McKESSON

DICOM Conformance Statement

McKesson Cardiology™

Release 13.2
November 2015
Doc ID DCM-10014
Doc Revision 1.0

Produced in Cork, Ireland

Revision History

Revision	Revision Date	Summary of Changes
Rev. 1.0	November 2015	Initial release

Table of Contents

1. Introduction

This document contains DICOM conformance statements for McKesson Cardiology™ 13.2.

Note: The Digital Imaging and Communications in Medicine (DICOM) Standard is constantly evolving. This DICOM Conformance Statement describes McKesson's conformance thereto at the time of writing. As the DICOM Standard evolves according to users' request, McKesson modifies its product accordingly. Revised versions of the DICOM Conformance Statement are issued periodically. The currently published version may not reflect all the latest modifications. Please contact McKesson Support for more information. McKesson reserves the right to make changes in its products to comply with evolving DICOM Standards and to update the DICOM Conformance Statement at reasonable intervals.

McKesson Cardiology includes both ImageManager and ImageDisplay functionalities. During installation, the user may choose which functionality is to be installed.

- As **ImageManager**, McKesson Cardiology permits the external systems to have access to data stored on the McKesson Cardiology database.
- As **ImageDisplay,** McKesson Cardiology provides an operator with options to store, query, retrieve and print DICOM data into and from DICOM compatible systems.

2. Implementation Model

McKesson Cardiology provides:

- Image storage (SCU/SCP)
- Queries on image database (SCU/SCP)
- Retrieving images (SCU/SCP)
- Commitment for the storage of data (SCU/SCP)
- Printing images (SCU)
- Getting Worklist (SCU)
- Providing Worklist (SCP)
- Managing Modality-performed procedure steps (SCP/SCU)

2.1 Application Data Flow Diagram

Figure 1 on page 6 shows the relationship between McKesson Cardiology ImageManager, ImageDisplay and external applications.

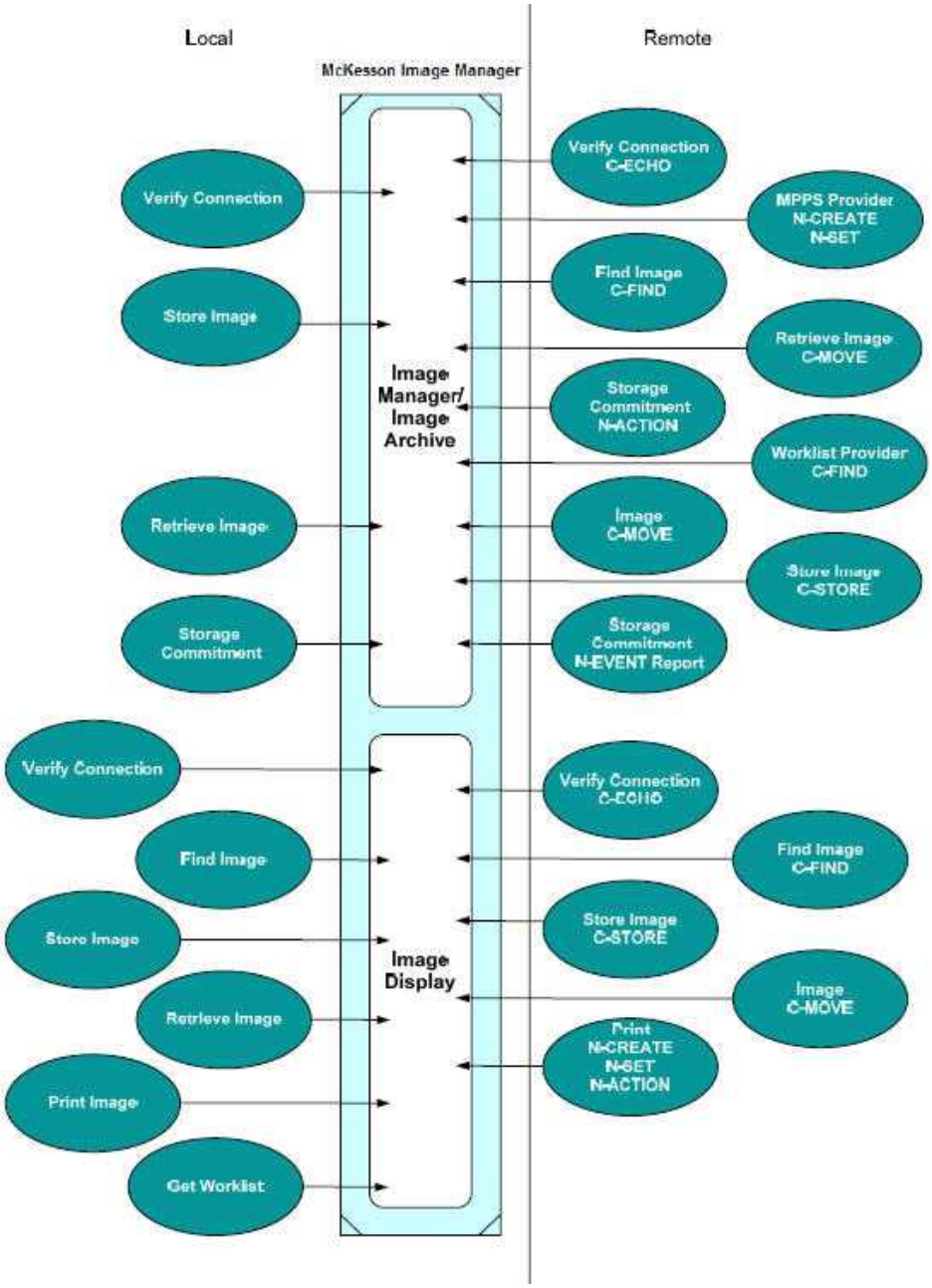

Figure 1- Implementation Model

2.2 Functional Definition of Application Entities

The McKesson Cardiology ImageManager uses a registry and configuration files that contain information used to validate association attempts from Local and Remote Application entities. The McKesson Cardiology ImageManager then listens for association requests on the configured port.

An association request for Storage Services from a Remote Application Entity causes the McKesson Cardiology ImageManager to validate the request according to the configuration parameters set at execution time. The Remote Application Entity then sends the Information Object Instance.

The McKesson Cardiology ImageManager stores the received Information Object Instance on its local database, if the data does not already exist, and in a predefined directory on hard disk. The data remains in that directory until removed by the McKesson Cardiology ImageManager based on the LimitDays quota.

An association request from a Remote Application Entity for Query or Retrieve Services causes McKesson Cardiology ImageManager to validate the request according to the configuration parameters set at execution time. The Remote Application Entity then sends the Query or Retrieve request.

The McKesson Cardiology ImageManager searches the local database for the instance(s) specified. If the request was C-FIND, then a response is returned for each match. If the request was C-MOVE, then an association is originated to the sub association for the C-STORE operation with the destination Application Entity specified in the C-MOVE message.

The Operator defines to which DICOM server the requests are routed. If a print request is received, the system passes the request to a DICOM print provider.

McKesson Cardiology ImageManager SCP is able to accept multiple associations at a time. The number of simultaneous associations is configurable (in relation to system resources).

McKesson Cardiology ImageArchive SCP transfers images to remote DICOM devices (C-STORE operation) and is able to send Store Commitment requests automatically after a transfer images request is finished. McKesson Cardiology ImageArchive SCP receives Store Commitment N-EVENT- REPORT responses on the separate association on which the N-ACTION operation was performed.

For image retrieval, McKesson Cardiology ImageArchive SCP sends retrieve requests to remote DICOM devices with destination McKesson Cardiology ImageManager Application Entity Title. Retrieved images are transferred from a predefined directory to

the McKesson Cardiology database. If a communication error occurs, requests are automatically retried several times

2.3 Sequencing of Real-World Activities

Not Applicable

3. AE Specifications

McKesson Cardiology initiates and accepts Associations. McKesson Cardiology is composed of a single Application Entity, MEDSERVER AE (AE title is configurable).

3.1 AE McKesson Cardiology – Specification

McKesson Cardiology provides Standard Conformance to the following DICOM 3.0 SOP Classes as SCP.

Table 1 - SOP Classes Supported by McKesson Cardiology as SCP

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Patient Root Query/Retrieve Info Model - Find	1.2.840.10008.5.1.4.1.2.1.1
Study Root Query/Retrieve Info Model - Find	1.2.840.10008.5.1.4.1.2.2.1
Patient Root Query/Retrieve Info Model - Move	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Info Model - Move	1.2.840.10008.5.1.4.1.2.2.2
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1
Modality Worklist Information Model -FIND	1.2.840.10008.5.1.4.31
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Computed Tomography Image Storage	1.2.840.10008.5.1.4.1.1.2
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Magnetic Resonance Image Storage	1.2.840.10008.5.1.4.1.1.4
Enhanced Magnetic Resonance Image Storage	1.2.840.10008.5.1.4.1.1.4.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Multi-Frame Single bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1
Multi-Frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multi-Frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multi-Frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
X-Ray Bi-Plane Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.3
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5

SOP Class Name	SOP Class UID
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Radiotherapy Image	1.2.840.10008.5.1.4.1.1.481.1
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3
Digital Intra-oral X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1
Visible Light Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
Visible Light Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
Visible Light Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
Visible Light Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1
High Resolution Audio Waveform Storage (Retired)	1.2.840.10008.5.1.4.1.1.9.2.2
Draft Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1
Intravascular Optical Coherence Tomography Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.14.1
Intravascular Optical Coherence Tomography Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.14.2
Basic Text Structure Report	1.2.840.10008.5.1.4.1.1.88.11
Enhanced Structure Report	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive Structure Report	1.2.840.10008.5.1.4.1.1.88.33
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1

McKesson Cardiology provides Standard Conformance to the following DICOM 3.0 SOP Classes as SCU.

Table 2 - SOP Classes Supported by McKesson Cardiology as SCU

SOP Class	SOP Class UID
Verification	1.2.840.10008.1.1
Patient Root Query/Retrieve Info Model - Find	1.2.840.10008.5.1.4.1.2.1.1
Study Root Query/Retrieve Info Model - Find	1.2.840.10008.5.1.4.1.2.2.1
Patient Root Query/Retrieve Info Model - Move	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Info Model - Move	1.2.840.10008.5.1.4.1.2.2.2
Modality Worklist Information Model -FIND	1.2.840.10008.5.1.4.31
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Computed Tomography Image Storage	1.2.840.10008.5.1.4.1.1.2
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Magnetic Resonance Image Storage	1.2.840.10008.5.1.4.1.1.4
Enhanced Magnetic Resonance Image Storage	1.2.840.10008.5.1.4.1.1.4.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Multi-Frame Single bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1
Multi-Frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multi-Frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multi-Frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
X-Ray Bi-Plane Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.3
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Radiotherapy Image	1.2.840.10008.5.1.4.1.1.481.1
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1

SOP Class	SOP Class UID
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3
Digital Intra-oral X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1
Visible Light Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
Visible Light Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
Visible Light Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
Visible Light Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1
High Resolution Audio Waveform Storage (Retired)	1.2.840.10008.5.1.4.1.1.9.2.2
Draft Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1
Intravascular Optical Coherence Tomography Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.14.1
Intravascular Optical Coherence Tomography Image Storage – for Presentation	1.2.840.10008.5.1.4.1.1.14.2
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59
Basic Text Structure Report	1.2.840.10008.5.1.4.1.1.88.11
Enhanced Structure Report	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive Structure Report	1.2.840.10008.5.1.4.1.1.88.33
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1

3.1.1 Association Establishment Policies

3.1.1.1 General

PDU size is configurable for both SCU/SCP.

3.1.1.2 Number of Associations

The number of simultaneous associations is defined by the configuration.

Asynchronous mode (multiple concurrent operations on one association) is not supported.

3.1.1.3 Implementation Identifying Information

McKesson Cardiology provides an implementation class UID - 2.16.376.1.1.511752891.1.

McKesson Cardiology provides an implementation version name – MEDCON01MAR2007.

3.1.2 Association Initiation Policy

McKesson Cardiology attempts to initiate a new association in the following cases:

- To check the connection to the remote system
- To transfer (store) a series of images on the remote system
- To find several images in the remote system
- To retrieve several images from the remote system
- To print several images
- To get the worklist
- To confirm storage commitment

3.1.2.1 Real-World Activity – Verification

Associated Real-World Activity

The associated Real-World Activity is an attempt to check whether remote AE is ready for DICOM dialog.

Proposed Presentation Contexts

For this Real-World Activity, McKesson Cardiology will propose one of the Presentation Contexts listed in Table 3.

Table 3 - Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Verification	1.2.840.10008.1.1	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Verification	1.2.840.10008.1.1	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

3.1.2.2 Real-World Activity – Storing Images

Associated Real-World Activity

The associated Real-World Activity is an attempt to store a series of images on a remote system.

The McKesson Cardiology ImageManager initiates an association for C-STORE if it has received a valid C-MOVE message from a Remote Application Entity. The SOP Class UID of the Information Object to be sent over the C-STORE context is used to verify that a valid Presentation Context exists prior to issuing the C-STORE message.

Proposed Presentation Contexts

McKesson Cardiology will propose one Presentation Context, as shown in Table 4 on page 15. The proposed Presentation Context will use the SOP Class UID that corresponds to the Series modality.

Table 4 - Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
See Note		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
See Note		Implicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
See Note		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
See Note		JPEG Lossless, Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCU	None
See Note		JPEG Lossy Process 1	1.2.840.10008.1.2.4.50	SCU	None
See Note		RLE Lossless	1.2.840.10008.1.2.5	SCU	None

Note: The Abstract Syntax corresponds to the SOP Class UID for Series modality. The selection of these syntaxes can be found in Table 5:

Table 5 - Abstract Syntaxes

Abstract Syntax	
Name	**UID**
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Computed Tomography Image Storage	1.2.840.10008.5.1.4.1.1.2
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Magnetic Resonance Image Storage	1.2.840.10008.5.1.4.1.1.4
Enhanced Magnetic Resonance Image Storage	1.2.840.10008.5.1.4.1.1.4.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Multi-Frame Single bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1
Multi-Frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multi-Frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multi-Frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
X-Ray Bi-Plane Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.3
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Radiotherapy Image	1.2.840.10008.5.1.4.1.1.481.1
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3

Abstract Syntax	
Name	**UID**
Digital Intra-oral X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1
Visible Light Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
Visible Light Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
Visible Light Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
Visible Light Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1
High Resolution Audio Waveform Storage (Retired)	1.2.840.10008.5.1.4.1.1.9.2.2
Draft Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59
Basic Text Structure Report	1.2.840.10008.5.1.4.1.1.88.11
Enhanced Structure Report	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive Structure Report	1.2.840.10008.5.1.4.1.1.88.33
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1

3.1.2.3 Real-World Activity – Finding Images

Associated Real-World Activity

The associated Real-World Activity is an attempt to find some of the images in a remote system. The user of the Client Application selects the Query operation button on the user interface. The user can specify wild card or specific information for Patient Name, Patient ID, Patient Sex, Patient Birthdate, Study ID, Study UID, Study Accession Number, Study Date Range, Study Time Range, Referring Physician, Modalities in Study.

Wild card queries can result in an excessive number of responses. The user interface is able to restrict the number of patients displayed.

The user can cancel the current Query operation by clicking the Cancel button.

McKesson Cardiology ImageManager defaults to using Patient Root Query Model when initiating query request. The query model used can be changed to Study Root Query Model by changing a configuration parameter.

Multiple Sources Option

McKesson Cardiology ImageDisplay can be configured to access multiple ImageManager / ImageArchive sources with a single user request.

If communication with one information source fails, McKesson Cardiology ImageDisplay provides the information it received from other sources. In addition, the McKesson Cardiology ImageDisplay informs the users that they are viewing potentially incomplete results.

When McKesson Cardiology ImageDisplay performs a study-level or series-level query to multiple sources and finds the study/series referenced in multiple places, the study/series is either duplicated or the study/series is split across the systems. When the user queries of the study/series, McKesson Cardiology ImageDisplay collates the information, determine if the information is actually duplicated or split, and presents a consolidated view of results to the user.

Proposed Presentation Contexts

For this Real-World Activity, McKesson Cardiology will propose one of the Presentation Contexts listed in Table 6.

Table 6- Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Patient Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2.	SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Patient Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Study Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Patient Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Study Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

3.1.2.4 Real-World Activity – Retrieving Images

Associated Real-World Activity

The associated Real-World Activity is an attempt to retrieve images from a remote system.

The user selects one or more images, series or studies within studies from a list presented as a result of a previous Query operation. Then the user selects the Retrieve operation button on the user interface to initiate the move operation.

The user can cancel the current Retrieve operation by clicking the Cancel button.

Multiple Sources Option

McKesson Cardiology ImageDisplay can be configured to access multiple ImageManager/ImageArchive sources with a single user retrieval request.

When McKesson Cardiology ImageDisplay performs a study-level or series-level query to multiple sources and finds the study/series referenced in multiple places, the study/series is either duplicated or the study/series is split across the systems. When

the user requests a retrieval of the study/series, McKesson Cardiology ImageDisplay collates the information, determines whether the information is actually duplicated or split, and presents a consolidated view of results to the user.

Avoiding redundant retrieval is managed by checking whether a definite IOD has already been retrieved in the current session.

Proposed Presentation Contexts

For this Real-World Activity, McKesson Cardiology will propose one of the Presentation Contexts listed in Table 7.

Table 7 - Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Patient Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Patient Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Study Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Patient Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Study Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

3.1.2.5 Real-World Activity – Printing Images

Associated Real-World Activity

The associated Real-World Activity is a request to print one or more images.

The Print Module represents a single Application Entity. It acts independently of other DICOM applications that may be running on the same system. The Print Module can support printing to multiple DICOM printers at the same time, each printer being uniquely identified by an Application Entity Title and port.

Proposed Presentation Contexts

McKesson Cardiology will propose one of the Presentation Contexts listed in Table 8.

Table 8 - Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	JPEG Lossless Hierarchical First-Order Predictions	1.2.840.10008.1.2.4.70	SCU	None
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	JPEG Lossy Process 1	1.2.840.10008.1.2.4.50	SCU	None
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	RLE Lossless	1.2.840.10008.1.2.4.5	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	JPEG Lossless Hierarchical First-Order Predictions	1.2.840.10008.1.2.4.70	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	JPEG Lossy Process 1	1.2.840.10008.1.2.4.50	SCU	None
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	RLE Lossless	1.2.840.10008.1.2.4.5	SCU	None

3.1.2.6 Real-World Activity – Getting Storage Commitment from Remote System

McKesson Cardiology DICOM Archive requests Storage Commitment from the remote DICOM Archive solution after sending images to the remote DICOM Archive and receiving a response confirming the images were archived.

Table 9 - Proposed Presentation Contexts

Presentation Context Table				
Abstract Syntax		Transfer Syntax		Role
Name	UID	Name	UID	
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU

3.1.2.7 Real-World Activity – Getting Modality Worklist from Remote System

McKesson Cardiology user requests Modality Worklist from the remote information system. The associated Real-World activity is requested by the user to perform a Worklist query based on user-specified criteria. The association is closed when all data have been received from the remote DICOM network node. The client is also able to abort the association through an operator-requested abort or when an error occurs.

Table 10 - Proposed Presentation Contexts

Presentation Context Table				
Abstract Syntax		Transfer Syntax		Role
Name	UID	Name	UID	
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU

Dependent on user requested search type, C-FIND request will contain elements of the following sets of matching key attributes:

Find by Accession number

Matching Key Attribute	Matching Key Type
(0008,0050) Accession Number	O

Find by Patient ID and Name

Matching Key Attribute	Matching Key Type
(0010,0020) Patient ID	R
(0010,0010) Patient's Name	R

Find by Scheduled Date, Station and Physician

Matching Key Attribute	Matching Key Type
(0040,0002) Scheduled Procedure Step Start Date	R
(0040,0006) Scheduled Performing Physician's Name	R
(0040,0010) Scheduled Station Name	R
(0040,0001) Scheduled Station AE Title	R

Find by Modality

Matching Key Attribute	Matching Key Type
(0008,0060) Modality	R

3.1.3 Association Acceptance Policy

McKesson Cardiology accepts an association for storing, finding and retrieving images.

3.1.3.1 Real World Activity – Verification

McKesson Cardiology accepts associations from nodes that wish to perform a verification operation on McKesson Cardiology.

Associated Real World Activity – Verification

The Real World Activity associated with the C-ECHO request is that an external node wishes to verify network or server operation without initiating any actual work.

Presentation Context Table

Table 11 shows the Presentation Contexts that may be accepted by McKesson Cardiology for verification operations.

Table 11 - Acceptable Presentation Contexts for McKesson Cardiology for Verification

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	DICOM Implicit VR Little	1.2.840.10008.1.2	SCP	None
Verification	1.2.840.10008.1.1	DICOM Explicit VR Little	1.2.840.10008.1.2.1	SCP	None
Verification	1.2.840.10008.1.1	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

SOP Specific Conformance for SOP Class Verification

Not Applicable.

Presentation Context Acceptance Criterion

McKesson Cardiology will accept the verification SOP classes listed in Table 11 above. McKesson Cardiology defines no limit on the number of presentation contexts accepted. If McKesson Cardiology runs out of resources when trying to accept multiple presentation contexts, McKesson Cardiology will reject the association request.

Transfer Syntax Selection Policies

McKesson Cardiology prefers Explicit Little Endian Transfer Syntax.

If offered a choice of Transfer Syntaxes in a Presentation Context, it will apply the following priority to the choice of Transfer Syntax:

1. Explicit Little Endian Transfer Syntax
2. Implicit Little Endian Transfer Syntax
3. Explicit Big Endian Transfer Syntax

3.1.3.2 Real-World Activity – Storing Images

The Real-World Activity associated with the C-STORE operation is the storage of the image in the McKesson system. McKesson Cardiology will issue a failure status response if it is unable to store the image.

When McKesson Cardiology receives the association request, it will allow the following activities to be performed during that association:

- Verification - Allow a remote DICOM device to verify that **McKesson Cardiology ImageManager** is active on the DICOM network

- Storage Commitment - Receive the request for storage commitment. No manual operation is needed.

Associated Real-World Activity

The Real-World activity associated with the C-STORE operation is the storage of the image on the disk of the system upon which McKesson Cardiology is running. Images are stored by writing the data set of the C-STORE command to disk and adding the PS 3.10 header.

McKesson Cardiology will issue a failure status response if it is unable to store the image on disk or if the image does not conform to the IOD of the SOP class under which it was transmitted.

Presentation Context Table

Any of the Presentation Contexts shown in Table 12 are acceptable to McKesson Cardiology for receiving images.

Table 12 - Acceptable Presentation Contexts for McKesson Cardiology

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
See Note	See Note	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
See Note	See Note	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
See Note	See Note	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
See Note	See Note	JPEG Lossless Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
See Note	See Note	JPEG Lossy Process 1	1.2.840.10008.1.2.4.50	SCP	None
See Note	See Note	RLE Lossless	1.2.840.10008.1.2.4.5	SCP	None

Note: The Abstract Syntax corresponds to the SOP Class UID for Series modality and can be one of the following syntaxes.

Table 13- Abstract Syntaxes

Abstract Syntax	
Name	**UID**
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Computed Tomography Image Storage	1.2.840.10008.5.1.4.1.1.2
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Computed Tomography Image Storage	1.2.840.10008.5.1.4.1.1.2
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Magnetic Resonance Image Storage	1.2.840.10008.5.1.4.1.1.4
Enhanced Magnetic Resonance Image Storage	1.2.840.10008.5.1.4.1.1.4.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Multi-Frame Single bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1
Multi-Frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multi-Frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multi-Frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
X-Ray Bi-Plane Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.3
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
Radiotherapy Image	1.2.840.10008.5.1.4.1.1.481.1
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2

Abstract Syntax	
Name	**UID**
Digital Mammography Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3
Digital Intra-oral X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1
Visible Light Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
Visible Light Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
Visible Light Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
Visible Light Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1
High Resolution Audio Waveform Storage (Retired)	1.2.840.10008.5.1.4.1.1.9.2.2
Draft Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59
Basic Text Structure Report	1.2.840.10008.5.1.4.1.1.88.11
Enhanced Structure Report	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive Structure Report	1.2.840.10008.5.1.4.1.1.88.33
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1

3.1.3.3 SOP Specific Conformance

SOP Specific Conformance to Storage SOP Classes

McKesson Cardiology conforms to the SOPs of the Storage Service Class at Level 2 (Full). No elements are discarded or coerced by McKesson Cardiology. In the event of a successful C-STORE operation, the Images have successfully been written to McKesson system. They may be accessed by McKesson applications or through DICOM Query/Retrieve Model.

If McKesson Cardiology returns one of the following status codes, then the C-STORE was unsuccessful.

Status Code	Action	Status	Description
A700	Refused	Out of resources	Indicates that there is not enough space to store the image.
A800		SOP Class Not Supported	Indicates that the SOP Class of the Image in the C-Store operation did not match the Abstract Syntax negotiated for the Presentation Context. This indicates a problem with the SCU of the Service Class.
A900	Failed	Data Set does not match SOP Class	Indicates that the Data Set does not encode an instance of the SOP Class specified. This indicates a problem with SCU of the Service Class.
C000	Unable to Process	Unable to understand	Indicates that McKesson Cardiology cannot parse the Data Set into elements. This indicates a problem with the SCU.

Presentation Context Acceptance Criterion

McKesson Cardiology defines no limit on the number of presentation contexts accepted.

If McKesson Cardiology runs out of resources when trying to accept multiple presentation contexts, McKesson Cardiology will reject the association request. McKesson Cardiology does not check for duplicate presentation contexts and will accept duplicate presentation contexts.

Transfer Syntax Selection Policies`

McKesson Cardiology prefers explicit Little Endian Transfer Syntax with compressed pixel data.

If offered a choice of Transfer Syntaxes in a Presentation Context, it will apply the following priorities to the choice of Transfer Syntax:

1. JPEG Lossless, Hierarchical, First-Order Prediction Transfer Syntax
2. Explicit Little Endian Transfer Syntax
3. Implicit Little Endian Transfer Syntax
4. Explicit Big Endian Transfer Syntax

3.1.3.4 Real World Activity – Finding Images

Associated Real World Activity

The Associated Real-World Activity associated with the C-FIND operation is the finding of the image in the McKesson system. McKesson Cardiology will issue a failure status response if it is unable to find the image. The search is performed by comparing the keys specified in request with corresponding keys of images in system.

Presentation Context Table

Any of the Presentation Contexts shown in Table 14 are acceptable to McKesson Cardiology for finding images.

Table 14- Acceptable Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Patient Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Patient Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Study Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Patient Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Study Root Query/Retrieve Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

SOP Specific Conformance for FIND SOP Classes

McKesson Cardiology conforms to the SOPs of the Find Service Class at Level 2 (Full).

The McKesson Cardiology ImageManager searches the McKesson database for the requested Information Objects described in the C-FIND identifier and returns a response for each match. Possible response status values are listed in the following table.

Status Code	Action	Status	Description
A700	Refused	Out of resources	Indicates that there is not enough space to store the image
A900	Failed	Data Set does not match SOP Class	Indicates that the Data Set does not encode an instance of the SOP Class specified. This indicates a problem with SCU of the Service Class
C000	Unable to Process	Unable to understand	Indicates that McKesson Cardiology cannot parse the Data Set into elements. This indicates a problem with the SCU
FE00	Cancel		Terminated due to Cancel Request

Status Code	Action	Status	Description
0000	Success		Matching completed
FF00	Pending		Matches are continuing

The attribute (0000,0902) contains a descriptive message to explain error returns.

Presentation Context Acceptance Criterion

McKesson Cardiology defines no limit on the number of presentation contexts accepted.

If McKesson Cardiology runs out of resources when trying to accept multiple presentation contexts, McKesson Cardiology will reject the association request. McKesson Cardiology does not check for duplicate presentation contexts and will accept duplicate presentation contexts.

Transfer Syntax Selection Policy

The McKesson Cardiology Application Entity conforms to the DICOM Patient Root Query/Retrieve and DICOM Study Root Query/Retrieve Service Class as an SCP for the Abstract Syntaxes listed in Table 13.

McKesson Cardiology prefers explicit Little Endian Transfer Syntax.

If offered a choice of Transfer Syntaxes in a Presentation Context, it will apply the following priority to the choice of Transfer Syntax:

1. Explicit Little Endian Transfer Syntax
2. Implicit Little Endian Transfer Syntax
3. Explicit Big Endian Transfer Syntax

3.1.3.5 Real World Activity – Retrieving

Associated Real World Activity

The Real-World Activity associated with the C-MOVE operation is the retrieving of the image from the McKesson system. McKesson Cardiology will issue a failure status response if it is unable to retrieve the image.

Presentation Context Table

Any of the Presentation Contexts shown in Table 15 are acceptable to McKesson Cardiology for retrieving images.

Table 15- Acceptable Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Patient Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Patient Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Study Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Patient Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Study Root Query/Retrieve Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

A response is returned for each match found in the attached database.

3.1.3.6 SOP Specific Conformance for MOVE SOP Classes

McKesson Cardiology conforms to the SOPs of the Move Service Class at Level 2 (Full). Possible response status values are listed in the following table.

Status Code	Action	Status
A700	Refused	Out of resources
A702		Unable to perform sub-operation
A801		Move destination unknown
A900	Failed	Data Set does not match SOP Class
C000		Unable to Process
FE00	Cancel	Terminated due to Cancel Request
0000	Success	Sub-operations completed
B000	Warning	Sub-operations completed – 1 or more failures
FF00	Pending	Matches are continuing

The attribute (0000,0902) contains a descriptive message to explain error returns.

Presentation Context Acceptance Criterion

McKesson Cardiology defines no limit on the number of presentation contexts accepted.

If McKesson Cardiology runs out of resources when trying to accept multiple presentation contexts, McKesson Cardiology will reject the association request. McKesson Cardiology does not check for duplicate presentation contexts and will accept duplicate presentation contexts.

Transfer Syntax Selection Policy

McKesson Cardiology prefers explicit Little Endian Transfer Syntax.

If offered a choice of Transfer Syntaxes in a Presentation Context, it will apply the following priority to the choice of Transfer Syntax:

1. Explicit Little Endian Transfer Syntax
2. Implicit Little Endian Transfer Syntax
3. Explicit Big Endian Transfer Syntax

3.1.3.7 Real-World Activity – Storage Commitment

The associated Real-World Activity is an attempt to make the commitment for the safekeeping of the SOP instances. McKesson Cardiology uses Storage Commitment SOP Class Push Model implementation in order to guarantee the safe storage of SOP instances.

McKesson Cardiology always returns the N-EVENT-REPORT on a separate association. This association is opened with reverse role negotiation, that is, the Calling AE is the SCP and the Called AE is the SCU.

After an N-ACTION request containing the Study Component Sequence has been received, the Storage Commitment N-EVENT-REPORT is built and returned.

Proposed Presentation Contexts

For this Real-World Activity, McKesson Cardiology will propose the Presentation Contexts listed in Table 16.

Table 16- Proposed Presentation Contexts

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Storage Commitment Push Model	1.2.840.10008.1.20.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.2	SCU	None

3.1.3.8 Real-World Activity – Providing Modality Worklist

McKesson Cardiology Worklist SCP application will wait for an association as an SCP for the Modality Worklist Service Class. When a C-FIND request is received, a search is done in McKesson Cardiology database for the data with the requested attributes, and a list of found attributes is returned to the remote requester. The McKesson Cardiology Worklist Service accepts a number of associations, which is configured at the time of system initialization.

Asynchronous mode is not supported.

Table 17- Proposed Presentation Contexts

Presentation Context Table				
Abstract Syntax		Transfer Syntax		Role
Name	UID	Name	UID	
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU

SOP Specific Conformance for Modality Worklist SOP Class

The supported Return Key Attributes are listed in the following table.

Description	Tag	Matching Key Type	Return Key Type
Scheduled Procedure Step			
Scheduled Procedure Step Sequence	0040,0100	R	1
>Scheduled Station AE Title	0040,0001	R	1
>Scheduled Procedure Step Start Date	0040,0002	R	1
>Scheduled Procedure Step Start Time	0040,0003	R	1
>Modality	0008,0060	R	1
>Scheduled Performing Physician's Name	0040,0006	R	2
>Scheduled Procedure Step Description	0040,0007	O	1C
>Scheduled Station Name	0040,0010	O	2
>Scheduled Procedure Step ID	0040,0009	O	1
>Scheduled Procedure Step Location	0040,0011	O	2
>Scheduled Action Item Code Sequence	0040,0008	O	1C
>>Code Value	0008,0100	O	1C
>>Coding Scheme Designator	0040,0102	O	1C
>>Pre-Medication	0040,0012	O	2C
>Scheduled Procedure Step Status	0040,0020	O	3
Requested Procedure			
Requested Procedure ID	0040,1001	O	1
Requested Procedure Description	0032,1060	O	1C
Requested Procedure Code Sequence	0032,1064	O	1C
>Code Value	0008,0100	O	1C
>Coding Scheme Designator	0008,0102	O	1C
Study Instance UID	0020,000D	O	1
Referenced Study Sequence	0008,1110	O	2
>Referenced SOP Class UID	0008,1150	O	1C
>Referenced SOP Instance UID	0008,1155	O	1C
Requested Procedure Priority	0040,1003	O	2
Imaging Service Request			
Accession Number	0008,0050	O	2

Description	Tag	Matching Key Type	Return Key Type
	0032,1032	O	2
Referring Physician's Name	0008,0090	O	2
Visit Identification			
Admission ID	0038,0010	O	2
Current Patient Location	0038,0300	O	2
Patient Identification			
Patient's Name	0010,0010	R	1
Patient ID	0010,0020	R	1
Patient Demographic			
Patients Birth Date	0010,0030	O	2
Patient's Sex	0010,0040	O	2
Patient's Weight	0010,1030	O	2
Confidentiality constraint on patient data	0040,3001	O	2
Patient Medical			
Patient State	0038,0500	O	2
Pregnancy Status	0010,21C0	O	2
Medical Alerts	0010,2000	O	2
Contrast Allergies	0010,2110	O	2
Special Needs	0038,0050	O	2
All other Attributes from the Patient Medical Module		O	3

3.1.3.9 Real-World Activity – Providing Modality Performed Procedure Step (MPPS)

McKesson Cardiology MPPS SCP application will wait for an association as an SCP for the MPPS Service Class. When N-CREATE/N-SET events are received, a search for the data with the received attributes is performed on the McKesson Cardiology database and the required data are stored on the McKesson Cardiology database.

The McKesson Cardiology MPPS SCP can also serve as MPPS SCU in order to transfer an entire data set, as is, to another MPPS SCP, if configured to do so.

Table 18- Proposed Presentation Contexts

Presentation Context Table				
Abstract Syntax		Transfer Syntax		Role
Name	UID	Name	UID	
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU

3.1.3.10 SOP Specific Conformance for MPPS SOP Class

The supported Return Key Attributes are as follows:

Description	Tag	Return Key Type N-CREATE	Return Key Type N-SET	Requirement Type Final State
SOP Common				
Specific Character Set	0008,0005	1C (Required if an extended or replacement character set is used)	Not allowed	
Performed Procedure Step Information				
Performed Station AE Title	0040,0241	1	Not allowed	
Performed Station Name	0040,0242	2	Not allowed	
Performed Location	0040,0243	2	Not allowed	
Performed Procedure Step ID	0040,0253	1	Not allowed	
Performed Procedure Step Start Date	0040,0244	1	Not allowed	

Description	Tag	Return Key Type N-CREATE	Return Key Type N-SET	Requirement Type Final State
Performed Procedure Step Start Time	0040,0245	1	Not allowed	
Performed Procedure Step Status	0040,0252	1	1	
Performed Procedure Step End Date	0040,0250	1	1	1
Performed Procedure Step End Time	0040,0251	1	1	1
Performed Procedure Step Description	0040,0254	2	2	
Performed Procedure Type Description	0040,0255	2	2	
Procedure Code Sequence	0008,1032	2	2	
>Code Value	0008,0100	1C (Required if Sequence Item is present)	1C (Required if Sequence Item is present)	
>Coding Scheme Designator	0008,0102	1C (Required if Sequence Item is present)	1C (Required if Sequence Item is present)	
>Coding Scheme Version	0008,0103	3	3	
>Code Meaning	0008,0104	3	3	
Comments on the Performed Procedure Step	0040,0280	1	3	
Performed Procedure Step Relationship				
Scheduled Step Attribute Sequence	0040,0270	1	Not allowed	
>Study Instance UID	0020,000D	1	Not allowed	
>Referenced Study Sequence	0008,1110	2	Not allowed	

Description	Tag	Return Key Type N-CREATE	Return Key Type N-SET	Requirement Type Final State
>>Referenced SOP Class UID	0008,1150	1C (Required if Sequence Item is present	Not allowed	
>>Referenced SOP Instance UID	0008,1155	1C (Required if Sequence Item is present)	Not allowed	
>Accession Number	0008,0050	2	Not allowed	
>Place Order Number/Imaging Service Request	0040,2016	3	Not allowed	
>Filler Order Number/Imaging Service Request	0040,2017	3	Not allowed	
>Requested Procedure ID	0040,1001	2	Not allowed	
>Requested Procedure Step Description	0032,1060	2	Not allowed	
>Scheduled Procedure Step ID	0040,0009	2	Not allowed	
>Scheduled Procedure Step Description	0040,0007	2	Not allowed	
>Scheduled Protocol Code Sequence	0040,0008	2	Not allowed	
>>Code Value	0008,0100	1C (Required if Sequence Item is present)	Not allowed	
>>Coding Scheme designator	0008,0102	1C (Required if Sequence Item is present)	Not allowed	
>>Coding Scheme Version	0008,0103	3	Not allowed	

Description	Tag	Return Key Type N-CREATE	Return Key Type N-SET	Requirement Type Final State
>>Code Meaning	0008,0104	3	Not allowed	
Patient's Name	0010,0010	2	Not allowed	
Patient's ID	0010,0020	2	Not allowed	
Patient's Birth Date	0010,0020	2	Not allowed	
Patient's Sex	0010,0040	2	Not allowed	
Referenced Patient Sequence	0008,1120	2	Not allowed	
>Referenced SOP Class UID	0008,1150	1C (Required if Sequence Item is present)	Not allowed	
>Referenced SOP Instance UID	0008,1155	1C (Required if Sequence Item is present)	Not allowed	
Performed Procedure Discontinuation Reason Code Sequence	0040,0281	3	3	
>Code Value	0008,0100	1	1	
>Coding SchemeDesignator	0008,0102	1	1	
>Coding SchemeVersion	0008,0103	3	3	
>Code Meaning	0008,0104	3	3	
Image Acquisition Results				
Modality	0008,0060	1	Not allowed	
Study ID	0020,0010	2	Not allowed	
Performed Protocol Code Sequence	0040,0260	2	2	
>Code Value	0008,0100	1	1	
>Coding Scheme Designator	0008,0102	1	1	
>Coding Scheme Version	0008,0103	3	3	

Description	Tag	Return Key Type N-CREATE	Return Key Type N-SET	Requirement Type Final State
>Code Meaning	0008,0104	3	3	
Performed Series Sequence	0040,0340	2	1	1
>Performed Physician's Name	0008,1050	2	2	2
>Protocol Name	0018,1030	1	1	1
>Operator's Name	0008,1070	2	2	2
>Series Instance UID	0020,000E	1	1	1
>Series Description	0008,103E	2	2	2
>Retrieve AE Title	0008,0054	2	2	2
>Referenced Image Sequence	0008,1140	2	2	
>>Referenced SOP Class UID	0008,1150	1	1	
>>Referenced SOP InstanceUID	0008,1155	1	1	
>Referenced Non-Image Composite SOP Image Sequence	0040,0220	2	2	
>>Referenced SOP Class UID	0008,1150	1	1	
>>Referenced SOP InstanceUID	0008,1155	1	1	
>All other attributes from Performed Series Sequence		3	3	
All other attributes from Radiation Dose Module and Billing and Material Code Module		3	3	

Possible response status values are:

Status Code	Action	Status
A7xx	Refused	Out of resources
A9xx	Failed	Identifier does not match SOP Class
Cxxx		Unable to Process
0110		Unable to generate data
0000	Success	Sub-operations completed

4. Communication Profiles

4.1 TCP/IP Stack

McKesson Cardiology provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.1.1 TCP/IP API

McKesson Cardiology ImageManager inherits its TCP/IP stack from the computer system upon which it executes.

5. Extensions/Specializations/Privatization

McKesson Cardiology supports all the private tags on Level 2. McKesson private tags are listed in Table 19.

Table 19- McKesson Private Attributes

Data Element Tag	Name	Remark
(000D,0010)	Private Attributes Identification Code	
(000D,1000)	Patient TCS Location ID	
(000D,1001)	Study TCS Location ID	
(000D,1002)	Instance TCS Location ID	
(000D,1003)	Instance TCS ID	
(000D,1004)	Instance TCS Location ID	
(000D,1005)	Patient TCS ID	
(000D,1006)	Related File	
(000D,1007)	Additional Patient ID	
(000D,1021)	Patient Creation Date	
(000D,1022)	Patient Creation Time	
(000D,1038)	Instance Description	
(000D,1062)	TCS Document File	
(000D,1063)	Annotation Note	
(000D,1076)	Annotation Creation Date	
(000D,1077)	Annotation Creation Time	
(000D,1082)	Instance Creation Date	
(000D,1083)	Instance Creation Time	
(000D,1090)	TCS Document Type	
(000D,1095)	Referenced Instance Sequence	Internal enumerator for document type
(000D,1096)	Procedure Type Code	

Data Element Tag	Name	Remark
(000D,1097)	Patient Optional ID	
(000D,1098)	Patient NHS number	
(000D,1099)	Patient NHS status	
(000D,0011)	Private Attributes Identification Code	
(000D,1101)	Patient Name	
(000D,1102)	Patient ID	
(000D,1103)	Patient Additional ID	
(000D,1104)	Patient Optional ID	
(000D,1105)	Series Description	
(000D,1106)	Series Optional ID	
(000D,1107)	Referring Physicians Name	
(000D,1108)	Performing Physicians Name	Names are Delimited by "\"
(000D,1109)	Instance Name	
(000D,1110)	Instance Description	
(000D,0012)	Private Attributes Identification Code	
(000D,1202)	MMI Type	
(000D,1203)	Encapsulated Document Sequence	
(000D,1204)	Encapsulated Document	
(000D, 1205)	Encapsulated Document Length	(000D, 1205)
(000D,0013)	Private Attributes Identification Code	
(000D,1301)	Hostname	
(000D,1302)	Changing Information Sequence	
(000D,1303)	Calling AE Title	

Elements from (000D,1101) – (000D,1110) are used for recording the UNICODE version of the relevant standard and private elements (if required).

Elements from (000D,1202) – (000D, 1205) are used to encapsulate non-DICOM files.

Element (000D, 1302) is used to save sequence of elements changed when a DICOM file is updated. All elements represent internal information used for media exchange between McKesson Systems.

6. Configuration

McKesson Cardiology maintains configuration data in Registry and Configuration files. All parameters of DICOM services (including AE Title and TCP Listen Port) are configurable. Configuration may be performed by McKesson Cardiology Administration utility or manually.

7. Contact and Support Information

7.1.1 Contact and Support for US customers

McKesson does not guarantee support response for issues initiated via e-mail. For immediate support, please contact the official McKesson Cardiology Imaging toll-free support call center.

McKesson Technologies Inc.
1639 Route 10 East - Suite 100
Parsippany, NJ 07054

Phone: McKesson Cardiology Non-invasive Support line: 1-866-777-0202;
McKesson Cardiology Invasive Support line: 1-877-654-4366

Customer portal: https://migscrm.mckesson.com/

7.1.2 Contact and Support for UK customers

Phone: +44 (0)208-952-7399; E-mail: emisupport@mckesson.co.uk