

DICOM Conformance Statement



McKesson Cardiology™ ECG Management

Release 13.2.1
June 2016
Doc ID DCM-10019
Doc Revision 1.0

Revision History

| Revision | Revision Date | Summary of Changes |
|----------|---------------|--------------------|
| Rev. 1.0 | June 2016 | Initial release |
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1. Introduction

This document contains DICOM conformance statements for McKesson Cardiology™ ECG Management 13.2.1.

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

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

2. Implementation Model

McKesson Cardiology ECG Management 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](#) shows the relationship between **McKesson Cardiology ECG Management** and external applications.

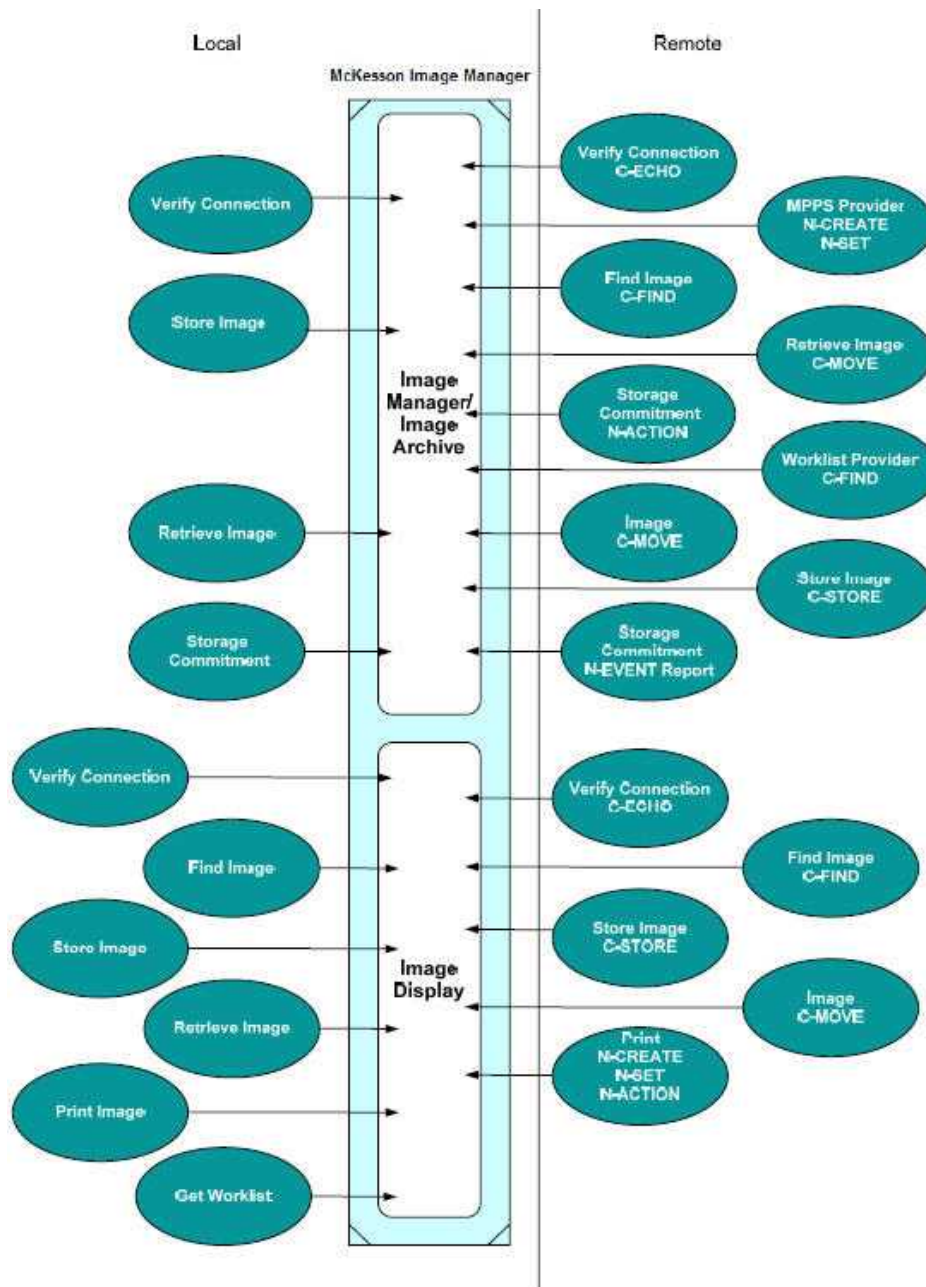


Figure 1- Implementation Model

2.2 Functional Definition of Application Entities

The **McKesson Cardiology ECG Management ImageManager** uses a registry and configuration files that contain information used to validate association attempts from Local and Remote Application entities. The **McKesson Cardiology ECG Management 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 ECG Management 13.2.1 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 ECG Management ImageManager stores** the received Information Object Instance on its local database, if the data does not already exist, or in a predefined directory on hard disk. The data remains in that directory until removed by the **McKesson Cardiology ECG Management ImageManager** based on the LimitDays quota.

An association request from a Remote Application Entity for Query or Retrieve Services causes **McKesson Cardiology ECG Management 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 ECG Management 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 subassociation for the C-STORE operation with the destination Application Entity specified in the C-MOVE message.

Operator defines to which DICOM server the requests are routed. In case of a print request, the system passes the request to a DICOM print provider.

McKesson Cardiology ECG Management 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 ECG Management 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 ECG Management ImageArchive SCP** receives Store Commitment N-EVENT- REPORT responses on the separate association on which the N-ACTION operation was performed.

For retrieval of images, **McKesson Cardiology ECG Management ImageArchive SCP** sends retrieve requests to remote DICOM devices with destination **McKesson Cardiology ECG Management ImageManager** Application Entity Title. Retrieved images are transferred from a predefined directory to the **McKesson Cardiology ECG Management** 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 ECG Management initiates and accepts Associations. **McKesson Cardiology ECG Management** is composed of a single Application Entity, MEDSERVER AE (AE title is configurable).

3.1 AE McKesson Cardiology ECG Management – Specifications

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

Table 1- SOP Classes Supported by McKesson Cardiology ECG Management 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 |
| 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 |
| Grayscale Softcopy Presentation State Storage | 1.2.840.10008.5.1.4.1.1.11.1 |
| 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 |

| SOP Class Name | SOP Class UID |
|--------------------------------|-------------------------------|
| 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 ECG Management provides Standard Conformance to the following DICOM 3.0 SOP Classes as SCU.

Table 2- SOP Classes Supported by McKesson Cardiology ECG Management as SCU

| 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 |
| 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 |
| 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 |
| Grayscale Softcopy Presentation State Storage | 1.2.840.10008.5.1.4.1.1.11.1 |
| 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 |

| SOP Class Name | SOP Class UID |
|--------------------------------|-------------------------------|
| 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 configuration.

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

3.1.1.3 Implementation Identifying Information

McKesson Cardiology ECG Management will provide an implementation class UID - 2.16.376.1.1.511752891.1.

McKesson Cardiology ECG Management will provide an implementation version name – MEDCON01MAR2007.

3.1.2 Association Initiation Policy

McKesson Cardiology ECG Management 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 work list
- 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 ECG Management** 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 ECG Management 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 ECG Management will propose one Presentation Context, as shown in [Table 4](#). 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 | See Note | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| See Note | See Note | Implicit VR Little Endian | 1.2.840.10008.1.2.1 | SCU | None |
| See Note | See Note | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| See Note | See Note | JPEG Lossless, Hierarchical, First-Order Prediction | 1.2.840.10008.1.2.4.7.0 | SCU | None |
| See Note | See Note | JPEG Lossy Process 1 | 1.2.840.10008.1.2.4.5.0 | SCU | None |
| See Note | 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 and can be one of the following:

Table 5- Abstract Syntaxes

| Abstract Syntax | |
|--|--------------------------------|
| Name | UID |
| 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 |
| Grayscale Softcopy Presentation State Storage | 1.2.840.10008.5.1.4.1.1.11.1 |
| 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 |

| Abstract Syntax | |
|--|-------------------------------|
| Name | UID |
| 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 ECG Management 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 ECG Management ImageDisplay can be configured to access multiple **ImageManager / ImageArchive** sources with a single user request.

If communication with one information source fails, **McKesson Cardiology ECG Management ImageDisplay** provides the information it received from other sources. In

addition, the **McKesson Cardiology ECG Management ImageDisplay** informs the users that they are viewing potentially incomplete results.

When **McKesson Cardiology ECG Management 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 ECG Management 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 ECG Management** 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 |
| 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 |

| 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 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 ECG Management ImageDisplay can be configured to access multiple **ImageManager/ImageArchive** sources with a single user retrieval request.

When **McKesson Cardiology ECG Management 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 ECG Management 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 ECG Management** 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 |
| 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 ECG Management 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 |
| Basic Grayscale Print Management Meta SOP Class | 1.2.840.10008.5.1.1.9 | JPEG Lossless Hierarchical First-Order Predictions | 1.2.840.10008.1.2.4.7.0 | SCU | None |
| Basic Grayscale Print Management Meta SOP Class | 1.2.840.10008.5.1.1.9 | JPEG Lossy Process 1 | 1.2.840.10008.1.2.4.5.0 | 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 | 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 | 1.2.840.10008.1.2.4.7.0 | SCU | None |
| Basic Color Print Management Meta SOP Class | 1.2.840.10008.5.1.1.18 | JPEG Lossy Process 1 | 1.2.840.10008.1.2.4.5.0 | 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 a Remote System

McKesson Cardiology ECG Management 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 |

| Presentation Context Table | | | | |
|-------------------------------|----------------------|------------------------|---------------------|------|
| Abstract Syntax | | Transfer Syntax | | Role |
| Name | UID | Name | UID | |
| 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 ECG Management 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 ECG Management accepts an association for storing, finding and retrieving images.

3.1.3.1 Real World Activity – Verification

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

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 ECG Management** for verification operations.

Table 11- Acceptable Presentation Contexts for McKesson Cardiology ECG Management 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 |

| Presentation Context Table | | | | | |
|----------------------------|-------------------|------------------------------|---------------------|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name | UID | | |
| 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 ECG Management will accept the verification SOP classes listed in [Table 1](#) above. **McKesson Cardiology ECG Management** defines no limit on the number of presentation contexts accepted. If **McKesson Cardiology ECG Management** runs out of resources when trying to accept multiple presentation contexts, **McKesson Cardiology ECG Management** will reject the association request.

Transfer Syntax Selection Policies

McKesson Cardiology ECG Management 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 ECG Management** will issue a failure status response if it is unable to store the image.

When **McKesson Cardiology ECG Management** receives the association request, it will allow the follow activities to be performed during that association:

- Verification - Allow a remote DICOM device to verify that **McKesson Cardiology ECG Management 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 ECG Management** 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 ECG Management 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 ECG Management** for receiving images.

Table 12- Acceptable Presentation Contexts for McKesson Cardiology ECG Management

| 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 | 1.2.840.10008.1.2.4.7.0 | SCP | None |
| See Note | See Note | JPEG Lossy Process 1 | 1.2.840.10008.1.2.4.5.0 | 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 |
| Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7 |

| Abstract Syntax | |
|--|--------------------------------|
| Name | UID |
| 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 |
| Grayscale Softcopy Presentation State Storage | 1.2.840.10008.5.1.4.1.1.11.1 |
| 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 ECG Management conforms to the SOPs of the Storage Service Class at Level 2 (Full). No elements are discarded or coerced by **McKesson Cardiology ECG Management**. 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 ECG Management** returns one of the following status codes, then the C-STORE was unsuccessful.

| tatus 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 ECG Management cannot parse the Data Set into elements. This indicates a problem with the SCU. |

Presentation Context Acceptance Criterion

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

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

Transfer Syntax Selection Policies

McKesson Cardiology ECG Management 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 ECG Management** 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 ECG Management** 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 |
| 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 |

| 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 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 ECG Management conforms to the SOPs of the Find Service Class at Level 2 (Full).

The **McKesson Cardiology ECG Management 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 |
| 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 ECG Management defines no limit on the number of presentation contexts accepted. If **McKesson Cardiology ECG Management** runs out of resources when trying to accept multiple presentation contexts, **McKesson Cardiology ECG Management** will reject the association request. **McKesson Cardiology ECG Management** does not check for duplicate presentation contexts and will accept duplicate presentation contexts.

Transfer Syntax Selection Policy

The **McKesson Cardiology ECG Management** 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 ECG Management 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 ECG Management** 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 ECG Management** for retrieving images.

Table 15- Acceptable Presentation Contexts

| Presentation Context Table | | | | |
|----------------------------|-----|-----------------|-----|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role |
| Name | UID | Name | UID | |
| | | | | Extended Negotiation |

| 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 ECG Management 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 ECG Management defines no limit on the number of presentation contexts accepted.

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

Transfer Syntax Selection Policy

McKesson Cardiology ECG Management 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 ECG Management** uses Storage Commitment SOP Class Push Model implementation in order to guarantee the safe storage of SOP instances.

McKesson Cardiology ECG Management 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 ECG Management** 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 ECG Management 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 ECG Management** database for the data with the requested attributes, and a list of found attributes is returned to the remote requester. The **McKesson Cardiology ECG Management** 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 |

| Description | Tag | Matching Key Type | Return Key Type |
|--|-----------|-------------------|-----------------|
| >>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 |
| Scheduled Procedure Step | | | |
| Requesting Physician | 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 |

| Description | Tag | Matching Key Type | Return Key Type |
|--|-----|-------------------|-----------------|
| All other Attributes from the Patient Medical Module | | 0 | 3 |

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

McKesson Cardiology ECG Management 13.2.1 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 ECG Management** database and the required data are stored on the **McKesson Cardiology ECG Management** database.

The **McKesson Cardiology ECG Management** 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 | |
| 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 | |

| Description | Tag | Return Key Type N-CREATE | Return Key Type N-SET | Requirement Type Final State |
|---|-----------|---|---|------------------------------------|
| >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 | |
| >>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 | |

| Description | Tag | Return Key Type N-CREATE | Return Key Type N-SET | Requirement Type Final State |
|--|-----------|---|-----------------------------|------------------------------------|
| >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 | |
| >>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 | |

| Description | Tag | Return Key Type N-CREATE | Return Key Type N-SET | Requirement Type Final State |
|--|-----------|---|-----------------------------|------------------------------------|
| >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 | |
| >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 | |

| Description | Tag | Return Key Type N-CREATE | Return Key Type N-SET | Requirement Type Final State |
|--|-----------|--------------------------------|-----------------------------|------------------------------------|
| >>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 ECG Management 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 ECG Management ImageManager inherits its TCP/IP stack from the computer system upon which it executes.

5. Extensions/Specializations/Privatization

McKesson Cardiology ECG Management 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 | Encapsulated document extension |
| (000D,1203) | Encapsulated Document Sequence | |
| (000D,1204) | Encapsulated Document | |
| (000D, 1205) | Encapsulated Document Length | |
| (000D,0013) | Private Attributes Identification Code | |
| (000D,1301) | Hostname | Internal use in Modality Worklist |
| (000D,1302) | Changing Information Sequence | |
| (000D,1303) | Calling AE Title | Internal use in Modality Worklist |

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 ECG Management 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 ECG Management** 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 MK4-HEMO (1-877-654-4366)

Customer portal: <https://mckesson.subscribenet.com/control/mckc/login>

7.1.2 Contact and Support for UK customers

UK McKesson Cardiology customers: +44(0) 208-952-7399

Irish McKesson Cardiology customers: 1-800-936-904

Online customer support: <http://migscrm.mckesson.com>

McKesson Technologies UK Limited

Block 3, The Exchange
Brent Cross Gardens
London, NW4 3RJ

7.1.3 Contact and support for international customers

Phone: +972-3-769-8000; toll-free: 1-866-654-9632

E-mail: CardioSupport@mckesson.com