blending** mouse mode, either from the MPR Viewport Right-click Menu or by repeatedly right-clicking on an image to cycle through the available mouse modes.

Once the Fusion Blending mouse mode has been selected, click and drag the cursor from the bottom of the fused MPR Viewport to the top in order to increase the opacity of the **base** Series (once you reach the top of the Viewport, only the base Series should be visible).

Alternatively, you can click and drag the cursor from the top of the fused MPR Viewport to the bottom in order to increase the opacity of the **overlay** Series (once you reach the bottom of the Viewport, only the overlay Series should be visible).

NOTE: Image Fusion Blending can also be set as part of a Hanging Protocol, as described in Section 4.12 below.

d. Image Fusion Registration



By default, the **Page Images**, **Pan** and **Rotation** tools will affect both the base and the overlay Series simultaneously. Registration Mode, however, will allow you to affect just the overlay Series with these tools in order to manually align the overlay with the base Series. It can be turned on either by clicking the **Registration Toggle tool** on the **MPR Viewport Toolbar**, as shown on the left, or by selecting **Registration Toggle** from the **MPR Viewport Right-click Menu**.

Registration Mode will be turned **off** by default for Series with a **common frame of reference**. These are generally acquired on a single device in a single session (e.g. a PET/CT scanner) and will be automatically aligned when displayed together in a fused MPR Viewport.

Registration Mode will be turned **on** by default for Series with a **non-common frame of reference**. These Series will be initially displayed in a fused MPR Viewport as closely aligned as possible without needing to analyze pixel data and the overlaid Series shall be scaled to match the size of the base Series. When you are satisfied with the alignment of the fused Series, be sure to turn Registration Mode off before attempting to use the Page Images, Pan or Rotation tools.

If you change the alignment by mistake or otherwise wish to revert to the default alignment settings, select **Delete Registration** from the **MPR Viewport Right-click Menu**.

e. Selecting Color Maps for Fused Images



While in Image Fusion Mode, you can select a color map for the base and overlay Series independently by clicking on the **Color Map Select** tool on the MPR Viewport Toolbar, as shown on the left, or by selecting **Color Map Select** from the **MPR Viewport Right-click Menu**.

In each case, you will be shown a submenu with an entry for each of the two Series, as in the following example:



Color Map Options for Fused Series

Click on the desired Series to select from the full list of available color map options for that Series.

NOTE: By default, CT/MR Series will be displayed in grayscale and NM/PT Series will be displayed with Hot Iron.

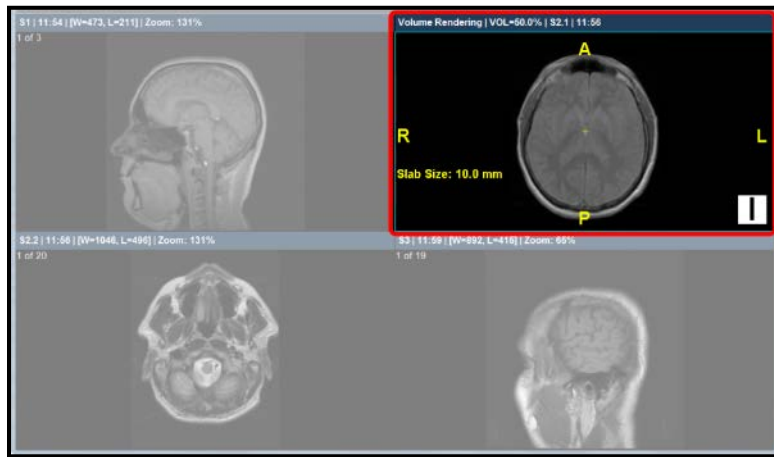
4.8.4. One-click MIP

Maximum Intensity Projection (MIP) is typically used with contrast-enhanced images to maximize the visualization of vasculature. A MIP is created by combining a Series of slices with display of the brightest pixel on any slice at each location.

A MIP can be displayed as a 3D Rendered Volume either within a standard viewport or in a separate pop-up MIP Viewport.

a. Viewing a MIP Rendered Volume within a Standard Viewport

A MIP 3D Rendered Volume can be displayed within the Merge PACS Viewer by converting a standard Series Viewport into a special Rendered Volume Viewport, as in the following example:



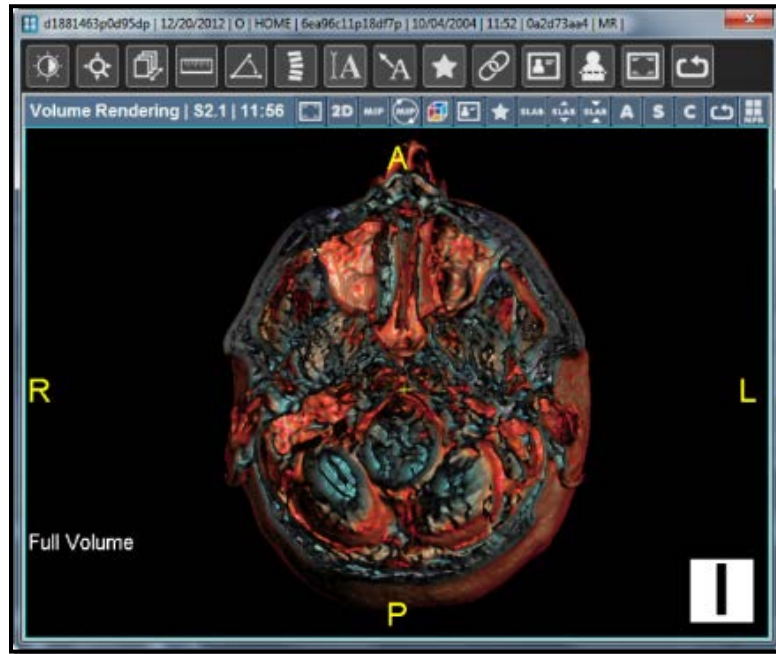
Rendered Volume Viewport

This special MIP Viewport can be invoked in either of the following ways:

- MIP Clicking on the **One-click MIP** icon on the **Series Toolbar**, as described in subsection 4.2.5, above, and shown on the left.
 - Selecting **Axial MIP**, **Sagittal MIP**, **Coronal MIP** or **3D Volume** from the **3D** sub-menu of the **Series Right-click Menu**, as described in subsection 4.2.5, above.

b. Viewing a MIP 3D Rendered Volume in a Separate MIP Viewport

A MIP 3D Rendered Volume can also be displayed in a separate stand-alone pop-up 3D window, as in the following example:



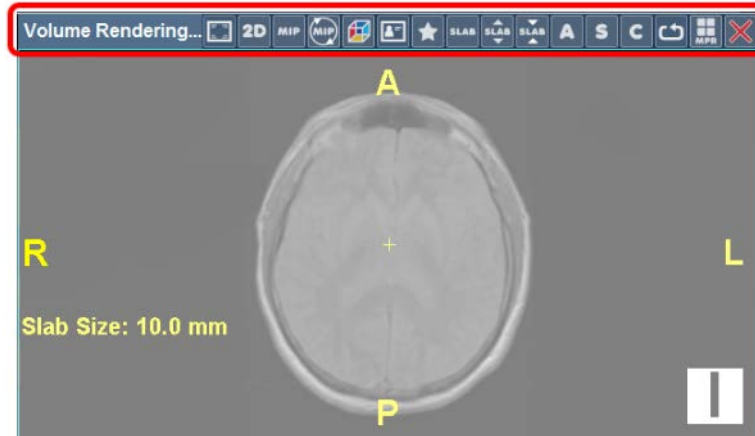
Standalone Rendered Volume Viewport

This pop-up MIP 3D Rendered Volume Viewport can be invoked in any of the following ways:

- Selecting **3D Volume**, **Sagittal MIP**, **Coronal MIP** or **Axial MIP** from the Primary and Prior Exam **Series Navigation Thumbnail Right-click Menus** at the **Patient Record**, as described in subsections Note: and 3.8.7 above.
- Selecting **3D CVR Volume**, **Sagittal MIP**, **Coronal MIP** or **Axial MIP** from the **Series Thumbnail Right-Click Menu**, as described in subsection 4.2.4 above.

c. The MIP Viewport Toolbar

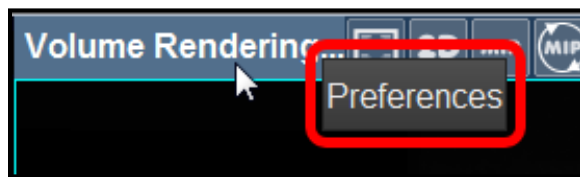
At the top of the MIP Viewport is the **MIP Viewport Toolbar**, as shown in the following example:



MIP Viewport Toolbar

The **MIP Viewport Toolbar** displays information for the Series in the MIP Viewport as well as various tools that apply to that Viewport:

- The left side of the MIP Viewport Toolbar displays the following information about the Series within the Viewport, where available:
 - **Percentage through the Volume (MIP Only)**
 - **Series Number**
 - **Series Description**
 - **Series Time**
- The right side of the MIP Viewport Toolbar displays the available tools that apply to the Viewport. The actual tools that appear will depend on how you have configured the Toolbar, as described below. For a complete list of possible tools, refer to subsection 4.2.7 above.
- Right-clicking on the Series Information section of the MIP Viewport Toolbar will immediately cause a **Preferences** link to be displayed, as in the following example:



MIP Viewport Toolbar Preferences Link

Clicking the Preferences link will take you directly to the **Series Toolbar** section of the **Merge PACS Preferences** dialog, as described in subsection 24.1.20 below, where you can customize the set of tools that appear on the **3D MIP Window** Series Toolbars as well as configure when the tools should be displayed.

d. Available Mouse Modes

Repeatedly right-clicking on an image within the MIP Viewport will toggle the cursor among the following commonly used 3D mouse modes:



Rotate



Page



Window/Level



Pan/Zoom



Line Measurement

NOTE: The available mouse modes, as well as the order in which they appear, can be customized for different modalities, as described in Chapter 24 below.

NOTE: This feature can be disabled by **deselecting** the **Delayed Right Click** option in the Merge PACS Preferences dialog, as described in Chapter 24 below. If the feature is disabled (or if you hold down the right mouse button on an image instead of briefly clicking), the **MIP Viewport Right-click Menu** will be displayed instead, as described in paragraph e, below.

NOTE: The ability to cycle between different mouse modes will not operate if you have custom configured your mouse button actions, as described in Chapter 24 below.

These mouse modes are also available, along with additional mouse modes, via the Rendered Volume Series Right-click Menu, as described in paragraph e, below.

e. MIP Viewport Right-click Menu













































Right-clicking on the MIP Viewport and holding the mouse button down for a few seconds will bring up the **MIP Viewport Right-click Menu**, as shown in the example to the left.

The MIP Viewport Right-click Menu contains a variety of additional navigation, layout, and image manipulation options, as well as the ability to save and print an image. Some of the options available on the Right-click Menu are also available elsewhere in the MIP Viewport and are included here for your convenience.

MIP Viewport Right-click Menu

The MIP Viewport Right-click Menu has the following possible options:

Option	General Description																												
Set Mouse Mode	Allows you to select one of the following tools (note that your mouse cursor will change to reflect the chosen tool):																												
	<table border="0"> <tr> <td></td> <td>Page</td> <td></td> <td>Probe</td> </tr> <tr> <td></td> <td>Window/Level</td> <td></td> <td>ROI</td> </tr> <tr> <td></td> <td>MPR Slab</td> <td></td> <td>Line Measurement</td> </tr> <tr> <td></td> <td>Zoom/Pan Combo</td> <td></td> <td>Angle Measurement</td> </tr> <tr> <td></td> <td>Pan</td> <td></td> <td>Cobb Angle</td> </tr> <tr> <td></td> <td>Zoom</td> <td></td> <td>Text Annotation</td> </tr> <tr> <td></td> <td>Auto Skim</td> <td></td> <td>Pointer Text</td> </tr> </table>		Page		Probe		Window/Level		ROI		MPR Slab		Line Measurement		Zoom/Pan Combo		Angle Measurement		Pan		Cobb Angle		Zoom		Text Annotation		Auto Skim		Pointer Text
	Page		Probe																										
	Window/Level		ROI																										
	MPR Slab		Line Measurement																										
	Zoom/Pan Combo		Angle Measurement																										
	Pan		Cobb Angle																										
	Zoom		Text Annotation																										
	Auto Skim		Pointer Text																										
Zoom	Selects a magnification level for the images in the selected Series Viewport, including “center and fill.”																												
3D Orientation	Temporarily change the orientation of the selected image (flip horizontal, flip vertical, rotate 90 degrees, etc.)																												
Set Key Image	Flag the selected image as a “key image” for later reference and launches the Key Image Viewport in a separate pop-up window.																												
Load Comparison Study	Allows you to select from a list of available comparison studies that can be opened within the Merge PACS Viewer alongside the currently open Study or studies.																												

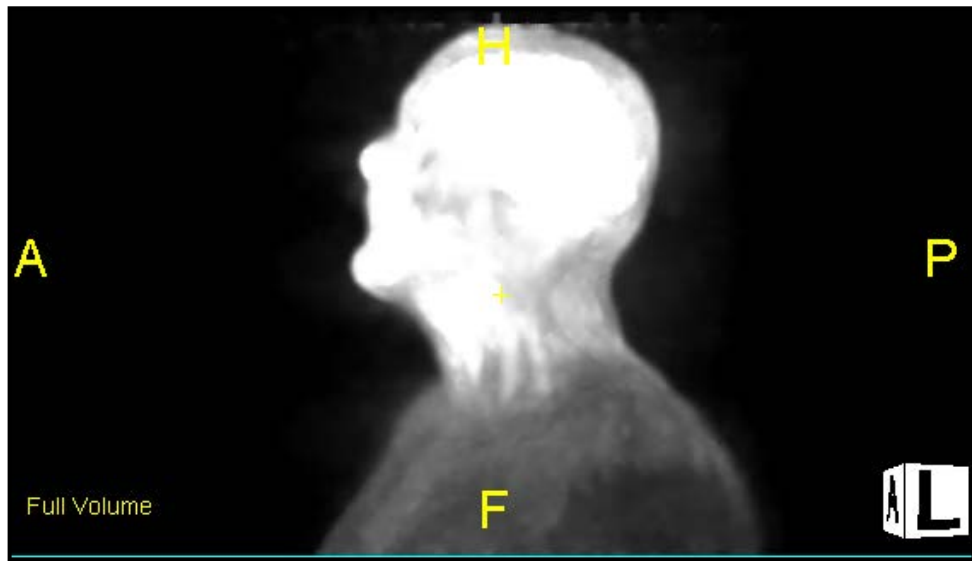
Option	General Description
DICOM Overlay Series Toggle	Toggles the DICOM Overlay display on and off for this Series Viewport.
Show Hide Annotations	Toggles the display of any existing annotations on and off for this Series Viewport.
Slab Toggle	Toggles slab mode on and off.
Show Full MIP Volume	Sets the current MIP mode to full volume mode. This will display and allow you to rotate the entire volume instead of just a plane within the volume. Note that this option will automatically be turned off if you manually turn on slab mode (either from the right-click menu or the toolbar) or enter CVR mode .
SUV Parameters	Allows you to define any missing parameters that are required to calculate SUV values (PET Series only).
Window/Level Presets / Color Presets	Choose a window/level option, if available, for the rendered volume. Note that if Color Volume Rendering is in use, this option will allow you to select from a variety of color presets instead.
Change Rendering Type	Allows you to change how the rendered volume in the Rendered Volume Viewport is generated. The following options are available: <ul style="list-style-type: none"> • CVR • MIP • Spinning MIP (PET and Breast Tomosynthesis Series Only) • Average Intensity Projection • Faded MIP • Minimum Intensity Projection
Decrease Slab Thickness	Decreases the width of the slab currently displayed in the Rendered Volume Viewport by a small increment.
Increase Slab Thickness	Increases the width of the slab currently displayed in the Rendered Volume Viewport by a small increment.
Manually Change Slab Thickness	Allows you to manually enter a value for the slab thickness, in millimeters.
Record 3D Movies	Allows you to record a sequence of steps that includes the transformation and Series Viewport settings for each frame. When this option is selected a special Record 3D Movies dialog will be displayed. You can then transform the Series displayed in the Rendered Volume Viewport with the various available tools. When finished, click the Stop icon within the Record 3D Movies dialog and then click the Save icon to save the sequence. Once saved, the 3D movie will be available from within the Patient Record and the Merge PACS Viewer as a separate Series.
Clear Series Window	Clears this Series Viewport completely.
Save Image	Save the image currently displayed in the Series Viewport, together with any user annotations, to your hard drive as a standard jpeg file.
Print Image	Send the image currently displayed in the Series Viewport, together with any user annotations, to a printer.

Option	General Description
Clone Window	Display the contents of the Series Viewport in a new pop-up Series Viewport window.

4.8.5. Spinning MIP View (PET and Breast Tomosynthesis Series Only)



If you are currently viewing a PET or Breast Tomosynthesis series within a Viewport, clicking on the **Spinning MIP** icon Clicking on the **Series Toolbar** or the **MIP Viewport Toolbar**, as shown on the left, will cause the Series to be displayed as a rotating Maximum Intensity Projection rendered volume in a head-to-foot orientation, as in the following example:



Spinning MIP View

NOTE: The Spinning MIP view can also be enabled by selecting Spinning MIP from the **3D** submenu of the **Series Right-click Menu** or the **Change Rendering Type** submenu of the MIP Viewport Right-click Menu

NOTE: For Breast Tomosynthesis series, the images will be displayed in aligned view, as described in subsection 4.9.14 below.

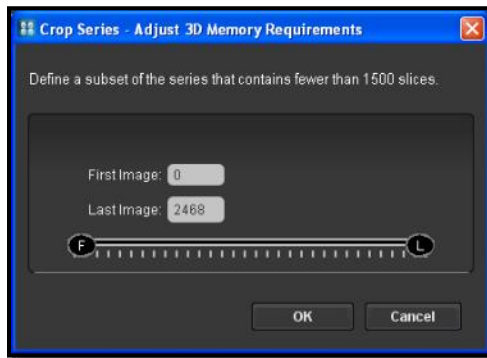
Repeatedly clicking the **Spinning MIP** tool a second time will toggle the rotation of the MIP on and off.

4.8.6. 3D Cropping

CT Series with more than 1500 slices cannot be loaded as-is into 3D mode on Workstations using 32-bit operating systems. Therefore, you may need to crop Series that have more than 1500 slices before being able to view them in 3D mode.

NOTE: This limitation only applies to systems using 32-bit operating systems (as opposed to 64-bit). In addition, setting the user preference **Automatically Split CT Series**, as described in Chapter 24 below, may reduce the need to crop large CT studies.

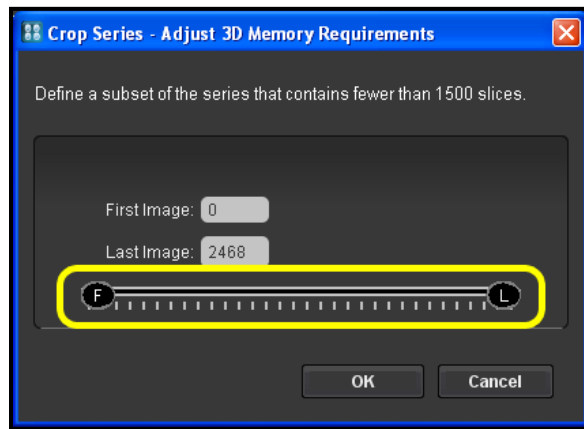
If a CT Series needs to be cropped before being loaded into 3D mode, a dialog box such as the one shown below will be displayed when you first attempt to load the Series in 3D mode:



3D Cropping Dialog Window

NOTE: The 3D Cropping Dialog Window can also be manually invoked from the Series Right-click Menu, as described in subsection 4.2.5, above.

The bottom half of the window contains a slider to define the subset of images you wish to be included, as seen in the following example:



Defining the Subset Range

To define the subset of images to be loaded into the 3D viewer, move the left slider to the right and/or the right slider to the left with your mouse until the number of slices of required memory drops below 1500. Alternatively, you can manually enter the desired starting and ending image numbers in the boxes to the left of the sliders.

When finished, click on the **OK** button to display the cropped Series.

4.8.7. DICOM Overlay in 3D Mode

The DICOM Overlay display works the same way in all 3D modes as it does in 2D mode, except that the following attributes are not displayed:

- image number
- slice location
- slice thickness attributes

4.9. Viewing Mammography Images

The Merge PACS Viewer treats mammography images different from other images. In particular:

- A special **Thumbnail Viewer** is launched automatically that provides access to the tools most commonly used with mammography images for use when viewing images in full-screen mode, including some tools designed specifically for use with mammography images.
- Mammography images are always displayed **uncompressed**.
- Certain **DICOM fields** are always displayed, regardless of whether the DICOM Overlay feature is turned on or off.
- A special interface is provided for **paging** through alternate views of mammography images, where applicable.
- Special **Wall-to-Wall** orientation options are available that can align two side-by-side Mammography images so that they appear chest-wall to chest-wall.
- A special **Intelligent Invert** feature is available.
- Special **Zoom** options are available.
- Additional **viewing tools** are available specifically for use with Mammography images.
- Display of prior mammography studies can be stacked and scrolled through in two special modes.
- **CAD summary information** can be displayed directly on the image by default.
- **Mass density marks** are displayed, where applicable.
- **Breast Tomosynthesis** images are displayed with special features and options.
- The **Patient Record** toggle tool can be configured to toggle between display of both the Patient Record and the Mammography Thumbnail Viewer.

NOTE: Breast tomosynthesis images that are received as multiframe images with modality MG will be treated as mammography images by the Merge PACS Viewer. Tomosynthesis images that are received as single-frame CT images, however, will be displayed as ordinary CT images and none of the special mammo features will be available when viewing them.

If the **Use Toolbox Series Right-click Menu** option has been selected from the Merge PACS Preferences dialog, as described in subsection 24.1.16 below, the Series Right-Click Menu will instead contain only the active tools that are present in the mouse cycle mode for mammography images, as in the following example:



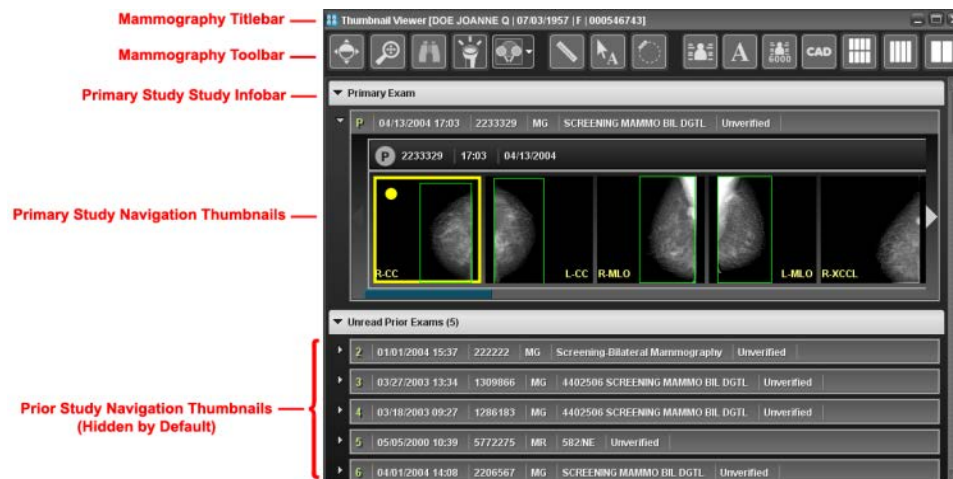
Toolbox Series Right-Click Menu

NOTE: The tools displayed in the Toolbox Series Right-click menu will not include the configuration drop-down component of the tools.

The actual tools that are included on the menu can be configured from the **Customize Mouse-Cycle modes** window, as described in subsection 24.1.10 below

4.9.1. Mammography Thumbnail Viewer

When a mammography Study is loaded into the Merge PACS Viewer, a separate Mammography Thumbnail Viewer will be launched in a separate pop-up window, as in the following example:



Mammography Thumbnail Viewer

The Mammography Thumbnail Viewer is designed to be positioned on a separate monitor when viewing mammography images in full-screen mode (*i.e.*, with the Application Toolbar and Series Navigation Thumbnails hidden). It provides access to the tools most commonly used with mammography images and also provides navigation thumbnails for the primary and any relevant prior studies.

a. Mammography Thumbnail Viewer Titlebar

The **Mammography Thumbnail Viewer Titlebar** is located at the top of the Mammography Thumbnail Viewer and displays information about the patient whose Study is currently being viewed in the Merge PACS Viewer, as in the following example:



The Mammography Thumbnail Viewer Titlebar

The Mammography Titlebar displays the following information about the Study:

- Patient Name
- Patient Date of Birth
- Patient Sex
- Issuer of Patient ID (IPID)
- Patient Medical Record Number (MRN)

b. Mammography Thumbnail Viewer Toolbar

The **Mammography Thumbnail Viewer Toolbar** is located below the Titlebar and displays tools that apply to that Study being viewed, as in the following example:



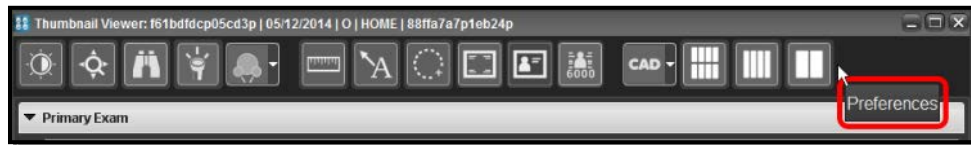
The Mammography Thumbnail Viewer Toolbar

The Toolbar may display a variety of tools, depending on your login privileges and how the Toolbar is configured (as described below). For a complete list of possible tools, refer to subsection 4.2.7 above.

NOTE: All of these tools, with the exception of the three **Series Layout** buttons, can also be configured to be available on the **Application Toolbar**, as described in subsection 4.2.2 above.

c. Customizing the Mammography Thumbnail Viewer Toolbar

Right-clicking on any blank space on the Mammography Thumbnail Viewer Toolbar will immediately cause a **Preferences** link to be displayed, as in the following example:



Mammography Thumbnail Viewer Toolbar Preferences Link

Clicking the Preferences link will take you directly to the **Application Toolbar** section of the **Merge PACS Preferences** dialog, as described in subsection 24.1.20 below, where you can customize the set of tools that appear on the **Thumbnail Viewer** Application Toolbar.

d. Mammography Thumbnail Viewer Study InfoBar

The primary Study and each prior Study have their own **Mammography Study InfoBar** that displays information about that Study, as in the following example:



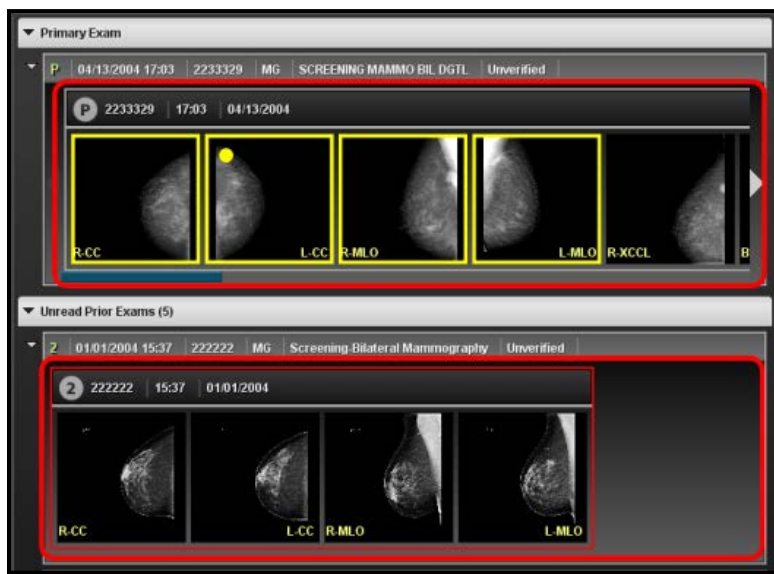
Mammography Study InfoBar

Each Mammography Study Infobar displays the following information about the Study:

- **Study Date/Time**
- **Accession Number**
- **Modality**
- **Study Description**
- **Workflow Status** (primary Study only)

e. Mammography Thumbnail Viewer Navigation Thumbnails

The primary Study and each prior Study also have their own set of **Mammography Navigation Thumbnails** that can be used to open one or more Series into the Merge PACS Viewer or into a separate pop-up Series Viewport window, as in the following example:



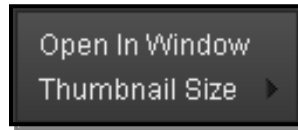
Mammography Navigation Thumbnails

NOTE: If there are too many thumbnail images to fit the width of the screen, arrows will appear to the left and/or right of the thumbnail images that you can click on to view the rest of the thumbnails. In addition, a scrollbar will be displayed directly below the thumbnail images.

NOTE: By default, the Navigation Thumbnails for prior studies will be hidden. Click on the small triangle to the left of a Study's Infobar to display/hide the Navigation Thumbnails for that Study.

- To open a particular Series into the Merge PACS Viewer, click on the Navigation Thumbnail for that Series and drag and drop it into a Series Viewport within the Merge PACS Viewer.

- Double-clicking on a Navigation Thumbnail will open the Series in a separate pop-up “clone” window, as described in subsection 4.2.6 above. By default, there can only be one clone window open at a time: if you want to open additional Series in separate clone windows (as opposed to reusing the currently open clone window), hold down the **Shift** key while double-clicking.
- Right-clicking on a thumbnail image will display the **Mammography Navigation Thumbnail Right-click Menu** for that Series, as in the following example:

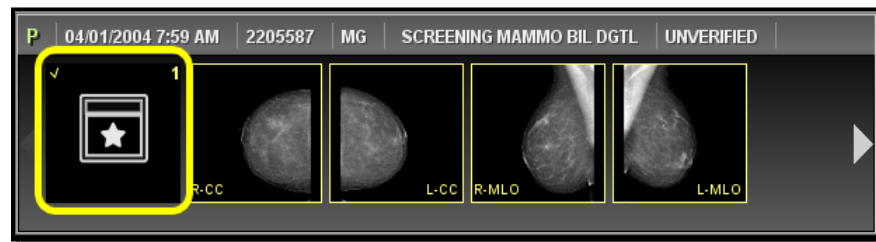


Mammography Navigation Thumbnail Right-click Menu

Each Mammography Navigation Thumbnail Right-click Menu contains the following options:

Option	General Description
Open in Window	Open the Series in a separate pop-up “clone” window, as described in subsection 4.2.6 above.
Thumbnail Size	Change the size of all Series Navigation Thumbnails within the Patient Record.

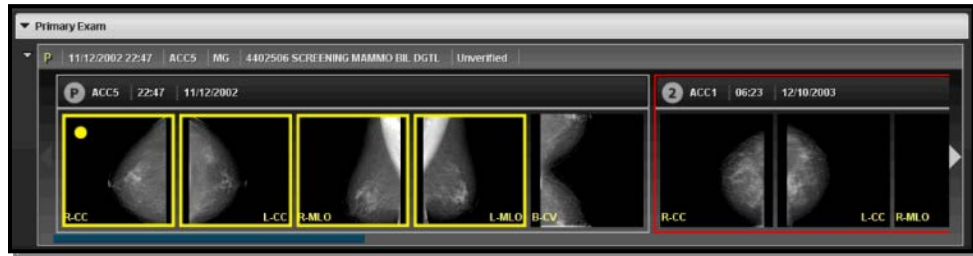
- If there are any key images that have been flagged, the first Navigation Thumbnail will be a special **Key Image Series Navigation Thumbnail**, as in the following example:



Key Image Navigation Thumbnail

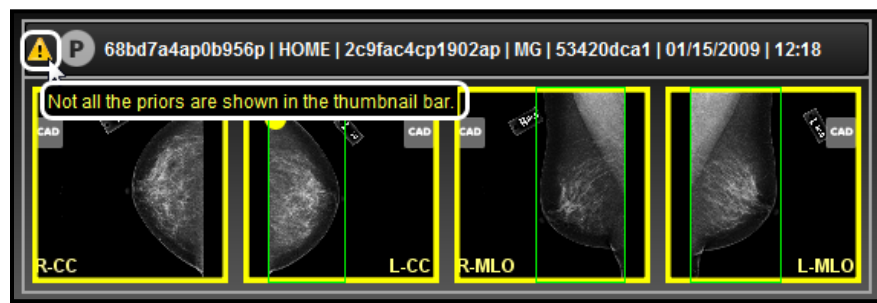
- You can **drag** this Thumbnail into an existing Series Viewport within the Merge PACS Viewer to view all key images in that Series Viewport.
- You can **double-click** on this Thumbnail to open a separate Key Image Viewport, as described in Section 4.11, below.
- You can also **right-click** on this Thumbnail and select **Open Key Image Viewport** from the Right-click Menu to open a separate Key Image Viewport, as described in Section 4.11, below.

- If the **Automatically Stack/Scroll MG Priors** modality preference is selected, as described in 24.1.11 below, or the **Show Thumbnails for Comparison Studies** user preference is selected, as described in subsection 24.1.19 below, the Navigation Thumbnails for all relevant priors will also be displayed to the right of the primary Study's Navigation Thumbnails, as in the following example:



Navigation Thumbnails for Prior Studies

- The thumbnail bars for any prior studies will be bordered in red.
- The order in which the comparison studies are displayed is controlled by the **Show Unread Studies First** preference, as described in subsection 24.1.19 below.
- The determination of whether a study qualifies as a comparison study is based on the Patient Comparison Strategy and “Selection of Priors” option configured for your site, as well as Multiple Patient Identity (if MPI is enabled for your site), as described in Appendix C below.
- The thumbnails for comparison studies operate exactly the same as those for the primary study (e.g., you can double-click to display the series in a separate pop-up window and right-click to display a Thumbnail Right-click Menu).
- By default, Series Navigation Thumbnails for up to ten comparison studies can be displayed at once, but this number is configurable on a site-by-site basis. If there are additional comparison studies whose thumbnails are not currently displayed, a special warning icon will appear on the primary study's Thumbnail Titlebar, as in the following example:

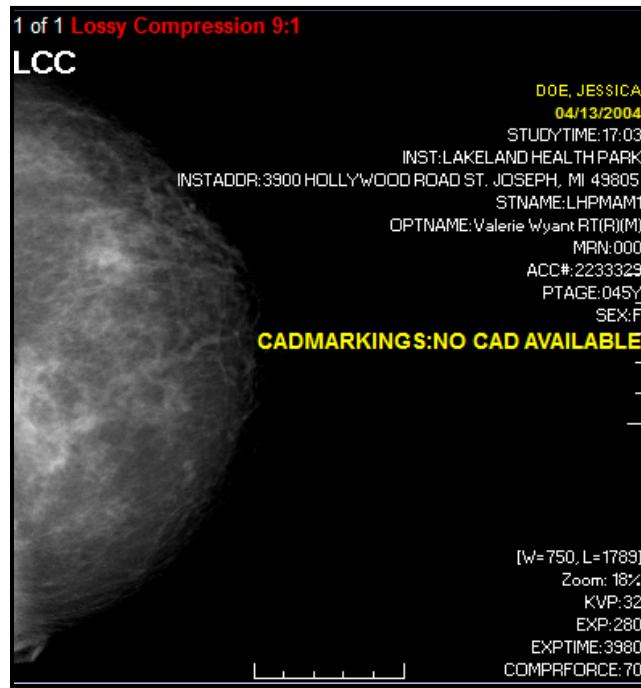


Not All the Priors Are Shown in the Thumbnail Bar

Hovering your mouse cursor over the warning icon will display the text, “Not all the priors are shown in the thumbnail bar,” as in the example above.

4.9.2. DICOM Overlay for Mammography Images

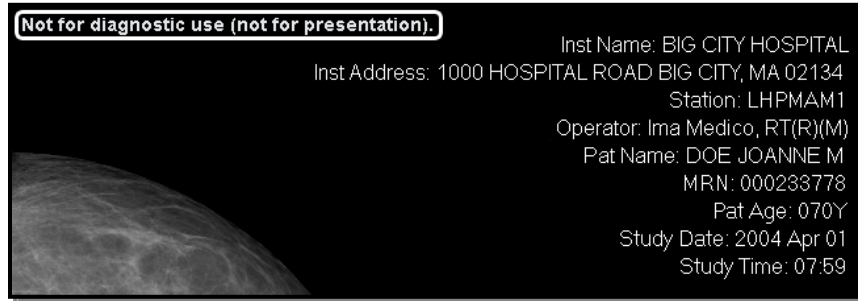
Mammography images have their own special set of DICOM tags overlaid on them, as shown in the following example:



Sample Mammography Image

- The following optional tags may be toggled on and off via any of the DICOM Overlay tools:
 - Institution Name
 - Institution Address
 - Station Name
 - Operator Name
 - Patient age
 - Study Time
 - Cassette/screen identification
 - kVp
 - Exposure (mAs)
 - Exposure Time (msec)
 - Compression Force
- The following tags are permanently displayed and cannot be toggled off:
 - Patient Name
 - Patient MRN
 - Issuer of Patient ID (IPID)
 - Study Date
 - Laterality
 - View
 - Window/Level

- In addition, if the “Presentation Intent Type” DICOM tag indicates that the image is not for presentation, a warning message to this effect will be displayed at the top of the image, as in the following example:

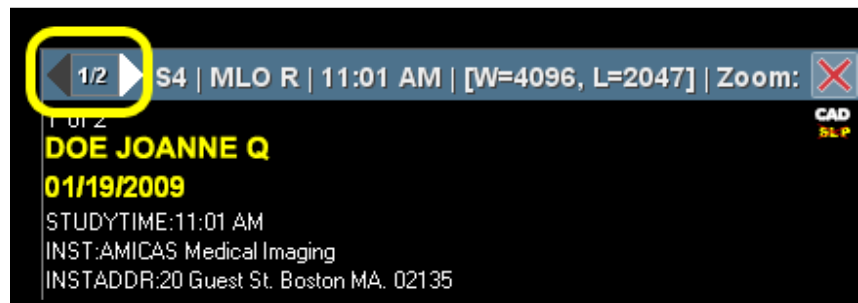


This Image Is Not for Presentation

- The various tags will be repositioned so as to not block anatomical structures if the image is flipped horizontally.

4.9.3. Paging through Multiple Views

Although mammography images are usually displayed one per Series, occasionally there may be multiple alternate views of a given mammography image. When this is the case, a left and right arrow will be displayed, together with the image count, at the far left of the Series Toolbar, as in the following example:

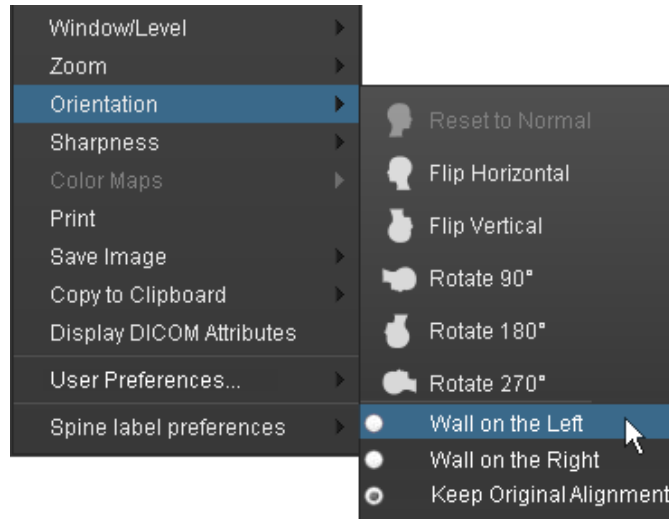


Arrows for Paging through Mammography Images

NOTE: You can also use all the standard image navigation tools, as described in subsection 4.4.1 above, to page through different views.

4.9.4. Wall-To-Wall Display of Mammography Images

When viewing mammography images, you can opt to display side-by-side Mammography images so that they appear chest-wall to chest-wall. This is done by selecting the **Wall on the Left** or **Wall on the Right** option (as applicable) from the **Orientation** sub-menu of the **Series Right-click Menu**, as seen in the following example:

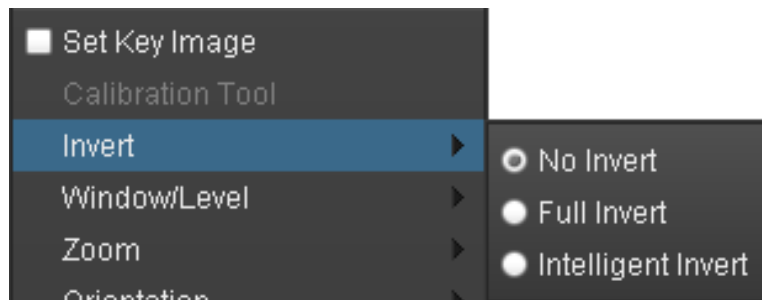


Wall-To-Wall Option

- Select **Wall on the Left** to align the wall of the breast with the left side of the Viewport.
- Select **Wall on the Right** to align the wall of the breast with the left side of the Viewport.
- Click the **Keep Original Alignment** option to turn off the Wall-To-Wall feature.

4.9.5. Mammography Invert Options

When viewing mammography images, the standard **Invert** option in the **Series Right-click Menu**, as described in subsection 4.5.12 above, will instead display a sub-menu of invert options, as in the following example:



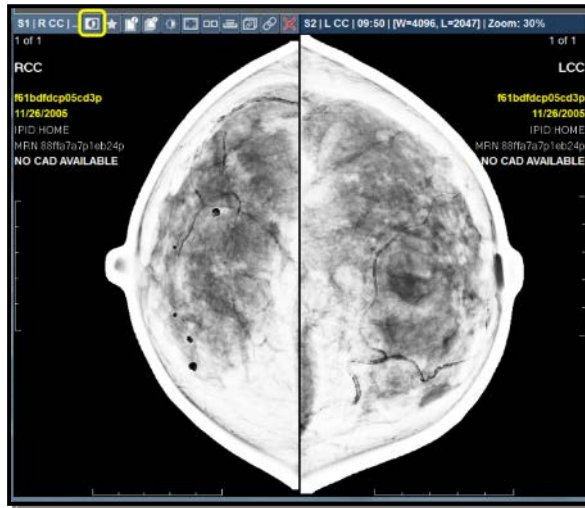
Mammography Invert Options

The following options are available:

Option	General Description
No Invert	Displays the image in standard display mode.
Full Invert	Temporarily reverses all black and white pixels for the images currently within the Series Viewport.
Intelligent Invert	Temporarily inverts only the breast region of the image and not the region outside.



In addition, you can perform an Intelligent Invert for a pair of related side-by-side mammography images by clicking on the special **Paired Invert** icon that appears on the Series Toolbar for mammography images, as shown on the left and illustrated in the following example:



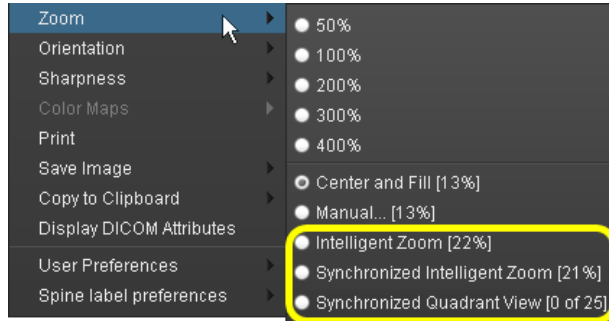
Paired Intelligent Invert

4.9.6. Zooming with the Zoom/Pan Combo Tool

As described in 4.5.5 above, when using the Zoom/Pan Combo tool to zoom in on an image, the zoom effect radiates from the center of the viewport by default. For mammography images, however, the image will instead automatically be panned so that the chest wall is against the viewport wall at all times.

4.9.7. Intelligent Zoom and Quadrant View

When viewing mammography images, the standard **Zoom** sub-menu of the **Series Right-click Menu**, as described in subsection 4.5.3 above, contain a number of additional mammography-specific options, as in the following example:



Mammography-specific Zoom Options

The following options are available:

Option	General Description
Intelligent Zoom	Optimizes the display of the image in the active Series Viewport so that the maximum region is displayed without clipping of any of the breast tissue.
Synchronized Intelligent Zoom	Optimizes the display of the images in all Series Viewports, synchronizing them so that they all have the same zoom level. This means that the zoom level will be set to the minimum required to display the maximum region of the largest image without clipping of any of the breast tissue of that image. As a result, smaller images may not fill their entire Viewport.
Synchronized Quadrant View	Divides each image into enough regions so that each region will fit in the Series Viewport at 100% (full resolution) and then lets the user step through these regions. The same corresponding region is displayed in each Series Viewport for each image and the number of regions will depend on the size of the Series Viewport and the resolution of the images.

NOTE: **Synchronized Intelligent Zoom** and **Synchronized Quadrant View** will be available for both standard mammography images and multi-frame breast tomosynthesis images (as described in subsection 4.9.14 below), even when you are viewing both types of image simultaneously in different viewports.

4.9.8. Binocular Tool



The Binocular Tool, available on both the main Application Toolbar and the Mammography Thumbnail Viewer Toolbar and shown on the left, allows you to use the mouse cursor to display only the part of the image within the tool's viewing area for a pair of related side-by-side mammography images; the rest of the images will be shuttered/remain hidden, as in the following example:



Binocular View

- The default size and shape of the viewing area can be changed from the Merge PACS Preferences dialog, as described in Chapter 24 below.
- When active, you can manually change the size of the tool's viewing area with the mouse wheel (scroll up to decrease the size and down to increase the size).
- By default, the Binocular tool will remain active only while you hold down the left mouse button ("operate on click-drag"). If desired, this can be changed so that the tool remains active until another tool is selected or the left mouse button is clicked a second time ("operate on click") from the Merge PACS Preferences dialog, as described in Chapter 24 below. Note that if "operate on click" is selected, the right mouse button will not work within the Viewport until the tool is dismissed.

4.9.9. Hot Light Tool



The Hot Light Tool, available on both the main Application Toolbar and the Mammography Thumbnail Viewer Toolbar and shown on the left, allows you to use the mouse cursor to display the part of the image within the tool's viewing area with a percentage increase in intensity; the rest of the image will be displayed with the original Window/Level values, as in the following example:



Hot Light View

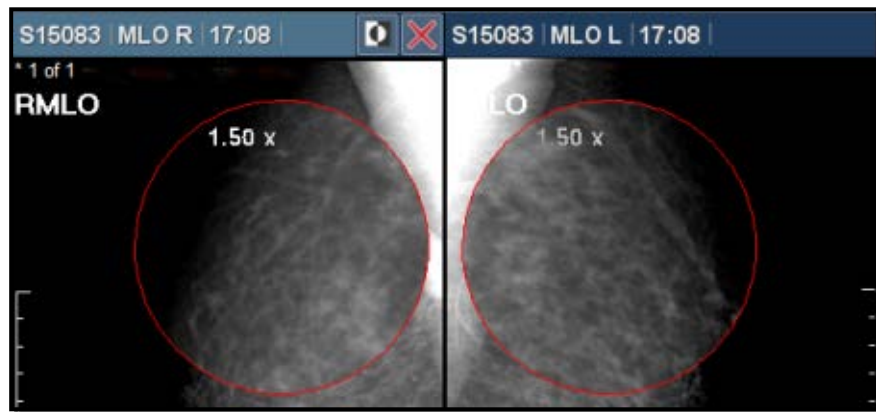
- The default size and intensity of the viewing area can be changed from the Merge PACS Preferences dialog, as described in Chapter 24 below.
- When active, you can manually change the intensity within tool's viewing area with the mouse wheel (scroll up to decrease the intensity and down to increase the intensity).
- By default, the Hot Light tool will remain active only while you hold down the left mouse button ("operate on click-drag"). If desired, this can be changed so that the tool remains active until another tool is selected or the left mouse button is clicked a second time ("operate on click") from the Merge PACS Preferences dialog, as described in Chapter 24 below. Note that if "operate on click" is selected, the right mouse button will not work within the Viewport until the tool is dismissed.

4.9.10. Dual Link Magnifier

The Dual Link Magnifier includes a tool and a preferences menu to configure that tool as follows:



The Dual Link Magnifier Tool, available on both the main Application Toolbar and the Mammography Thumbnail Viewer Toolbar and shown on the left, allows you to use the mouse cursor to simultaneously magnify a selected region of a pair of related side-by-side mammography images, as in the following example:



Dual Link Magnifying Glass View

- When active, you can manually change the magnification level within tool's viewing area with the mouse wheel (scroll up to decrease the magnification and down to increase the magnification).
- When active, you can click on the right mouse button to toggle between Normal and Invert mode.
- By default, the Dual Link Magnifier tool will remain active only while you hold down the left mouse button ("operate on click-drag"). If desired, this can be changed so that the tool remains active until another tool is selected or the left mouse button is clicked a second time ("operate on click") from the Merge PACS Preferences dialog, as described in Chapter 24 below.



The Dual Link Magnifier Preferences menu, accessed by clicking the triangle to the right of the Dual Link Magnifier Tool, as shown on the left, allows you to select whether you want the Dual Link Magnifier to display in **Normal** or **Invert** mode by default. Regardless of which option is selected, you can still manually select a different mode while using the tool by clicking on the **right** mouse button, as described above.

4.9.11. Mammography Prior Studies Stacking Options



If the **Automatically Stack/Scroll MG Priors** modality preference is selected for mammography images, as described in Section 24.1.11 below, the **Scroll MG Priors** button will be available to be added to the **Application Toolbar**, as shown on the left. Clicking on this button will toggle between the following two display modes (note that the appearance of the button will change to reflect the currently selected mode):

Button	Mode	General Description
--------	------	---------------------



Mode #1

For each view (RCC, LCC, etc.), the image from the primary Study will be displayed in one Series Viewport with the image(s) of the same view from any qualifying prior studies stacked below it in the same Series Viewport. For example:

RCC from primary Study (with prior RCCs stacked underneath)	LCC from primary Study (with prior RCCs stacked underneath)	RMLO from primary Study (with prior RMLOs stacked underneath)	LMLO from primary Study (with prior LMLOs stacked underneath)
---	---	---	---

When scrolling on the first Series Viewport, after passing the primary Study RCC, you can move through the RCC view for each of the prior studies.



Mode #2

For each view (RCC, LCC, etc.), the image from the primary Study will be displayed in one Series Viewport and the images from the qualifying prior studies will be displayed in the next Series Viewport. For example:

RCC from primary Study	Stacked RCCs from prior studies	LCC from primary Study	Stacked LCCs from prior studies
------------------------	---------------------------------	------------------------	---------------------------------

There will only be one image in the first and third Series Viewports. When scrolling through the second viewport, for example, you can move through the RCC view for each of the prior studies.

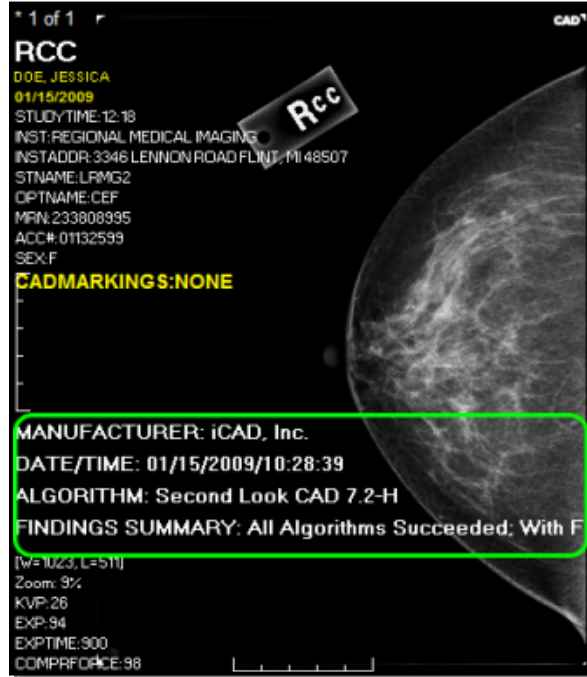
NOTE: If desired, you can configure the Viewer to always display Prior Mammography studies to the left of the primary Study from the Merge PACS Preferences dialog, as described in Section 24.1.11 below.

NOTE: The Cine feature is not available when standard mammography images are stacked in the same viewport. It is, however, available for use with multi-frame breast tomosynthesis images, as described in subsection 4.9.14 below.

NOTE: Although stacked scrolling is available for both conventional mammography and tomosynthesis studies, they will not be stacked together. For example, the viewport that contains the conventional LCC is not going to have a tomosynthesis LCC from a prior study stacked behind it.

4.9.12. Displaying CAD Summary

If you have turned the display of CAD markings on from the **Application Toolbar**, the **Series Right-click Menu** or the **Mammography Toolbar**, CAD summary information will be displayed directly on the image by default, as in the following example:

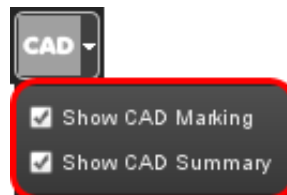


CAD Summary

CAUTION: CAD markings are displayed in Merge PACS to bring areas of interest to the attention of the Radiologist. They are intended only to assist the Radiologist in minimizing observational oversights and not as a primary diagnostic tool.



This behavior can be changed from the **Toggle CADSR Overlay Menu**, located on the **Application Toolbar** and the **Mammography Toolbar** and shown on the left. When activated, the menu displays the following options:



CAD Overlay Menu Options

If the **Show CAD Marking** option is selected but the **Show CAD Summary** option is **not** selected, the summary will not be displayed on the image and a special Cad Summary indicator will be displayed in the upper-right corner of the image instead, as in the following example:



CAD Summary Indicator

- Clicking on this icon will cause a small pop-up window to be displayed with the summary information, as in the following example:



CAD Summary Window

- Click on the red **X** in the upper-right corner of this window to close it.

The CAD summary will include a notification that “**Adjusted co-ordinates to display CAD markings**” if the CAD SR was generated from for processing images and:

- The **for presentation image's** DICOM header does not contain explicit information to indicate a direct relationship between the **for processing** and **for presentation** images, and
- The **pixel spacing** values **do not** match between the **for presentation** image and the **CAD SR**, but
- The **patient orientation** values **do** match between the **for presentation** image and the **CAD SR**.

NOTE: If this is the case, the CAD marks will be displayed based on the pixel spacing from the CAD SR.

4.9.13. Mass Density Marks

If CAD markings are turned on, some mammography images may display **mass density marks**. Each mark consists of a center point and an outline represented by a polyline to indicate the high density tissue border.

NOTE: Although mass density marks may, at times, appear to follow the rough outline of the breast, their purpose is not to display the outline of the breast.

4.9.14. Breast Tomosynthesis Images

The Merge PACS Viewer can display multi-frame breast tomosynthesis (also known as 3D Mammography) images in both 2D and 3D mode. In general, breast tomosynthesis images are displayed within the Merge PACS Viewer the same way that standard mammography images are displayed, with the following exceptions:

a. Thumbnail Images

For breast tomosynthesis images, each multi-frame image is displayed as a separate image set in the thumbnails, as opposed to combining all images with the same view code into a single image set.

b. Intelligent Invert and Intelligent Zoom

For breast tomosynthesis images, the skin line detection algorithm used for the **Intelligent Invert** feature, described in subsection 4.9.5 above, and the **Intelligent Zoom** feature, described in subsection 4.9.7 above, might be applied based on the **middle** frame of the image instead of being applied to each frame individually according to the following logic:

- If the tomosynthesis image is not currently displayed in any viewport, the skin line detection is applied only to the middle slice for the thumbnail.
- If the tomosynthesis image is currently displayed in a viewport, but you do not start scrolling through the image until after the middle slice is available, the skin line detection will be applied to the first slice and the middle slice.
- If the tomosynthesis image is currently displayed in a viewport and you start scrolling before the middle slice is available, the skin line detection will be applied to all the frames displayed in the viewport until the middle slice becomes available.

c. Scrolling

Unlike standard multi-frame image scrolling used for CT images (head to foot), scrolling up with the center mouse wheel through the frames of a breast tomosynthesis image will scroll through the stack in a direction **away** from the detector.

d. Stacked Scrolling

For breast tomosynthesis images, the Stacked Scrolling feature described in subsection 4.9.8 above is available as with conventional mammography images, except that thin-slice and thick-slice tomosynthesis images will not be stacked together, but will instead be treated like separate views and stacked separately.

Also, tomosynthesis and conventional mammography studies will not be stacked together. For example, the viewport that contains the conventional LCC is not going to have a tomosynthesis LCC from a prior study stacked behind it.

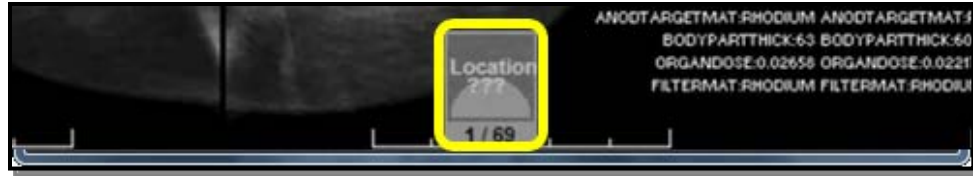
e. Slice Position Indicator

The Slice Position Indicator is an interactive graphic that dynamically shows the current slice (frame) number and relative thickness of the slice for the image currently displayed in the Viewport, as well as the relative position of the viewed slice within the stack, as in the following example:



Slice Position Indicator

- The thickness of the vertical dark line indicates the relative thickness of the slice currently being viewed.
- The numbers at the bottom of the below the Slice Position Indicator show the relative position of the slice within the stack (e.g., the 11th slice out of 40 total slices).
- As you scroll through the slices in the Viewport, the vertical dark line will move up or down to indicate the slice position within the image and the relative position indicator will update to show the current slice number and the total number of slices.
- You can also click on the vertical dark line within the Slice Position Indicator graphic and drag it up or down to scroll through the slices in the Viewport.
- The Slice Position Indicator graphic can be placed anywhere on the border of the Viewport by clicking on it someplace other than on the vertical dark line and dragging it to the desired location.
- By default, the slice position indicator for multi-frame breast tomosynthesis images indicates **M-L** (Medial-Lateral) for Mediolateral-Oblique (MLO) views and **S-I** (Superior-Inferior) for Cranial-Caudal (CC) views. You can change this to instead display R-L (Right-Left) and (H-F) Head-Foot instead, however, by deselecting the **Use ML Indicator Orientation** option for the mammography modality user preference, as described in subsection 24.1.11 below.
- If the image position isn't correctly encoded within the Image Position DICOM attribute (e.g., for any orthogonal view there is no variation in z-axis values or for any lateral view there is no variation in x-axis values), a message such as the following will be displayed within the slice indicator instead of the slice location:



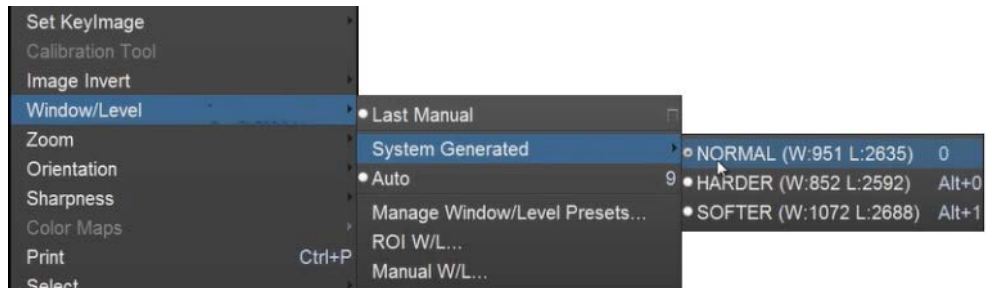
Unknown Location Message

- The display of the Slice Position Indicator can be toggled on and off for the entire Study from the **Study Right-click Menu**, as described in subsection 4.2.4.c above, or for one or more individual Viewports from the **Series Right-click Menu**, as described in subsection 4.2.5.c above.
- The initial show/hide state of the Slice Position Indicator can be set from the **Preferences** menu when configuring modality preferences for MG images, as described in Chapter 24 below.

NOTE: The show/hide state of the Slice Position Indicator, as well as its current position within the viewport (if shown), are saved in Hanging Protocols and Study Presentations, as described in Section 4.12 below.

f. Additional System Generated Window/Level Options

If any additional look-up tables (*i.e.*, sets of viewing parameters) are included in the DICOM header for a given breast tomosynthesis image, the standard “System Generated” option under “Window/Level” on the Series Right-click menu will turn into a submenu that will allow you to select from the values provided, as in the following example:



System Generated Options

g. Aligned MIP and MPR

The standard Axial, Sagittal, and Coronal views available when viewing 3D images, as described in Section 4.8 above, are typically oblique relative to the body axis. When viewing breast tomosynthesis images in 3D mode, however, they will be displayed in a special “aligned” view that is parallel to the stack of images you have acquired. More specifically, it represents a view direction that is perpendicular to the breast tomosynthesis image plane, and rotated and/or flipped so that the image has the standard mammography hanging orientation.

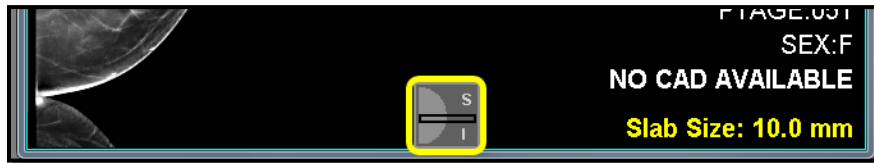
NOTE: Standard mammography hanging orientation means that the axilla is towards the top and the patient-posterior is at the left of the Viewport for left-laterality images and at the right of the Viewport for right-laterality images.

NOTE: As with other modalities, the existing criteria for 3D must be met for 3D functionality to be available (for example, there must be at least 5 frames).

NOTE: If a Hanging Protocol is configured to display a MIP/MPR BTO without displaying the 2D image as well, the MIP/MPR might be smaller compared to the version displayed as a one-click MIP/MPR.

The Slice Position Indicator described in paragraph 4.9.14.e above is still available in Aligned MIP view, with the following differences:

- It will show the thickness and position of the **slab** instead of an individual slice and the slice number will not be displayed, as shown in the following example:

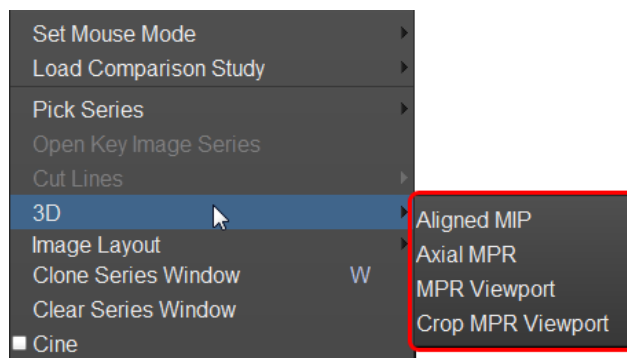


Slice Position Indicator for Aligned MIP and MPR

- If you change the slab thickness (buttons), the Slice Position Indicator will automatically update.
- You can also click and drag the slab within the Slice Position Indicator to move it.

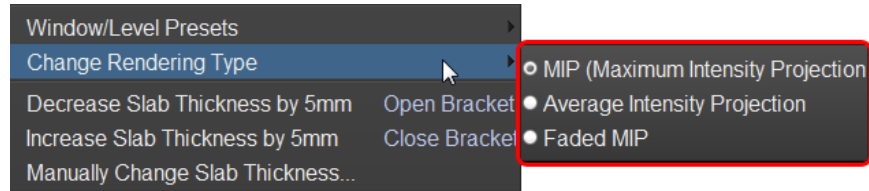
h. 3D Options in Series Right-Click Menu

When viewing breast tomosynthesis images in 2D mode, the 3D options available from the Series Right-click menu will be fewer than those available for standard 3D images, as in the following example:



3D Options in Series Right-click Menu

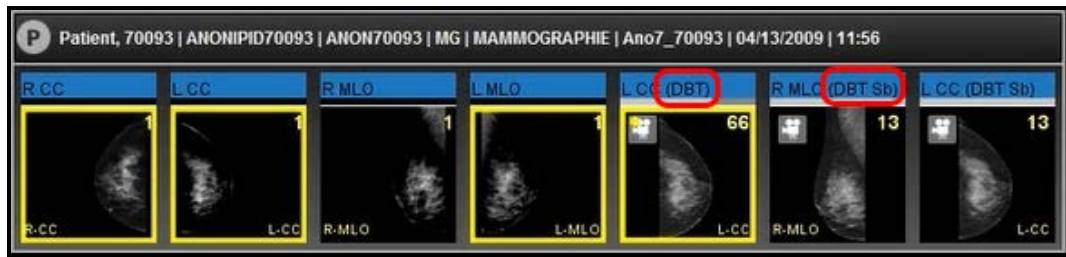
When viewing breast tomosynthesis images in 3D MIP mode, the Change Rendering Type options available from the MIP Viewport Right-click Menu will also be fewer than those available for standard 3D MIPs, as in the following example:



Change Rendering Type Options in MIP Viewport Right-click Menu

i. Thin-slice and Thick-slice (“Slab”) Images

Some breast tomosynthesis scanners produce both a “thin-slice” image and a “thick-slice” (or “slab”) image for the same view. Within the PACS Viewer, thin-slice tomosynthesis images are labeled with a “DBT” suffix (“Digital Breast Tomosynthesis”) and thick-slice images are labeled with a “DBT Sb” suffix (“Digital Breast Tomosynthesis Slab”), as in the following example:



Thin-Slice and Thick-Slice Breast Tomosynthesis Images

NOTE: Thick-slice images have significantly fewer frames than thin-slice images and would not typically be used for creation of 3D MIP or MPR volumes.

For breast tomosynthesis images, the Stacked Scrolling feature described in subsection 4.9.8 above is available and operates the same as with conventional mammography images, except that thin-slice and thick-slice tomosynthesis images will not be stacked together, but will instead be treated like separate views and stacked separately.

j. Background Generation of 3D Volumes

By default, 3D volumes for breast tomosynthesis images are generated at the time you select to create a MIP or MPR for a specific image. This process can be lengthy for breast tomosynthesis images, however. Therefore, a special **Enable Background Loading for Tomosynthesis** user preference is available, as described in subsection 24.1.6 below.

When this preference is enabled, 3D processing will be performed for breast tomosynthesis images in the background as soon as they are loaded into the Viewer in order to speed up the process of generating 3D volumes such as MIP or MPR. This will be done only if the following conditions are met, however:

- The Workstation is 64-bit.
- The image is already pre-cached before it is loaded into the Viewer.
- The image is not a thick-slice (“slab”) image.
- There is sufficient memory to perform the operation.

NOTE: If a study contains multiple tomosynthesis images, the 3D volumes will be processed in sequential order. If you manually select to generate a 3D volume for one image while the 3D background loader is still running, the on-demand request will take precedence and the background loader will be paused.

k. Display of Synthetic Images

In general, breast tomosynthesis studies do not involve a separate 2D scan of the patient in addition to the 3D scan that produces the multi-frame images, so as to minimize radiation exposure to the patient. Some scanners, however, create a synthetic single-frame 2D image based on the 3D scan that may be labeled **C-View** (Hologic) or **V-Preview** (GE).

Regardless of how the synthetic images are generated or encoded, Merge PACS will always group them with the conventional mammography images of the same view. This means that there will not be a separate thumbnail image for these synthetic images.

Synthetic images can be identified in one of two ways:

- Depending on the scanner, the text “C-View” or “V-Preview” will be burned into the images themselves. Note that this burned in text may or may not be visible depending on the Series layout currently being used within the Viewer, since the text may fall outside the viewport.
- The text “C-View” or “V-Preview” will be included in the first quadrant of the overlay text when present in the Series description of each such image.

l. Toggling Between Patient Record and Thumbnail Viewer

By default, clicking on the **Patient Record** icon on the **Application Toolbar** will toggle the display of the Patient Record on and off. It will not, however, affect the display of the Mammography Thumbnail Viewer.

If the **Show Thumbnail Viewer in Toggle** user preference is selected for MG studies, as described in subsection 24.1.11 below, clicking the Patient Record icon will toggle the display of both the Patient Record and the Mammography Thumbnail Viewer.

m. Image Level Manipulation

The Image Level Manipulation feature, described in subsection 4.2.5 above, is not supported for use with Secondary Capture Image Storage Tomosynthesis series. This is because the PACS Viewer only supports display of the single representative frame for the Secondary Capture, not the entire tomosynthesis data set that is embedded in the header as private data.

4.10. Setting Key Images

The Merge PACS Viewer allows you to mark any number of images in a Series as a “key” image. Key images are flagged and added to a special Key Image Series that can be viewed within any Series Viewport in the Merge PACS Viewer or in a special Key Image Viewport, as described in Section 4.11 below.

Each Key Image reflects the state of the image (zoom factor, window/level, annotations, etc.) at the time the image was flagged as a Key Image. You can therefore flag the same image multiple times if you want different states preserved. If you accidentally flag an image as a Key Image, you can remove it from the Key Image Series via the Key Image Viewport.

Depending on how your custom user preferences are configured, as described in Chapter 24 below, setting a key image may cause the Key Image Viewport to be automatically launched.

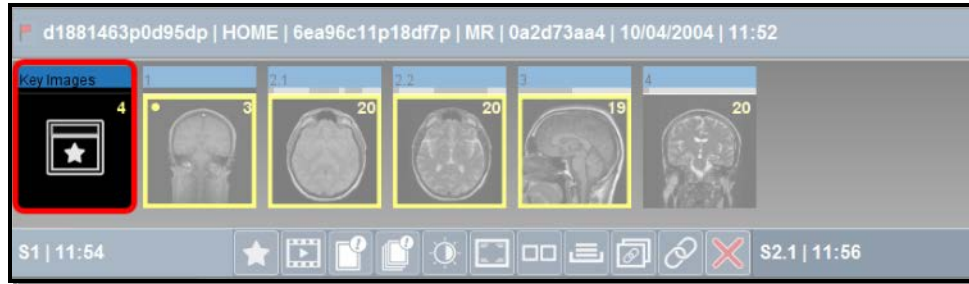
NOTE: Key images are considered secondary images.

Once an image has been flagged as a Key Image, a special marker will be displayed to the right of the Image Titlebar for that image, as in the following example:



Key Image Marker

In addition, as described in subsections Note: and 4.2.4 above, a separate Navigation Thumbnail will be displayed for the Key Image Series in the Patient Record and within the Merge PACS Viewer, as in the following example:

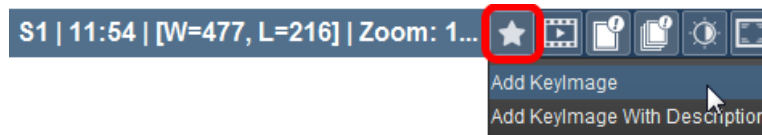


Key Image Navigation Thumbnail

4.10.1. Setting Key Images from the Series Toolbar



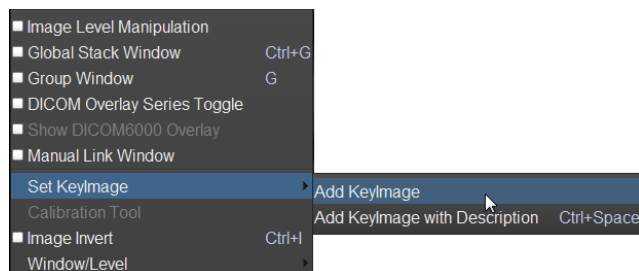
You can flag an image as a Key Image by clicking the **Set Key Image** tool from the **Series Toolbar**, as shown on the left, and selecting the **Add KeyImage** option from the KeyImage menu, as in the following example:



Setting a Key Image

4.10.2. Setting Key Images from the Series Right-click Menu

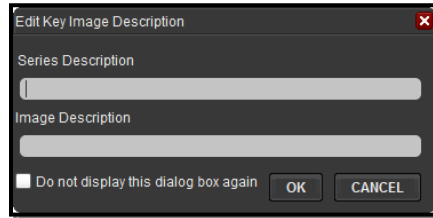
You can also flag an image as a Key Image from the **Series Right-click Menu**, as seen in the following example:



Setting a Key Image

4.10.3. Adding a Key Image with Description

From both the Series Toolbar and the Series Right-click Menu, you can also choose to edit the key image's default description when setting it by selecting the **Add KeyImage with Description** option from the menu. When selected, the **Edit key Image Description** dialog will be displayed, as in the following example:



Editing the Key Image Description

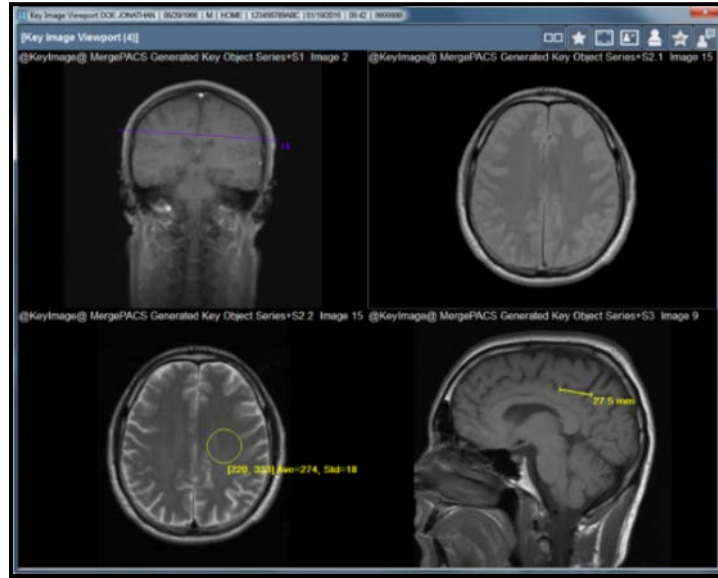
- Enter a Series description for this key image in the **Series Description** field.
- Enter an image description for this key image in the **Image Description** field.
- Select the **Do not display this dialog box** again checkbox if you want to use the entered information as a default value for all key images created for this Study during the current Viewer session.
- When finished, click the **OK** button to save your changes or the **CANCEL** button to exit the dialog without making any changes.

4.10.4. Automatically Setting Annotated Images as Key Images

If the **Automatically Mark Annotated Images as Key Images** user preference is selected, as described in Chapter 24 below, adding a text annotation (not including spine labeling) to an image will cause that image to automatically be flagged as a key image. Key images that are automatically set will be displayed with a special icon within the Key Image Viewer, as described in subsection 4.11.9 below.

4.11. Viewing Key Images

The Key Image Viewport displays the Key Image Series, which contains all images for the current Study that have been flagged as Key Images, as in the following example:



Key Image Viewport

NOTE: Key images are considered secondary images.

The Key Image Viewport can be accessed in the following ways:

- **Double-clicking** the **Key Image Navigation Thumbnail** from the Patient Record or within the Merge PACS Viewer, as described in subsections 3.8.1 and 4.2.4 above, will launch the Key Image Viewport in a separate pop-up window.
- Selecting **Open Key Image Viewport** from the **Key Image Thumbnail Right-click Menu** will also launch the Key Image Viewport in a separate pop-up window.
- **Dragging and dropping** the **Key Image Navigation Thumbnail** into a Series Viewport within the Merge PACS Viewer will convert that Series Viewport into a Key Image Viewport.
- Selecting **Open Key Image Series** from a **Series Right-click Menu** will also convert that Series Viewport into a Key Image Viewport and display the Key Image Series within.

In addition, you can configure your User Preferences, as described in Chapter 24 below, so that the Key Image Viewport is automatically launched as a separate pop-up window in one or more of the following situations:

- Whenever an image is flagged as a Key Image
- When the primary Study is first opened within the Merge PACS Viewer
- When a comparison Study is opened

4.11.1. Key Image Viewport Titlebar

If the Key Image Viewport is being displayed as a separate pop-up window, the top of the window will contain the **Key Image Viewport Titlebar**, as shown in the following example:



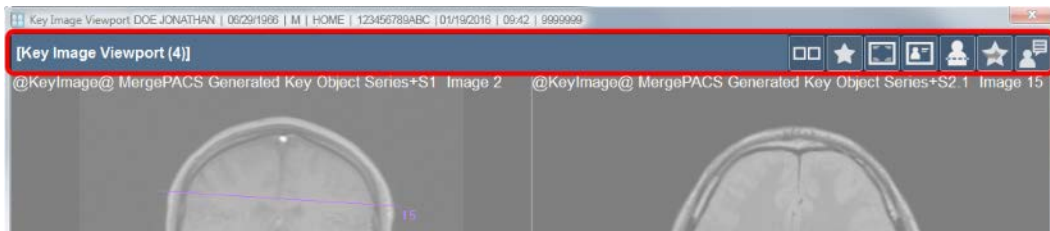
The Key Image Viewport Titlebar

The Key Image Viewport Titlebar displays the following information, where available:

- Patient Name
- Patient Medical Record Number (MRN)
- Patient Date of Birth
- Study Date/Time
- Patient Sex
- Accession Number
- Issuer of Patient ID (IPID)

4.11.2. Key Image Series Toolbar

Below the Key Image Viewport Titlebar (or at the top of the Viewer if The Key Image Viewport is being displayed within an existing Viewport) is the **Key Image Series Toolbar**, as shown in the following example:



Key Image Series Toolbar

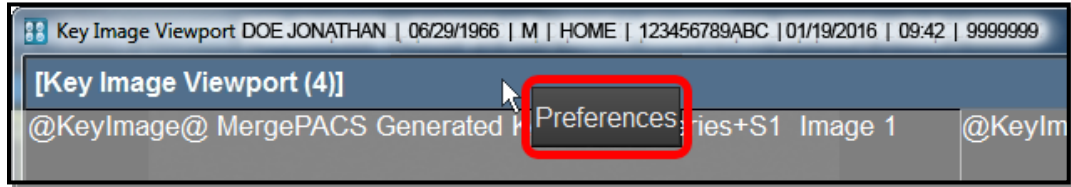
The Key Image Series Toolbar displays various tools that apply to the Key Image Viewport.

a. Available Tools

The right side of the Key Image Series Toolbar displays the available tools that apply to the Key Image Viewport. The actual tools that appear will depend on how you have configured the Toolbar (as described in paragraph b below). For a complete list of possible tools, refer to subsection 4.2.7 above.

b. Customizing the Key Image Series Toolbar

Right-clicking on the Series Information section of the Rendered Volume Series Toolbar will immediately cause a **Preferences** link to be displayed, as in the following example:

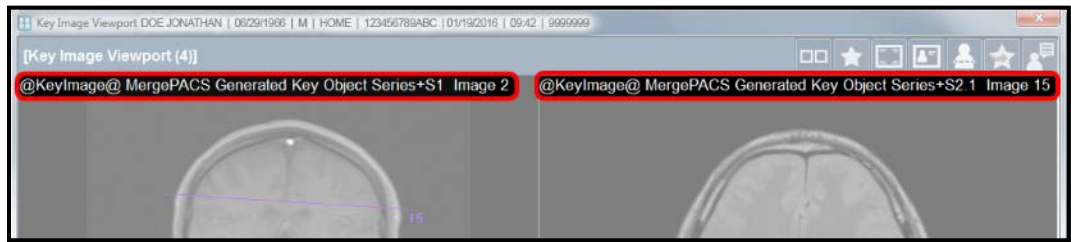


Key ImageSeries Toolbar Preferences Link

Clicking the Preferences link will take you directly to the **Series Toolbar** section of the **Merge PACS Preferences** dialog, as described in subsection 24.1.20 below, where you can customize the set of tools that appear on the **KeyImage Window** Series Toolbar as well as configure when the tools should be displayed.

4.11.3. Key Image Titlebar

The top section of the each key image within the Key Image Viewport displays information about that image, as in the following example:

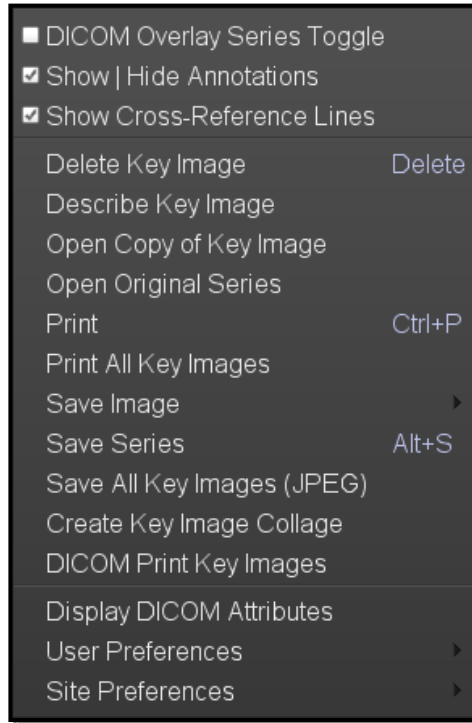


Key Image Titlebars

Each Key Image Titlebar displays the following information about the image:

- **Image Description**
- **Zoom Factor**
- **Compression Ratio** (if the image has been lossy compressed)

4.11.4. Key Image Series Right-click Menu



The Key Image Series Right-click Menu

Right-clicking on a Key Image and holding the mouse button down for a few seconds will bring up the **Key Image Series Right-click Menu**, as shown in the example to the left.

The Key Image Series Right-click Menu contains a variety of options, some of which are also available from the Key Image Series Toolbar.

The Key Image Series Right-click Menu has the following possible options:

Option	General Description
DICOM Overlay Series Toggle	Toggles DICOM Overlay display for the Key Image Viewport on and off.
Show Hide Annotations	Toggles the display of any annotations on and off.
Show Cross-Reference Lines	Toggles the display of any available reference lines on and off.
Delete Key Image	Removes the image from the Key Image Series.
Describe Key Image	Allows you to edit the description of this key image via a separate pop-up dialog window.
Open Copy of Key Image	Opens a copy of the image in a separate pop-up Series Viewport window for manipulation.
Open Original Series	Opens the entire Series that the image is a part of in a separate pop-up Series Viewport window.
Print	Send the image, together with any user annotations, to a printer.
Print All Key Images	Sends all key images, together with any user annotations, to a printer.

Option	General Description
Save Image	Save the selected image, together with any user annotations, to your hard drive in a variety of available image formats, as described in subsection 4.7.1 above.
Save Series	Save the entire Series, together with any user annotations, to your hard drive in a variety of available image formats, as described in subsection 4.7.1 above.
Save All Key Images (JPEG)	Create JPEG versions of all key images and prompt you for a directory where they should be saved.
DICOM Print Key Images	Sends all key images to an available DICOM printer, as described in subsection 4.7.2 above.
DICOM Send Key Images	Sends all key images to an available DICOM device, as described in subsection 4.11.6 below.
Display DICOM Attributes	View the complete set of DICOM attributes for the image.
Process Pending Annotated Key Images	If the user preference has been selected to mark annotated images as key images upon exiting a Study, selecting this option will process those annotated images immediately. This option can also be accessed from the Key Image Series Toolbar, as described in subsection 4.11.2 above.
Preferences	Allows you to set various personalized viewing preferences, as described in Chapter 24 below.

4.11.5. Creating a Key Image Collage



Once you have flagged two or more images as key images, you can create a new key image collage showing the existing key images combined into a single collage image by clicking on the **Create Key Image Collage** icon on the **Key Image Series Toolbar**, as shown on the left, or by selecting **Create Key Image Collage** from the **Key Image Series Toolbar Right-click Menu**.

The new key image collage will be displayed as a new key image within the Key Image Viewport as in the following example:



Key Image Collage

NOTE: You may need to change the Image Layout of the Key Image Viewport, as described in subsection 4.11.2 above, in order to view the new key image collage.

NOTE: If not all key images are currently being displayed in the Key Image Viewer (e.g., five total key images but a 2x2 layout), you will be prompted for a choice of whether you want to create a collage for just the current page or to create separate collages for each page within the Key Image Viewport.

NOTE: The collage will be added as a Key Image to the KO Series for the Study.

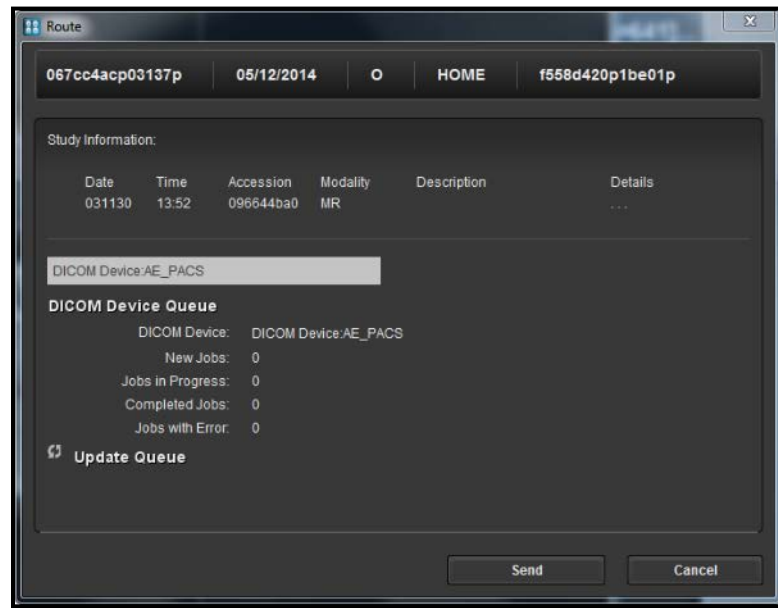
NOTE: Collage key images will not be included in other collages; instead, the cell where the collage would be located will be blank in the newly created collage.

4.11.6. Sending Key Images



If your system has been configured to send information to one or more DICOM devices, you can send the just key images currently flagged for a study (as opposed to routing the entire study) to one of those devices by either clicking on the **Send Key Images** icon on the **Key Image Series Toolbar**, as shown on the left, or by selecting the **DICOM Send Key Images** option from the **Key Image Series Right-click Menu**.

This will cause the Routing dialog to be displayed, as in the following example:



Routing Dialog

Click the **Send** button to send the key images to the DICOM device displayed in the dialog. For information on selecting a different DICOM device and monitoring the routing progress, refer to Chapter 14 below.

NOTE: The key images will not actually be sent until after you have closed the study.

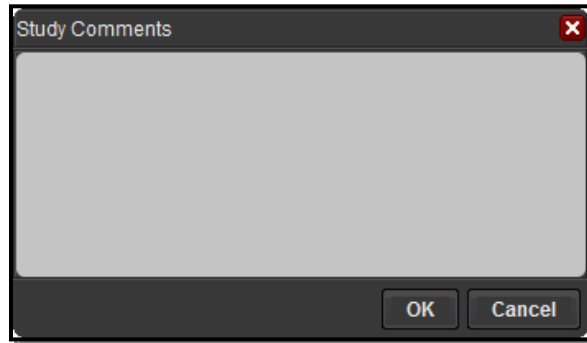
NOTE: If any of the flagged images are 3D key images, you will need to also manually send the study to the selected DICOM device, as described in Chapter 14 below.

4.11.7. Adding Study Comments



You can add comments (up to 1024 characters) that will be associated with all of a study's images, including key images, by clicking on the **Add Study Comments** icon on the **Key Image Series Toolbar**, as shown on the left.

When you click on the Add Study Comments icon, the **Study Comments** panel will be displayed, as in the following example:



Study Comments Panel

Enter or edit the desired text and click the **OK** button to save your changes.

Note the following:

- The Study Comments panel will show the current value stored in the specified DICOM tag and anything entered in the panel will replace what is currently stored in that tag.
- The saved comments will be included in any current and future key images for the study as well as all other images for that study.
- Deleting the contents of the panel and clicking the **OK** button will clear the study comments from all of the study's images.
- These comments are completely separate from the comments history workflow described in Chapter Chapter 5 below.
- The comment text will be stored in the "Additional Patient History" (0010,21b0) tag in the DICOM header for each image and can be viewed from the **DICOM Attributes Viewer** described in subsection 4.5.9.b above.
- Any updates made to the comment text will be propagated as PDE notifications through telemedicine and will also be logged to the Audit log (visible from within the Merge PACS Watch application).

4.11.8. Key Image Indicator

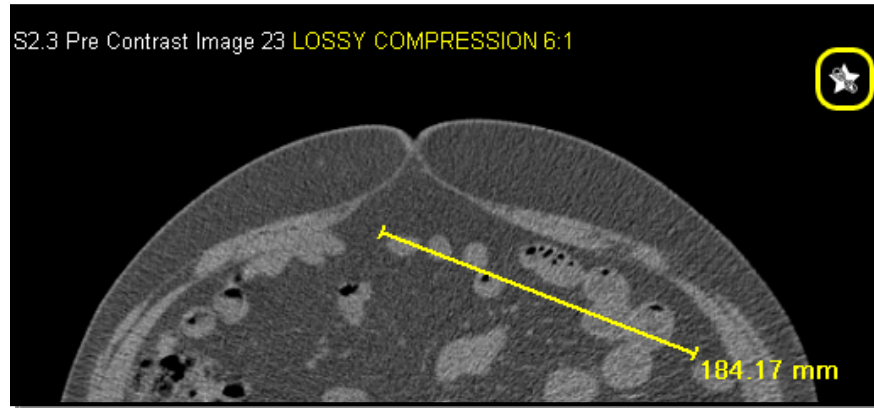
Images that have been flagged as a Key Image will have an orange triangle displayed to the right of the Image Titlebar for that image in the standard Series Viewport, as in the following example:



Key Image Indicator

4.11.9. Automatically Flagged Key Images

As described in subsection 4.10.3 above, the Merge PACS Viewer can be configured to automatically flag an image as a key image when a text annotation (not including spine labeling) is added to that image. Key images that are automatically flagged will be displayed with a special icon within the Key Image Viewer, as in the following example:



Automatically Flagged Key Image

NOTE: Annotations on automatically flagged key images will dynamically be updated within the Key Image Viewport whenever the annotations on the original image are changed.

4.12. Hanging Protocols and Study Presentations

A **Hanging Protocol** is essentially a display template for a specified type of Study that controls the way a Study is displayed when it is first opened in the Merge PACS Viewer. When a Study is opened in the Merge PACS Viewer, the system checks to see if there is an existing Hanging Protocol associated with that type of Study and, if so, displays the Study according to settings contained within that Hanging Protocol. If there are multiple Hanging Protocols associated with a particular Study, the most recently created one will be used and the user will be given the ability to select a different protocol once the Study has been opened. Hanging protocols are associated with usernames, and which Hanging Protocols are available to you will depend on your user account.

A **Study Presentation** is a Hanging Protocol that has been assigned to a specific Study as opposed to a specific type of Study. When a Study is opened in the Merge PACS Viewer, the system will first check to see if there is a Study Presentation associated with that Study and, if so, will display the Study according to the settings contained within that presentation. If there is no Study Presentation associated with a Study, the system will then check to see if there are any general Hanging Protocols associated with that type of Study. Study presentations are associated with the studies themselves and are independent of login privileges.

4.12.1. Settings Preserved by Hanging Protocols and Study Presentations

In general, Hanging Protocols and Study Presentations can be defined to preserve the following:

- **A wide variety of display attributes** (Window/Level, Zoom, Pan, Invert, etc.)
- **Display/Position of Slice Position Indicator** (Breast Tomosynthesis images only)
- **Display of multiple comparison studies**
- **Display of Series-level comparison Series Viewports**
- **Display of 3D/MPR Series**
- **Image Fusion Blending**
- **Display of Cloned windows**

NOTE: Hanging Protocols cannot preserve Zoom levels when set to a specific percentage or manual amount. If you wish to preserve Zoom levels with HP, you should only select the “Center and Fill” Zoom option or use the Intelligent Zoom feature with Mammography images.

NOTE: The display of Foreign Studies in a comparison study window, as described in subsection 3.8.9 above, will not be preserved as part of Hanging Protocols.

Hanging Protocols and Study Presentations can also be configured to perform multiple steps.

4.12.2. Hierarchy of Hanging Protocols and Study Presentation Application

The Merge PACS Viewer will initially display studies according to the following hierarchy:

- If a Study Presentation has been saved for the Study, it will be initially applied by default.
- If there is no Study Presentation saved for a particular Study, the best matching Hanging Protocol that applies to that Study will be applied.
- If there is no Study Presentation or Hanging Protocol that applies to the Study, the Study will be displayed according to any default modality-specific layout that has been defined for this modality.

4.12.3. The Hanging Protocol Menu

The creation, selection and management of Hanging Protocols and Study Presentations is done via the **Hanging Protocol Menu**, which is accessed by clicking on the **Hanging Protocol** button on the **Application Toolbar** within the Merge PACS Viewer. The appearance of the Hanging Protocol button will vary depending on whether there is Hanging Protocol or Study presentation currently loaded, as described below:



There is no Hanging Protocol or Study Presentation currently loaded for the current Study.



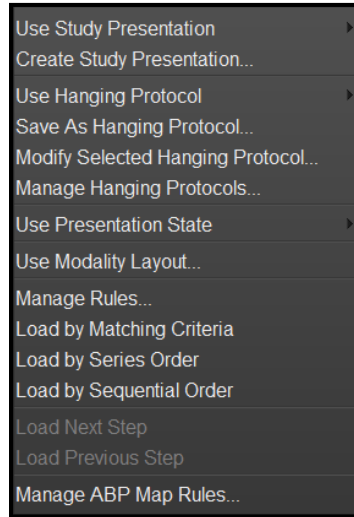
There is a **Study Presentation** currently loaded for the current Study.



There is a **Hanging Protocol** currently loaded for the current Study.

NOTE: The **Study Toolbar** within the Merge PACS Viewer can also be optionally configured to display the Hanging Protocol button, as described in subsection 4.2.3 above. However, the version of the button that appears on the Study Toolbar will always appear as the standard coat hanger icon regardless of whether there is a Study Presentation or Hanging Protocol currently loaded for the Study.

When you click on the Hanging Protocol button, the Hanging Protocol Menu will be displayed as in the following example:



The Hanging Protocol Menu

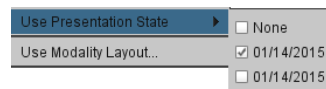
NOTE: The availability of some of the options on the Hanging Protocol is determined by your login privileges and/or whether there is currently a hanging protocol applied to the Study.

The Hanging Protocol Menu has the following options available, each of which is described in greater detail below:

Option	General Description
Use Study Presentation	Select a specific step of the Study Presentation, if any, that has been saved for this Study.
Create Study Presentation / Update Study Presentation	Create a new Study Presentation based on the current display settings of this Study or edit the Study Presentation that has already been saved for this Study.
Use Hanging Protocol	Select from a list of available Hanging Protocols, if any, that apply to this Study.
Save As Hanging Protocol	Create a new Hanging Protocol based on the current presentation state of this Study.
Modify Selected Hanging Protocol	Modify the Hanging Protocol, if any, that is currently being applied to this Study.
Manage Hanging Protocols	Subscribe and unsubscribe to shared Hanging Protocols created by other users, as well as delete Hanging Protocols you have previously created. Refer to the <i>Merge PACS 7.3 Administration Manual</i> for more information.

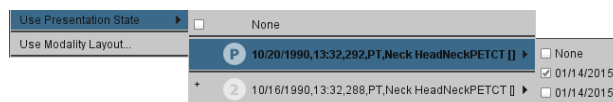
Use Presentation State Displays a submenu of externally created (“foreign”) Presentation States available for the study or studies currently loaded into the Viewer (e.g., a primary study and a prior comparison study) that allows you to apply one or more of foreign Presentation States to those studies.

If there is only one study currently being viewed, the submenu will display a list of available foreign Presentation States for that study, along with a “None” option that will allow you to deselect any Presentation States currently applied, as in the following example:



Available Foreign Presentation States for One Study

If multiple studies are currently being viewed, the submenu will display an option for each study with a further nested submenu that will allow you to select one or more foreign Presentation States from a particular study, along with a “None” option for each study and a global “None” option for all studies, as in the following example:



Available Foreign Presentation States for Multiple Studies

NOTE: Hovering your mouse cursor over an option will cause a pop-up “tool-tip” to be displayed showing the time the Presentation State was created.

Option	General Description
	<p>In general, the selected foreign Presentation State(s) will be applied on top of the currently selected Hanging Protocol or Study Presentation. The images the selected Presentation State(s) reference will have their presentations updated in the following ways:</p> <ul style="list-style-type: none"> • The annotations specified in the foreign Presentation State(s) will be added to the image in addition to any annotations drawn on the image from Merge PACS. If an image is referenced by more than one presentation instance in the foreign Presentation State(s), the annotations from all references shall be added to the image. • The viewing parameters (e.g., window/level) specified in the Foreign Presentation State(s) shall be used instead of those defined in the Hanging Protocol, Study Presentation or image defaults. If an image is referenced by more than one presentation instance in the Foreign Presentation State(s), the viewing parameters of the most recently applied Foreign Presentation State that includes viewing parameters will be used. In other words, the final state of an image with multiple foreign Presentation States applied to it will depend on the order you choose to apply those Presentation States.
	<p>NOTE: If the Automatically Apply Presentation State user preference is selected, as described in subsection 24.1.3 below, the most recently created Presentation State will be automatically applied to each study currently being viewed.</p>
	<p>NOTE: If you deselect a foreign Presentation State that is currently selected, the Viewer will go back to the original presentation and then apply the currently selected foreign Presentation States in the order that you selected them.</p>
	<p>NOTE: The PACS Viewer supports the application of up to five separate foreign Presentation States per study.</p>
	<p>NOTE: Selecting a presentation state from the Use Presentation State menu will cause that presentation state to be applied, as well as any relevant Hanging Protocol or Study Presentation, on the primary study window as well as any comparison study windows. If you want to only apply a foreign presentation state to a study without also applying any Hanging Protocol or Study Presentation and without applying it to other open study windows, you can do so via the Apply Presentation State icon on the Study Toolbar, as described in subsection 4.12.16 below.</p>

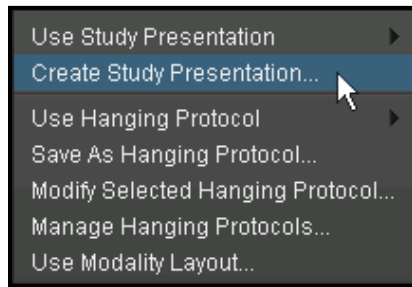
Option	General Description
Use Modality Layout	Apply the default modality-specific layout that has been defined for this modality in lieu of the Hanging Protocol currently applied.
Manage Rules	Allow you to create and manage rules for the selection and implementation of Hanging Protocols.
Load by Matching Criteria	Forces the Hanging Protocol to match based on the defined Matching Criteria (this is the default behavior).
Load by Series Order	Forces the Hanging Protocol to match based on Series Order.
Load by Sequential Order	Forces the Hanging Protocol to match based on Sequential Order.
Load Next Step	If multiple steps have been defined for the Hanging Protocol or Study Presentation currently being applied, loads the next step in the sequence.
Load Previous Step	If multiple steps have been defined for the Hanging Protocol or Study Presentation currently being applied, loads the previous step in the sequence.
Manage ABP Map Rules	Allows you to manage the Anatomical Body Parts mapping rules.

4.12.4. Creating a Study Presentation

Once you have manually adjusted the display of the Study currently being viewed in the Merge PACS Viewer, you can choose to save those display settings as a Study Presentation for the Study. If a Study Presentation has already been saved for the Study, you can also add additional steps to the Study Presentation or delete existing steps.

a. Creating the First Step for a Study Presentation

To begin creating a Study Presentation, make sure the Study is displayed in the desired manner and then select **Create Study Presentation** from the Hanging Protocol Menu, as in the following example:



Creating a Study Presentation

NOTE: If a Study Presentation has already been created for this Study, this menu option will appear as **Update Study Presentation** instead.

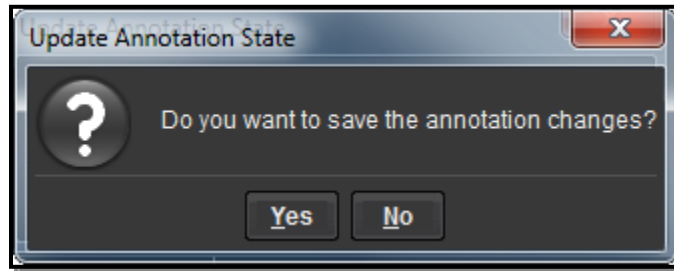
Clicking on the Create Study Presentation option will cause the **Save Study Presentation State** window to be displayed, as in the following example:

The Save Study Presentation State Window

- If desired, you can click on the **Default Description** of this step and enter a new description, as in the following example:

Changing the Default Description of this Step

- When finished, click on the **Save** button at the bottom of the window and then click the **Yes** button at the pop-up **Update Annotation State** dialog that is displayed, as in the following example:

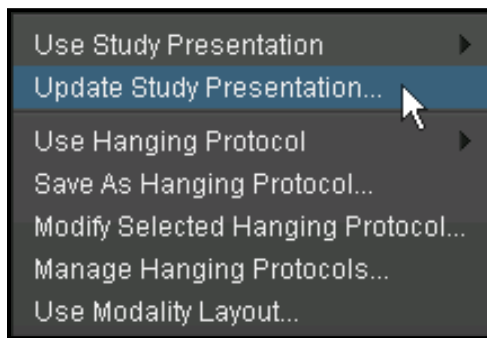


Update Annotation State

NOTE: The Update Annotation State dialog will not be displayed if you have selected the **Automatically Save Annotations on Exit** user preference, as described in subsection 24.1.2 below.

b. Updating an Existing Study Presentation

If a Study Presentation has already been created for a Study, you can add additional steps as well as replace and delete existing steps. If you want to add an additional step or replace an existing step with a new one, first make sure the Study is displayed in the desired manner. When you are ready to update the Study Presentation, select **Update Study Presentation** from the Hanging Protocol Menu, as in the following example:

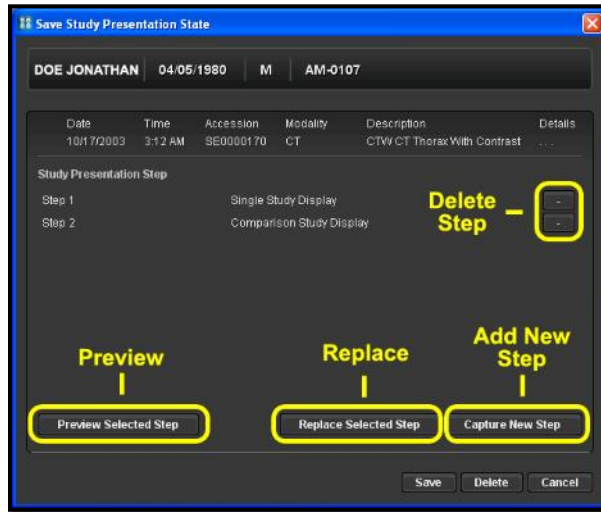


Update Study Presentation


NOTE: If no Study Presentation currently exists for this Study, this menu option will appear as **Create Study Presentation** instead.

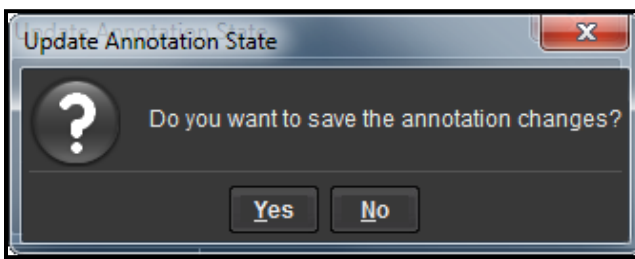
NOTE: Presentation states created in the QC Editor cannot be edited in the Viewer, and any attempts to do so will not be retained.

Clicking on the Update Study Presentation option will cause the **Save Study Presentation State** window to be displayed, as in the following example:



The Save Study Presentation State Window

- To **add** the current display settings as a new step, click on the **Capture New Step** button.
- To **replace** an existing step with the current display settings, click on the description of the step to be replaced and then click on the **Replace Selected Step** button.
- To **preview** how an existing step will cause the Study to be displayed, click on the description of the desired and then click on the **Preview Selected Step** button.
- To **delete** an existing step, click on the  button to the right of that step's description.
- To **edit** the description of an existing step, click on the **Default Description** of the desired step and enter a new description.
- When finished, click on the **Save** button at the bottom of the window and then click the **Yes** button at the pop-up **Update Annotation State** dialog that is displayed, as in the following example:



Update Annotation State

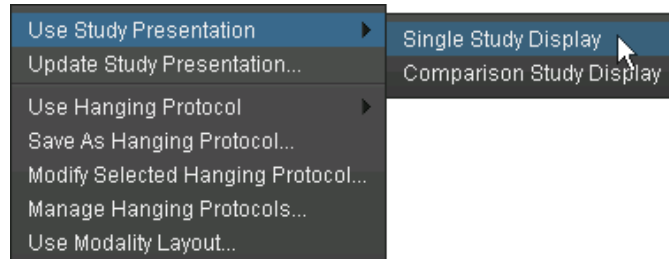
NOTE: The Update Annotation State dialog will not be displayed if you have selected the **Automatically Save Annotations on Exit** user preference, as described in subsection 24.1.2 below.

4.12.5. Selecting a Study Presentation Step

As described in subsection 4.12.4 above, Study Presentations can be created with multiple steps. By default, the first step will be applied to the Study when it is first opened in the Merge PACS Viewer, but you can select a different a different step in one of the following ways:

a. Selecting a Study Presentation Step from the Hanging Protocol Menu

As described above, you can select a specific step of the Study Presentation, if any, that has been saved for this Study from the **Use Study Presentation** option of the Hanging Protocol Menu, as in the following example:



Selecting a Study Presentation Step

b. Selecting a Study Presentation Step from the Application Toolbar

If there are multiple steps defined for the Study Presentation currently loaded, you can move among them by clicking on the left and right arrow buttons to the left of the Hanging Protocol button on the **Application Toolbar**, as in the following example:

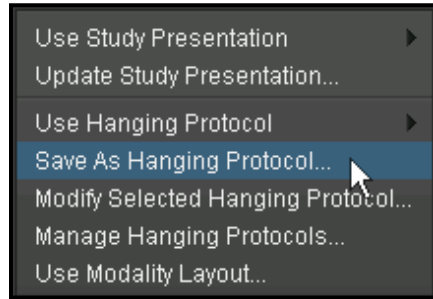


Study Presentation Navigation Buttons

The numbers displayed on the Study Presentation icon, if any, represent how many additional or previous steps are available. In the example above, the third of eight steps is currently being displayed (*i.e.*, there are two previous steps and there are five additional steps available).

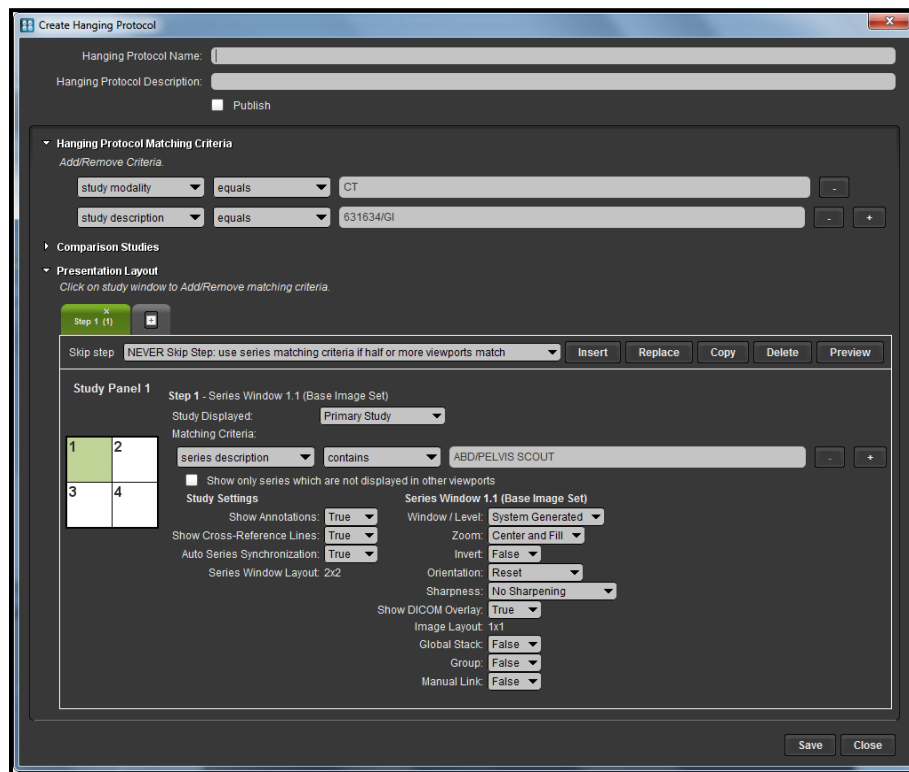
4.12.6. Creating a Hanging Protocol

Once you have manually adjusted the display of the Study currently being viewed, you can choose to save those display settings as a Hanging Protocol for other studies of the same type. This is done by then selecting **Save As Hanging Protocol** from the Hanging Protocol Menu, as in the following example:



Creating a Hanging Protocol

Clicking on the **Save As Hanging Protocol** option will cause the **Create Hanging Protocol** window to be displayed, as in the following example:



The Create Hanging Protocol Window

The Create Hanging Protocol window is divided up into several sections, described below, each of which can be used to customize the hanging protocol.

a. General Information

At the top of the Create Hanging Protocol window is the General Information section, as in the following example:

The General Information Section

The following information can be entered:

Option	Description
Hanging Protocol Name	Enter a name for this Hanging Protocol so it can be easily identified.
Hanging Protocol Description	If desired, enter additional descriptive information to help distinguish this protocol from other protocols for the same Study type.
Publish	If you have the appropriate login privileges, you can click on the Publish box to allow other users to have access to this Hanging Protocol.

b. Matching Criteria

Below the General Information section is the Hanging Protocol Matching Criteria section, as in the following example:

The Hanging Protocol Matching Criteria Section

NOTE: You can choose to hide or display this section by clicking on the small triangle to the left of the section heading.

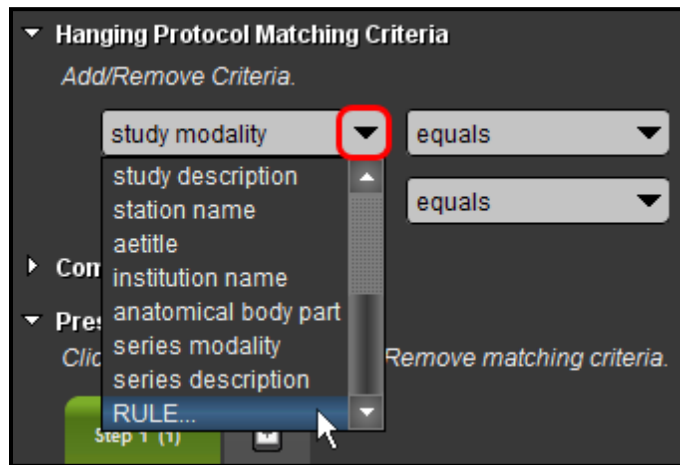
- By default, this section will already contain information to match the current Study, but you can edit this information as follows:
 - To **edit** an existing matching criterion, select the desired options from the two drop-down menus for that criterion and enter the desired text in the matching field on the right.
 - To **add** a new criterion, click on the **[+]** button to the right of the last criterion listed.

- To **delete** an existing criterion, click on the [-] button to the right of that criterion.
- To **reorder** the criteria and change the order in which they are applied, click on any criterion (any place other than on the drop-down menus, fields or buttons) and drag and drop it above or below another criterion.
- In general, the Hanging Protocol will match **all** the specified criteria. However, if you use the **same** criterion multiple times (e.g., “Study modality equals CR,” “Study modality equals DR”), the Hanging Protocol will match **any** of those criteria.
- When **Series number** is used as a matching criterion at the series level, the system will check for the matching series number. If there are no matching series, system will pick the first series as a matched record and it will apply the Hanging Protocol.
- For **mammography** images, if **Series Description** is used as a matching criterion it will match based on the Merge PACS internal image stack description that is used for splitting and is displayed in the navigation thumbnail header. For example, Breast Tomosynthesis images have a "(DBT)" suffix appended to their internal series description within Merge PACS, so if you wanted to configure the Hanging Protocol to load an R CC Breast Tomosynthesis image into a particular viewport, you could match based on the following:
 - View code equals “CC”
 - Laterality equals “R”
 - Series Description contains “(DBT)”
- If using the **equals** operator, the text must match exactly. Wildcard characters cannot be used.
- If using the **contains** operator, the following applies:
 - You can use an asterisk (*) as a wildcard to replace a single character or a string of characters to make the information more generic so as to apply to a larger number of studies. For example, “Study Description – contains – **Head CT * Contrast**” would apply to “Head CT **with** Contrast” , “Head CT **without** Contrast” and “Head CT **w/** Contrast.”
 - You do not need to put an asterisk at the beginning or ends of words. For example, “Study Description – contains – **spin**” would apply to all studies that have the word “spin” in the Study description (including “spine” and “spinal”).
 - You can use the vertical separator (|) [shift-\] as an “or” indicator. For example, ““Study Description contains **spin|pelvis**” would apply to all studies that either have the word “spin” in the Study description **or** have the word “pelvis” in the description.

- You can use the **Regular Expression** operator to create flexible criteria, as in the following examples (note that all keywords should be lower case in the actual expressions):

Desired Criteria	Regular Expression
Starts with “Head”	head.*
Does not start with “Head”	(?!head.*).*
Ends with “Head”	.*head
Does not end with “Head”	(?!.*head).*
Contains “Head”	.*head.*
Does not contain “Head”	(?!.*head.*).*
Starts with “Head” and ends with “Neck”	head.*neck
Contains “Head” or “Neck”	.*(head neck).*
Contains “Head” and “Neck” in order	.*head.*neck.*
Contains “Neck” or “Head” but not “Brain”	(?!.*brain.*).*(neck head).*

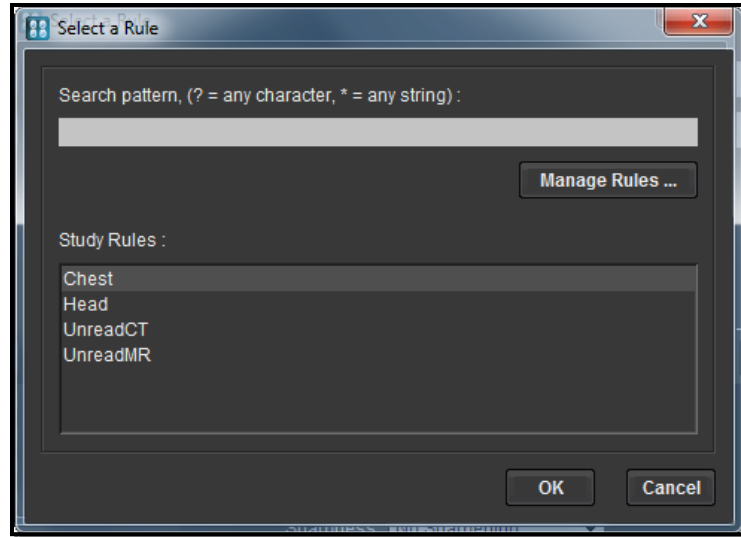
- If your site has one or more custom study-level user rules created for use with Hanging Protocols, you can also select one of these rules instead of specifying detailed criteria by selecting **RULE** from the first criteria drop-down menu, as in the following example:



Using a Rule Instead of Matching Criteria

NOTE: Use of the HP Rules can dramatically simplify long term maintenance of the hanging protocols. Please consult your PACS Administrator for information on using the rules created for your site and/or creating additional rules.

- Once you select the **RULE** option, the **Select a Rule** dialog will be displayed with a list of all available study-level Hanging Protocol rules, as in the following example:



Selecting a Study Rule

- Click on the desired rule to select it and click the **OK** button.

NOTE: Filter the list of rules by entering text to match in the **Search pattern** field at the top

NOTE: If you have the login privilege to **add/edit/delete user rules**, you can edit the rules displayed by clicking on the **Manage Rules** button. Refer to Chapter 13 of the *Merge PACS 7.3 Administration Manual* for details on managing user rules.

Once you have selected a rule, the Select a Rule dialog will close and the chosen rule will be displayed as the only matching option, as in the following example:



Selected Rule

NOTE: Since only one rule may be selected for this Hanging Protocol, the **[+]** will re-launch the **Select a Rule** dialog instead of adding a new matching criteria.

c. Comparison Studies

Below the Hanging Protocol Matching Criteria section is the Comparison Studies section, as in the following example:



The Comparison Studies Section

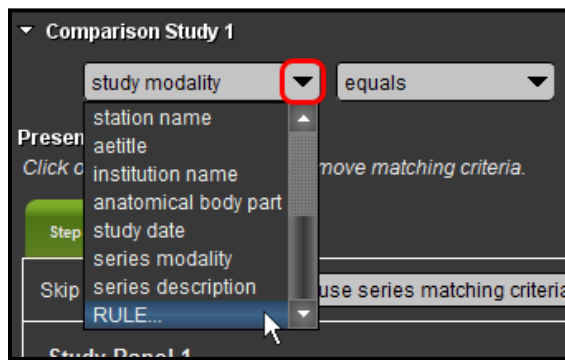
NOTE: You can choose to hide or display this section by clicking on the small triangle to the left of the section heading.

- If one or more comparison studies are currently being displayed, this section will already contain information to match those studies. Otherwise, the entire section will be hidden except for the heading, and you can force it to be displayed by clicking on the small triangle next to the section header.
- Information in the Comparison Studies section can be edited as follows:
 - To **add** a listing for an additional **comparison Study**, click on the **[+]** button to the right of the last Study listed.
 - To **delete** a listing for an existing **comparison Study**, click on the **[-]** button to the right of that Study.
 - To **add** a new **matching criterion** for a Study, click on the **[+]** button to the right of the last criterion listed for that Study.
 - To **delete** an existing **matching criterion** for a Study, click on the **[-]** button to the right of that criterion.
 - To **reorder** the comparison **studies** listed, click on the description of a Study and drag and drop it above or below one of the other comparison studies.
 - To **reorder** the **criteria** for a Study, click on any criterion (any place other than on the drop-down menus, fields or buttons) and drag and drop it above or below another.
- In general, the Hanging Protocol will match **all** the specified criteria. However, if you use the **same** criterion multiple times (e.g., “Study modality equals CR,” “Study modality equals DR”), the Hanging Protocol will match **any** of those criteria.
- When Series number is used as a matching criteria at the series level, the system will check for the matching series number. If there are no matching series, system will pick the first series as a matched record and it will apply the Hanging Protocol.
- If using the **equals** operator, the text must match exactly.
- If using the **contains** operator, the following applies:
 - You can use an asterisk (*) as a wildcard to replace a single character or a string of characters to make the information more generic so as to apply to a larger number of studies. For example, “Study Description – contains – **Head CT * Contrast**” would apply to “Head CT **with** Contrast” , “Head CT **without** Contrast” and “Head CT **w/** Contrast.”

- You do not need to put an asterisk at the beginning or ends of words. For example, “Study Description – contains – **spin**” would apply to all studies that have the word “spin” in the Study description (including “spine” and “spinal”).
- You can use the vertical separator (|) [shift-\] as an “or” indicator. For example, “Study Description contains **spin|pelvis**” would apply to all studies that either have the word “spin” in the Study description **or** have the word “pelvis” in the description.
- You can use the **Regular Expression** operator to create flexible criteria, as in the following examples (note that all keywords should be lower case in the actual expressions):

Desired Criteria	Regular Expression
Starts with “Head”	head.*
Does not start with “Head”	(?!head.*)*
Ends with “Head”	.*head
Does not end with “Head”	(?!.*head)*
Contains “Head”	.*head.*
Does not contain “Head”	(?!.*head.*)*
Starts with “Head” and ends with “Neck”	head.*neck
Contains “Head” or “Neck”	.*(head neck)*
Contains “Head” and “Neck” in order	.*head.*neck.*
Contains “Neck” or “Head” but not “Brain”	(?!.*brain.*)*(neck head)*

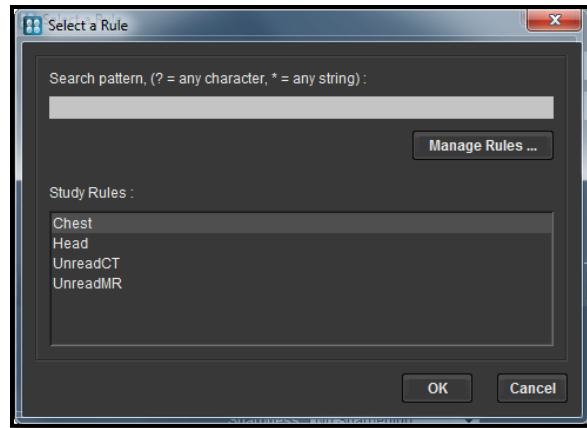
- If your site has one or more custom study-level user rules created for use with Hanging Protocols, you can also select one of these rules instead of specifying detailed criteria by selecting **RULE** from the first criteria drop-down menu, as in the following example:



Using a Rule Instead of Matching Criteria

NOTE: Use of the HP Rules can dramatically simplify long term maintenance of the hanging protocols. Please consult your PACS Administrator for information on using the rules created for your site and/or creating additional rules.

- Once you select the RULE option, the **Select a Rule** dialog will be displayed with a list of all available study-level Hanging Protocol rules, as in the following example:



Selecting a Study Rule

- Click on the desired rule to select it and click the **OK** button.

NOTE: Filter the list of rules by entering text to match in the **Search pattern** field at the top

NOTE: If you have the login privilege to **add/edit/delete user rules**, you can edit the rules displayed by clicking on the **Manage Rules** button.

Once you have selected a rule, the Select a Rule dialog will close and the chosen rule will be displayed as the only matching option, as in the following example:

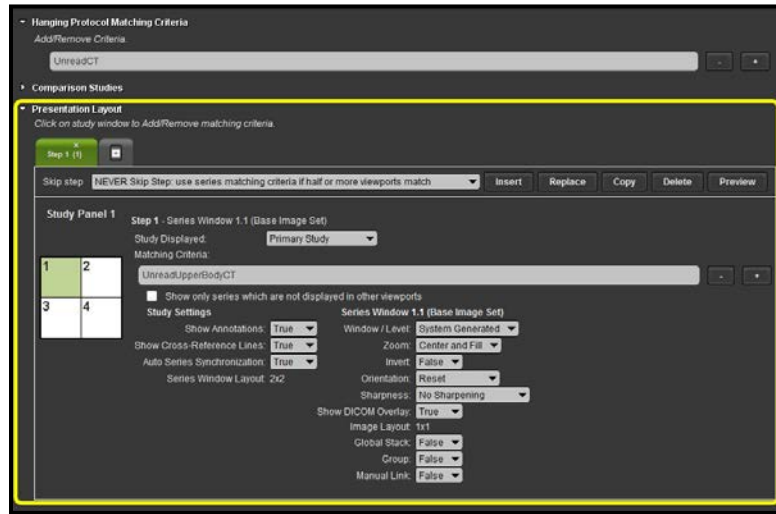


Selected Rule

NOTE: Since only one rule may be selected for this Hanging Protocol, the **[+]** will re-launch the **Select a Rule** dialog instead of adding a new matching criteria.

d. Presentation Layout

At the bottom of the Create Hanging Protocol window is the **Presentation Layout** section, as in the following example:

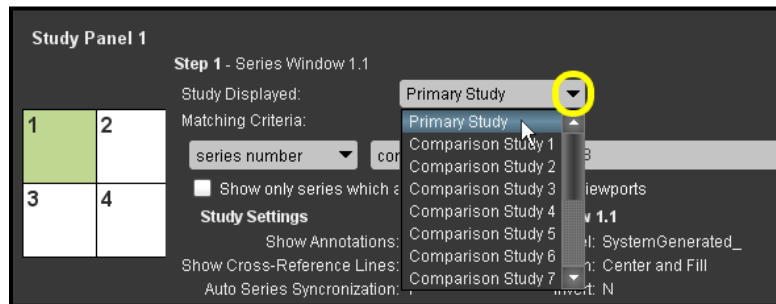


The Presentation Layout Section

If multiple studies are currently being displayed in separate Study panels, information for each panel will have a separate listing (you will need to use the scroll bar at the right of the window to view the information for these panels). In addition, the information for each Study panel will display the Series Layout currently being displayed within that panel.

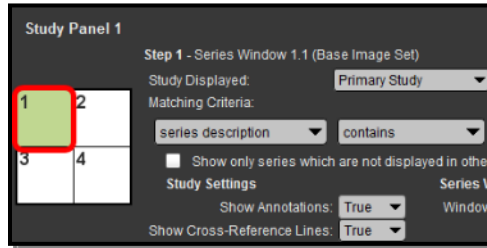
NOTE: The Study and Series layout information will always reflect the Study and Series layout currently being displayed within the Merge PACS Viewer and cannot be edited from the Create Hanging Protocol Screen.

- The following information can be edited for each of the available Study panels:
 - To specify which **Study** is to be displayed within this Study Panel, select the desired Study from the drop-down **Study Displayed** menu, as in the following example:



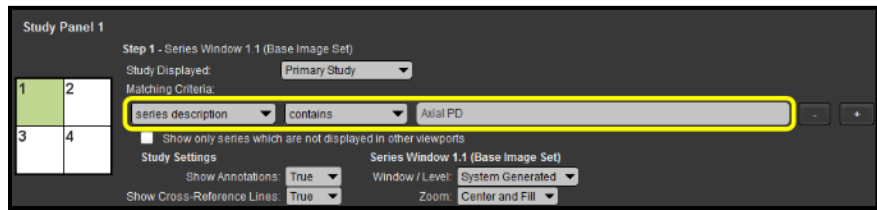
Specifying the Desired Study

- If the current Series Layout is displaying multiple Series Viewports, edit the information for the desired Viewport as follows:
 - If necessary, click on the Viewport you want to edit in the Series Layout diagram, as in the following example:



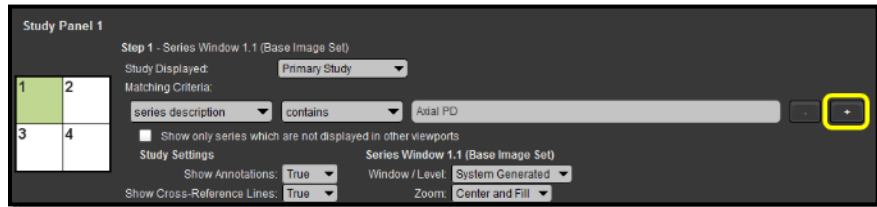
Specifying the Desired Study

- To **edit** an existing matching criterion for the selected Series Viewport, select the desired options from the two drop-down menus for that criterion and enter the desired text in the matching field on the right, as shown below:



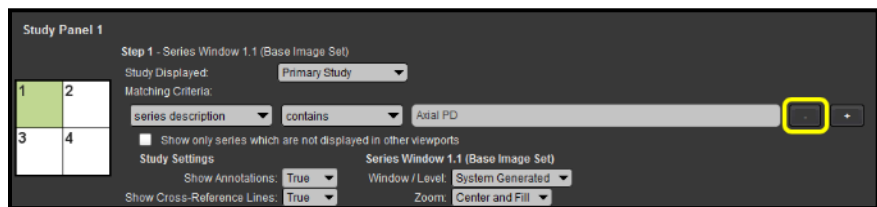
Editing Matching Criterion

- To **add** a new criterion, click on the **[+]** button to the right of the last criterion listed, as in the following example:



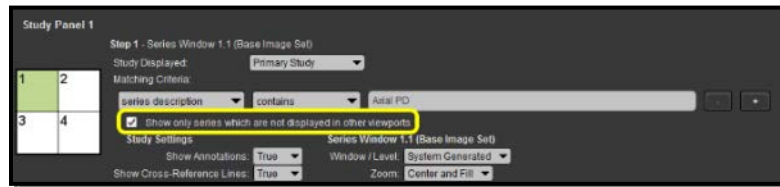
Adding a New Matching Criterion

- To **delete** an existing criterion, click on the **[-]** button to the right of that criterion, as in the following example:



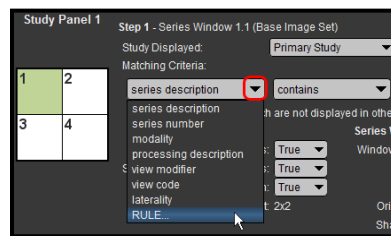
Deleting a Matching Criterion

- To **reorder** the criteria and change the order in which they are applied, click on any criterion (any place other than on the drop-down menus, fields or buttons) and drag and drop it above or below another criterion.
- To prevent Series that are already displayed in other viewports from being displayed in the current viewport, select the **Show only Series which are not displayed in other viewports** option, as in the following example:



Show Only Series Which Are Not Displayed in Other Viewports

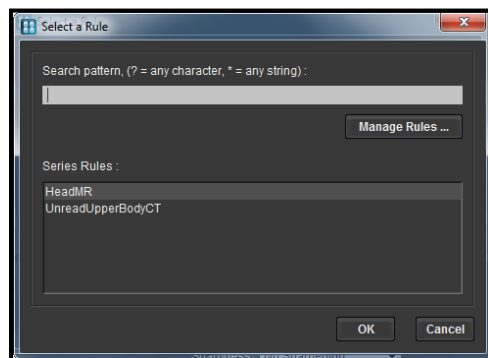
- If your site has one or more custom series-level user rules created for use with Hanging Protocols, you can also select one of these rules instead of specifying detailed criteria by selecting **RULE** from the first criteria drop-down menu, as in the following example:



Using a Rule Instead of Matching Criteria

NOTE: Use of the HP Rules can dramatically simplify long term maintenance of the hanging protocols. Please consult your PACS Administrator for information on using the rules created for your site and/or creating additional rules.

- Once you select the RULE option, the **Select a Rule** dialog will be displayed with a list of all available series-level Hanging Protocol rules, as in the following example:



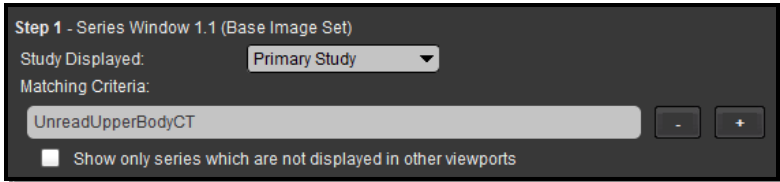
Selecting a Series Rule

- Click on the desired rule to select it and click the **OK** button.

NOTE: Filter the list of rules by entering text to match in the **Search pattern** field at the top

NOTE: If you have the login privilege to **add/edit/delete user rules**, you can edit the rules displayed by clicking on the **Manage Rules** button.

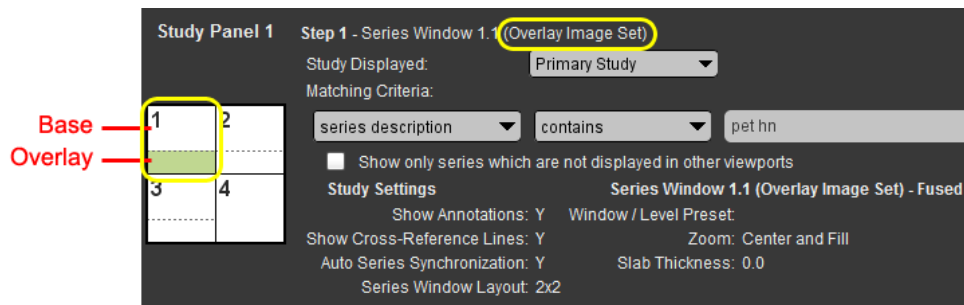
Once you have selected a rule, the *Select a Rule* dialog will close and the chosen rule will be displayed as the only matching option, as in the following example:



Selected Rule

NOTE: Since only one rule may be selected for this Presentation Step, the **[+]** will re-launch the **Select a Rule** dialog instead of adding a new matching criteria.

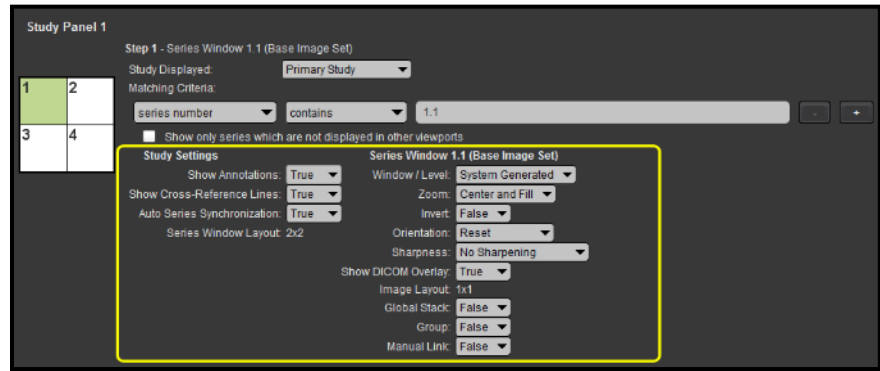
- If the current Series Layout includes any fused MPR Viewports, as described in subsection 4.8.3 above, the graphic representing each fused MPR Viewport will be divided into a top and bottom section, as in the following example:



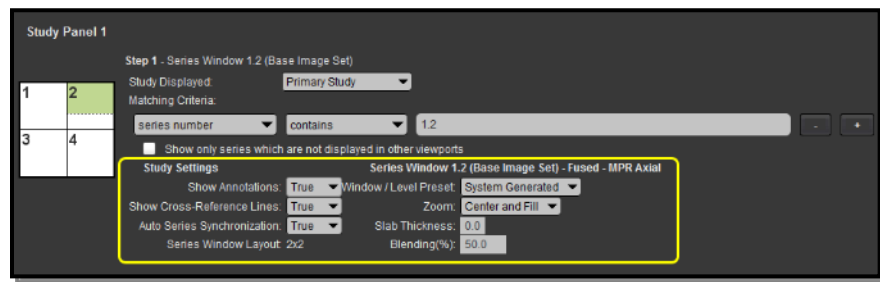
Fused MPR Viewport Representation

- Click on the top section of the graphic to change the matching criteria for the base Series.
- Click on the bottom section of the graphic to change the matching criteria for the overlay Series.

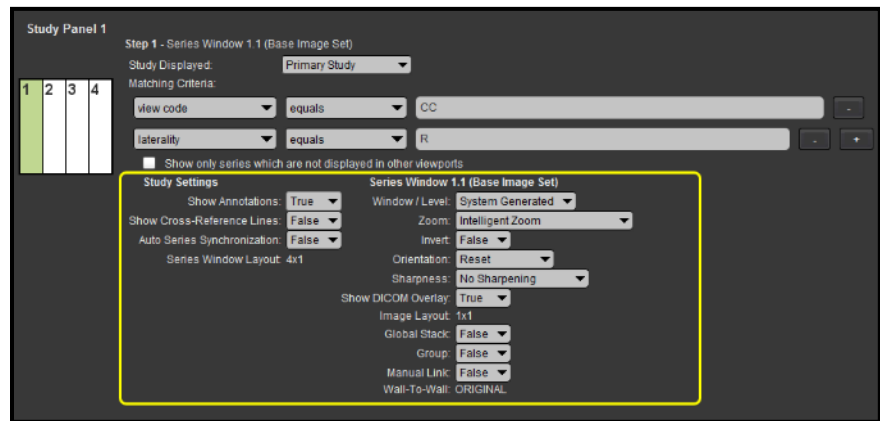
- By default, the actual presentation information for this step will match the current presentation state of the study, but you can edit any of this information except for the Series Window Layout and Image Layout as shown in the following examples:



Editing Presentation State Information – Standard Viewport

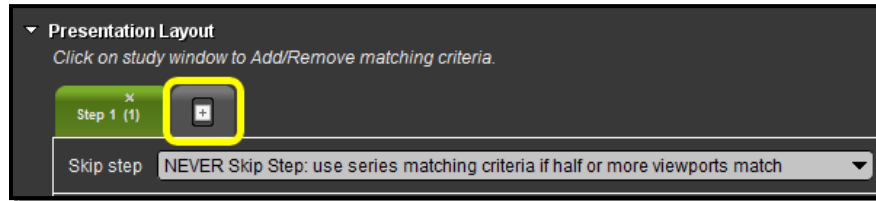


Editing Presentation State Information – MPR Viewport with Image Fusion



Editing Presentation State Information – Mammography Viewport

- You can also **add, insert, replace, edit, copy, move, delete** and **preview** steps as follows:
 - To **add** a new step, make whatever changes are desired to the display within the Merge PACS Viewer and then click on the **[+]** button at the top of the Presentation Layout Section, as in the following example:



Adding a New Step

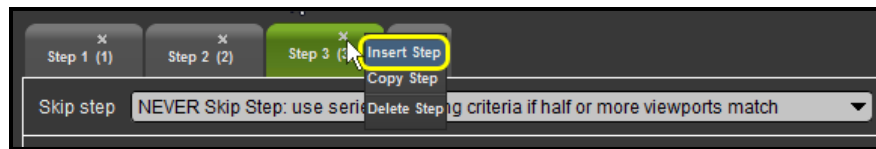
NOTE: You can also click on the **[+]** button without making any changes within the Viewer and then manually change the Presentation State settings for the new step within the Create Hanging Protocol window itself.

- To **Insert** a step **before** an existing step, click on the tab corresponding to the desired existing step at the top of the Presentation Layout Section and then click the **Insert** button, as in the following example:



Adding a New Step

You can also right-click on the existing step and select **Insert Step** from the Step Right-click Menu, as in the following example:



Inserting a Step from the Right-click Menu

- To **replace** an existing step, make whatever changes are desired to the display within the Merge PACS Viewer, click on the tab corresponding to that step at the top of the Presentation Layout Section and then click the **Replace** button, as in the following example:



Replacing a Step

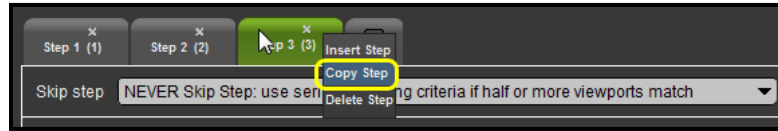
- To **edit** a step instead of replacing it, select the desired step and then manually change the Presentation State settings for the step within the Create Hanging Protocol window itself.

- To **copy** a step (which can then be edited as necessary), click on the tab corresponding to that step at the top of the Presentation Layout Section and then click the **Copy** button, as in the following example:



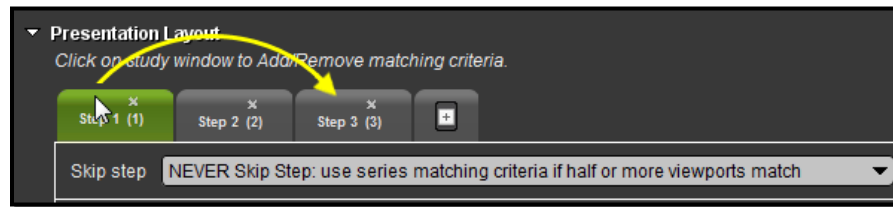
Copying a Step

You can also right-click on the existing step and select **Copy Step** from the Step Right-click Menu, as in the following example:



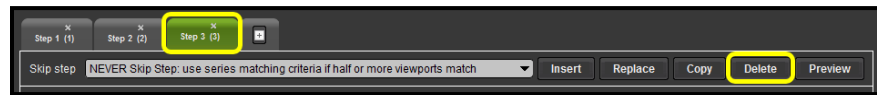
Copying a Step from the Right-click Menu

- To **move** a step (*i.e.*, change the order the steps are performed), click on the header of the step you want to move and drag it to its new position, as in the following example:



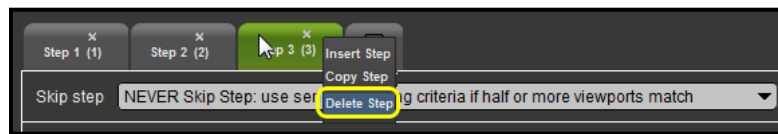
Moving a Step

- To **delete** a step, click on the tab corresponding to that step at the top of the Presentation Layout Section and then click the **Delete** button, as in the following example:



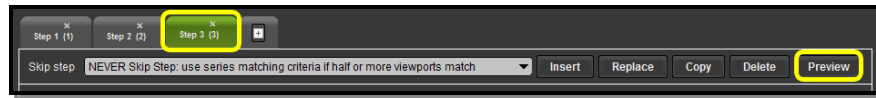
Deleting a Step

You can also delete a step by clicking on the small **x** in the step's tab or right-clicking on the step and selecting **Delete Step** from the Step Right-click Menu, as in the following example:



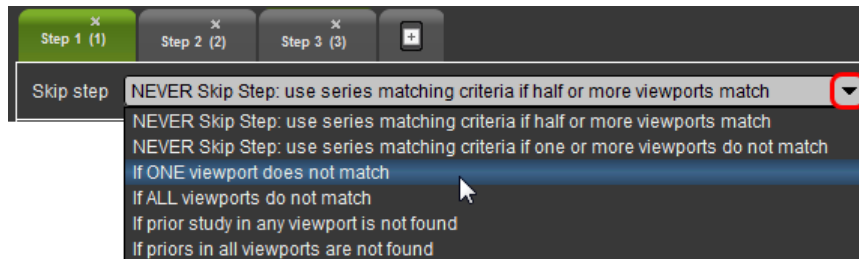
Deleting a Step from the Right-click Menu

- To **preview** a step, click on the tab corresponding to that step at the top of the Presentation Layout Section and then click the **Preview** button, as in the following example:



Previewing a Step

- For each step, you can also select an option to skip the step under specified circumstances from the drop-down **Skip step** menu, as in the following example:



Skipping a Step

The following options are available:

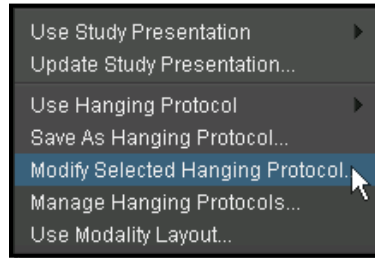
- **Never skip step: use Series matching criteria if half or more viewports match.**
- **Never skip step: use Series matching criteria if one or more viewports do not match.**
- **Skip step if one viewport does not match.**
- **Skip step if all viewports do not match.**
- **Skip step if prior Study in any viewport is not found.**

e. Saving the Hanging Protocol

When you have finished making whatever edits are desired, as described in the preceding paragraphs, click on the **Save** button at the bottom of the Create Hanging Protocol window. Alternatively, you can click on the **Close** button to exit the window without saving your changes.

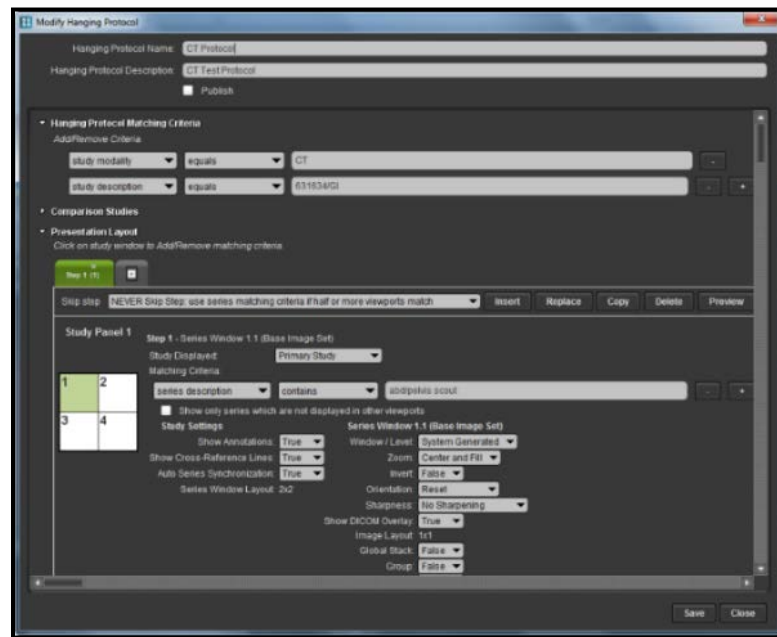
4.12.7. Modifying Current Hanging Protocol

If there is a Hanging Protocol currently being applied to the Study displayed within the Merge PACS Viewer, you can modify that Hanging Protocol by selecting **Modify Selected Hanging Protocol** from the Hanging Protocol Menu, as in the following example:



Modifying the Current Hanging Protocol

Clicking on the **Modify Selected Hanging Protocol** option will cause the **Modify Hanging Protocol** window to be displayed, as in the following example:



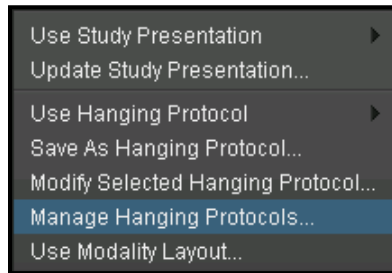
The Modify Hanging Protocol Window

The Modify Hanging Protocol window has the same options available as the Create Hanging Protocol window described in subsection 4.12.6 above.

NOTE: When replacing a step in a Hanging Protocol to include a comparison study, if there is no previously saved Hanging Protocol the system will default to the first comparison study on the list instead of using the comparison study that you actually placed in the viewport. You should therefore make sure that the correct comparison study is selected before saving the changes.

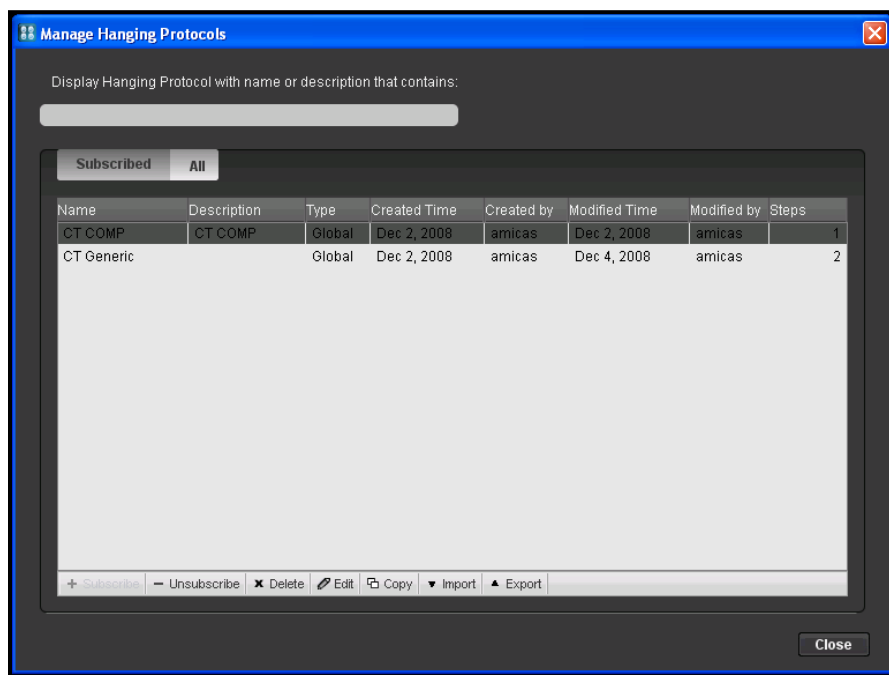
4.12.8. Managing Hanging Protocols

Depending on your login privileges, you can subscribe and unsubscribe to shared Hanging Protocols created by other users, as well as delete and edit Hanging Protocols you have previously created, by selecting **Manage Hanging Protocols** from the **Hanging Protocol Menu**, as shown in the following example:



Managing Hanging Protocols

Clicking on the Manage Hanging Protocols option will cause the **Manage Hanging Protocols** window to be displayed, as in the following example:



The Manage Hanging Protocols Window

The top of Manage Hanging Protocols window has the following two tabs:

Tab	Description
Subscribed	Displays the Hanging Protocols to which you are currently subscribed
All	Displays all hanging protocols that have been created.

Once you have clicked on the desired tab, select the desired Hanging Protocols and then use the buttons at the bottom of the window to do any of the following:

NOTE: You can select multiple Hanging Protocols by holding down the Ctrl or Shift key while clicking on the desired Hanging Protocols.

- Click on the **Unsubscribe** button to remove the selected Hanging Protocols from the list of Hanging Protocols available for your use.
- Click on the **Delete** button to delete the selected Hanging Protocols from the system.
- Click on the **Edit** button to modify the selected Hanging Protocols (this will cause the **Modify Hanging Protocol** window to be displayed, as described in subsections 4.12.6 and 4.12.7 above).

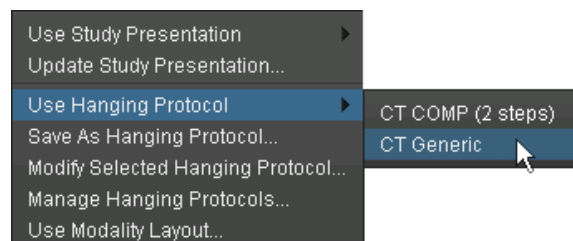
NOTE: When editing a Hanging Protocol from the Manage Hanging Protocols window, the **Preview** button will not be available to preview individual steps. The **Preview** button is only available when creating a new Hanging Protocol or modifying the Hanging Protocol that is currently applied to the Study.

- Click on the **Copy** button to make duplicates of the selected Hanging Protocols that can then be edited.
- Click on the **Import** button to add one or more Hanging Protocols that have been saved to a local or network resource.
- Click on the **Export** button to save the selected Hanging Protocols to a local or network resource.

NOTE: If the list of subscribed or all Hanging Protocols is lengthy, you can reduce the number of entries displayed by entering text in the field at the top of the window. The window will then only display Hanging Protocols whose name or description contains that text.

4.12.9. Selecting a Hanging Protocol

If one or more hanging protocols apply to the Study you are currently viewing, you can select a hanging protocol to use from the **Hanging Protocol Menu**, as shown in the example below:



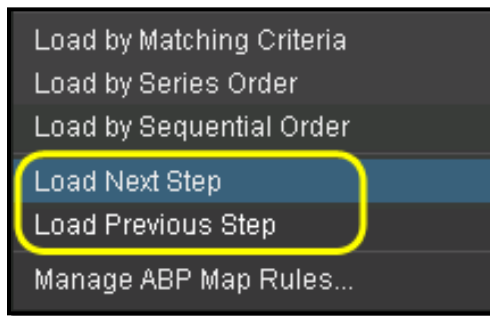
Selecting a Hanging Protocol

4.12.10. Loading the Next or Previous Hanging Protocol Step

As described in subsection 4.12.6 above, Hanging Protocols can be created with multiple steps. By default, the first step will be applied to the Study when it is first opened in the Merge PACS Viewer, but you can select a different a different step in one of the following ways:

a. Selecting a Hanging Protocol Step from the Hanging Protocol Menu

If the Hanging Protocol or Study Presentation currently loaded has multiple steps defined, you can move forward and backwards through those steps by selecting the **Load Next Step** and **Load Previous Step** options from the **Hanging Protocol Menu**, as in the following example:



Navigating Through Steps

b. Selecting a Hanging Protocol Step from the Application Toolbar

If there are multiple steps defined for the Hanging Protocol currently loaded, you can move among them by clicking on the left and right arrow buttons to the left of the Hanging Protocol button on the **Application Toolbar**, as in the following example:



Hanging Protocol Navigation Buttons

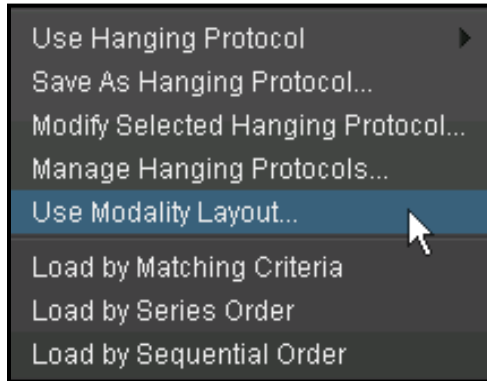
The numbers displayed on the Hanging Protocol icon, if any, represent how many additional or previous steps are available. In the example above, the third of eight steps is currently being displayed (*i.e.*, there are two previous steps and there are five additional steps available).

c. Keyboard Shortcuts

If there are multiple steps defined for the Hanging Protocol, you can press **F1 – F10** on your keyboard to go directly to a numbered step.

4.12.11. Using Modality Layout

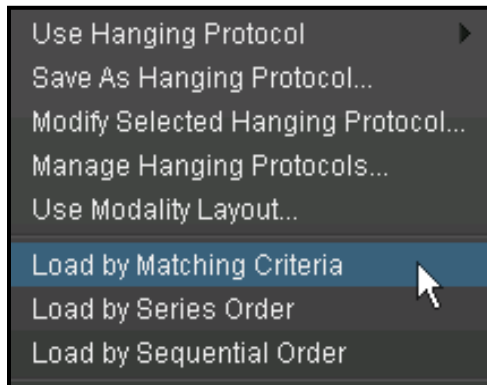
If no Study Presentation or Hanging Protocol matches the current Study, the Merge PACS Viewer will initially display the Study according to the default modality-specific layout that has been defined for this modality, if any. If, however, there is a Study Presentation or Hanging Protocol that matches and you would like to manually apply the default modality-specific layout, you can do so by selecting the **Use Modality Layout** option from the **Hanging Protocol Menu**, as in the following example:



Using Modality Layout

4.12.12. Loading by Matching Criteria

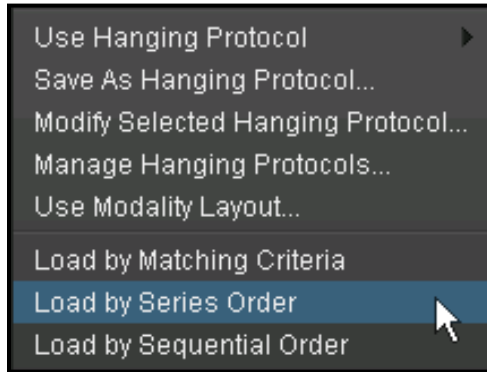
By default, Hanging Protocols are applied based on matching criteria. If you select a different option, as described below, you can return to this default setting by selecting the **Load by Matching Criteria** option from the **Hanging Protocol Menu**, as in the following example:



Load by Matching Criteria

4.12.13. Loading by Series Order

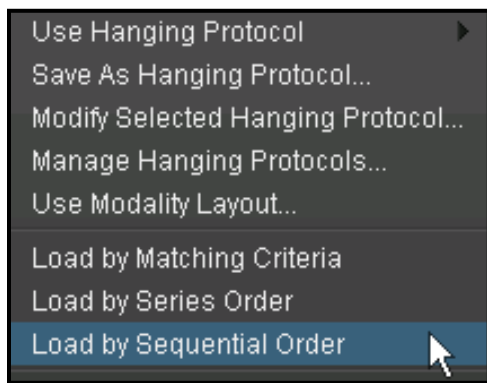
By default, Hanging Protocols are applied based on matching criteria. If you would like to have them applied according to Series order instead, select the **Load by Series Order** option from the **Hanging Protocol Menu**, as in the following example:



Load by Series Order

4.12.14. Loading by Sequential Order

By default, Hanging Protocols are applied based on matching criteria. If you would like to have them applied according to sequential order instead, select the **Load by Sequential Order** option from the **Hanging Protocol Menu**, as in the following example:



Load by Sequential Order

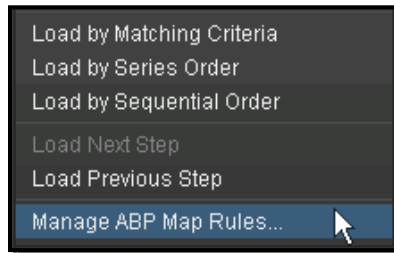
4.12.15. Managing Anatomical Body Part Mapping Rules

The Merge PACS Workstation can be optionally configured to utilize the concept of an **Anatomical Body Part (ABP)** to characterize a Study based on the physical region of the scan. In general, an ABP map provides mapping of modality, procedure name/code, Study Description or other HL7/Dicom fields to specific body parts.

Once an ABP map has been defined, the various Anatomical Body Parts can be used to create matching criteria when creating a Hanging Protocol, as described in subsection 4.12.6 above.

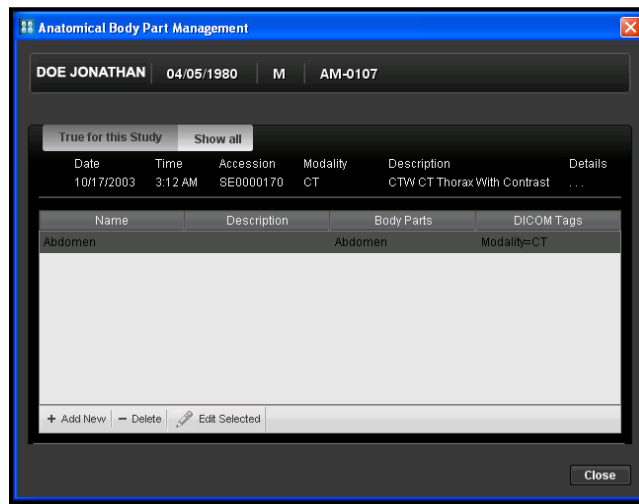
The ABP map can also be used for determining relevant priors, depending on how your user preferences have been set, as described in Chapter 24 below.

If you have the login privilege to manage Anatomical Body Part rules, you can edit the ABP map by selecting **Manage ABP Map Rules** from the **Hanging Protocol Menu**, as in the following example:



Editing the ABP Map

Clicking on the Manage ABP Map Rules option will cause the **Anatomical Body Part Management** window to be displayed, as in the following example:



The Anatomical Body Part Management Window

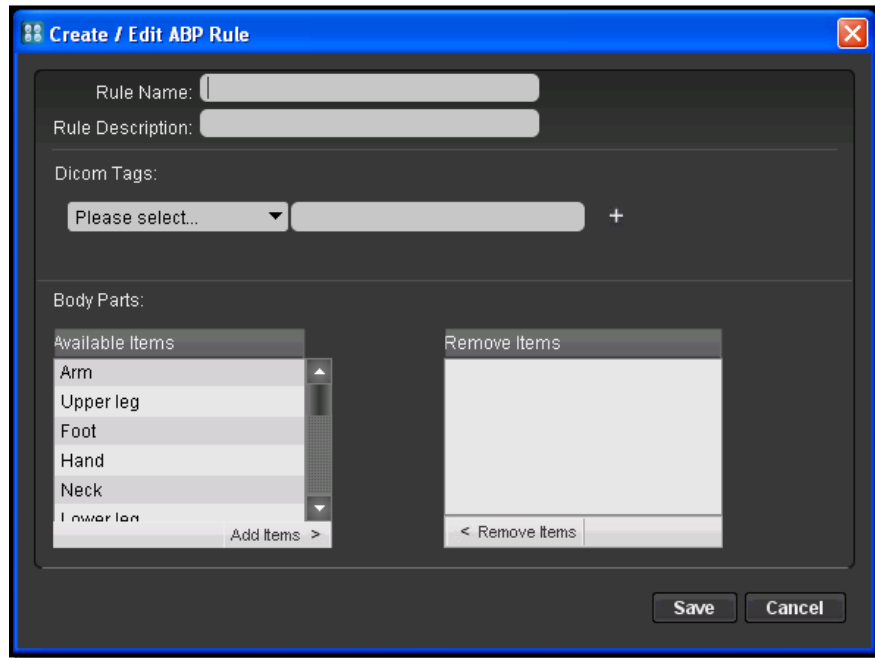
The top of Anatomical Body Part Management window has the following two tabs:

Tab	Description
True for this Study	Displays the body part rules that apply to the current Study.
Show all	Displays all body part rules.

NOTE: Depending on how your system is configured, the **Show all** tab may display a set of pre-configured rules in addition to ones that were custom-created.

At each tab, you can use the buttons at the bottom of the window to do any of the following:

- Click on the **Add New** button to create a new body part rule. When you click on the Add New button, the **Create / Edit ABP Rule** window will be displayed, as in the following example:



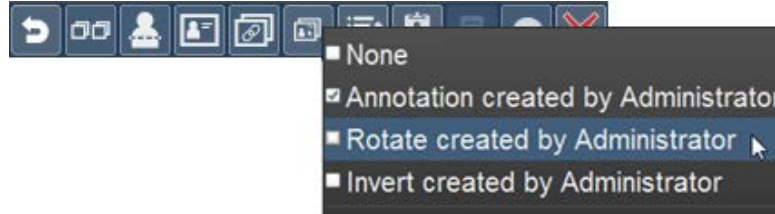
The Create / Edit ABP Rule Window

- Enter a name and, if desired, a brief description for this rule in the fields at the top of the window.
- Select the type of DICOM Tag to be matched from the drop-down menu and enter the text to be matched in the field to the right.
- If necessary, click on the **[+]** button to add additional DICOM tags to be matched.
- If more than one DICOM tag has been defined, you can click on the **[-]** button next to a DICOM tag to remove it from the rule.
- Click on the body part you wish to map to the DICOM tags in the **Available Items** window and then click on the **Add Items** button (or else just double-click on the desired body part to add it). Repeat for additional body parts.
- If you need to delete a body part from the rule, click on the unwanted body part in the **Remove Items** window and then click on the **Remove Items** button (or else just double-click on the desired body part to add it).
- When finished, click on the **Save** button at the bottom of the window.
- Click on the **Delete** button to remove the selected rule entirely.
- Click on the **Edit Selected** button to make changes to a previously defined rule. This will cause the **Create / Edit ABP Rule** window described above to be displayed.

4.12.16. Applying Foreign Presentation States to Individual Studies



The **Apply Presentation State** icon on the **Study Toolbar**, as shown on the left, allows you to select among any available foreign presentation states for the study in question, as in the following example:



Selecting a Foreign Presentation State for this Study

- If only one Study is available in the Study window, the Apply Presentation State icon will list only the primary study's foreign presentation states.
- If multiple Studies are available in the Study window, the Apply Presentation State icon will list foreign presentation states separately for each study.

NOTE: Selecting a presentation state from the **Apply Presentation State** icon will only cause that presentation state to be applied to the selected study without also applying any relevant Hanging Protocols or Study Presentations. If you want any relevant Hanging Protocols or Study Presentations to also be applied and also have this presentation state applied to all open study windows (primary and comparison), you can select the desired presentation state from the **Use Presentation State** submenu of the main **Hanging Protocol Menu** on the **Application Toolbar**, as described in subsection 4.12.3 above.

The following are the differences in behaviour between the "Apply Presentation State" icon on the Study Toolbar and the "Use Presentation State" option on the Hanging Protocol Menu, depending on whether or not a Hanging Protocol (HP) or Study Presentation (SP) is available:

Condition	"Apply Presentation State" Icon	"Use Presentation State" Option
Neither SP nor HP is available	The selected foreign presentation state will only be applied to the current Study window. If the "none" option is selected, the foreign presentation state will be deselected and will reset with modality default values.	The selected foreign presentation state will be applied to the all Study windows. If the "none" option is selected, the foreign presentation state will be deselected and will reset with modality default values.
Only SP is available	The selected foreign presentation state will only be applied to the current Study window and the Study Presentation will not be reloaded. If the "none" option is selected, the foreign presentation state will be deselected and will reset with modality default values.	The Study Presentation will be reloaded and the selected foreign presentation state will only be applied on top of it. If the "none" option is selected, the foreign presentation state will be deselected and will reset with the Study Presentation.

Condition	“Apply Presentation State” Icon	“Use Presentation State” Option
Only HP is available	The selected foreign presentation state will only be applied to the current Study window and the Hanging Protocol will not be reloaded. If the “none” option is selected, the foreign presentation state will be deselected and will reset with modality default values.	<p>NOTE: Layout and changes may be lost when the foreign presentation state is applied if the Study Presentation was created without a Comparison Study and a Comparison Study is manually loaded.</p> <p>The Hanging Protocol will be reloaded and the selected foreign presentation state will only be applied on top of it. If the “none” option is selected, the foreign presentation state will be deselected and will reset with the Hanging Protocol.</p> <p>NOTE: Layout and changes may be lost when the foreign presentation state is applied if the Hanging Protocol was created without a Comparison Study and a Comparison Study is manually loaded.</p>
Both SP and HP are available	The selected foreign presentation state will only be applied to the current Study window and neither the Study Presentation nor the Hanging Protocol will be reloaded. If the “none” option is selected, the foreign presentation state will be deselected and will reset with modality default values.	<p>The Study Presentation will be reloaded and the selected foreign presentation state will only be applied on top of it. If the “none” option is selected, the foreign presentation state will be deselected and will reset with the Study Presentation.</p> <p>NOTE: Layout and changes may be lost when the foreign presentation state is applied if the Study Presentation was created without a Comparison Study and a Comparison Study is manually loaded.</p>

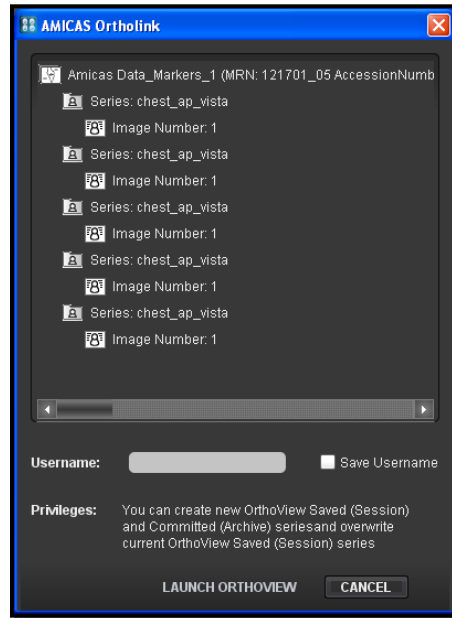
4.13. Using Orthopedic Templating Toolsets



The OrthoLink icon on the RealTime Worklist and the Patient Record, as shown on the left, provides integration with third-party orthopedic templating toolsets such as OrthoView™ or Merge OrthoCase™. If your workstation has such a toolset installed, clicking on the OrthoLink will allow you to load selected images into that toolset.

NOTE: OrthoLink is only available with CR images.

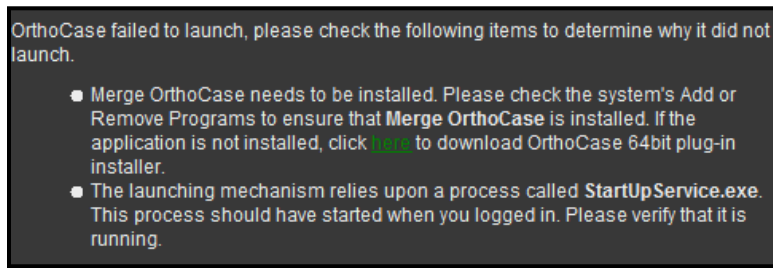
If your Workstation is configured to work with OrthoView, clicking on the OrthoLink icon will cause a pop-up OrthoLink Staging Dialog to appear, as shown in the following example:



OrthoLink Staging Dialog

- Select the image you want to load into the orthopedic toolkit by clicking on the image description in the staging dialog. Hold down the **Ctrl** key while clicking to select multiple images.
- Enter your OrthoView username in the field desired and, if desired, click the “Save Username” checkbox to have your username entered automatically the next time you use OrthoLink.
- Click the **Launch OrthoView** button to start OrthoView and pass the selected images to it.

If your Workstation is configured to work with Merge OrthoCase, OrthoCase will be launched automatically in a separate window. If OrthoCase is not currently installed on your workstation, a warning dialog such as the following will be displayed that will allow you to install OrthoCase by clicking on a link:



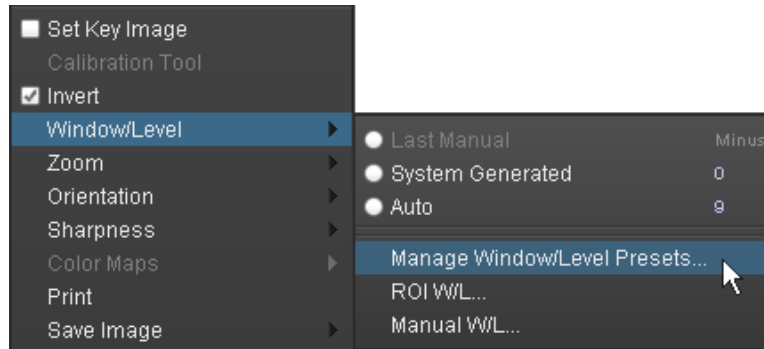
OrthoCase Launch Failure

For information on using the specific orthopedic templating toolset installed on your workstation, refer to the user documentation specific to that toolset.

4.14. Managing Window/Level Presets

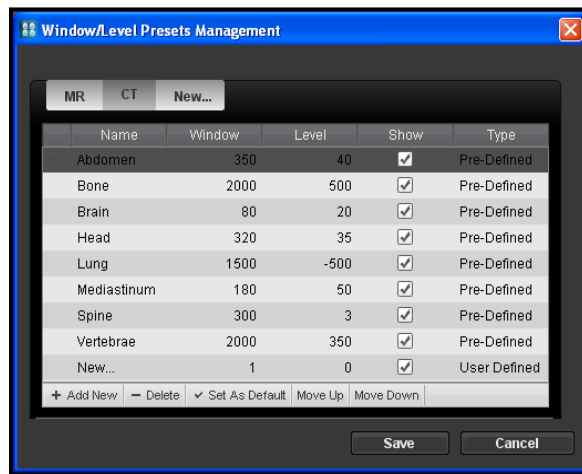
As described in subsection 4.5.1 above, various Window and Level presets are available from the **Series Right-click Menu**. You can create new presets as well as edit or delete any existing preset for a particular modality type. Any custom window/level presets you create will be stored with your user profile and will be available to you regardless of which machine you log onto.

To access the Window/Level Presets Manager, select **Manage Window Level Presets** from the **Window/Level** sub-menu of the **Series Right-click Menu**, as shown in the following example:



Using the Right-click Menu to Manage Window/Level Presets

This will bring up the **Window/Level Presets Manager** as shown in the example below:

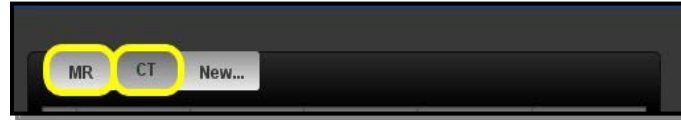


The Windows/Level Presets Manager

At the Window/Level Presets Manager you can make changes to existing presets or create new presets.

4.14.1. Editing Existing Window/Level Presets for a Modality

If you want to make changes to presets that have already been created for a specific modality, including adding new presets for that modality, click on the tab corresponding to that modality at the top of the window, as in the following example:

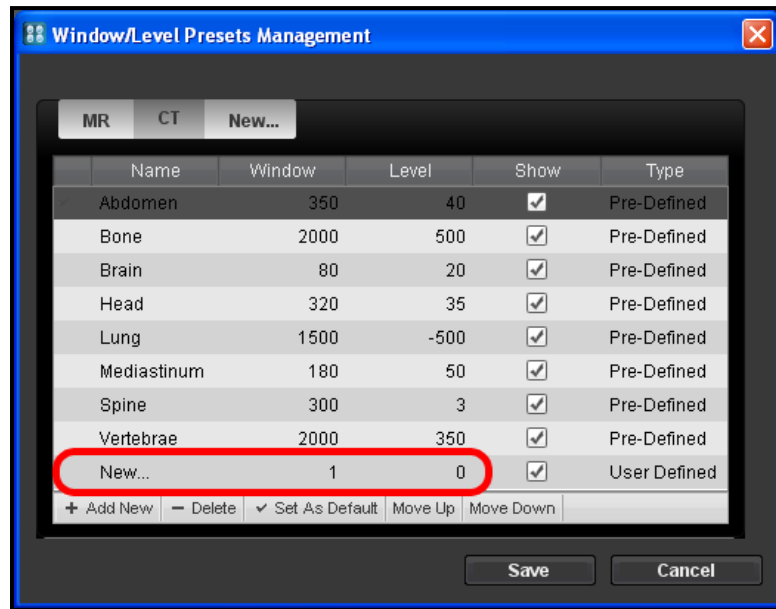


Modality Tabs

NOTE: If the modality for the Study currently being viewed has Window/Level presets associated with it, the presets for that modality will be displayed by default.

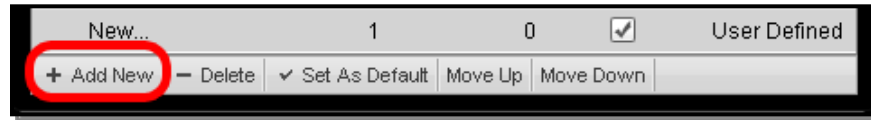
NOTE: CT studies have a set of predefined Window/Level presets that cannot be edited or deleted. You can, however, choose not to show them and/or add new presets for CT studies, as described below.

- To **edit** an existing preset for this modality, **double-click** on the **Name, Window** and **Level** columns for that preset to edit the information displayed, as well as select whether or not this preset should be displayed as an option in the **Series Right-click Menu**.
- To create a **new** preset for this modality, **double-click** on the **Name, Window** and **Level** columns for the default **New...** preset that appears at the bottom of the list, as in the following example:



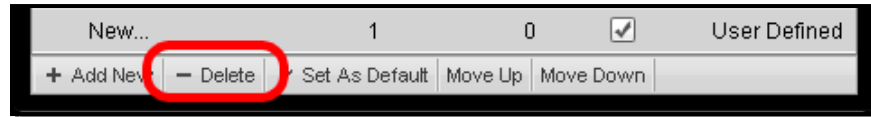
Entering a New Preset for this Modality

If you need to add additional presets, click on the **Add New** button at the bottom of the window to add a new blank preset, as in the following example:



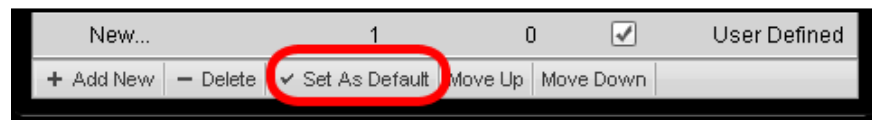
Adding Another New Preset

- To **delete** an existing preset, highlight the unwanted preset by clicking on it once and then click the **Delete** button at the bottom of the window, as in the following example:



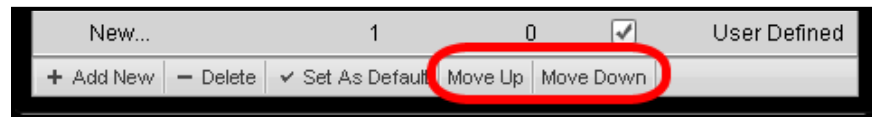
Deleting a Preset

- To set one of the presets as the **default** for this modality, highlight the desired preset and then click the **Set As Default** button at the bottom of the window, as in the following example:



Setting a Default Preset

- To **reorder** the way the presets appear in the Series Right-click Menu, highlight the desired preset and then click the **Move Up** and **Move Down** button at the bottom of the window as needed, as in the following example:

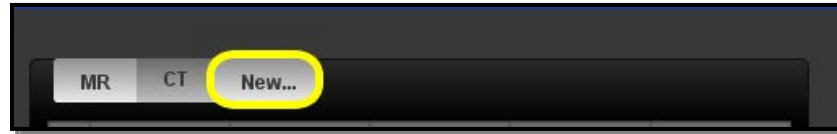


Repositioning a Preset

- When you have finished making the desired additions, deletions and/or edits, click on the **Save** button at the bottom of the screen to record your changes. Note that any preset that has been created or edited will have a check mark in the first column to indicate that it contains changes that will be saved.

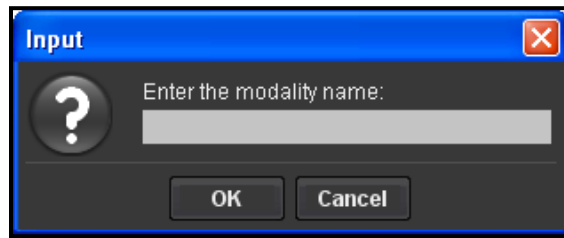
4.14.2. Defining New Window/Level Presets for a Modality

If you want to define Window/Level presets for a modality that does not already have presets associated with it, click on the **New** tab at the top of the window, as in the following example:



Defining a New Set of Window/Level Presets

You will then be prompted to enter the name of the modality, as in the following example:

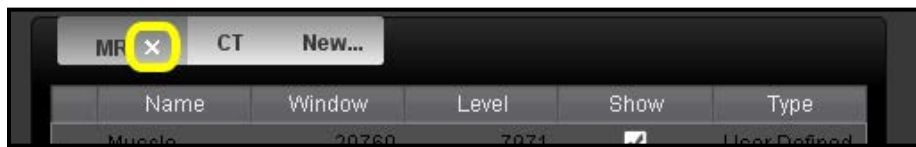


Entering the Name of the Modality

- Enter the desired name and click the **OK** button to save the name and return to the main Window/Level Preset window.
- You can then define and edit the various presets as described in subsection 4.14.1 above.

4.14.3. Deleting a Set of Modality Window/Level Presets

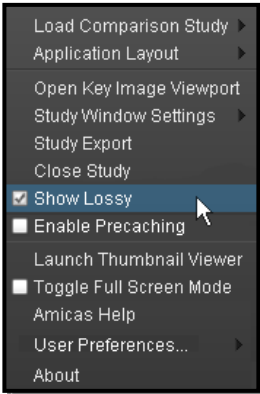
If necessary, you can delete an entire set of Window/Level presets for a given modality. When you click on the tab for the modality at the top of the screen, a white **X** will appear next to the modality's name, as in the following example:



Deleting a Set of Presets

NOTE: The Window/Level presets for CT studies is hard coded and cannot be deleted.

4.15. Using Lossy Images Instead of Lossless



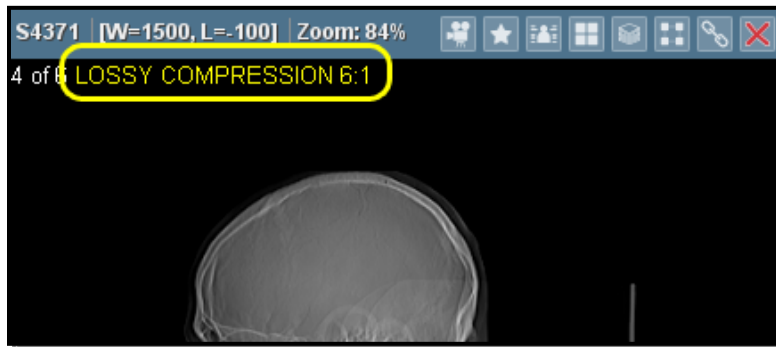
Selecting Lossy Compression

By default, the Merge PACS Viewer displays patient images using “lossless” compression. Lossless compression reduces the file size of images by encoding them more efficiently without removing any information.

In situations where bandwidth and transmission speeds are a concern (e.g., if accessing the Merge PACS Workstation from a home computer with a slow Internet connection), you can choose to display “lossy” versions of the images instead. Lossy compression removes redundant and “unimportant” information from the original image data, resulting in reduced file sizes. Note, however, that the use of lossy image compression may present potential loss in clinical diagnostic image quality and higher lossy compression levels are likely to cause image artifacts or obscure small or low contrast details within the image.

To display lossy images instead of lossless, select the **Show Lossy** option from the **Study Right-click Menu**, as described in subsection 4.2.4 above and shown in the example to the left.

Once you have turned off the Lossless option, each image will display a lossy compression ratio in its general description, as shown in the following example:



Lossy Compression Ratio

Once the Show Lossy option has been selected, all images that have not already been loaded in lossless format will be displayed with lossy compression until you deselect this option.

Deselecting the Show lossy option will cause the loading of lossless images to resume.

NOTE: Selecting or deselecting the Show Lossy option will apply to all studies viewed during the current Merge PACS Workstation session (i.e., until you log off the system or exit the Workstation Browser entirely).

NOTE: If an image has been compressed multiple times (“recompressed”), the highest compression ratio used will be displayed.

Chapter 5. Viewing Orders and Comments

As described in Sections 3.2, 3.4, 3.7, and 4.1 above, orders, comments and warnings associated with a specific Study or exam can be viewed either via a separate pop-up **Order Viewer** window or a separate pop-up **Comments Viewer**. In addition, you can add comments directly to a study's DICOM header from the Study Toolbar, as described in subsection 4.2.3 above.

5.1. The Order Viewer

5.1.1. Overview



The **Order Viewer** icon, as illustrated to the left, allows you to view information about any orders, comments or warnings associated with a Study or exam, as well as additional information such as allergies, diagnosis and questionnaires (where available), in the **Order Viewer**, as in the following example:

The screenshot shows the Order Viewer window for patient SARAH DOE. The window displays the following information:

- Patient Information:** Name: DOE, SARAH; DOB: 02/03/1983; Sex: M; Home: 888; Admitted: 09/12/2012 14:13; 7771; BREAST ULTRASOUND BILA | NM.
- Allergies:**

Type	Description	Severity	Reaction	Identification Date
FA	2 EGG	MO	rash	08/10/1989
- Diagnosis:**




Code	Type
535.61	DUCODENITIS WITH HEMORRHAGE IBC
	F
- Orders:**
 - Order 1:

Order Field	Order Value
Reason for exam	
Procedure Start Date / Time	09/12/2012 13:13
Accession Number	7771
Description	BREAST ULTRASOUND BILA
Procedure Code	12345678
Procedure Code Scheme	99MMC
- Operator:** Barry
- Comments:**
 - Use Standard Comment:
 - Flagged:
- Comment History:**

Comments	By	Commented At
Tumor has grown an additional 2 % since previous visit	Barry Goldberg	09/05/2014 14:51:18
Follow-up comment	Barry Goldberg	09/05/2014 14:50:34
Initial comment	Barry Goldberg	09/05/2014 14:50:08

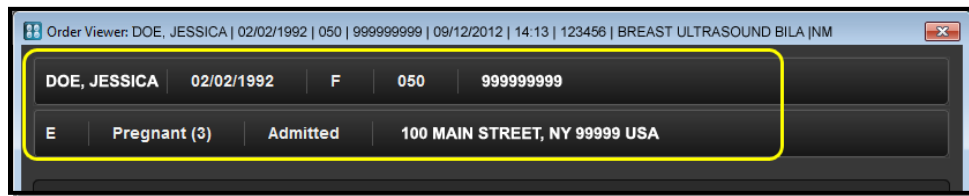
The Order Viewer

Note that, when accessed from the RTWL, the appearance of the Order Viewer icon will change depending on whether there is just an order associated with a Study, just comments, or both:

Icon	Description
	There is an order associated with this Study.
	The most recent comment for this Study was manually flagged by the commenter.
	There is an order associated with this Study and the most recent comment for this Study was manually flagged by the commenter.

5.1.2. Viewing General Patient Information

The top section of the Order Viewer displays general information about the patient, as in the following example:



General Patient Information

The following information is included:

- **Name**
- **Date of Birth**
- **Gender**
- **IPID**
- **MRN**
- **VIP Indicator** (if available)
- **Pregnancy Status** (if available)
- **Admission Status**
- **Address**

NOTE: **VIP Indicator**, **Pregnancy Status** and **Admission Status** are received directly from the third-party Electronic Medical Record (EMR)/Ordering System and cannot be edited from within Merge PACS, although Pregnancy Status will be shown as “Unknown” if no pregnancy status is provided by the EMR/Ordering System. If any of this information is incorrect, contact your PACS Administrator to have it updated in that third-party system.

NOTE: The availability of the Pregnancy Status can be configured on a site-by-site basis.

5.1.3. Viewing Allergies, Diagnoses, Orders and Questionnaires

The center section of the Order Viewer has separate panels to display Allergy information, Diagnosis information, the actual Order(s) and any Questionnaire associated with this exam, as in the following example:

The screenshot displays the Order Viewer interface for patient DOE, SARAH. The central section contains four expandable panels: Allergies, Diagnosis, Orders, and Comment History. A scroll bar is present on the right side of this section. The Allergies panel shows one entry: Type FA, Description 2 EGG, Severity MO, Reaction rash, Identification Date 08/10/1989. The Diagnosis panel shows one entry: Code 535.61, Description DUODENITIS WHEMORRHAGE I9C, Type F. The Orders panel shows one order with details: Reason for exam, Procedure Start Date / Time 09/12/2012 13:13, Accession Number 7771, Description BREAST ULTRASOUND BILA, Procedure Code 12345678, Procedure Code Scheme 99MMC. The Comment History panel shows three comments: 'Tumor has grown an additional 2 % since previous visit' by Barry Goldberg on 09/05/2014 14:51:18, 'Follow-up comment' by Barry Goldberg on 09/05/2014 14:50:34, and 'Initial comment' by Barry Goldberg on 09/05/2014 14:50:08.

Allergies, Diagnosis, Orders and Questionnaire

NOTE: The **Allergies** and **Diagnosis** panels are optional and may be hidden on a site-wide basis.

- If there is too much information to be displayed within this center section, a scroll bar will appear on the right-hand side to allow you to scroll through the various panels, as in the example above.
- Each panel within this section can be expanded or contracted by clicking on the white triangle to the left of the panel's name.
- When there is too much information to be displayed within this center section, a site preference determines which panel should be shown by default (e.g., the preference might be set to always scroll down to the bottom of the section and show the Questionnaire panel). Regardless of which panel is shown by default, however, you can always use the scroll bar to view the other panels.

a. Viewing Allergy Information

If this order has any allergy information associated with it, you can view/hide it by clicking on the small triangle next to **Allergies**, as in the following example:

Type	Description	Severity	Reaction	Identification Date
FA	2 EGG	MO	rash	08/10/1989

Allergy Information

NOTE: Allergy information is received directly from the third-party Electronic Medical Record (EMR)/Ordering System and cannot be edited from within Merge PACS. If any of this information is incorrect, contact your PACS Administrator to have it updated in that third-party system.

b. Viewing Diagnosis Information

If this order has any diagnosis information associated with it, you can view/hide it by clicking on the small triangle next to **Diagnosis**, as in the following example:

Code	Type
535.61 DUODENITIS W/HEMORRHAGE I9C	F

Diagnosis Information

NOTE: Diagnosis information is received directly from the third-party Electronic Medical Record (EMR)/Ordering System and cannot be edited from within Merge PACS. If any of this information is incorrect, contact your PACS Administrator to have it updated in that third-party system.

c. Viewing and Printing Orders

If there are any orders associated with this exam, they will be displayed in the Orders section of the Order Viewer, as in the following example:

DOE, SARAH | 02/03/1983 | M | Home | 888

E | Pregnant (3) | Admitted | 111 Main Street NY 111-1111 USA


▼ Allergies

Type	Description	Severity	Reaction	Identification Date
FA	2 EGG	MO	rash	08/10/1989

▼ Diagnosis

Code	Type
535.61 DUODENTIS W/HEMORRHAGE I9C	F

▼ Orders

▼ Order 1 

Order Field	Order Value
Reason for exam	
Procedure Start Date / Time	09/12/2012 13:13
Accession Number	7771
Description	BREAST ULTRASOUND BILA
Procedure Code	12345678
Procedure Code Scheme	99MMC

Operator:

Viewing an Order

- If there are multiple orders, each order will be displayed in its own subsection and you can collapse or expand the display of each order individually by clicking on the small white triangle next to the heading for that order.
- To print out a copy of an order, click on the little printer icon shown in the upper-right hand corner of the desired order, as in the following example:

▼ Orders

▼ Order 1 

Order Field	Order Value
Reason for exam	
Procedure Start Date / Time	09/12/2012 13:13
Accession Number	7771
Description	BREAST ULTRASOUND BILA
Procedure Code	12345678
Procedure Code Scheme	99MMC

Printing an Order

d. Viewing Questionnaires

If your system is configured to include technician-entered questionnaires as part of the order information and there is such a questionnaire for this exam, the questions and responses to those questions will be displayed below the order information, as in the following example:

Questionnaire	
Acuity Questions	Answers
Vena Cava filt/shunt?	N
Pacemaker/Internal Defibrillator?	N
Shrapnel?	N
Jnt replacement/prost./rods?	N
Are You Claustrophobic?	N
Hx. of metal in either eye?	N
Cochlear Implant?	N

Questionnaire Questions and Responses

5.1.4. Adding, Viewing and Deleting Comments

The bottom section of the Order Viewer allows you to add, view and delete comments for this exam, as in the following example:

The screenshot displays the 'Order Viewer' for patient DOE, SARAH. The interface includes sections for Allergies, Diagnosis, and Orders. The 'Comments' section is highlighted with a green box and contains the following elements:

- Operator:** barry
- Use Standard Comment:**
- Flagged:**
- Comments:** A large text input area.
- Add Comment:** A button to submit the comment.
- Comment History:** A table showing previous comments.

Comments	By	Commented At
Turnor has grown an additional 2 % since previous visit	Barry Goldberg	09/05/2014 14:51:19
Follow-up comment	Barry Goldberg	09/05/2014 14:50:34
Initial comment	Barry Goldberg	09/05/2014 14:50:08

Adding, Viewing and Deleting Comments

a. Adding Comments

The Add Comments section allows you to add a comment to this exam that can be viewed by other users, as shown in the following example:

Adding a Comment

To add a comment:

1. Select a different user from the drop-down **Operator** field if necessary (e.g., if you are entering this comment on somebody else's behalf).
2. If any standard comments have been defined for your system, you can also select one from the "Use Standard Comment" drop-down menu to automatically populate the Comments box with pre-defined text.
3. Enter the desired text in the **Comments** field.
4. If you want this comment to be flagged throughout the system, make sure that the checkbox marked "**Flagged**" is selected.

NOTE: If the most recent comment for a Study is flagged, a green flag icon will be displayed in various places throughout the system, including on the RTWL, the Query Page, the Patient Record and the Merge PACS Viewer.

5. Click the **Add Comment** button to submit your comment.

The comment is added to the **Comment History** section, as in the following example:

Comments	By	Commented At
Tumor has grown an additional 2 % since previous visit	Barry Goldberg	09/05/2014 14:51:18
Follow-up comment	Barry Goldberg	09/05/2014 14:50:34
Initial comment	Barry Goldberg	09/05/2014 14:50:08

Newly Added Comment

b. Viewing Comments and Warnings

Any manually-entered comments and system-generated warnings are displayed in the Comments History section at the very bottom of the Order Screen, as in the following example:

	Comments	By	Commented At
	Tumor has grown an additional 2 % since previous visit	Barry Goldberg	09/05/2014 14:51:18
	Follow-up comment	Barry Goldberg	09/05/2014 14:50:34
	Initial comment	Barry Goldberg	09/05/2014 14:50:08

Viewing Previously Entered Comments and Warnings



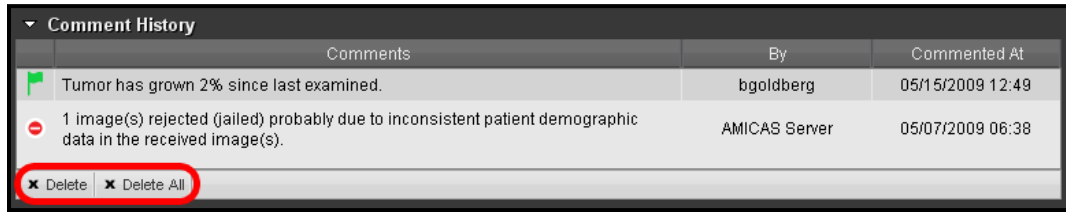
Audio comments are identified with a speaker icon, as illustrated to the left. Clicking on an audio comment will cause the VoiceClip player to launch and play the selected comment, as described in Chapter 9 below.

NOTE: If Merge PACS is running in Standalone mode, both audio comments for studies that are currently online (not archived) and audio comments that are stored in the external volume will be displayed. If Merge PACS is running in Integrated mode, audio comments stored within EA will be displayed. If an existing RadSuite Server was upgraded to Merge PACS 7.3 in Integrated mode, audio comments from EA will be displayed if they were either imported from EA into PACS or after the upgrade or else were entered in EA after the upgrade.

- You can toggle the display of the list of comments and warnings by clicking on the small white triangle to the left of the Comment History.
- You can resize any of the columns in the Comments History section by clicking on the space between any two column headers and dragging the header to the desired size.

c. Deleting Comments

Comments that have been manually entered (as opposed to system-generated warnings) can be deleted either individually or all together from the Comment History section, as in the following example:



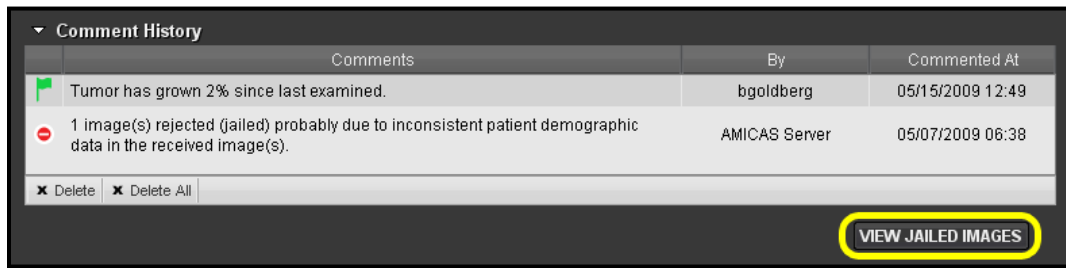
Deleting Manually-Entered Comments

NOTE: You may need to manually resize the bottom of the Order Viewer window to display the delete buttons.

- To delete a specific comment, clicking on the comment once to highlight it and then clicking on the **Delete** button at the bottom of the Comment History section.
- To delete all comments, click on the **Delete All** button.

5.1.5. Accessing Jailed Images

If Merge PACS is configured to run in **Standalone** mode and there are any jailed images for this Study, a **VIEW JAILED IMAGES** button will be displayed at the bottom of the window, as in the following example:




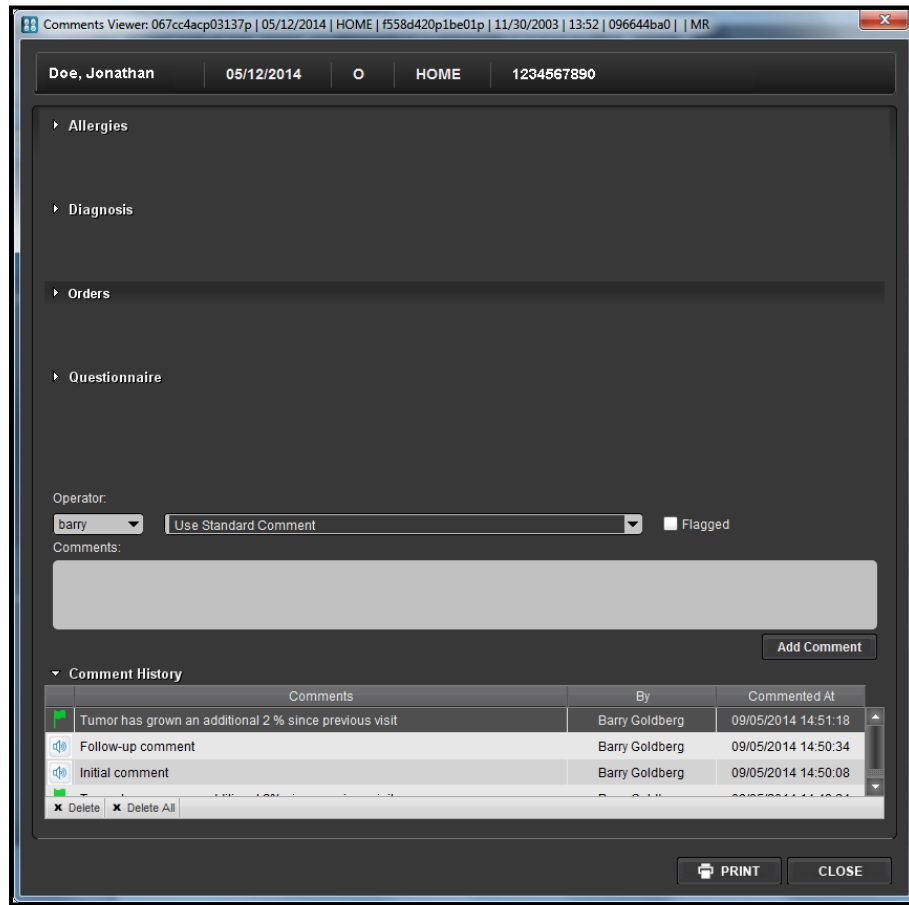
View Jailed Images Button

NOTE: When accessing the Merge PACS Viewer as an embedded viewer within another application, you will not be able to view jailed images from within the Order Viewer.

For information on viewing jailed images, refer to Chapter 17 below.

5.2. The Comments Viewer

 The Comments Viewer is accessed by clicking on the **Comments Viewer** icon, the **Comments** flag or the **Warning** flag, as illustrated to the left. It is functionally identical to the Order Viewer, except that the top of the window does not display as much information and you can print all information instead of just the order, as shown in the following example:



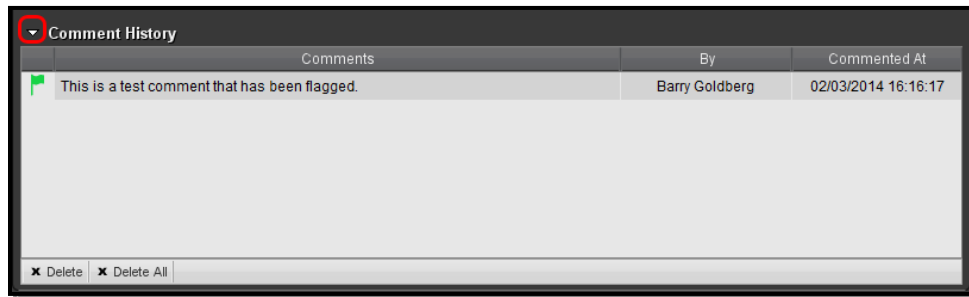
Comments Viewer

Depending on your user privileges and how your system is configured, you can also use the Comments Viewer to do the following:

- View general patient information
- View allergy information, if any
- View diagnosis information, if any
- View the order associated with a Study, if any
- View the questionnaire associated with a Study, if any
- Access jailed images, if any
- Print any of the information displayed within the Comments Viewer

5.2.1. Showing and Hiding Information

The visibility of each section of the Comments Viewer can be toggled on and off by clicking on the triangle to the left of that section, as in the following example:



Displaying/Hiding a Section

Unlike with the Order Viewer, when you choose to show or hide particular sections, your choices will be saved with your user preferences so the same sections will be showed or hidden the next time you access the Comments Viewer, even after logging out and logging back in to the Workstation.

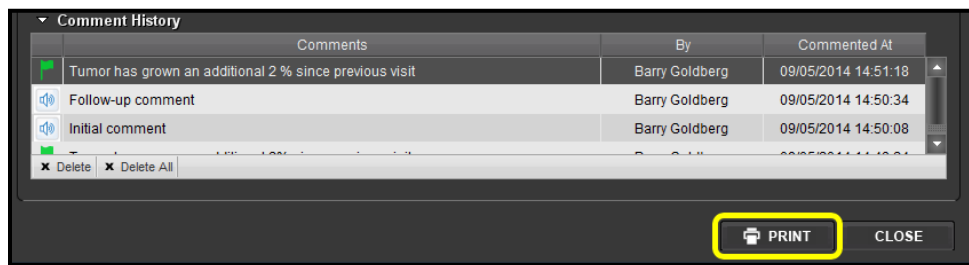
NOTE: You may need to expand the Comment History section the first time you open the Comment Viewer.

5.2.2. Printing from the Comments Viewer

Unlike the Order Viewer, which only allows you to print the order associated with a Study, the Comments Viewer allows you to print all information that is currently displayed within the Viewer.

To print information from the Comments Viewer:

1. Expand each section of the Comments Viewer you want to print, making sure to hide any section you do not want to print.
2. Click on the **PRINT** button at the bottom of the Comments Viewer, as in the following example:



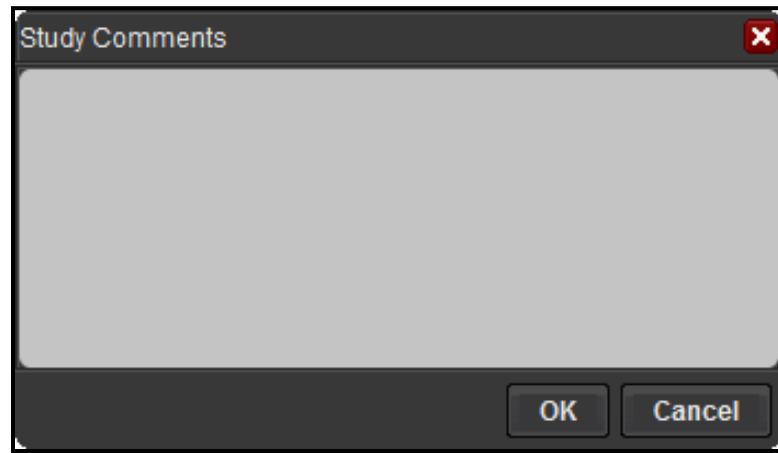
Printing All Displayed Information

5.3. Adding DICOM Study Comments



You can add comments (up to 1024 characters) that will be associated with all of a study's images, including key images, by clicking on the **Add Study Comments** icon on the **Study Toolbar**, as shown on the left.

When you click on the Add Study Comments icon, the **Study Comments** panel will be displayed, as in the following example:



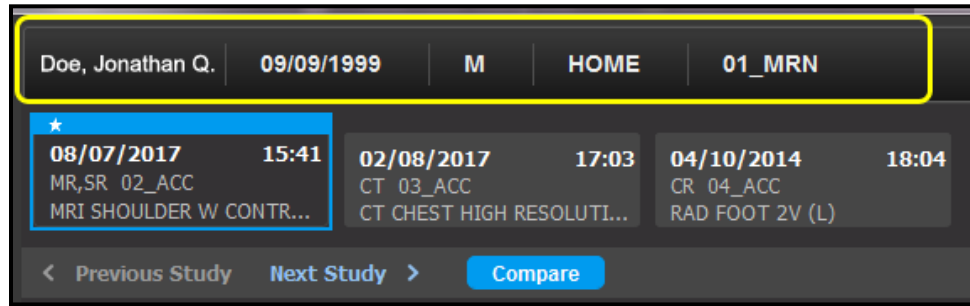
Study Comments Panel

Enter or edit the desired text and click the **OK** button to save your changes.

Note the following:

- The Study Comments panel will show the current value stored in the specified DICOM tag and anything entered in the panel will replace what is currently stored in that tag.
- Deleting the contents of the panel and clicking the **OK** button will clear the study comments from all of the study's images.
- These comments are completely separate from the comments history workflow described in the previous sections of this Chapter.
- The comment text will be stored in the "Additional Patient History" (0010,21b0) tag in the DICOM header for each image and can be viewed from the **DICOM Attributes Viewer** described in subsection 4.5.9.b above.
- Any updates made to the comment text will be propagated as PDE notifications through telemedicine and will also be logged to the Audit log (visible from within the Merge PACS Watch application).

The top section of the Report Viewer displays the demographic information for the patient, as in the following example:



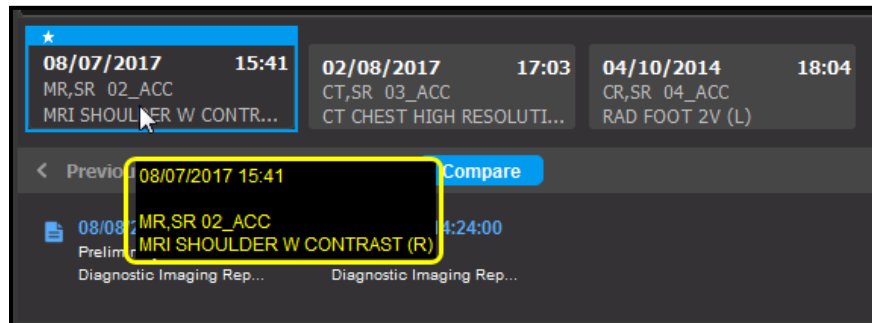
Patient Demographic Information

Below the demographic information are one or more navigation thumbnails for each exam for this patient that has at least one report, as in the following example:



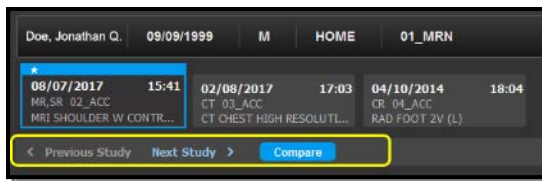
Exam Navigation Thumbnails

- The list of exams is determined by the **Patient Comparison Strategy** and the **“Selection of Priors”** option configured for your site, as well as Multiple Patient Identity (if MPI is enabled for your site), as described in Appendix C below.
- These exams are sorted in reverse chronological order according to Study Date/Time.
- The currently selected exam will be highlighted by a blue border.
- The exam for which the Report Viewer was launched is marked with small star.
- If desired, hover your mouse cursor over any exam thumbnail to display the full description of the exam as a tool-tip, as in the following example:



Full Description of Exam

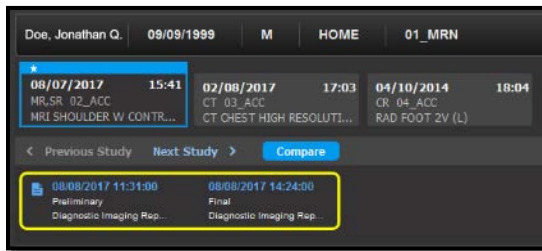
Below the exam navigation thumbnails are the **Compare Reports** buttons, as in the following example:



Compare Reports Buttons

NOTE: Refer to Section 6.2 below for information on comparing two reports side-by-side.

Below the Compare Reports buttons is the list of reports for the selected exam, as in the following example:



List of Reports for this Exam

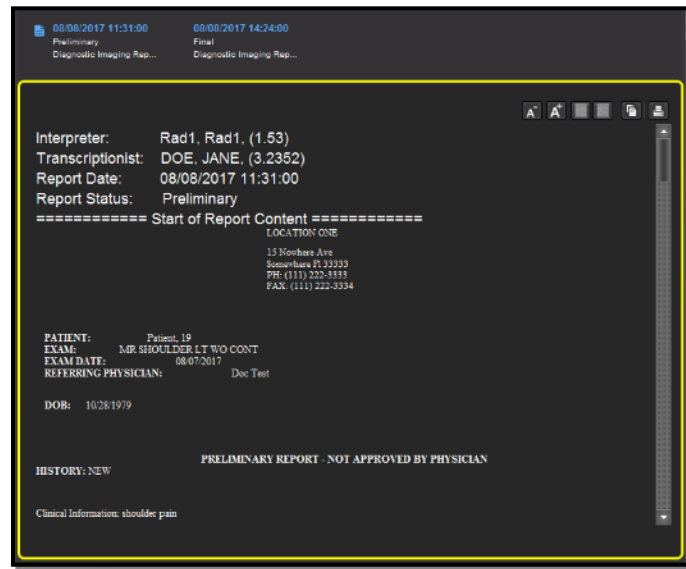
- Reports are listed in reverse chronological order according to report date/time.
- Click on any report to display it in the main report window.
- The currently selected report will have a blue report icon next to it.
- Only the most recent report will be listed if the **Show only latest report for each study in the Report Viewer** user preference is selected, as described in subsection 24.1.16 below.
- Depending on how your system is configured, you can hover your mouse cursor over any report thumbnail to display more information about the report as a tool-tip, as in the following example:



Detailed Report Information

NOTE: If Merge PACS is integrated with Merge Cardio™, multiple clinical reports may be generated per study, each with the same date & time. These reports will each have their own document title, however, and will be automatically sorted for each date & time based on the display priority order information sent from Cardio.

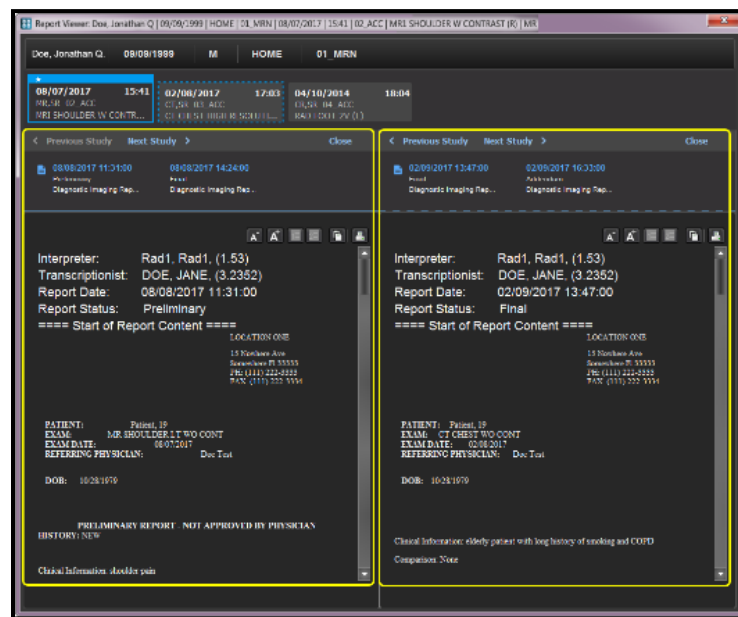
Below the list of reports for the selected exam is the main report window, as in the following example:



Report Window

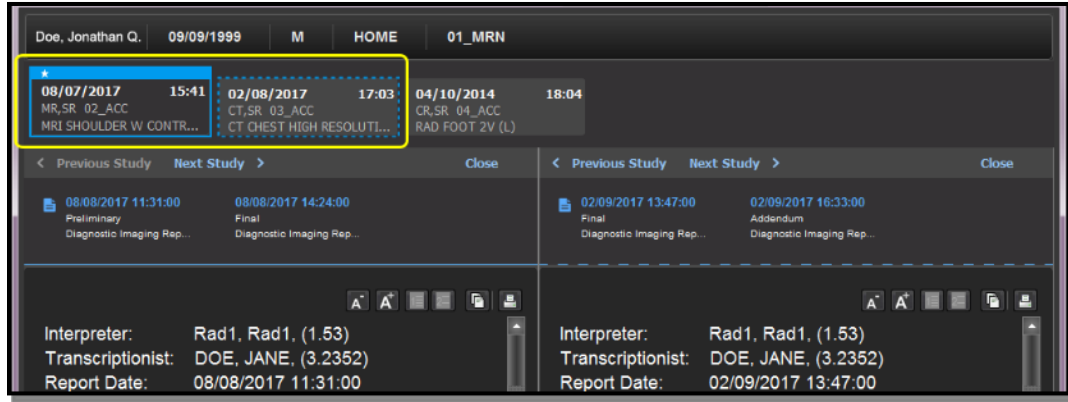
6.2. Comparing Two Reports

Click the **Compare** button described above to display two reports for a particular patient side by side, as in the following example:



Comparing Reports

By default, the currently selected report will be displayed in the left-hand pane and the most recent report for the next most recent exam will be displayed in the right-hand pane. Note that the navigation thumbnail for the exam whose reports are displayed in the left-hand pane will be highlighted with a solid blue border and the navigation thumbnail for the exam whose reports are displayed in the right-hand pane will be highlighted with a dotted blue line, as in the following example:



Highlighted Exam Navigation Thumbnails

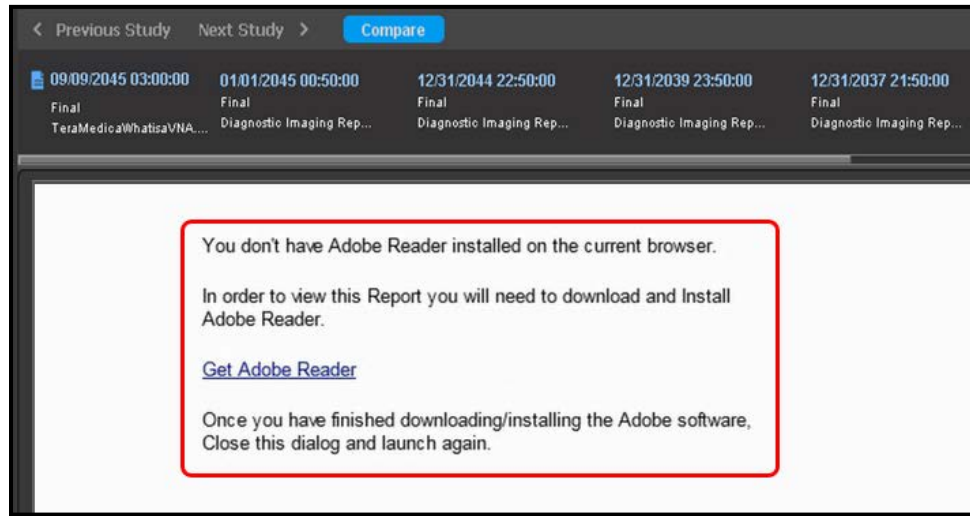
Within each pane, you can select the desired exam and report to be displayed as follows:

- To select a different exam, click on the **Previous Study** or **Next Study** buttons at the top of the pane. You can also drag and drop any of the exam navigation thumbnails into the pane.
- To select a different report, click on the desired report within the list of reports in that pane.

To exit out of compare reports mode, click the **Close** link at the top of whichever pane you wish to close

6.3. Viewing PDF Reports

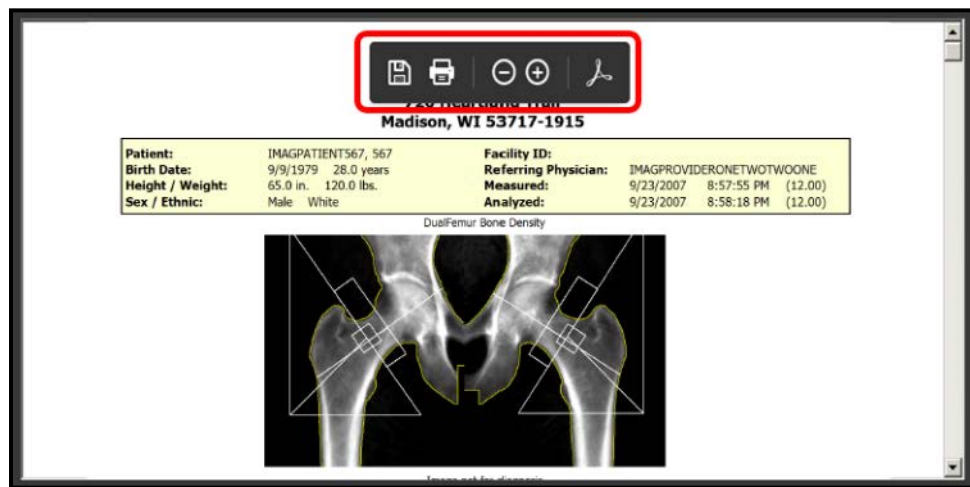
In order to view reports in PDF format, the Adobe Reader plugin must be installed on the Workstation browser. If it is not currently installed, you will be prompted to install it when you attempt to view a PDF report, as in the following example:



Adobe Reader Plugin Needs to Be Installed

- Click on the **Get Adobe Reader** link to begin the installation process.
- Once the plugin has been installed, close and relaunch the Report Viewer.

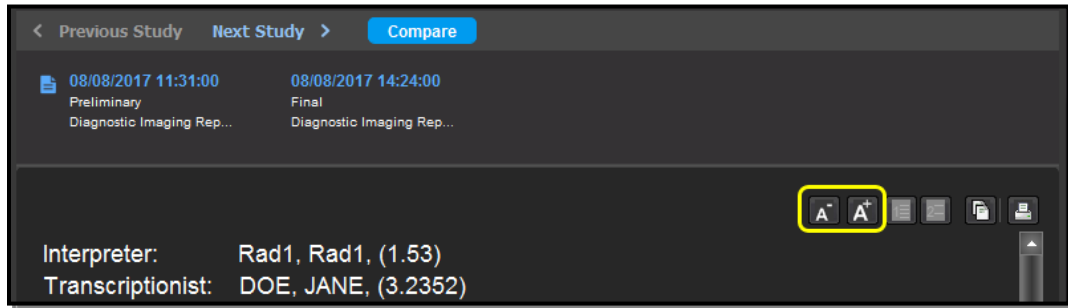
When viewing PDF reports within the Report Viewer, you can hover your mouse cursor over the report to temporarily display the set of tools provided by Adobe to **Save, Print, Zoom Out, Zoom In** and display the full **Acrobat toolbar**, as in the following example:



Adobe Reader Tools

6.4. Changing the Display Font Size

If desired, you can change the font sized used to display the reports other than PDF reports by clicking on either of the **Font Size** icons displayed in the upper-right hand corner of the main report window (or each of the report panes if comparing two reports), as in the following example:

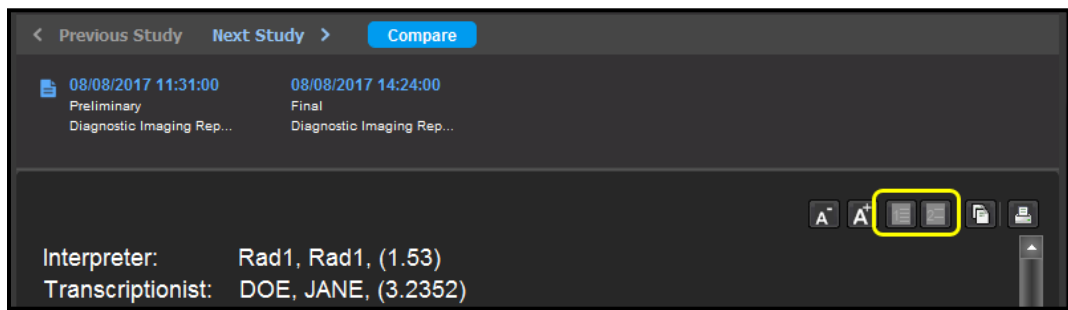


Changing the Font Size

NOTE: This feature only affects the size of the text displayed within the Report Viewer and does not affect the size of the text when printed out.

6.5. Changing the Line Spacing

If desired, you can change the line spacing for reports other than PDF or HTML-formatted HL7 reports by selecting one of the two available line spacing icons displayed in the upper-right hand corner of the main report window (or each of the report panes if comparing two reports), as in the following example:

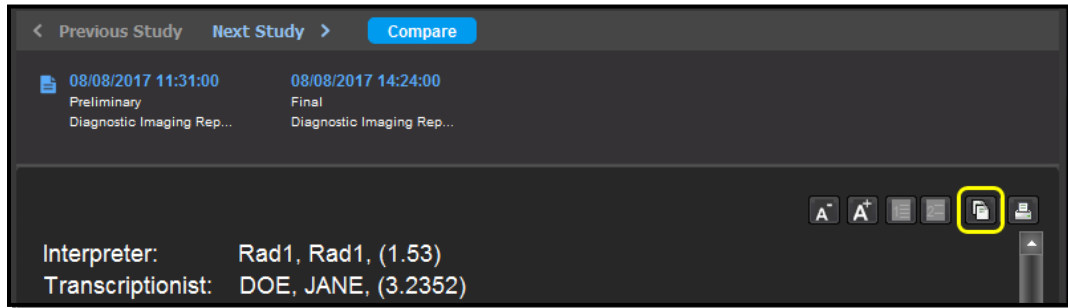


Changing the Line Spacing

NOTE: This feature only affects the way the text is displayed within the Report Viewer and does not affect the text when printed out.

6.6. Copying a Report

To copy the text of reports other than PDF reports (e.g., so that you can paste it into an e-mail or a document), use your mouse to select the desired text and then click on the copy icon displayed in the upper-right hand corner of the main report window (or each of the report panes if comparing two reports), as in the following example:

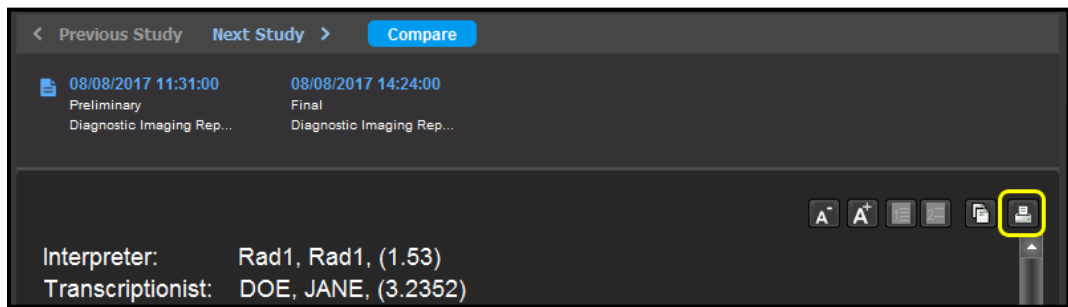


Copying a Report

You can also click on the copy icon without selecting any text to copy all the text of the report.

6.7. Printing a Report

To print a copy reports other than PDF reports, click on the printer icon displayed in the upper-right hand corner of the main report window (or each of the report panes if comparing two reports), as in the following example:



Printing a Report

Chapter 7. Associating and Dissociating Studies to and from Worklists

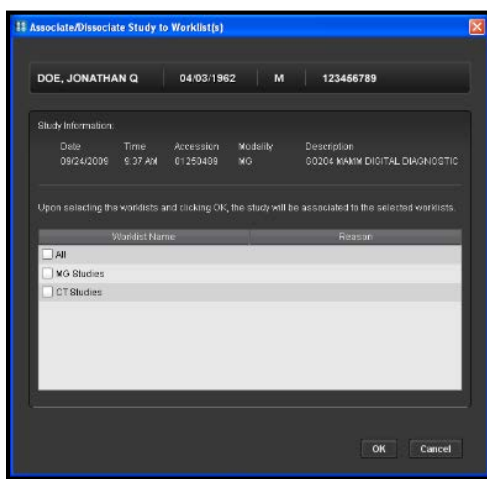
If you accessed a particular exam or Study via RealTime Worklist, you can add that Study or exam to another worklist to which you have access. You can also remove the Study or exam from another worklist to which you have previously added it.

7.1. Associating Studies to a Worklist



You can add a Study or exam to another worklist to which you have access by clicking on the **Associate/Dissociate Study** icon from a worklist, the Query Page, the Patient Record, or the Study Toolbar within the Merge PACS Viewer, as shown on the left.

When you click on the Associate/Dissociate Study icon, the **Associate/Dissociate Study** window will be displayed, as in the following example:



The Associate/Dissociate Study Window

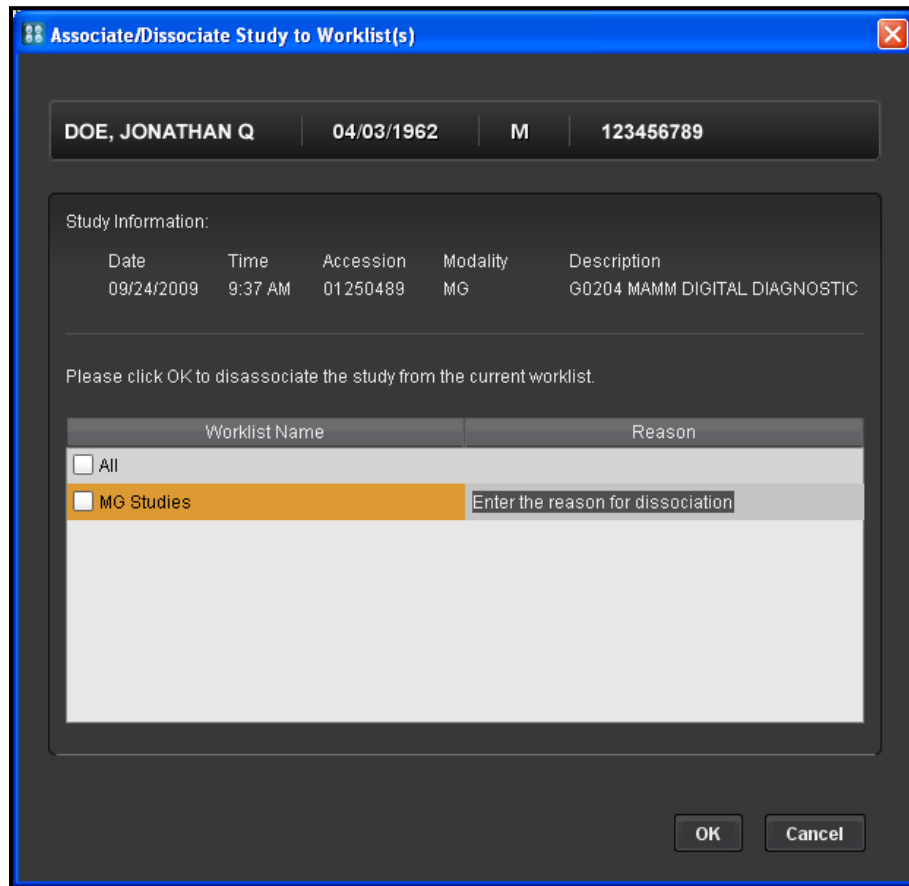
- Click on the check box next to each worklist you want to associate this Study to.
- If this Study is already associated to a worklist and you want to dissociate it, click on the check box next to that worklist to deselect it.
- If desired, enter a reason for the association/dissociation in the **Reason** field for the selected/deselected worklist.
- When finished, click on the **OK** button at the bottom of the window.

7.2. Removing Studies from a Worklist



If you are viewing a worklist that one or more studies have been associated to, you can remove those studies from the worklist by clicking on the **Remove Study** icon, as shown on the left.

When you click on the Remove Study icon, a special version of the **Associate/Dissociate Study** window will be displayed, as in the following example:



The Associate/Dissociate Study Window

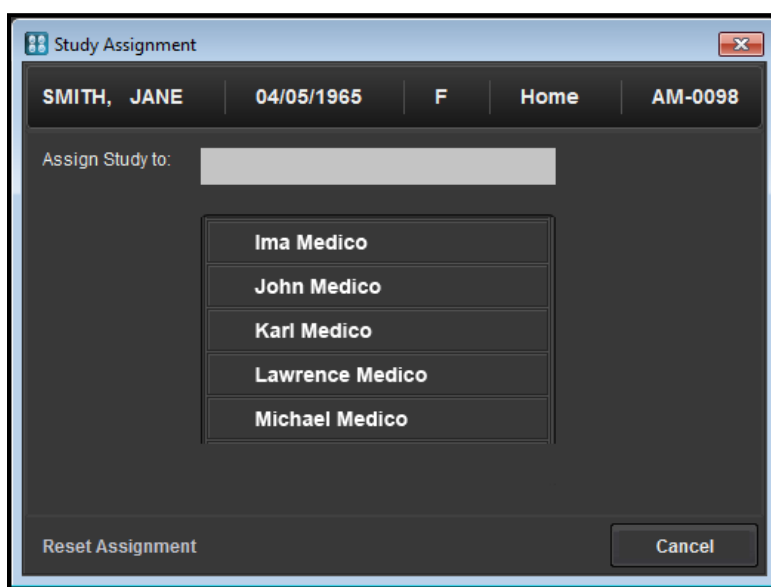
- Click on the check box next to the worklist from which you want to remove this Study (the currently viewed worklist will be highlighted in orange).
- Enter a reason for the association/dissociation in the **Reason** field for the selected worklist.
- When finished, click on the **OK** button at the bottom of the window.

Chapter 8. Assigning a Study to Another User



As described in subsections 3.3.4, and 3.2.4 above, you can flag a Study that appears on a RTWL worklist to have it be assigned to another user by clicking on the **Assign Study** icon, as shown on the left. If that user has access to a worklist configured to display studies assigned to him, this Study will appear on that worklist.

Clicking the Assign Study icon will cause the **Study Assignment** window to be displayed, as in the following example:



Study Assignment

NOTE: The list of available users includes those users who are currently in a group that has the “Allow Group to be added for Study Assignment” privilege assigned to it.

- Click on the name of the user to whom you want to assign this Study. The Study Assignment window will close and the Study will be assigned to the selected user.
- If the list of users is too long, you can filter the list by entering all or part of the desired user’s name in the **Assign Study to** field.
- If a Study has already been assigned to another user and you want to remove that assignment, the **Reset Assignment** button at the bottom left of the window will be active and you can click on it.

Chapter 9. Recording and Listening to Audio Comments

VoiceClip is an optional feature that, depending on your login privileges, allows you to listen to and record brief audio annotations that can be saved as comments for particular studies. By default, each annotation can last up to thirty seconds, but this can be custom-configured on a site-by-site basis.

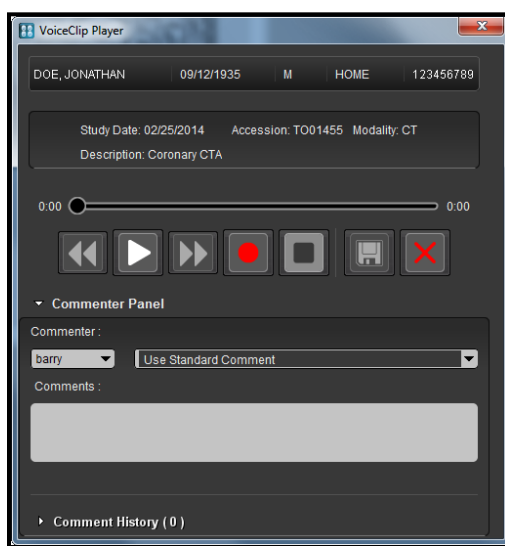
CAUTION: Voice clips are a communication tool only and should not be used as the sole repository of a diagnosis or information critical to treatment or diagnosis. Essential clinical information or findings should always be contained in a report.

9.1. Recording Audio Comments with VoiceClip










If you have been given the user privilege to record audio comments (VoiceClips), you can activate the VoiceClip recorder by clicking on the VoiceClip icon, as shown on the left, from the **Merge PACS Viewer**, **RTWL/RTSL** or the **Patient Record**. Note that you must have properly installed microphone and speakers connected to your workstation in order to use this feature.

Once you have clicked the VoiceClip icon, the **VoiceClip Player** window will be displayed in **record/playback** mode, as in the following example:



Recording an Audio Annotation with VoiceClip

The VoiceClip Player has the following buttons:

Button	Name	General Description
	Previous	Click this button to play the previous audio comment, if any. Comments are listed in reverse chronological order (newest comment at the top), so the "previous" comment is the one higher up on the list (<i>i.e.</i> , more recent).
	Play	Click this button to play back an audio annotation that has previously been recorded.
	Next	Click this button to play the next audio comment (in reverse chronological order), if any. Comments are listed in reverse chronological order (newest comment at the top), so the "next" comment is the one further down on the list (<i>i.e.</i> , older).
	Record	Click this button to begin recording an audio annotation.
	Stop	Click this button to stop recording or stop playing back an audio annotation.
	Save	Click this button to save an audio annotation that you have recorded.
	Delete	Click this button to erase an audio annotation that has previously been saved.

NOTE: If one or more audio comments are already recorded for this Study, the **most recent** comment will begin to play automatically when the VoiceClip player is launched.

To record a VoiceClip audio comment:

1. Click the **Record** button to begin recording.

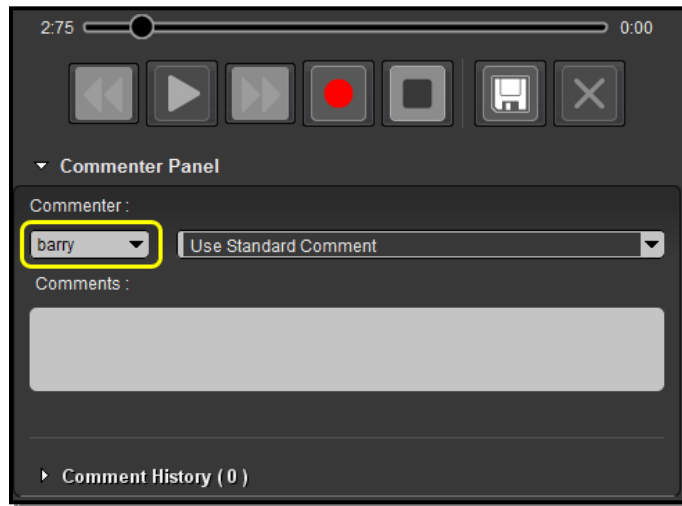
The counter will advance from left to right to indicate that recording is occurring, as in the following example:



Recording in Progress

2. Clearly speak your comment into the microphone attached to your workstation.
3. When you have finished saying the comment, click on the **Stop** button.

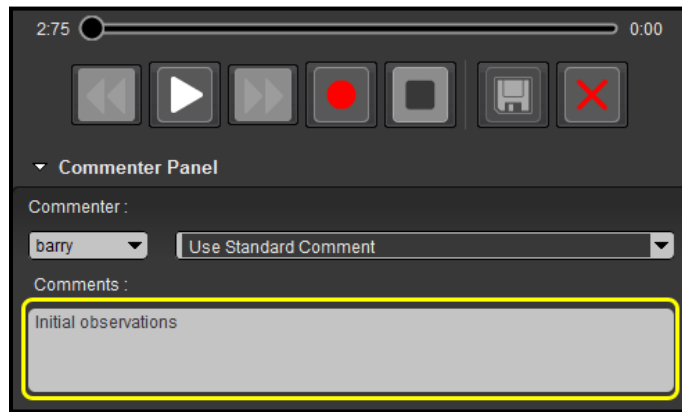
4. Make sure that your user name is correctly displayed in the **Commenter** box, as in the following example:



Commenter

NOTE: You can toggle display of the Commenter Panel on and off by clicking on the white triangle to the left of “**Commenter Panel.**”

5. By default, this audio comment will be displayed with the text “Audio comment only” wherever comments are displayed throughout the Workstation. If you want to add a custom text comment, enter it in the **Comments** box, as in the following example:

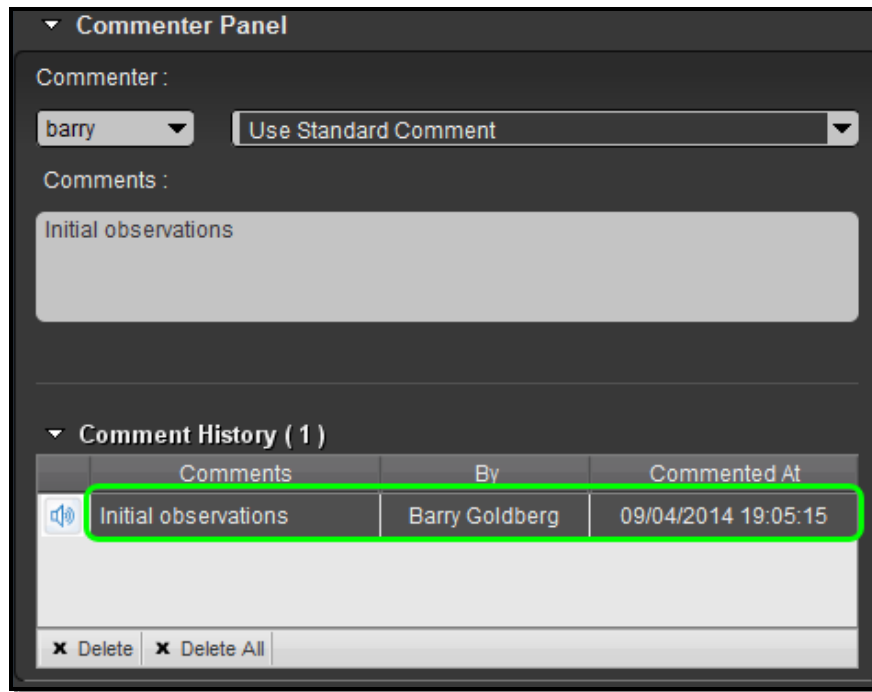


Comment Text

NOTE: If any standard comments have been defined for your system, you can also select one from the “Use Standard Comment” drop-down menu to automatically populate the Comments box with pre-defined text.

- When you are finished, click on the **Save** button.

The comment is saved and is displayed in the **Comment History section** of the VoiceClip Player window, as in the following example:



Comment Displayed in Comment History

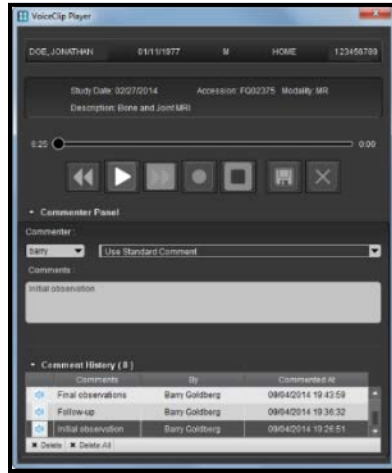
- If you need to delete a comment, make sure it is selected in the Comment History and then either click the main **Delete** button or click on the **Delete** or **Delete All** buttons at the bottom of the Comment History.

NOTE: You cannot use the main **Delete** button if the audio comment is currently playing.

- When finished, exit the VoiceClip Player window by clicking on the small **X** in the upper right corner.





9.2. Playing Existing Annotations with VoiceClip

If you only have the user privilege to play audio comments (VoiceClips), or you access the VoiceClip icon from the Query Page, the **VoiceClip Player** window will be displayed in **play only** mode, as in the following example:



Listening to an Audio Annotation with VoiceClip

- The audio annotation should begin playing automatically once the VoiceClip Player window is opened.
- The following buttons will be enabled when accessing the VoiceClip Player in playback-only mode:

Button	Name	General Description
	Previous	Click this button to play the previous audio comment, if any. Comments are listed in reverse chronological order (newest comment at the top), so the “previous” comment is the one higher up on the list (<i>i.e.</i> , more recent).
	Play	Click this button to play back an audio annotation that has previously been recorded.
	Next	Click this button to play the next audio comment (in reverse chronological order), if any. Comments are listed in reverse chronological order (newest comment at the top), so the “next” comment is the one further down on the list (<i>i.e.</i> , older).
	Stop	Click this button to stop playing back an audio annotation.

- When finished, exit the VoiceClip Player window by clicking on the small **X** in the upper right corner.

NOTE: Your Merge PACS Workstation can be configured to automatically launch the VoiceClip Player window whenever you view a Study that has an audio comment associated with it. For details, refer to subsection 24.1.3 below

Chapter 10. Integration with Third-party Applications

10.1. Types of Integration

The Merge PACS Workstation provides two types of integration with third-party applications:

10.1.1. Direct API-based Integration

Direct API-based integration is used for certain third-party dictation/report applications such as Dictaphone's **PowerScribe™** and Agfa's **TalkStation™**. Integration involves passing patient and Study information directly to the application.

10.1.2. XML File-based Integration

XML File-based integration is used with dictation/report applications (such as PowerScribe or Epic), document management applications (such as OnBase), and any other application that supports XML file-based integration.

The Merge PACS Workstation integrates with these applications by writing patient and Study information to an XML file and placing ("dropping") it into a directory on the Workstation. By default, this occurs when the Study is first loaded into the Primary Viewer, but the system can be configured so that it occurs at one or more of the following times:

- When the user logs in to the Workstation
- When the user logs out of the Workstation
- When a Study is loaded into the Primary Viewer
- When the user switches between studies
- When a prior Study is opened within the 3rd-party application
- When the Primary Viewer is closed
- When the user clicks on the 3rd Party Application Synchronization button
- At startup before login
- At shutdown after logout

NOTE: Some applications can be configured to launch automatically when the XML file is created, whereas others will need to be manually launched after the XML file is created.

For certain applications, such as **PowerScribe 360** and **Epic Hyperspace**, Merge PACS can also be configured to provide **Bi-directional XML Integration**, which lets Merge PACS **receive** inbound XML messages and act on those messages. For example, if an XML file for a Study is received where “response event = dictated,” the Study state can be automatically changed to “preliminary.” Or if an XML file for a Study is received where “response event = signed,” the Study state can be automatically changed to “read.”

In addition, a URL is provided that the Dictation/Document Software vendor may use to send a status update notifying Merge PACS that the user has finished a dictation. Once the external application has sent a call to this URL, Merge PACS will process and update the Study status to DICTATED. This will save the Radiologist time by removing the need to click the appropriate status update in the Merge PACS Workstation.

NOTE: For **Epic**, the Dictation event will be disabled.

10.2. General Information

3rd-party Application Synchronization is not a voice dictation system; it only provides a link to the voice dictation system, if any, that is installed on your workstation. For additional information, refer to the user documentation specific to the third-party dictation/report application being used.

3rd-party Application Synchronization supports **PowerScribe** in both **Voice Recognition** and **Digital Dictation** modes, and which mode is launched will depend on how PowerScribe is configured for your login.

When 3rd-party Application Synchronization is being used with Direct API based integration (including VoiceLink), there are a number of user preferences available that can control its behavior, as described in Section Note: below.

If **Bi-directional XML integration** is being used, whether with **PowerScribe 360**, **Epic Hyperspace** or some other application, there are a number of user preferences available that can control its behavior, as described in Chapter 24 below.

NOTE: When running multiple instances of the Merge PACS Workstation on one workstation, only one instance may communicate with **PowerScribe**.

CAUTION: When a Study is launched in a third-party application, make sure you check the demographics to verify the correct patient’s information was sent.

10.3. 3rd Party Application Synchronization Button



The **3rd-Party Application Synchronization** icon on the **Patient Record Toolbar** and the **Application Toolbar**, as shown on the left, allows you to synchronize one or more application with the selected Study.

Depending on how your system and the third-party applications are configured, clicking this button will also cause the application(s) to be launched if not already launched.

The 3rd-party Application Synchronization button will appear as one of the following two ways:



Third-party applications are currently synchronized with this Study.



Third-party applications are currently not synchronized with this Study.

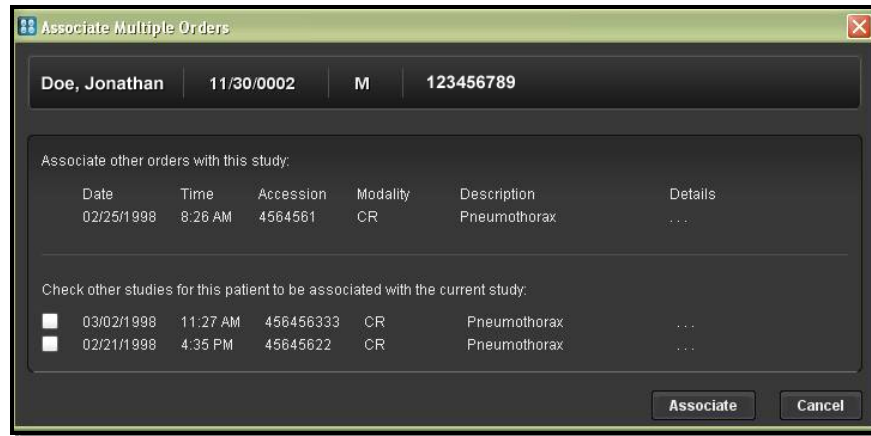
Clicking this button will synchronize the Study with all applications, except those that you have specified should not be synched, as described in Section 10.4 below.

If the third-party dictation/report application is not already running, when you click on the 3rd-party Application Synchronization icon you will be prompted to enter a username and password as in the example shown below:

External Application Login

- If the third-party application is one that requires a separate user name and password (such as PowerScribe), enter that information here and click the **Login** button. Depending on how Merge PACS has been configured, you can also click on the **Remember my username and password** checkbox to prevent being prompted for your username and password in the future.
- If the third-party application does not require a separate username and password, you can click the **Cancel** button to exit this window. If you would like to prevent this window from reappearing in the future, however, you can enter any random text for a username and password, click the **Save Password** option, and then click the **OK** button.

If there are multiple unread studies when you click on the 3rd-party Application Synchronization button, a window will be displayed to allow you to associate multiple studies/orders with the report being dictated:



Associate Multiple Orders Window

- If desired, select one or more additional studies to be associated with the report to be dictated.
- Click on the **Associate** button (whether or not you have selected any additional studies).

NOTE: If an application has been configured for auto synchronization, the Associate Multiple Orders window will not be displayed automatically. It will, however, still be displayed (if appropriate) by clicking on the 3rd-party Application Synchronization button.

NOTE: This feature will be enabled only if the **Associate accessions with primary Study to 3rd Party Application** user preference is selected, as described in Chapter 24 below, and if the application is configured to drop an XML file when dictation of the primary Study is started.

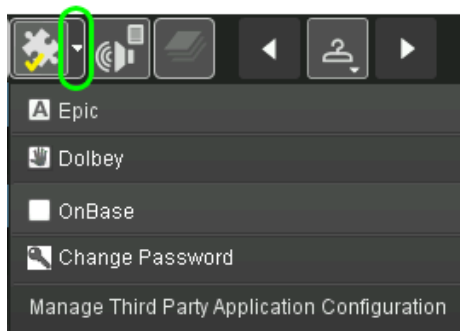
CAUTION: Upon closing the Study, all the associated studies will be marked as Read (automatically if “Get next Study, Mark current as Read” button is used or through the change status dialog).

For additional information on the third-party application being used, refer to the user documentation specific to that application.

10.4. 3rd Party Application Synchronization Menu



The **3rd Party Application Synchronization Menu** is accessed by clicking on the triangle to the right of the **3rd-Party Application Synchronization** icon on the **Patient Record Toolbar** and the **Application Toolbar**, as shown on the left. When that triangle is clicked, the menu itself will be displayed, as in the following example:



The 3rd-party Application Synchronization Menu

10.4.1. Configuring Individual Applications

The top section of the menu lists each application for which integration is currently configured and clicking on the checkbox next to each listed application repeatedly will cycle through the following states:

State	Description
<input type="checkbox"/>	Do not sync this application. For applications using XML Integration, this means that no XML file will be created).
<input checked="" type="checkbox"/>	Sync this application automatically whenever a Study is launched (<i>i.e.</i> , switch the Study context to the active primary Study being loaded). Note that for applications that use XML integration, automatic synchronization will only occur if your system has been configured to create an XML file for this application when a Study is loaded into the Primary Viewer.
<input type="checkbox"/>	Only synchronize studies with this application when the 3rd-party Application Synchronization button is manually clicked. If the application is already synchronized with one Study, clicking on the button for another Study will change the focus of the application to that Study (if the application is configured to do this)

NOTE: When the "Lock and Update Study Status in Secondary Viewer" user preference is enabled, as described in subsection 24.1.1 below, the Secondary Viewer will behave like a Primary Viewer. If the application is configured to sync automatically, the Study will be automatically synced with the 3rd-party application when it is opened in the Primary Viewer. If a second Study is then opened in the Secondary Viewer without closing the primary Study, the primary Study will lose the sync and the secondary Study will automatically sync with the third party application instead.

10.4.2. Changing a Password

If your system is configured to provide Bi-directional XML Integration with a 3rd-party application and the password is saved within Merge PACS after the first login, an additional **Change Password** option will be available that will allow you to change the external application username and password you entered when you first logged into the Merge PACS Workstation.

Clicking on this option will cause the **Change External Apps Password** dialog to be displayed, as in the following example:

The 3rd-party Application Synchronization Menu

Update your username and/or password in the spaces provided and then click on the **OK** button at the bottom of the dialog.

10.4.3. Managing Third-party Application Configuration

If your site has been configured to use Bi-directional XML, you can configure the actions performed by the Workstation when various responses are sent from the integrated third-party application. You can also configure what notifications are sent to the third-party application (via xml drop) in certain circumstances. This is done by selecting the **Manage Third-party Application Configuration** option from the 3rd Party Application Synchronization Menu.

NOTE: This option is also available from the **Merge PACS Preferences dialog**, as described in subsection 24.1.15 below.

For more information on configuring 3rd Party Application options, refer to subsection 24.1.15 below.

Chapter 11. Managing Access to a Study



The **Access Control** icon on the **RealTime Worklist**, the **Exam Toolbar** within the Patient Record and the **Study Toolbar** within the Merge PACS Viewer, as shown on the left, allows you to grant one or more users or groups access to a particular Study or exam.

Clicking on this icon will cause a separate **Grant Access** pop-up window to appear, as in the following example:

Grant Access

DOE JOANNE | 11/05/1987 | F | 937653741551

Grant Access to this Study:

Date	Time	Accession	Modality	Description	Details
11/20/2006	8:47 AM	937653741551	US	OB	...

Find Physicians

Provider Name:

Login	Name	Code	Email	Phone	Address

Comments:

Assign Group Access Also
 Send Notification

Commentator:

▸ Physicians that have Access to this Exam

▸ Groups that have Access to this Exam

The Grant Access Window

11.1. Granting Access to a Study

The top section of the Grant Access window allows you to search for physicians to whom you want to grant access to this exam, as shown in the following example:

Grant Access to this Study:

Date	Time	Accession	Modality	Description	Details
11/20/2006	8:47 AM	937653741551	US	OB	...

Find Physicians

Provider Name Find Physicians

Search for Physicians to Grant Access

- Select either **Provider Name** or **Provider Code** from the drop-down search options menu, enter the desired text in the field provided, and then click the **Find Physician** button to display a list of matching physicians, as in the following example:

Find Physicians

Provider Name Find Physicians

Provider Name	Provider Code	Name	Code	Email	Phone	Address
imedico		Medico, Ima	1003	imedico@hospita...	617-123-4567	10 Main Street, nu...
ymedico		Medico, Yura	1004			100 Maple Street, ...

Comments:

Assign Group Access Also

Send Notification

Commentator: Grant Access

List of Matching Physicians

NOTE: If searching by Provider Name, you need to enter the physician's full name in the format "Last Name, First Name, Middle Initial." Alternatively, you can use an asterisk as a wild card. For example, "gold*" will find physicians named Jonathan Gold, Barry S. Goldberg and Harold Goldstein.

- Click on the listing of the physician to whom you want to grant access to this exam.
- If you want to grant access to all groups this physician is a member of, click the checkbox next to the **Assign Group Access Also** option.
- If your site is using Merge's AMICAS Reach ("Reach") Referring Physician Module and you want a notification e-mail sent to this physician saying that he or she has been granted access to this exam, click the checkbox next to the **Send Notification** button and enter a comment in the **Comments** box.
- When finished, click the **Grant Access** button to perform the selected actions.

11.2. Revoking Access to a Study

If any users and/or groups have already been granted access to this exam, they will be listed at the bottom of the Grant Access window, as in the following example:

▼ Physicians that have Access to this Exam					
Login	Name	Code	Email	Phone	Address
imedico	Medico, Ima	1003	imedico@hospita...	617-123-4567	10 Main Street, Bl...
- Remove Access					

▼ Groups that have Access to this Exam		
Group Name	Number of Users	Members with access
Referring	127	Referring Physicians
- Remove Access		

Users and Groups with Access to this Exam

NOTE: Click on the white triangles to expand or hide each individual list.

- To revoke access from a user included in the list of Existing Users, click on that user's listing with the left mouse button to highlight it and then click the **Remove Access** button, as in the following example:

▼ Physicians that have Access to this Exam					
Login	Name	Code	Email	Phone	Address
imedico	Medico, Ima	1003	imedico@hospita...	617-123-4567	10 Main Street, Bl...
- Remove Access					

Revoking User Access to this Exam

- To revoke access from an entire group included in the list of Existing Groups, click on that group's listing with the left mouse button to highlight it and then click the **Remove Access** button, as in the following example:

▼ Groups that have Access to this Exam		
Group Name	Number of Users	Members with access
Referring	127	Referring Physicians
- Remove Access		

Revoking Group Access to this Exam

Chapter 12. Changing the Workflow Status and/or HL7 Attributes of a Study

Depending on how your system is configured, you can change the status and/or specific HL7 Attributes of a Study in either of the following two locations:

- The **Change Workflow Status** window, accessed by clicking on the **Change Status** icon
- At the **Update Study Status** window, accessed automatically when exiting a Study

12.1. The Change Workflow Status Window



The **Change Status** icon on the **RealTime Worklist**, the **Exam Toolbar** within the Patient Record and the **Study Toolbar** within the Merge PACS Viewer, as shown on the left, allows you to change the workflow status and/or select HL7 attributes for a Study or exam. When you click on the Change Status icon, the **Change Workflow Status** window for the exam or Study will be displayed as a separate pop-up window, as in the following example:

The Change Workflow Status Window

12.1.1. Changing the Workflow Status

The middle section of the Change Workflow Status window allows you to change the status of the exam, as in the following example:

Dimension	Status	Change to	Parameter	Notes
Diagnostic	Unread	- SELECT -		
StudyLocking		- SELECT -		
ER	ER Read	- SELECT -		

Change Status Panel

- The actual number of statuses that can be set from the Change Status panel depends on how your system and individual worklist have been configured.
- For each available status type (or “dimension”) you can set the status by selecting the desired option from the drop-down menu for that dimension, as in the following example:

Dimension	Status	Change to	Parameter	Notes
Diagnostic	Unverified	- SELECT -	- CLEAR -	Importer
StudyLocking	In Use	- SELECT -	AMICAS	dicom@GOLDBERG...
HL7 Attribute	Current	Unread		
Order Status	None	Preliminary	- SELECT -	
Reading Pool	Unknown	Final	- SELECT -	

Selecting a Status

- If a particular status dimension has multiple parameters available, you can select the desired parameter for that status from the list of options in the **Parameter** column.
- If desired, you can add a note in the **Notes** column for any status by double-clicking on the column for the desired status and entering the desired text.

NOTE: Depending on the status selected and how your site is configured, you may be required to enter a comment, as described in subsection 12.1.3 below.

12.1.2. Changing HL7 Attributes

If you have login privileges to update HL7 attributes, the middle section of the Change Workflow Status window will also allow you to change one or more specific HL7 attributes of the exam, as in the following example:

Dimension	Status	Change to	Parameter	Notes
Diagnostic	Unread	- SELECT -		
StudyLocking		- SELECT -		
ER	ER Read	- SELECT -		

HL7 Attribute	Current Value	Change to
Order Status	None	- SELECT -
Reading Pool	None	- SELECT -
Order Priority	None	- SELECT -
Patient Class	None	- SELECT -

Change HL7 Attributes Panel

This feature provides users with the ability to override the order status of an exam and is typically only available to administrators and technologists.

NOTE: If either the order or the accession number is missing for this exam, you will not be able to change the HL7 attributes and a message to this effect will be displayed at the bottom of the window.

NOTE: Changes made to HL7 attributes will be applied only to the primary study and not selected priors.

The following HL7 Attributes can be changed from the Change Workflow Status window:

- **Order Status**
- **Reading Pool**
- **Order Priority**
- **Patient Class**

To change an HL7 attribute for the primary study, click the drop-down menu for the desired attribute in the **Change to** column and select the desired value, as in the following example:

HL7 Attribute	Current Value	Change to
Order Status	None	- SELECT -
Reading Pool	Unknown	- SELECT - In Progress Complete
Order Priority	None	- SELECT -
Patient Class	Outpatient	- SELECT -

Changing an HL7 Attribute

Sample workflows for the use of this feature include the following:

- Change the **Order Priority** HL7 attribute to increase the status of an order to STAT or to lower the status from STAT to Urgent or Routine (e.g., when a referring physician has requested a Study as STAT just because a patient is waiting during an appointment and it would be more appropriate for the status to be Urgent).
- Change the **Patient Class** HL7 attribute to correct the frequent miscoding of Emergency patients as Outpatient on the RIS.
- Change the **Reading Pool** HL7 attribute in cases where Reading Pool is used to drive worklists and where the assignment may be wrong in some cases (e.g., Neck or Head CT to Neuro instead of MSK).

12.1.3. Entering and Viewing Comments

The bottom section of the Update Study Status window allows you to add a comment to this Study as well as view any previously entered comments, as in the following example:

▼ Commenter Panel

Commenter :
 barry Use Standard Comment Publish

Comments :
 [Large text area for entering comments]

▼ Comment History (4)

Comments	By	Commented At
Tumor has grown an additional 2 % since previous visit	Barry Goldberg	09/05/2014 14:51:...
Follow-up comment	Barry Goldberg	09/05/2014 14:50:...
Initial comment	Barry Goldberg	09/05/2014 14:50:...

Delete Delete All

Change No Change

Adding and Viewing Comments

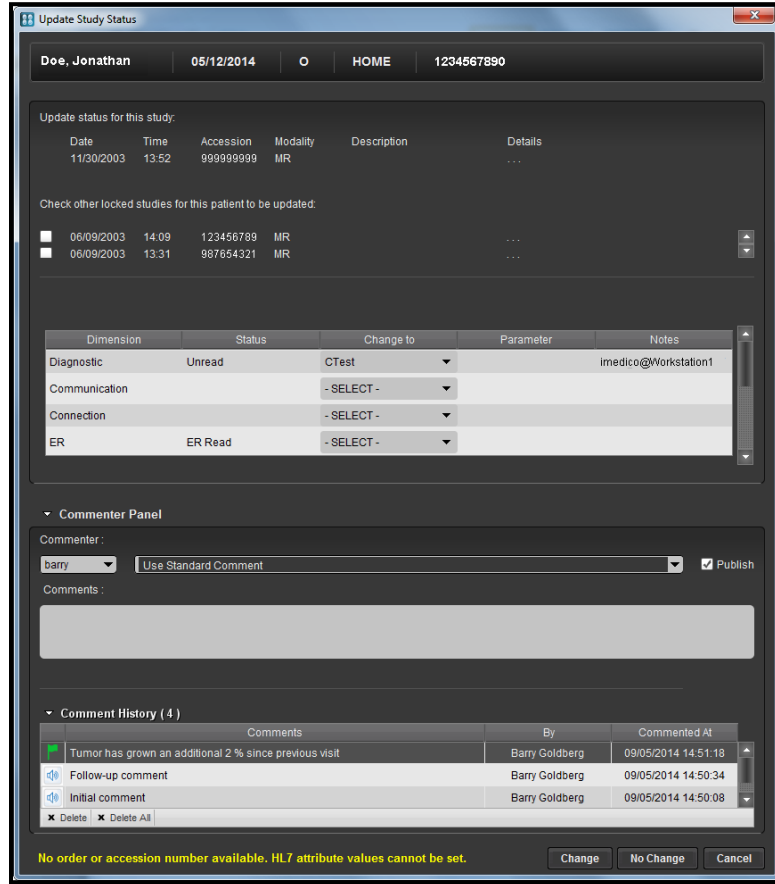
For information on adding, viewing and deleting comments, refer to subsection 5.1.4 above

12.1.4. Saving Your Changes

When you have finished setting the status, changing the HL7 attributes and/or leaving a comment, click the **Change** button at the bottom of the window to record your changes and close the window. You can also click on the **No Change** button to close the window without making any changes.

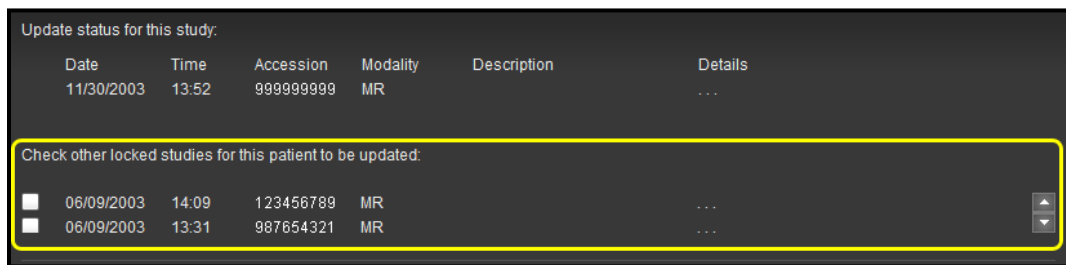
12.2. The Update Study Status Window

Depending on how your system is configured, whenever you exit a Study the **Update Study Status** window may automatically be displayed, as in the following example:



The Update Study Status Window

If your user preferences are set to automatically lock unread prior studies (whether all priors, relevant priors, or priors of the same modality type), as described in Chapter 24 below, the top section of the Update Study Status window will allow you to select which of those prior studies you want to be updated with the chosen statuses, as in the following example:



Prior Studies that are Currently Locked

- Selecting one or more prior studies will always update the status of those prior studies **in addition to** the status of the primary Study. It is not possible to just update the status and/or attributes of the prior studies.
- You can only update the status of prior studies, not change the HL7 attributes for those studies.
- Click on the “. . .” in the Details column for a Study will cause the **Study Details** window to be displayed for that Study, as in the following example:

The screenshot shows a window titled "Study Details" for patient "Jones, Jane" at "RemoteClinic" with ID "1234". The window is divided into two main sections: "Study Patient Demographics" and "Study Information".

Study Patient Demographics:

- Patient Name: Jones*Jane***
- Prefix:
- First: Jane
- Middle:
- Last: Jones
- Suffix:
- IPID: RemoteClinic
- Patient ID: 1234
- Patient DOB:
- Patient Sex:

Study Information:

- Accession:
- Study Date: 05/28/2001
- Study Time:
- Description:
- Modality: CT
- Patient Age:
- Referring: ****
- Station Name:
- Errors: 0
- Series / Images: 1/1
- Institution:

Patient Demographics Change History

Date & Time	Change Field	Original Value	New Value	Issuer
01/02/2013 13:10:56	ReferringPhysicianNa...	HALLINAN*BARBARA...	HALLINAN*BARBARA...	amcas

Series/Images(13/2072)

Series	Description	Images
7	SHORT MRS	1
101	Survey	9
301	Sag T1 mah 3D_TFE	170

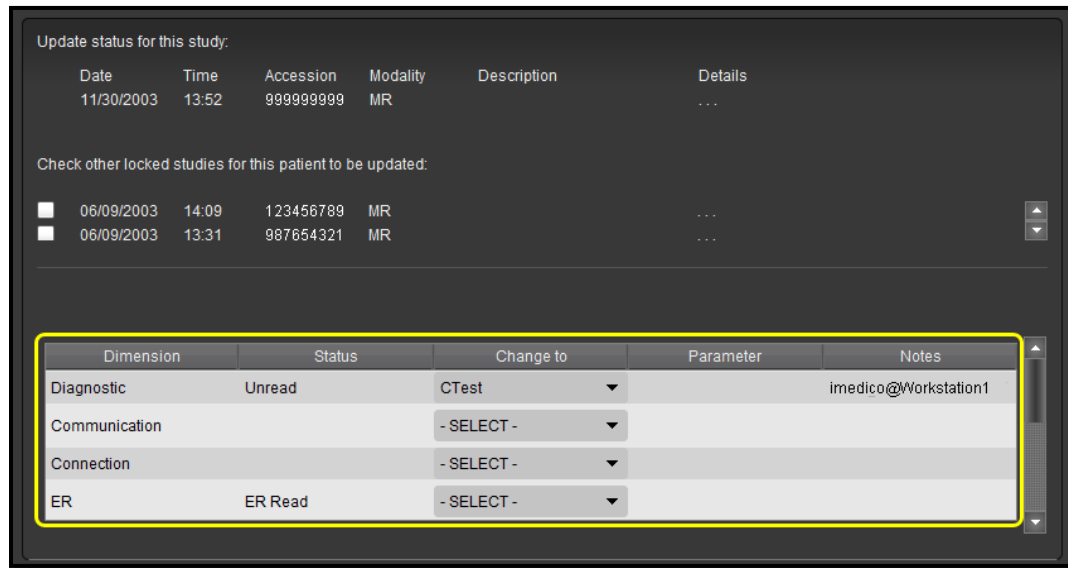
A "Close" button is located at the bottom right of the window.

Accessing the Study and Patient Demographics for a Study

Refer to Section 18.1 below for more information on the Study Details window.

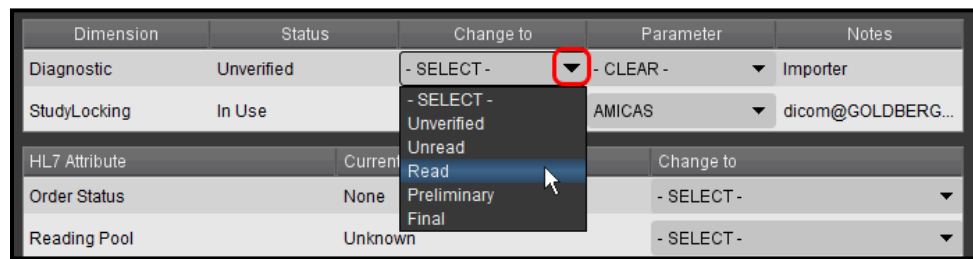
12.2.1. Changing the Workflow Status

The middle section of the Update Study Status window allows you to change the status of the exam, as in the following example:



Change Status Panel

- The actual number of statuses that can be set from the Update Status panel depends on how your system and individual worklist have been configured.
- For each available status type (or “dimension”) you can set the status by selecting the desired option from the drop-down menu for that dimension, as in the following example:



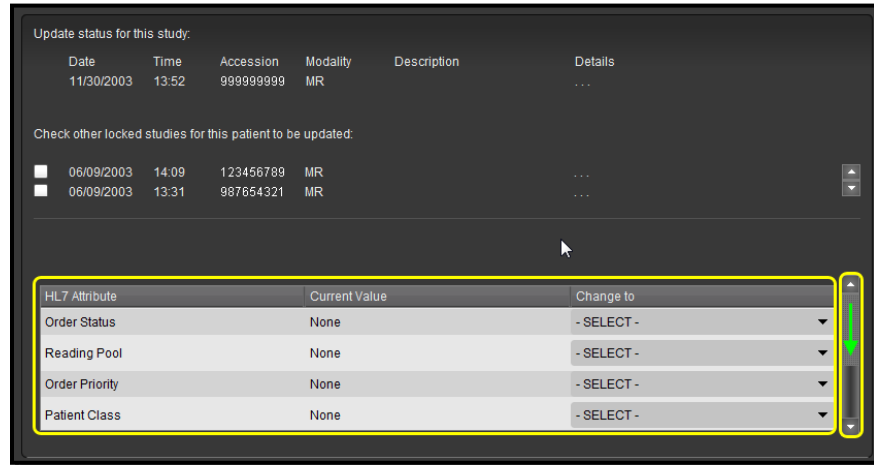
Selecting a Status

- If a particular status dimension has multiple parameters available, you can select the desired parameter for that status from the list of options in the **Parameter** column.
- If desired, you can add a note in the **Notes** column for any status by double-clicking on the column for the desired status and entering the desired text.

NOTE: Depending on the status selected and how your site is configured, you may be required to enter a comment, as described in subsection 12.2.3 below.

12.2.2. Changing HL7 Attributes

If you have login privileges to update HL7 attributes, you can scroll down to the bottom of the middle section of the Update Status window to change one or more select HL7 attributes of the exam, as in the following example:



Change HL7 Attributes Panel

This feature provides users with the ability to override the order status of an exam and is typically only available to administrators and technologists.

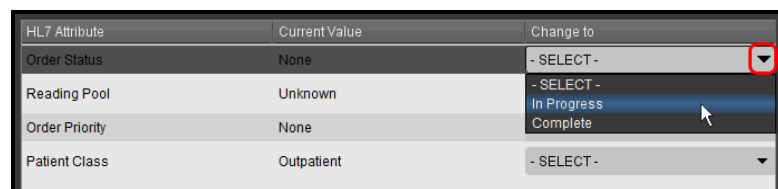
NOTE: If either the order or the accession number is missing for this exam, you will not be able to change the HL7 attributes and a message to this effect will be displayed at the bottom of the window.

NOTE: Changes made to HL7 attributes will be applied only to the primary study and not selected priors.

The following HL7 Attributes can be changed from the Change Workflow Status window:

- **Order Status**
- **Reading Pool**
- **Order Priority**
- **Patient Class**

To change an HL7 attribute, click the drop-down menu for the desired attribute in the **Change** column and select the desired value, as in the following example:



Changing an HL7 Attribute

Sample workflows for the use of this feature include the following:

- Change the **Order Priority** HL7 attribute to increase the status of an order to STAT or to lower the status from STAT to Urgent or Routine (e.g., when a referring physician has requested a Study as STAT just because a patient is waiting during an appointment and it would be more appropriate for the status to be Urgent).
- Change the **Patient Class** HL7 attribute to correct the frequent miscoding of Emergency patients as Outpatient on the RIS.
- Change the **Reading Pool** HL7 attribute in cases where Reading Pool is used to drive worklists and where the assignment may be wrong in some cases (e.g., Neck or Head CT to Neuro instead of MSK).

12.2.3. Entering and Viewing Comments

The bottom section of the Update Study Status window allows you to add a comment to this Study as well as view any previously entered comments, as in the following example:

Comments	By	Commented At
Tumor has grown an additional 2 % since previous visit	Barry Goldberg	09/05/2014 14:51:18
Follow-up comment	Barry Goldberg	09/05/2014 14:50:34
Initial comment	Barry Goldberg	09/05/2014 14:50:08

Adding and Viewing Comments

For information on adding, viewing and deleting comments, refer to subsection 5.1.4 above

12.2.4. Saving Your Changes

When you have finished setting the status, changing the HL7 attributes and/or leaving a comment, click the **Change** button at the bottom of the window to record your changes, close the window and exit the Study. You can also click on the **No Change** button to exit the Study without making any changes or the **Cancel** button to return to the Study without making any changes.

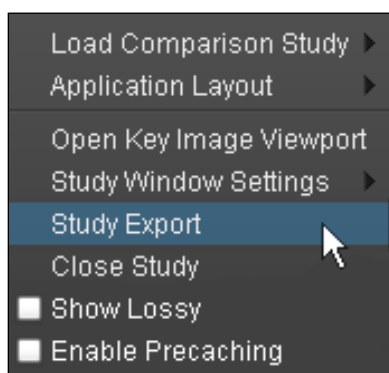
Chapter 13. Exporting Studies



Clicking on the **Burn CD/DVD** icon from a **worklist**, the **Query Page**, the **Patient Record**, the **Local Study** page or the **Recently Viewed** page, as shown on the left, will allow you to export one or more studies for one or more patients to a CD or DVD (if you have a CD writer or DVD burner installed on your Workstation), to a folder on your local Workstation, and/or to a folder on network accessible drive. If desired, you can also export any available prior studies as well as reports, key images, annotations and DICOM AU objects (including VoiceClips created by Merge PACS) associated with the studies.

NOTE: Mammography images that are exported will be displayed without laterality or view position within the CD Viewer, but users can view this information within the DICOM Attributes Viewer for each image.

The Study export feature can also be accessed by selecting **Study Export** from the **Study Right-click Menu**, as in the following example:

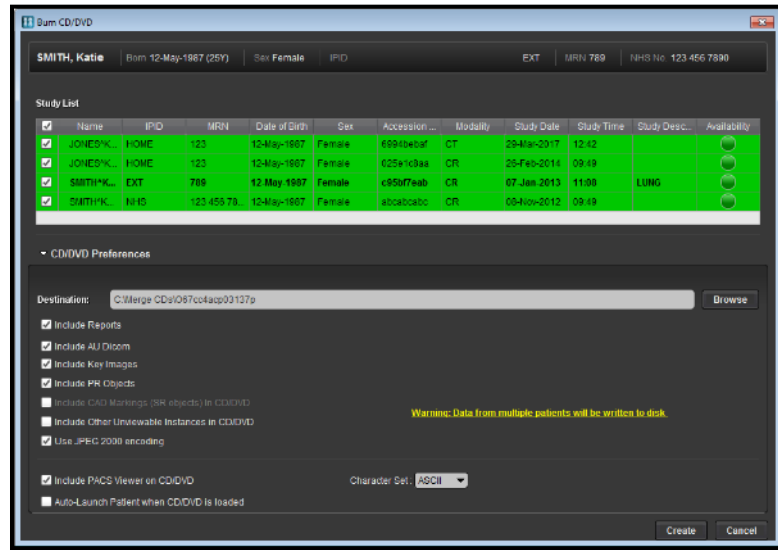


Study Export

The following procedure describes the necessary steps to export one or more studies:

1. Make sure there is a blank CD or DVD in your CD/DVD writer or an empty folder on a local or network accessible drive.
2. Click on the **Burn CD/DVD** icon for the Study you wish to copy (or select **Study Export** from the **Study Right-click Menu** while viewing the Study).

The **Burn CD/DVD** window opens:



The Burn CD Window

The top section of the Burn CD/DVD window contains a **Study List** that displays the primary Study selected at the top with any prior studies below it.





- The list of prior studies is determined by the Patient Comparison Strategy and “Selection of Priors” option configured for your site, as well as Multiple Patient Identity (if MPI is enabled for your site), as described in Appendix C below.
- If one or more prior studies has the same MRN and IPID as a different patient on the Merge PACS Server but is included because it matches the Patient Comparison Strategy and “Selection of Priors” option configured for your site, a yellow warning message will be displayed indicating that data from multiple patients will be included.
- The far right column of the Study List that displays the **Availability Status** indicator for each Study, as in the following example:

Name	IPID	MRN	Date of Bir...	Sex	Accession Nu...	Modality	Study Date	Study T...	Study Description	Availability
Doe^Jonathan	Home	PID000T1	11/11/1911	F	A000T11	CT	01/01/1941	11:11	Thorax*3 CHEST ABD PELVIS	Green
Doe^Jonathan	Home	PID000T1	11/11/2011	M	A000T12	CT	11/11/2011	12:12	Thorax*3 CHEST ABD PELVIS	Green
+ Doe^Jonathan	Home	PID000T1	11/11/2011	M	A000T14	CT	11/11/2011	12:12	Thorax*3 CHEST ABD PELVIS	Green

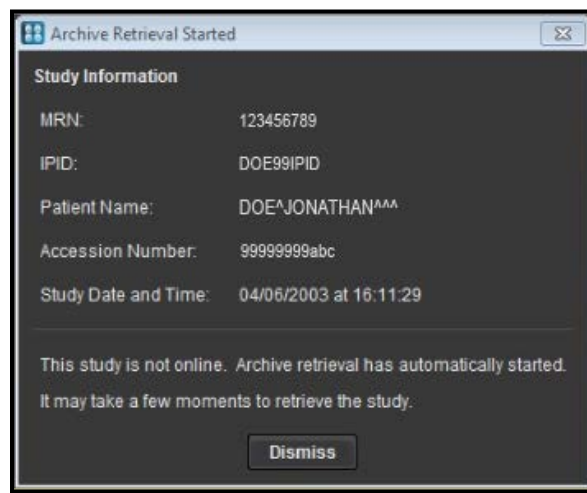
Availability Status Indicator

- The appearance of the indicator indicates the availability of the Study as follows:

Indicator	Color	Description
	Green	The Study is available online for exporting.
	Black	The Study is currently offline and not available for exporting.
	Blue	A request to retrieve the Study has been submitted, but the retrieval process has not yet started.

Indicator	Color	Description
	Black / Green	The Study is currently being retrieved. Note that the percentage of green shown will change to indicate the progress of the retrieval process.
	Orange	Images for this Study are currently being imported for the first time or additional images are currently being added to an existing Study.
	Red	Retrieval of the Study has completed, but with errors (either fewer images were received than expected or all images failed compression)
	Gray	The availability of the Study is currently unknown (this may occur during timeout or error scenarios).

- If the **primary** Study is currently not available online, a retrieval request will automatically be submitted when you first launch the Burn CD/DVD window for that Study and a dialog similar to the following will be displayed:



Retrieval Started

NOTE: Prior studies will not automatically be retrieved when you launch the Burn CD/DVD window for the primary Study. Instead, all selected priors will be retrieved when you click on the **Create** button, as described below.

3. If you wish to export another Study (and any or all of its priors) to the same CD/DVD or folder, leave the Burn Study window open and click on the **Burn CD/DVD** icon (or select the **Study Export** option) for the second Study.

The **Study List** will now display both studies selected and their priors, as in the following example:

<input checked="" type="checkbox"/>	Name	IPID	MRN	Date of Bir...	Sex	Accession Num...	Modality	Study Date	Study Time	Study Description	Availability
<input checked="" type="checkbox"/>	Doe^Jessica	Home	PID000T1	11/11/1911	F	A000T13	CT	01/01/1941	11:11	Thorax^3 CHEST ABD PELVIS	<input type="radio"/>
<input checked="" type="checkbox"/>	Doe^Jessica	Home	PID000T1	11/11/2011	F	A000T12	CT	11/11/2011	12:12	Thorax^3 CHEST ABD PELVIS	<input type="radio"/>
<input checked="" type="checkbox"/>	Doe^Jessica	Home	PID000T1	11/11/2011	F	A000T14	CT	11/11/2011	12:12	Thorax^3 CHEST ABD PELVIS	<input type="radio"/>
<input checked="" type="checkbox"/>	Doe^Joanne	Home	AM-0098	04/05/1965	F	SE0000166	MR	06/09/2003	13:31	C.SPINE^*_C SYN_	<input type="radio"/>
<input checked="" type="checkbox"/>	Doe^Joanne	Home	AM-0098	04/05/1965	F	SE0000168	MR	11/30/2003	13:52	T.SPINE^*_C SYN_	<input type="radio"/>

CD/DVD Preferences

Destination:

Include Reports
 Include AU Dicom
 Include Key Images
 Include PR Objects
 Include CAD Markings (SR objects) in CD/DVD
 Include Other Unviewable Instances in CD/DVD
 Use JPEC 2000 encoding
 Include PACS Viewer on CD/DVD
 Auto-Launch Patient when CD/DVD is loaded

Warning: Data from multiple patients will be written to disk.

Character Set: ASCII

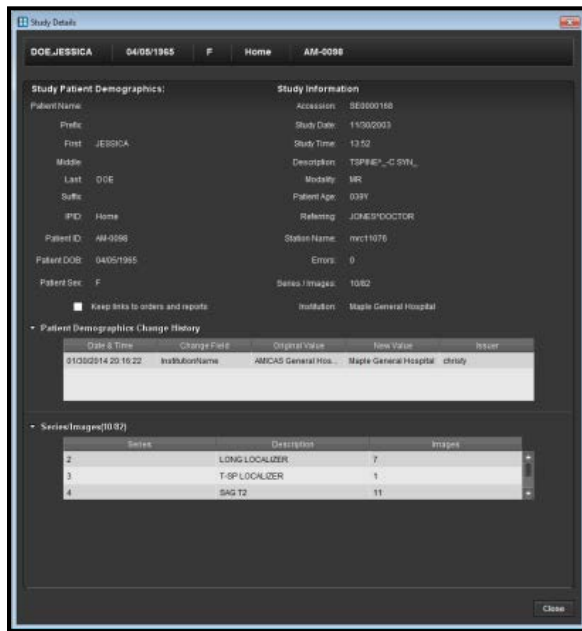
Multiple Studies Selected

CAUTION: If you have selected studies belonging to different patients, a yellow warning message will be displayed informing you of this, as in the example above.

- Use the checkboxes in the Study List to deselect any studies you do not want to be included on the CD/DVD.

NOTE: By default, all prior studies included in the Study List will be selected. The Workstation can be configured, however, to have prior studies unselected by default via the Merge PACS Preferences dialog, as described in Section 24.1 below.

- If desired, you can double-click on any Study in the Study List to view the Study patient demographics for that Study in the **Study Details** window, as in the following example:

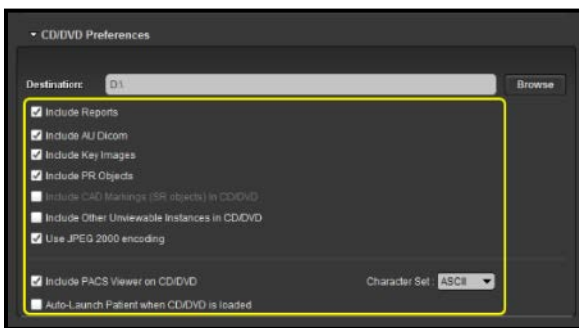


Accessing the Study and Patient Demographics for a Study

Refer to Section 18.1 below for more information on the Study Details window.

NOTE: You cannot edit patient or Study demographics at the Study Details window when accessed from the Burn CD dialog.

- If desired, select one or more options by clicking the applicable checkboxes in the CD/DVD Preferences section of the Burn CD/DVD window, as in the following example:



CD/DVD Burning Options

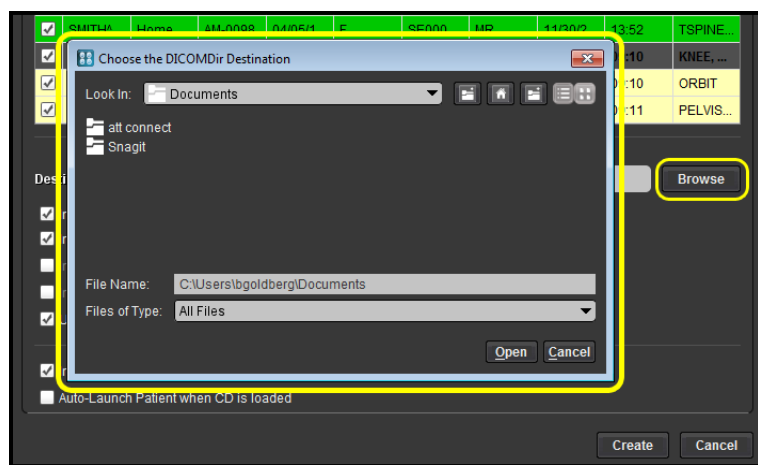
NOTE: You can toggle the display of the CD/DVD Preferences section on and off by clicking on the arrow to the left of the CD/DVD Preferences section heading.

The following options may be available, depending on how your site is configured:

Option	General Description
Include Reports	If selected , any reports associated with the selected studies will be included.
Include AU Dicom	If selected, any audio comments (“VoiceClips”) associated with the selected studies will be included.
Include Key Images	If selected , any key images associated with the selected studies will be included.
Include PR Objects	If selected , any Presentation State objects, including annotations, associated with the selected studies will be included. Note that this option may be disabled on a site-by-site basis.
Include CAD Markings (SR objects) in CD/DVD	If selected , any CAD markings and Structured Reports associated with the selected studies will be included. Note that this option may be disabled on a site-by-site basis.
Include Other Unviewable Instances in CD/DVD	If selected, certain other DICOM objects that are not viewable in the Merge PACS viewer will be included. These include specialized image/object types such as RT images, private SOP classes, or Raw Storage IODs (objects that hold private data types). NOTE: These specialized image / object types may be useful in certain circumstances but may cause problems for the destination PACS when trying to import the studies that contains them. As a result, we recommend that the default selection be to NOT export these to the CD/DVD.
Use JPEG 2000 encoding	If selected , Study images will be compressed using JPEG2000 encoding. This will result in smaller images, but the images may not be viewable by non-Merge PACS viewers. If this option is deselected , images will be burned in uncompressed DICOM format. This will result in larger images, but the images will be viewable by all viewers. Note that this option may be disabled on a site-by-site basis. NOTE: When studies containing compressed multi-frame images are burned to a CD/DVD, deselecting the “Use JPEG 2000 encoding” option will not cause the images to be burned in uncompressed DICOM format (<i>i.e.</i> , the images will not be decompressed before being burned to the CD/DVD).

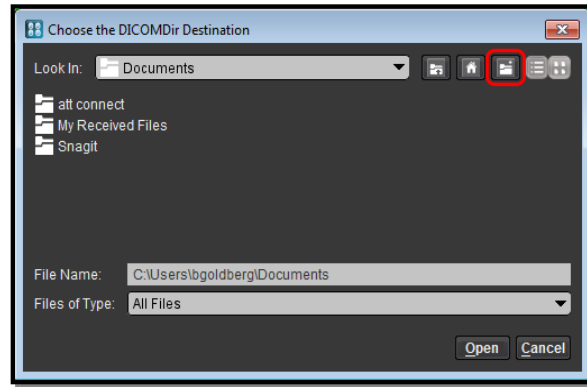
Option	General Description
Include Merge PACS Viewer on CD/DVD	<p>If selected, a thin client version of the Merge PACS Viewer will be included on the disc so that patients can view the images directly from the CD/DVD.</p> <hr/> <p>NOTE: Depending on how your system is configured, this option may instead refer to the Merge eFilm Lite viewer instead of the Merge PACS Viewer. Note that the eFilm Lite Viewer does not currently support display of Key Images and PR Objects, although those items will still be burned onto the CD/DVD if selected.</p>
Auto-Launch Patient when CD/DVD is loaded	<p>If selected, the CD Viewer will automatically be launched when the CD is inserted into the CD drive. If the CD contains a single Study, that Study will automatically be opened in the Viewer. If the CD contains multiple studies, a Study List will be displayed to let the user select the desired Study to open.</p>
Character Set	<p>Select the character-set attribute(s) that OrthoPACS will set in the DICOM Directory (DICOMDIR) that it creates on the CD. The following options may be available:</p> <ul style="list-style-type: none"> ASCII PACS will not set the character set attribute (0008,0005) in the DICOMDIR that it creates on the CD. LATIN1 PACS will set the character set attribute (0008,0005) to "ISO_IR 100" in the DICOMDIR that it creates on the CD. AUTO PACS will set the character set attribute (0008,0005) to the union of the character sets in the patient hierarchy that is being burned to CD.

- Click on the **Browse** button, if necessary, to select the location where the blank CD/DVD or destination folder is located, as in the following example:



Selecting the Desired Location

If you are exporting to folder on a local or network accessible drive and need to create a new empty folder, click the **Create new Folder** icon, as in the following example:



Creating a New Folder

- Click on the **Create** button at the bottom of the window to begin the Study export process.

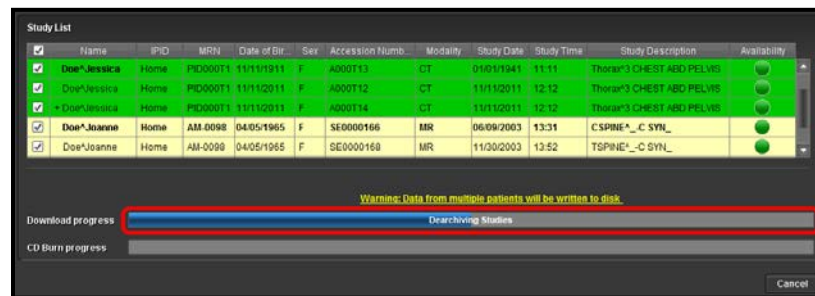
The Study export process proceeds as follows:

- All selected studies are verified to make sure they are eligible for export (i.e., there are no Quality Control operations in progress or waiting in the queue on the Merge PACS Server for the Study, the Study has not been modified on the Server since you viewed it or selected it to be exported, etc.).

NOTE: If a Study has been modified on the Server, a warning will be displayed and you can choose to export the Study anyway. If a QC operation is in progress or in the queue, however, an error will be displayed and you will not be allowed to proceed.

- If Merge PACS is configured to retrieve studies and any of the selected studies are not currently online, a retrieval request will automatically be triggered for those studies. Retrieval will then occur at the same time as the studies that are online are downloaded to your Workstation and the offline studies will be downloaded as soon as they are retrieved. Once all the selected studies have been downloaded from the Server, they will then be exported to the selected CD/DVD or folder.

*The retrieval and downloading progress will be displayed on the **Download progress** bar, as in the following example:*



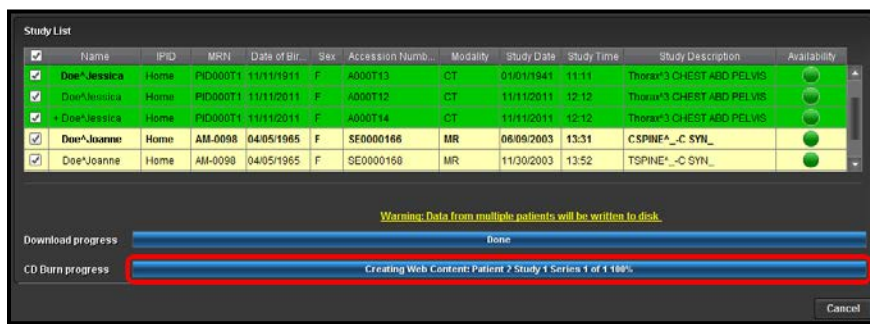
Download Progress

The following messages may appear on the Download progress bar during the download process:

Message	General Description
Dearchiving Studies	All selected studies are currently archived and we are waiting for the studies to be retrieved from archive.
Downloading & Dearchiving Studies	Some of the selected studies are archived and are being de-archived and some of the selected studies are online and are being downloaded.
Downloading Studies	All selected studies are online and are being downloaded

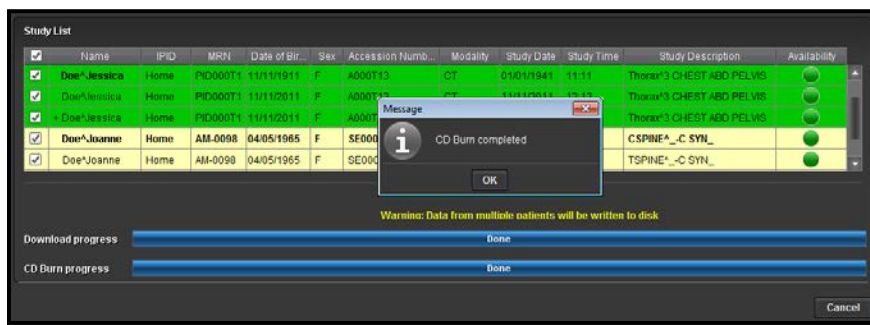
NOTE: At any point during the Download and/or Dearchiving Studies process, you can click **Cancel** button to terminate. If there are any issues, you will be notified of the error(s) and then taken to initial CD/DVD Burn dialog.

- Once all eligible studies are downloaded, the progress of the actual export process will be displayed on the **CD/DVD Burn progress bar**, as in the following example:



CD Burn Progress

- When the export process is complete, a message will be displayed, as in the following example:



CD Burn Complete

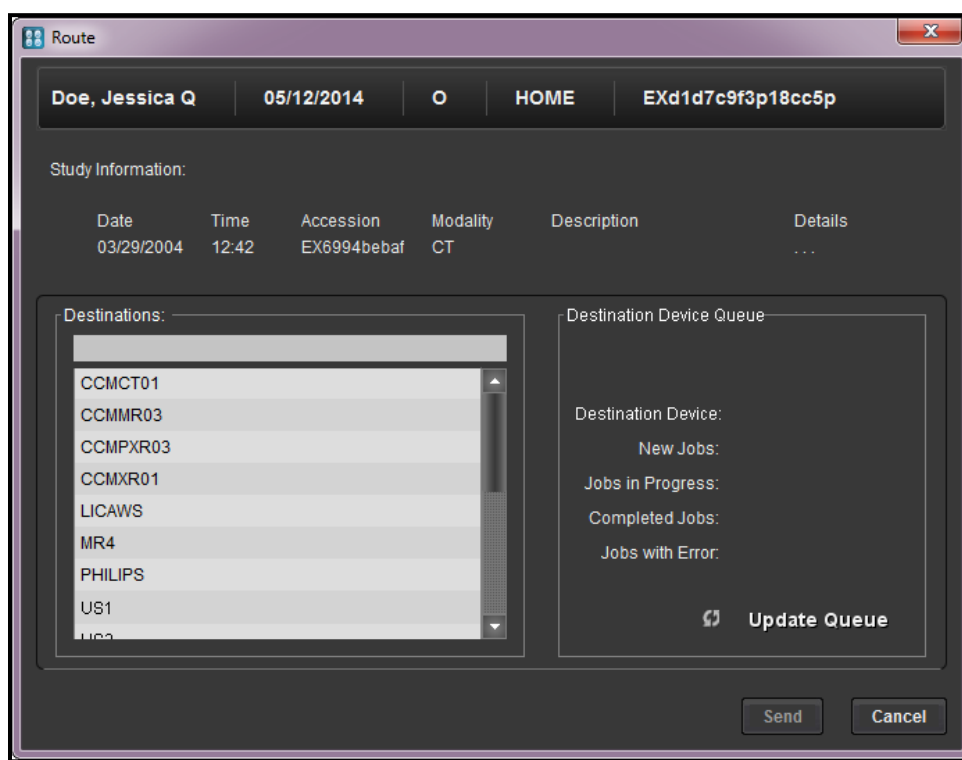
- Click the **OK** button on the message dialog to exit the CD/DVD Burn window.

Chapter 14. Routing Studies to Other Locations



Clicking on the **Route Study** icon from a **worklist** or the **Patient Record**, as shown on the left, will allow you to manually send a Study to another available location (a different Merge PACS Server or a local DICOM device) and to view the transmission status of studies that have been, or are in the process of being, sent.

When you click on the Route Study icon, the **Route Study** window for that Study will be displayed as a separate pop-up window, as in the following example:

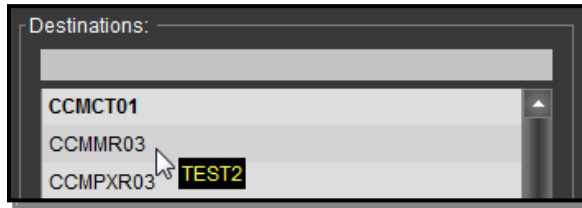


The Route Study Window

Note the following:

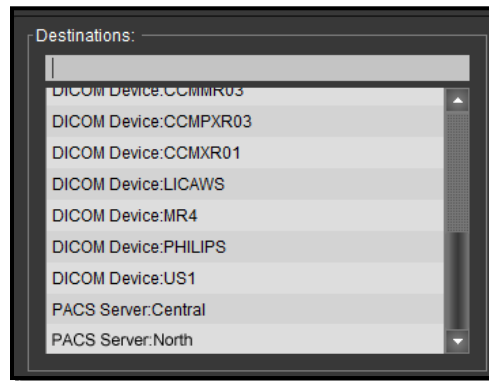
- If Merge PACS has been configured to run in **Standalone** mode, the **Station Name** for each available DICOM device will be displayed if one has been configured for that device. If no Station Name is configured for a device, the device's **AE Title** will be displayed instead.
- If Merge PACS has been configured to run in **Integrated** mode, the **Device Description** defined in the attached iCEA Server will be displayed.

- In all cases, the AE Title can be displayed in a pop-up tool tip by hovering your mouse cursor over the destination's listing, as in the following example:



AE Title Hover Text

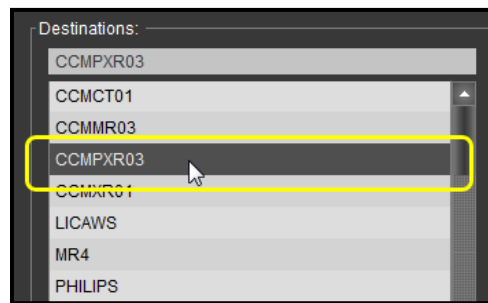
- By default, the list of available **Destinations** is displayed in alphabetical order, except that the five destinations most recently used by you will be displayed at the top of the list for the sake of convenience.
- If both DICOM Devices and PACS Servers are available as routing destinations, each destination listed will be prefaced by either "DICOM Device" or "PACS Server", as in the following example:



DICOM Devices and PACS Servers

To route a study to a DICOM Device:

- Click on the destination to which you want to route the study in the list of available **Destinations**, as in the following example:



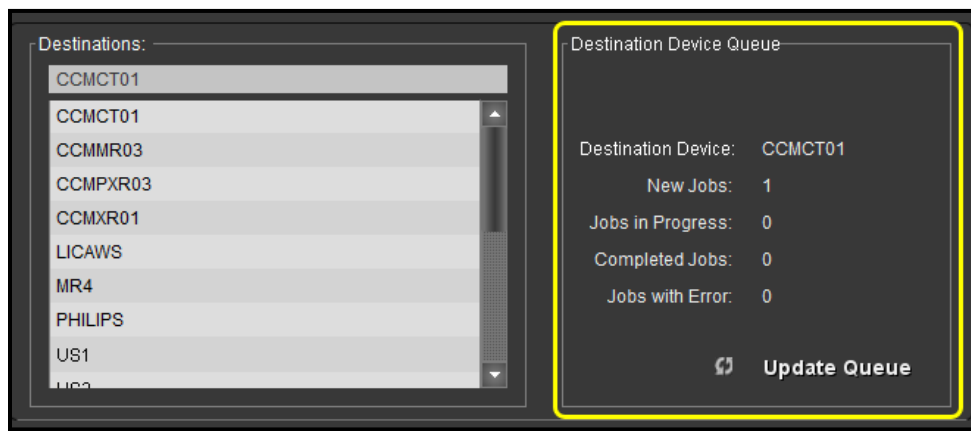
Selecting a Routing Destination

If there are too many destinations listed, you can first filter the list by entering text in the **Destinations** field, as shown in the example below:



Filtering the List of Destinations

2. Once you have selected the destination, click on the **Send** button at the bottom of the window to begin the transfer process. The transfer status will be displayed as in the example below:



Viewing the Transfer Status of a Study

3. Press the **Update Queue** button to refresh the information on the screen.

Chapter 15. Requesting Studies from a DICOM Archive



If your Merge PACS has access to a separate DICOM Archive, clicking on the **Import from DICOM Device** icon from the **Patient Record**, as shown on the left, will allow you to request images from that archive.

When you click on the Import from DICOM Device icon, the **DICOM Q/R – Import from DICOM Device** window will be displayed as a separate pop-up window, as in the following example:

The DICOM Q/R – Import from DICOM Device Window

Once a request has been made, the Study images will then be brought into Merge PACS, where they can be retrieved using the standard Query feature described in Section 3.4. Note that the DICOM Q/R feature is unrelated to the Merge Archive feature.

To request and retrieve a Study from a DICOM archive:

1. Select the desired DICOM Device from the drop-down **DICOM Device** menu, if necessary, and enter one or more of the following search criteria in the appropriate fields:
 - **MRN** (this will be entered by default, but can be changed or removed if desired)
 - **IPID** (this will be entered by default, but can be changed or removed if desired)
 - **Study Date**
 - **Patient Name** (you can use an asterisk at the end of a partial last name as a wildcard. For example, “gold*” will locate patients with the last name Goldberg and Goldstein)
 - **Accession Number**

- Click the **Search** button to send your request to the specified DICOM archive, as in the following example:

Searching for Matching Studies

If any studies are found that match your request, they will be displayed in the window with check boxes next to them, as in the following example:

Select	Accession Number	Date/Time	Modality	Name	DOB	Description
<input type="checkbox"/>	43416780000100		CT	DOE JONATHAN Q	Thu Nov 02 ...	CTFACEWO CT FACIAL WITHO...
<input type="checkbox"/>	43416780000200		CT	DOE JONATHAN Q	Thu Nov 02 ...	CTA NECK CT ANGIO NECK
<input type="checkbox"/>	43416780000100		CT	DOE JONATHAN Q	Thu Nov 02 ...	CTTHOR1 CT THORAX W CONT...
<input type="checkbox"/>	43416780000400		CT	DOE JONATHAN Q	Thu Nov 02 ...	CTTHOR0 CT THORAX WWO CO...
<input type="checkbox"/>	00002460		CR	DOE JOANNE M	Mon Oct 31 ...	ELBOW
<input type="checkbox"/>	SE000252		CR	DOE JENNIFER P	Tue Dec 04 ...	PELVIS

List of Matching Studies

NOTE: If Merge PACS is configured to run in **Integrated** mode with **Multiple Patient Identities (MPI)** enabled, the search will return MPI matches if full IPID and MRN are specified as search criteria. For more information on MPI support, refer to Appendix C.2 below.

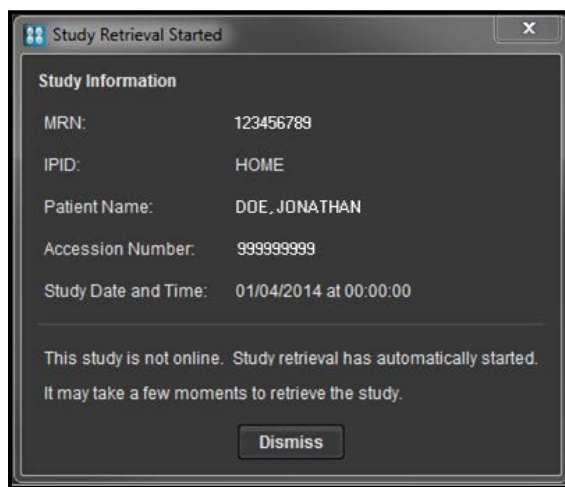
- Select the desired Study or studies and then click on the **Import** button at the bottom of the window. Note that the status of the import process will be displayed at the bottom of the window, as in the following example:

Import Status

- When the importing process is complete, you can close the DICOM Q/R window. The retrieved Study or studies will now be available via the regular Query feature, as described in Section 3.4.

Chapter 16. Viewing Archived Studies

If Merge PACS is configured to retrieve studies and a primary or prior Study is currently not available online, attempting to open the Study in the Primary or Secondary Viewer will automatically trigger a retrieval request. When this occurs, a **Study Retrieval Started** dialog such as the following will be shown:



Study Retrieval Started

NOTE: This dialog will disappear automatically after five seconds or when you click the **Dismiss** button. Clicking the **Dismiss** button will not cancel the retrieval.

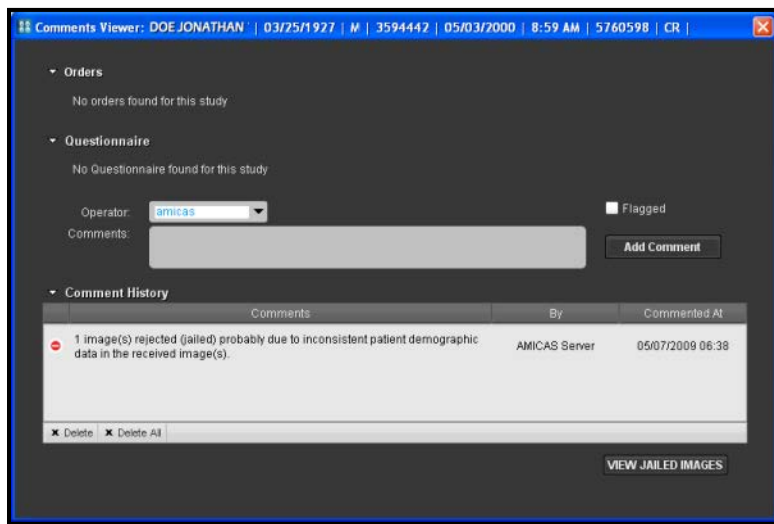
Once the retrieval process has completed, the Study will automatically open in the selected Viewer, except as noted below:

- If another Study is opened in the Viewer while the archived Study is being retrieved, the retrieval process will continue in the background but the Study will need to be manually opened (e.g., by clicking on the **View Study** action icon again) once it is fully online.
- If you are attempting to open the Study in the **Secondary Viewer**, the maximum number of studies that can be automatically opened in simultaneous instances of the Viewer instances (including the Primary Viewer) is configurable on a site-by-site basis. For example, if the maximum number is set to four and there are already four Viewer instances open, attempting to open another offline Study in a Secondary Viewer will cause the Study to be retrieved but will not automatically open it in a Viewer.
- Merge PACS can also be configured to never automatically open retrieved studies in the Secondary Viewer. In this case, the retrieval process will occur in the background and you will need to manually open it in a Secondary Viewer once the process is complete.

Chapter 17. Viewing Jailed Images

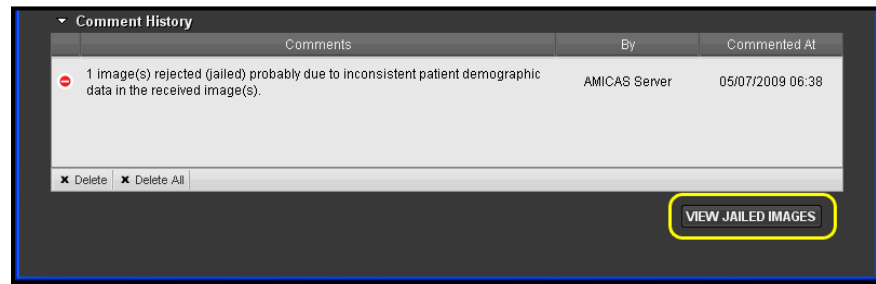
Each image that is sent to Merge PACS from the various imaging modalities has a number of DICOM attributes associated with it to tell Merge PACS which patient and Study the image belongs to. If an image is received by the system with missing DICOM information or else with information that doesn't match images that have already been received for that Study, and Merge PACS has been configured to run in **Standalone** mode, the image is placed into a special folder on the Merge PACS Server called the "DICOM Jail."

As mentioned in subsections 3.5.4, 3.8.3, 3.7.1 and 4.2.3 above, studies with one or more jailed images will have a red warning icon displayed on the Query Page, The Patient Record and within the Merge PACS Viewer. Clicking on the warning icon point will launch a separate pop-up **Comment Viewer** window with the warning message displayed, as shown in the following example:



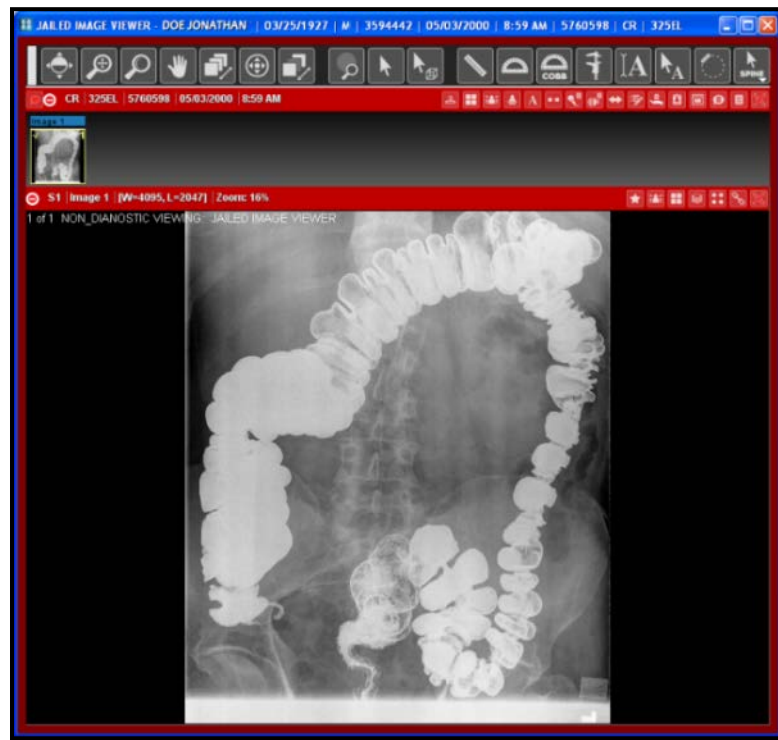
Comment Viewer Window with Warning Displayed

- If the Study has one or more **jailed images** (*i.e.*, images that were not compressed due to missing or mismatched DICOM information) and Merge PACS has been configured to permit viewing of these images, you will see a “VIEW JAILED IMAGES” button at the bottom of the Comment Viewer, as shown in the following example:



View Jailed Image Button

- Clicking on the View Jailed Images button will launch a special Viewer window that will display only the jailed images from that Study, as shown in the following example:



Viewing Jailed Images

- Studies that have jailed images will not appear on a worklist and can only be viewed by using the Query Page.
- This special Viewer window is outlined in red to distinguish it from the regular Viewer window.
- Because the images have not been fully imported, they will not have been compressed and may take longer than usual to display.

Chapter 18. Viewing and Editing Patient and Study Demographics

Depending on your login privileges, you can view and edit patient and Study demographic information from a variety of locations within the Merge PACS Workstation. This can be done from a **Study Details** window that allows you to view and edit both patient and Study demographic information for a particular Study, as well as a **Patient Demographics** window that allows you to view and edit general patient demographic information for a particular patient.

18.1. Study Details Window



The **Study Demographics** icon on the **RealTime Worklist**, the **RealTime Study List**, the **Teaching Worklist** and the Primary Exam Toolbar and Secondary Exam Toolbar within the **Patient Record**, as shown on the left, will display the demographic information for the exam in a separate pop-up **Study Details** window, as in the following example:

The screenshot shows a window titled "Study Details" with a dark background. At the top, it displays patient information: "DOE, JESSICA", "F", "HOME", and "4367". Below this, there are two main sections: "Study Patient Demographics" and "Study Information".

Study Patient Demographics:

- Patient Name: Doe*Jessica****
- Prefix:
- First: JESSICA
- Middle:
- Last: DOE
- Suffix:
- IPID: HOME
- Patient ID: 4367
- Patient DOB:
- Patient Sex: F

Study Information:

- Accession: 123456789
- Study Date: 08/09/2013
- Study Time: 23:40
- Description: HEAD & SPINE CERVICAL WO CONTRAST
- Modality: CT
- Patient Age: 075Y
- Referring: Bronkalla
- Station Name: ID_STATION
- Errors: 0
- Series / Images: 4/165
- Institution: Hartland General

There is a checkbox labeled "Keep links to orders" which is currently unchecked.

▼ Patient Demographics Change History

Date & Time	Change Field	Original Value	New Value	Issuer
10/10/2014 08:30:39	IssuerOfPatientID	Home	HOME	mbronkalla

▼ Series/Images(4/165)

Series	Description	Images
1	2.0	2
2	Spine 2.0	81
3	Bone 2.0	81

A "Close" button is located at the bottom right of the window.

The Study Details Window

- The top section of the Study Details window displays both patient demographic and Study demographic information for this exam.
- The center section of the Study Details window displays the history of any changes that have previously been made to the demographics for this exam.
- The bottom section of the Study Details window displays information about the individual Series that make up this exam.
- If you have access privileges to edit patient and Study information, you can click on the small pencil icon in the upper right-hand section of the window to launch a **patient data editor**, as in the following example:

The screenshot shows a dark-themed window with a header bar containing 'Jones, Jane', 'RemoteClinic', and '1234'. Below the header, there are two main sections: 'Study Patient Demographics:' and 'Study Information'. Under 'Study Patient Demographics:', 'Patient Name:' is 'Jones^Jane^^^'. Under 'Study Information:', 'Accession:' is visible. A yellow pencil icon is circled in the top right corner of the window.

Accessing the Patient Data Editor

NOTE: The Patient Name, Date of Birth and Sex are the calculated values based on consolidated patient information, as described in Appendix C below.

- This will convert the Study demographic information displayed at the top of the window into editable fields, as in the following example:

The screenshot shows the 'Patient Data Editor' window. The header bar contains 'Jones, Jane', '02/03/2014', 'O', 'Home', and '123456789'. The main area is divided into 'Study Patient Demographics:' and 'Study Information'. The 'Study Information' section is highlighted with a red box and contains several input fields: 'Accession:' (72e4f22af), 'Study Date:' (07/30/2012), 'Study Time:' (14:13), 'Description:', 'Modality:' (MR), 'Patient Age:', 'Referring:', 'Station Name:', 'Errors:' (0), 'Series / Images:' (24/1748), and 'Institution:'. Other fields in the 'Study Patient Demographics:' section include 'Patient Name:', 'Prefix:', 'First:', 'Middle:', 'Last:' (Jones), 'Suffix:', 'IPID:' (Home), 'Patient ID:', 'Patient DOB:' (02/03/2014), 'Patient Sex:' (O), and a 'Keep links to orders' checkbox. At the bottom, there is an 'Operator:' dropdown menu (Barry Goldberg) and a 'Reason:' text field.

Editing Study Demographic Information

NOTE: The Patient Demographics information cannot be edited from this window. To edit patient demographics, use the Patient Demographics Window, as described in Section 18.2 below.

NOTE: Study demographics can also be edited from the Quality Control Editor. For more information, refer to the *Merge PACS 7.3 Quality Control Editor Users Guide*.

- Edit the information as necessary.
- Select the **Keep Links to Orders** checkbox if you want to preserve the links between this Study and any orders associated with it.

NOTE: The default state of the **Keep Links to Orders** checkbox is determined by a site configuration, but it is recommended to be selected. If you change the default, it will be preserved for your login.

- Make sure you are selected from the **Operator** drop-down menu
- Enter a reason for the edit in the **Reason** field.
- When finished, click on the **Save Edited Study Details** icon in the upper right-hand section of the window, as in the following example:

The screenshot shows a dark-themed window with the following content:

- Header: Jones, Jane | 02/03/2014 | O | Home | 123456789
- Section: Study Patient Demographics: Study Information
- Fields: Patient Name: Jones^Jane^AAAA | Accession: 72e4f22af
- Icon: A red square icon with a white document and checkmark symbol in the top right corner.

Saving Edited Patient and Study Demographic Information

18.2. Patient Demographics Window



The **Patient Demographic** icon on the main **Patient Record Toolbar**, as illustrated to the left, will display the general demographic information for this patient in a separate pop-up window, as in the following example:

The screenshot shows a pop-up window titled "Patient Demographics" with the following content:

- Header: DOE, JONATHAN | 03/02/1952 | M | 9999999
- Fields: Patient Code: 1234567890 | Creation Date: 12/10/2012 14:50
- Total Studies: 6
- Section: Primary Study
- Table:

Date	Time	Accession	Description	Details
05/05/2000	10:39	5772275	582INE	...
- Section: Comparison Studies (5)
- Table:

Date	Time	Accession	Description	Details
04/13/2004	17:03	2233329	SCREENING MAMMO
04/01/2004	14:08	2206567	SCREENING MAMMO
01/01/2004	15:37	2222222	Screening-Bilateral Ma
03/27/2003	13:34	1309866	4402508 SCREENING
03/18/2003	09:27	1286183	4402505 SCREENING
- Button: Close

The Patient Demographics Window

If you have access privileges to edit patient data information, you can click on the small pencil icon in the upper right-hand section of the window to launch a **patient data editor**, as in the following example:

Accessing the Patient Data Editor

This will cause a number of editable fields to be displayed at the top of the window, as in the following example:

Editing Patient Demographic Information

NOTE: Patient demographics can also be edited from the Quality Control Editor. For more information, refer to the *Merge PACS 7.3 Quality Control Editor Users Guide*.

Edit the information as necessary, make sure you are selected from the Operator drop-down menu, enter a reason for the edit in the **Reason** field and then click on the **Save Edited Study Details** icon in the upper right-hand section of the window, as in the following example:

Saving Edited Patient Demographic Information

NOTE: Select the **Keep Links to Orders** checkbox if you want to preserve the links between this patient and any orders associated with the patient. The default state of the checkbox is determined by a site configuration, but it is recommended to be selected. If you change the default, it will be preserved for your login.

Chapter 19. The Technologist WorkPanel



The **Technologist WorkPanel** icon on the **RealTime Worklist**, the **Patient Record** and the **Study Toolbar** within the Merge PACS Viewer, as shown on the left, is an optional feature that provides a number of different tools commonly used by Technologists in a single window, as in the following example:

The Technologist WorkPanel

Some of these tools can only be found on the Technologist WorkPanel, while others can also be accessed from elsewhere within the Merge PACS Workstation. If the optional Merge RadStream component has been enabled on your system, the Technologist WorkPanel will also contain tools specific to Merge RadStream.

At the Technologist WorkPanel you can do the following:

- View **Patient and Exam Information**
- Set the **verification status** of the Study
- **Manually match** the Study to an order so that the Study will assume the patient demographics of that order.
- **Manually link** the Study to an order so that an outbound HL7 message will be generated for that order.
- Enter **Comments** that can be viewed from within the Order Viewer
- View **Contact Information** for physicians associated with this Study/order
- Change the **Access Control** for this Study/exam

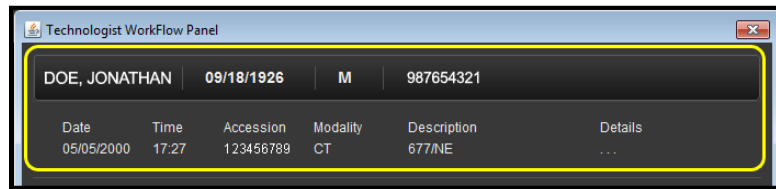
In addition, if the optional Merge RadStream component has been enabled, you can do the following:

- Set the **Communication** and **Connection status** for this Study
- Set **Exam Acuity**

NOTE: If the Technologist WorkPanel is already open for one Study and you click on the Technologist WorkPanel icon for a different Study, a new instance of the Technologist WorkPanel will be opened for the new Study in a separate window.

19.1. Viewing Patient and Exam Information

The top portion of the Technologist WorkPanel displays information about the patient and exam, as in the following example:

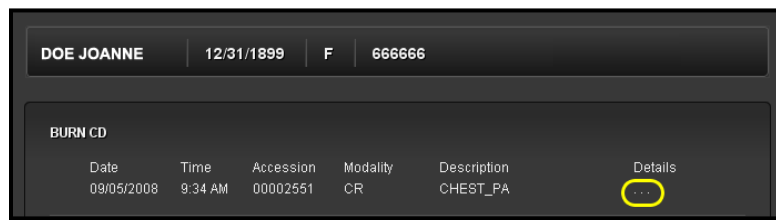


Patient and Exam Information

The following information is displayed:

- Patient Name
- Patient Date of Birth
- Issuer of Patient ID (IPID)
- Patient Medical Record Number (MRN)
- Patient Sex
- Study Accession Number
- Study Modality
- Procedure Date/Time
- Reason for Exam
- Exam Description

In addition, you can click on the ... link in the **Details** column to view the Study demographics for any Study listed, as in the following example:

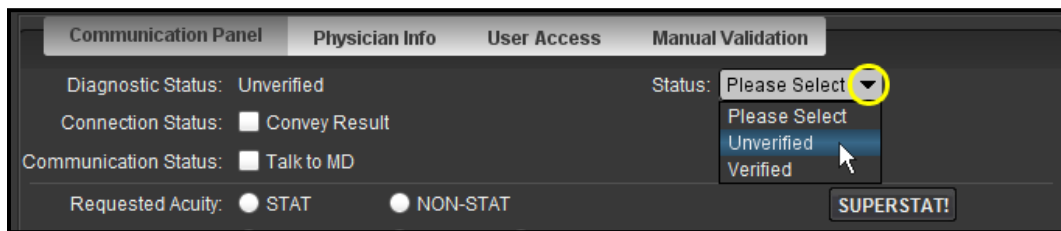


Accessing the Study and Patient Demographics for a Study

Clicking on this link will cause the **Study Details** window to be displayed as separate pop-up window, as described in Chapter 18 above.

19.2. Verifying a Study

Depending on how your system is configured, the Communication Panel tab of the Technologist WorkPanel may include a drop-down **Status** menu, as in the following example:



Setting the Validation Status

NOTE: The Status menu is only available at the default **Communication Panel** tab.

The Status menu allows you to set the validation status of the current Study in the following situations:

- If **Manual Validation** has been enabled for your system, this would primarily be done for **quality control** purposes (*i.e.*, to prevent studies from being forwarded to other Merge PACS Servers or displayed on the Query Page unless they are first manually verified). Depending on how your site is configured, manually setting the validation status of a Study to “Verified” might also trigger the automatic assignment of that Study to a pre-defined group of users.
- If **Automatic Validation** has been enabled for your system, this would primarily be done to override the validation and allow a Study to be forwarded to another Merge PACS Server despite the fact that it failed automatic validation.

NOTE: In general, it is recommended that the underlying problem be fixed (*i.e.*, by using the **Manual Order Matching** feature described in Section 19.3, below or using the **Problem Studies Tool** described in the *Merge PACS 7.3 Administration Manual* rather than simply manually setting the validation status here.

Click the **Save** button to submit your status. You can then exit the Technologist WorkPanel by clicking the red **X** in the upper right-hand corner of the window.

NOTE: If you accessed this Study via the RealTime Worklist, setting the validation status to “Verified” will change the Study’s **workflow status** on the worklist from **Unverified** to **Unread** (or the equivalent names for your site). Conversely, setting the validation status to “Unverified” will change the Study’s workflow status to **Unverified** (or the equivalent thereof).

19.3. Manually Matching an Order to the Study

If **Automatic Validation** has been enabled and configured to check for **matching orders** (“Order Matching Validation”), the system will automatically flag as “Unverified” any Study for which it cannot find a matching order. Rather than simply overriding the automatic validation and manually setting the validation status, as described in the preceding Section, you can use the Technologist WorkPanel to you search for orders currently in the system and manually match one of those orders to the current Study, at which point the Automatic Validation process will re-validate the Study and change the status to “Verified.”

If **Automatic Validation** has **not** been enabled (or if it has been configured to check for something other than matching orders), you can still use the Technologist WorkPanel to you search for orders currently in the system and manually match one of those orders to the current Study. Once this is done, however, the status of the Study will not be changed.

Clicking on the **Manual Validation** tab will cause the Manual Validation section of the WorkPanel to be displayed instead of the default Communication Panel, as in the following example:

The screenshot shows the 'Manual Validation' tab selected. The search criteria are set to 'Accession Number' and 'Last 7 Days'. The 'Match Order' button is located at the bottom left of the search area.

The Manual Validation Section

Click on the arrow to the left of **Orders Available for Matching** to display a list of all orders from this modality that are not currently matched with a Study, if any, as in the following example:

Patient Name	Accession	MRN	DOB/S	Station	Scheduled Time	Description
DOE, JONATHAN	123456789	987654321	01/23/1944 /O	null	12/22/2012 @00:00	677/NE

The Manual Validation Section

If the desired order is not displayed, you can use the **Search for Orders** section to locate the correct order:

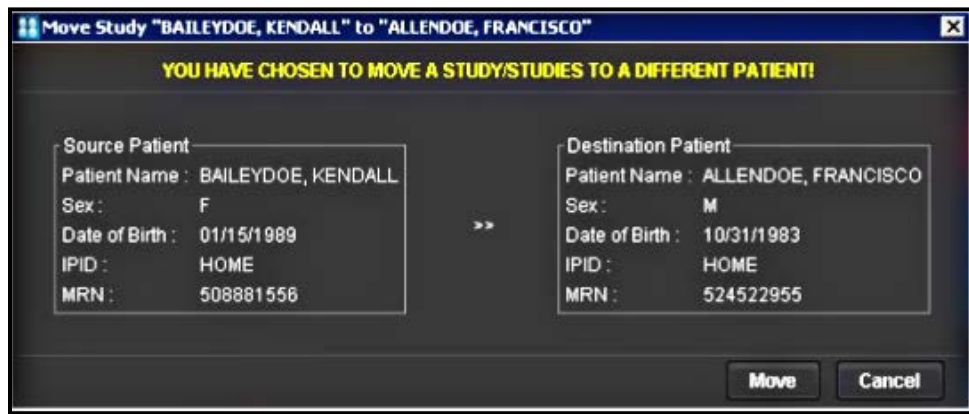
- Select a search criterion from the **Search by** drop-down menu and enter a value to match in the field next to the menu.

NOTE: If searching by **Station Name** or **Patient Name**, you can use an asterisk (*) as a wildcard character.

- If desired, you can select a pre-defined date range for your search by clicking on the **Date** option and selecting from the drop-down Date menu.
- Alternatively, you can enter a specific date range by clicking on the **Range** option and then entering a starting and ending date in the fields provided.
- If desired, you can opt to only show orders that are not currently associated with any studies by selecting the **Show only unlinked orders** option.
- If desired, you can also change the number of results to be displayed per page from the drop-down **Results per page** menu.
- When finished, click on the **Search** button to generate a list of orders matching your query.

Once you have located the desired order, click on the **Match Order** button for that order to manually match it with the Study currently open in the Viewer.

If the selected order is for a different patient, a warning dialog such as the following will be displayed:



Moving a study to a Different Patient

Click **Move** to continue the operation or **Cancel** to cancel the operation.

NOTE: Once an order is manually matched with the Study, the Study will assume the patient demographics of that order.

19.4. Manually Linking Multiple Orders to the Study

Occasionally, a situation might arise where multiple orders are generated for a Study but the Study is only linked to one of those orders. If you are using a dictation system that will only generate reports for orders that are associated with a Study, you can manually link all orders associated with the current Study to that Study and cause a notification message to be sent to the dictation system.

If your system is configured with this feature enabled, clicking on the **Order Link Notification** tab will cause the Order Link Notification section of the WorkPanel to be displayed instead of the default Communication Panel, as in the following example:

Order Link Notification Section

Click on the arrow to the left of **Orders Available for Matching** to display a list of all orders from this modality that are not currently matched with a Study, if any, as in the following example:

Patient Name	Accession	MRN	DOB/S	Station	Scheduled Time	Description
DOE, JONATHAN	123456789	987654321	01/23/1944 /O	null	12/22/2012 @00:00	677/NE

Unlinked Orders from this Modality

If the desired order is not displayed, you can use the **Search for Orders** section to locate the correct order:

- Select a search criterion from the **Search by** drop-down menu and enter a value to match in the field next to the menu.

NOTE: If searching by **Station Name** or **Patient Name**, you can use an asterisk (*) as a wildcard character.

- If desired, you can select a pre-defined date range for your search by clicking on the **Date** option and selecting from the drop-down Date menu.
- Alternatively, you can enter a specific date range by clicking on the **Range** option and then entering a starting and ending date in the fields provided.
- If desired, you can opt to only show orders that are not currently associated with any studies by selecting the **Show only unlinked orders** option.
- If desired, you can also change the number of results to be displayed per page from the drop-down **Results per page** menu.
- When finished, click on the **Search** button to generate a list of orders matching your query.

Once you have located the desired order, click on the **Notify Order Link** button to manually send a message to the dictation system stating that the selected order is linked to the current Study.

NOTE: Only one message can be sent at a time. If a message needs to be sent for an additional order, you will need to re-run your search and click on the **Notify Order Link** button again.

19.5. Adding Comments to a Study

You can add a comment about this Study that will be saved on Merge PACS and can be viewed later by entering your comment at the Technologist Workstation, as in the following example:

The screenshot shows the 'Communication Panel' tab in the Technologist Workstation. It includes the following elements:

- Diagnostic Status:** Unverified
- Connection Status:** Convey Result
- Communication Status:** Talk to MD
- Requested Acuity:** STAT NON-STAT
- Subjective Acuity:** Extreme Moderate Mild
- Patient Waiting:** YES NO
- Patient/Parent Anxiety:** YES NO
- Requesting MD Anxiety:** YES NO
- Status:** Please Select (dropdown menu)
- Standard Comments:** (dropdown menu)
- Comments:** Tumor shows 5% growth since last visit (text field, highlighted with a yellow border)
- Commentor:** bgoldberg (dropdown menu)
- Buttons:** Publish (checked), SAVE, CLEAR
- Label:** SUPERSTAT!

Adding a Comment

- To add a comment:
 - Make sure the **Communication Panel** tab is being selected.
 - Enter the desired text in the **Comments** field.
 - Make sure that your user name is correctly displayed in the **Commenter** box.
 - Click the **Save** button to submit your comment and close the Technologist WorkPanel, or click the **Clear** button to clear the comments field before submitting. Note that once you have submitted a comment by clicking the **Save** button you cannot delete it.
- Once you have entered a comment, it will be displayed below the Comments field together with any previous comments or warnings (including system generated warnings), as in the following example:

The screenshot shows a dark-themed interface for adding comments. At the top, there is a dropdown menu set to "Standard Comments". Below it is a text input field labeled "Comments:". Underneath the input field is a "Commenter:" label followed by a dropdown menu showing "amicas", a checked "Publish" checkbox, and "SAVE" and "CLEAR" buttons. Below the form is a section titled "Comment History (1)" which contains a table with one row of data. The table has columns for "Comments", "By", and "Commented At". The row contains the text "Tumor shows 5% growth since last visit.", the name "bgoldberg", and the timestamp "03/30/2012 17:4...". A yellow box highlights the "Comment History" section.

Comments	By	Commented At
Tumor shows 5% growth since last visit.	bgoldberg	03/30/2012 17:4...

List of Comments

- By default, the most recent comment will be accessible from the Query Results page and RealTime Worklist. If you do not want it to be accessible from the Query Results page and RealTime Worklist, make sure that the checkbox marked "**Publish**" is **not** selected.
- Comments entered here will also appear in the Order Viewer, as described in Chapter 4.12 above.

19.6. Setting the Communication and Connection Status for a Study

If the optional Merge RadStream component has been enabled, you can set two common statuses for the current Study/order directly from the Technologist Workstation without needing to select them from drop-down menus, as shown in the following example:

Communication Panel Physician Info User Access Manual Validation

Diagnostic Status: Unverified Status: Please Select

Connection Status: Convey Result

Communication Status: Talk to MD

Setting Status from the Technologist WorkPanel

- Make sure the **Communication Panel** tab is selected.
- To set the Communication status for this Study/order to “Convey Result”, select the **Convey Result** checkbox.
- To set the Connection status for this Study/order to “Talk to MD”, select the **Talk to MD** checkbox.
- Click the **Save** button to save your changes.

NOTE: The names of the Communication and Connection status options displayed at the WorkPanel will reflect the actual status names defined for your site.

19.7. Viewing Physician Contact Information

Clicking on the **Physician Info** tab will allow you to view contact information for any physician associated with this Study/order (Ordering Physician, Referring Physician, Attending Physician or Other Physician), as in the following example:

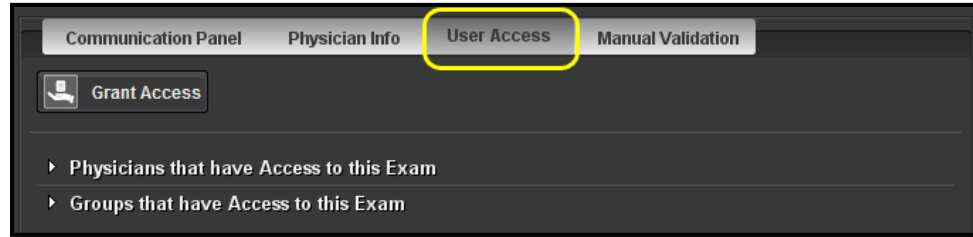
Date	Time	Accession	Modality	Description	Details
10/30/2006	13:22	567567	CR	Shoulder CR	...

Type	Name	Phone	Fax	Address
Referring	Medico, Ima	617-555-1234	617-555-9999	100 Main St., Melrose, MA
Reading	Medico, Yura	617-555-11111	617-555-8888	10 Maple St., Fitchberg...

Physician Contact Information

19.8. Granting Access to a Study/Exam

If you have the login privilege to grant other users access to exams, you can do so by clicking on the **User Access** tab on the Technologist Workstation to display the User Access section, as shown in the following example:

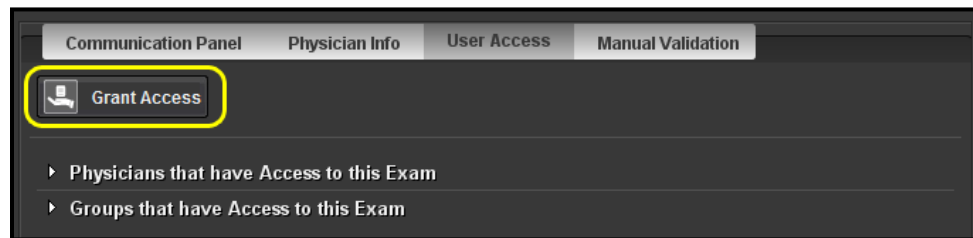


The User Access Section

The User Access section lists all physicians and groups that currently have access to this Study/exam. Click on the white triangles to expand or hide each individual list.

NOTE: Depending on how Merge PACS is configured, some users and groups may have unrestricted access to all studies/exams. These users and groups will not be displayed, since their access can neither be granted nor revoked.

To grant or revoke access to this Study/exam, click on the **Grant Access** link, as in the following example:



The Grant Access Link

This will cause the **Grant Access** screen to appear as a separate pop-up window, as in the following example:

The screenshot shows a window titled "Grant Access" for patient "DOE, JONATHAN" (DOB: 09/18/1926, M, ID: 987654321). It displays a table of access grants with columns: Date, Time, Accession, Modality, Description, and Details. Below the table is a "Find Physicians" section with a "Provider Name" dropdown and a "Find Physicians" button. A table with columns "Login", "Name", "Code", "Email", "Phone", and "Address" is shown below. The "Comments" section includes a text area, checkboxes for "Assign Group Access Also" and "Send Notification", and a "Commentator" dropdown set to "amicas". At the bottom, there are expandable sections for "Physicians that have Access to this Exam" and "Groups that have Access to this Exam", and a "Close" button.

The Grant Access Window

- Refer to Chapter 11 above for information regarding the Grant Access window.
- When finished, click on the **Close** button at the bottom of the window.

19.9. Setting Exam Acuity

If the optional **Merge RadStream** component is enabled for your system, the Technologist WorkPanel can also be used to enter information that will allow Merge RadStream to determine the acuity for this Study, as in the following example:

The screenshot shows the "Communication Panel" tab with a "Setting Acuity" section highlighted by a yellow box. The section includes:

- Diagnostic Status: Unverified
- Connection Status: Convey Result
- Communication Status: Talk to MD
- Requested Acuity: STAT NON-STAT
- Subjective Acuity: Extreme Moderate Mild
- Patient Waiting: YES NO
- Patient/Parent Anxiety: YES NO
- Requesting MD Anxiety: YES NO

 To the right, there is a "Status" dropdown menu set to "Please Select" and a "SUPERSTAT!" button.

Setting Acuity

NOTE: Exam Acuity is only available at the default **Communication Panel** tab.

Studies that are assigned a higher acuity score by the system will appear higher up in worklists that are set up to be sorted by acuity. The questions shown on the Technologist WorkPanel are one factor the system uses to set acuity scores.

Answer the questions by clicking on the radio buttons next to the desired response and then click on the **Save** button to record your answers.

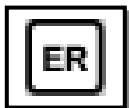
Depending on how your system is configured, the Technologist Workstation may also contain a **SUPERSTAT!** button, as in the following example:

The screenshot shows a software interface with several tabs: 'Communication Panel', 'Physician Info', 'User Access', and 'Manual Validation'. Under 'Communication Panel', there are fields for 'Diagnostic Status: Unverified', 'Connection Status: Convey Result', and 'Communication Status: Talk to MD'. Below these are radio button options for 'Requested Acuity' (STAT, NON-STAT), 'Subjective Acuity' (Extreme, Moderate, Mild), 'Patient Waiting' (YES, NO), 'Patient/Parent Anxiety' (YES, NO), and 'Requesting MD Anxiety' (YES, NO). A yellow rectangular box highlights a button labeled 'SUPERSTAT!' on the right side of the panel.

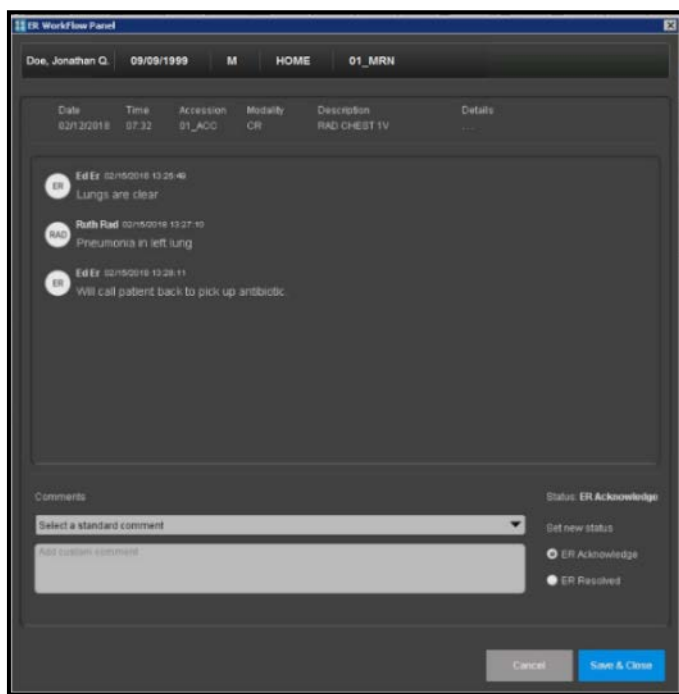
The SUPERSTAT! Button

- If this option is available, clicking on the SUPERSTAT! button will cause the Study in question to be assigned an acuity score that will exceed anything that is currently on the worklist, thereby enabling it to move right to the top.
- Once SUPERSTAT has been enabled, click on the **Save** button to apply the status and close the Technologist WorkPanel.
- Note that once the SUPERSTAT! button has been clicked, the rest of the acuity options will be disabled and the SUPERSTAT! button itself will be replaced with a **Cancel SuperStat** button.

Chapter 20. The ER WorkPanel



The **ER WorkPanel** icon on the **RealTime Worklist**, the **Patient Record** and the **Study Toolbar** within the Merge PACS Viewer, as shown on the left, is an optional feature that enables a status-driven workflow between ER physicians and radiologist, as shown in the following example:



The ER WorkPanel

NOTE: The ER WorkPanel can be configured to always open automatically whenever a study is launched (which would be standard for ER physicians) or conditionally, either whenever a study has one or more specified ER statuses (as might be standard for radiologists) or when the conditions of a specified rule are met, as described in subsection 24.1.1 below.

At the ER WorkPanel you can do the following:

- View **Patient** and **Exam** Information.
- Set the **ER Status** for this Study.
- **Enter a Comment** (or select a **Standard Comment**, if any have been defined for your system) to explain the reason for the selected status.
- **View Past Comments** that have been entered for this Study.

The available ER status options on the ER WorkPanel will be determined by the type of user accessing the WorkPanel (e.g., ER physician vs. radiologist) as well as the current point in the workflow, as custom defined for your system. For example:

- When an ER physician first opens a study, he or she may be presented with the option of setting the ER status to “ER Positive” or “ER Negative”.
- When a radiologist later reviews the study, he or she may be presented with the option of setting the ER status to “Rad Agree” or “Rad Disagree”.
- If the radiologist sets the status to “Rad Disagree”, the ER physician might then be presented with the option of setting the ER status to “ER Acknowledge” or “ER Resolved” the next time they access the ER WorkPanel for this exam.

The selected status can also be used to determine in which worklist block the exam will appear within specific RTWL or RTSL worklists.

Chapter 21. The Communication WorkPanel



If the optional Merge RadStream component is enabled for your system, the **Communication WorkPanel** icon on the **RealTime Worklist**, the **Patient Record** and the **Study Toolbar** within the Merge PACS Viewer, as shown on the left, will launch the Communication Workpanel, as in the following example:

Date	Time	Modality	Accession	Status
Feb 22, 2016	10:12:58	SR	GMRC-123	COMPLETE
Sep 24, 2007	06:36:59	SR	GMRC-123	
Sep 20, 2007	22:45:06	SR	GMRC-123	

Comments	By	Commented At
Tumor has grown an additional 20% since previous visit	Super User	02/22/2016 13:11:08
Follow-up Comment	Super User	02/22/2016 13:10:52
Initial Comment	Super User	02/22/2016 13:04:17

The Communication WorkPanel

The Communication WorkPanel provides a mechanism for an authorized user (the "Operator") to do the following:

- See **contact information** for the various physicians associated with a Study (Ordering Physician, Referring Physician and Radiologist)
- View a copy of the **reports** associated with this Study, if any, with relevant portions highlighted for non-PDF reports
- **Enter comments** regarding the contact made or attempted with each Physician and view a log of previously entered comments
- Set the **Communication** and **Connection status** for this Study
- Print the contents of the Communication WorkPanel

21.1. Viewing Physician Contact Information

Depending on how your system is configured, the Communication WorkPanel will allow you to view contact information for any physician associated with this Study/order (Ordering Physician, Referring Physician, Attending Physician or Other Physician) as well as the Radiologist, as in the following example:

The screenshot displays the Communication WorkPanel interface. At the top, 'Patient / Exam Information' includes fields for Name (IMAGPATIENT1209, 1209), DOB (12/31/1957), MRN (000-00-1209), IPID (HOME), Sex (M), Accession (GMRC-123), Modality (SR), Procedure Start Date/Time (09/20/2007 22:40), Reason For Exam (n/a), and Exam Description (Composer).

The 'Contact Info' section on the left is highlighted with a yellow box. It contains a 'Physician' dropdown menu (set to 'Not Available'), a 'Name' dropdown menu (set to 'Not Available'), and input fields for 'Phone' and 'Fax'. Below this is the 'Radiologist' section with 'Name' and 'Home Phone' input fields, and an 'Offline' status indicator with a red square.

The 'Communication Log' section features a table with columns for Date, Time, Modality, Accession, and Status. The log contains three entries:

Date	Time	Modality	Accession	Status
Feb 22, 2016	10:12:58	SR	GMRC-123	COMPLETE
Sep 24, 2007	06:36:59	SR	GMRC-123	
Sep 20, 2007	22:45:06	SR	GMRC-123	

Below the table, the 'Observation Date' is 02/22/2016 10:12:58, the 'Interpreter' is MP, RADIOLOGIST, (10), and the 'Transcriptionist' is MP, TRANSCRIPTIONIST, (30). The 'PROCEDURE' is Obstetricalultrasound, the 'HISTORY' is Check growth, and the 'COMPARISON' is None. The 'FINDINGS' section contains the text: 'An OB ultrasound was performed. There is a single liveintrauterine pregnancy in a cephalic presentation. The loweruterine segment is clear. There is no evidence of placentalaprevia or abruption. The placenta lies anteriorly. Thecervical length is 4.2 cm.'

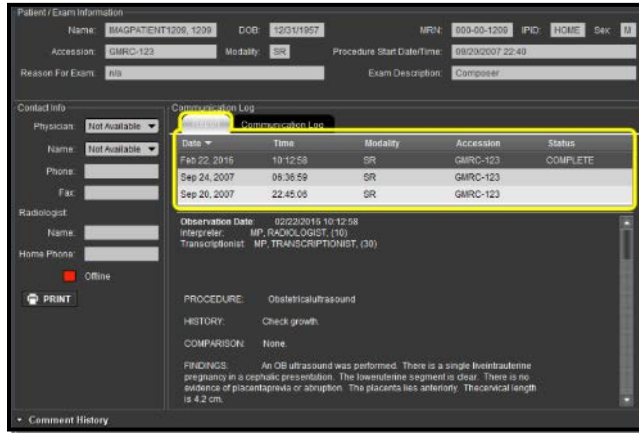
At the bottom left, there is a 'PRINT' button and a 'Comment History' dropdown menu.

Physician Contact Information

- To view the contact information for a particular physician associated with this Study/order, select the type of physician from the **Physician** drop-down menu, followed by the name of the desired physician from the **Name** drop-down menu. If available, that physician's contact information will then be displayed.
- If information for the Radiologist is available for this Study, it will be displayed below the Physician information together with a note indicating whether he or she is currently online or not.

21.2. Viewing Reports

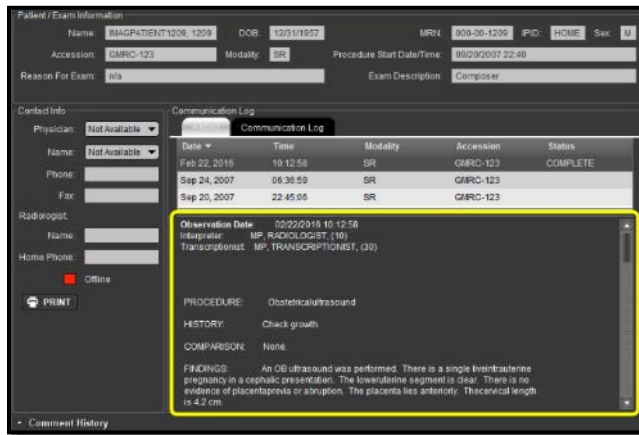
If there are any reports associated with this Study, they will be listed in the **Communication Log** section of the Communication WorkPanel under the **Report** tab, as shown in the following example:



Report Tab Showing List of Reports

NOTE: The Reports tab can display DICOM-wrapped Structured Reports (SRs) and encapsulated PDFs in addition to standard HL7 text reports.

By default, reports are listed at the top of the Report Viewer in reverse chronological order (*i.e.*, with the most recent report displayed at the top of the list). Also, by default, the content of the first report on the list will be displayed in the main part of the Report tab, as in the following example:

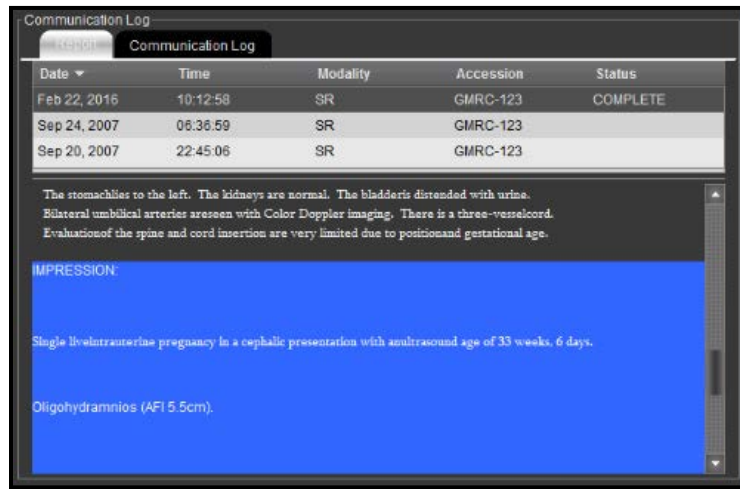


Report Displayed in Reports Tab

You can click on any other report listed in the table of available reports to have that report displayed in the main part of the Report tab.

21.2.1. Highlighted Reports

Depending on how your system is configured, key portions of non-PDF reports may be highlighted, as in the following example:



The screenshot shows a 'Communication Log' window with a table of reports and a text area below it. The table has columns for Date, Time, Modality, Accession, and Status. The text area contains a report snippet with the 'IMPRESSION' section highlighted in blue.

Date	Time	Modality	Accession	Status
Feb 22, 2016	10:12:58	SR	GMRC-123	COMPLETE
Sep 24, 2007	06:36:59	SR	GMRC-123	
Sep 20, 2007	22:45:06	SR	GMRC-123	

The stomachies to the left. The kidneys are normal. The bladder is distended with urine. Bilateral umbilical arteries are seen with Color Doppler imaging. There is a three-vessel cord. Evaluation of the spine and cord insertion are very limited due to position and gestational age.

IMPRESSION

Single live intrauterine pregnancy in a cephalic presentation with an ultrasound age of 33 weeks, 6 days.

Oligohydramnios (AFI 5.5cm).

Highlighted Report

The highlighting is done automatically based on keywords typically contained in reports (such as “impression” or “findings”).

21.2.2. Customizing the List of Reports

You can temporarily change both the order in which the reports are listed and the data columns that are included in the table of available reports. These changes will persist only during the current session of the Communication WorkPanel and will not be preserved.

a. Changing the Sort Order

By default, reports are sorted by date and listed in reverse chronological order, but you can change that temporarily by clicking on any column header to sort according to that column. Clicking on that same column header will still sort by that column, but will reverse the sort order. For example, if the list is already being sorted by date, clicking on the **Date** column header multiple times will switch between displaying the most recent report at the top and displaying the oldest report at the top. Clicking on the **Modality** column header, on the other hand, will cause the list to be sorted alphabetically by modality type and clicking on that column header multiple times will switch between alphabetical (a-z) and reverse alphabetical (z-a) sorting.

NOTE: The column currently used to sort the reports will have a small white triangle included in its header.

b. Configuring the Columns to Display

By default, the list of available reports includes columns for **Date**, **Time**, **Modality**, **Accession** and **Status**. You can temporarily change the columns to be displayed, however, by right-clicking on any heading to display a list of available columns, as in the following example:



Configuring Columns to Display

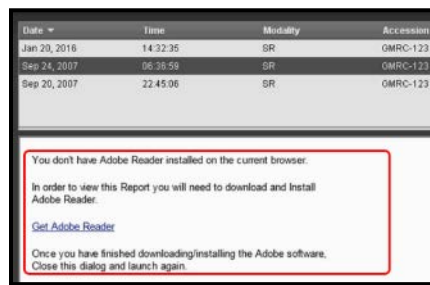
Check or uncheck the box next to any column to configure whether it should be displayed or not.

NOTE: The **Status** column displays the diagnostic status that was set for each report when the report first arrived into Merge PACS.

NOTE: Columns for one or more **Study Type Groups** may be displayed if Merge PACS is configured to run in **Integrated** mode and the attached iCEA Server is set up to tag studies according to Study Type with multiple study types associated with one or more Study Type Groups (e.g., an "OLOGY" group that would include Cardiology, Radiology and Neurology study types).

21.2.3. Viewing PDF Reports

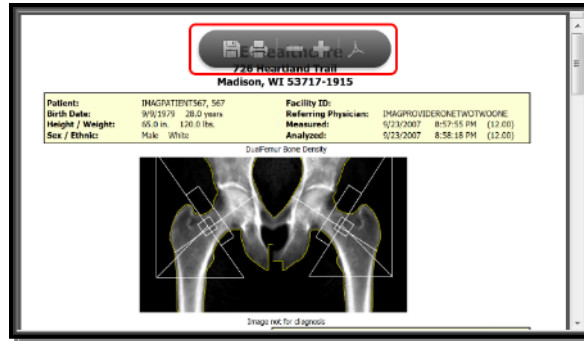
In order to view reports in PDF format, the Adobe Reader plugin must be installed on the Workstation browser. If it is not currently installed, you will be prompted to install it when you attempt to view a PDF report, as in the following example:



Adobe Reader Plugin Needs to Be Installed

- Click on the **Get Adobe Reader** link to begin the installation process.
- Once the plugin has been installed, close and relaunch the Communication WorkPanel.

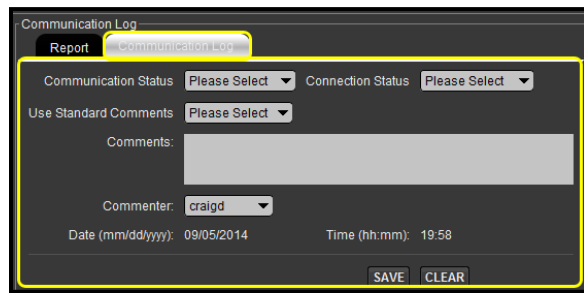
When viewing PDF reports within the Report Viewer, you can hover your mouse cursor over the report to temporarily display the set of tools provided by Adobe to **Save, Print, Zoom Out, Zoom In** and display the full **Acrobat toolbar**, as in the following example:



Adobe Reader Tools

21.3. Entering Comments and Setting Status

The Communication Log section includes a separate **Communication Log** tab that allows you to enter comments regarding the contact made or attempted with each Physician associated with this Study, as well as set the Communication and Connection status for this Study, as in the following example:



The Communication Log

- To leave a comment, make sure your username is selected in the drop-down **Commenter** menu and enter the desired text in the **Comments** box.
- If any standard comments have been defined for your system, you can also select one from the "Use Standard Comment" drop-down menu to automatically populate the Comments box with pre-defined text.
- To set the **Communication** and/or **Connection status** for this Study, select the desired status from one or both of the drop-down status menus.
- Click the **Save** button to record your changes and exit the Communication WorkPanel entirely.
- Alternatively, you can click the **Clear** button to remove any text entered in the Comments field.

21.4. Viewing Previously Entered Comments

Comments that have been previously entered can be viewed at the **Comment History** section of the Communication WorkPanel, as in the following example:

The screenshot displays the Communication WorkPanel interface. At the top, 'Patient / Exam Information' includes fields for Name (IMAGPATIENT1209_1209), DOB (12/31/1957), MRN (000-00-1209), IPID (HOME), Sex (M), Accession (GMRC-123), Modality (SR), Procedure Start Date/Time (09/20/2007 22:40), Reason For Exam (n/a), and Exam Description (Composar). Below this is 'Contact Info' with fields for Physician, Name, Phone, Fax, Radiologist Name, and Home Phone, along with an 'Offline' status indicator and a 'PRINT' button. The 'Communication Log' section contains a table with columns for Date, Time, Modality, Accession, and Status. Below the log, there are fields for Observation Date, Interpretar, and Transcriptionist, followed by PROCEDURE, HISTORY, COMPARISON, and FINDINGS. At the bottom, the 'Comment History' section is expanded, showing a table of comments with columns for Comments, Br, and Commented At.

Date	Time	Modality	Accession	Status
Feb 22, 2016	10:12:58	SR	GMRC-123	COMPLETE
Sep 24, 2007	06:36:59	SR	GMRC-123	
Sep 20, 2007	22:45:06	SR	GMRC-123	

Comments	Br	Commented At
Tumor has grown an additional 20% since previous visit	Super User	02/22/2016 13:11:08
Follow-up Comment	Super User	02/22/2016 13:10:52
Initial Comment	Super User	02/22/2016 13:04:17

Viewing Comment History



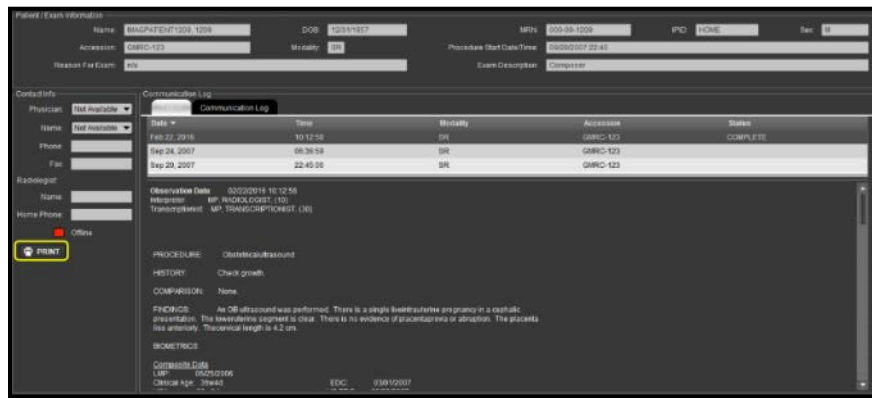
Audio comments are identified with a speaker icon, as illustrated to the left. Clicking on an audio comment will cause the VoiceClip player to launch and play the selected comment, as described in Chapter 9 above.

NOTE: If Merge PACS is running in Standalone mode, both audio comments for studies that are currently online (not archived) and audio comments that are stored in the external volume will be displayed. If Merge PACS is running in Integrated mode, audio comments stored within EA will be displayed. If an existing RadSuite Server was upgraded to Merge PACS 7.3 in Integrated mode, audio comments from EA will be displayed if they were either imported from EA into PACS or after the upgrade or else were entered in EA after the upgrade.

- You can toggle the display of the Comment History section by clicking on the small white triangle to the left of **Comment History**.
- You can resize any of the columns in the Comments History section by clicking on the space between any two column headers and dragging the header to the desired size.

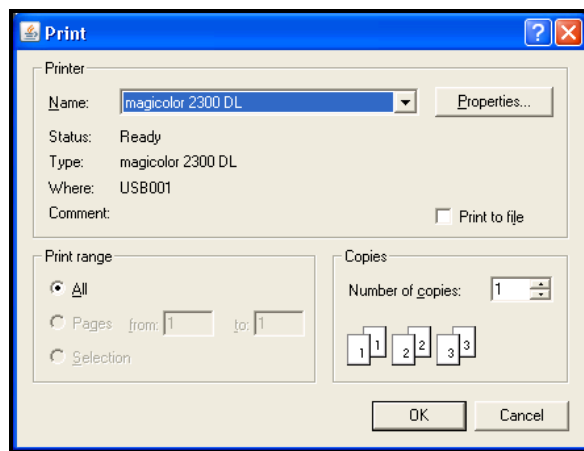
21.5. Printing the Content of the Communication WorkPanel

To print the content of the Communication WorkPanel, including the Patient / Exam Information, the Physician Contact Information, the list of available reports and the content of the report currently displayed on the screen, the Communication Log and the Comment History, click on the **Print** button below the Contact Info, as in the following example:



Print Button

This will cause a Print dialog to display, as in the following example:



Print Dialog

Select the desired printer from the drop-down list of available printers and click the **OK** button.

NOTE: The content of PDF reports will not be included when printing the contents of the Communication WorkPanel, but can be printed by using the Adobe Reader tools described in subsection 21.2.3 above.

Chapter 22. The Study Tagging Window



If you have the login privileges to access the Teaching Files feature, you can tag studies for later reference for teaching and/or conferencing purposes by clicking on the **Study Tagging** icon (found on the RealTime Worklist, the Query Search page, an existing Teaching Worklist or the Study Toolbar), as shown on the left. You can also tag a Study by selecting the Study Tagging option from the Series Right-click Menu.

Once tagged, these studies are displayed in special Teaching Worklists that allow you to quickly select and open the desired Study, as described in Section 3.4 above. In addition, you can add one or more special teaching tags to each Study that can be used to locate that Study at the Query Search Page, as described in Section 3.5 above.

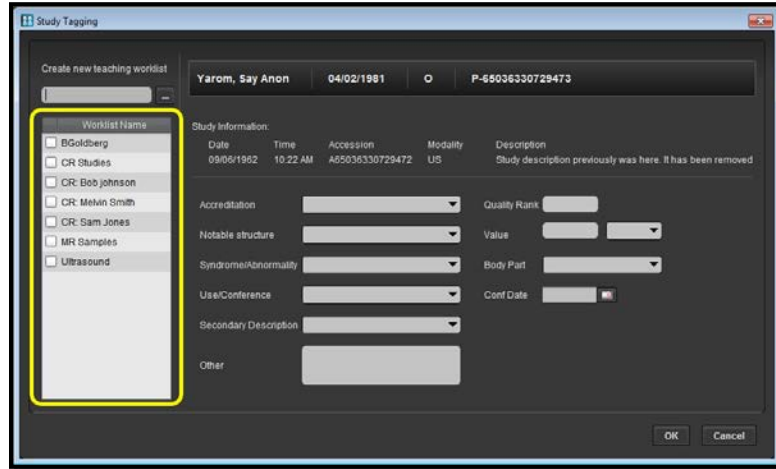
When you click on the Study Tagging icon for a particular Study, the **Study Tagging** window to be displayed, as in the following example:

Study Tagging Window

At the Study Tagging window you can assign the Study to one or more teaching worklists as well as add optional teaching tags to the Study. Depending on your login privileges, you can also create new teaching worklists, edit the tags for a Study already assigned to a teaching worklist and/or edit the lists of available values for the various tags.

22.1. Assigning a Study to a Teaching Worklist

The left-hand side of the Study tagging window displays a list of teaching worklists that have already been created and to which you have access, as in the following example:



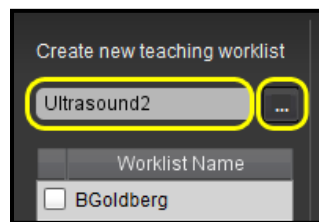
List of Available Teaching Worklists

NOTE: If your site has the “Briefcase” option enabled, a default teaching worklist will be created for you automatically called “<username>’s briefcase.” This worklist will initially be empty until you add studies to it.

- To assign this Study to one or more existing teaching worklists, click on the checkboxes next to the desired worklists so that a checkmark appears in the box.
- To remove a Study from a teaching worklist to which it is currently assigned, click on the checkbox next to the worklist so that the checkmark disappears.

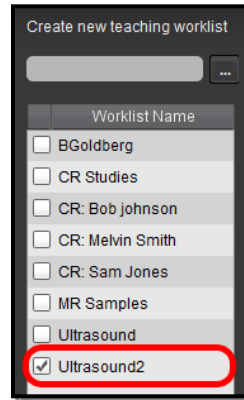
NOTE: Even if a Study is not assigned to any teaching worklists, it can still be located via the Query Search Page based on any teaching tags that are assigned to it.

- If you have the login privilege to create new teaching worklists, you can create a new worklist for this Study by entering the desired name of the worklist and clicking on the button to the right of the name field, as in the following example:



Creating a New Teaching Worklist

The new worklist will be added to the list of available worklists and the Study will be added to it by default, as in the following example:

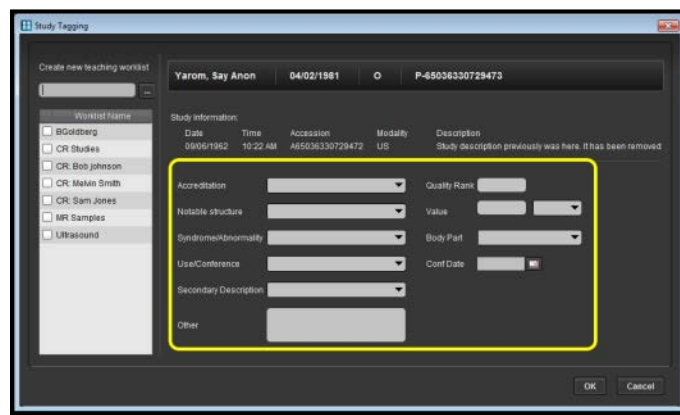


Newly Created Teaching Worklist

NOTE: Once a new teaching worklist is created, it can only be renamed or deleted by an Administrator.

22.2. Adding Teaching Tags to a Study

The right-hand side of the Study Tagging window contains a variety of fields and drop-down menus that allow you to optionally assign one or more teaching tags to the Study, as in the following example:



Teaching Tags

NOTE: Teaching tags are user-specific, meaning that multiple users can add tags to the same Study and each user will only be able to search on tags that they have added.

NOTE: The actual tags that appear in the Study Tagging window are customizable by an Administrator and may vary from site to site.

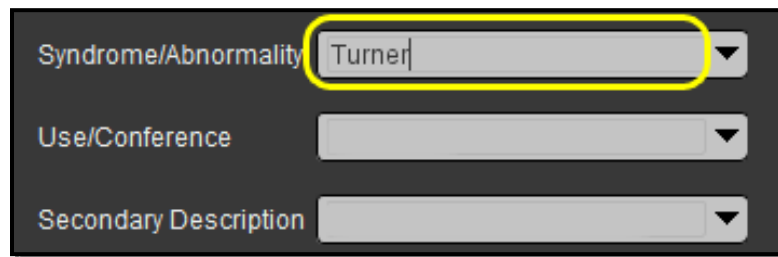
- If a tag has an arrow to the right of the field, click on the arrow to display a list of available options for that tag, as in the following example:



Selecting a Tag Value from a Drop-down Menu

NOTE: You can remove a previously assigned tag from a Study by selecting the default “blank” value.

- If you have the login privilege to add new tag values to the list of available values, you can also enter a new value for that tag by typing the desired value directly into the field, as in the following example:



Entering a New Tag Value

NOTE: If you have the login privilege to add new tag values, clicking anywhere on a field other than on the arrow will cause a cursor to be displayed for typing; you must click on the arrow to access the drop-down menu. If you do not have the login privilege to add new tag values, clicking anywhere on a field that has an arrow will cause the associated drop-down menu to be displayed.

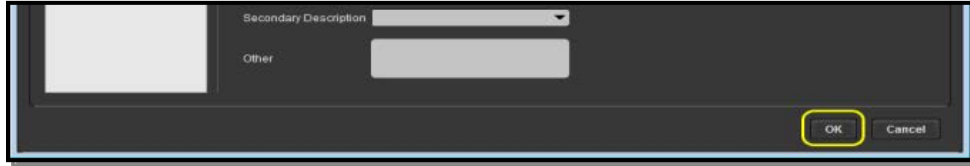
NOTE: Once a new value has been added to the list of available values for a tag, it can only be renamed or deleted by an Administrator.

NOTE: When you add a new tag value, it will be applied to the current Study and will be available in the drop-down menu the next time you access the Study Tagging window.

- If a tag does not have an arrow to the right of the field, you can enter a value for that field regardless of your privileges and can remove a value by deleting it.

22.3. Saving Tag Information

Once you have finished assigning this Study to one or more teaching worklists and/or assigning teaching tags to it, click on the **OK** button at the bottom of the Study Tagging window to save your changes and exit the window:



Saving Changes

Chapter 23. Merge Messenger

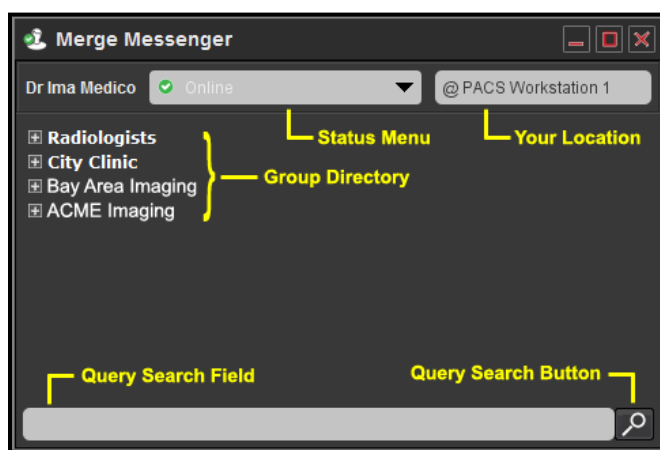


The **Merge Messenger** icon on the **Workstation Browser Toolbar** and the **Study Toolbar** within the Merge PACS Viewer, as shown on the left, is an optional feature that provides instant messaging capability between you and other users who have access to this feature and who are currently online.

Note that the actual appearance of the Merge Messenger icon will vary, depending on your current Messenger status:

Icon	Status	General Description
	Not Connected	The system is attempting to connect with the Merge Messenger service and your status is currently unknown. While your status is Not Connected, you will not appear on anybody else's contact list within Merge Messenger.
	Online	You are currently online and will appear on other users' contact lists within Merge Messenger. Note that this is the default status once connected and can also be manually selected after choosing one of the other statuses described below.
	Offline	You have chosen the "Offline" option from the Status Menu, described in Section 23.5 below, and will not appear on other users' contact lists within Merge Messenger.
	Busy	You have chosen the "Busy" option from the Status Menu, described in Section 23.5 below. You will still appear on other users' contact lists within Merge Messenger and other users can still send you messages, but you will have a red "busy" icon next to your name.
	Away	You have chosen the "Away" option from the Status Menu, described in Section 23.5 below. You will still appear on other users' contact lists within Merge Messenger and other users can still send you messages, but you will have a yellow "away" icon next to your name.

Clicking on the Merge Messenger icon will cause the main Merge Messenger window to be launched as a separate pop-up, as in the following example:



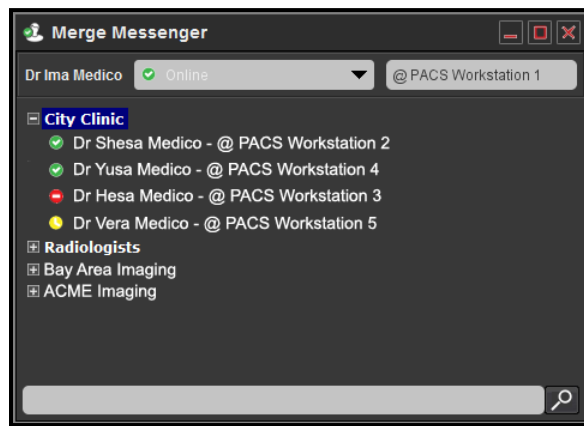
Merge Messenger Window

23.1. Initiating a Conversation

To initiate a conversation with another user from the Merge Messenger window, you need to first locate the user. This can be done via the **Group Directory** or via the **Query Search** function.

23.1.1. Locating a User via the Group Directory

The Group Directory on the Merge Messenger window lists all groups that have at least one member currently available (with a status of **Online**, **Busy** or **Away**). To view the available members in a group, **double-click** on the group name. The group will then be expanded to show you the available users in that group, as in the following example:

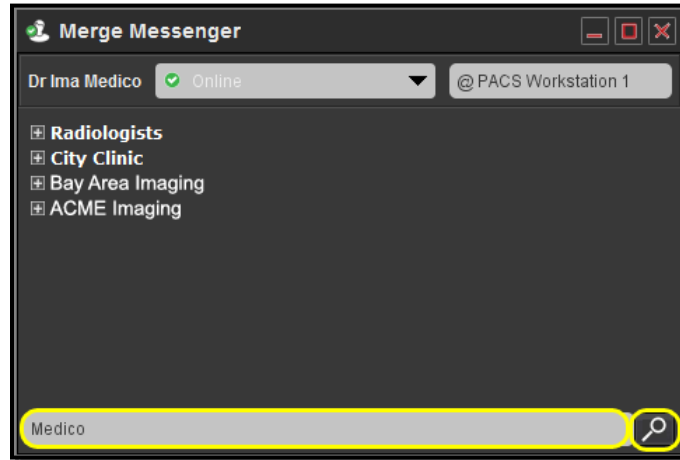


Expanded Group Showing Available Members

To initiate a conversation with a user, double-click on the desired user's name to launch the Merge Messenger Chat window, described in subsection 23.2 below.

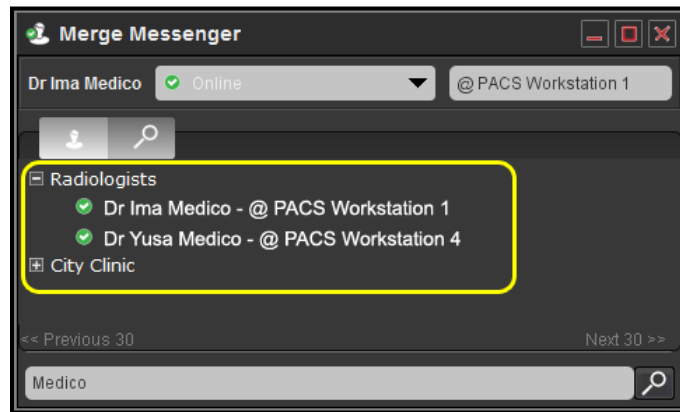
23.1.2. Searching for a User

You can perform a query search to quickly locate a user by entering all or part of the user's **last** name in the Query Search Field at the bottom of the Merge Messenger window and clicking on the Query Search Button, as in the following example:



Searching for a User

Once you click the Query Search Button, the search results will be displayed as in the following example:



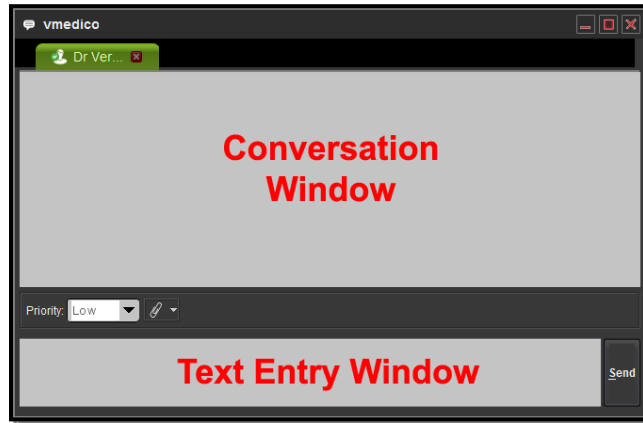
Search Results

The search results will display all groups that contain users whose last names match your query. By default, the group that you belong to will be expanded to display all matching members in that group. If desired, you can double-click on any other group name to see the matching members in that group.

To initiate a conversation with a user, double-click on the desired user's name to launch the Merge Messenger Chat window, described in subsection 23.2 below.

23.2. The Merge Messenger Chat Window

When you double-click a user's name, the Merge Messenger Chat window will be displayed as a separate pop-up, as in the following example:



Merge Messenger Chat Window

Note that the Chat Window is divided into two windows:

Window	General Description
Text Entry	Enter text in this window (maximum of 256 characters) and then either hit the Enter key or click on the Send button to the right of the Text Entry window.
Conversation	Both sides of your conversation will be displayed in this window. The contents of this window will be preserved until you log out of the Merge PACS Workstation, even if you close the Merge Messenger Chat window or the main Merge Messenger window.

23.2.1. Changing the Priority of Your Message

By default, your message will be sent at **Low** priority, which will cause the text to be displayed in a small font with gray letters. If desired, however, you can change the priority as follows:

Priority	General Description
Low	Message displays in small font with gray letters: <div style="border: 1px solid gray; padding: 2px; display: inline-block;">Dr Ima Medico : This is a low priority message.</div>
Normal	Message displays in small font with bold blue letters: <div style="border: 1px solid gray; padding: 2px; display: inline-block;">Dr Ima Medico : This is a normal priority message.</div>
High	Message displays in large font with bold red letters: <div style="border: 1px solid gray; padding: 2px; display: inline-block;">Dr Ima Medico : This is a high priority message.</div>

To change the priority of a message before sending it, select the desired priority from the drop-down **Priority** menu, as shown below:



Selecting Message Priority

23.2.2. Sending a Study Link

If have a Study currently open in a Viewer window (whether in a primary or secondary window), you can include a link to that Study within your message in one of two ways:

- Click on the **Send Study Link** icon to include a link to the **Primary** Study currently being viewed, as in the following example:



Sending Link to Primary Study

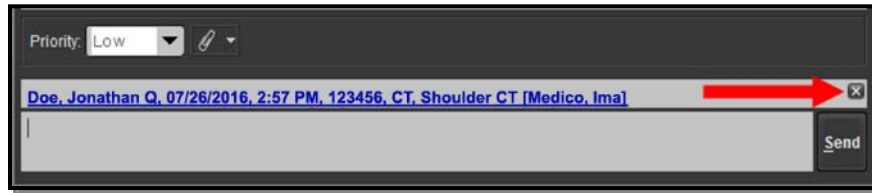
- If you are currently viewing multiple studies, click on the triangle to the right of the Send Study Link icon and select the Study you want to send a link to, as in the following example:



Selecting a Study

Once you have selected the Study, enter your text message (if any) in the Text Window and click on the **Send** button.

Note that if you want to remove a Study link from a message **before** sending it, click on the little **X** to the far-right of the Study description, as in the following example:



Removing a Study Link

CAUTION: Sending a Study link to another user via Merge Messenger will allow that user to view the Study even if that user would not otherwise have login privileges to do so.

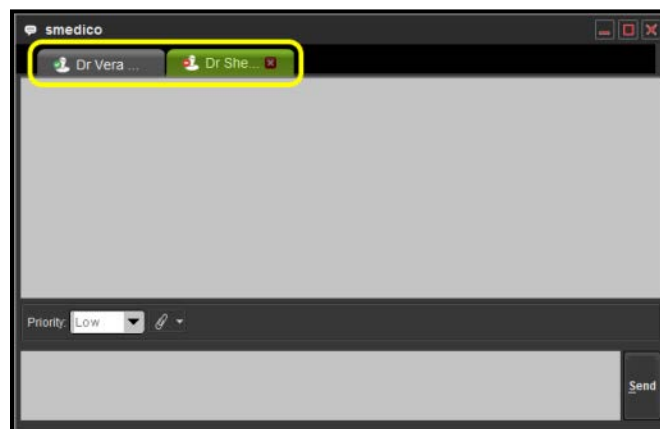
23.2.3. Viewing a Linked Study

If another user sends you a Study link in a message, you can do the following:

- **Hover** your mouse cursor over the link to view detailed information about the Study.
- **Right-click** on the link to open the Study in the **Primary** viewer.
- **Left-click** on the link to open the Study in a **Secondary** viewer.

23.3. Having Conversations with Multiple Users

If you want to start a conversation with another user without exiting your conversation with the current user, click on the new user's name in the main Merge Messenger window. Each user will now be displayed with a separate conversation tab at the top of the Chat Window, as in the following example:

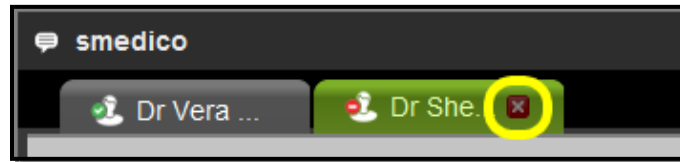


User Conversation Tabs

You can then click on any user's conversation tab to resume the conversation with that user. Note that once a tab has been added for a user, the tab will remain until you end the conversation, as described below.

23.4. Ending a Conversation

If you want to end a conversation with a user, make sure that user's conversation tab is selected (as described above) and then click on the red **X** on the right side of the tab, as in the following example:



Ending a Conversation

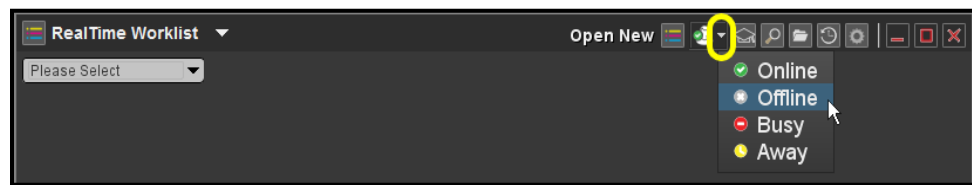
When the last user conversation tab is closed, the entire Chat Window will automatically close as well.

NOTE: Closing the Chat Window without closing the individual user conversation tabs will not end the conversations and all tabs will still be there the next time you reopen the Chat Window during the current login session.

23.5. Manually Changing Your Status

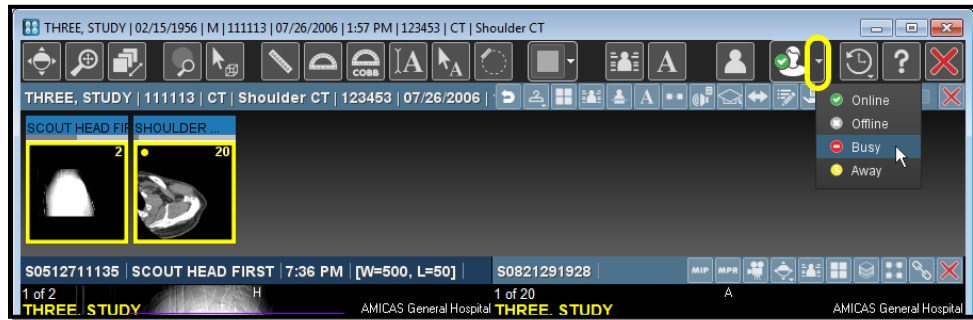
As stated above, if you have access privileges for Merge Messenger your status will be set to Online automatically once you log into the Merge PACS Workstation. At any time, however, you can manually change your status in any of the following ways:

- From the **Workstation Browser**, click on the arrow next to the Merge Messenger icon on the **Workstation Browser Toolbar** and select the desired status option from the drop-down menu:



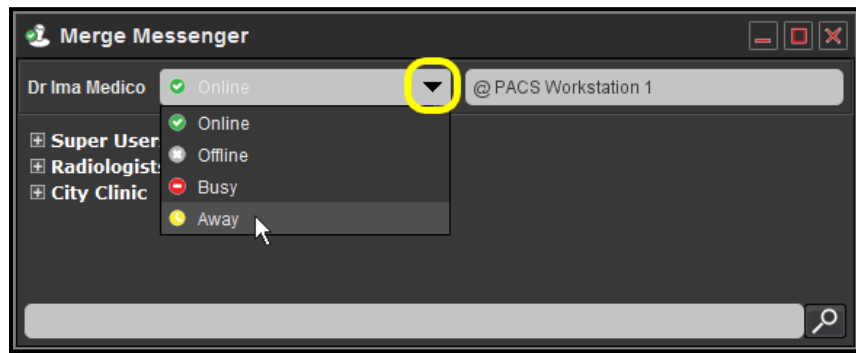
Changing Merge Messenger Status from the Workstation Browser

- From the **Merge PACS Viewer**, click on the arrow next to the Merge Messenger icon on the **Application Toolbar** and select the desired status option from the drop-down menu:



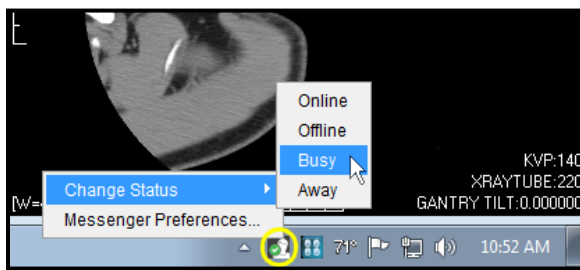
Changing Merge Messenger Status from the Merge PACS Viewer

- From the **Merge Messenger Window**, click on the arrow next to the Merge Messenger icon on the **Application Toolbar** and select the desired status option from the drop-down menu:



Changing Merge Messenger Status from Merge Messenger Window

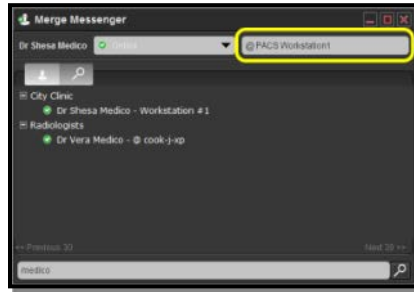
- From the **Windows System Tray** ("Task Bar"), **right-click** on the **Merge Messenger** icon, select **Change Status** from the pop-up menu and then select the desired status option:



Changing Merge Messenger Status from Windows System Tray

23.6. Manually Changing Your Location

When you show up in other user's contact lists within Merge Messenger, your user name will be displayed along with your location. By default, the location is the name of the Workstation where you are currently logged in. If desired, however, you can change the default and have any text displayed as your location. This is done by changing the default text in the **Location** field at the main Merge Messenger window, as in the following example:



The Merge Messenger Location Field

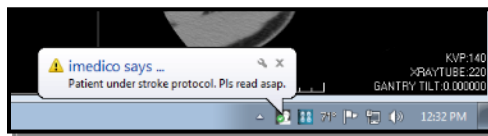
Enter the desired text (the @ sign is there by convention, but does not need to be retained) and press the **Enter** key. Your new location will now be displayed to all users.

NOTE: The @ sign included in the location field by default is there by convention and does not need to be retained.

NOTE: Your location is automatically saved as a local user preference for the Workstation and does not need to be re-entered every time you log in. If you access a different Workstation, however, you will need to enter it again.

23.7. The Merge Messenger Alert Balloon

Depending on how you have configured Merge Messenger, as described Chapter 24 below, an alert balloon will be displayed in your Windows System Tray / Task Bar whenever another user sends you an instant message. The balloon will contain the text of the message, as in the following example:

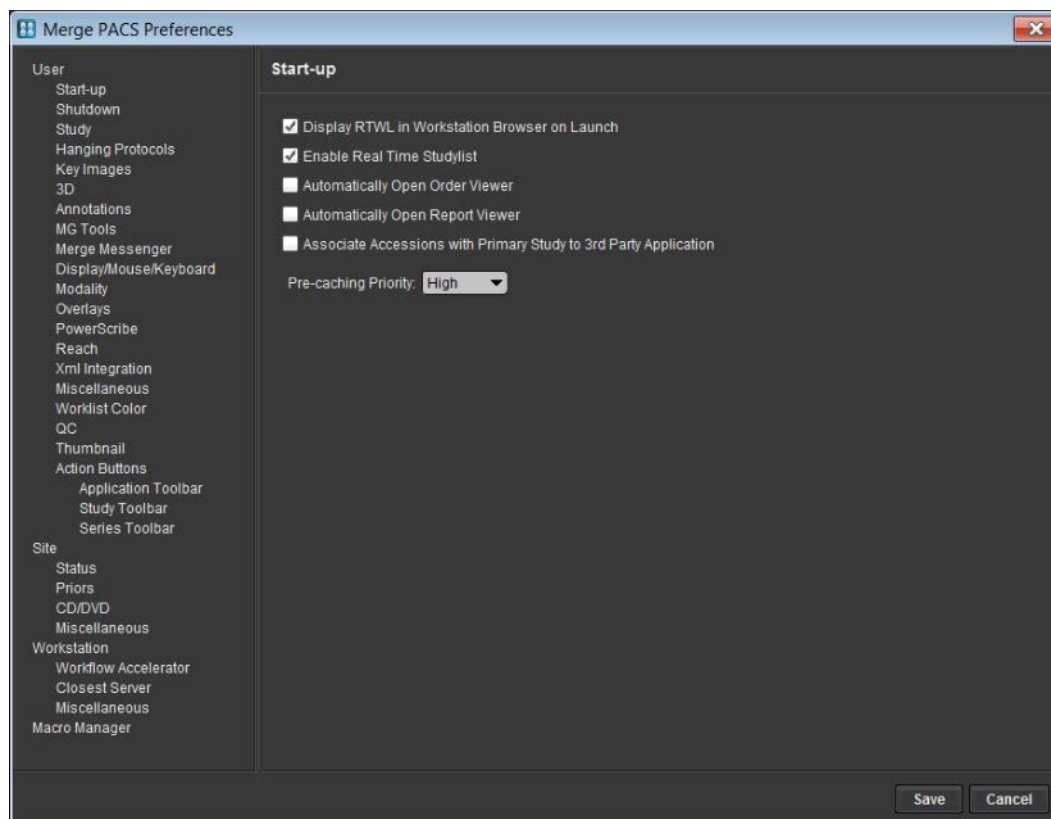


Merge Messenger Alert Balloon

NOTE: The font of the alert text will not change based on the priority of the message, but high priority messages will have a yellow alert icon displayed next to the user's name, as in the example above.

Chapter 24. Configuring Custom Viewing Preferences

The Merge PACS Preferences dialog is accessed by clicking on the **Preferences** link in various right-click menus throughout the Merge PACS Workstation and allows you to configure a variety of user and workstation preferences, as in the following example:



The Merge PACS Preferences Dialog

The left side of the dialog displays a menu of general categories of user and workstation preferences, as well as a link to the Macro Manager (if you have the login privilege to create macros). The right side of the dialog displays the specific preferences that can be set for each category.

NOTE: The availability of the specific preferences and options for each preference will depend on how your system is set up and what your login privileges are.

24.1. User Preferences

A number of user preferences can be set from the Merge PACS Preferences dialog. These preferences are associated with your login and will apply to any Workstation where you are logged in.

NOTE: Your default preferences are based on the preferences set for the user group(s) you are a member of as well as the preferences set for your site as a whole. These defaults can be overridden by selecting different values from the Preferences dialog unless they have been marked as “final” by the PACS Administrator.

24.1.1. Start-up

The following preferences related to starting up the Workstation and/or the PACS Viewer may be available, depending on how your system is set up and what your login privileges are:

Option	General Description
Display RTWL in Workstation Browser on Launch	If selected, RealTime Worklist (or RealTime Study List, if applicable) will be displayed by default in the Workstation Browser when it is launched.
Enable RealTime Study List	If you have login privileges to access the RealTime Study list, this option will be selected by default. If deselected, you will see the RealTime Worklist within the Workstation Browser instead.
Automatically Open Order Viewer	If selected, the Order Viewer will automatically be launched when a Study is first opened within the Merge PACS Viewer.
Automatically Open Report Viewer	If selected, the Report Viewer will automatically be launched when a Study is first opened within the Merge PACS Viewer.

Option	General Description						
Automatically Open ER Panel	<p>If selected, the ER Workpanel will automatically be launched when a study is first opened within the Merge PACS Viewer. If the “conditional” sub-option is enabled, you can further select one of the following:</p> <table border="1"> <thead> <tr> <th>Option</th> <th>General Description</th> </tr> </thead> <tbody> <tr> <td>ER Statuses</td> <td>Allows you to select one or more ER statuses, and the ER Workpanel will only be automatically launched when a study’s status is among the selected ER statuses.</td> </tr> <tr> <td>Rule</td> <td>Displays a Select Rule button that will let you search for and select a previously defined study rule, and the ER Workpanel will only be automatically launched when the conditions defined by the selected rule are met. When searching for a rule, if you have the login privilege to add/edit/delete user rules, you can also click on the Manage Rules button to create a new study rule that can then be selected. Refer to Chapter 13 of the <i>Merge PACS 7.3 Administration Manual</i> for details on creating user rules.</td> </tr> </tbody> </table>	Option	General Description	ER Statuses	Allows you to select one or more ER statuses, and the ER Workpanel will only be automatically launched when a study’s status is among the selected ER statuses.	Rule	Displays a Select Rule button that will let you search for and select a previously defined study rule, and the ER Workpanel will only be automatically launched when the conditions defined by the selected rule are met. When searching for a rule, if you have the login privilege to add/edit/delete user rules , you can also click on the Manage Rules button to create a new study rule that can then be selected. Refer to Chapter 13 of the <i>Merge PACS 7.3 Administration Manual</i> for details on creating user rules.
Option	General Description						
ER Statuses	Allows you to select one or more ER statuses, and the ER Workpanel will only be automatically launched when a study’s status is among the selected ER statuses.						
Rule	Displays a Select Rule button that will let you search for and select a previously defined study rule, and the ER Workpanel will only be automatically launched when the conditions defined by the selected rule are met. When searching for a rule, if you have the login privilege to add/edit/delete user rules , you can also click on the Manage Rules button to create a new study rule that can then be selected. Refer to Chapter 13 of the <i>Merge PACS 7.3 Administration Manual</i> for details on creating user rules.						
Mark Studies as Viewed when Launched in Web Viewer	<p>If selected, studies will be given a status of “Viewed” as soon as you click on the View Study in Web Access Viewer button on a worklist.</p> <hr/> <p>NOTE: This option will only be available if Merge PACS is configured for use with the iConnect Access Viewer.</p> <hr/> <p>CAUTION: When this option is enabled, the Study status will be set to “Viewed” prior to actually launching the iConnect Access Viewer. As a result, the status will be set to “Viewed” even if the Viewer fails to launch or the Study cannot be displayed.</p> <hr/>						
Keep Viewer Running in Background upon Exit	<p>If selected, the Merge PACS Viewer will be kept running in the background when you exit the Workstation so that it will load faster the next time it is launched. To exit the Viewer completely, right-click on the Merge PACS Workstation icon on the Windows Taskbar and select “Exit Merge PACS Diagnostic Workstation” from the pop-up menu.</p> <hr/> <p>NOTE: This option will only be available if you are running The Merge PACS Viewer from within another application (<i>i.e.</i>, as an “embedded viewer”) or from a command-line with <code>setBrowserVisible=false</code>.</p> <hr/>						
Associate accessions with primary Study to 3rd Party Application	<p>If selected, and your system is configured to integrate with a third-party dictation application, you will be prompted to select multiple accession numbers if there are multiple unread studies when you click the 3rd party Application Synchronization button.</p>						

Option	General Description
Pre-caching Priority	<p>If you have background pre-caching enabled, you can select from one of the following options to determine what priority the pre-caching process should be given by your Workstation:</p> <ul style="list-style-type: none"> • Low • Medium • High • Highest <p>With regard to precaching of multi-frame images in particular, selecting High or Highest will allow the Workstation to download four multi-frame images in parallel, Medium will download two images in parallel, and low will only download one at a time.</p>

24.1.2. Shutdown

The following preferences related to shutting down the Workstation and/or the PACS Viewer may be available, depending on how your system is set up and what your login privileges are:

Option	General Description
Automatically Save Annotations on Exit	<p>If selected and you have login privileges to automatically save annotations, any text annotations you add to a Study's images will automatically be saved when you exit the Study. In addition, you will not be prompted to save annotation changes when creating or editing a Study Presentation. If not selected, you will be prompted to save annotations when you exit and will also be prompted to save annotation changes when creating or editing Study Presentations.</p> <p>NOTE: If you have privileges to manually save annotations via the Save Annotations tool, as described in subsection 4.5.15.m above, you will not be able to enable the Automatically Save Annotations on Exit user preference.</p> <p>NOTE: QC special annotations created by Pixel-Masking and Burnt-in Text tools will not be saved automatically.</p>
Automatically Save Voice Clip on Exit	If selected, any recorded voice clips will automatically be saved when you exit the study.
Warn if Annotations Cannot Be Saved	If selected, a warning message will be displayed when you attempt to create an annotation if annotations cannot be saved for this Study (e.g., due to your login privileges, the status of the Study, etc.)
Delete Image Cache On Exit	If you have background pre-caching enabled, selecting this option will cause all images to be deleted from your workstation's hard drive when you exit the Merge PACS Workstation.
Log off Windows On Exit	If selected, you will be logged out of Windows when you exit the Merge PACS Workstation.

24.1.3. Study

The following preferences related to how studies are loaded and locked may be available, depending on how your system is set up and what your login privileges are:

a. Study Loading

The following preferences relate to the loading of studies:

Option	General Description										
Get Next Study by Precedence	This preference controls the behavior of the Open Next Study , Mark Study Read and Skip Study worklist navigation buttons on the Application Toolbar, as described in subsection 4.4.3 above, and the Open Next Study and Mark Study Read buttons on the Patient Record Toolbar, as described in subsection 3.8.2 above. The following options are available:										
	<table border="1"> <thead> <tr> <th>Option</th> <th>General Description</th> </tr> </thead> <tbody> <tr> <td>Go to top of worklist</td> <td>Opens the first candidate Study in the first unguarded block of the worklist</td> </tr> <tr> <td>Go to top of current worklist block</td> <td>Opens the first candidate Study in the current worklist block or, if there are no candidate studies in this block, opens the first candidate Study in the first unguarded block of the worklist.</td> </tr> <tr> <td>Go to next</td> <td> <p>The behavior depends on whether the worklist navigation button is clicked while viewing a Study from a “guarded” or an “unguarded” worklist block:</p> <ul style="list-style-type: none"> • From an unguarded block: <ul style="list-style-type: none"> ○ Opens the next remaining candidate Study in the current block, if any. ○ If there is no remaining candidate Study in the current block, opens the next candidate Study in next unguarded block in the worklist (based on display order). ○ If there is no remaining candidate Study in the worklist, opens the first candidate Study in the first unguarded block of the worklist. • From a guarded block: <ul style="list-style-type: none"> ○ Opens the next remaining candidate Study in the current block, if any. ○ If there is no remaining candidate study in the current block, opens the first candidate study in the current worklist block. </td> </tr> <tr> <td>None</td> <td>Disables this preference if the Load Next Study Based on Acuity Score (described below) is enabled. Otherwise, behaves the same as the “Go to next” option</td> </tr> </tbody> </table>	Option	General Description	Go to top of worklist	Opens the first candidate Study in the first unguarded block of the worklist	Go to top of current worklist block	Opens the first candidate Study in the current worklist block or, if there are no candidate studies in this block, opens the first candidate Study in the first unguarded block of the worklist.	Go to next	<p>The behavior depends on whether the worklist navigation button is clicked while viewing a Study from a “guarded” or an “unguarded” worklist block:</p> <ul style="list-style-type: none"> • From an unguarded block: <ul style="list-style-type: none"> ○ Opens the next remaining candidate Study in the current block, if any. ○ If there is no remaining candidate Study in the current block, opens the next candidate Study in next unguarded block in the worklist (based on display order). ○ If there is no remaining candidate Study in the worklist, opens the first candidate Study in the first unguarded block of the worklist. • From a guarded block: <ul style="list-style-type: none"> ○ Opens the next remaining candidate Study in the current block, if any. ○ If there is no remaining candidate study in the current block, opens the first candidate study in the current worklist block. 	None	Disables this preference if the Load Next Study Based on Acuity Score (described below) is enabled. Otherwise, behaves the same as the “Go to next” option
Option	General Description										
Go to top of worklist	Opens the first candidate Study in the first unguarded block of the worklist										
Go to top of current worklist block	Opens the first candidate Study in the current worklist block or, if there are no candidate studies in this block, opens the first candidate Study in the first unguarded block of the worklist.										
Go to next	<p>The behavior depends on whether the worklist navigation button is clicked while viewing a Study from a “guarded” or an “unguarded” worklist block:</p> <ul style="list-style-type: none"> • From an unguarded block: <ul style="list-style-type: none"> ○ Opens the next remaining candidate Study in the current block, if any. ○ If there is no remaining candidate Study in the current block, opens the next candidate Study in next unguarded block in the worklist (based on display order). ○ If there is no remaining candidate Study in the worklist, opens the first candidate Study in the first unguarded block of the worklist. • From a guarded block: <ul style="list-style-type: none"> ○ Opens the next remaining candidate Study in the current block, if any. ○ If there is no remaining candidate study in the current block, opens the first candidate study in the current worklist block. 										
None	Disables this preference if the Load Next Study Based on Acuity Score (described below) is enabled. Otherwise, behaves the same as the “Go to next” option										

Option	General Description
	<p>NOTE: Worklist blocks can be configured to be “guarded” so that the various Worklist Navigation Buttons will skip over them.</p> <hr/> <p>NOTE: A “candidate” Study is one that has viewable images, is not currently hidden (either by itself, as part of a hidden status group or as part of a hidden date group, but not just when within a hidden worklist block) and is neither locked nor reserved by another user.</p> <hr/> <p>NOTE: The “Go to top of worklist” and “Go to top of current worklist block” options are recommended for use with worklists configured so that studies may be removed when their statuses are changed (e.g., a worklist that is configured to only show studies in “Unread” or “Unverified” status will remove a Study once it is manually marked as “Read” or the user clicks on the Mark Study Read button). The “Go to next” option should be used with worklists that do not remove studies to prevent getting stuck on the first few studies in the worklist.</p>
<p>Load Next Study Based on Acuity Score</p>	<p>If selected and the optional Merge RadStream component is enabled, the Open Next Study and Mark Study Read buttons on the Patient Record Toolbar and the Merge PACS Application Toolbar will select the next Study based on acuity score instead of position on the worklist.</p> <hr/> <p>NOTE: If this option is selected, you must set the Get Next Study by Precedence preference described above to “None.”</p> <hr/> <p>NOTE: If this preference is selected, the Open Next Study and Mark Study Read options will be highlighted in red on the Patient Record Toolbar and the Open Previous Study option will be hidden on both the Patient Record Toolbar and the Application Toolbar.</p>
<p>Automatically Play Voice Clip on Load</p>	<p>If selected and you have login privileges to listen to audio annotations via VoiceClip, the first audio annotations that has been recorded for a Study will be played automatically when the Study is first opened.</p>
<p>Automatically Split CR Series</p>	<p>If selected, CR Series with multiple images will automatically be split into separate Series for display purposes within the Merge PACS Viewer.</p>
<p>Automatically Split CT Series</p>	<p>If selected, CT Series will be split into multiple Series for display purposes within the Merge PACS Viewer in the following cases:</p> <ul style="list-style-type: none"> • When the origin of the images change • When the orientation of the images change (except for short runs, i.e., of 5 slices or less) • When the gap between slices exceeds 5 times the current slice thickness

Option	General Description
Automatically Split MR Series	<p>If selected, MR Series with multiple images will automatically be split into separate Series for display purposes within the Merge PACS Viewer based on:</p> <ul style="list-style-type: none"> • Echo Number • Temporal Position Identifier (TPI) • Positional Sequence • Stack Axis/Positional Break
Automatically Split MG Series	<p>If selected, MG Series with multiple images will automatically be split so that each image will be its own Series. Note the following:</p> <ul style="list-style-type: none"> • In general, images will be grouped based on laterality, view code and view code modifier. • 3D breast tomosynthesis images will be separated from 2D images even if they represent the same laterality and view. • 3D breast tomosynthesis images will be labeled with (DBT) suffix. <hr/> <p>CAUTION: Deselecting this option may cause Hanging Protocols for MG studies to be applied incorrectly and therefore should only be deselected if you are using the Quality Control Tool from the Merge PACS Management Pages.</p> <hr/>
Automatically Split DX Series	<p>If selected, DX Series with multiple images will automatically be split into separate Series for display purposes within the Merge PACS Viewer.</p>
Preserve Presentation State within Viewport	<p>If selected, the current presentation state (W/L, zoom, etc.) within each Series Viewport will be maintained when a new Series is opened within that Series Viewport.</p>

b. Locking

The following preferences relate to the locking of studies:

Option	General Description
Lock and Update Study Status in Secondary Viewer	<p>If selected, studies opened in a Secondary Merge PACS Viewer window will be locked and users will be prompted to set the status upon exiting.</p> <p>If not selected, studies opened in the Secondary Viewer window will be read-only (they will not be locked, you will be unable to change the workflow status and the context of any dictation application will remain on the Study in the Primary Viewer).</p>
<p>NOTE: When this option is enabled, the Secondary Viewer will behave like a Primary Viewer. If the application is configured to sync automatically, the Study will be automatically synced with the 3rd-party application when it is opened in the Primary Viewer. If a second Study is then opened in the Secondary Viewer without closing the primary Study, the primary Study will lose the sync and the secondary Study will automatically sync with the third party application instead.</p>	

Unread Study Lock Select one of the following options to configure how unread studies are locked:

Option	General Description
All	If selected, all studies related to the Study currently being viewed (primary as well as priors) will be locked from within RTWL.
Same Modality	If selected, only studies of the same modality type as the Study currently being viewed will be locked from within RTWL.
Only Relevant	If selected, only relevant prior studies related to the Study currently being viewed will be locked from within RTWL.
Only Primary Study	If selected, only the primary Study currently being viewed will be locked from within RTWL.

c. Comparison Studies

The following preferences relate to the loading of comparison studies:

Option	General Description						
Display Warning Indicator on All Priors	If selected, all prior studies loaded in comparison mode will bear the warning icon indicating that they are prior studies.						
Allow Rapid Review of Unread Studies	If selected, studies with a status of UNREAD will be included for use with the Rapid Review feature described in subsection 4.4.3 above.						
Consider All Unverified as Unread Studies	If selected, studies with a status of UNVERIFIED will be treated the same as UNREAD studies while in comparison mode.						
Automatically pre-cache relevant prior studies	If selected, images for relevant prior studies will be pre-cached as soon as the primary Study is loaded into the Merge PACS Viewer. If not selected, images for relevant prior studies will not be cached until the prior Study is itself loaded into the viewer.						
Automatically pre-cache unread studies	If selected, images for unread prior studies will be pre-cached as soon as the primary Study is loaded into the Merge PACS Viewer. If not selected, images for unread prior studies will not be cached until the prior Study is itself loaded into the viewer.						
Order Priors	Select one of the following options to configure how comparison studies are ordered (including the display of Navigation Thumbnail Images for comparison studies that are manually dragged and dropped into the Viewer): <table border="1"> <thead> <tr> <th>Option</th> <th>General Description</th> </tr> </thead> <tbody> <tr> <td>Chronologically</td> <td>If selected, the list of prior studies will be displayed in reverse chronological order instead of by relevance.</td> </tr> <tr> <td>By Relevance</td> <td>If selected, the list of prior studies will be sorted by relevance. In the case of Navigation Thumbnail Images for comparison studies, this would only apply to non-relevant studies that are dragged and dropped into the viewer.</td> </tr> </tbody> </table>	Option	General Description	Chronologically	If selected, the list of prior studies will be displayed in reverse chronological order instead of by relevance.	By Relevance	If selected, the list of prior studies will be sorted by relevance. In the case of Navigation Thumbnail Images for comparison studies, this would only apply to non-relevant studies that are dragged and dropped into the viewer.
Option	General Description						
Chronologically	If selected, the list of prior studies will be displayed in reverse chronological order instead of by relevance.						
By Relevance	If selected, the list of prior studies will be sorted by relevance. In the case of Navigation Thumbnail Images for comparison studies, this would only apply to non-relevant studies that are dragged and dropped into the viewer.						

d. Presentation State

Option	General Description
Automatically Apply Presentation State	If selected, if there are any externally created ("foreign") Presentation States available for a Series, the most recent one will be automatically applied when the Series is opened, whether as part of the primary study or as part of a comparison study. Note that the externally created Presentation State will be applied on top of the currently selected Hanging Protocol or Study Presentation, if any.

24.1.4. Hanging Protocols

One or more of the following options relating to Hanging Protocols may be available, depending on how your system is set up and what your login privileges are:

Option	General Description
Override DICOM Overlay Setting	If selected, any DICOM Overlay settings contained within a Hanging Protocol or Study Presentation will be overridden by the DICOM Overlay button and the DICOM Overlay Series Toggle option.
Include UNREAD Studies as Comparison Candidates	If selected, studies with a status of UNREAD will be considered valid comparison candidates for Hanging Protocols.
Include Studies Newer than Primary as Comparison Candidates	If selected, studies that have a time/date stamp newer than the primary Study will be considered valid comparison candidates for Hanging Protocols.
Show Unviewed Images after Last Hanging Protocol Step (MG Only)	If selected, when a Hanging Protocol is applied to an Mammography Study, all unviewed images will automatically be displayed in a 2x1 layout after the last step has been applied. The images will be displayed using modality preferences and in the same sequence as they are present in a Study.

24.1.5. Key Images

One or more of the following options related to Key Images may be available, depending on how your system is set up and what your login privileges are:

Option	General Description
Automatically Mark Annotated Images as Key Images	If selected, any images that have annotations added to them will automatically be flagged as key images.
Open Key Image Viewport on Primary Study Load	If selected, the Key Image Viewport will automatically be displayed when the primary Study is loaded, if applicable.
Open Key Image Viewport on Comparison Study Load	If selected, the Key Image Viewport will automatically be displayed when a prior Study is loaded, if applicable.
Open Key Image Viewport When Image Added	If selected, the Key Image Viewport will automatically be displayed whenever an image is flagged as a key image.
Show Key Image Series for Comparison Study	If selected, key images for comparison studies will be displayed when the primary Study is being viewed.
Allow Priors as Key Images	If selected, images that are part of a prior Study will be able to be flagged as key images.
Auto Layout Key Image Window	If selected, the system will attempt to optimize the layout of the images within the Key Image Viewport (as opposed to displaying them in the order they were flagged).

24.1.6. 3D

One or more of the following options related to The Merge PACS Viewer's inherent 3D functionality may be available, depending on how your system is set up and what your login privileges are:

Option	General Description
Default Single View Orientation	<p>Allows you to select one of the following options as the default single view orientation:</p> <ul style="list-style-type: none"> • Axial • Coronal • Sagittal
Grouped 3D View Orientation	<p>Allows you to select one of the following options as the default grouped view orientation:</p> <ul style="list-style-type: none"> • Axial • Coronal • Sagittal
Volume Rendering Orientation	<p>Allows you to select one of the following options as the default volume rendering orientation:</p> <ul style="list-style-type: none"> • MIP • MinP • Average • CVR • Faded MIP
Initial Slab Thickness (mm)	<p>Allows you to select one of the following options as the default initial slab thickness in millimeters:</p> <ul style="list-style-type: none"> • 2.5 • 5.0 • 10.0 • No Slab
Thin Slice Interpolation	<p>Allows you to select one of the following options as the default thin slice interpolation for MPR images to improve the image quality:</p> <ul style="list-style-type: none"> • NONE • TRILINEAR • TRICUBIC
Thick Slice Interpolation	<p>Allows you to select one of the following options as the default thick slice interpolation for MPR images to improve the image quality:</p> <ul style="list-style-type: none"> • NONE • TRILINEAR • TRICUBIC

Option	General Description						
	<p>NOTE: This should be set to Tricubic or Trilinear unless there are large numbers of lossy thick slice images that are used. Use of the "None" option will result in sub-optimal image quality for PET images.</p>						
Thick / Thin Boundary (mm)	Allows you to set the default thick / thin boundary (in millimeters) for MPR images, which will determine whether the image quality should be in thin slice interpolation or thick slice interpolation.						
Enable Skimming for Volume Navigation Mouse Mode	When selected, the standard "page" mouse tool will act as a "skimming" tool for 3D volumes, except that no warning will be displayed that images are being skipped.						
Enable Background Loading for Tomosynthesis	When enabled, 3D processing will be performed for multi-frame breast tomosynthesis images in the background as soon as they are loaded into the Viewer in order to speed up the process of generating 3D volumes such as MIP or MPR.						
Integrate with TeraRecon	<p>If Merge PACS has been configured to use TeraRecon to provide 3D functionality instead of the Merge PACS Viewer's inherent 3D rendering tools, select this option and have your PACS Administrator enter the following information in the fields provided:</p> <ul style="list-style-type: none"> • Host • Username • Password • Load Command 						
Integrate with Vitrea	<p>If Merge PACS has been configured to use Vitrea® to provide 3D functionality instead of the Merge PACS Viewer's inherent 3D rendering tools, select this option and enter the following information in the fields provided:</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Load Command</td> <td>visend load STUDYUID SERIESUID IMAGEUID</td> </tr> <tr> <td>Unload Command</td> <td>visend unload STUDYUID SERIESUID IMAGEUID</td> </tr> </tbody> </table>	Parameter	Value	Load Command	visend load STUDYUID SERIESUID IMAGEUID	Unload Command	visend unload STUDYUID SERIESUID IMAGEUID
Parameter	Value						
Load Command	visend load STUDYUID SERIESUID IMAGEUID						
Unload Command	visend unload STUDYUID SERIESUID IMAGEUID						

24.1.7. Annotations

One or more of the following options related to the use of annotations within the Viewer may be available, depending on how your system is set up and what your login privileges are:

Option	General Description
Line Thickness	<p>Allows you to select the thickness of all annotation measurement lines. The following options are available:</p> <ul style="list-style-type: none"> • Thin • Medium • Thick
Show Cursor While Annotating	<p>By default, the mouse cursor will be displayed on the screen while you use any annotation tool. If desired, you can choose to hide the cursor while annotating by deselecting this option.</p>
Allow Xref Update on Mouse Hover	<p>By default, the “active” Viewport for the purpose of cross-reference lines is whichever Viewport the mouse cursor is currently hovering over, regardless of whether you have actually clicked on that Viewport. If this option is not selected, you must actually click on a Viewport to make it “active” for the purpose of cross-reference lines.</p>
Allow Small Line Annotations	<p>By default, very small line measurements (<i>i.e.</i>, of only a few pixels) are not recognized. If this option is selected, line measurements of any size (<i>i.e.</i>, if you have moved the mouse cursor to any new location after clicking), will remain after releasing the mouse button.</p>
Render Annotations in Grayscale Mode with Shadow Effect	<p>If selected, any text annotations will be displayed as gray text with a shadow, so as to be more visible against white backgrounds.</p> <p style="text-align: center;">CAUTION: Using this option on color monitors is not recommended, since CAD markers may not be visible.</p> <p style="text-align: center;">NOTE: This preference will only be effective if Global Stack has not been enabled for the Series Viewport.</p>
PET SUV Measurements	<p>Allows you to select one or more of the following Standardized Uptake Values (SUVs) to be displayed when using the Probe or the ROI tool with PET images:</p> <ul style="list-style-type: none"> • Body Weight (g/ml) • Lean Body Mass (g/ml) • Ideal Body Weight (g/ml) • Body Surface Area (cm²/ml) <p>Refer to Appendix B below for details on how SUVs are calculated.</p>

24.1.8. MG Tools

One or more of the following options related to the use of Mammography-specific tools within the Viewer may be available, depending on how your system is set up and what your login privileges are:

Option	General Description
Magnifying Glass	<p>Allows you to select the size and shape of the Magnify tool's viewing area as follows:</p> <ul style="list-style-type: none"> • Size: <ul style="list-style-type: none"> ○ Smallest ○ Small ○ Medium ○ Large ○ Largest ○ Custom • Shape: <ul style="list-style-type: none"> ○ Rectangle ○ Circle
Binoculars	<p>Allows you to select the size and shape of the Binocular tool's viewing area as follows:</p> <ul style="list-style-type: none"> • Size: <ul style="list-style-type: none"> ○ Smallest ○ Small ○ Medium ○ Large ○ Largest ○ Custom • Shape: <ul style="list-style-type: none"> ○ Rectangle ○ Circle

Option	General Description
Hot Light	<p>Allows you to select the size and intensity of the Binocular tool's viewing area as follows:</p> <ul style="list-style-type: none"> • Size: <ul style="list-style-type: none"> ○ Smallest ○ Small ○ Medium ○ Large ○ Largest ○ Custom • Intensity: <ul style="list-style-type: none"> ○ 10% ○ 15% ○ 20% ○ 25% ○ Custom

24.1.9. Merge Messenger

If your site has been configured to use Merge Messenger and your login privileges grant you access, the following preferences related to configuring your Merge Messenger preferences will be available:

Option	General Description
Messenger Client always on top	If selected, the main Merge Messenger window will always be on top of other application windows unless minimized.
Automatically Launch Messenger Client	<p>If selected, the Merge Messenger application will be automatically launched when you log into the Merge PACS Workstation (<i>i.e.</i>, the Merge Messenger icon will be displayed on the Windows System Tray as “Online” and will begin listening for messages).</p> <p>If not selected, the Merge Messenger icon will display as “Not Connected” on the System Tray as well as in the Workstation Browser and the Merge PACS Viewer. To launch Merge Messenger, click on the Merge Messenger icon in the Workstation Browser or the Merge PACS Viewer once to launch the application and then, once the icon changes to “online” status, click it again to open the Merge Messenger window as usual.</p>
Chat window always on top	If selected, the Merge Messenger Chat window will always be on top of other application windows unless minimized.
Show chat message in system tray	If selected, the content of any messages received will be displayed in an alert balloon in the Windows System Tray / Task Bar.

Option	General Description						
Report Idle Time	Allows you to select one of the following options:						
	<table border="1"> <thead> <tr> <th>Option</th> <th>General Description</th> </tr> </thead> <tbody> <tr> <td>Never</td> <td>Remain “Online” until you manually select another status or log off entirely.</td> </tr> <tr> <td>Based on mouse or keyboard use</td> <td>Automatically change your status to “Away” after a set period of keyboard and mouse inactivity.</td> </tr> </tbody> </table>	Option	General Description	Never	Remain “Online” until you manually select another status or log off entirely.	Based on mouse or keyboard use	Automatically change your status to “Away” after a set period of keyboard and mouse inactivity.
Option	General Description						
Never	Remain “Online” until you manually select another status or log off entirely.						
Based on mouse or keyboard use	Automatically change your status to “Away” after a set period of keyboard and mouse inactivity.						
Minutes before becoming Idle	If the Based on mouse or keyboard use option has been selected for “Report Idle Time”, this allows you to specify how many minutes of inactivity should trigger a change to “ Away ” status. Note that you can either select a number from the drop-down menu or enter a number manually.						

24.1.10. Display/Mouse/Keyboard

One or more of the following options related to the use of your mouse and keyboard, as well as the overlay font height, may be available, depending on how your system is set up and what your login privileges are:

a. Mouse

The following general preferences related to your mouse usage are available:

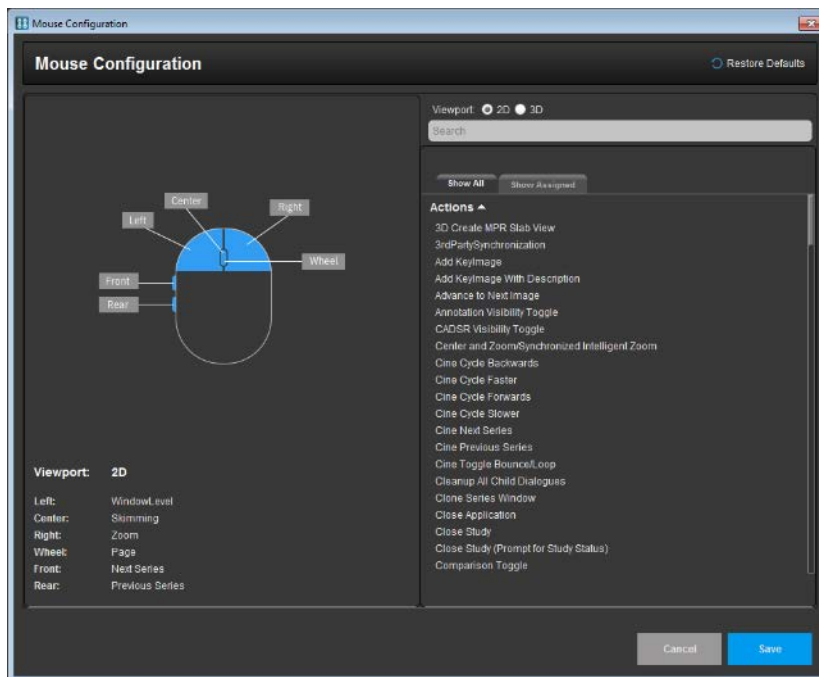
Option	General Description						
Interaction	Allows you to configure whether you need to hold down the left mouse button in order to use the various Mammography-specific tools (Binocular , Hot Light , Dual Link Magnifier). The following options are available:						
	<table border="1"> <thead> <tr> <th>Option</th> <th>General Description</th> </tr> </thead> <tbody> <tr> <td>Operate on Click-drag</td> <td>The left mouse button must be held down</td> </tr> <tr> <td>Operate on Click</td> <td>Click once to activate the tool, click again to turn off</td> </tr> </tbody> </table>	Option	General Description	Operate on Click-drag	The left mouse button must be held down	Operate on Click	Click once to activate the tool, click again to turn off
Option	General Description						
Operate on Click-drag	The left mouse button must be held down						
Operate on Click	Click once to activate the tool, click again to turn off						
Use Skimming for Middle Mouse Drag	If selected, the Skimming tool (described in subsection 4.4.1 above) will be available by pressing and holding the center wheel on your mouse as you drag your cursor across a Series Viewport.						
Delayed Right Click	If selected, the Series Right-click Menu will only appear if you click on hold the mouse button for a brief period of time and single clicking with the right-mouse button will toggle among mouse modes. If not selected, single-clicking with the right mouse button will immediately display the menu.						

Option	General Description
Ignore Horizontal Mouse Movement when Paging	If not selected, you will be able to page through images forwards and backwards by moving the mouse to the right and left, in addition to moving the mouse up and down.
Assign Mouse Button Actions	Select this option and then click on the Customize button to launch the Mouse Configuration dialog, as described in subparagraph i below.
Customize Mouse-Cycle Modes/Toolbox	Click on the Customize button to launch the Customize Mouse-Cycle Modes dialog, as described in subparagraph ii below.

i. Assigning Mouse Button Actions

By default, the actions performed by each of your mouse buttons are generally controlled by the currently-active tool in the Viewer. For example, if the Zoom/Pan tool is active, then clicking and dragging with the left mouse button will pan the image and scrolling with the mouse wheel will zoom the image in or out. If desired, however, you can custom configure your mouse buttons so that pressing a mouse button on an image within a Series Viewport will perform the specified action or assigned tool based on the type of viewport (2D/3D). This is done by selecting the **Assign Mouse Button Actions** preference option and then clicking on the **Customize** button next to that option.

When you click on the Customize button the Mouse configuration window will be displayed as a separate pop-up window, as in the following example:



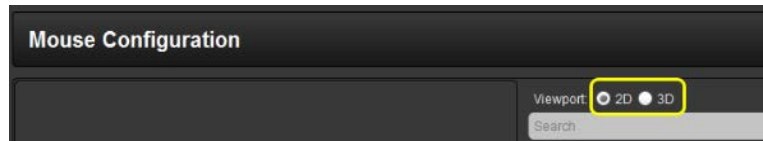
The Mouse Configuration Dialog

Note the following:

- Enabling the **Assign Mouse Button Actions** preference will cause the **Delayed Right Click** preference to be automatically enabled and grayed out so it cannot be disabled.
- The selected tools and actions will be available to you via the configured mouse buttons when you first open a study.
- Once a study is open, you can manually select another other tool to use with the left mouse button by selecting that tool from a toolbar or right-click menu as well as using a keyboard shortcut.
 - While using a manually selected tool, that tool will override the behavior of any applicable mouse buttons.
 - When you are finished with the manually selected tool, you can return to the configured mouse button tools/actions by either performing a quick right-click or by using the “Release Tool” keyboard shortcut (“\” by default, but this can be configured as described in paragraph b below).
- When you first open a study, the cursor that is displayed by default will be the one associated with whichever tool is assigned to the **left** mouse button.

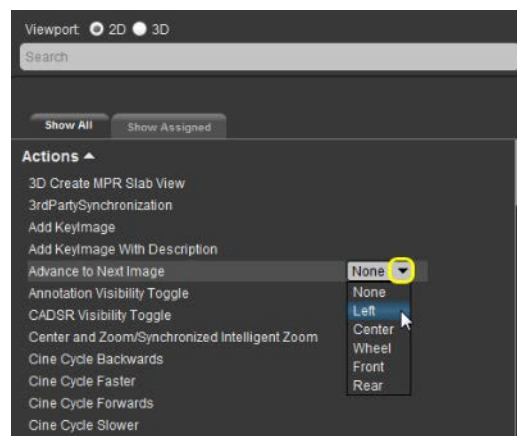
To assign actions and/or tools to specific buttons for use with specific types of viewports, do the following:

- Select the type of Series Viewport (2D/3D) for which you want to configure the mouse button actions and tools, as in the following example:



Selecting Type of Viewport to Configure

- To assign an **action** to a particular mouse button, click on the desired action in the list of available actions to highlight it and then select the desired button from the associated drop-down menu, as in the following example:

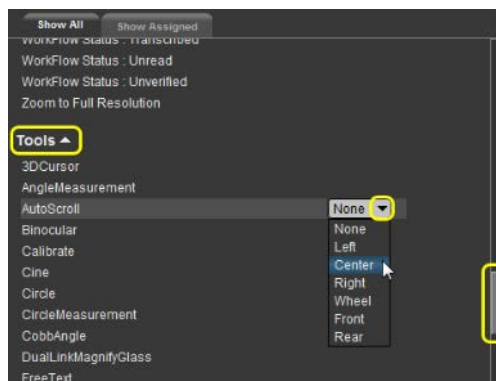


Assigning an Action to a Mouse Button

NOTE: You can filter the list of available actions by entering text in the **Search** field.

NOTE: You cannot assign an action to the right mouse button, only a tool (as described below).

- To assign a **tool** to a particular mouse button, scroll down to the list of tools, click on the desired tool and then select the desired button from the associated drop-down menu, as in the following example:

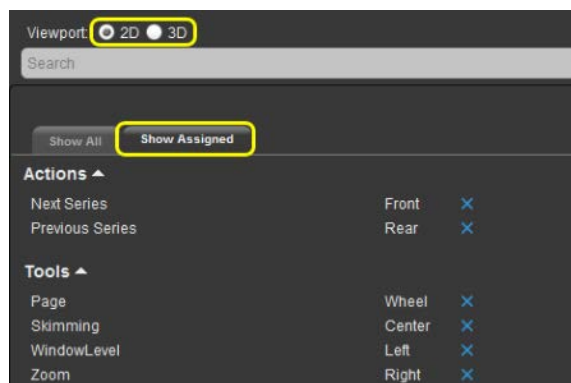


Assigning an Action to a Mouse Button

NOTE: You can filter the list of available actions by entering text in the **Search** field.

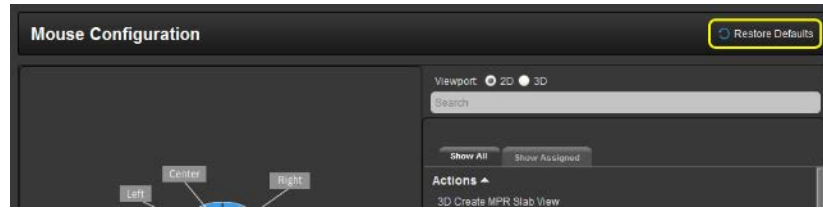
NOTE: When a mouse button is tied to a tool (rather than an action), the mouse button will acquire the usual behavior of the **left** mouse button of that tool. For example, by default the Zoom/Pan tool uses the left mouse button to pan and the center wheel to zoom. If you were to assign the Zoom/Pan tool to the **right** mouse button, the right mouse button would now perform the pan operation, but no other button (including the center wheel) would perform the zoom operation unless you have explicitly configured that other button to perform the zoom operation.

To view all currently assigned actions or tools for the selected Viewport type, click the **Show Assigned** tab, as in the following example:



Currently Assigned Actions and Tools for this Viewport Type

To reset all mouse buttons to their default values for all Viewport types, click on **Restore Defaults**, as in the following example:



Currently Assigned Actions and Tools for this Viewport Type

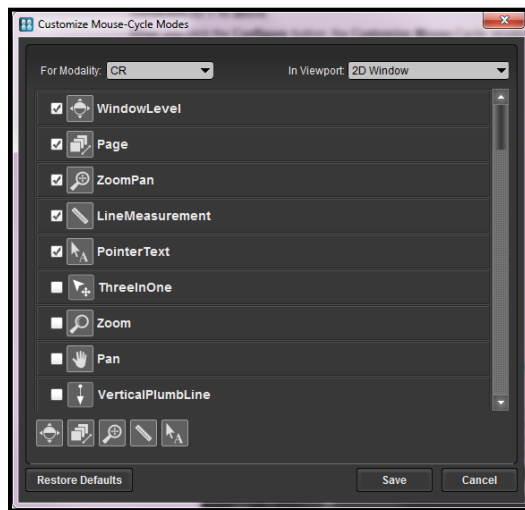
ii. Customizing Mouse-Cycle Modes

As described in subsections 4.2.2, 4.8.1, 4.8.2, 4.8.3 and 4.8.4 above, repeatedly right-clicking on an image will toggle the cursor among a variety of commonly used mouse modes. The Merge PACS Viewer allows you to customize, for each modality, which mouse modes will be available as well as the order in which they appear. This is done by clicking the **Customize** [Mouse-Cycle Modes] button.

NOTE: When cycling through the mouse mode cycle list, the **Page** tool will only be shown if the current series window contains at least two images, regardless of how you have customized the mouse cycle modes.

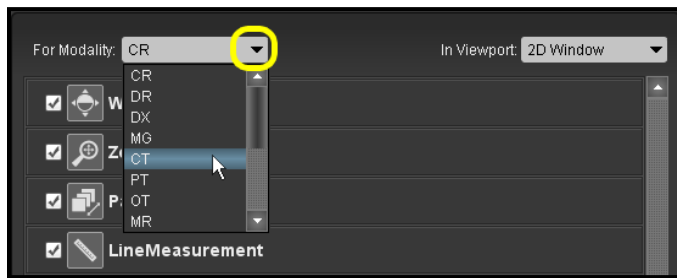
NOTE: Mouse-cycle modes will not be available if you have custom configured your mouse button actions, as described above.

When you click the **Customize** button, the **Customize Mouse-Cycle modes** window will be displayed as a separate pop-up window, as in the following example:



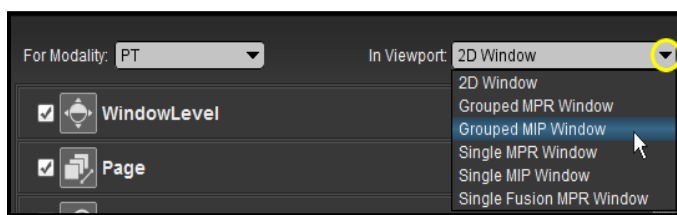
The Customize Mouse-Cycle Modes Window

- Since mouse-cycle modes can be customized for individual modality types (and different modality types have different mouse modes available), you need to first select the modality whose mouse-cycle mode you wish to customize. This is done by selecting the desired modality from the drop-down **For Modality** menu, as in the following example:



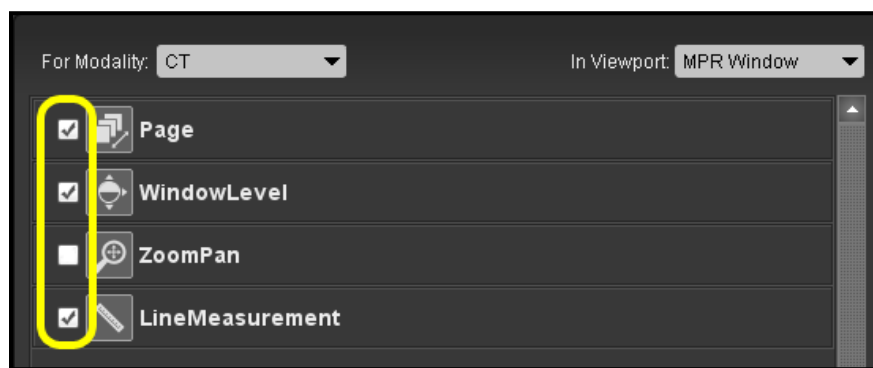
Selecting the Modality

- For modalities that support 3D viewing, each type of viewport can also have its own customized mouse-cycle mode. Once you have selected the desired modality, you can select the desired type of viewport whose mouse-cycle mode you want to customize from the drop-down **In Viewport** menu, as in the following example:



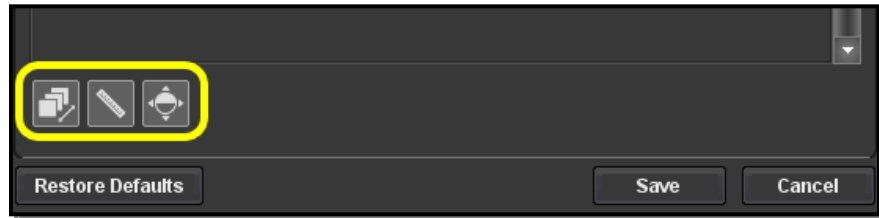
Selecting the Viewport Type

- Once you have selected the desired modality (and, if applicable, viewport type), you can select and change the order of the available mouse modes as follows:
 - To select or deselect an available mouse mode for inclusion in the cycle, click on the check box next to the mouse mode, as shown below:



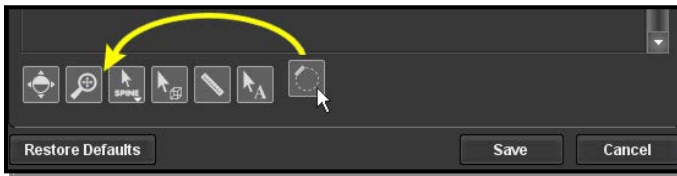
Selecting and Deselecting Mouse Modes

Mouse modes that have been selected will be displayed at the bottom of the window, as in the following example:



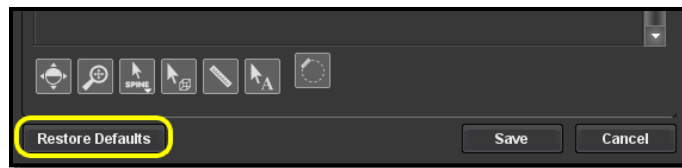
Selected Mouse Modes

- To change the order of the selected mouse modes, use your mouse to drag and drop them into the desired order, as in the following illustration:



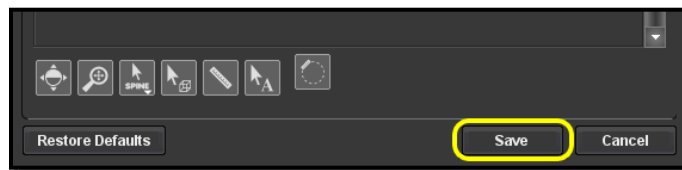
Reordering Mouse Modes

- If you need to restore all mouse-cycle modes to their default settings, click on the **Restore Defaults** button at the bottom of the window, as in the following example:



Restoring Default Settings

- When you have finished making all the desired changes, click on the **Save** button at the bottom of the window, as in the following example:



Saving Changes

NOTE: You can also click on the **Cancel** button to exit the window without saving any changes.

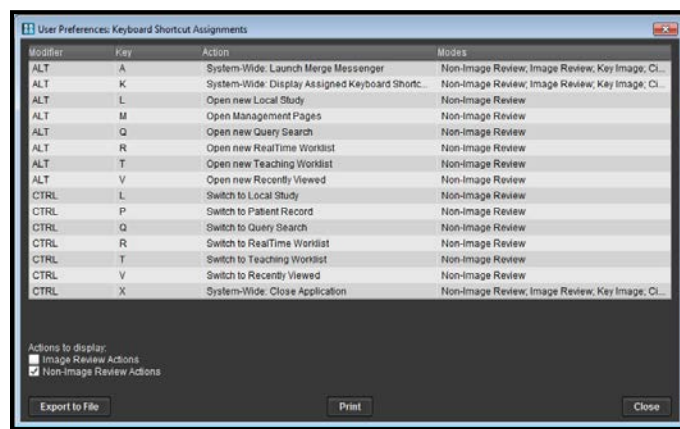
b. Keyboard

Most of the various actions (whether functions or tools) within the Workstation are associated with keyboard shortcuts that let users perform the function or select the tool by pressing one or more keys on their keyboard. New installations of Merge PACS come with a set of default keyboard shortcuts that can be customized at the site or group level, but you can also override these defaults with your own customized keyboard shortcuts.

Note the following:

- Not all keys or keystroke combinations are allowed (a warning message will be displayed if you attempt to use an invalid key).
- Some actions have shortcuts that are not configurable.
- Any macros that have been created, as described in Section 24.3 below, can also be assigned to keyboard shortcuts.

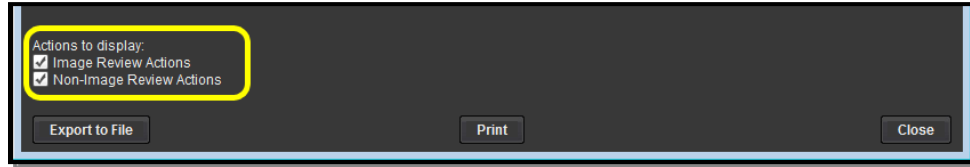
Click on the **Display** button to launch the **Keyboard Shortcut Assignments** dialog in a separate pop-up window, which allows you to view a list of all currently assigned keyboard shortcuts that can be sorted, printed out or exported to a Comma Separated Value (.csv) file that can be opened in spreadsheet applications such as Microsoft® Excel, as in the following example:



Keyboard Shortcut Assignments Window

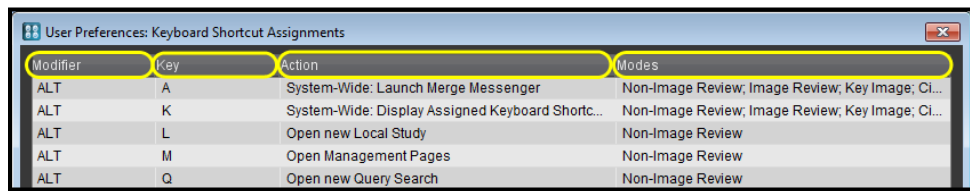
NOTE: You can also view all assigned keyboard shortcuts by clicking on the **View All Assigned** button on the **Customize Keyboard Shortcuts** dialog, described below, or by selecting **Display Assigned Keyboard Shortcuts** from the **Patient Record Right-click Menu** or the **Study Right-click Menu**.

- By default, only the actions that correspond with the location from which you accessed the Customize Keyboard Shortcuts window will be displayed (*i.e.*, if launched from the Viewer, only Image Review actions will be displayed), but you can use the checkboxes at the bottom of the window to display the shortcuts assigned to other actions in addition to or instead of, as in the following example:



Selecting the Keyboard Shortcuts to Display

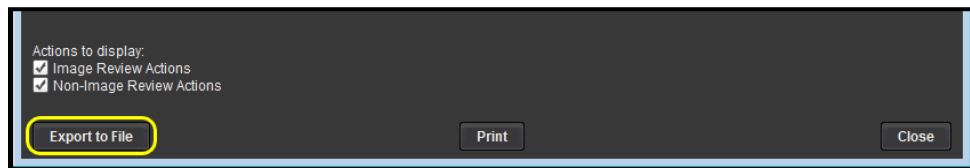
- Once you have selected the type of shortcuts to display, you can **sort** the list by clicking on any of the column headings at the top of the window, as in the following example:



Sorting the List of Keyboard Shortcuts

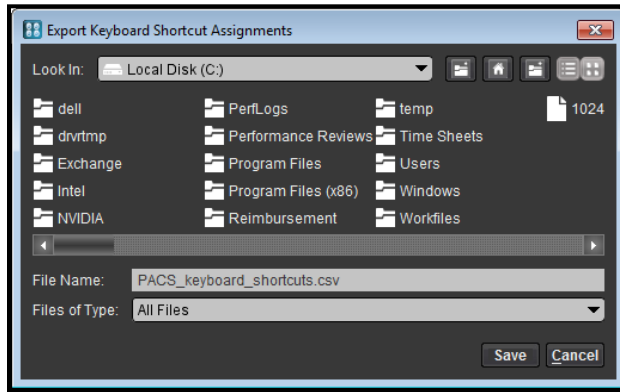
NOTE: Clicking on the same column header repeatedly will toggle between sorting in ascending and descending order for that column.

- Click on the **Export to File** button at the bottom of the window to create a **Comma Separated Value** (.csv) file containing the shortcuts currently being displayed that can be saved and opened in spreadsheet applications such as Microsoft® Excel, as in the following example:



The Export to File Button

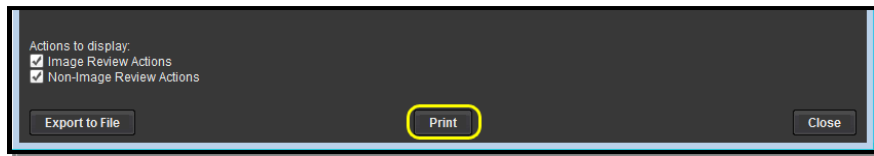
The **Export Keyboard Shortcut Assignments** window is displayed, as in the following example:



Exporting the List of Keyboard Shortcuts

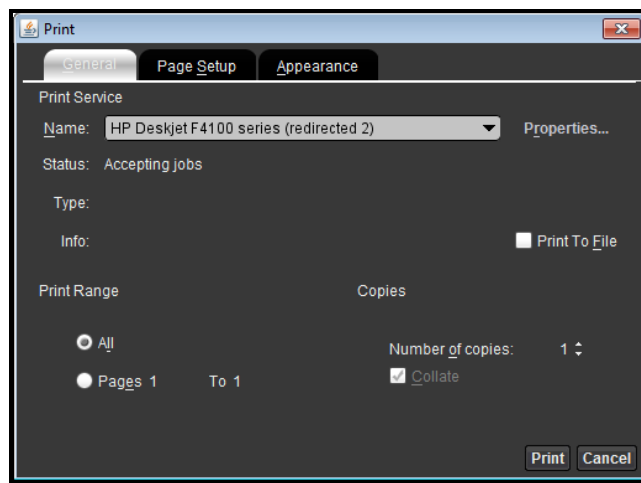
Browse to the location where you would like to save the file and click on the **Save** button at the bottom of the window.

- Click on the **Print** button at the bottom of the window to send the list of shortcuts currently being displayed to a local or network attached printer, as in the following example:



The Print Button

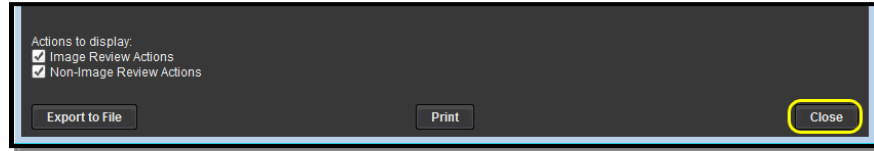
The **Print Keyboard Shortcut Assignments** window is displayed, as in the following example:



Printing the List of Keyboard Shortcuts

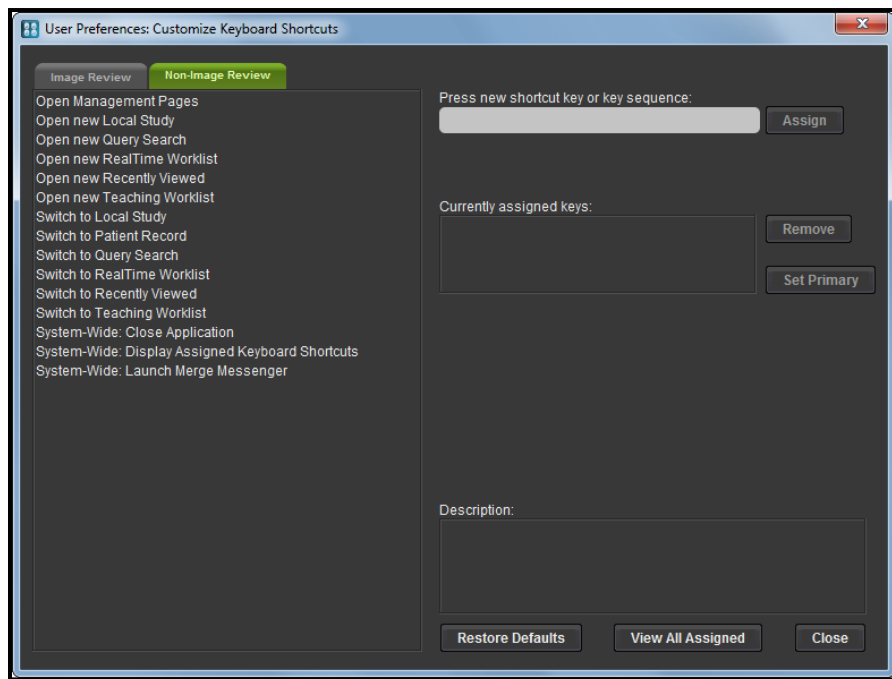
Select the desired printer from the drop-down **Name** menu and click on the **Print** button at the bottom of the window.

- Click on the **Close** button at the bottom of the window to exit the Keyboard Shortcut Assignments Window and return to the main Customize Keyboard Shortcuts Window, as in the following example:



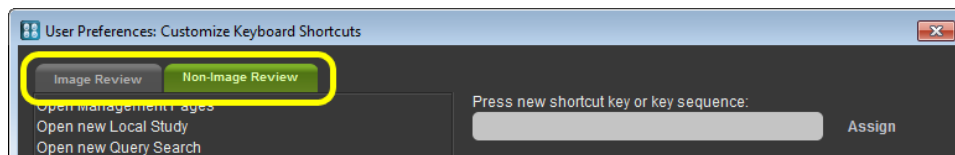
Exporting the List of Keyboard Shortcuts

Click on the **Customize** button to launch the **Customize Keyboard Shortcuts** dialog that allows you to add new keyboard shortcuts, edit existing keyboard shortcuts, and view a list of all current keyboard shortcuts that can be printed and/or exported to a Comma Separated Value (.csv) file that can be opened in spreadsheet applications such as Microsoft® Excel, as in the following example:



Customize Keyboard Shortcuts Dialog

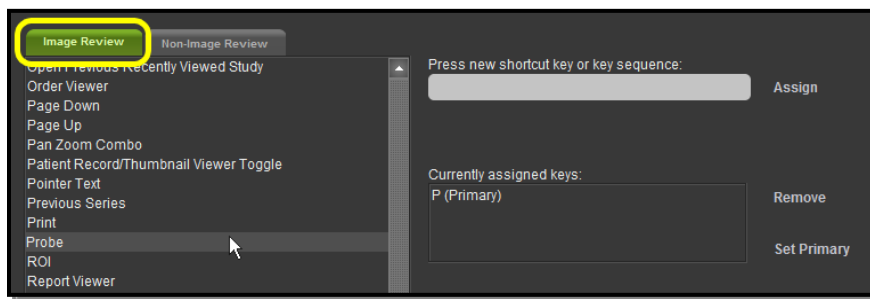
- The tabs at the top of the window allow you to select between **Image Review** actions and **Non-Image Review** actions, as in the following example:



Selecting Between Image Review and Non-Image Review

NOTE: The **Non-Image Review** tab will be selected by default when you first access the Customize Keyboard Shortcuts dialog.

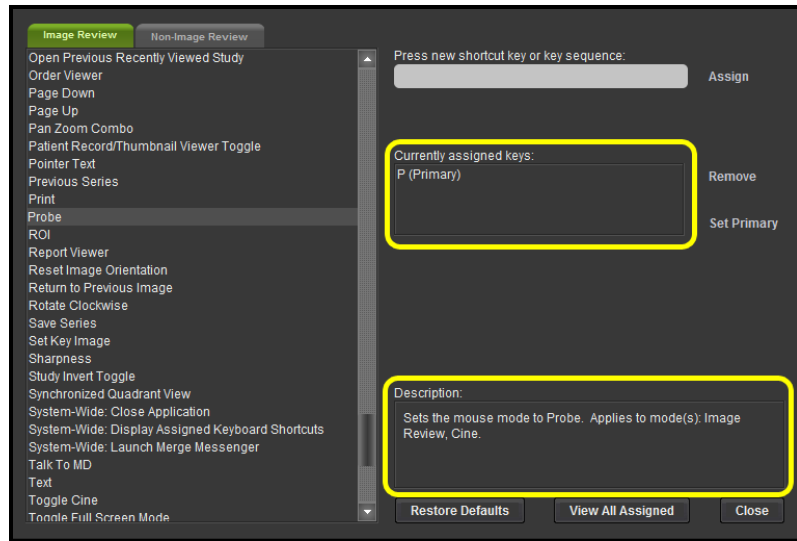
- To assign or change the keyboard shortcut associated with a particular action (including macros), click on the appropriate tab at the top of the Customize keyboard Shortcut window (**Image Review** or **Non-Image Review**) and then click on the desired action, as in the following example:



Selecting the Desired Action

NOTE: Once you have clicked on any action, you can type a letter or character to jump directly to the first action that begins with that letter or character. For example, typing “R” while viewing the **Image Review** list of actions will jump directly to **ROI** (the first action beginning with “R”) and typing “PRO” will jump directly to **Probe**.

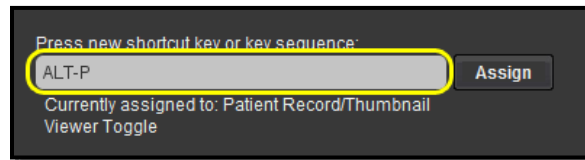
- When you click on an action, the right side of the window will display the shortcut or shortcuts currently assigned to that action as well as a brief description of the action, as in the following example:



Information About the Selected Action

NOTE: Up to four keyboard shortcuts can be assigned to a single action. Only one shortcut can be configured as the “**primary**” shortcut for the action, however, and that shortcut will be displayed alongside the action’s name in the various menus and tool-tips.

- Click on the **Press new shortcut key or key sequence** box and enter the key or combination of keystrokes (e.g., ALT+P) you want to assign to this action, as in the following example:

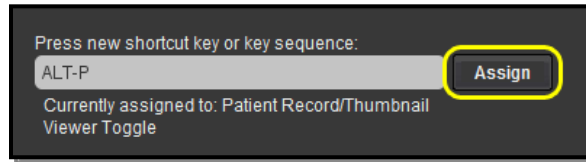


Entering The Keyboard Shortcut

NOTE: Keyboard shortcuts assigned to **Non-Image Review** actions (including macros) must either (a) contain the **ALT** key as a modifier (e.g., ALT+P), (b) contain the **CTRL** key as a modifier (but cannot be combined with C, V, X, Left Arrow, Right Arrow, Home, or End), or (c) be a **Function** key (e.g., F8). Note that, since macros are always displayed in both the Image Review and Non-Image Review lists, these restrictions will apply to all macros even if selected from the Image Review list.

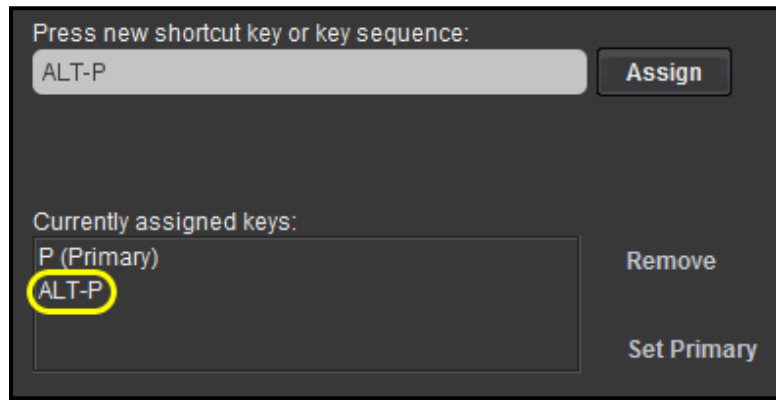
CAUTION: If the key or key sequence entered is already assigned to another action, that information will be displayed directly below the box as in the example above. Proceeding with the assignment will remove the shortcut from the currently assigned action.

- Once you have entered the desired key or keystroke combination, click on the Assign button, as in the following example:



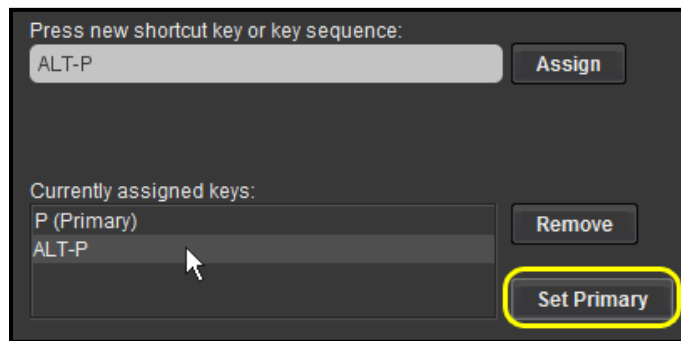
The Assign Button

- The newly assigned keyboard shortcut will now be displayed in the list of **Currently assigned keys** for this action, as in the following example:



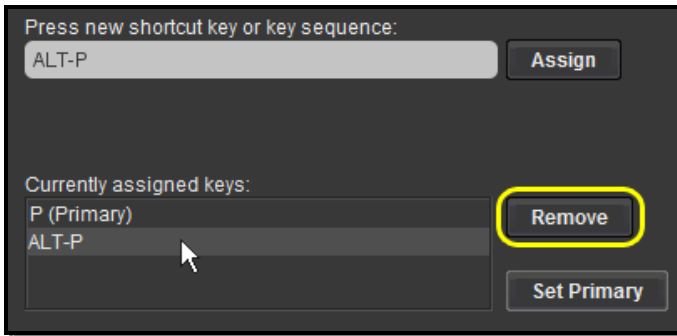
Newly Assigned Keyboard Shortcut

- If the newly assigned shortcut is the only one assigned to this action, it will be designated the **primary** shortcut automatically and will be displayed alongside the action in the various menus and tool-tips. If there was already a primary shortcut and you want to make the newly assigned shortcut primary, click on the new shortcut once to select it and then click on the **Set Primary** button, as in the following example:



Setting Keyboard Shortcut as Primary

- If you need to remove a keyboard shortcut that you have assigned to an action, click on the shortcut once to select it and then click on the **Remove** button, as in the following example:



Removing a Keyboard Shortcut

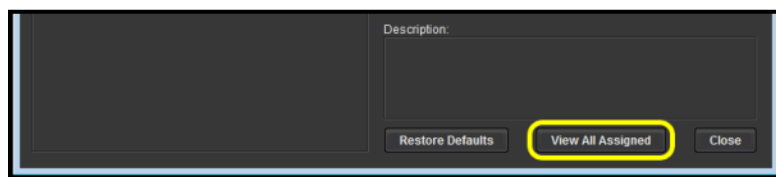
- If necessary, you can click on the **Restore Defaults** button at the bottom of the window to remove any custom keyboard shortcuts that you have created:



Restoring Default Keyboard Shortcuts

NOTE: Once your custom keyboard shortcuts have been removed, the keyboard shortcuts will be based on the values set for the group(s) to which you belong, those defined for the entire site and the factory defaults, as applicable.

- Click on the **View All Assigned** button at the bottom of the Customize Keyboard Shortcut dialog to view a list of all currently assigned keyboard shortcuts that can be sorted, printed out or exported to a Comma Separated Value (.csv) file that can be opened in spreadsheet applications such as Microsoft® Excel, as in the following example:

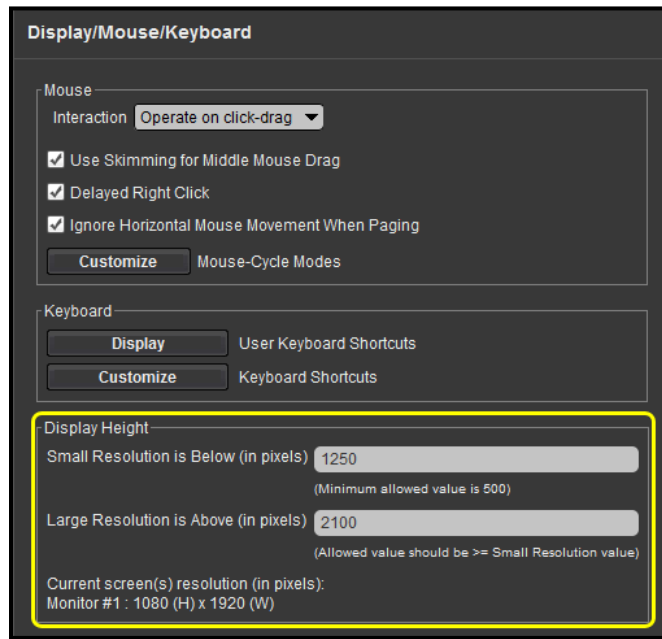


Viewing All Assigned Keyboard Shortcuts

c. Display Height

As described in subsection 24.1.12 below, you can customize the display of the Lossy Compression overlay text and each DICOM field included in the DICOM overlay text to appear in a bold and/or color highlighted font as well as to appear in a small, medium or large font size. In addition, you can configure a different “base font size” to be used for all overlay text with different screen resolutions.

In order to configure a different base font size for different screen solutions, however, you must first define what constitutes a “small” and “large” screen resolution in the **Display Height** section, as shown below:



Display Height

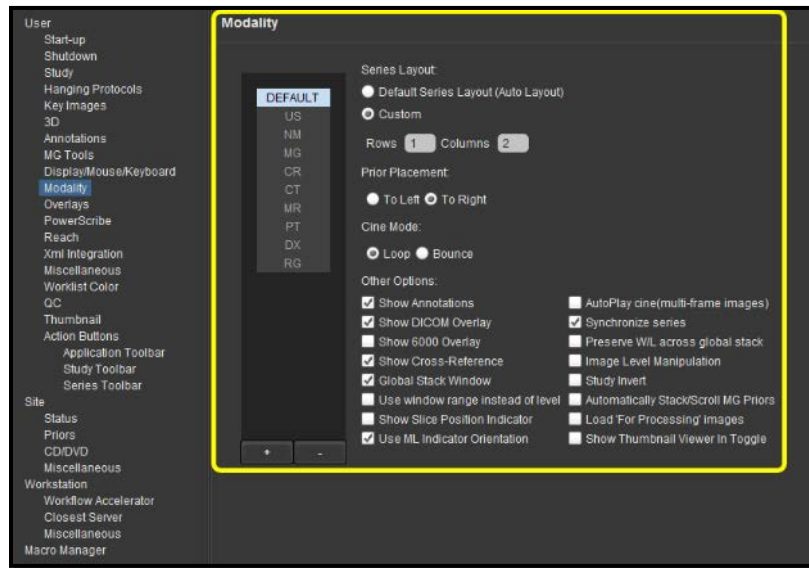
You can manually define “small” resolution as being below a certain number of pixels in height and define “large” resolution as being above a certain number of pixels in height. The system will then automatically calculate “medium” resolution as being anything between those two numbers:

Option	General Description
Small Resolution is Below (in pixels)	Enter the maximum height (in pixels) of a monitor to be considered “small resolution”
Large Resolution is Above (in pixels)	Enter the minimum height (in pixels) of a monitor to be considered “large resolution”

For example, a user might define “Small Resolution” as any screen with a resolution of anything below 1200 (pixels) in height and “Large Resolution” as any screen with a resolution of anything above 2048 (pixels) in height. The system would then automatically calculate “Medium Resolution” as any screen with a resolution between 1200 and 2048 pixels in height.

24.1.11. Modality

The Modality preferences section allows you to set a variety of default preferences for different modalities, as in the following example:



Modality Preferences

The left-hand side of the screen has a menu displaying four specific image modality types that can be selected [**CT**, **MR**, **CR** and **MG**], as well as a **DEFAULT** setting for every other type of modality. You can also use the **+** and **-** buttons at the bottom of the menu to add new modality types or remove modality types that you have previously added (you cannot remove any of the four predefined modality types).

For each modality type, you can set the default Series layout as well as various miscellaneous preferences, as described below.

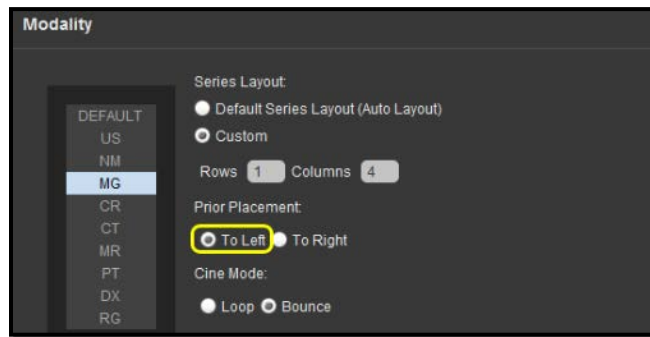
a. Series Layout

For each modality type you can select one of the following two options with regard to Series Layout:

Option	General Description
Default Series Layout (Auto Layout)	This allows the Merge PACS Viewer to automatically determine the optimal Series layout, based on the number of Series in a given Study.
Custom	This allows you to manually enter the number of rows and columns that should be displayed.

b. Prior Placement

By default, when you are viewing Primary Mammography and Prior Mammography studies together in **Compare Studies** mode, as described in subsection 4.4.4 above, or **Stack Scrolling** mode, as described in subsection Note: above, the Prior Study will be displayed to the right of the Primary Study. If desired, however, you can configure the Viewer to always display Prior Mammography studies to the left of the Primary Study by selecting the **To Left** option under **Prior Placement**, as in the following example:



Selecting Prior Placement to the Left

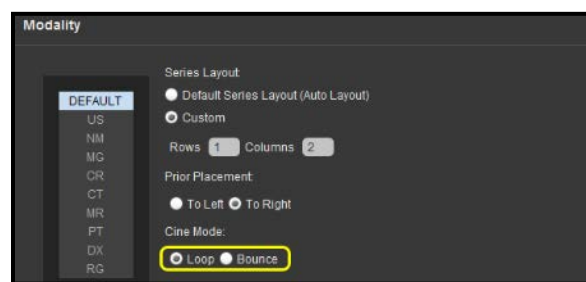
NOTE: This option will only be available when setting the **MG** (or the **DEFAULT**) modality.

c. Cine Mode

Depending on the modality, the Cine mode will operate in one of the following two modes by default:

Mode	Description
Loop	After the last image in the series is displayed the paging cycle will start over again with the first image
Bounce	The paging cycle will keep reversing directions when the last and first images are displayed. This is the default for MG, PT and NM modalities.


If desired, however, you can change the default Cine mode for one or more modalities by selecting the desired **Cine Mode** option, as in the following example:



Selecting Cine Mode

d. Other Options

For each modality type, you can set the following miscellaneous display preferences:

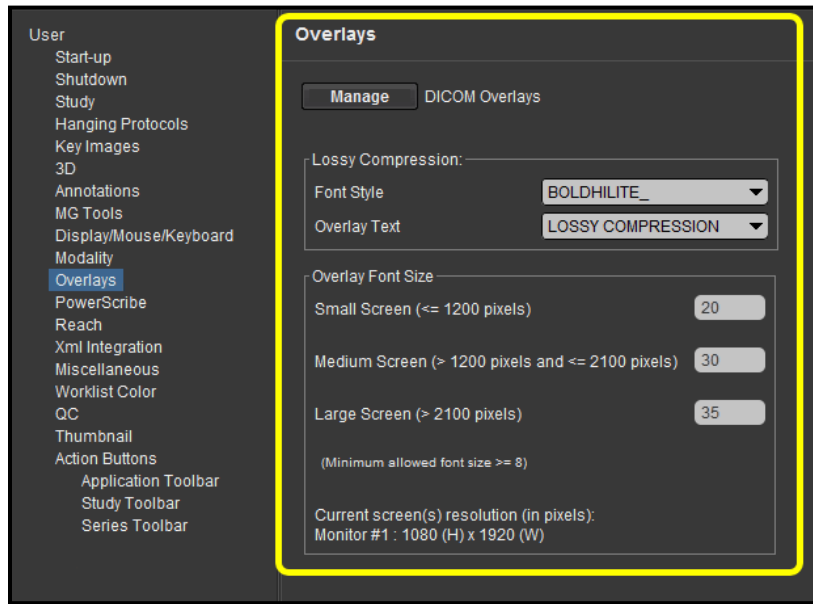
Option	General Description
Show Annotations	If selected, the display of annotations will be automatically enabled whenever a Study of this particular modality type is loaded into the Viewer.
AutoPlay Cine (multi-frame images)	If selected, multi-frame images will automatically be loaded in Cine mode whenever a Study of this particular modality type is loaded into the Viewer.
Show DICOM Overlay	If selected, the DICOM Overlay option will be automatically enabled whenever a Study of this particular modality type is loaded into the Viewer.
Synchronize Series	If selected, the Automatic Series Synchronization option will be automatically enabled whenever a Study of this particular modality type is loaded into the Viewer.
Show 6000 Overlay	If selected, the DICOM 6000 Overlay option will be automatically enabled (if applicable) whenever a Study of this particular modality type is loaded into the Viewer.
Preserve W/L Across Global Stack	If selected, window and level settings will be carried over from one Series to the next when using the Global Stack feature.
Show Cross Reference	If selected, the Reference Lines button on the Toolbar (as described in subsection 4.4.2 above) will be automatically enabled whenever a Study of this particular modality type is loaded into the Viewer.
Image Level Manipulation	If selected, the Image Level Manipulation option will automatically be enabled whenever a Study of this particular modality type is loaded into the Viewer.
Global Stack Window	If selected, the Global Stack option will be automatically enabled whenever a Study of this particular modality type is loaded into the Viewer.
Study Invert	If selected, the Invert option will be automatically enabled for all images whenever a Study of this particular modality type is loaded into the Viewer.
Use Window Range Instead of Level	 <p>If selected, the Window/Level tool will appear as a special Window Range cursor, as shown on the left, whenever a Study of this particular modality type is loaded into the Viewer.</p> <p>Once selected, moving the cursor up and down adjusts the lower end of the window and moving it left and right adjusts the upper end of the window.</p> <p>This option will be checked by default for NM and PT modalities.</p>

Option	General Description
<p>Automatically Stack/Scroll MG Priors</p>	<p>If selected, any relevant prior mammography studies will automatically be loaded into the Viewer along with the primary Study and the Navigation Thumbnails for the prior studies will be displayed with the primary Study's Navigation Thumbnails. In addition, the Scroll MG Priors tool in the Application Toolbar will become active, as described in subsection Note: above.</p> <p>This option is only available when setting the preferences for the Default and Mammography (MG) modalities.</p> <hr/> <p>NOTE: If this preference is not selected, Navigation Thumbnails for relevant prior mammography studies will still be displayed if the Show Thumbnails for Comparison Studies preference is selected, as described in subsection 24.1.19 below</p>
<p>Show Slice Position Indicator</p>	<p>If selected, the Slice Position Indicator will be displayed for Breast Tomosynthesis images.</p> <p>This option is only available when setting the preferences for the Default and Mammography (MG) modalities.</p>
<p>Load "For Processing" Images</p>	<p>By default, MG images that are classified as "for processing" (<i>i.e.</i>, that are used by CAD systems and as a source of "for presentation" images and not intended to be reviewed as part of a normal read) will not be loaded into the Viewer or cached in RTWL. You can change this, however, by selecting the Load "For Processing" Images preference.</p> <p>This option is only available when setting the preferences for the Default and Mammography (MG) modalities.</p> <hr/> <p>NOTE: The number of images for a given study listed on a worklist or the Query Page is based on the images stored on the PACS Server, not those loaded into the Viewer. Therefore, if this option is not selected and a study has any "for processing" images available, the number of images shown as available for a study will be less than the actual number of studies loaded.</p>

Option	General Description
Use ML Indicator Orientation	<p>By default, the slice position indicator for multi-frame breast tomosynthesis images indicates Medial-Lateral (M-L) for lateral views, as opposed to Right-Left (R-L), and Superior-Inferior (S-I) for orthogonal views, as opposed to Head-Foot (H-F). You can change this to display R-L and H-F instead, however, by deselecting the Use ML Indicator Orientation option.</p> <p>This option is only available when setting the preferences for the Default and Mammography (MG) modalities.</p>
Show Thumbnail Viewer in Toggle	<p>By default, clicking on the Patient Record icon on the Application Toolbar within the Viewer will toggle the display of the Patient Record on and off, but will not affect the display of the Mammography Thumbnail Viewer (when viewing Mammography Images).</p> <p>Selecting the Show Thumbnail Viewer in Toggle option, however, will cause the Patient Record icon to toggle the display of both the Patient Record and the Mammography Thumbnail Viewer.</p> <p>Note that this option is only available when setting the preferences for the Default and Mammography (MG) modalities.</p>
DBT upward scrolling is toward the paddle	<p>By default, when viewing mammography images, scrolling "upward" on DBT series will move the images toward the paddle. To change this behavior, this option should be deselected.</p> <p>This option is only available when setting the preferences for the Default and Mammography (MG) modalities.</p>

24.1.12. Overlays

The Overlays Preferences section allows you to configure how DICOM overlay and Lossy Compression overlay text is displayed on images within Series Viewports, as in the following example:



Overlay Preferences

a. Customizing the Lossy Compression Overlay

By default, the text that is displayed on an image to indicate that it is being displayed with lossy compression is labeled “Lossy Compression” and is displayed in a large bold yellow font. If desired, however, the label and font type can be changed as follows.

- To change the **appearance** of the overlay text, select one of the following options from the pull-down **Font Style** menu:

Option	Description
HILITE_	Field will be displayed in medium color-highlighted text.
HILITESM_	Field will be displayed in small color-highlighted text.
HILITELG_	Field will be displayed in large color-highlighted text.
BOLDHILITE_	Field will be displayed in medium bold color-highlighted text.
BOLDHILITESM_	Field will be displayed in small bold color-highlighted text.
BOLDHILITELG_	Field will be displayed in large bold color-highlighted text.
BOLDWHITESM_	Field will be displayed in small bold white text.
BOLDWHITEREG_	Field will be displayed in medium bold white text.
BOLDWHITELG_	Field will be displayed in large bold white text.

- To change the **content** of the overlay text, select one of the following options from the pull-down **Overlay Text** menu:

Option	Description
Lossy Compression	Displays the words “Lossy Compression”
Ratio	Displays the actual compression ratio
Lossy	Displays the word “Lossy”

b. Customizing the DICOM Overlay

The DICOM Overlay that is displayed within the Merge PACS Viewer can be custom configured to display differently for specific modalities. For each modality, the following things can be customized:

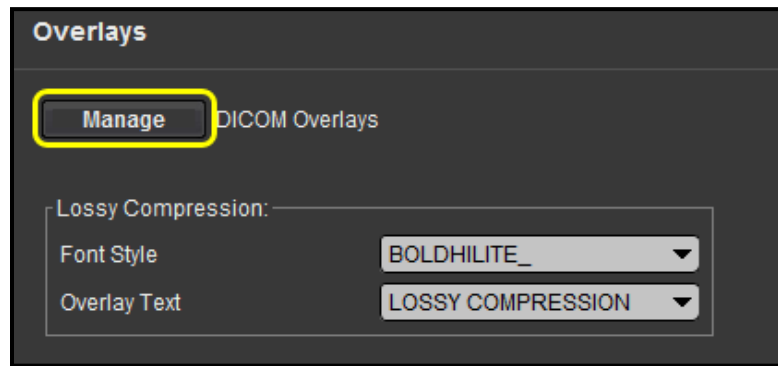
- Which DICOM fields or Viewer keywords should be displayed
- Where (which quadrant) each DICOM field or Viewer keyword should be displayed
- How (with what label or formatting) each DICOM field or Viewer keyword should be displayed
- Which, if any, DICOM fields or Viewer keywords should be considered “minimal” (*i.e.*, to be displayed when the DICOM Overlay feature is turned off).

NOTE: Viewer keywords let you display information derived from current settings within the Viewer, such as Window/Level and Zoom, as opposed to hard-coded information sent from the modalities.

In addition, a default can be customized that will apply to all modalities that don’t have specific configurations.

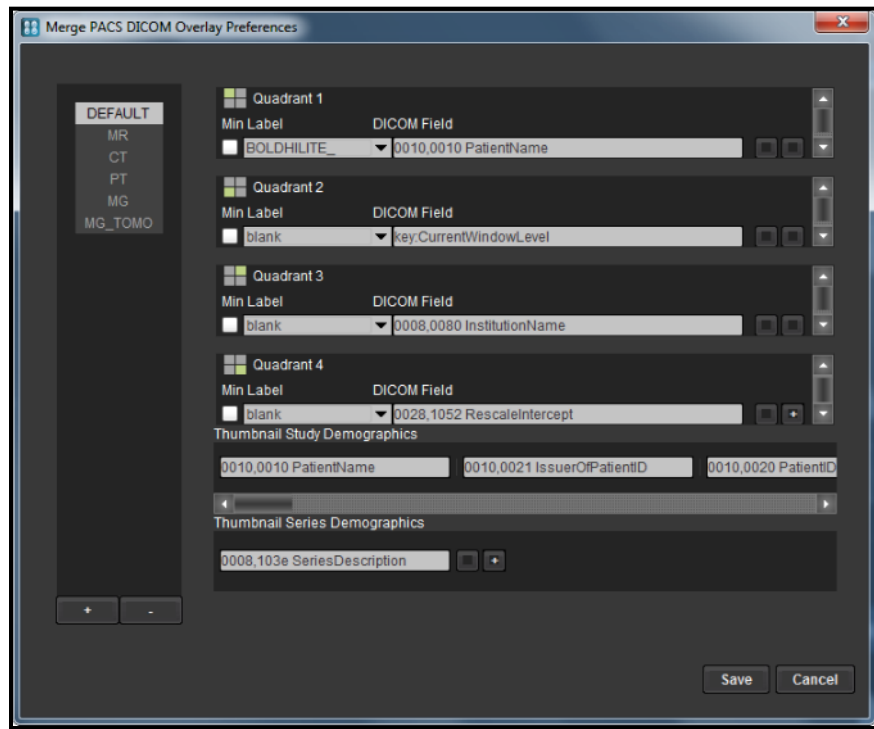
To customize the DICOM Overlay:

- Click on the **Manage** [DICOM Overlays] button, as in the following example:



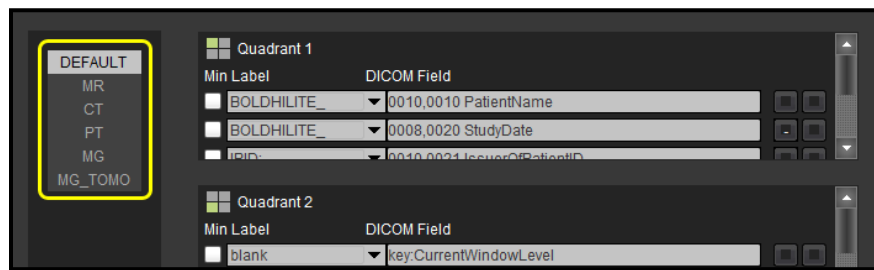
The Manage DICOM Overlays Button

The **DICOM Overlay Preferences** dialog is displayed, as in the following example:



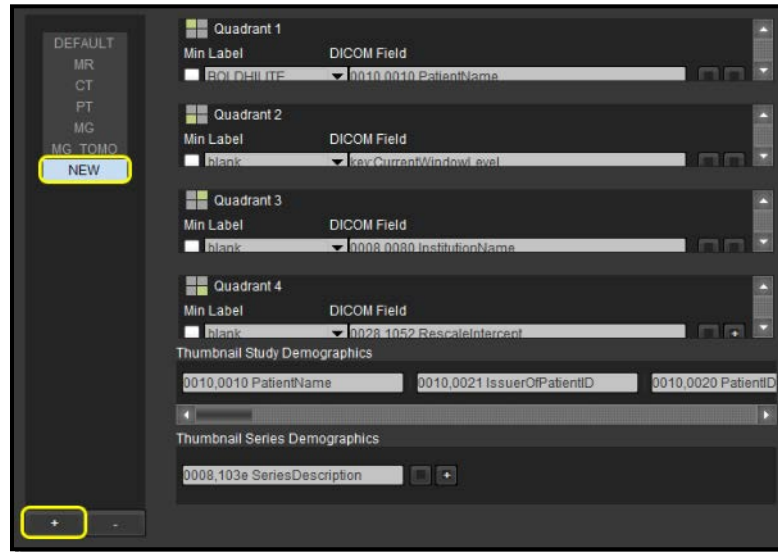
The DICOM Overlays Preferences Dialog

- To edit the DICOM Overlay for a modality that already has a custom DICOM Overlay associated with it (or change the default DICOM Overlay), select the desired modality from the left-hand menu, as in the following example:



Modalities with Custom DICOM Overlays

3. To customize the DICOM Overlay for modality not listed in this menu, click on the + button at the bottom of the menu to add a new entry, as in the following example:



Adding a New Modality

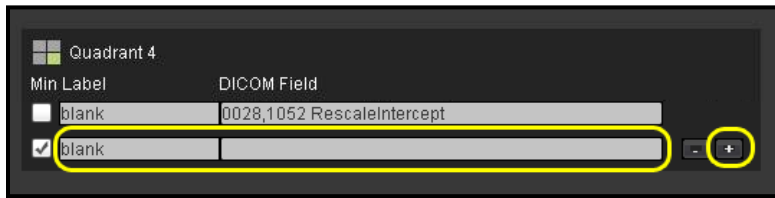
- When you click on the + button, a new entry labeled “NEW” will be added to the menu. Double-click on the entry and then replace “NEW” with the desired modality abbreviation.
- The fields for newly added modalities will be prepopulated with the same values as the DEFAULT modality.

CAUTION: If a modality is listed in this menu, its DICOM Overlay will *only* display those fields that are defined here. So, for example, if you wanted to add one new field for display with CR images, you would need to also define all the standard fields (Patient Name, Patient ID, etc.) in addition to the new field.

- To **delete** a modality that you have added, click on the entry for that modality to select it and then click on the – button at the bottom of the menu. Note that you cannot delete any of the predefined modalities.

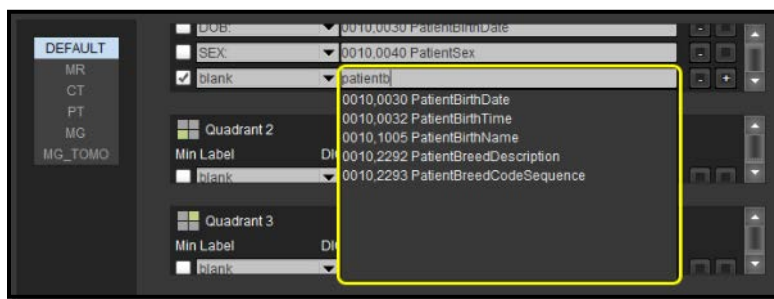
4. Once you have selected the desired modality, edit each quadrant of the DICOM Overlay as follows:

- To **add** a new DICOM field or Viewer keyword, do the following:
 - Click on the **+** button at the bottom of the list of fields for that quadrant to cause a new blank DICOM Field to be added, as in the following example:



Adding a New DICOM Field

- Enter the exact name of the new DICOM field or Viewer keyword in the DICOM Field column. Note the following:
 - If entering the name of a DICOM field, begin typing the desired value. As you start to type in the name for the field, a pop-up menu will be displayed that will allow you to select from a list of fields that match what you have entered, as in the following example:



Filtered DICOM Field Menu

NOTE: Only non-DICOM sequence elements (*i.e.*, top level DICOM attributes that are not sequences of other DICOM attributes) are available for viewing within the DICOM Overlay feature.

- If entering the name of a Viewer keyword, make sure the keyword is entered in the following format:

Key: <KeywordName>

The following Viewer keywords are currently supported:

Viewer keyword	Description
CurrentDisplayFov_Viewport	Display the width and height of the whole Viewport, in mm.
CurrentDisplayFov_VisibleImageArea	Display the width and height of the visible area of the image in the Viewport, in mm.

Viewer keyword	Description
CurrentWindowLevel	Display the current Window/Level setting. NOTE: If the current Window/Level is displayed in any other quadrant besides the default bottom-left quadrant, the values will not update dynamically when the user changes them but will instead reflect the original W/L values.
CurrentZoom	Display the current zoom setting.
Gap	Display a blank line with only a vertical bar symbol “ ” showing. NOTE: In order for the gap to be displayed, you must select a font style for the label, as described below. For all other keywords, the label can be left at the default “blank”.

- If desired, you can configure how the field or keyword is displayed (*i.e.*, with a specified label or font style) by doing one of the following:
 - To specify a **label** to be displayed for this field or keyword, click on the entry in the **Label** column for the field or keyword and type in the desired label name (*e.g.*, “DOB:” or “IPID:”).

NOTE: If you want a separator between the label and the value, such as a colon or a dash or a space, it needs to be included as part of the label.

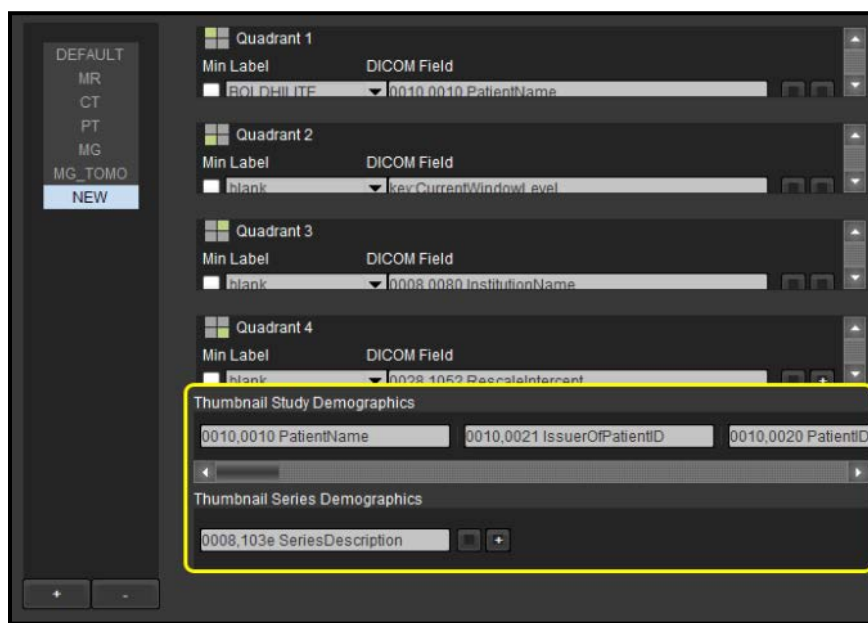
- To specify a **font style** for the field or keyword instead of a label, click on the arrow to the right of the **Label** field and select one of the following options:

Option	Description
HILITE_	Field will be displayed in medium color-highlighted text
HILITESM_	Field will be displayed in small color-highlighted text
HILITELG_	Field will be displayed in large color-highlighted text
BOLDHILITE_	Field will be displayed in medium bold color-highlighted text
BOLDHILITESM_	Field will be displayed in small bold color-highlighted text
BOLDHILITELG_	Field will be displayed in large bold color-highlighted text
BOLDWHITESM_	Field will be displayed in small bold white text
BOLDWHITEREG_	Field will be displayed in medium bold white text

Option	Description
BOLDWHITELG_	Field will be displayed in large bold white text

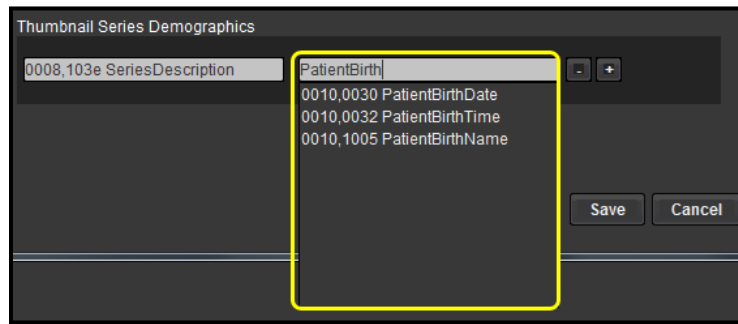
NOTE: For each font style, the “medium” size is set by the base DICOM overlay font size set for the current screen resolution, as described in Paragraph c below, and the “small” and “large” sizes are calculated based on that base font size.

- If desired, you can set a field or keyword as **minimal** (*i.e.*, to be displayed even when the DICOM Overlay feature is turned off) by clicking the check box to the left of the field or keyword.
 - To **edit** a DICOM field or Viewer keyword currently being displayed, make the desired changes to the Label, DICOM Field name and/or Minimal status of that field or keyword.
 - To **remove** an existing DICOM field or Viewer keyword, click on the **—** button to the right of that field or keyword.
5. If desired, you can also edit the Study and Series demographics displayed on the Series Navigation Thumbnails for the desired modality by editing the fields at the bottom of the window, as in the following example:



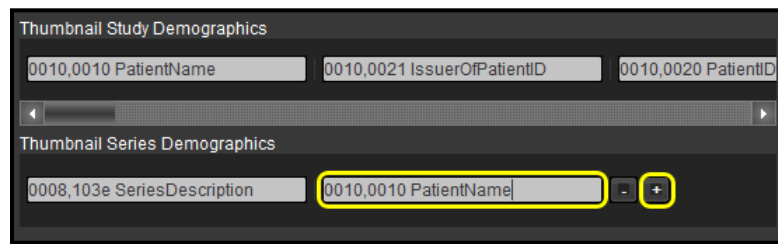
Adding a New DICOM Field

- To **edit** an existing DICOM attribute listed, delete the existing text and begin entering the desired label or name. As you start to type in the label or name for the field, a pop-up menu will be displayed that will allow you to select from a list of fields that match what you have entered, as in the following example:



Filtered DICOM Field Menu

- To **add** a new DICOM field, click on the **+** button to the right of the list of fields for the desired type of demographics and type in the desired label and name in the space provided, as in the following example:



Adding a New DICOM Field

NOTE: Use the scroll bar(s) to view the **+** button if there are currently too many fields to display on the screen.

NOTE: Only non-DICOM sequence elements (*i.e.*, top level DICOM attributes that are not sequences of other DICOM attributes) are available for display on Series Navigation Thumbnails.

- To **remove** an existing DICOM field, click on the **–** button to the right of that field.

NOTE: For Mammo (**MG**) and Mammo Tomosynthesis (**MG_TOMO**) modalities, the Thumbnail Series Demographics will always display **Laterality**, **View Code** and **View Modifier** and these attributes cannot be removed. These attributes will not be visible within this dialog, however, since they can be neither edited nor deleted, You can only add DICOM attributes to Series Demographics for MG and MG_TOMO.

- When finished, click on the **OK** button at the bottom of the dialog to record your changes and exit the dialog.

c. Setting the Base Font Size for DICOM Overlay per Screen Resolution

Once you have defined what constitutes a “small” and “large” screen resolution, as described in subsection 24.1.10 above, you can set the base overlay font size to be used with each of those resolutions, as shown below:



Setting the Base DICOM Overlay Font Size

For each screen resolution, the “Overlay Font Size” defines the base font that is used for any “medium” font style selected for the Lossy Compression overlay text and individual DICOM overlay fields. The “small” and “large” font styles are then calculated based on that base font by subtracting or adding an offset of five pixels.

NOTE: The recommended lower base font size is 14.

24.1.13. PowerScribe

Depending on how your system is set up and your login privileges, you may select **one or more** of the following PowerScribe-related options:

Option	General Description
Automatically Launch PowerScribe	If selected, PowerScribe will automatically be launched in the background when the Merge PACS Workstation is first opened.
Automatically Hide PowerScribe Windows	If selected, all PowerScribe windows will be hidden when not in use.
Automatically Load Non-Final Reports	If selected, reports that are not marked as final will automatically be loaded into PowerScribe in addition to reports that are marked as final.
Automatically Add Addendum to Final Reports	If selected, any addendums to final reports will automatically be added within PowerScribe.

In addition, you may define what PowerScribe should do when specific Report events occur as follows:

Event	General Description
Report is Saved	Select whether PowerScribe should: <ul style="list-style-type: none"> • Close Study • Open Next Study
Report is Signed	Select whether PowerScribe should: <ul style="list-style-type: none"> • Close Study • Open Next Study
Report is Approved (V5.0 only)	Select whether PowerScribe should: <ul style="list-style-type: none"> • Close Study • Open Next Study
Report is Sent to Editor (V5.0 only)	Select whether PowerScribe should: <ul style="list-style-type: none"> • Close Study • Open Next Study

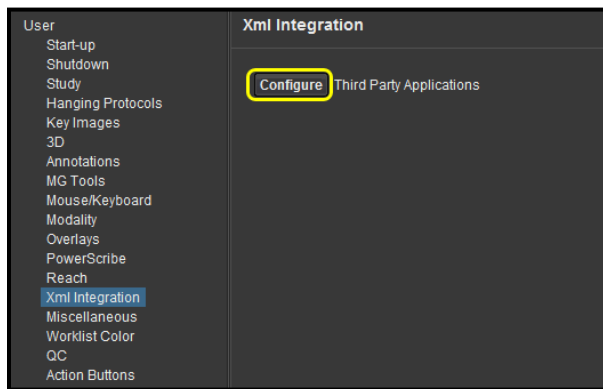
24.1.14. Reach

If your site is using the Reach Referring Physician Module, this section will contain a number of user preferences related to the use of that module.

For more information, please refer to the *Merge PACS 7.3 Reach Administration Manual*.

24.1.15. XML Integration

If your site has been configured to use Bi-directional XML integration, as described in Chapter 10 above, you can configure the actions performed by the Workstation when various responses are sent from the integrated third-party application. You can also configure what notifications are sent to the third-party application (via xml drop) in certain circumstances. This is done by selecting the **Configure** button under **XML Integration**, as in the following example:

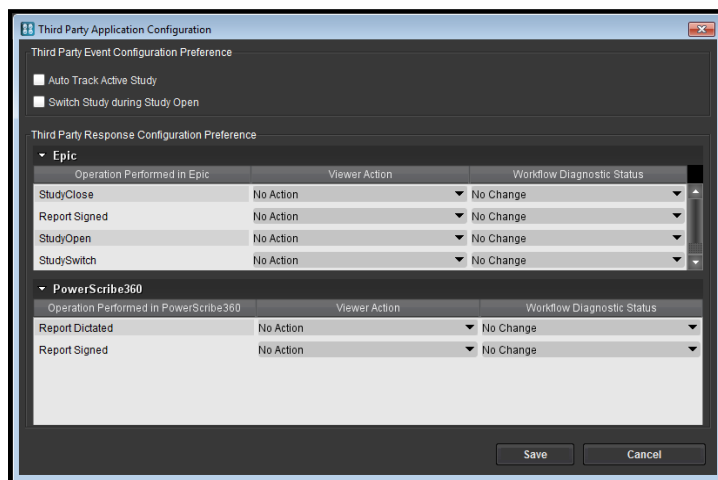


XML Integration Preferences

NOTE: The Configure button will only be available if bi-directional XML integration has been enabled.

NOTE: If bi-directional XML integration has been enabled, this option will also be available from the **3rd Party Application Synchronization Menu**, as described in Section 10.4 above.

When you select this option, the **Third Party Application Configuration** window will be displayed as a separate pop-up window, as in the following example:



The Third Party Application Configuration Window

a. Third-party Event Configuration Preferences

As described in Chapter 10 above, Merge PACS can be configured to notify an available 3rd-party application of various Viewer events by dropping an XML file into a directory on the workstation that is monitored by that application. If Merge PACS has been configured to notify a 3rd-party application whenever a user switches between studies in general, you can configure the following options for your specific Workstation via the checkboxes in the top section of the Third Party Application Configuration window:

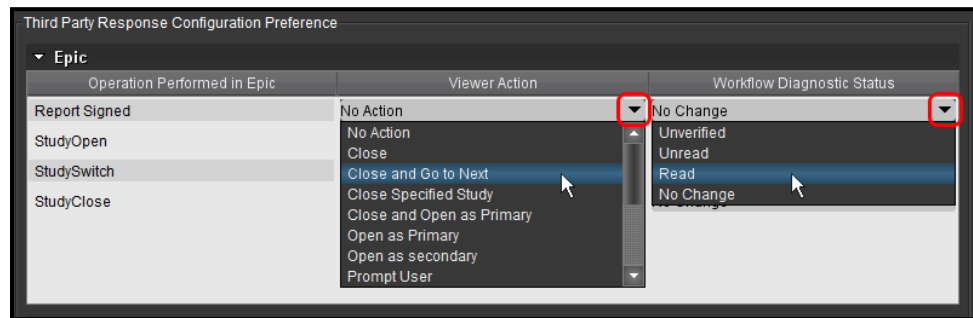
Option	General Description
Auto Track Active Study	If selected, the 3 rd -party application will automatically be notified of a Study switch whenever you change Study focus (e.g., when you switch from the Primary Viewer to the Secondary Viewer). This will cause the context within the 3 rd -party application to switch to the Study that was switched to.
Switch Study during Study Open	If selected, the 3 rd -party application will automatically be notified of a Study switch whenever you open a Study for viewing in the Primary Viewer.

b. Third-party Response Configuration Preferences

The bottom section of the Third Party Application Configuration window allows you to configure response configuration preferences for one or more individual third-party applications. Each available third-party application will be listed separately, and you can expand/collapse the information for each application by clicking on the triangle to the left of that application's name.

Each application will list one or more "response events" that describe the operation performed by the application (e.g., "Report Dictated" or "Report Signed"). The list of actual response events may vary depending on the application and is also customizable on a site-by-site basis.

For each response event, you can specify what action you want the Workstation to perform and what the workflow diagnostic status for the Study should be set to when the response event is received. This is done by selecting from the drop-down **Viewer Action** and **Workflow Diagnostic Status** menus for each response event, as in the following example:



Specifying Viewer Action and Workflow Diagnostic Status

With the options being selected in the example above, when the “Epic” application sends a “StudyClose” response event to the Merge PACS Viewer for a Study, the Viewer will close the Study and mark it as “Read.”

The following actions can be configured:

Action	General Description
No Action	No action will be taken in Merge PACS.
Close	If there is an accession number in the XML file that matches the study currently open in the Primary Viewer, close that study from the Primary Viewer. Otherwise, no action will be taken.
Close and go to Next	Close the current Study in the Primary Viewer and load the next Study in the Primary Viewer.
Close Specified Study	If there is no accession number in the XML file, the Study currently in focus will be closed. If there is an accession number in the XML file: <ul style="list-style-type: none"> • If the accession number matches a currently open Study, that Study will be closed. • If the accession number does not match a currently open Study, do not close anything.
Close and Open as Primary	Close the current Study in the Primary Viewer and open the requested Study in the Primary Viewer.
Open as Primary	Open the specified Study in the Primary Viewer if there is currently no Study in the Primary Viewer. If the specified Study is open in the Primary or Secondary Viewer, switch focus to that Viewer instead. If the specified Study is not already open and another Study is already open in the Primary Viewer, take no action.
Open as Secondary	Open the specified Study in a Secondary Viewer. If the specified Study is currently open in the Primary or a Secondary Viewer, switch focus to that Viewer instead.
Prompt User	Display a dialogue letting the user select any of the actions described above. Note that an additional action called “Send Resync Response to Third Party Application” will be included that will drop the Study Open XML with the Primary Study accession number, followed by the Study Switch XML (if configured to drop this event).
Pre-Caching of Studies [Scroll bar required to view this option]	Pre-cache all studies that match the criteria in the list of the newly received pre-caching request XML message, in the order specified in the list, to the Workstation where the request XML message was received. Note that any Study pre-caching requests still pending from a previous pre-caching request XML message will be cancelled.

24.1.16. Miscellaneous

One or more of the following miscellaneous options related to the operation of the Workstation may be available, depending on how your system is set up and what your login privileges are:

Option	General Description
Report Viewer Font Size	Allows you to select one the default font size used in the Report Viewer. The following options are available: <ul style="list-style-type: none"> • 15 [pt] • 18 [pt] • 22 [pt]
UI Color Model	Allows you to select the color scheme for the Merge PACS Viewer. The following options are available: <ul style="list-style-type: none"> • Color • Grayscale
List Priors without Timestamps	Allows you to specify where prior studies without timestamps should appear in relation to other prior studies. The following options are available: <ul style="list-style-type: none"> • Top – Above all other prior studies • Bottom – Below all other prior studies
DICOM Attribute Viewer Font Size	Allows you to select one the default font size used in the DICOM Attribute Viewer. The following options are available: <ul style="list-style-type: none"> • SMALL • MEDIUM • LARGE
Order Viewer Default Visible Section	By default, when you access the Order Viewer and there is too much information to be displayed without vertical scroll bars, the top section of the Order Viewer (typically the Allergies section) will be displayed and you will need to scroll down to view the other sections (Diagnosis, Orders or Questionnaire). If desired, however, you can select to have the scroll bar automatically jump one of the following sections whenever you open the Order Viewer. <ul style="list-style-type: none"> • Allergies • Diagnosis • Orders • Questionnaire

NOTE: These options will have no effect if the display of the Allergies and/or Diagnosis sections in the Order Viewer has been turned off completely for your site.

Series Layout Configuration	Allows you to set how many rows and columns of options will be displayed when you click on the Series Layout Menu icon, as described in subsection 4.3.2 above.
Show only latest report for each study in the Report Viewer	Allows you to configure the Report Viewer to display only one report (the most recent) for each study in the Report Viewer.

Option	General Description
Select Priors Automatically when Adding to CD/DVD Burning list	If selected, when adding studies to the CD Burning dialog's Study list, the prior studies will be automatically selected.
Use Toolbox Series Right-click Menu	If selected, the Series Right-Click Menu will contain only the active tools that are present in the mouse cycle mode for the modality from which the menu was invoked instead of the complete set of options.
Show status as check box	If selected, any status dimension that has only one available status option will be displayed as a checkbox instead of a drop-down menu on the Update Study Status dialog.
Wrap When Paging Images	If selected, images will “wrap” when you are paging through them. In other words, when you reach the last image in a Series while paging forward, the first image will be displayed next. Similarly, when you reach the first image in a Series while paging backwards, the last image will be displayed next.
Show Application Toolbar	<p>If not selected, the main Application Toolbar will be hidden from view.</p> <hr/> <p>NOTE: Manually pinning and unpinning the Application Toolbar, as described in subsection Note: above, will automatically toggle the selection of this option.</p> <hr/>
Skip Update Status for Close Viewer	If selected, clicking on the Close Viewer button on the Application Toolbar will exit the application without prompting you to update the Study status.
Enable Alternative CAD Marker Association	The Merge PACS Viewer uses a standard scheme to automatically associate structured reports with DICOM images. If the reports are not being correctly associated with the DICOM images for a given site, select this option to use an available alternative scheme.
Ignore private DICOM Tags	By default, the Merge PACS Workstation will process all DICOM tags associated with images, including private DICOM tags. With datasets that contain a lot of private data, however, this can cause unacceptable amounts of memory usage. If this is a problem, select this option to prevent private DICOM tags from being processed.
Enable Column Filtering	By default, you can click on the column headers of the various worklists and enter text below the header, and the worklist will be filtered to only display studies where the value in the column matches the text entered. Deselecting this option will disable column filtering.

Option	General Description
Enable Window/Level Clamping	<p>If a Hanging Protocol includes custom-defined Window/Level presets, those custom W/L settings may not be appropriate for all images in other studies to which the Hanging Protocol is applied (causing some images to be displayed as completely black, for example).</p> <p>If this option is selected, the system will automatically override custom-defined presets and change the W/L to “auto” for images the system determines would not display correctly with the specified W/L setting.</p>
Viewer Defaults to use Displayed FOV Match	<p>Select this to enable the Displayed FOV Match Feature, described in subsection 4.4.4.b above, by default. If this option is selected, clicking on the Displayed FOV Match icon on the Application Toolbar will toggle the feature off instead of on.</p>
Show Cutlines Options in Menu	<p>Select this to display the Cutlines feature, described in subsection 4.4.2 above, in the Series Right-click Menu.</p>
Include Headers for Print	<p>When images are printed by selecting Print from the Series Right-click Menu, a header is displayed at the top of the printed image that reads, “Not for Diagnostic Use” and will also display the following additional information by default:</p> <ul style="list-style-type: none"> • Patient Name • MRN • Patient DOB • Patient Code • Study Date/Time • Referring Physician • Series Number • Accession Number • Image Number <p>Deselecting this option will prevent this additional information from being included.</p> <p>Note that, regardless of whether this option is selected or not, each printed images will also include a footer that includes the following information:</p> <ul style="list-style-type: none"> • Patient Name • MRN • Study Date • Study Description • Series Description • Image Number • Frame Number • Date Printed
Import User Preferences	<p>Click the Import button to import user preferences from another Workstation or from a different user on the same Workstation, as described in Section 24.5 below</p>
Export User Preferences	<p>Click the Export button to export your user preferences to a file that can be used to import the preferences to another Workstation or to a different user on the same Workstation, as described in Section 24.4 below.</p>
Restore User Preference Defaults	<p>Click the Restore button to restore your user preferences to their default values.</p>

Option	General Description
--------	---------------------

NOTE: Selecting this option will cause the Merge PACS Workstation to close and you will need to manually restart the Workstation in order to continue.

24.1.17. Worklist Color

The following options allow you to set the default color scheme for worklists that will be applied to new worklists you create:

Option	Description
--------	-------------

Base Color Select one of the following options to determine the base (i.e., background) color of each row:

- Grey
- Determined by Primary Dimension Status
- Determined by Order Priority
- Determined by Due In

Columns Show Their Own Color Select one of the following options:

Option	Description
--------	-------------

Yes Individual columns will be colored according to the color defined for the status of those dimensions (if they are configured to allow the use of their status colors), as in the following example:



No All columns will be colored the same as the selected Base Color, as in the following example:

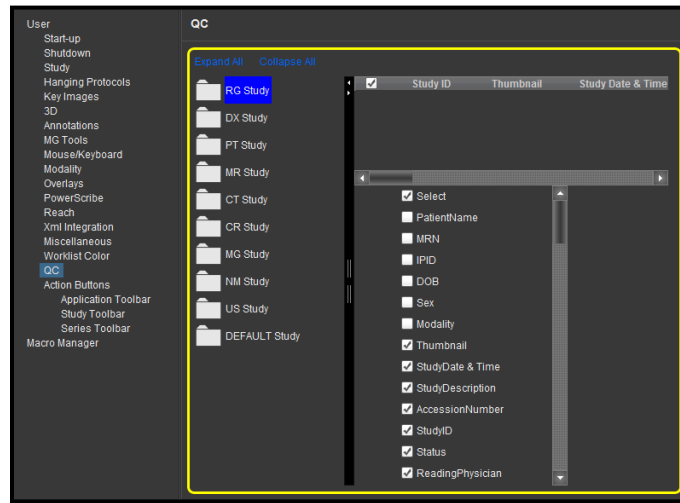


NOTE: The selected option will only be applied to new worklists you create and will not apply to all worklists that you view.

NOTE: The selected color scheme can be overridden for specific worklists when created.

24.1.18. QC

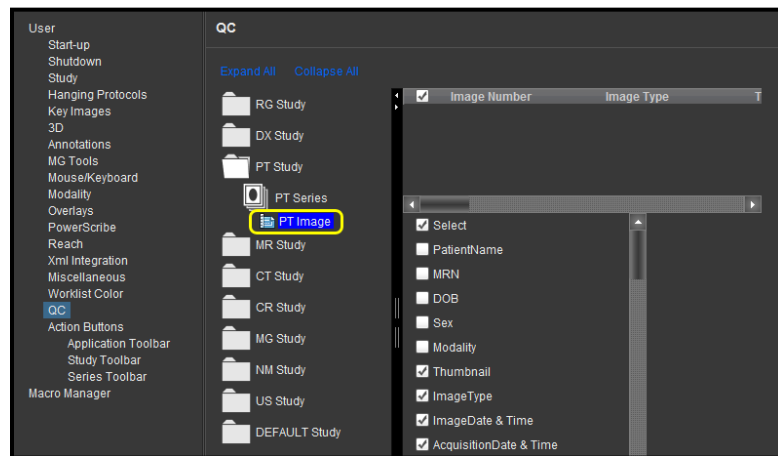
The QC Preferences section allows you to customize the default display of columns within the Selection Panel of the **Quality Control Editor** for different types of studies, Series and images on a site-wide basis, as in the following example:



Column Editing Panel

For each available modality type, you can individually customize the display of the entire Study, the Series and individual images within the Selection panel as follows:

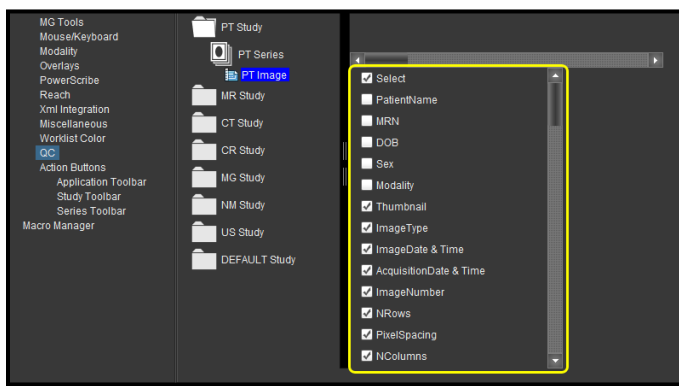
- Select the display whose default column values you want to customize by clicking on it in the **Display Selection** panel, as in the following example:



Selecting Display to Customize

NOTE: Double-click on a **Study** folder to display the **Series** folder and double-click the **Series** folder to display the **Image** instance. You can also click on the **Expand All** and **Collapse All** links at the top of the screen.

- Once you have selected a display to customize, use the **Column Selection** panel to select or deselect individual columns to be displayed, as in the following example:



Selecting Columns to Be Displayed

NOTE: The actual columns displayed in the Column Selection panel will depend on whether you are customizing the display of a Study, Series or image.

- Resize any column by placing your mouse cursor between that column's header and the column header to its right until a double-sided arrow is displayed, as in the following example, and then clicking and dragging the border between the columns to the left or right as desired:



Resizing a Column

NOTE: Use the scroll bar below the column headers to view all columns.

- Change the order of the columns by clicking on any column header and dragging it to a new location.
- Change the column sort order by clicking on the column header you want to sort on. Note the following:
 - Clicking once on a column header will cause the rows to be sorted in ascending order. Clicking again will reverse the sort order to descending.

- You can sort on multiple columns by holding down the **CTRL** key as you click. Columns will sort in the order that they were selected. Immediately after selecting a column for sorting, you can click on it again to reverse the sort order for that particular column as long as you are still pressing the **CTRL** key.

For more information on the QC Editor, refer to the *Merge PACS 7.3 Quality Control Editor Users Guide*.

24.1.19. Thumbnail

The Thumbnail Preferences section allows you to configure how the Series Navigation Thumbnail icons, as described in subsection 4.2.4 above, are displayed within the Viewer. The following options are available:

Option	Description
Show Thumbnails for Comparison Studies	<p>If selected, Series Navigation Thumbnails for all available (“online”) relevant comparison studies will automatically be displayed beside the primary study’s Series Navigation Thumbnails when the primary study is loaded into the Viewer.</p> <hr/> <p>NOTE: The order in which the comparison studies are displayed is controlled by the Show Unread Studies First preference described below.</p>
Show Unread Studies First	<p>If selected, navigation thumbnails for unread relevant comparison studies will be displayed first, followed by other relevant comparison studies and then foreign studies. If not selected, all comparison studies will be sorted based on the configured Order Priors Comparison Studies preference, as described in subsection 24.1.3 above.</p> <hr/> <p>NOTE: This option will only be available if Show Thumbnails for Comparison Studies is enabled..</p>
Show Thumbnails	<p>If not selected, the Series Navigation Thumbnails within the Merge PACS Viewer will be hidden from view.</p>

Option	Description
Thumbnail Location in the Viewer	<p>Allows you to configure the location of the Series Navigation Thumbnails within the Viewer. The following options are available:</p> <ul style="list-style-type: none"> • Top • Bottom • Left • Right <hr/> <p>NOTE: When displaying multiple studies, the system will prevent Series Navigation Thumbnails from displaying between two study panels so as to avoid confusion, e.g., displaying them to the left and right in a two-panel layout instead of both to the left or both to the right. The actual location will depend on the study layout selected.</p>

24.1.20. Action Buttons

The Action Buttons Preferences section allows you to custom configure which of the available tools and macros you want to be displayed on the various toolbars within the Viewer and customize the specific tools to a limited degree. For the Study and Series toolbars, you can also configure when you want the tools or macros to be displayed or hidden.

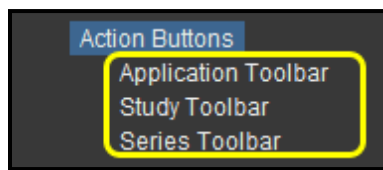
NOTE: You can also configure the Application toolbar for the separate Quality Control Editor application from this section.

The following items can be added to individual toolbars:

- Any default tool available for the toolbar
- Any macros that have been created and assigned to a tool icon

a. Selecting a Toolbar to Edit

At the Action Buttons Preferences, you can configure Application, Study and Series toolbars depending on which option you select, as in the following example:

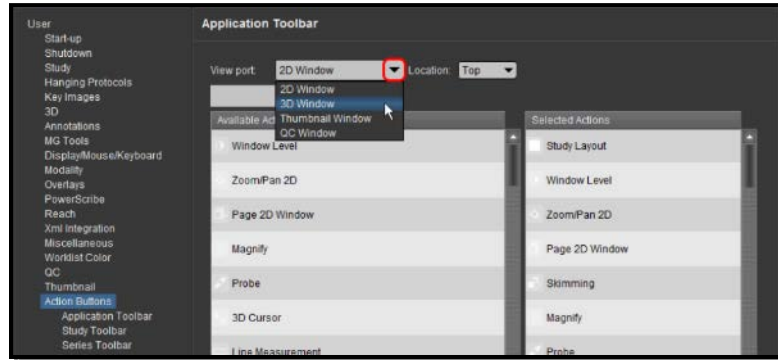


Types of Toolbars

NOTE: If you access the Merge PACS Preferences window by clicking on the Preferences link for a specific toolbar, the option for that type of toolbar will be selected by default.

If you have selected to configure the Application or Series Toolbar, you can also select the specific Viewport Mode to configure as follows:

- If configuring the **Application** Toolbar, select the desired Viewport Mode from the dropdown **View port** menu, as in the following example:

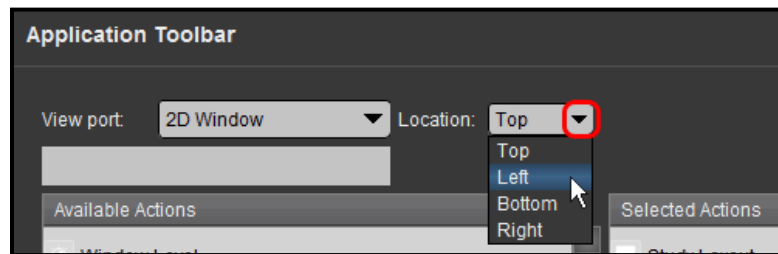


Selecting the Application Toolbar Viewport Mode

The following Viewport modes are available:

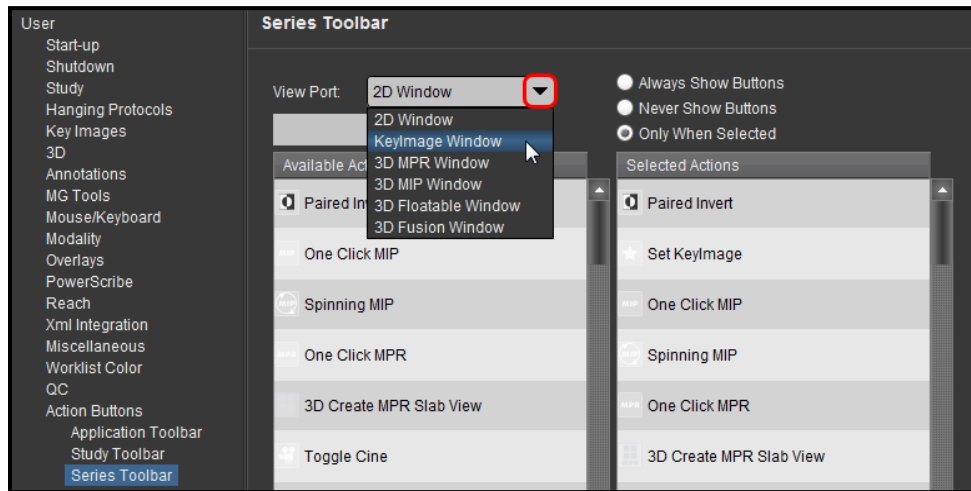
Option	Description
2D Window	The Application toolbar displayed in standard 2D mode, as described in subsection Note: above
3D Window	The Application toolbar displayed at the MPR Window , as described in subsection 4.8.1 above
Thumbnail Window	The Application toolbar displayed at the Mammography Thumbnail Viewer , as described in subsection 4.9.1 above
QC Window	The Application Toolbar displayed within the Quality Control Editor. For more information, refer to the <i>Merge PACS 7.3 Quality Control Editor Users Guide</i> .

You can also configure the location of the Application Toolbar within the Viewer by selecting from the drop-down **Location** menu, as in the following example:



Selecting the Application Toolbar Location

- If configuring the **Series** Toolbar, select the desired Viewport Mode from the dropdown **View port** menu, as in the following example:



Selecting the Series Toolbar Viewport Mode

The following Viewport modes are available:

Option	Description
2D Window	The Series Toolbar displayed in standard 2D mode, as described in subsection 4.2.5 above.
KeyImage Window	The Key Image Series Toolbar , as described in subsection 4.11.2 above
3D MPR Window	The Orthogonal MPR Series Toolbar and MPR Viewport Toolbar , as described in subsection 4.8.1 above
3D MIP Window	The MIP Viewport Toolbar , as described in subsection 4.8.4 above
3D Floatable Window	The Rendered Volume Series Toolbar , as as described in subsection 4.8.1 above
3D Fusion Window	The MPR Viewport Toolbar displayed when viewing fused images, as described in 4.8.3 above

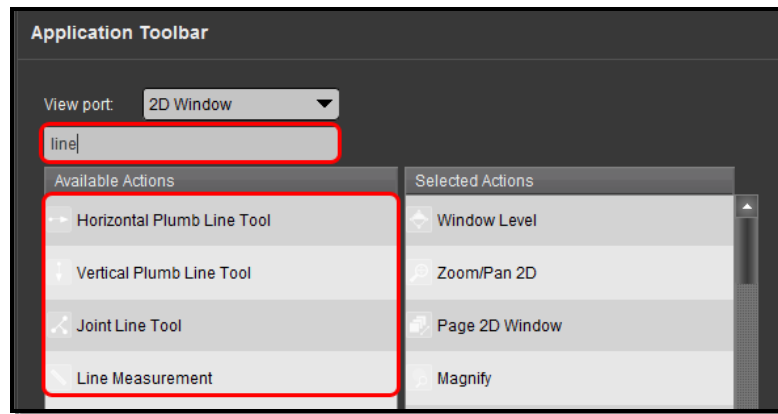
b. Adding a Tool or Macro to the Selected Toolbar

Once you have selected the specific toolbar and viewport (if applicable), you can add one or more tools or macros from the list of Available Actions.

NOTE: A macro must first be created, as described in Section 24.3 below, before it can be added to a toolbar.

To add a tool or a macro to the selected toolbar:

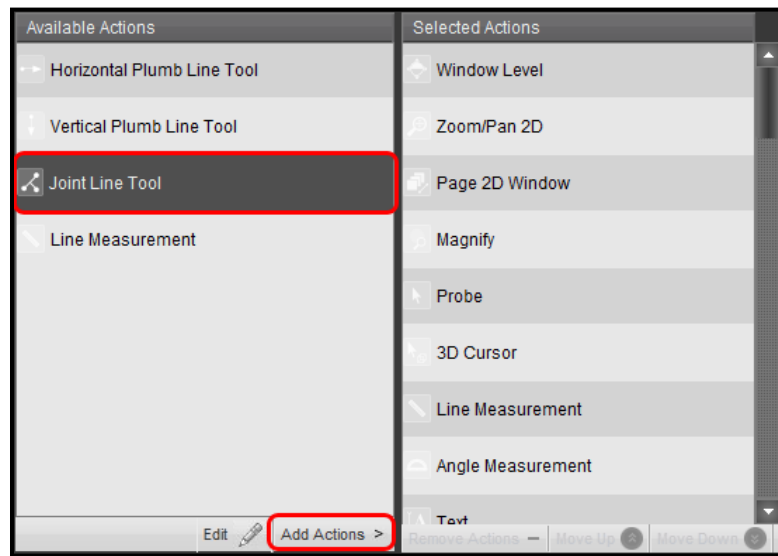
1. If desired, you can filter the list of Available Actions by entering text to match in the field at the top of the Available Actions panel, as in the following example:



Filtering the List of Available Actions

NOTE: All macros will be prefixed with **“Macro:”**

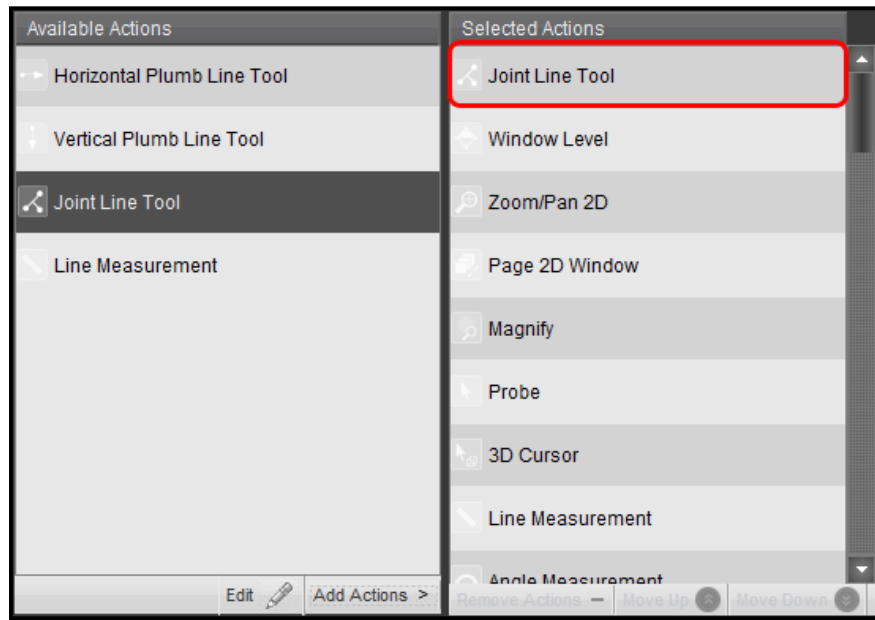
2. Click on the tool or macro that you want to add to the selected toolbar to highlight it and click on the **Add Actions** button at the bottom of the Available Actions panel, as in the following example:



Adding an Action to the Toolbar

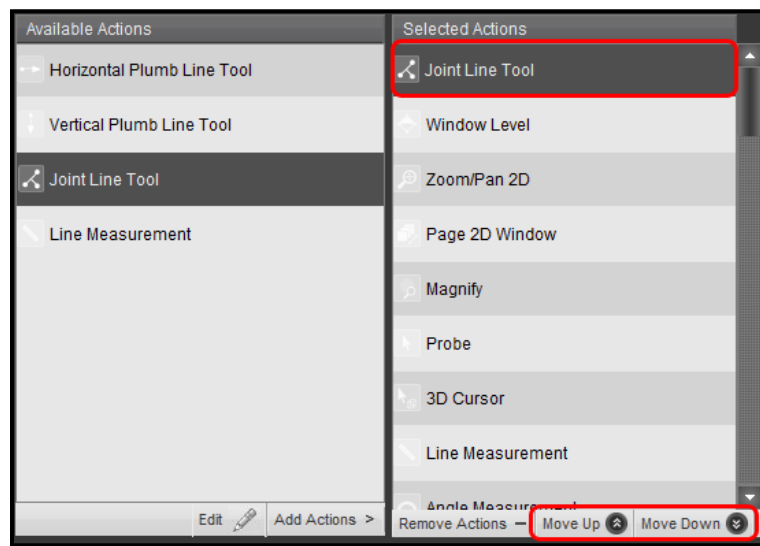
NOTE: You can also add an item by simply **double-clicking** on it.

The new tool or macro will be added to the selected toolbar and displayed at the top of the **Selected Actions** panel, as in the following example:



Action Added to the Toolbar

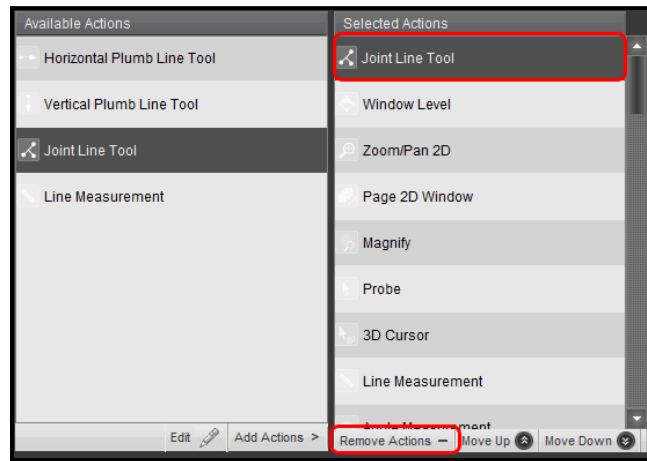
3. The Selected Actions panel displays the tools and macros in the order they will appear on the toolbar, from left to right as you move down the list. If you want to reposition the order of the items on the list, click on an item to highlight it and then use on the **Move Up** and **Move Down** buttons at the bottom of the Selected Actions panel to move it where you would like, as in the following example:



Re-ordering the Items on the Toolbar

c. Removing a Tool or a Macro from the Toolbar

To remove a tool or macro from the selected toolbar, click on the item in the **Selected Actions** panel once to highlight it and then click the **Remove Actions** button at the bottom of the Selected Actions panel, as in the following example:



Removing a Tool or Macro

NOTE: You can also double-click on any item in the **Selected Actions** panel to remove it.

d. Editing the Properties of a Tool or Macro

If desired, you can edit one or more of the following properties of an available default **tool** or available **macro** before adding it to a toolbar:

- The **ToolTip** displayed for the tool (*i.e.*, the pop-up text that displays when you hover your cursor over the tool)
- The **Modalities** for which the tool will be available
- Whether a **Gap** (*i.e.*, a spacer) should be displayed on the **Application** Toolbar before and/or after the tool.

In addition, you can edit one or more of the following properties of an available **macro** before adding it to a toolbar:

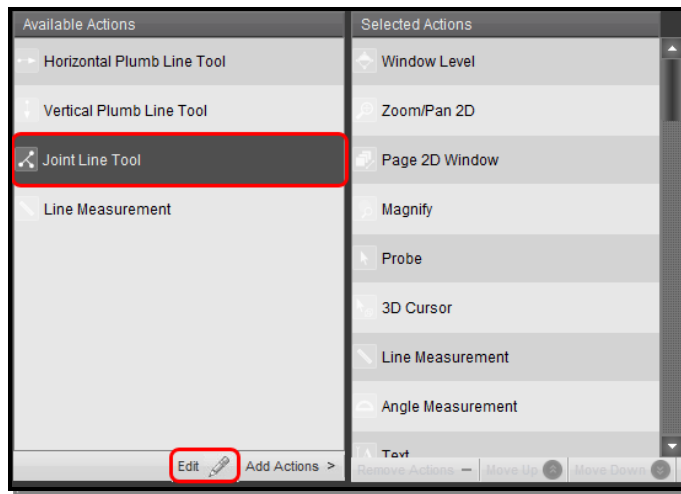
- The general **Description** of the macro
- The **Icon** displayed for the macro.

NOTE: A macro must first be created, as described in Section 24.3 below, before it can be edited.

NOTE: Editing the properties of a tool or macro will affect every toolbar the tool or macro is displayed on, not just the currently selected toolbar.

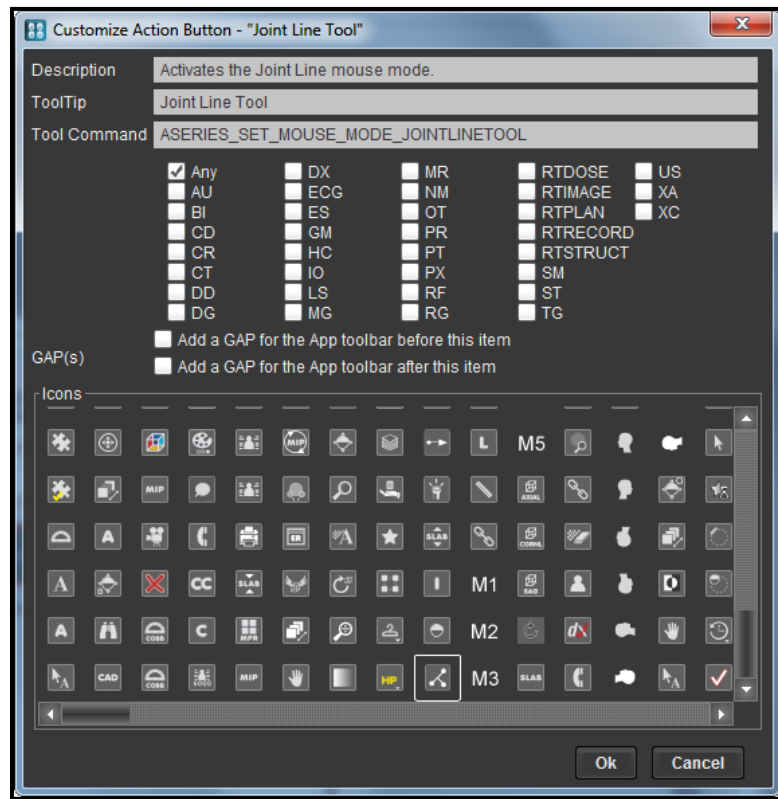
To edit the properties of a default tool or an available macro:

1. Click on the tool you want to edit and then click on the **Edit** button at the bottom of the **Available Actions** panel, as in the following example:



Editing a Default Tool

The **Customize Action Button** dialog for the selected tool or macro is displayed, as in the following example:



Customize Action Button Dialog

2. To change the description for a macro, edit the information in the **Description** field, as in the following example:

The screenshot shows a configuration dialog for a macro. The fields are: Description (DropXMLandJPEG), ToolTip (DropXMLandJPEG), and Tool Command (DropXMLandJPEG). Below these are checkboxes for various modalities: Any (checked), AU, BI, CD, CR, CT, DD, DG, DX, ECG, ES, GM, HC, IO, LS, MG, MR, NM, OT, PR, PT, PX, RF, RG, RTDOSE, RTIMAGE, RTPLAN, RTRECORD, RTSTRUCT, SM, ST, TG, US, XA, and XC. At the bottom, there are two checkboxes for adding a GAP for the App toolbar before or after this item.

Editing the Description

3. To change the ToolTip for a tool or macro, edit the information in the **ToolTip** field, as in the following example:

The screenshot shows a configuration dialog for a macro. The fields are: Description (Activates the Joint Line mouse mode.), ToolTip (Joint Line Tool), and Tool Command (ASERIES_SET_MOUSE_MODE_JOINTLINETOOL). Below these are checkboxes for various modalities: Any (checked), AU, BI, CD, CR, CT, DD, DG, DX, ECG, ES, GM, HC, IO, LS, MG, MR, NM, OT, PR, PT, PX, RF, RG, RTDOSE, RTIMAGE, RTPLAN, RTRECORD, RTSTRUCT, SM, ST, TG, US, XA, and XC. At the bottom, there are two checkboxes for adding a GAP for the App toolbar before or after this item.

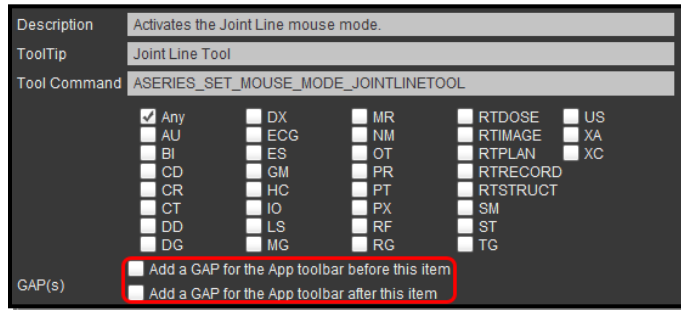
Editing the ToolTip Text

4. To change the specific modalities for which this tool or macro will be available, select one of more **Modality** checkboxes, as in the following example:

The screenshot shows a configuration dialog for a macro. The fields are: Description (Activates the Joint Line mouse mode.), ToolTip (Joint Line Tool), and Tool Command (ASERIES_SET_MOUSE_MODE_JOINTLINETOOL). Below these are checkboxes for various modalities: Any (checked), AU, BI, CD, CR, CT, DD, DG, DX, ECG, ES, GM, HC, IO, LS, MG, MR, NM, OT, PR, PT, PX, RF, RG, RTDOSE, RTIMAGE, RTPLAN, RTRECORD, RTSTRUCT, SM, ST, TG, US, XA, and XC. At the bottom, there are two checkboxes for adding a GAP for the App toolbar before or after this item.

Selecting Modalities for the Tool

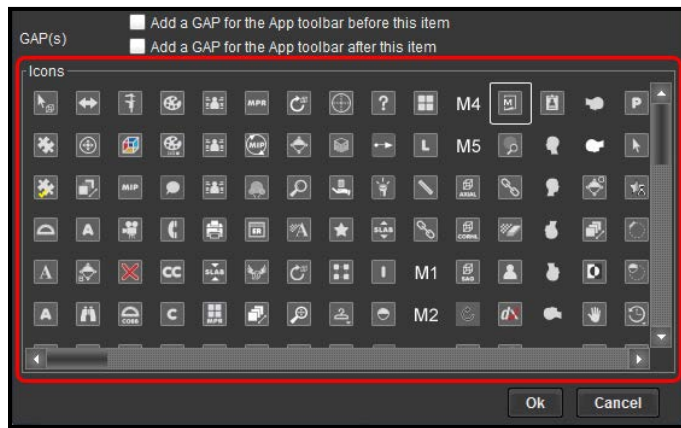
- To add a spacer gap on the toolbar before or after this tool or macro on the **Application** toolbar, click the appropriate checkbox, as in the following example:



Adding a Spacer Gap

NOTE: Spacer gaps are only displayed for tools or macros included on an **Application** toolbar.

- To change the icon that will be displayed for macro, click on the desired icon from the list of available icons, as in the following example:



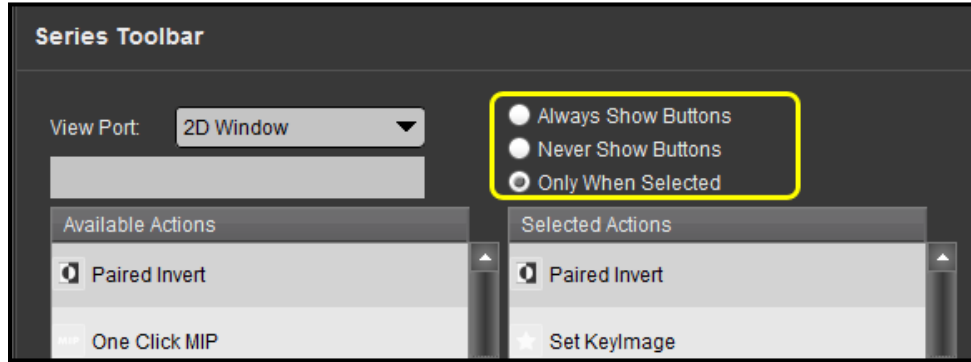
Changing the Icon

CAUTION: Reusing built-in system icons should be done at your own risk, since the icons will no longer perform as described in this User Guide.

- When finished, click the **OK** button at the bottom of the dialog to save your changes or the **Cancel** button to exit the dialog without making any changes.

e. Configuring When Tools or Macros Should Be Displayed

If you are configuring a Study or Series toolbar, you can select when the items on the toolbar should be displayed or hidden, as in the following example:



Selecting When to Display Tools on Toolbar

The following options are available:

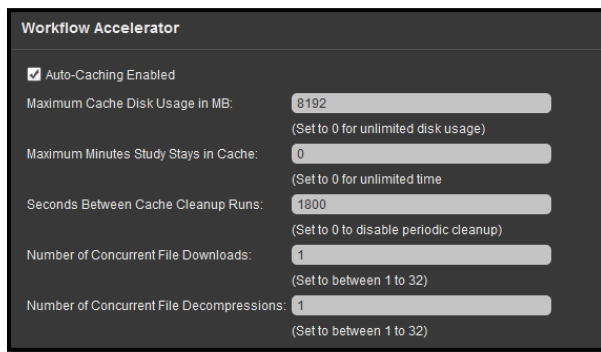
Option	Description
Always Show Buttons	All items configured for this toolbar will be displayed at all times.
Never Show Buttons	The items configured for this toolbar will be hidden at all times.
Only When Selected	The items configured for this toolbar will only be displayed for the currently active Study/Series Viewport.

24.2. Workstation Preferences

The following preferences are stored locally for this Workstation and are not saved with your login.

24.2.1. Workflow Accelerator Preferences

The Workflow Accelerator Preferences section allows you to configure local workstation properties related to image caching, as in the following example:



Workflow Accelerator Preferences

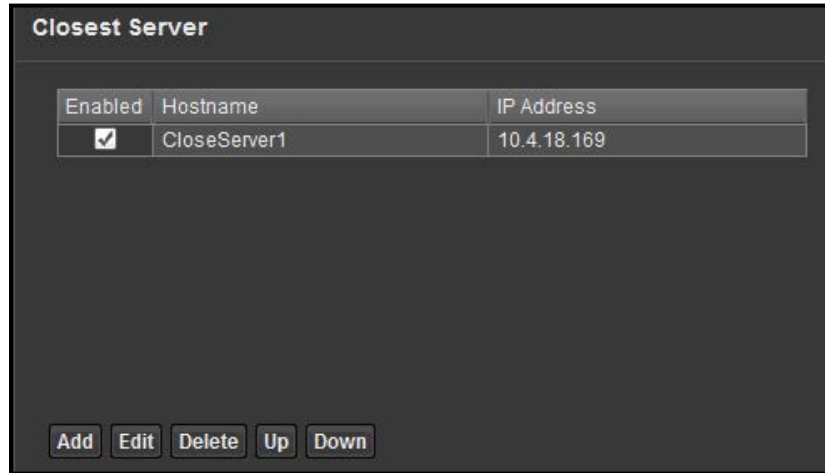
The following options can be configured:

Option	General Description
Auto-Caching Enabled	Turns on automatic caching of images
Maximum Cache Disk Usage in MB	<p>The Default value for worklist cache is set to 32 GB. The maximum cache disk usage, however, must be less than the available cache disk space. Note the following:</p> <ul style="list-style-type: none"> In general, a higher value will cause more disk space to be used, while a lower value will cause less disk space to be used. A value of "0" will allow for unlimited disk storage (<i>i.e.</i>, studies will continue to be cached until your hard drive is full).

Option	General Description
Maximum Minutes Study Stays in Cache	<p>Workflow Accelerator can be configured to automatically mark for removal studies that are older than a specified length of time based upon their Study date and time, regardless of the amount of disk storage available. A value of "0" will provide for unlimited time.</p> <p>Note that a higher value will use more disk space, but should provide better perceived performance as more studies will be available immediately. Conversely, a lower value will use less disk space but could result in slower time-to-first image for studies that are older than the specified age.</p>
Seconds Between Cache Cleanup Runs	<p>During each "cache cleanup run" Workflow Accelerator will delete studies that have been marked for removal. A value of "0" will disable this feature.</p> <p>Note that the lower the value, the more system resources will be devoted to determining what needs to be deleted, which may affect performance.</p>
Number of Concurrent File Downloads	<p>This controls how many concurrent file downloads are allowed for the Workflow Accelerator caching process. The maximum value allowable is calculated based on the number of internal processors on your workstation.</p> <p>Note that increasing the value will boost the rate of download for the cache, but will at the same time degrade interactive performance. Therefore, set this to the maximum that you can tolerate in terms of degradation in performance.</p>
Number of files to Concurrent File Decompressions	<p>This controls how many concurrent file decompressions are allowed for the Workflow Accelerator caching process. The maximum value allowable is calculated based on the number of internal processors on your workstation.</p> <p>Note that increasing the value will boost the rate of download for the cache, but will at the same time degrade interactive performance. Therefore, set this to the maximum that you can tolerate in terms of degradation in performance.</p>

24.2.2. Closest Server Preferences

The Closest Server Preferences section allows you to define one or more Merge PACS Servers that should be contacted first when Workflow Accelerator attempts to get studies from a local spoke server instead of the main hub, as in the following example:



The screenshot shows a dialog box titled "Closest Server". It contains a table with the following data:

Enabled	Hostname	IP Address
<input checked="" type="checkbox"/>	CloseServer1	10.4.18.169

At the bottom of the dialog, there are five buttons: "Add", "Edit", "Delete", "Up", and "Down".

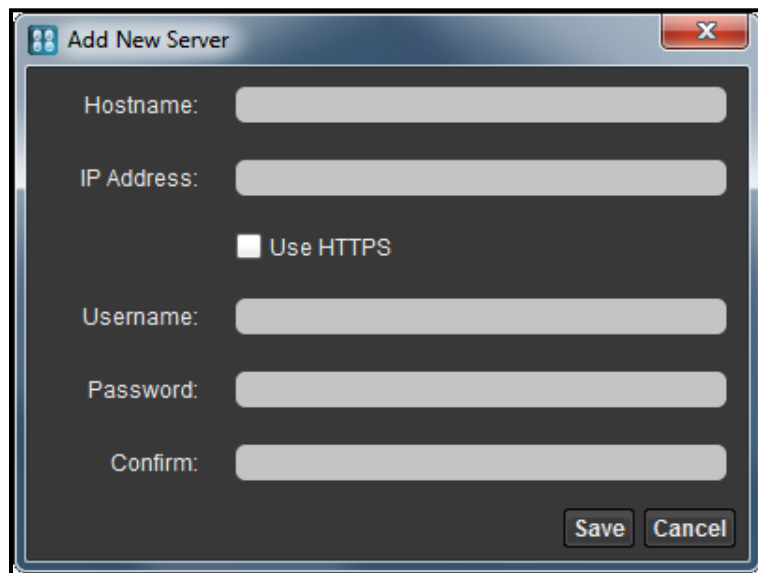
Closest Server Preferences

a. Adding a New Closest Server

To add a new Server to the list of Closest Servers:

1. Click on the **Add** button at the bottom the Closest Server Preferences screen.

The **Add a New Server** dialog is displayed, as in the following example:



The screenshot shows a dialog box titled "Add New Server". It contains the following fields and controls:

- Hostname:
- IP Address:
- Use HTTPS
- Username:
- Password:
- Confirm:
- Buttons: "Save" and "Cancel"

Add New Server

- Enter the following information:

Field	General Description
Hostname	The Hostname of the spoke Server
IP Address	The IP Address of the spoke Server
Use HTTPS	Select if the spoke Server has SSL enabled and requires HTTPS.
Username	A valid username for a local Windows account on the spoke Server server.
Password	The password for the user account entered above.
Confirm	Re-enter the password entered above.

- When finished, click **Save** to record your changes and close the dialog, or **Cancel** to close the dialog without saving.

b. Editing an Existing Closest Server

To edit information about an existing Server on the list of Closest Servers:

- Click on the desired Server once to highlight it.
- Click on the **Edit** button at the bottom of the screen.

The **Edit Server** dialog is displayed, as in the following example:

Edit Server

- Make the required changes and click **Save** to record your changes and close the dialog, or **Cancel** to close the dialog without saving

c. Deleting an Existing Closest Server

To delete an existing Server from the list of Closest Servers:

- Click on the Server once to highlight it.
- Click on the **Delete** button at the bottom of the screen.

d. Changing the Priority of the Closest Servers

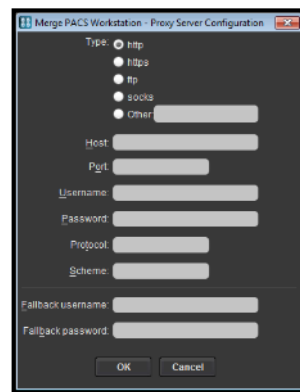
The Workstation will attempt to contact the listed Servers in the order they appear on the list. To change the priority of the Servers, click on a Server once to highlight it and then use the **Up** and **Down** buttons at the bottom of the screen.

NOTE: For OrthoCase or iConnect Access to work with the closest server placeholder, the iConnect Access Server will need to be set as the first in the list of closest servers.

24.2.3. Miscellaneous Preferences

The following Miscellaneous Local Workstation preferences can be set:

Option	General Description
Configure Proxy Settings	If your Merge PACS Workstation needs to connect through a proxy server, clicking the Configure Proxy Settings button will cause the Proxy Server Configuration dialog to be displayed, as in the following example:



Proxy Server Configuration

Enter the required information and click the **OK** button. Note the following:

- The **Fallback username** and **Fallback password** fields are optional. If specified, and Merge PACS cannot find a password authenticator that matches the host/port/protocol/scheme specified, a password authenticator using this fallback username/password will be returned. This is an added safety in case Merge PACS cannot properly ascertain what host/port/protocol/scheme is being requested.
- These proxy settings will only apply to the this Workstation.
- Proxy settings can also be configured for this Workstation from the Welcome Screen.

Option	General Description
Viewer Icon Size	<p>Select the size of the various icons displayed within the Merge PACS Workstation. The following options are available:</p> <ul style="list-style-type: none"> • Smallest • Small • Medium • Large • Largest
Image Resampling Interpolation	<p>Select the type of resampling interpolation algorithm used by the Merge PACS Viewer to display digitized CR images. The following options are available:</p> <ul style="list-style-type: none"> • Linear • Super Sampling <p>Note that selecting Super Sampling may reduce the appearance of grid artifacts (a.k.a. "moiré patterns").</p>
Autologout Timeout	<p>If your system has a default auto logout period set, this allows you to override the default logout period and either turn it off completely (by setting the logout period to 0) or else set a custom period from 1 to 60 minutes.</p> <hr/> <p>NOTE: If your system has a default auto logout period set, you will not be able to save your login credentials even if you set the logout period to 0. You will not be automatically logged out, but you will need to still provide your password whenever you log in.</p> <hr/>

24.3. Managing Macros

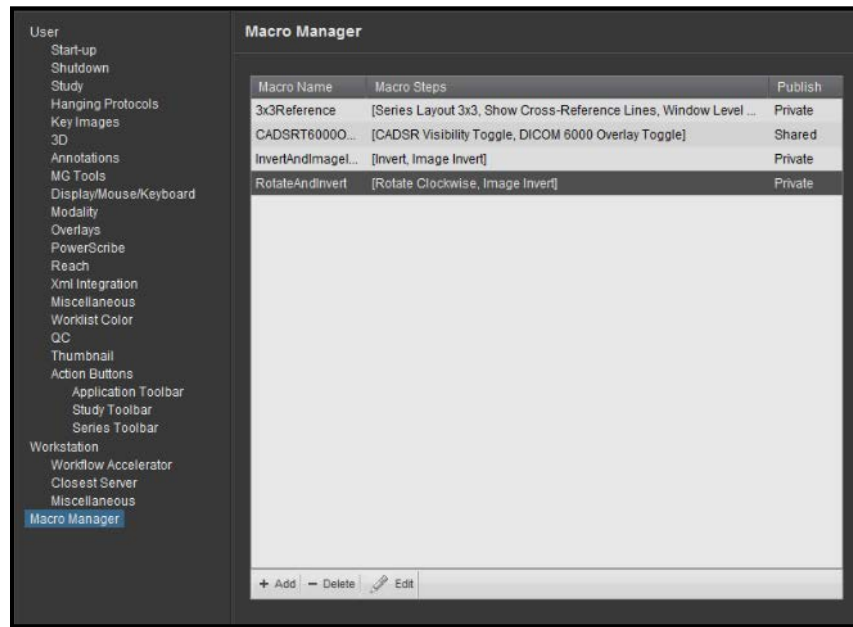
A macro is a sequence of defined actions that can be performed via a single keystroke or toolbar button. The actions that can be included in a macro can be any of the following:

- a **default system action** such as rotate, toggle cine, show cross-reference lines, etc.
- a **custom drop command** (to drop a JPEG and/or XML event for the current Study)
- a **custom operating system command** (e.g., to launch an external application via command line)
- another **macro**

NOTE: Once you have created a macro, you need to assign it to a keyboard shortcut, as described in subsection 24.1.10 above, or add it as an Action Button on a Toolbar, as described in subsection 24.1.20 above.

NOTE: If a macro requires user action (such as entering a comment) and you cancel the action, the rest of the macro will continue to run as configured.

The Macro Manager allows you to create and manage one or more macros, as in the following example:



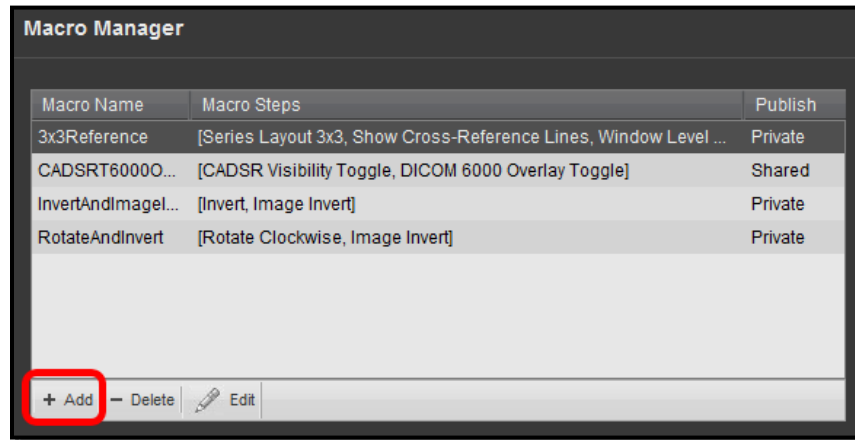
Macro Manager

NOTE: Merge PACS includes a default macro called **CADSRT6000OVERLAY** that toggles the display of both the DICOM 6000 overlay and the CADSRT overlay with a single click and that can be added to the Application, Study and/or Series toolbars. It cannot be edited or deleted from the Macro Manager directly, but you can configure how it appears on individual toolbars (tooltip, icon, placement, etc.) as described in subsection 24.1.20 above.

24.3.1. Creating a New Macro

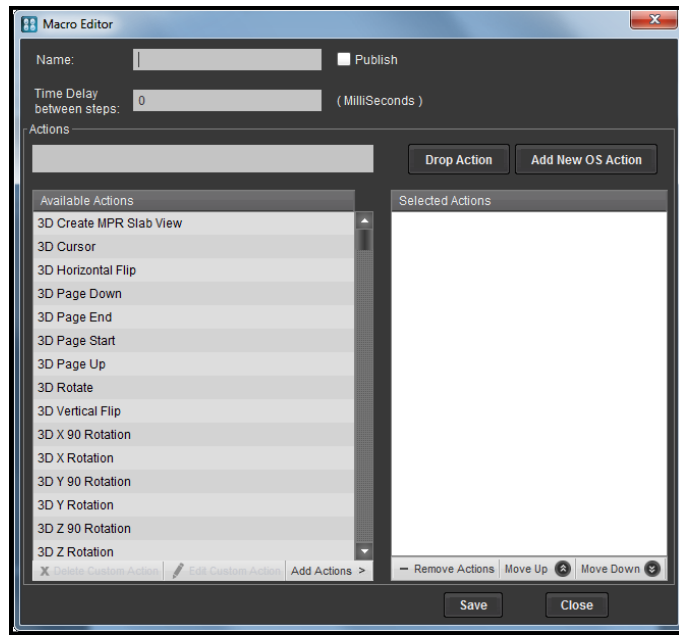
To create a new macro:

1. Click on the **Add** button at the bottom of the Macro Manager screen to create a new macro, as in the following example:



Adding a New Macro

The **Macro Editor** window is displayed, as in the following example:



Macro Editor

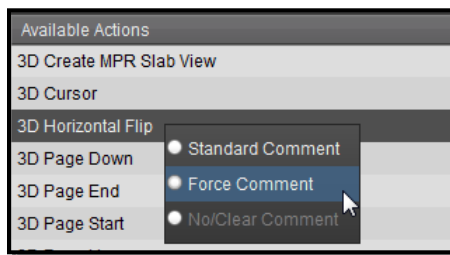
- In the **Name** field, enter a short, descriptive name for the macro.

NOTE: The name cannot include any special characters such as .,:_/'"()!?\$&%#* @^

- Click on the **Publish** checkbox if you'd like this macro to be available to other users (and you have login permissions to do this).
- In the **Time Delay between steps** field, enter the length of the delay (in milliseconds) you would like there to be between the various steps of the macro, if any.


NOTE: The time delay must be an integer. Decimal values (e.g.. 0.5) are not allowed.

- To add a **default system action**, an existing **custom** action or another existing **macro** as a step to this macro, do the following:
 - Click on the desired item in the **Available Actions** panel to highlight it.
 - If you want to display a standard comment or force the user to enter a comment whenever this action is performed, right-click on the action and select the desired option from the pop-up menu, as in the following example:



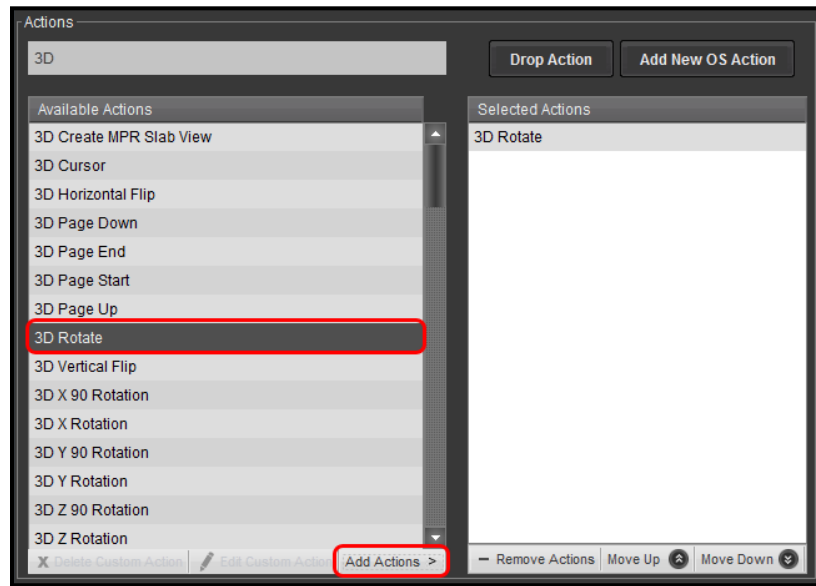
Comment Options

The following options are available:

Option	Description
Standard Comment	Automatically add specific comment to the study when this action is performed. When this option is selected, you will be prompted to enter the text of the comment you want to be added, as in the following example:
	
Force Comment	Display a prompt onscreen when this action is performed to require the user to enter a comment.
No/Clear Comment	Do not display a comment or prompt for a comment (and clear any Standard Comment already entered).

Entering a Standard Comment

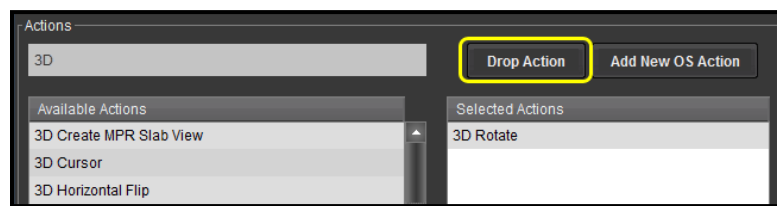
- c. Click on the **Add Actions** button at the bottom of the panel, as in the following example:



Adding an Action

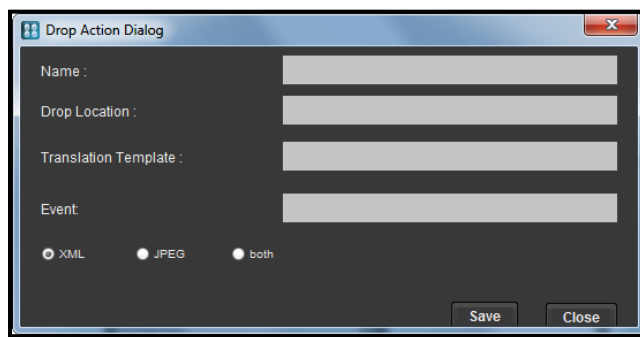
Note the following:

- You can filter the list of Available Actions by entering text to match in the field at the top of the Available Actions panel.
 - All macros will be prefixed with “**Macro:**”
 - All custom actions will be prefaced with “**Custom:**”
 - You can also add an item by simply **double-clicking** on it.
6. To create a new **drop command** as a custom action that can be added to this or any other macro, do the following:
- a. Click the **Drop Action** button, as in the following example:



Creating a Drop Command Custom Action

The **Drop Action Dialog** window is displayed, as in the following example:

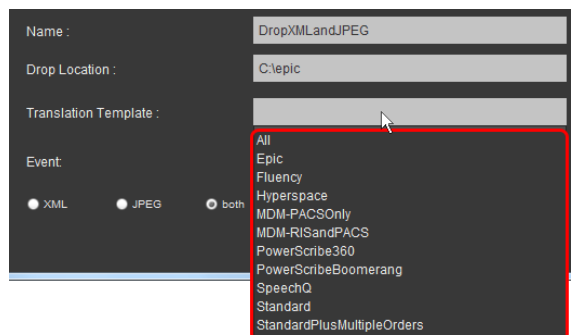


Drop Action Dialog

- b. In the **Name** field, enter a short, descriptive name for this action.

NOTE: The name cannot include any special characters such as `.,:;_-'"/"!?$&%#* @^`

- c. In the **Drop Location** field, enter the location on the Workstation where the XML and/or JPEG files should be dropped when this action is executed (e.g., C:\Epic).
- d. Click on the **Translation Template** field to display a list of available translation templates for this drop event and then double-click on the appropriate template for this drop event, as in the following example:



Selecting a Translation Template

NOTE: The menu of available Translation Templates can be filtered by entering text in the **Translation Templates** field, but you still must select the desired option.

- e. Click on the **Event** field to display a list of available events that can trigger the drop for this drop event and then double-click on the desired event, as in the following example:

The screenshot shows a configuration window with the following fields: Name (DropXMLandJPEG), Drop Location (C:\epic), Translation Template (Epic), and Event. The Event field is currently empty, and a dropdown menu is open, listing the following events: Destroy, DictationStart, Initialize, Login, Logout, PriorStudyOpen, StudyClose, StudyOpen, and StudySwitch. A mouse cursor is hovering over the 'Initialize' option.

Selecting an Event

NOTE: The menu of available Events can be filtered by entering text in the **Event** field, but you still must select the desired option.

NOTE: If you are integrating with an application that requires a specifically named event that is not included in the menu, you can enter the name of that event directly into the **Event** field.

- f. Select whether the drop event should include an **XML** file, a **JPEG** image or **both**, as in the following example:

The screenshot shows the same configuration window as in the previous image. The Event field now contains the text 'Initialize'. Below the Event field, there are three radio buttons for file format selection: XML, JPEG, and both. The 'both' radio button is selected. To the right of these radio buttons are two checkboxes: 'Annotation' and 'Overlays', both of which are checked. At the bottom right of the window are 'Save' and 'Close' buttons.

Selecting What to Include in the Drop

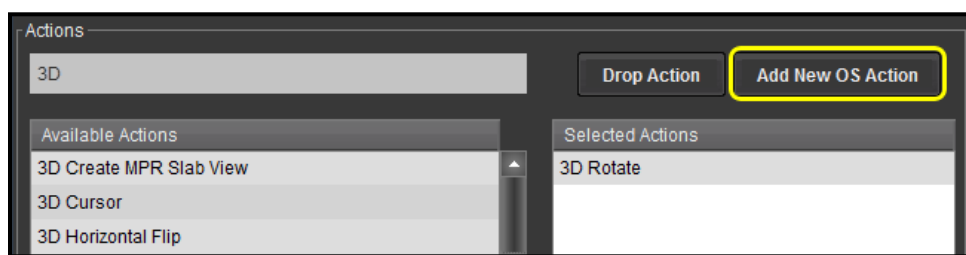
NOTE: If you have selected **JPEG** or **both**, you can also choose to include **Annotations** and/or **Overlays** by selecting the appropriate checkbox(es).

- g. When finished, click **Save** to record your changes and exit the dialog or **Close** to exit the dialog without saving your changes.

Once created, the new drop action will be added to the list of Available Actions and can be added to the macro as described in Step 5 above.

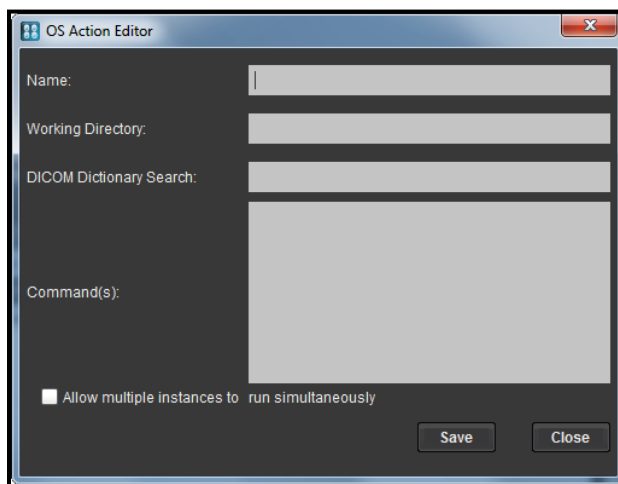
NOTE: If necessary, you can select the drop action in the Available Actions panel and click the **Edit Custom Action** button at the bottom of the panel to launch the Drop Action Dialog or click the **Delete Custom Action** to delete it. Only the respective user can edit or delete the Custom Action, however (custom actions created by one user will be visible to other users, but cannot be edited or deleted).

- 7. To create a new **operating system command** as a custom action that can be added to this or any other macro, do the following:
 - a. Click the **Add New OS Action** button, as in the following example:



Creating a Operating System Custom Action

The **OS Action Editor** window is displayed, as in the following example:



OS Action Editor

- b. In the **Name** field, enter a short, descriptive name for this action.

NOTE: The name cannot include any special characters such as `.,:;_/'"()!?$%#* @^`

- c. In the **Working Directory** field, enter the working directory required for this action, if any.
- d. In the **Command(s)** field, enter the required command or commands for this action. Note the following:
 - To assist in this process, you can use the **DICOM Dictionary Search** field to enter the value for specific DICOM tags, as in the following example:
 - Enter the command up to the point where you need to references a specific DICOM tag's value, as in the following example:

The screenshot shows a configuration form with the following fields:

- Name: DocScan
- Working Directory: (empty)
- DICOM Dictionary Search: (empty)
- Command(s): C:\DocScan2.0.10.21\dsTrigger.exe |

The Command(s) field is highlighted with a red border.

Entering the Start of the Command

- Click on the **DICOM Dictionary Search** field to display a list of available DICOM tags and then double-click on the desired item in the list, as in the following example:

The screenshot shows the same configuration form as above, but with the DICOM Dictionary Search field open. The dropdown menu displays the following options:

- studyd
- 0008,0020 StudyDate
- 0008,1030 StudyDescription

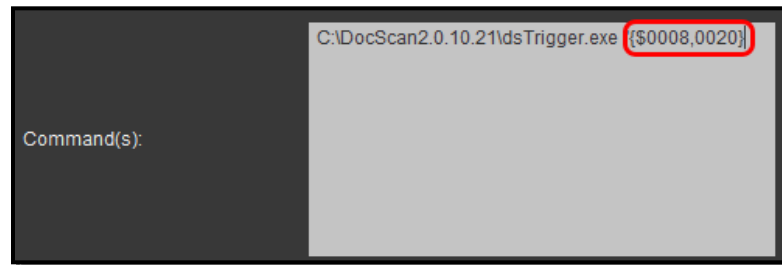
The '0008,0020 StudyDate' option is highlighted with a red border.

Selecting a DICOM Tag to Be Inserted into Command

NOTE: The menu of available DICOM tags can be filtered by entering text in the **DICOM Dictionary Search** field, but you still must select the desired option by double-clicking on it.

NOTE: Within the Command(s) field, you can also type "{\$" and the DICOM attribute dropdown will automatically show up without needing to move up the DICOM Dictionary Search field.

The selected DICOM tag's value will be inserted into the command, as in the following example:



DICOM Tag Value Inserted into Command

- If you want to add a third-party application executable file location, it needs to be enclosed in double quotes, after which the command line arguments can be specified, as in the following example:

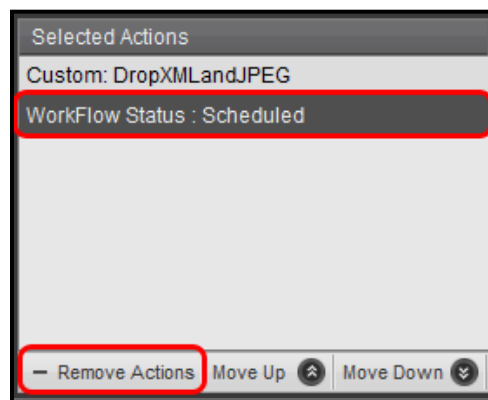
`"C:\Test.exe" AN={$0008,0050}`

- Click on the **Allow multiple instances to run simultaneously** checkbox if you want to allow multiple instances of this command to run at the same time.
- When finished, click **Save** to record your changes and exit the dialog or **Close** to exit the dialog without saving your changes.

Once created, the new OS action will be added to the list of Available Actions and can be added to the macro as described in Step 5 above.

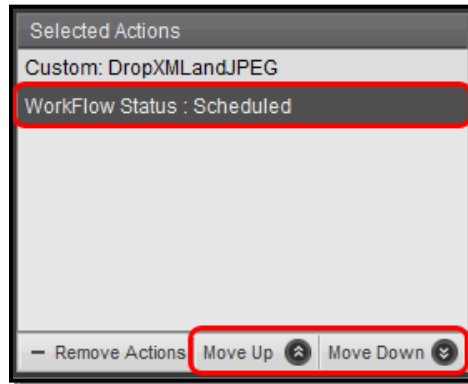
NOTE: If necessary, you can select the OS action in the Available Actions panel and click the **Edit Custom Action** button at the bottom of the panel to launch the **OS Action Editor** or click the **Delete Custom Action** to delete it. Only the respective user can edit or delete the Custom Action, however (custom actions created by one user will be visible to other users, but cannot be edited or deleted).

- If you need to remove a defined action for a macro, click on the action you want to remove in the Selected Actions panel and click the **Remove Actions** button at the bottom of the panel, as in the following example:



Removing an Action

9. Actions will be executed in the order they appear in the Selected Actions panel. If you need to change the order of execution, click on an action to select it and then use the **Move Up** and **Move Down** buttons at the bottom of the panel, as in the following example:



Re-Ordering Actions

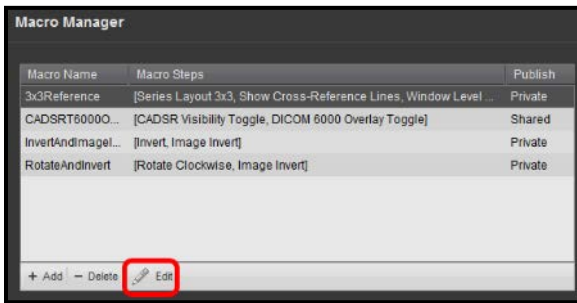
10. When you have finished adding all desired actions to this macro, click the **Save** button at the bottom of the Macro Editor to save your changes and close the window or click the **Close** button to exit without saving.

The new macro is added to the list of macros on the main Macro Manager screen and you can now assign it to a keyboard shortcut, as described in subsection 24.1.10 above, or add it as an Action Button on a Toolbar, as described in subsection 24.1.20 above.

24.3.2. Editing an Existing Macro

To edit an existing macro:

1. Click on the desired macro at the main Macro Manager screen to select it and then click the **Edit** button at the bottom of the screen, as in the following example:



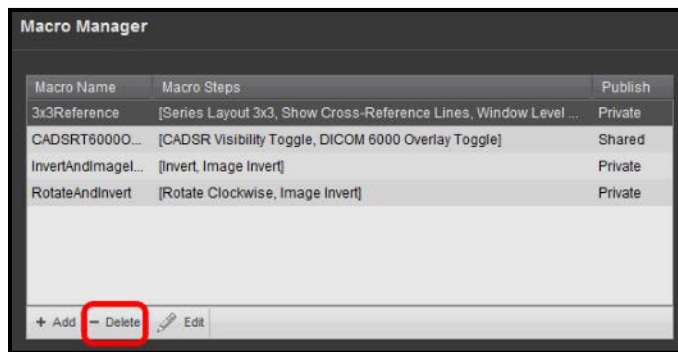
Editing an Existing Macro

The Macro Editor Dialog is displayed.

2. Edit the macro as necessary, following the procedures described in subsection 24.3.1 above.

24.3.3. Deleting an Existing Macro

To delete an existing macro, click on the macro at the main Macro Manager screen to select it and then click the **Delete** button at the bottom of the screen, as in the following example



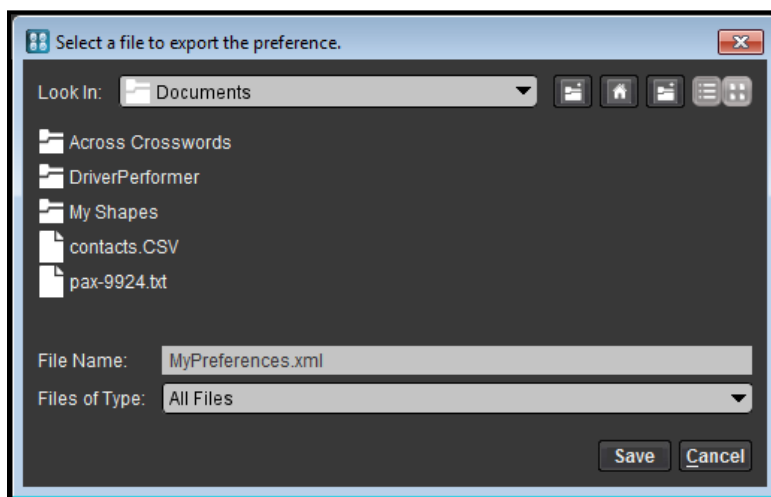
Deleting an Existing Macro

NOTE: Only the respective creator user can perform edit and delete operation. Other users can use a macro if it has been shared, but cannot edit or delete it.

24.4. Export User Preferences

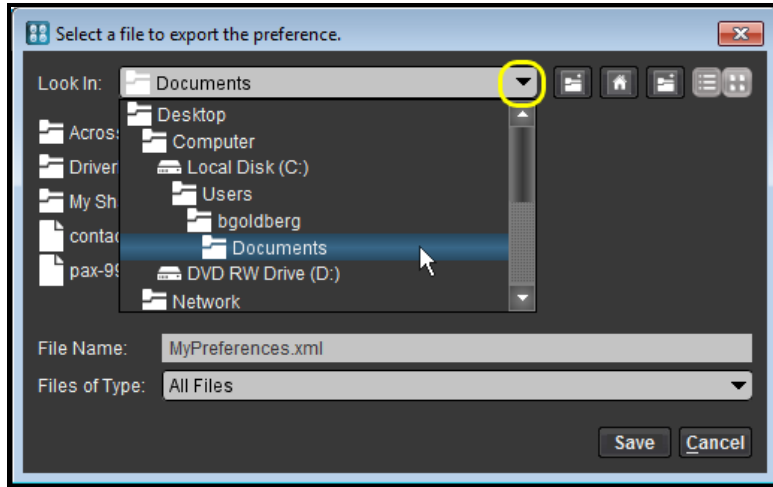
As described in subsection 24.1.16 above, the **Export User Preferences** option allows you to export all user preferences to an external **.xml** or **.txt** file that can then be used to import the preferences to another Workstation or to a different user on the same Workstation.

When you select this option, the **Export User Preferences** window will be displayed as a separate pop-up window, as in the following example:



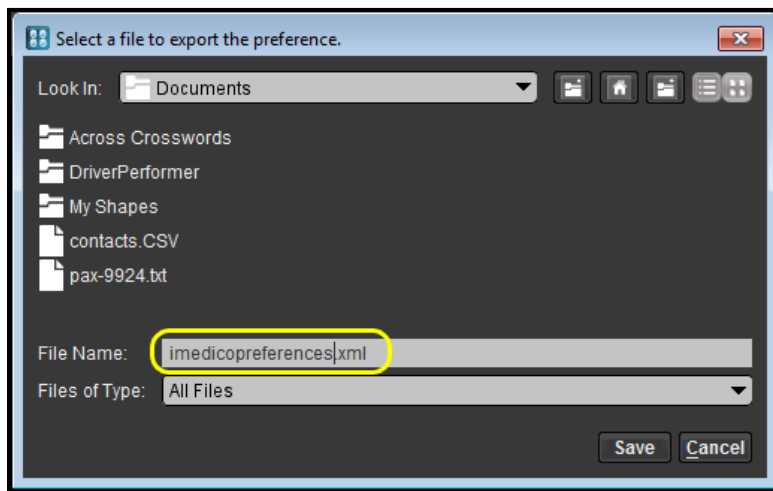
The Export User Preferences Window

By default, the file will be saved to your individual Windows user directory. If desired, however, you can select a different location for the file from the **Look In** drop-down menu, as in the following example:



Selecting a Location for the Exported File

If desired, you can change the name of the file in the **File Name** text field, as in the following example:



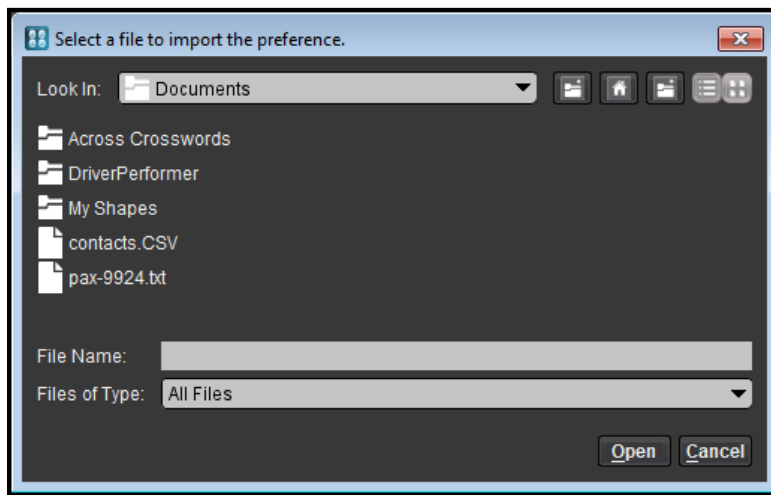
Selecting a Location for the Exported File

When finished, click on the **Save** button at the bottom of the window.

24.5. Import User Preferences

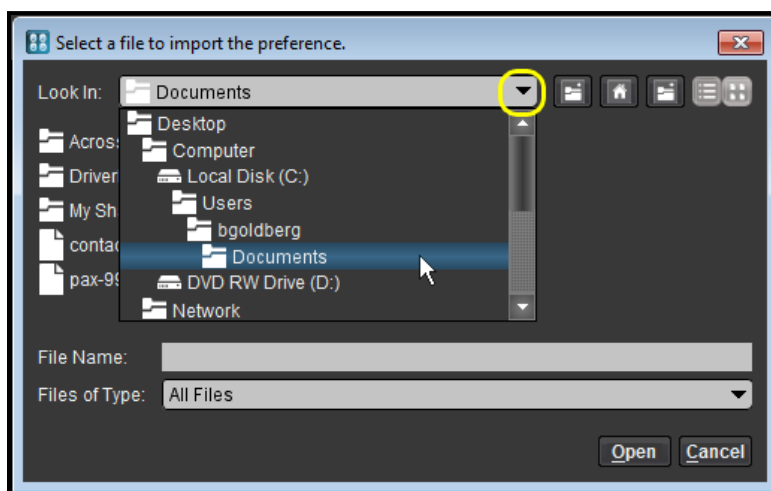
As described in subsection 24.1.16 above, the **Import User Preferences** option allows you to import all user preferences from another Workstation or from a different user on the same Workstation. Note that the preferences are stored in an external **.xml** or **.txt** file that must first be created, as described in Section 24.4 above.

When you select this option, the **Import User Preferences** window will be displayed as a separate pop-up window, as in the following example:



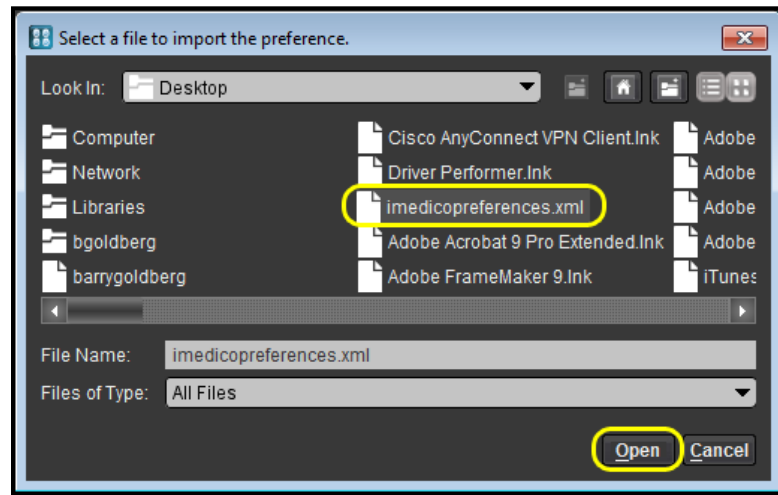
The Import User Preferences Window

By default, Import Preferences Dialog will display the contents of your individual Windows user directory. If the file containing the preferences is displayed there, click on it to select it. If the file is located somewhere else, you can browse to the file's location from the **Look In** drop-down menu, as in the following example:



Selecting the File to Be Imported

Once you have located the directory where the preferences file is stored, click on the name of the file once to select it and then click on the **Open** button, as in the following example:



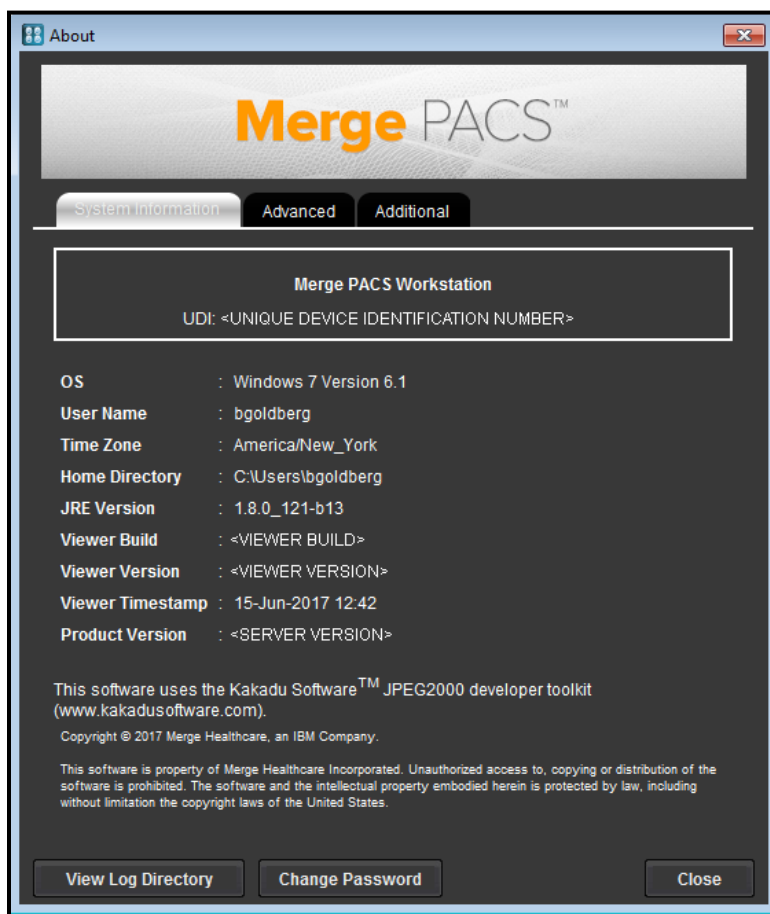
Selecting the File to Be Imported

NOTE: You can also double-click on the name of the file to open it.

NOTE: Selecting this option will cause the Merge PACS Workstation to close and you will need to manually restart the Workstation in order to continue.

Chapter 25. Viewing System Information

As described in subsections 3.8.4.b, 3.8.7.b and 4.2.4.c above, various right-click menus throughout the Merge PACS Workstation include an **About** option. Selecting this option will display a pop-up window that provides system information, as in the following example:



The About Merge PACS Workstation Window (System Information)

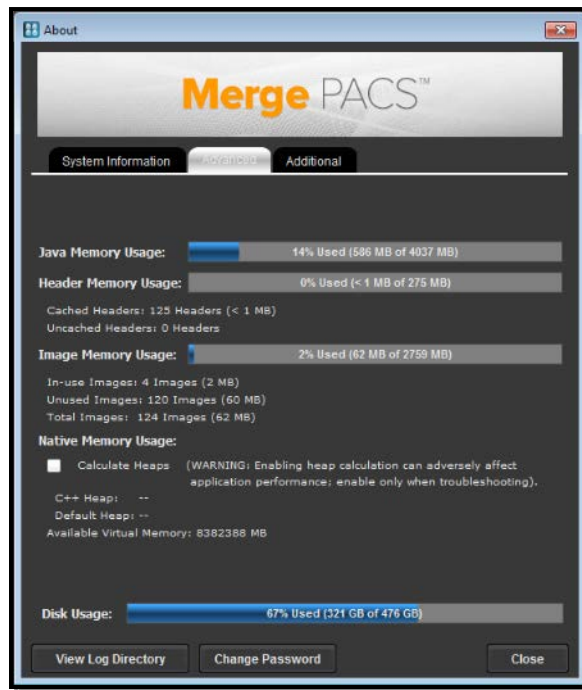
NOTE: The **About** dialog can also be launched from the **Merge PACS Workstation System Tray Menu**, as described in Chapter 26 below.

25.1. System Information Tab

By default, the **System Information** tab will be displayed, which shows the current version of the Merge PACS Workstation you are using (including the Unique Device Identification, or UDI, number) as well as your Windows operating system and username.

25.2. Advanced Tab

Clicking on the **Advanced** tab at the top of the window display will information about memory and disk usage, as in the following example:



The About Merge PACS Workstation Window (Memory and Disk Usage)

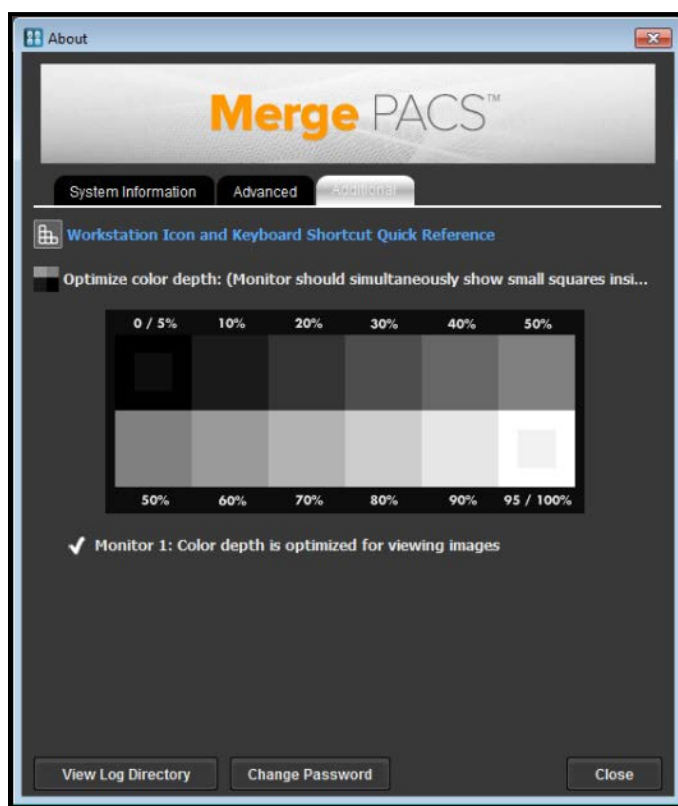
The following information is displayed on the Advanced tab:

Information	Description
Java Memory Usage	Memory currently used by Java Run-time Environment (JRE). By default, the Viewer will calculate the amount of memory to allocate to the Java heap based on the amount of physical RAM installed on the machine. If necessary, however, a specific amount of RAM can be configured on a per-Workstation basis by your PACS Administrator.
Header Memory Usage	Memory currently used to hold the header information of the DICOM header. Below the total amount of memory used it displays the cached and uncached memory values.

Information	Description
Image Memory Usage	Memory currently used to hold by the image pixels currently displayed in the image viewports.
Native Memory Usage	Memory currently used to hold the rendering values.
Disk Usage	Space currently used on the disk configured to run the Workstation (e.g., the C:/ drive).

25.3. Additional Tab

Clicking on the **Additional** tab will provide you access to additional resources and tools, as in the following example:

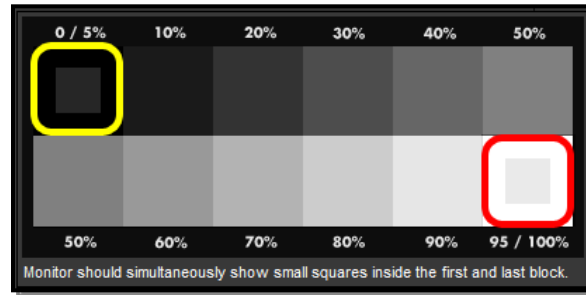


The About Merge PACS Workstation Window (Additional Resources and Tools)

Clicking on the **Workstation Icon and Keyboard Short Quick Reference** link will let you view and download a quick reference guide that can be printed if so desired.

The Merge PACS Workstation is appropriate for clinical diagnosis, but it is the user's responsibility to provide a suitable monitor that has been appropriately calibrated. In particular, the brightness and contrast levels of your image viewing monitors must be carefully adjusted in order to view images correctly. The **Optimize color depth** information provides a test pattern image that can be used to calibrate your monitor.

The first and last squares of the test pattern contain a small dark gray and a small light gray square, respectively, as seen below:



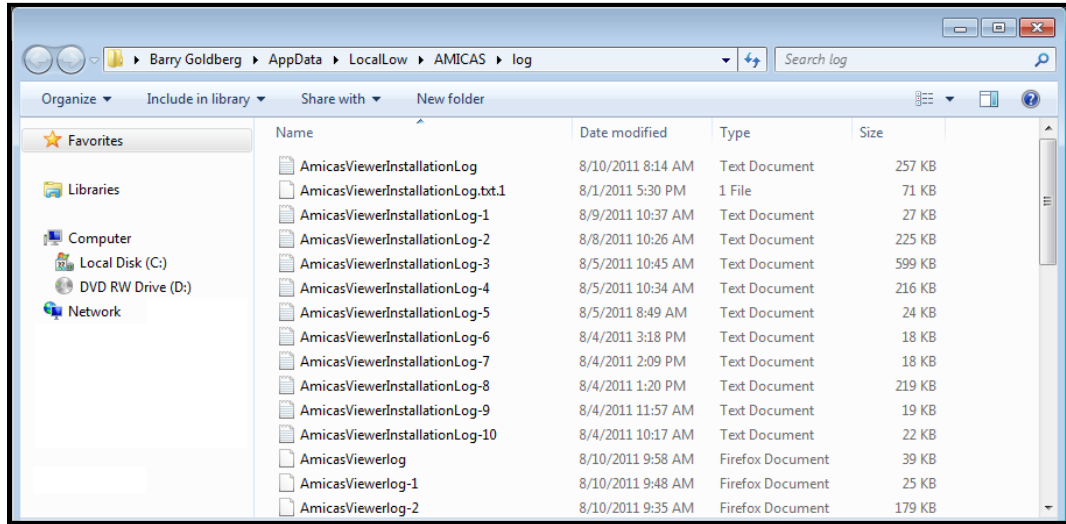
The Monitor Calibration Test Pattern

- If you cannot see either one of these squares, adjust the brightness and contrast controls of your monitor until they **both** become visible.
- When performing the test described above, it is recommended that you dim the lights in the room if possible.
- When adjusting the brightness and contrast, change each setting as **little** as possible until the desired results are achieved. Remember -- the goal is to have the **maximum** brightness and contrast that still allows all 12 squares in the test pattern to be discernible.
- Brightness and contrast interact with each other [greater contrast, for example, will make an image appear brighter], so it is important to adjust **both** the brightness and contrast.
- Note that, although you should not need to recalibrate your monitor every time you turn on your computer, it is recommended that you visually check each time to make sure you can see the "hidden" squares described above.

NOTE: For detailed instructions on how to configure dual monitors for use with the Merge PACS Workstation, refer to Appendix A below.

25.4. Viewing the Log Directory

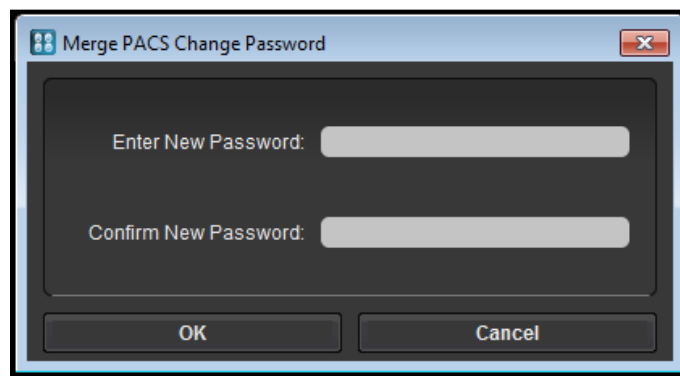
Clicking on the **View Log Directory** button at the bottom of the window will launch Windows Explorer and display the contents of the directory where Merge PACS Workstation log files are stored, as in the following example:



Viewing the Merge PACS Workstation Log Directory

25.5. Changing Your Password

Clicking on the **Change Password** button at the bottom of the window will launch a dialog that will let you change your password, as in the following example:



Changing a Password

Enter and confirm your new password and then click **OK**.

Chapter 26. System Tray Menu



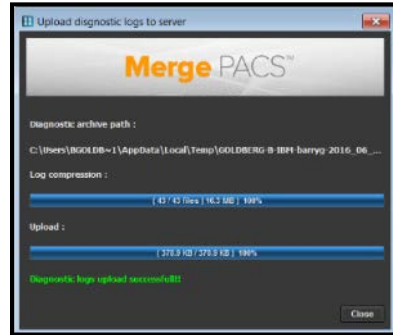
The Merge Viewer icon, as illustrated on the left, will be displayed in the Windows system tray whenever the Merge PACS Workstation is running. Right-clicking that icon will cause the **Merge PACS Workstation System Tray Menu** to be displayed, as in the following example:



The Merge PACS Workstation System Tray Menu

The Merge PACS Workstation System Tray Menu has the following options:

Option	Description
Help	Launch this User Guide in PDF Format
About	Launch the About screen, as described in Chapter 25 above.
Upload diagnostic workstation logs to server	Upload diagnostic logs for the Workstation to the Merge PACS Server. When finished, a confirmation window such as the following will be displayed:



Diagnostic Log Upload Successful

NOTE: The Diagnostic archive path is the location on the local Workstation where the logs are temporarily stored before being uploaded to the Server.

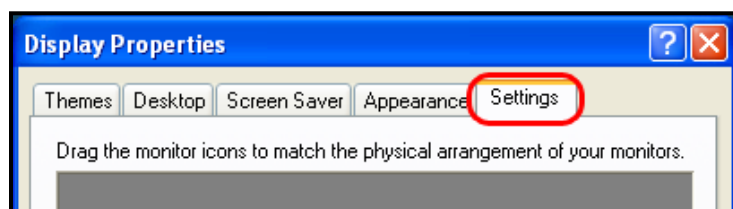
Terminate Diagnostic Workstation Immediately (FAST)	Exit the Workstation without any confirmation dialog or prompt to set status.
Exit Diagnostic Workstation	Exit the Workstation with standard confirmation dialog and prompt to set status as appropriate.

Appendix A. Dual Monitor Configuration

The following steps describe how to configure dual Barco™ monitors for use with the Merge PACS Workstation.

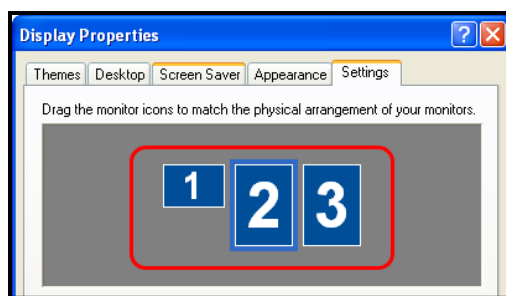
NOTE: The appearance of the windows and dialog boxes displayed below will vary according to your specific operating system and are meant as examples only.

1. Right-click anywhere on your workstation's desk-top and select "Properties" from the pop-up menu to launch the **Display Properties** window.
2. Click on the **Settings** tab at the top of the Display Properties window:



Changing the Display Settings

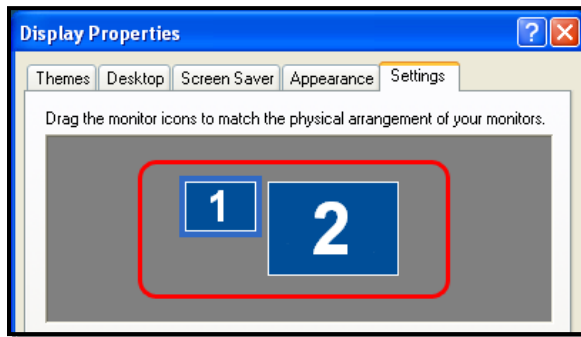
- A correctly configured dual monitor set-up should show icons representing three separate monitors (one primary and two attached), as in the following example:



Correct Configuration

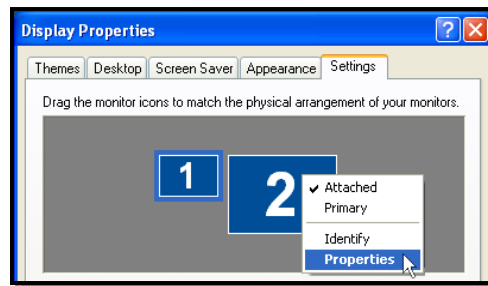
The monitors should be ordered in increasing value so that expanding the display to snap to full size across two monitors will move to right side of the Monitor.

- An incorrectly configured dual monitor set-up will only show icons representing two separate monitors (one primary and one attached), as in the following example:



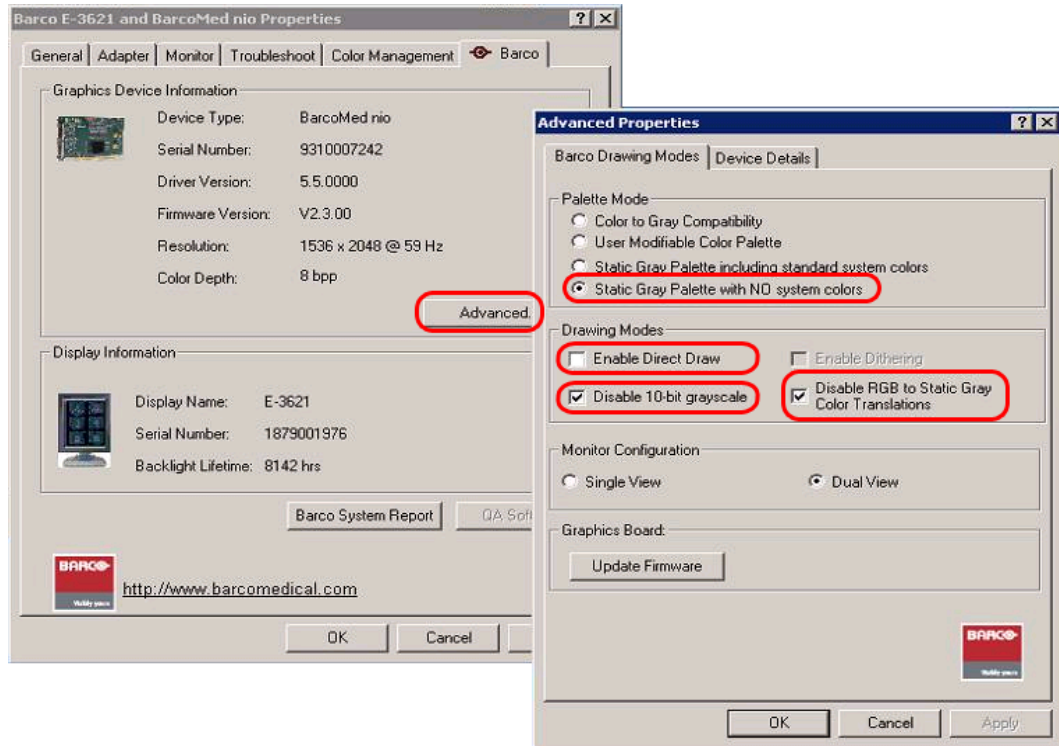
Incorrect Configuration

3. If the monitors are correctly configured, click the **OK** button at the bottom of the Display Properties window. Note that if you had to change the scheme or theme as described in steps 2 or 3 above, it may take a little while for your workstation to adjust.
4. If the monitors are incorrectly configured, right-click on the icon for the second monitor and select "Properties" from the pop-up menu:



Setting the Monitor Properties

A Barco Properties window similar to the one shown below will be displayed:



Barco Properties Window

NOTE: Depending on the version of your Barco drivers, you may need to click on the **Advanced** tab or the **BarcoMed Driver** tab to see this window.

- If available, make sure that the **Static Gray Palette with NO system colors** option is selected.
- Make sure that **Enable Direct Draw** is **not** selected.
- Make sure that **Disable 10-by grayscale** is selected.
- If available, make sure that **Disable RGB to Static Gray Color Translations** is selected.
- Under "Monitor Configuration" make sure that the **Dual View** option is selected (depending on your operating system, this option may be labeled "DualView is active" or "Enable DualView").

Click the **OK** button at the bottom of the Display Properties window. Note that if you had to change the scheme or theme as described in steps 2 or 3 above, it may take a little while for your workstation to adjust.

Appendix B. Standardized Uptake Values (SUV)

When using the **ROI Measurement** and **Probe** tools with 2D PET images, values can be displayed with any of the following units, based on the data provided by the modality:

Unit	Description	Unit	Description
NONE	unitless	MLG	milliliter/gram
CNTS	counts	1CM	1/centimeter
CM2	centimeter ²	UMOLML	micromole/milliliter
CM2ML	centimeter ² / milliliter	PROPCNTS	proportional to counts
PCNT	percent	PROPCPS	proportional to counts/sec
CPS	counts/second	MLMINML	milliliter/minute/milliliter
BQML	Becquerels/milliliter	MLML	milliliter/milliliter
MGMINML	milligram/minute/milliliter	GML	grams/milliliter
UMOLMINML	micromole/minute/milliliter	STDDEV	standard deviations
MLMING	milliliter/minute/gram		

NOTE: SUV is not supported with 3D PET images.

To aid in the interpretation of PET images, if the units are in **BQML**, **GML**, or **CM2ML**, the ROI and Probe tools will display the absorption of an injected isotope in body tissue based on **Standardized Uptake Values (SUV)**. SUV statistics are indicated based on the DICOM data present in the image and one or more of the following user preferences for SUV display:

- **Body Weight (BW)**
- **Lean Body Mass (LBM)**
- **Body Surface Area (BSA)**
- **Ideal Body Weight (IBW)**

CAUTION: Standardized Uptake Values are not absolute values. For details on the equations used to calculate these values in the application, see below.

CAUTION: Standardized Uptake Values are displayed only if the image contains values for the required DICOM tags.

CAUTION: Diagnostic interpretation should always be based on both the SUV Min/Max values and the Standard Deviation before making a diagnostic decision about pathology.

B.1. Requirements for Displaying Standardized Uptake Values

If the units are **GML** or **CM2ML** than the modality pixel values represent the SUV, no correction has to be applied.

If the units are **CM2ML**, the SUV will be considered BSA; all other SUV types will display N/A

If the units are **GML**, the SUV can be either BW or LBM. There is an extra tag SUV Type (0054, 1006) that can distinguish between BW and LBM; if not present, the SUV will be considered implicitly BW; all other SUVs will display N/A

If the units are **BQML**, a correction has to be applied to the modality pixel values. In order to calculate the SUV, the following DICOM tags are required to be present in the dataset (refer to Appendix B.1 for details how these DICOM tags are used in SUV calculations):

DICOM Tag Name	Group, Element	Required Value	BW	LBM	IBW	BSA
Units	(0054,1001)	BQML(Becquerels per milliliter)	X	X	X	X
Decay Correction	(0054,1102)	START or ADMIN	X	X	X	X
Series Time	(0008,0031)	Specified (Expressed in hhmmss.frac)	X	X	X	X
Radionuclide Total Dose	(0018,1074)	Specified in BQ (becquerels) and > 0	X	X	X	X
Radiopharmaceutical Start Time	(0018,1072)	Specified (Expressed in hhmmss.frac)	X	X	X	X
Radionuclide Half Life	(0018,1075)	Specified in seconds and > 0	X	X	X	X
Patient Weight	(0010,1030)	Specified and > 0.0 (Expressed in kg)	X	X	X	X
Patient Size	(0010,1020)	Specified and > 0.0 (Expressed in meters)		X	X	X

NOTE: If one of the required DICOM tags listed above is not present in the dataset, the SUV will display N/A.

B.2. Basic Calculation for Standardized Uptake Value (SUV)

The general equation for SUV is as follows:

$$\text{SUV} = \text{Modality Pixel Value} * (\text{Body Parameter}) / (\text{Corrected Dose})$$

- **Body Parameter** has a different value for each type of SUV:

SUV	Body Parameter Value
BW (g)	Patient Weight * 1000
LBM (g)	<ul style="list-style-type: none"> • Male (Patient Sex is 'M'): (1.10 * Patient Weight - 120.0 * POWER ((Patient Weight / (Patient Size * 100)), 2)) * 1000 • Female (Patient Sex is 'F'): (1.07 * Patient Weight - 148.0 * POWER ((Patient Weight / (Patient Size * 100)), 2)) * 1000 <p>Lean Body Weight refers to the sum of the weight of your bones, muscles and organs (everything other than fat in your body)¹.</p>
IBW (g)	<ul style="list-style-type: none"> • Male (Patient Sex is 'M'): (48.0 + 1.06 * (Patient Size - 152)) * 1000 • Female (Patient Sex is 'F'): (45.5 + 0.91 * (Patient Size - 152)) * 1000²
BSA (cm2)	POWER(Patient Weight, 0.425) * POWER(Patient Size * 100, 0.725) * 0.007184 * 10000 ³

- **Corrected Dose** has different values depending on the Decay Correction value:
 - If the Decay Correction is **ADMIN** then the **corrected dose** = Radionuclide Total Dose
 - If the Decay Correction is **START** then the **corrected dose** = Radionuclide Total Dose * EXP(-0.693147 * TIME_DIFF / Radionuclide Half Life), where TIME_DIFF is the difference in seconds between Radiopharmaceutical Start Time (the time the patient activity was measured) and the Series Time (start scan time); if the two times are equal then the corrected dose = Radionuclide Total Dose. Note that Radionuclide Half Life is usually 6588 seconds for F18 isotope.

NOTE: The PACS Viewer uses only tags defined by the DICOM standard to calculate the SUVs; it does not take into account any private tags used by some modality vendors.

¹ James WPT. *Research on obesity*. London. Her Majesty's Stationery Office

² Hamwi GJ. *Therapy: changing dietary concepts*. In: *Diabetes Mellitus: Diagnosis and Treatment (vol. 1)*. Danowski TS (ed). American Diabetes Association. New York. 1964, pp73-8.

³ DuBois D; DuBois EF: *A formula to estimate the approximate surface area if height and weight be known*. *Arch Int Med* 1916 17:863-71.

Appendix C. Consolidating Patient Information

When a Study is imported, a patient identity for the new Study is created and a unique identifier is generated. Based on the unique identifier, the Study is either matched to a pre-existing patient and stored as such or stored as a new patient. When patient demographics are updated or merged with another patient, the unique identifier is then used to group all related studies and process the update or merge request.

Merge PACS uses one or more of the following methods to determine whether studies should be grouped together, depending on how it is configured:

- Patient Comparison Strategy (PCS)
- Master Patient Index (MPI)
- Selection of Priors

C.1. Patient Comparison Strategy

Merge PACS can be configured with a Patient Comparison Strategy to provide fine grain control on patient update and merges, using additional patient demographic values to identify and group studies related to a given patient.

There are three Patient Comparison Strategies available with Merge PACS:

Comparison Strategy	Description
StrictComparisonStrategy	Uses the Patient's full name (all five components of DICOM person name), Patient MRN and Patient IPID to group related studies.
LastNameOnlyComparisonStrategy	Uses the Patient's last name (Last Name component of DICOM person name), Patient MRN and Patient IPID to group related studies.
PatientIDOnlyComparisonStrategy	Uses Patient MRN and Patient IPID to group related studies.

NOTE: For all patient comparison strategies, IPID and MRN matching is performed based on exact values (e.g., "ABC" will be considered different from "abc" and "123" will be considered different from "1.2.3").

NOTE: Consult with your PACS Administrator if you want to know which strategy is employed with your Merge PACS implementation.

When patient information is grouped using Patient Comparison Strategy, Merge PACS applies a “Last Wins” rule (*i.e.*, based on patient information in the most recent Study) to calculate the final patient information and for all related studies.

The following pieces of information are calculated:

- **Patient Name**
- **Patient Date of Birth**
- **Patient Sex**

Under “Last Wins” rule, Merge PACS uses the last piece of data that is not null or empty. For example, look at the three studies in the following example:

Study #	Patient Name	DOB	Sex
1	Doe, Jonathan	19770101	O
2	Doe, Jonathan	19770101	
3	Doe, Jonathan Q		M

After consolidation, the patient information for all studies would be consolidated as follows:

Patient Name	DOB	Sex
Doe, Jonathan Q	19770101	M

C.2. Multiple Patient Identity (MPI)

Multiple Patient Identity (MPI) allows patients who might not otherwise be identified as the same patient (*e.g.*, because of different names, IPIDs and/or MRNs) to be linked together by referencing some external “source of truth” such as an Enterprise Master Patient Index (EMPI) or a HIS/RIS. For example, if a patient “Jane Smith” had a procedure at one institution with an IPID of “ABC” and was assigned an MRN of “123456789,” then got married and changed her name to “Jane Brown” and then had a procedure at another institution with an IPID of “XYZ” and an MRN of “987654321,” Merge PACS would normally not be able to recognize that they were the same patient. MPI, however, would allow the system to recognize that “Jane Smith” and “Jane Brown” were the same patient under certain circumstances.

MPI is used within the Merge PACS Workstation in the following two workflows:

- To determine the list of prior/comparison studies for each primary study
- To determine the search results when performing a query on a particular patient

In addition, when MPI support is enabled, Merge PACS can be configured to display some or all of the following ID components for each study in places such as the Viewer Titlebar and Study Titlebar, as well as many other places where patient demographics are displayed such as the Report Viewer and the Change Workflow Status dialog:

ID Component	Description
Local IPID	The Issuer of Patient ID (IPID) associated directly with the study
Local MRN	The Medical Record Number (MRN) associated directly with the study

ID Component	Description
Master IPID	The Master IPID for Merge PACS, if this patient has an MRN for this IPID.
Master MRN	The MRN for this patient associated with the Master IPID. A patient may have multiple studies with different MRNs associated with them, but will only have one Master MRN.

In order for Merge PACS to use MPI, the following must be true:

- Merge PACS must be configured to run in **Integrated** mode with iCEA v. 11.4 or higher.
- The attached iCEA must be configured to receive information from some external source of truth such as an EMPI or a HIS/RIS.
- The **Patient Comparison Strategy**, as described in Appendix C.1 above, must be set to **IPID + MRN**.
- Merge PACS has been configured to enable MPI.

Whatever the external source of truth is, it makes iCEA aware of the various identities and tells iCEA which identities belong to the same person via standard HL7 ADT messages. The PID segment of these messages can contain one or multiple identities; where multiple identities are included, they will be considered linked (*i.e.*, be considered the same person). iCEA can cache this linking information and Merge PACS can then ask iCEA for alternate identities of a person and use this information to present other studies for that person.

C.3. Selection of Priors

When determining whether a particular Study is considered a “prior” or “comparison” Study of another Study within Merge PACS, Merge PACS first looks to the Patient Comparison Strategy configured for a site to determine a match and, if applicable, the MPI. Merge PACS then looks to the “Selection of Priors” option that is selected for the site to see if any additional studies should be included in the list of priors. Studies that do not match the Patient Comparison Strategy but do match the “Selection of Priors” option are displayed with a “+” from various places within the Workstation.

CAUTION: Any prior matches that include a “+” are more loosely matched than other prior matches and you should use your judgment to decide if this exam is truly for the same patient.

The following is a list of “Selection of Priors” options that are available for Merge PACS:

Preference	Description
MRN	Determine priors based solely on MRN
IPID and MRN	Determine priors based on a combination of Issuer of Patient ID (IPID) and MRN (<i>i.e.</i> , both must match to be considered a prior).
MRN and Name	Determine priors based on a combination of MRN and Patient Name (<i>i.e.</i> , both must match to be considered a prior).

Preference	Description
IPID and MRN and Name	Determine priors based on a combination of IPID, MRN and Patient Name (<i>i.e.</i> , all must match to be considered a prior).
MRN or Name/DOB/Sex	Determine priors based on either MRN or a combination of Patient Name, Date of Birth and Sex.
(MRN and Name) or Name/DOB/Sex	Determine priors based on either a combination of MRN and Patient Name or a combination of Patient Name, Date of Birth and Sex.
Name/DOB/Sex	Determine priors based on a combination of Patient Name, Date of Birth and Sex.

NOTE: For all selection of priors options that involve IPID and MRN, matching is performed based on exact values (*e.g.*, “ABC” will be considered different from “abc” and “123” will be considered different from “1.2.3”).

Consult with your PACS Administrator if you want to know which option is selected with your Merge PACS implementation.

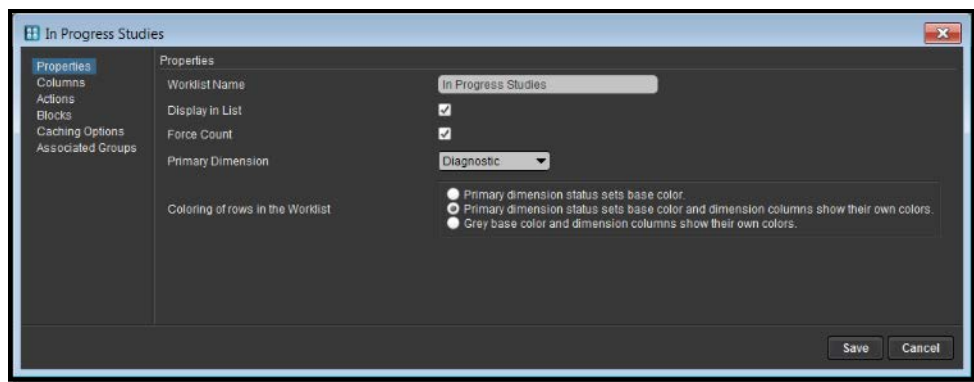
Appendix D. Configuring Worklist Blocks

As described in subsections 3.3.14 and 3.2.11 above, if you have privileges to edit worklists you can configure which pre-existing worklist blocks make up that worklist directly from RTWL or RTSL.

To configure worklist blocks for a worklist:

1. Click on the name of the currently loaded worklist at the top of the RTWL or RTSL window.

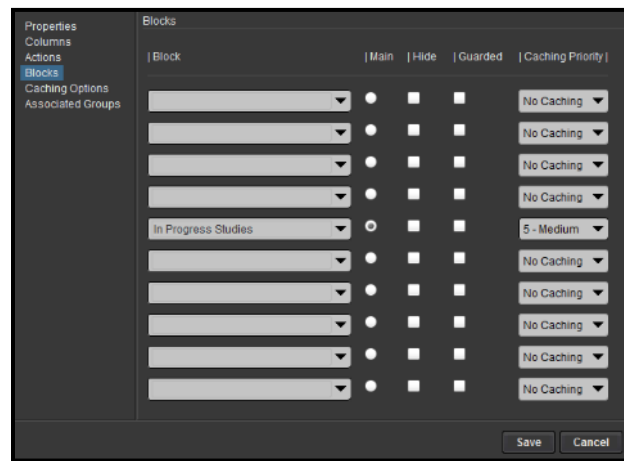
The **Worklist Editor** for the selected worklist is displayed, as in the following example:



Worklist Editor

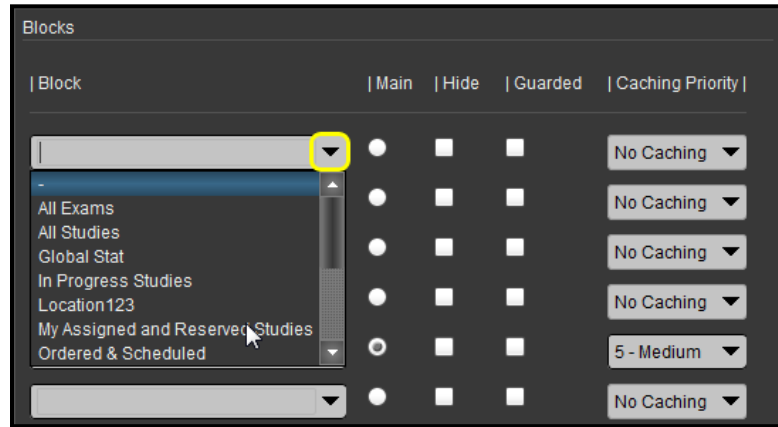
2. Click on the **Blocks** option in the left-hand menu.

The **Blocks** configuration screen is displayed, as in the following example:



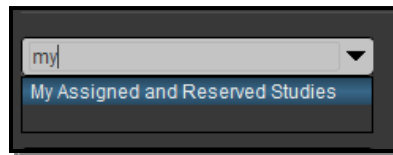
Block Configuration

- Select the desired worklist block from one of the available drop-down menus in the **Block** column, as in the following example:



Selecting a Worklist Block to Add

- If you know the name of the desired block, you can also start typing its name in the text field to display a list of matching blocks, as in the following example:



Filtering on Block Name

- You may add as many as ten worklist blocks to this worklist.
 - Worklist Blocks will be displayed within this worklist in the same top-down order they appear on this dialog.
 - To remove a worklist block that has previously been selected, choose the - option from the drop-down menu.
 - Leaving a dropdown menu for a worklist block blank will not cause any extra space to be displayed within this worklist. Therefore, you might want to leave the first one or two drop-down menus blank initially in case you later want to add additional worklist blocks to the top of this worklist.
- If you want this worklist block to be the main worklist block for this worklist, click on the **Main** radio button for this worklist block.

NOTE: The main worklist block will be the one that exams are added to when users manually associate exams to this worklist.

- If you want this worklist block to be hidden (*i.e.*, displayed in a collapsed state) by default on this worklist, select the **Hidden** checkbox for this worklist block.
- If you want this worklist block to be guarded (*i.e.*, skipped over when users click on the **Next Study** or **Previous Study** buttons within the PACS Viewer) on this worklist, select the **Guarded** checkbox for this worklist block.

NOTE: If you are already viewing a study contained within a guarded worklist block, you will still be able to navigate among other studies within that block using the **Next Study** and **Previous Study** buttons.

- If desired, you can set the caching priority for this worklist block (relevant to other worklist blocks on this worklist) by selecting a number from 1-10 from the drop-down **Caching Priority** menu for this worklist block, as in the following example:

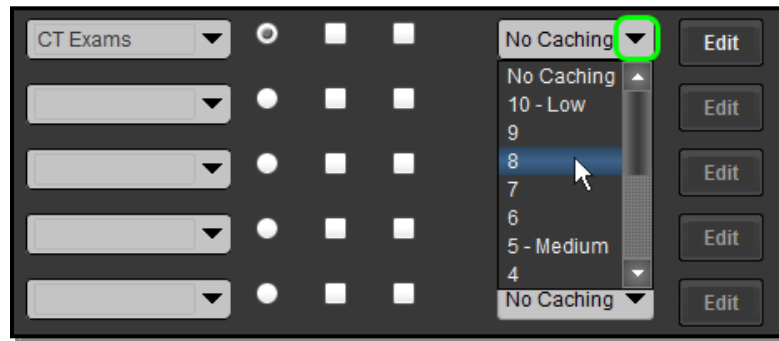
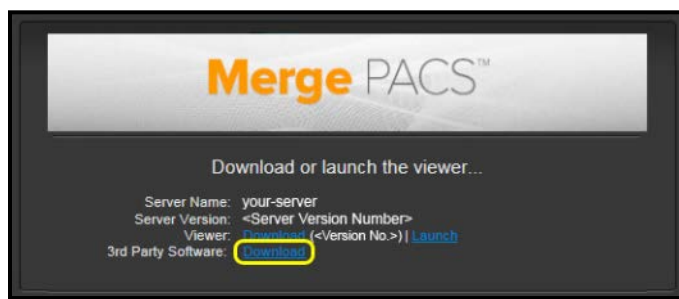


Figure 1: Setting the Caching Priority for a Worklist Block

- Repeat steps 3-7 for any additional worklist blocks you want to add to this worklist. When finished, click the **Save** button at the bottom of the Worklist Editor window.

Appendix E. Installing OrthoView™

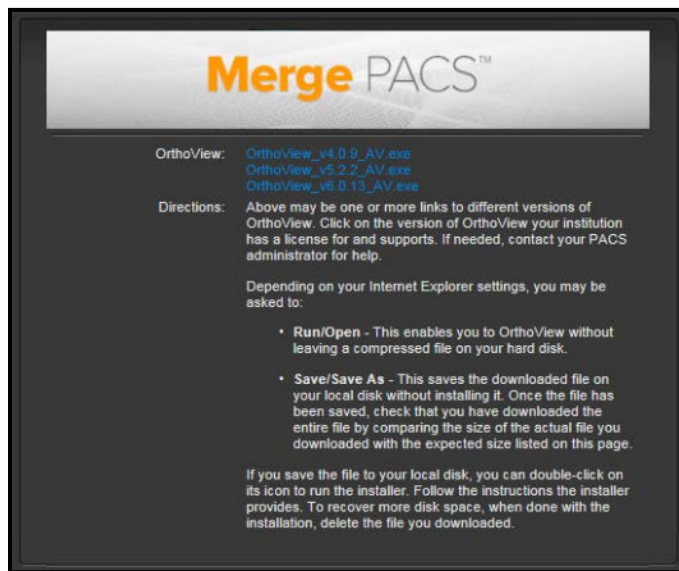
If you need to install the OrthoView™ orthopedic templating toolset, click on the 3rd Party Software **Download** link on your Merge PACS Server's **Download and Launch** webpage, as described in the Section 2.1 above, as shown in the following example:



Click to Install OrthoView™

NOTE: Workstations that are configured for use with **OrthoPACS™** will have access to Merge OrthoCase by default and will not need to install OrthoView.

Clicking this link will prompt you to log into Merge PACS and then launch the OrthoView installer in a separate window or tab, as in the following example:



The OrthoView Installation Window

At the OrthoView Installation window, click on the appropriate link as directed to begin the installation process.