TOSHIBA

No. MIIUS0051EA

DICOM CONFORMANCE STATEMENT

FOR

DIAGNOSTIC ULTRASOUND SYSTEM

Nemio MX™

MODEL SSA-590A V1.00

(DATA MANAGEMENT BOARD MODEL UIDM-590A)

TOSHIBA MEDICAL SYSTEMS CORPORATION

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1. CONFORMANCE STATEMENT OVERVIEW

Table 1-1 provides an overview of the network services supported by *Nemio* MX*TM*.

Table 1-1
Network Services

SOP Classes	User of service (SCU)	Provider of service (SCP)
Transfer		
Secondary Capture Image Storage	Yes	Yes
Ultrasound Image Storage	Yes	Yes
Ultrasound Multi-frame Image Storage	Yes	Yes
Enhanced SR Storage	Yes	Yes
Storage Commitment		
Storage Commitment Push Model	Yes	No
Query/Retrieve		
Study Root Q/R Information Model – Find	Yes	No
Study Root Q/R Information Model – Move	Yes	No
Workflow Management		
Modality Worklist Information Model – Find	Yes	No
Modality Performed Procedure Step	Yes	No
Print Management		
Basic Grayscale Print Management	Yes	No
Basic Color Print Management	Yes	No

Table 1-2 provides an overview of the Media Storage Application Profiles supported by *Nemio* MX*TM*.

Table 1-2
Media Services

Media Storage Application Profile	Write Files (FSC)	Read Files (FSR)
Compact Disk – Recordable		
US Image CD	Yes	Yes
DVD Plus Recordable		
US Image DVD	Yes	Yes
USB Media		
General Purpose USB Media	Yes	Yes

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3. INTRODUCTION

3.1 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

3.2 Remarks

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a first-level validation for interoperability between different applications supporting the same DICOM functionality.

This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.

The scope of this Conformance Statement is to facilitate communication with Toshiba Medical Systems and other vendors' Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [DICOM]. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:

- The comparison of different conformance statements is the first step towards assessing interconnectivity between Toshiba Medical Systems and non-Toshiba Medical Systems equipment.
- Test procedures should be defined to validate the desired level of connectivity.
- The DICOM standard will evolve to meet the users' future requirements. Toshiba Medical Systems is actively involved in developing the standard further and therefore reserves the right to make changes to its products or to discontinue its delivery.

3.3 Definitions, Terms and Abbreviations

Definitions, terms and abbreviations used in this document are defined within the different parts of the DICOM standard. Abbreviations and terms are as follows:

AE	Application Entity
CD-R	Compact Disk Recordable
DIMSE	DICOM Message Service Element
DVD	A trademark of the DVD forum that is not an abbreviation
DVD+R	DVD Plus Recordable
FSC	File-Set Creator
FSR	File-Set Reader
IE	Information Entity
IOD	Information Object Definition
ISO	International Standard Organization
MPPS	Modality Performed Procedure Step
MSPS	Modality Scheduled Procedure Step
MWM	Modality Worklist Management
PDU	Protocol Data Unit
SCU	Service Class User (DICOM client)
SCP	Service Class Provider (DICOM server)
SOP	Service-Object Pair
UID	Unique Identifier

3.4 References

[DICOM] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-3.18, 2009

4. Networking

4.1 Implementation Model

4.1.1 Application Data Flow

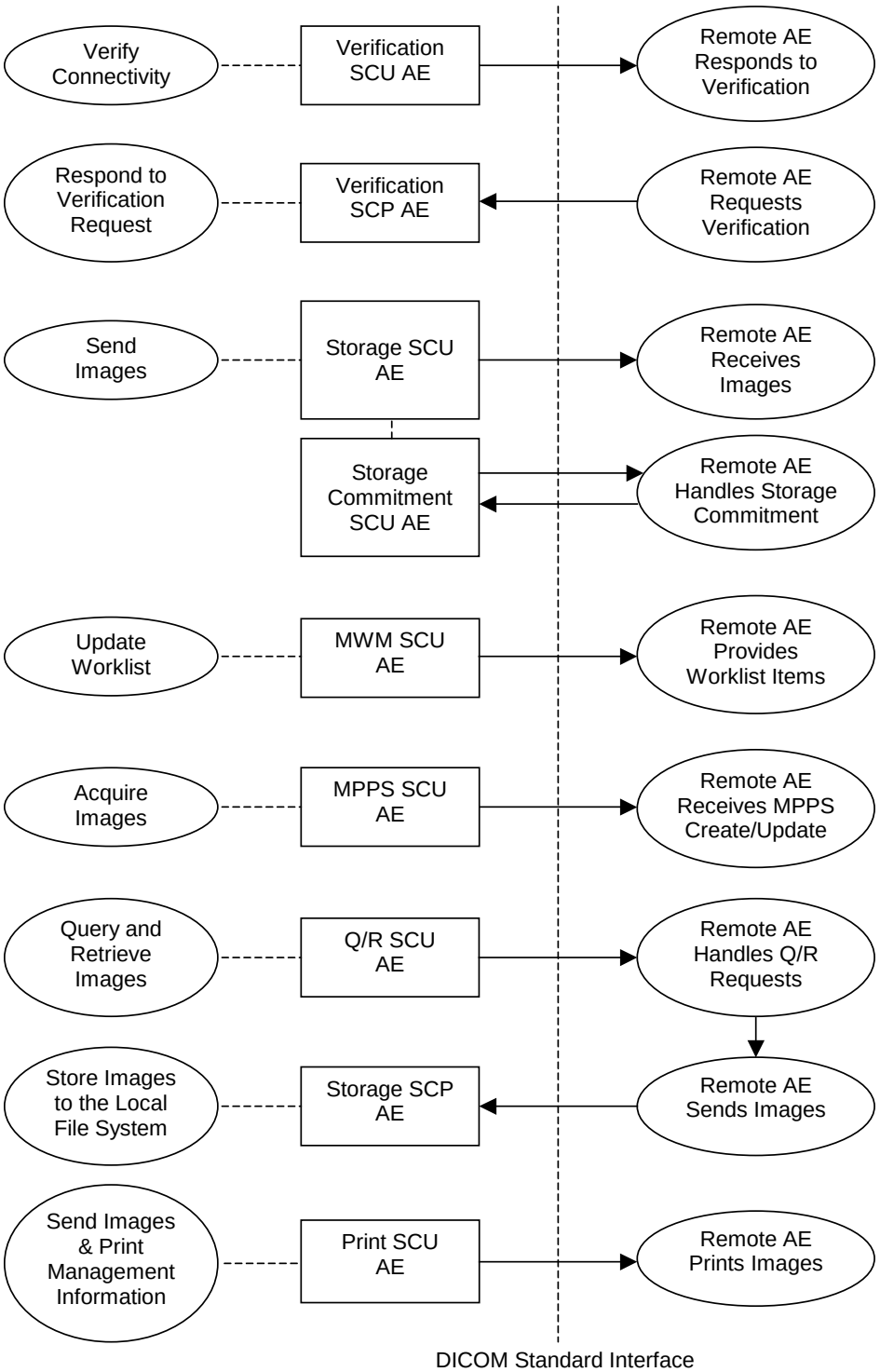

Figure 4.1-1
Application data flow diagram

- The Verification SCU AE issues a C-ECHO to verify a DICOM connection to a remote AE. It is associated with the local real-world activity “Verify Connectivity”. “Verify Connectivity” is performed via the Service Tool.
- The Verification SCP AE responds successfully to C-ECHO requests from a remote AE. It is associated with the local real-world activity “Respond to Verification Request”
- The Storage SCU AE sends images to a remote AE. It is associated with the local real-world activity “Send Images”. “Send Images” is performed upon user request for specific images selected.
  If the remote AE is configured as a Storage Commitment SCP AE, the Storage SCU AE will send a storage commitment request to the Storage Commitment SCU AE.
- Receiving the storage commitment request from the Storage SCU AE, the Storage Commitment SCU AE will request Storage Commitment and if a commitment is successfully obtained will record this information in the local database.
- The MWM SCU AE receives worklist information from a remote AE. It is associated with the local real-world activity “Update Worklist”. When the “Update Worklist” is performed the MWM SCU AE queries a remote AE for worklist items and provides the set of worklist items matching the query request. ”Update Worklist” is performed as a result of an operator request.
- The MPPS SCU AE sends MPPS information to a remote AE. It is associated with the local real-world activity “Acquire Images”. When the “Acquire Images” is performed the MPPS SCU AE creates and updates Modality Performed Procedure Step instances managed by a remote AE. Acquisition of images will result in automated creation of an MPPS Instance. Completion of the MPPS is performed as the result of an operator action.
- The Q/R SCU AE queries a remote AE for lists of studies and retrieves selected studies. It is associated with the local real-world activity “Query and Retrieve Images”.
- The Storage SCP AE receives incoming images. It is associated with the local real-world activity “Store Images to the Local File System”. “Store Images to the Local File System” stores the received images to the local file system.
- The Print SCU AE prints images on a remote AE (Printer). It is associated with the local real-world activity “Send Images & Print Management Information”. “Send Images & Print Management Information” creates a print-job within the print queue containing one or more virtual film sheets composed from images selected by the user.

4.1.2 Functional definition of AEs

4.1.2.1 Functional definition of verification SCU AE

The Verification SCU AE issues a C-ECHO to verify a DICOM connection to a remote AE. It is performed via the Service tool.

4.1.2.2 Functional definition of verification SCP AE

The Verification SCP AE responds successfully to C-ECHO requests from a remote AE.

4.1.2.3 Functional definition of storage SCU AE

The existence of a send-job queue entry with associated network destination will activate the Storage SCU AE. An association request is sent to the destination AE and upon successful negotiation of a Presentation Context the image transfer is started. If the image transfer fails, the Storage SCU AE will retry this send-job automatically. If the remote AE is configured as a Storage Commitment SCP AE, the Storage SCU AE will send a storage commitment request to the Storage Commitment SCU AE.

4.1.2.4 Functional definition of storage commitment SCU AE

Receiving the storage commitment request from the Storage SCU AE, the Storage Commitment SCU AE will request Storage Commitment and if a commitment is successfully obtained will record this information in the local database.

4.1.2.5 Functional definition of MWM SCU AE

The MWM SCU AE attempts to download a worklist from a remote node. If the MWM SCU AE establishes an association to a remote AE, it will transfer patient's information and worklist items via the open association. The results will be displayed in a separate list. The patient's information will be used for the patient registration.

4.1.2.6 Functional definition of MPPS SCU AE

The MPPS SCU AE performs the creation of an MPPS Instance automatically when the user selects and starts a worklist item. Further updates on the MPPS data can be performed automatically.

4.1.2.7 Functional definition of Q/R SCU AE

The Q/R SCU AE is activated when the user selects a remote node to query and enters some key information, Patient's Name, Patient ID and/or Accession Number. The user can select studies to be retrieved. The images will be received at the Storage SCP AE.

4.1.2.8 Functional definition of storage SCP AE

The Storage SCP AE waits for another application to connect at the presentation address configured for its AE Title. The Storage SCP AE will accept associations with Presentation Contexts for SOP Classes of the Verification and Storage Service Classes. Any images received on such Presentation Contexts will be stored to the local file system.

4.1.2.9 Functional definition of Print SCU AE

The existence of a print-job in the print queue will activate the Print SCU AE. An association is established with the printer and the printer's status determined. If the printer is operating normally, the film sheets described within the print-job will be printed. If the printer is not operating normally, this print-job can be canceled or restarted by the user operations.

4.1.3 Sequencing of real-world activities

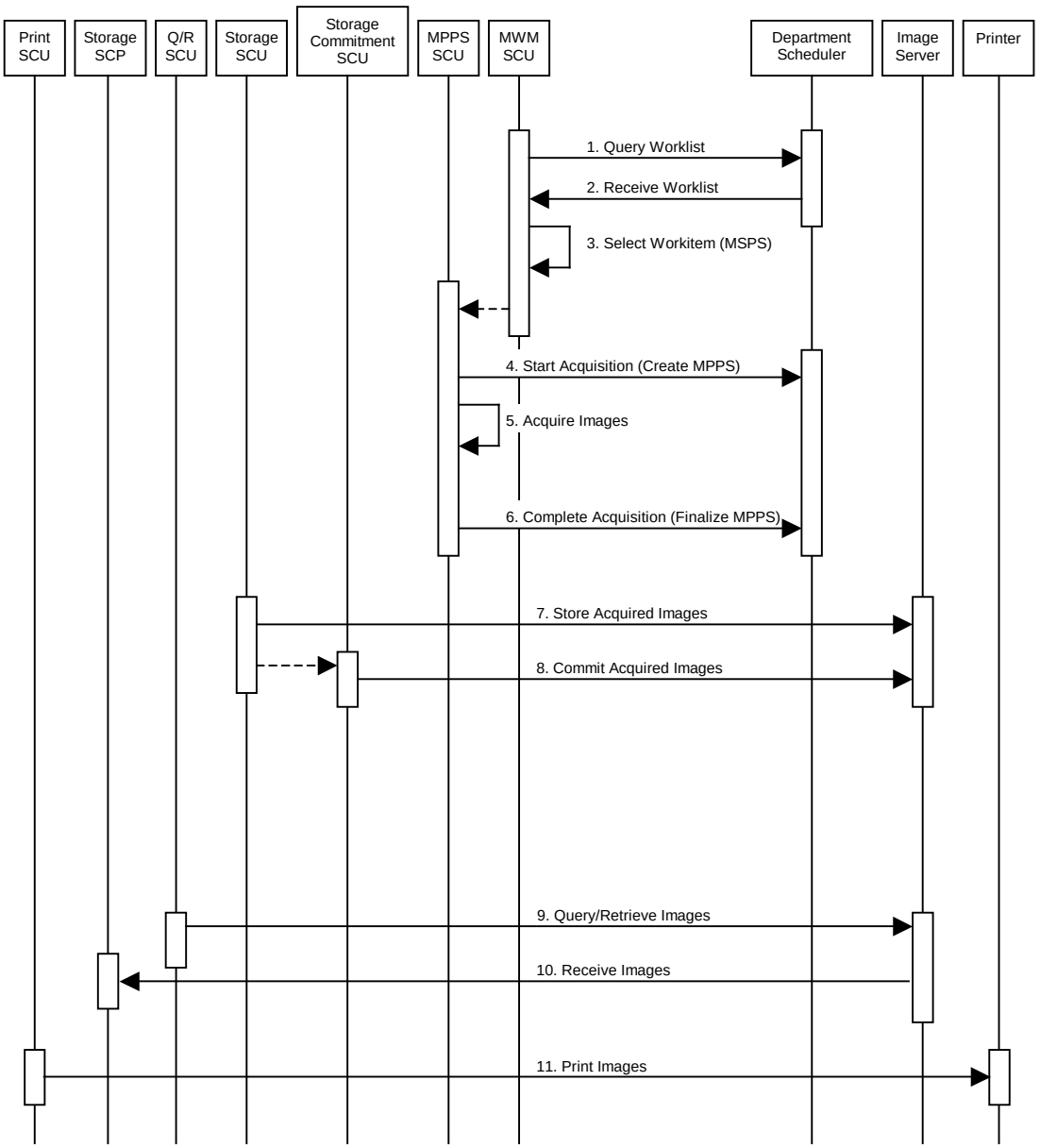

Figure 4.1-2
Sequencing Constraints

Under typical scheduled workflow conditions the sequencing constraints illustrated in Figure 4.1-2 apply:

1. Query Worklist
2. Receive Worklist of Modality Scheduled Procedure Steps (MSPS)
3. Select Workitem (MSPS) from Worklist
4. Start Acquisition and Create MPPS
5. Acquire Images
6. Complete Acquisition and Finalize MPPS
7. Store Acquired Images
8. Commit Acquired Images
9. Query/Retrieve Images
10. Receive Images
11. Print Images

Other workflow situations (e.g. unscheduled procedure steps) will have other sequencing constraints. Some activities may be omitted according to situations.

4.2 AE Specifications

4.2.1 Verification SCU AE specification

4.2.1.1 SOP Classes

The Verification SCU AE provides standard conformance to the following SOP Classes:

Table 4.2-1
SOP Classes for the verification SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	No

4.2.1.2 Association Policies

4.2.1.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-2
DICOM Application context for the verification SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2 Number of associations

The Verification SCU AE initiates one association at a time.

Table 4.2-3
Number of associations initiated for the verification SCU AE

Maximum number of simultaneous associations	1

4.2.1.2.3 Asynchronous nature

The Verification SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Table 4.2-4
Asynchronous nature for the verification SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.1.2.4 Implementation identifying information

The implementation information for the Verification SCU AE is:

Table 4.2-5
DICOM implementation class and version for the verification SCU AE

Implementation Class UID	1.2.392.200036.9116.6.19
Implementation Version Name	TM_NEMIOMX_1.0

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – Verify Connectivity

4.2.1.3.1.1 Description and Sequencing of Activities

The Verification SCU AE attempts to initiate a new association in order to issue a verification request (C-ECHO) if needed.

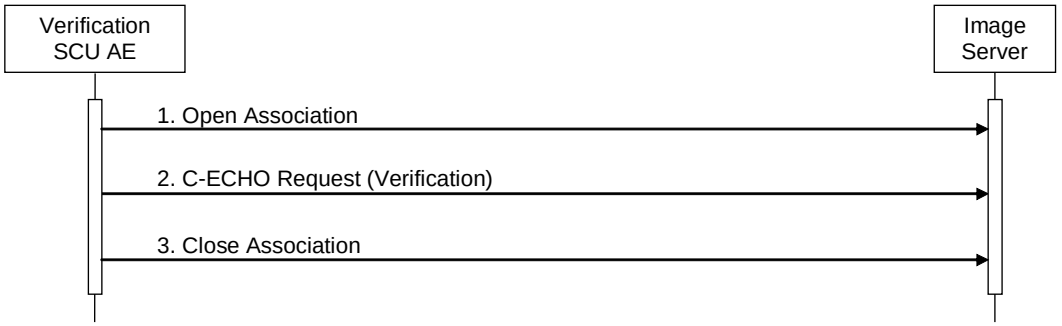

Figure 4.2-1
Sequencing of activity – verify connectivity

A possible sequence of interactions between the Verification SCU AE and an Image Server (e.g. a storage or archive device supporting the Verification SOP Classes as an SCP) is illustrated in the Figure above:

1. The Verification SCU AE opens an association with the Image Server.

2. The Verification SCU AE issues a verification request (C-ECHO) and the Image Server replies with a C-ECHO response (status success).

3. The Verification SCU AE closes the association with the Image Server.

4.2.1.3.1.2 Proposed Presentation Contexts

The Verification SCU AE will propose the Presentation Contexts shown in the following table:

Table 4.2-6
Proposed Presentation Contexts for activity verify connectivity

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.1.3.1.3 SOP specific conformance for verification SOP class

The Verification SCU AE provides standard conformance to the Verification Service Class as an SCU.

The behavior of Verification SCU AE when encountering status codes in a C-ECHO response is summarized in the table below:

Table 4.2-7
Verification response status handling behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The Verification SCU AE judges the remote AE is present and active on the network.

The behavior of Verification SCU AE during communication failure is summarized in the table below:

Table 4.2-8
Verification communication failure behavior

Exception	Behavior
Timeout	The association is aborted and the send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.
Association aborted by the SCP or network layers	The send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.

4.2.2 Verification SCP AE specification

4.2.2.1 SOP Classes

The Verification SCP AE provides Standard Conformance to the following SOP Classes:

Table 4.2-9
SOP Classes for the verification SCP AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	No	Yes

4.2.2.2 Association policies

4.2.2.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-10
DICOM application context for the verification SCP AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.2.2.2 Number of associations

The Verification SCP AE supports one association at a time.

Table 4.2-11
Number of associations accepted for the verification SCP AE

Maximum number of simultaneous associations	1

4.2.2.2.3 Asynchronous Nature

The Verification SCP AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Table 4.2-12
Asynchronous nature for the verification SCP AE

Maximum number of outstanding asynchronous transactions	1

4.2.2.2.4 Implementation Identifying Information

The implementation information for the Verification SCP AE is:

Table 4.2-13
DICOM implementation class and version for the verification SCP AE

Implementation Class UID	1.2.392.200036.9116.6.19
Implementation Version Name	TM_NEMIOMX_1.0

4.2.2.3 Association Initiation Policy

The Verification SCP AE does not initiate associations.

4.2.2.4 Association acceptance policy

4.2.2.4.1 Activity – respond to verification request

4.2.2.4.2 Description and sequencing of activities

When the Verification SCP AE accepts an association, it will respond to a verification request (C-ECHO).

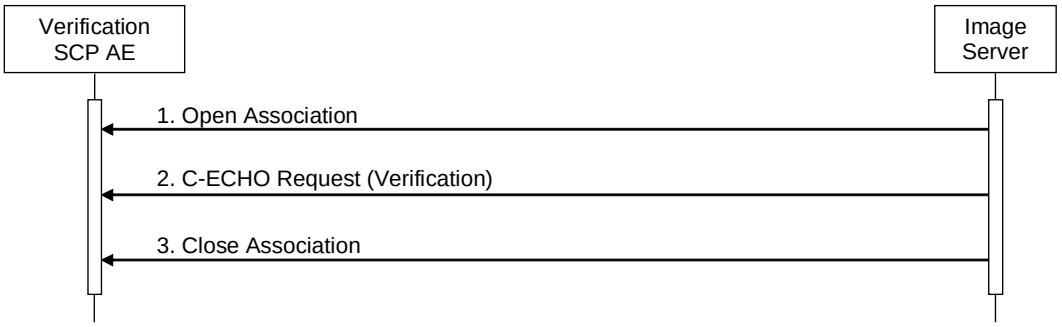

Figure 4.2-2
Sequencing of activity – respond to verification request

A possible sequence of interactions between the Verification SCP AE and an Image Server (e.g. a storage or archive device supporting the Verification SOP Classes as an SCU) is illustrated in the figure above:

1. The Image Server opens an association with the Verification SCP AE.
2. The Image Server issues a verification request (C-ECHO) and the Verification SCP AE replies with a C-ECHO response (status success).
3. The Image Server closes the association with the Verification SCP AE.

The Verification SCP AE does not care about a called/calling AE title contained in association requests.

4.2.2.4.2.1 Accepted Presentation Contexts

The Verification SCP AE will accept Presentation Contexts shown in the table below.

Table 4.2-14
Proposed Presentation Contexts for activity respond to verification request

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

4.2.2.4.2.2 SOP specific conformance for Verification SOP Class

The Verification SCP AE provides standard conformance to the Verification Service Class as an SCP.

4.2.3 Storage SCU AE Specification

4.2.3.1 SOP Classes

The Storage SCU AE provides Standard Conformance to the following SOP Classes:

Table 4.2-15
SOP Classes for the Storage SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6		
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1		
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3		
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1		
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22		

4.2.3.2 Association policies

4.2.3.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-16
DICOM Application context for the Storage SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.3.2.2 Number of associations

The Storage SCU AE initiates one association at a time. Until the active job is completed or failed, the other remains pending.

Table 4.2-17
Number of associations initiated for the Storage SCU AE

Maximum number of simultaneous associations	1

4.2.3.2.3 Asynchronous nature

The Storage SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Table 4.2-18
Asynchronous nature for the Storage SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.3.2.4 Implementation identifying information

The implementation information for the Storage SCU AE is:

Table 4.2-19
DICOM implementation class and version for the Storage SCU AE

Implementation Class UID	1.2.392.200036.9116.6.19
Implementation Version Name	TM_NEMIOMX_1.0

4.2.3.3 Association initiation policy

4.2.3.3.1 Activity – send images

4.2.3.3.1.1 Description and sequencing of activities

The Storage SCU AE attempts to initiate a new association in order to issue a storage request (C-STORE). If the job contains multiple images then multiple C-STORE requests will be issued over the same association. If the image transfer fails, the Storage SCU AE will retry this send-job automatically.

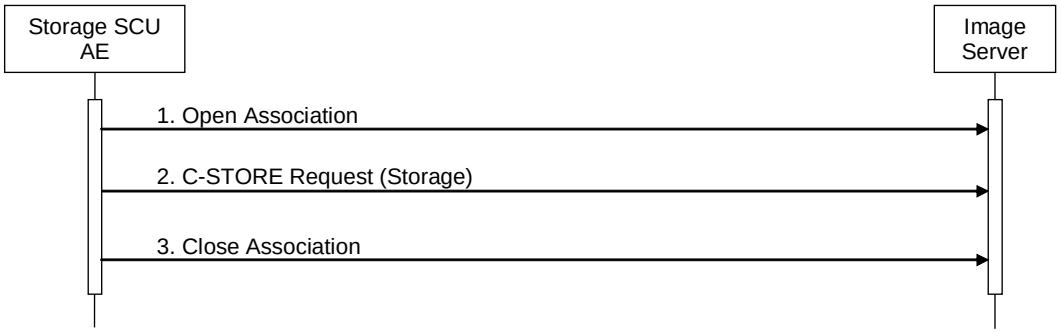

Figure 4.2-3
Sequencing of activity – send images

A possible sequence of interactions between the Storage SCU AE and an Image Server (e.g. a storage or archive device supporting the Storage SOP Classes as an SCP) is illustrated in the Figure above:

1. The Storage SCU AE opens an association with the Image Server.
2. Acquired images are transmitted to the Image Server using a storage request (C-STORE) and the Image Server replies with a C-STORE response (status success).
3. The Storage SCU AE closes the association with the Image Server.

4.2.3.3.1.2 Proposed Presentation Contexts

The Storage SCU AE will propose the Presentation Contexts shown in the following table:

Table 4.2-20
Proposed Presentation Contexts for activity send images

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		RLE Lossless	1.2.840.10008.1.2.5		
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		RLE Lossless	1.2.840.10008.1.2.5		
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		RLE Lossless	1.2.840.10008.1.2.5		
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		RLE Lossless	1.2.840.10008.1.2.5		
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		RLE Lossless	1.2.840.10008.1.2.5		
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.3.3.1.3 SOP Specific Conformance for Storage SOP Classes

The Storage SCU AE provides standard conformance to the Storage Service Class as an SCU.

The behavior of Storage SCU AE when encountering status codes in a C-STORE response is summarized in the table below:

Table 4.2-21
Storage C-STORE response status handling behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has successfully stored the SOP Instance. If all SOP Instances in a send job have status success then the job is marked as complete.
*	*	Any other status code	The association is aborted and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application.

The behavior of Storage SCU AE during communication failure is summarized in the table below:

Table 4.2-22
Storage communication failure behavior

Exception	Behavior
Timeout	The association is aborted and the send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.
Association aborted by the SCP or network layers	The send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.

If the image transfer fails, the Storage SCU AE will retry this send-job automatically.

The contents of Image Storage SOP Instances created by the Storage SCU AE conform to the DICOM Image IOD definitions and are described in section 8.1.

4.2.4 Storage Commitment SCU AE specification

4.2.4.1 SOP Classes

The Storage Commitment SCU AE provides Standard Conformance to the following SOP Classes:

Table 4.2-23
SOP Classes for the Storage Commitment SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No

4.2.4.2 Association policies

4.2.4.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-24
DICOM Application Context for the Storage commitment SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.4.2.2 Number of associations

The Storage Commitment SCU AE initiates one association at a time.

Table 4.2-25
Number of associations initiated for the Storage Commitment SCU AE

Maximum number of simultaneous associations	1

The Storage Commitment SCU AE accepts one association at a time to receive an N-EVENT-REPORT notification for the Storage Commitment Push Model SOP Class.

Table 4.2-26
Number of associations accepted for the Storage Commitment SCU AE

Maximum number of simultaneous associations	1

4.2.4.2.3 Asynchronous nature

The Storage Commitment SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Table 4.2-27
Asynchronous nature for the Storage Commitment SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.4.2.4 Implementation identifying information

The implementation information for the Storage Commitment SCU AE is:

Table 4.2-28
DICOM implementation class and version for the Storage Commitment SCU AE

Implementation Class UID	1.2.392.200036.9116.6.19
Implementation Version Name	TM_NEMIOMX_1.0

4.2.4.3 Association initiation policy

4.2.4.3.1 Activity – commit sent images

4.2.4.3.1.1 Description and sequencing of activities

If the remote AE is configured as a Storage Commitment SCP AE, the Storage Commitment SCU AE will, after all images have been sent, transmit a single storage commitment request (N-ACTION). Upon receiving the N-ACTION response the Storage Commitment SCU AE will release the association. The notification of storage commitment (N-EVENT-REPORT) will be received over a separate association.

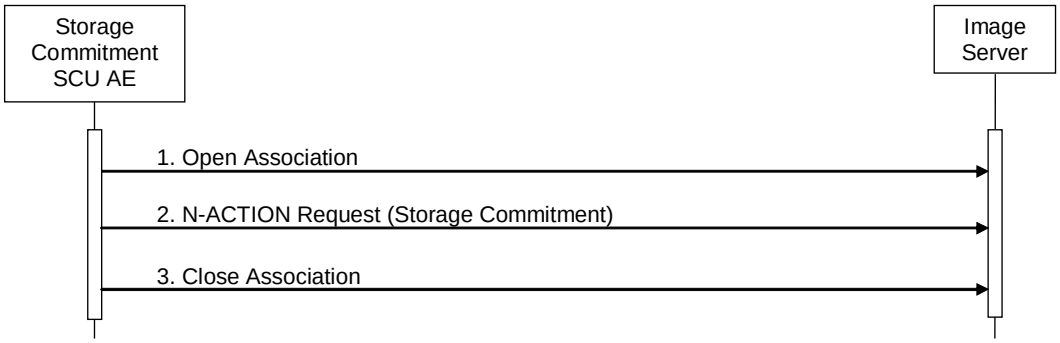

Figure 4.2-4
Sequencing of activity – commit sent images

A possible sequence of interactions between the Storage Commitment SCU AE and an Image Server (e.g. a storage or archive device supporting the Storage Commitment SOP Classes as an SCP) is illustrated in the figure above:

1. The Storage Commitment SCU AE opens an association with the Image Server.
2. A storage commitment request (N-ACTION) is transmitted to the Image Server to obtain storage commitment of previously transmitted images. The Image Server replies with an N-ACTION response indicating the request has been received and is being processed.
3. The Storage Commitment SCU AE closes the association with the Image Server.

   Note: The N-EVENT-REPORT will be sent over a separate association initiated by the Image Server. (See Section 4.2.4.4.1)

4.2.4.3.1.2 Proposed Presentation Contexts

The Storage Commitment SCU AE will propose the Presentation Contexts shown in the following table:

Table 4.2-29
Proposed Presentation Contexts for activity commit sent images

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

A Presentation Context for the Storage Commitment Push Model will only be proposed if the remote AE is configured as a Storage Commitment SCP AE.

4.2.4.3.1.3 SOP specific conformance for Storage Commitment SOP Class

4.2.4.3.1.3.1 Storage Commitment operations (N-ACTION)

The Storage Commitment SCU AE provides standard conformance to the Storage Commitment Service Class as an SCU.

The Storage Commitment SCU AE will request storage commitment for instances of the Storage SOP Classes if the remote AE is configured as a Storage Commitment SCP AE and a presentation context for the Storage Commitment Push Model has been accepted.

The behavior of Storage SCU Commitment AE when encountering status codes in an N-ACTION response is summarized in the table below:

Table 4.2-30
Storage Commitment N-ACTION response status handling behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The request for storage commitment is considered successfully sent. A timer is started which will expire if no N-EVENT-REPORT for the Transaction UID is received within a configurable timeout period.
*	*	Any other status code	The association is aborted and the request for storage commitment is marked as failed.

The behavior of Storage Commitment AE during communication failure is summarized in the table below:

Table 4.2-31
Storage Commitment communication failure behavior

Exception	Behavior
Timeout	The association is aborted and the send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.
Association aborted by the SCP or network layers	The send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.

4.2.4.4 Association acceptance policy

4.2.4.4.1 Activity – receive storage commitment response

4.2.4.4.1.1 Description and sequencing of activities

The Storage Commitment SCU AE will accept associations in order to receive responses to a storage commitment request.

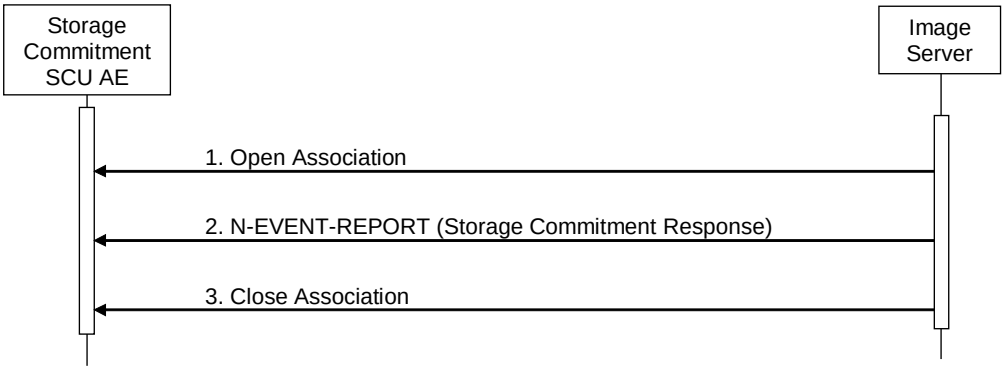

Figure 4.2-5
Sequencing of activity - receive storage commitment response

A possible sequence of interactions between the Storage Commitment SCU AE and an Image Server (e.g. a storage or archive device supporting Storage Commitment SOP Classes as an SCP) is illustrated in the figure above:

1. The Image Server opens an association with the Storage Commitment SCU AE.
2. The Image Server sends an N-EVENT-REPORT request notifying the Storage SCU AE of the status of a previous storage commitment request. The Storage SCU AE replies with an N-EVENT-REPORT response confirming receipt.
3. The Image Server closes the association with the Storage Commitment SCU AE.

The Storage Commitment SCU AE does not care about a called/calling AE title contained in association requests.

4.2.4.4.1.2 Accepted Presentation Contexts

The Storage Commitment SCU AE will accept Presentation Contexts shown in the table below.

Table 4.2-32
Acceptable Presentation Contexts for activity receive storage commitment response

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.4.4.1.3 SOP specific conformance for Storage Commitment SOP Class

4.2.4.4.1.3.1 Storage Commitment notifications (N-EVENT-REPORT)

The Storage Commitment SCU AE provides standard conformance to the Storage Commitment Service Class as an SCU.

The behavior of Storage Commitment SCU AE when receiving Event Types within the N-EVENT-REPORT is summarized in the table below.

Table 4.2-33
Storage Commitment N-EVENT- REPORT behaviour

Event Type Name	Event Type ID	Behavior
Storage Commitment Request Successful	1	The Storage Commitment SCU AE permits the operator(s) to delete the Referenced SOP Instances under Referenced SOP Sequence (0018, 1199), or deletes the Instances from the local database automatically.
Storage Commitment Request Complete – Failures Exist	2	The Storage Commitment SCU AE requests the Storage SCU AE to send the Referenced SOP Instances under Failed SOP Sequence (0018, 1198).

The reasons for returning specific status codes in an N-EVENT-REPORT response are summarized in the table below.

Table 4.2-34
Storage Commitment N-EVENT-REPORT response status reasons

Service Status	Further Meaning	Status Code	Reasons
Success	Success	0000	The storage commitment result has been successfully received.
Failure	Processing Failure	0110H	An internal error occurred during processing of the N-EVENT-REPORT. A short description of the error will be returned in Error Comment (0000,0902).

4.2.5 MWM SCU AE Specification

4.2.5.1 SOP Classes

The MWM SCU AE provides Standard Conformance to the following SOP Classes:

Table 4.2-35
SOP Classes for the MWM SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Yes	No

4.2.5.2 Association policies

4.2.5.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-36
DICOM Application Context for the MWM SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.5.2.2 Number of associations

The MWM SCU AE initiates one association at a time for a worklist request.

Table 4.2-37
Number of associations initiated for the MWM SCU AE

Maximum number of simultaneous associations	1

4.2.5.2.3 Asynchronous nature

The MWM SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Table 4.2-38
Asynchronous nature for the MWM SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.5.2.4 Implementation identifying information

The implementation information for this Application Entity is:

Table 4.2-39
DICOM implementation class and version for the MWM SCU ae

Implementation Class UID	1.2.392.200036.9116.6.19
Implementation Version Name	TM_NEMIOMX_1.0

4.2.5.3 Association initiation policy

4.2.5.3.1 Activity – update worklist

4.2.5.3.1.1 Description and sequencing of activities

The request for an “Update Worklist” is initiated by user interaction, i.e. pressing the buttons “Retrieve Worklist”.

Upon initiation of the request, the MWM SCU AE will build an Identifier for the C-FIND request, will initiate an association to send the request and will wait for worklist responses. After retrieval of all responses, the MWM SCU AE will access the local database to add or update patient demographic data. The results will be displayed in a separate list.

The MWM SCU AE will initiate an association in order to issue a C-FIND request according to the Modality Worklist Information Model.

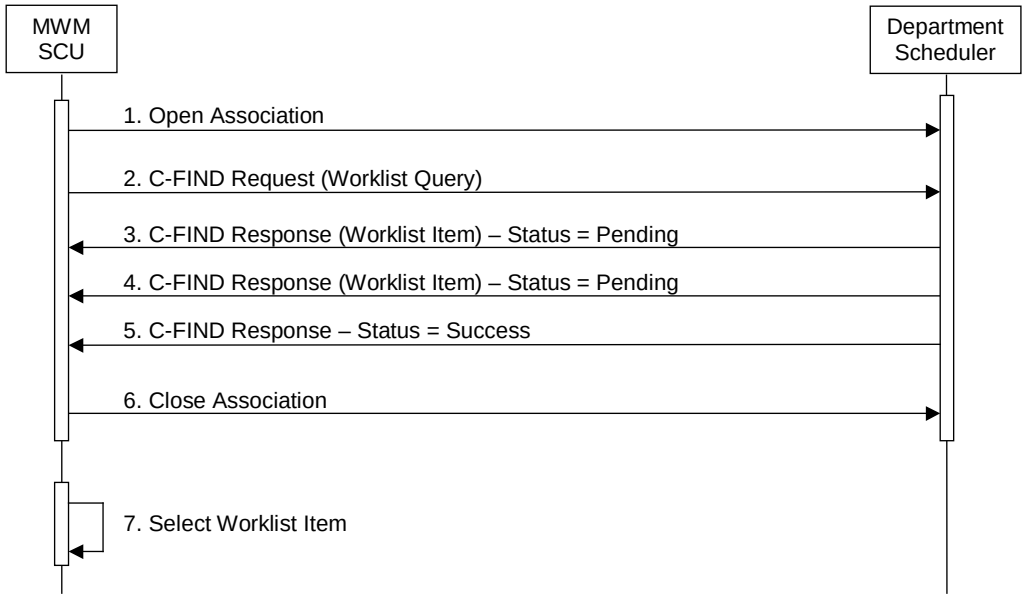

Figure 4.2-6
Sequencing of activity – update worklist

A possible sequence of interactions between the MWM SCU AE and a Department Scheduler (e.g. a device such as a RIS or HIS which supports the modality worklist SOP Class as an SCP) is illustrated in the figure above:

1. The MWM SCU AE opens an association with the Department Scheduler
2. The MWM SCU AE sends a C-FIND request to the Department Scheduler containing the Worklist Query attributes.
3. The Department Scheduler returns a C-FIND response containing the requested attributes of the first matching worklist item.
4. The Department Scheduler returns another C-FIND response containing the requested attributes of the second matching worklist item.
5. The Department Scheduler returns another C-FIND response with status Success indicating that no further matching worklist items exist. This example assumes that only 2 worklist items match the Worklist Query.

6. The MWM SCU AE closes the association with the Department Scheduler.
7. The user selects a worklist item from the Worklist and prepares to acquire new images.

4.2.5.3.1.2 Proposed Presentation Contexts

The MWM SCU AE will propose Presentation Contexts shown in the following table:

Table 4.2-40
Proposed Presentation Contexts for activity update worklist

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.5.3.1.3 SOP Specific Conformance for Modality Worklist SOP Class

The MWM SCU AE provides standard conformance to the Modality Worklist SOP Class as an SCU.

The behavior of the MWM SCU, when encountering status codes in a Modality Worklist C-FIND response is summarized in the table below.

Table 4.2-41
Modality worklist C-FIND response status handling behaviour

Service Status	Further Meaning	Status Code	Behavior
Success	Matching is complete	0000	The SCP has completed the matches. Worklist items are available for display or further processing.
*	*	Any other status code	The association is aborted using A-ABORT and the status meaning is logged.

The behavior of the MWM SCU AE during communication failure is summarized in the table below.

Table 4.2-42
Modality worklist communication failure behavior

Exception	Behavior
Timeout	The association is aborted using A-ABORT and the reason is logged.
Association aborted by the SCP or network layers	The reason is logged.

Acquired images will always use the Study Instance UID specified for the Scheduled Procedure Step (if available). If an acquisition is unscheduled, a Study Instance UID will be generated locally.

The table below provides a description of the MWM SCU AE Worklist Request Identifier and specifies the attributes that are copied into the images. Unexpected attributes returned in a C-FIND response are ignored.

Table 4.2-43
Worklist request identifier

Module Name Attribute Name	Tag	VR	M	R	D	IOD
SOP Common Module						
Specific Character Set	(0008,0005)	CS				
Scheduled Procedure Step Module						
Scheduled Procedure Step Sequence	(0040,0100)	SQ		x		
>Modality	(0008,0060)	CS	S	x		x
>Requested Contrast Agent	(0032,1070)	LO				
>Scheduled Station AE Title	(0040,0001)	AE	S	x		
>Scheduled Procedure Step Start Date	(0040,0002)	DA	R	x	x	
>Scheduled Procedure Step Start Time	(0040,0003)	TM		x	x	
>Scheduled Procedure Step End Date	(0040,0004)	DA				
>Scheduled Procedure Step End Time	(0040,0005)	TM				
>Scheduled Performing Physician's Name	(0040,0006)	PN		x		
>Scheduled Procedure Step Description	(0040,0007)	SH		x		x
>Scheduled Protocol Code Sequence	(0040,0008)	SQ		x		x
>Scheduled Procedure Step ID	(0040,0009)	SH		x		x
>Scheduled Station Name	(0040,0010)	LO		x		
>Scheduled Procedure Step Location	(0040,0011)	SH		x		
>Pre-Medication	(0040,0012)	CS		x		
>Scheduled Procedure Step Status	(0040,0020)	LO				
>Comments on Scheduled Procedure Step	(0040,0400)	LT		x		
Requested Procedure Module						
Referenced Study Sequence	(0008,1110)	SQ		x		x
Study Instance UID	(0020,000D)	UI		x		x
Requested Procedure Description	(0032,1060)	LO		x	x	x
Requested Procedure Code Sequence	(0032,1064)	SQ		x		x
Requested Procedure ID	(0040,1001)	SH	S	x	x	x
Reason for the Requested Procedure	(0040,1002)	LO				
Requested Procedure Priority	(0040,1003)	SH				
Patient Transport Arrangements	(0040,1004)	LO				
Requested Procedure Location	(0040,1005)	LO				
Placer Order Number / Procedure	(0040,1006)	SH				
Filler Order Number / Procedure	(0040,1007)	SH				
Confidentiality Code	(0040,1008)	LO				
Reporting Priority	(0040,1009)	SH				
Names of Intended Recipients of Results	(0040,1010)	PN				
Requested Procedure Comments	(0040,1400)	LT				
Imaging Service Request Module						
Accession Number	(0008,0050)	SH	S	x	x	x
Referring Physician's Name	(0008,0090)	PN		x	x	x
Requesting Physician	(0032,1032)	PN				
Requesting Service	(0032,1033)	LO				
Reason for the Imaging Service Request	(0040,2001)	LO				
Issue Date of Imaging Service Request	(0040,2004)	DA				
Issue Time of Imaging Service Request	(0040,2005)	TM				
Placer Order Number / Imaging Service Request	(0040,2006)	SH				
Filler Order Number / Imaging Service Request	(0040,2007)	SH				
Order Entered By	(0040,2008)	PN				
Order Enters Location	(0040,2009)	SH				
Order Callback Phone Number	(0040,2010)	SH				
Imaging Service Request Comments	(0040,2400)	LT				
Visit Relationship Module						
Referenced Patient Sequence	(0008,1120)	SQ				
Visit Identification Module						
Institution Name	(0008,0080)	LO				
Institution Address	(0008,0081)	ST				
Institution Code Sequence	(0008,0082)	SQ				
Admission ID	(0038,0010)	LO		x		x
Issuer of Admission ID	(0038,0011)	LO				

Module Name Attribute Name	Tag	VR	M	R	D	IOD
Visit Status Module						
Visit Status ID	(0038,0008)	CS				
Current Patient Location	(0038,0300)	LO		x		x
Patient's Institution Residence	(0038,0400)	LO				
Visit Comments	(0038,4000)	LT				
Visit Admission Module						
Referring Physician's Address	(0008,0092)	ST				
Referring Physician's Telephone Number	(0008,0094)	SH				
Admitting Diagnosis Description	(0008,1080)	LO				
Admitting Diagnosis Code Sequence	(0008,1084)	SQ				
Route of Admissions	(0038,0016)	LO				
Admitting Date	(0038,0020)	DA				
Admitting Time	(0038,0021)	TM				
Patient Relationship Module						
Referenced Visit Sequence	(0008,1125)	SQ				
Referenced Patient Alias Sequence	(0038,0004)	SQ				
Patient Identification Module						
Patient's Name	(0010,0010)	PN	W	x	x	x
Patient ID	(0010,0020)	LO	S	x	x	x
Issuer of Patient ID	(0010,0021)	LO				
Other Patient IDs	(0010,1000)	LO				
Other Patient Names	(0010,1001)	PN				
Patient's Birth Name	(0010,1005)	PN				
Patient's Mother's Birth Name	(0010,1060)	PN				
Medical Record Locator	(0010,1090)	LO				
Patient Demographic Module						
Patient's Birth Date	(0010,0030)	DA		x	x	x
Patient's Birth Time	(0010,0032)	TM				
Patient's Sex	(0010,0040)	CS		x	x	x
Patient's Insurance Plan Code Sequence	(0010,0050)	SQ				
Patient's Age	(0010,1010)	AS				
Patient's Size	(0010,1020)	DS				
Patient's Weight	(0010,1030)	DS				
Patient's Address	(0010,1040)	LO				
Military Rank	(0010,1080)	LO				
Brach of Service	(0010,1081)	LO				
Country Residence	(0010,2150)	LO				
Region of Residence	(0010,2152)	LO				
Patient's Telephone Number	(0010,2154)	SH				
Ethnic Group	(0010,2160)	SH				
Occupation	(0010,2180)	SH				
Patient's Religious Reference	(0010,21F0)	LO				
Patient Comments	(0010,4000)	LT				
Patient Data Confidentiality Constraint Description	(0040,3001)	LO				
Patient Medical Module						
Medical Alerts	(0010,2000)	LO				
Contrast Allergies	(0010,2110)	LO				
Smoking Status	(0010,21A0)	CS				
Additional Patient History	(0010,21B0)	LT				
Pregnancy Status	(0010,21C0)	US				
Last Menstrual Date	(0010,21D0)	DA				
Special Needs	(0038,0050)	LO				
Patient State	(0038,0500)	LO				

The above table should be read as follows:

Module Name: The name of the associated module for supported worklist attributes.

Attribute Name : Attributes supported to build the MWM SCU AE Worklist Request Identifier.

Tag : DICOM tag for this attribute.

VR : DICOM VR for this attribute.

M : Matching keys for (automatic) Worklist Update.
S: Single Value Matching
R: Range Matching
W: Wild Card Matching

R : Return keys. An "x" will indicate that the MWM SCU AE will supply this attribute as Return Key with zero length for Universal Matching.

D : Displayed keys. An “x” indicates that this worklist attribute is displayed to the user during a patient registration. For example, Patient Name will be displayed when registering the patient prior to an examination.

IOD : An "x" indicates that this worklist attribute is included into all Object Instances created during performance of the related Procedure Step.

4.2.5.4 Association acceptance policy

The MWM SCU AE does not accept associations.

4.2.6 MPPS SCU AE specification

4.2.6.1 SOP Classes

The MPPS SCU AE provides Standard Conformance to the following SOP Classes:

Table 4.2-44
SOP Classes for the MPPS SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Yes	No

4.2.6.2 Association policies

4.2.6.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-45
DICOM Application Context for the MPPS SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.6.2.2 Number of associations

The MPPS SCU AE initiates one association at a time.

Table 4.2-46
Number of Associations initiated for the MPPS SCU AE

Maximum number of simultaneous associations	1

4.2.6.2.3 Asynchronous nature

The MPPS SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Table 4.2-47
Asynchronous nature for the MPPS SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.6.2.4 Implementation identifying information

The implementation information for this Application Entity is:

Table 4.2-48
DICOM implementation class and version for the MPPS SCU AE

Implementation Class UID	1.2.392.200036.9116.6.19
Implementation Version Name	TM_NEMIOMX_1.0

4.2.6.3 Association initiation policy

4.2.6.3.1 Activity – acquire images

4.2.6.3.1.1 Description and sequencing of activities

The MPPS SCU AE performs the creation of an MPPS instance automatically when the user selects and starts a worklist item. Further updates on the MPPS data can be performed when the user completes the acuisition.

The MPPS SCU AE will initiate an association to issue an:

- N-CREATE request according to the CREATE Modality Performed Procedure Step SOP Instance operation, or an:
- N-SET request to update the contents and state of the MPPS according to the SET Modality Performed Procedure Step Information operation.

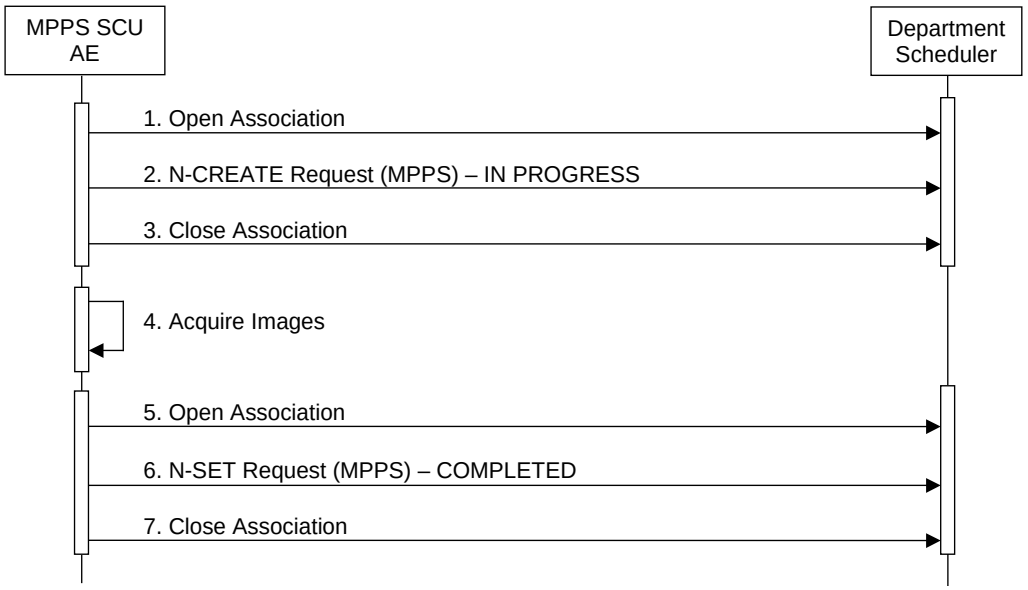

Figure 4.2-7
Sequencing of activity – acquire images

A possible sequence of interactions between the MPPS SCU AE and a Department Scheduler (e.g. a device such as a RIS or HIS which supports the MPPS SOP Class as an SCP) is illustrated in the Figure above:

1. The MPPS SCU AE opens an association with the Department Scheduler
2. The MPPS SCU AE sends an N-CREATE request to the Department Scheduler to create an MPPS instance with status of “IN PROGRESS” and create all necessary attributes. The Department Scheduler acknowledges the MPPS creation with an N-CREATE response (status success).
3. The MPPS SCU AE closes the association with the Department Scheduler.
4. All images are acquired and stored in the local database.
5. The MPPS SCU AE opens an association with the Department Scheduler.
6. The MPPS SCU AE sends an N-SET request to the Department Scheduler to update the MPPS instance with status of “COMPLETED” and set all necessary attributes. The Department Scheduler acknowledges the MPPS update with an N-SET response (status success).

7. The MPPS SCU AE closes the association with the Department Scheduler.

4.2.6.3.1.2 Proposed Presentation Contexts

The MPPS SCU AE will propose Presentation Contexts shown in the following table:

Table 4.2-49
Proposed Presentation Contexts for real-world activity acquire images

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.6.3.1.3 SOP Specific Conformance for MPPS SOP Class

The MPPS SCU AE provides standard conformance to the Modality Performed Procedure Step SOP Class as an SCU.

The behavior of the MPPS SCU AE, when encountering status codes in an MPPS N-CREATE or N–SET response is summarized in the table below.

Table 4.2-50
MPPS N-CREATE / N-SET response status handling behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
*	*	Any other status code	The association is aborted and the MPPS is marked as failed. The status meaning is logged and reported to the user.

The behavior of the MPPS SCU AE during communication failure is summarized in the table below:

Table 4.2-51
MPPS communication failure behavior

Exception	Behavior
Timeout	The association is aborted and MPPS is marked as failed. The reason is logged and reported to the user.
Association aborted by the SCP or network layers	The MPPS is marked as failed. The reason is logged and reported to the user.

The table below provides a description of the MPPS N-CREATE and N-SET request identifiers sent by the MPPS SCU AE. Empty cells in the N-CREATE and N-SET columns indicate that the attribute is not sent. An “x” indicates that an appropriate value will be sent. A “Zero length” attribute will be sent with zero length.

Table 4.2-52
MPPS N-CREATE / N-SET request identifier

Attribute Name	Tag	VR	N-CREATE	N-SET
Specific Character Set	(0008,0005)	CS	ISO_IR 100	
Performed Procedure Step Relationship				
Scheduled Step Attributes Sequence	(0040,0270)	SQ	Always Set	
> Study Instance UID	(0020,000D)	UI	From Modality Worklist	
> Referenced Study Sequence	(0008,1110)	SQ	From Modality Worklist	
>> Referenced SOP Class UID	(0008,1150)	UI	From Modality Worklist	
>> Referenced SOP Instance UID	(0008,1155)	UI	From Modality Worklist	

Attribute Name	Tag	VR	N-CREATE	N-SET
> Accession Number	(0008,0050)	SH	From Modality Worklist	
> Placer Order Number/Imaging Service Request	(0040,2016)	LO		
> Filler Order Number/Imaging Service Request	(0040,2017)	LO		
> Requested Procedure ID	(0040,1001)	SH	From Modality Worklist	
> Requested Procedure Description	(0032,1060)	LO	From Modality Worklist	
> Scheduled Procedure Step ID	(0040,0009)	SH	Zero length	
> Scheduled Procedure Step Description	(0040,0007)	LO	Zero length	
> Scheduled Protocol Code Sequence	(0040,0008)	SQ		
Patient's Name	(0010,0010)	PN	From Modality Worklist or user input	
Patient ID	(0010,0020)	LO	From Modality Worklist or user input.	
Patient's Birth Date	(0010,0030)	DA	From Modality Worklist or user input.	
Patient's Sex	(0010,0040)	CS	From Modality Worklist or user input.	
Referenced Patient Sequence	(0008,1120)	SQ	From Modality Worklist.	
Performed Procedure Step Information				
Performed Procedure Step ID	(0040,0253)	SH	Automatically created.	
Performed Station AE Title	(0040,0241)	AE	MPPS AE Title	
Performed Station Name	(0040,0242)	SH	From configuration	
Performed Location	(0040,0243)	SH	Zero length	
Performed Procedure Step Start Date	(0040,0244)	DA	Actual start date	
Performed Procedure Step Start Time	(0040,0245)	TM	Actual start time	
Performed Procedure Step Status	(0040,0252)	CS	IN PROGRESS	COMPLETED or DISCONTINUED
Performed Procedure Step Description	(0040,0254)	LO	Zero length	
Performed Procedure Type Description	(0040,0255)	LO	Zero length	
Procedure Code Sequence	(0008,1032)	SQ	Zero or more items	Zero or more items
Performed Procedure Step End Date	(0040,0250)	DA	Zero length	Actual end date
Performed Procedure Step End Time	(0040,0251)	TM	Zero length	Actual end time
Image Acquisition Results				
Modality	(0008,0060)	CS	US	
Study ID	(0020,0010)	SH	From Modality Worklist or automatically created.	
Performed Protocol Code Sequence	(0040,0260)	SQ	Zero or more items	Zero or more items

Attribute Name	Tag	VR	N-CREATE	N-SET
Performed Series Sequence	(0040,0340)	SQ	Zero length	One or more items
> Performing Physician's Name	(0008,1050)	PN		Zero length
> Protocol Name	(0018,1030)	LO		x
> Operator's Name	(0008,1070)	PN		Zero length
> Series Instance UID	(0020,000E)	UI		x
> Series Description	(0008,103E)	LO		Zero length
> Retrieve AE Title	(0008,0054)	AE		Zero length
> Referenced Image Sequence	(0008,1140)	SQ		One or more items
>> Referenced SOP Class UID	(0008,1150)	UI		x
>> Referenced SOP Instance UID	(0008,1155)	UI		x
> Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)	SQ		Zero length
>> Referenced SOP Class UID	(0008,1150)	UI		
>> Referenced SOP Instance UID	(0008,1155)	UI		
Billing and Material Code				
Film Consumption Sequence	(0040,0321)	SQ		
>Number of Films	(2100,0170)	IS		
>Medium Type	(2000,0030)	CS		
>Film Size ID	(2010,0050)	CS		
Billing Supplies and Devices Sequence	(0040,0324)	SQ		
>Quantity Sequence	(0040,0293)	SQ		
>>Quantity	(0040,0294)	DS		
>>Measuring Units Sequence	(0040,0295)	SQ		

4.2.6.4 Association Acceptance Policy

The MPPS SCU AE does not accept associations.

4.2.7 Q/R SCU AE specification

4.2.7.1 SOP Classes

The Q/R SCU AE provides Standard Conformance to the following SOP Classes:

Table 4.2-53
SOP classes for the Q/R SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Study Root Q/R Information Model – Find	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Study Root Q/R Information Model – Move	1.2.840.10008.5.1.4.1.2.2.2		

4.2.7.2 Association policies

4.2.7.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-54
DICOM Application Context for the Q/R SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.7.2.2 Number of associations

The Q/R SCU AE initiates one association at a time.

Table 4.2-55
Number of associations initiated for the Q/R SCU AE

Maximum number of simultaneous associations	1

4.2.7.2.3 Asynchronous nature

The Q/R SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Table 4.2-56
Asynchronous nature for the Q/R SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.7.2.4 Implementation identifying information

The implementation information for this Application Entity is:

Table 4.2-57
DICOM implementation class and version for the Q/R SCU AE

Implementation Class UID	1.2.392.200036.9116.6.19
Implementation Version Name	TM_NEMIOMX_1.0

4.2.7.3 Association initiation policy

4.2.7.3.1 Activity – query and retrieve images

4.2.7.3.1.1 Description and sequencing of activities

The Q/R SCU AE is activated when the user selects a remote node to query and enters some key information, Patient's Name, Patient ID and/or Accession Number. The user can select studies, series and images to be retrieved. The images will be received at the Storage SCP AE.

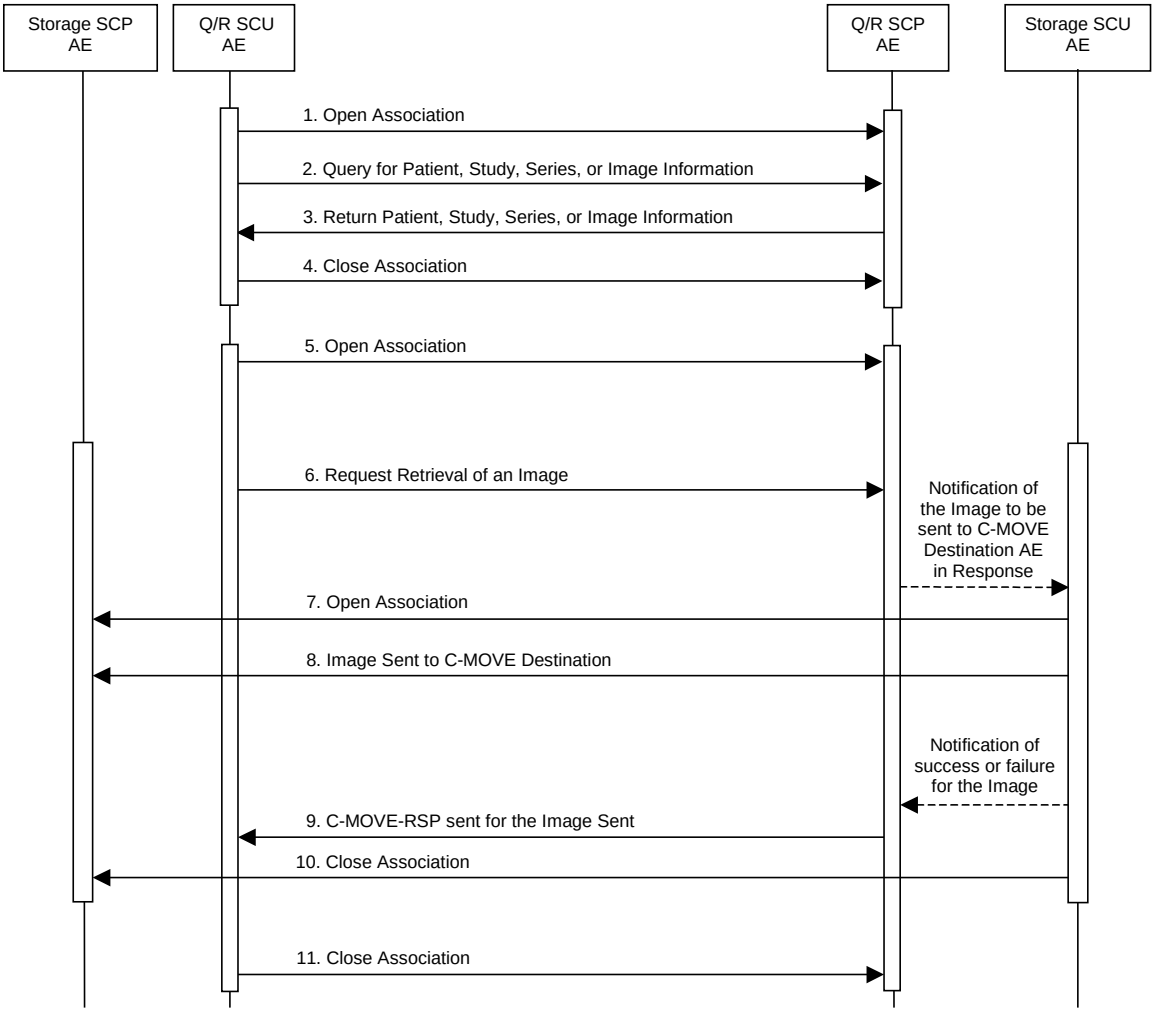

Figure 4.2-8
Sequencing of activity – query and retrieve images

The following sequencing constraints illustrated in the Figure above:

1. The Q/R SCU AE opens an association with the Q/R SCP AE.
2. The Q/R SCU AE sends a C-FIND-RQ Message
3. The Q/R SCP AE returns a C-FIND-RSP Message to the Q/R SCU AE with matching information.
   A C-FIND-RSP is sent for each entity matching the identifier specified in the C-FIND-RQ. A final C-FIND-RSP is sent indicating that the matching is complete.

4. The Q/R SCU AE closes the association.
5. The Q/R SCU AE opens an association with the Q/R SCP AE.
6. The Q/R SCU AE sends a C-MOVE-RQ Message. The Q/R SCP AE notifies the Storage SCU AE to send the Composite SOP Instances to the peer C-MOVE Destination AE as indicated in the C-MOVE-RQ.
7. The Storage SCU AE opens an association with the C-MOVE Destination AE.
8. The Storage SCU AE sends images to the C-MOVE Destination AE. The Storage SCU AE indicates to the Q/R SCP AE whether the transfer succeeded or failed.
9. The Q/R SCP AE then returns a C-MOVE-RSP indicating this success or failure.
10. The Storage SCU AE closes the association.
11. The Q/R SCU AE closes the association.

4.2.7.3.1.2 Proposed Presentation Contexts

The Q/R SCU AE will propose Presentation Contexts shown in the following table:

Table 4.2-58
Proposed Presentation Contexts for real-world activity query and retrieve images

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Study Root Q/R Information Model – Find	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Q/R Information Model– Move	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.7.3.1.3 SOP specific conformance for Q/R Find SOP Classes

The Q/R SCU AE provides standard conformance to the Query/Retrieve Find SOP Classes as an SCU.

The behavior of the Q/R SCU AE when encountering status codes in a Q/R C-FIND response is summarized in the table below:

Table 4.2-59
The Q/R SCU AE C-FIND response status behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Matching is complete	0000	The SCP has completed the matches. Worklist items are available for display or further processing.
*	*	Any other status code	The association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user.

The behavior of the Q/R SCU AE during communication failure is summarized in the table below.

Table 4.2-60
Q/R FIND communication failure behavior

Exception	Behavior
Timeout	The association is aborted and the study, series or image query is marked as failed. The reason is logged and reported to the user.
Association aborted by the SCP or network layers	The study, series or image query is marked as failed. The reason is logged and reported to the user.

All queries are initiated at the highest level of the information model (the STUDY level).

The table below provides a description of the Q/R SCU AE C-FIND Request Identifier.

Table 4.2-61
Study root request identifier for C-FIND

Name	Tag	Types of Matching
Study Level		
Study Date	(0008,0020)	U
Study Time	(0008,0030)	U
Accession Number	(0008,0050)	S,U
Study Description	(0008,1030)	U
Patient’s Name	(0010,0010)	S,*,U
Patient’s ID	(0010,0020)	S,U
Patient's Sex	(0010,0040)	U
Study Instance UID	(0020,000D)	U
Study ID	(0020,0010)	U
Number of Study Related Instances	(0020,1208)	U

Types of Matching:

The types of Matching supported by the Q/R SCU AE. An "S" indicates the identifier attribute uses Single Value Matching, an “R” indicates Range Matching, an “*” indicates wildcard matching, and a ‘U’ indicates Universal Matching.

4.2.7.3.1.4 SOP specific conformance for Q/R Move SOP Classes

The Q/R SCU AE provides standard conformance to the Query/Retrieve Move SOP Classes as an SCU.

The behavior of the Q/R SCU AE when encountering status codes in a Q/R C-MOVE response is summarized in the table below:

Table 4.2-62
The Q/R SCU AE C-MOVE response status behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Sub-operations complete – No Failures	0000	The Storage SCP AE has successfully received the SOP Instance. If all SOP Instances in a move job have status success then the job is marked as complete.
*	*	Any other status code	The association is aborted using A-ABORT and the move job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application.

The behavior of the Q/R SCU AE during communication failure is summarized in the table below.

Table 4.2-63
Q/R MOVE communication failure behavior

Exception	Behavior
Timeout	The association is aborted using A-ABORT and the retrieve is marked as failed. The reason is logged and reported to the user if an interactive query.
Association aborted by the SCP or network layers	The retrieve is marked as failed. The reason is logged and reported to the user if an interactive query.

The system requests Image Level Move only.

4.2.7.4 Association acceptance policy

The Q/R SCU AE does not accept associations.

4.2.8 Storage SCP AE specification

4.2.8.1 SOP Classes

The Storage SCP AE provides Standard Conformance to the following SOP Classes:

Table 4.2-64
SOP Classes for the Storage SCP AE

SOP Class Name	SOP Class UID	SCU	SCP
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Yes
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6		
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1		
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3		
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1		
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22		

4.2.8.2 Association Policies

4.2.8.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-65
DICOM Application Context for the Storage SCP AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.8.2.2 Number of associations

The Storage SCP AE supports one association at a time.

Table 4.2-66
Number of associations accepted for the Storage SCP AE

Maximum number of simultaneous associations	1

4.2.8.2.3 Asynchronous nature

The Storage SCP AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Table 4.2-67
Asynchronous nature for the Storage SCP AE

Maximum number of outstanding asynchronous transactions	1

4.2.8.2.4 Implementation identifying information

The implementation information for the Storage SCP AE is:

Table 4.2-68
DICOM implementation class and version for the Storage SCP AE

Implementation Class UID	1.2.392.200036.9116.6.19
Implementation Version Name	TM_NEMIOMX_1.0

4.2.8.3 Association initiation policy

The Storage SCP AE does not initiate associations.

4.2.8.4 Association acceptance policy

The Storage SCP AE accepts associations only if they have valid Presentation Contexts. If none of the requested Presentation Contexts are accepted then the association request itself is rejected. It can be configured to only accept associations with certain hosts (using TCP/IP address) and/or AE Titles.

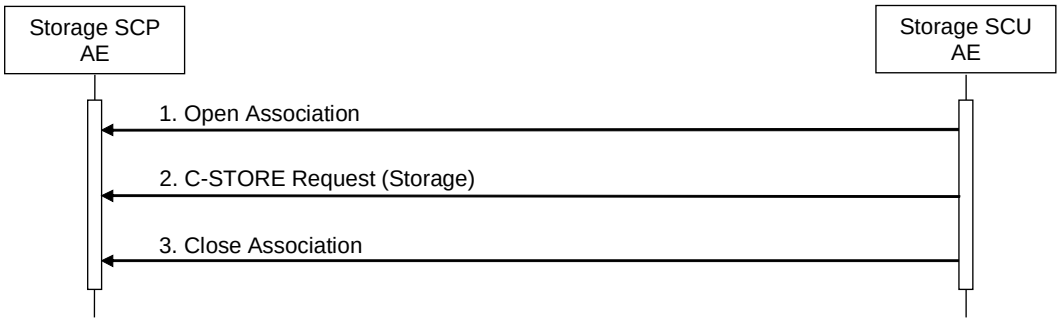

Figure 4.2-9
Sequencing of activity – Store images to the local file system

A possible sequence of interactions between the Storage SCP AE and a Storage SCU AE is illustrated in the Figure above:

1. The Storage SCU AE opens an association with the Storage SCP AE.
2. The Storage SCU AE sends images to the Storage SCP AE using a storage request (C-STORE) and the Storage SCP AE replies with a C-STORE response (status success).
3. The Storage SCU AE closes the association with the Storage SCP AE.

The Storage SCP AE does not care about a called/calling AE title contained in association requests.

4.2.8.4.1.1 Accepted Presentation Contexts

The default behavior of the Storage SCP AE supports the Implicit VR Little Endian and Explicit VR Little Endian transfer syntaxes. If the both transfer syntaxes are proposed per presentation context then the Storage SCP AE will select Explicit VR Little Endian Transfer Syntax.

Any of the presentation contexts shown in the following table are acceptable to the Storage SCP AE.

Table 4.2-69
Accepted Presentation Contexts by the Storage SCP AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		RLE Lossless	1.2.840.10008.1.2.5		
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		RLE Lossless	1.2.840.10008.1.2.5		
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		RLE Lossless	1.2.840.10008.1.2.5		
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		RLE Lossless	1.2.840.10008.1.2.5		
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		RLE Lossless	1.2.840.10008.1.2.5		
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.8.4.1.2 SOP Specific Conformance for Storage SOP Classes

The associated Activity with the Storage service is the storage of medical image data received over the network on a designated hard disk. The Storage SCP AE will return a failure status if it is unable to store the images on to the hard disk.

The Storage SCP AE is Level 0 conformant as a Storage SCP.

Table 4.2-70
The Storage SCP AE C-STORE response status return reasons

Service Status	Further Meaning	Status Code	Reason
Success	Success	0000	The Composite SOP Instance was successfully received, verified, and stored in the system database.
Refused	Out of Resources	A700	Indicates that there were not enough local resources.
Error	Cannot Understand	C000	Indicates that the Storage SCP AE cannot parse the Data Set into Elements.

4.2.9 Print SCU AE specification

4.2.9.1 SOP Classes

The Print SCU AE provides Standard Conformance to the following Meta SOP Classes:

Table 4.2-71
META SOP Classes for the Print SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Yes	No
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	Yes	No

The above Meta SOP Classes are defined by the following set of supported SOP Classes:

Table 4.2-72
SOP Classes for the Print SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No
Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No

4.2.9.2 Association Policies

4.2.9.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-73
DICOM Application Context for the Print SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.9.2.2 Number of associations

The Print SCU AE initiates one association at a time.

Table 4.2-74
Number of associations initiated for the Print SCU AE

Maximum number of simultaneous associations	1

4.2.9.2.3 Asynchronous nature

The Print SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Table 4.2-75
Asynchronous nature for the Print SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.9.2.4 Implementation identifying information

The implementation information for the Print SCU AE is:

Table 4.2-76
DICOM implementation class and version for the Print SCU AE

Implementation Class UID	1.2.392.200036.9116.6.19
Implementation Version Name	TM_NEMIOMX_1.0

4.2.9.3 Association initiation policy

4.2.9.3.1 Activity – send images & print management information

4.2.9.3.1.1 Description and sequencing of activities

A user composes images onto film sheets and requests them to be sent to a specific hardcopy device.
The user can select the desired film format and number of copies.

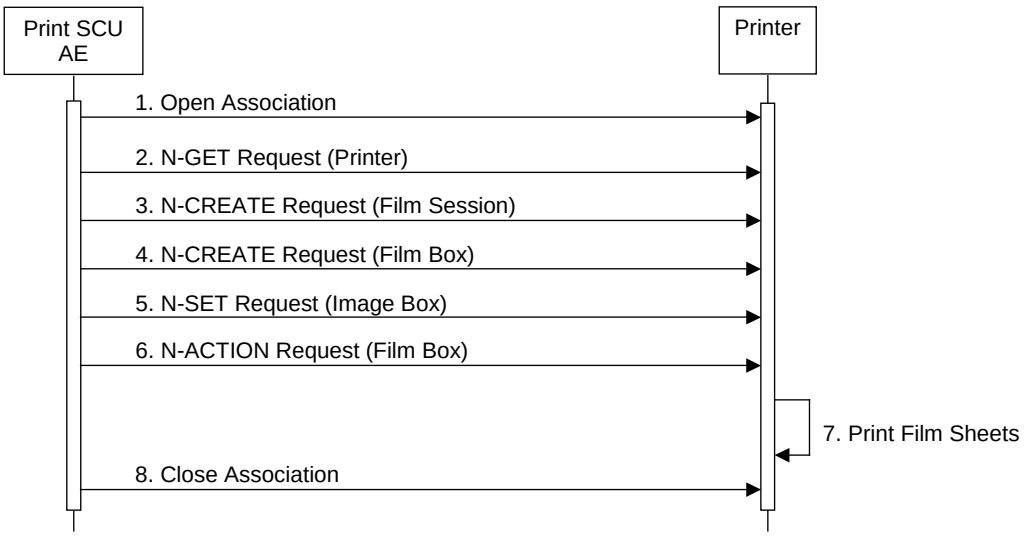

Figure 4.2-10
Sequencing of activity – send images & Print management information

A typical sequence of DIMSE messages sent over an association between the Print SCU AE and a Printer is illustrated in the Figure above:

1. The Print SCU AE opens an association with the Printer.
2. N-GET on the Printer SOP Class is used to obtain current printer status information.
3. N-CREATE on the Film Session SOP Class create a Film Session.
4. N-CREATE on the Film Box SOP Class create a Film Box linked to the Film Session.
5. N-SET on the Image Box SOP Class transfers the contents of the film sheet to the printer.
6. N-ACTION on the Film Box SOP Class instructs the Printer to print the Film Box.
7. The Printer prints the requested number of film sheets.
8. The Print SCU AE closes the association with the Printer.

4.2.9.3.1.2 Proposed Presentation Contexts

The Print SCU AE will propose the Presentation Contexts shown in the following table:

Table 4.2-77
Proposed Presentation Contexts for activity send images & print management information

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Print Job SOP Class	1.2.840.10008.5.1.1.14	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.9.3.1.3 Common SOP Specific Conformance for all Print SOP Classes

The general behavior of the Print SCU AE during communication failure is summarized in the table below. This behavior is common for all SOP Classes supported by the Print SCU AE.

Table 4.2-78
Print communication failure behavior

Exception	Behavior
Timeout	The association is aborted and the print-job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.
Association aborted by the SCP or network layers	The print-job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.

4.2.9.3.1.4 SOP specific conformance for Printer SOP Class

The Print SCU AE supports the following DIMSE operations and notifications for the Printer SOP Class:

— N-GET

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.9.3.1.4.1 Printer SOP Class operations (N-GET)

The Print SCU AE uses the Printer SOP Class N-GET operation to obtain information about the current printer status. The attributes obtained via N-GET are listed in the table below:

Table 4.2-79
Printer SOP Class N-GET request attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Printer Status	(2110,0010)	CS	Provided by Printer	ALWAYS	Printer
Printer Status Info	(2110,0020)	CS	Provided by Printer	ALWAYS	Printer

The Printer Status information is evaluated as follows:

1. If Printer Status (2110, 0010) is NORMAL, the print-job continues to be printed.
2. If Printer Status (2110, 0010) is FAILURE or WARNING, the Print SCU AE retries the print-job automatically.

The behavior of The Print SCU AE when encountering status codes in an N-GET response is summarized in the table below:

Table 4.2-80
Printer SOP Class N-GET response status handling behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The request to get printer status information was success.
*	*	Any other status code	The association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.9.3.1.5 SOP Specific Conformance for the Film Session SOP Class

The Print SCU AE supports the following DIMSE operations for the Film Session SOP Class:
— N-CREATE

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.9.3.1.5.1 Film Session SOP Class Operations (N-CREATE)

The attributes supplied in an N-CREATE Request are listed in the table below:

Table 4.2-81
Film session SOP Class N-CREATE request attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Copies	(2000,0010)	IS	1	ALWAYS	AUTO
Medium Type	(2000,0030)	CS	BLUE FILM, CLEAR FILM or PAPER	ALWAYS	USER

The behavior of The Print SCU AE when encountering status codes in an N-CREATE response is summarized in the table below:

Table 4.2-82
Film session SOP Class N-CREATE response status handling behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
*	*	Any other status code	The association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.9.3.1.6 SOP Specific Conformance for the Film Box SOP Class

The Print SCU AE supports the following DIMSE operations for the Film Box SOP Class:

— N-CREATE

— N-ACTION

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.9.3.1.6.1 Film Box SOP Class Operations (N-CREATE)

The attributes supplied in an N-CREATE Request are listed in the table below:

Table 4.2-83
Film box SOP Class N-CREATE request attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Display Format	(2010,0010)	ST	STANDARD\C,R (C,R) is (1,1) (1,2) (2,2) (2,3) (2,4) (3,4) (3,5) (4,4) (4,5) (4,6) (5,5) (5,6) for Film Orientation PORTRAIT, and (1,1) (2,1) (2,2) (3,2) (4,2) (4,3) (5,3) (4,4) (5,4) (6,4) (5,5) (6,5) for LANDSCAPE.	ALWAYS	USER
Film Orientation	(2010,0040)	CS	PORTRAIT or LANDSCAPE	ALWAYS	USER
Film Size ID	(2010,0050)	CS	8INX10IN, 10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, or 14INX17IN	ALWAYS	USER
Magnification Type	(2010,0060)	CS	REPLICATE, BILINEAR, CUBIC or NONE	ALWAYS	CONFIG
Min Density	(2010,0120)	US		ALWAYS	CONFIG
Max Density	(2010,0130)	US		ALWAYS	CONFIG
Referenced Film Session Sequence	(2010,0500)	SQ		ALWAYS	AUTO
>Referenced SOP Class UID	(0008,1150)	UI	1.2.840.10008.5.1.1.1	ALWAYS	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI	From created Film Session SOP Instance	ALWAYS	AUTO

The behavior of the Print SCU AE when encountering status codes in a N-CREATE response is summarized in the table below:

Table 4.2-84
Film box SOP Class N-CREATE response status handling behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
*	*	Any other status code	The association is aborted and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.9.3.1.6.2 Film box SOP Class operations (N-ACTION)

An N-ACTION Request is issued to instruct the Print SCP to print the contents of the Film Box. The Action Reply argument in an N-ACTION response is not evaluated.

The behavior of The Print SCU AE when encountering status codes in an N-ACTION response is summarized in the table below:

Table 4.2-85
Film box SOP Class N-ACTION response status handling behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully. The film has been accepted for printing.
*	*	Any other status code	The association is aborted and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.9.3.1.7 SOP Specific Conformance for the Grayscale Image Box SOP Class

The Print SCU AE supports the following DIMSE operations for the Grayscale Image Box SOP Class:

— N-SET

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.9.3.1.7.1 Grayscale Image Box SOP Class Operations (N-SET)

The attributes supplied in an N-SET Request are listed in the table below:

Table 4.2-86
Grayscale image box SOP Class N-SET request attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	(2020,0010)	US	1 .. 30	ALWAYS	AUTO
Basic Grayscale Image Sequence	(2020,0110)	SQ		ALWAYS	AUTO
>Samples Per Pixel	(0028,0002)	US	1	ALWAYS	AUTO
>Photometric Interpretation	(0028,0004)	CS	MONOCHROME2	ALWAYS	AUTO
>Rows	(0028,0010)	US	480	ALWAYS	AUTO
>Columns	(0028,0011)	US	640	ALWAYS	AUTO
>Pixel Aspect Ratio	(0028,0034)	IS	1\1	ALWAYS	AUTO
>Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
>Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
>High Bit	(0028,0102)	US	7	ALWAYS	AUTO
>Pixel Representation	(0028,0103)	US	0	ALWAYS	AUTO
>Pixel Data	(7FE0,0010)	OW		ALWAYS	AUTO

The behavior of the Print SCU AE when encountering status codes in a N-SET response is summarized in the table below:

Table 4.2-87
Grayscale image box SOP Class N-SET response status handling behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully. Image successfully stored in Image Box.
*	*	Any other status code	The association is aborted and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.9.3.1.8 SOP Specific Conformance for the Color Image Box SOP Class

The Print SCU AE supports the following DIMSE operations for the Color Image Box SOP Class:
— N-SET

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.9.3.1.8.1 Color Image Box SOP Class Operations (N-SET)

The attributes supplied in an N-SET Request are listed in the table below:

Table 4.2-88
Color image box SOP Class N-SET request attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	(2020,0010)	US	1 .. 30	ALWAYS	AUTO
Basic Color Image Sequence	(2020,0111)	SQ		ALWAYS	AUTO
>Samples Per Pixel	(0028,0002)	US	3	ALWAYS	AUTO
>Photometric Interpretation	(0028,0004)	CS	RGB	ALWAYS	AUTO
>Planar Configuration	(0028,0006)	US	0	ALWAYS	AUTO
>Rows	(0028,0010)	US	480	ALWAYS	AUTO
>Columns	(0028,0011)	US	640	ALWAYS	AUTO
>Pixel Aspect Ratio	(0028,0034)	IS	1\1	ALWAYS	AUTO
>Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
>Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
>High Bit	(0028,0102)	US	7	ALWAYS	AUTO
>Pixel Representation	(0028,0103)	US	0	ALWAYS	AUTO
>Pixel Data	(7FE0,0010)	OW		ALWAYS	AUTO

The behavior of the Print SCU AE when encountering status codes in an N-SET response is summarized in the table below:

Table 4.2-89
Color image box SOP Class N-SET response status handling behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully. Image successfully stored in Image Box.
*	*	Any other status code	The association is aborted and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.9.4 Association acceptance policy

The Print SCU AE does not accept associations.

4.3 Network interfaces

4.3.1 Physical network interface

This product supports a single network interface. One of the following physical network interfaces will be available depending on installed hardware options:

Table 4.3-1
Supported physical network interfaces

Ethernet 100baseT
Ethernet 10baseT

4.3.2 Additional protocols

None

4.4 Configuration

4.4.1 AE Title/Presentation address mapping

4.4.1.1 Local AE titles

All local applications use the AE Titles and TCP/IP Ports configured via the Service Tool. The Field Service Engineer can configure the TCP Port via the Service Tool.

Table 4.4-1
AE Title configuration

Application Entity	Default AE Title	Default TCP/IP Port
Verification SCU	NemioMX	Not Applicable
MWM SCU		
MPPS SCU		
Q/R SCU		
Print SCU		
Storage SCU		
Verification SCP		104
Storage SCP		
Storage Commitment SCU		

4.4.1.2 Remote AE Title/Presentation Address Mapping

The AE Titles, host names and port numbers of remote applications are configured using the Service Tool.

4.4.2 Parameters

A large number of parameters related to acquisition and general operation can be configured using the Service Tool. The table below only shows those configuration parameters relevant to DICOM communication. See the Product's Service Manual for details on general configuration capabilities.

Table 4.4-2
Configuration parameters

Parameter	Configurable (Yes/No)[Range]	Default Value
General Parameters		
MAX PDU Receive Size	Yes [1-9999]	32 Kbytes
MAX PDU Send Size		
Time-out waiting for an acceptance response to an association request (Application Level Timeout)	Yes [1-9999]	30 sec
Number of times a failed job may be retried	No	Forever, until the job succeeds or user deletes the job.
Delay between retrying failed jobs	No	60 sec.
Storage SCU Parameters		
Maximum number of simultaneously initiated associations by the Storage SCU AE	No	1
Supported transfer syntaxes	Yes	Implicit VR Little Endian
Storage Commitment SCU Parameters		
Maximum number of simultaneously initiated associations by the Storage Commitment SCU AE	No	1
Maximum number of simultaneously accepted associations by the Storage Commitment SCU AE	No	1
Delay association release after sending a storage commitment request (wait for a storage commitment notification over the same association)	Yes	0 sec
Modality Worklist SCU Parameters		
Maximum number of simultaneously initiated associations by the MWM SCU AE	No	1
Supported transfer syntaxes for MWM	No	Implicit VR Little Endian
Maximum number of worklist items	No	500
Query worklist for specific Scheduled Station AE Title	Yes	NemioMX
Query worklist for specific Modality	No	US
MPPS SCU Parameters		
Maximum number of simultaneously initiated associations by the MPPS SCU AE	No	1
Supported transfer syntaxes for MPPS	No	Implicit VR Little Endian
Storage SCP parameters		
Maximum number of simultaneously accepted associations by the Storage SCP AE	No	1
Print SCU Parameters		
Maximum number of simultaneously initiated associations by the Print SCU AE	No	1
Supported transfer syntaxes for Print	No	Implicit VR Little Endian

5. Media Interchange

5.1 Implementation Model

5.1.1 Application data flow

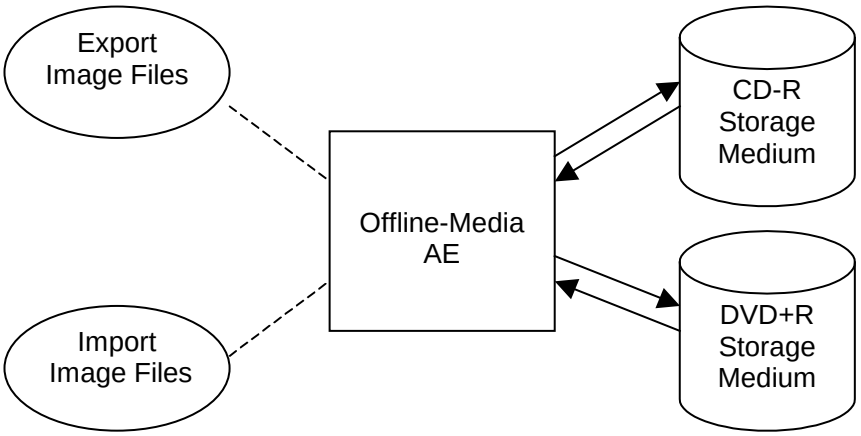

Figure 5.1-1
Application data flow diagram for Media Storage

- The Offline-Media AE exports image files to a CD-R or a DVD+R Storage medium. It is associated with the local real-world activity “Export Image Files” performed upon user request.
- The Offline-Media AE imports image files from a CD-R or a DVD+R Storage medium. It is associated with the local real-world activity “Import Image Files” performed upon user request.

5.1.2 Functional definition of AEs

5.1.2.1 Functional definition of offline-media AE

The Offline-Media AE is performed upon user request for selected studies/series/images to/from an offline DICOM CD-R or DVD+R medium. It therefore performs the following tasks:

Export:

- Builds DICOM Information Objects.
- Creates a DICOMDIR file that represents the contents of the DICOM Information Objects to be recorded.
- Records DICOM Information Objects and the DICOMDIR file to the CD-R or the DVD+R medium.

Import:

- Reads the DICOMDIR file that represents the contents of the data as recorded.
- Displays the ordered list of studies/series/images, identifying information.
- Loads the selected studies/series/images from the CD-R or the DVD+R medium and displays them on the screen.

Note: The Offline-Media AE can update files created by the product itself.

5.1.3 Sequencing of real-world activities

5.1.3.1 Activity – export image files

Operator requests to create new File-set(s) onto a new CD-R or DVD+R. The requests are placed in a queue and are executed in the background.

The operations for “Export Image Files” are described below:

Step-1: Select the studies on the local storage device to be created to the CD-R or the DVD+R medium.

Step-2: Select the image archiving.

Step-3: Select the virtual device as a destination.

Step-4: Request to copy to the CD-R or the DVD+R.

5.1.3.2 Activity – import image files

Operator requests to retrieve File-set(s) on the CD-R or the DVD+R. The requests are placed in a queue and are executed in the background.

The operations for “Import Image Files” are described below:

Step-1: Select the studies on the medium to be retrieved to the local storage device.

Step-2: Select the data retrieval.

Step-3: Request to copy to the local storage device.

5.1.4 File Meta Information for Implementation Class and Version

The implementation information written to the File Meta Header in each file is:

Table 5.1-1
DICOM implementation class and version for Media Storage

File Meta Information Version	1
Implementation Class UID	1.2.392.200036.9116.6.19
Implementation Version Name	TM_NEMIOMX_1.0

5.2 AE specifications

5.2.1 Offline-Media AE specification

The Offline-Media AE provides standard conformance to the DICOM Interchange Option of the Media Storage Service Class. The Application Profiles and roles are listed below:

Table 5.2-1
APPLICATION PROFILES, ACTIVITIES AND ROLES FOR OFFLINE-MEDIA

Application Profiles Supported	Real World Activity	Role	SC Option
AUG-US-ID-MF-CD, AUG-US-ID-MF-DVD	Export Image Files	FSC	Interchange
	Import Image Files	FSR	Interchange

5.2.1.1 File Meta information for the application entity

The Source Application Entity Title is the same as the Local AE Title.

5.2.1.2 Real-world activities

5.2.1.2.1 Activity – export image files

The Offline-Media AE acts as an FSC using the interchange option when requested to export SOP Instances from the local database to a CD-R or a DVD+R medium.

5.2.1.2.2 Activity –import image files

The Offline-Media AE acts as an FSR using the interchange option when requested to import SOP Instances from a CD-R or a DVD+R medium to the local database.

5.3 Augmented and private application profiles

5.3.1 Augmented application profiles

Not applicable to this product.

5.3.1.1 Augmented Application Profiles – AUG-US-ID-MF-CD & AUG-US-ID-MF-DVD

5.3.1.1.1 SOP Class Augmentations

The Augmented Application Profile supports the following SOP Classes and Transfer Syntaxes.

Table 5.3-1
SOP Class augmentations

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
DICOM Media Storage Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian	1.2.840.10008.1.2.1
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		RLE Lossless	1.2.840.10008.1.2.5
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		RLE Lossless	1.2.840.10008.1.2.5
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		RLE Lossless	1.2.840.10008.1.2.5
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1

5.3.1.1.2 Directory augmentations

Not applicable to this product.

5.3.1.1.3 Other augmentations

Not applicable to this product.

5.3.2 Private application profiles

Not applicable to this product.

5.4 Media Configuration

Not applicable to the Offline-Media AE.

6. Support of character sets

This product supports ISO-IR 100 (Latin alphabet No.1) Supplementary set of ISO8859.

7. Security

This product does not support any specific security measures.

It is assumed that the product is used within a secured environment. It is assumed that a secured environment includes at a minimum:

a. Firewall or router protections to ensure that only approved external hosts have network access to the product.

b. Firewall or router protections to ensure that the product only has network access to approved external hosts and services.

Other network security procedures such as automated intrusion detection may be appropriate in some environments. Additional security features may be established by the local security policy and are beyond the scope of this conformance statement.

8. Annexes

8.1 IOD Contents

8.1.1 Created SOP instances

Table 8.1-1 specifies the attributes of a Secondary Capture Image transmitted by the Storage SCU AE.

Table 8.1-2 specifies the attributes of an Ultrasound Image transmitted by the Storage SCU AE.

Table 8.1-3 specifies the attributes of an Ultrasound Multi-frame Image transmitted by the Storage SCU AE.

Table 8.1-4 specifies the attributes of an Enhanced SR transmitted by the Storage SCU AE.

The following tables use a number of abbreviations. The abbreviations used in the “Presence of …” column are:

VNAP	Value Not Always Present (attribute sent zero length if no value is present)
ANAP	Attribute Not Always Present
ALWAYS	Always Present
EMPTY	Attribute is sent without a value

The abbreviations used in the “Source” column:

MWL	the attribute value source Modality Worklist
USER	the attribute value source is from user input
AUTO	the attribute value is generated automatically
MPPS	the attribute value is the same as that use for Modality Performed Procedure Step
CONFIG	the attribute value source is a configurable parameter

8.1.1.1 SC Image IOD

Table 8.1-1
IOD of created SC Image SOP instances

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-5	ALWAYS
	Clinical Trial Subject	--	Not Present
Study	General Study	Table 8.1-6	ALWAYS
	Patient Study	Table 8.1-7	ALWAYS
	Clinical Trial Study	--	Not Present
Series	General Series	Table 8.1-8	ALWAYS
	Clinical Trial Series	--	Not Present
Equipment	General Equipment	Table 8.1-9	ALWAYS
	SC Equipment	--	Not Present
Image	General Image	Table 8.1-10	ALWAYS
	Image Pixel	Table 8.1-11	ALWAYS
	SC Image	--	Not Present
	Overlay Plane	--	Not Present
	Modality LUT	--	Not Present
	VOI LUT	--	Not Present
	SOP Common	Table 8.1-16	ALWAYS

8.1.1.2 US Image IOD

Table 8.1-2
IOD of created US image SOP instances

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-5	ALWAYS
	Clinical Trial Subject	--	Not Present
Study	General Study	Table 8.1-6	ALWAYS
	Patient Study	Table 8.1-7	ALWAYS
	Clinical Trial Study	--	Not Present
Series	General Series	Table 8.1-8	ALWAYS
	Clinical Trial Series	--	Not Present
Frame of Reference	Frame of Reference	--	Not Present
	Synchronization	--	Not Present
Equipment	General Equipment	Table 8.1-9	ALWAYS
Image	General Image	Table 8.1-10	ALWAYS
	Image Pixel	Table 8.1-11	ALWAYS
	Contrast/bolus	--	Not Present
	Palette Color Lookup Table	--	Not Present
	US Region Calibration	Table 8.1-12-15	ALWAYS
	US Image	Table 8.1-17	ALWAYS
	Overlay Plane	--	Not Present
	VOI LUT	--	Not Present
	SOP Common	Table 8.1-18	ALWAYS

8.1.1.3 US Multi-frame Image IOD

Table 8.1-3
IOD of created US multi frame Image SOP instances

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-5	ALWAYS
	Clinical Trial Subject	--	Not Present
Study	General Study	Table 8.1-6	ALWAYS
	Patient Study	Table 8.1-7	ALWAYS
	Clinical Trial Study	--	Not Present
Series	General Series	Table 8.1-8	ALWAYS
	Clinical Trial Series	--	Not Present
Frame of Reference	Frame of Reference	--	Not Present
	Synchronization	--	Not Present
Equipment	General Equipment	Table 8.1-9	ALWAYS
Image	General Image	Table 8.1-10	ALWAYS
	Image Pixel	Table 8.1-11	ALWAYS
	Contrast/bolus	--	Not Present
	Cine	Table 8.1-19	ALWAYS
	Multi-frame	Table 8.1-20	ALWAYS
	Frame Pointers	--	Not Present
	Palette Color Lookup Table	--	Not Present
	US Region Calibration	Table 8.1-12-15	ALWAYS
	US Image	Table 8.1-21	ALWAYS
	VOI LUT	--	Not Present
	SOP Common	Table 8.1-22	ALWAYS

8.1.1.4 Enhanced SR IOD

Table 8.1-4
IOD of created Enhanced SR SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-5	ALWAYS
	Specimen Identification	--	Not Present
	Clinical Trial Subject	--	Not Present
Study	General Study	Table 8.1-6	ALWAYS
	Patient Study	Table 8.1-7	ALWAYS
	Clinical Trial Study	--	Not Present
Series	SR Document Series	Table 8.1-23	ALWAYS
	Clinical Trial Series	--	Not Present
Equipment	General Equipment	Table 8.1-9	ALWAYS
Document	SR Document General	Table 8.1-24	ALWAYS
	SR Document Content	Table 8.1-23	ALWAYS, ONLY ONE ACCORDING TO THE TEMPLATE USED
	SOP Common	Table 8.1-25	ALWAYS

8.1.1.5 Common Modules

Table 8.1-5
Patient Module of created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	(0010,0010)	PN		ALWAYS	MWL/USER
Patient ID	(0010,0020)	LO		ALWAYS	MWL/USER
Patient's Birth Date	(0010,0030)	DA		VNAP	MWL/USER
Patient's Sex	(0010,0040)	CS		VNAP	MWL/USER
Referenced Patient Sequence	(0008,1120)	SQ		ANAP	MWL
>Referenced SOP Class UID	(0008,1150)	UI		ANAP	MWL
>Referenced SOP Instance UID	(0008,1155)	UI		ANAP	MWL
Ethnic Group	(0010,2160)	SH		ANAP	USER
Patient Comments	(0010,4000)	LT		ANAP	USER

Table 8.1-6
General Study Module of created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Instance UID	(0020,000D)	UI		ALWAYS	MWL/AUTO
Study Date	(0008,0020)	DA		ALWAYS	AUTO
Study Time	(0008,0030)	TM		ALWAYS	AUTO
Referring Physician's Name	(0008,0090)	PN		VNAP	MWL/USER
Study ID	(0020,0010)	SH		ALWAYS	AUTO
Accession Number	(0008,0050)	SH		VNAP	MWL/USER
Study Description	(0008,1030)	LO		ANAP	USER
Name of Physician(s) Reading Study	(0008,1060)	PN		ANAP	USER
Referenced Study Sequence	(0008,1110)	SQ		ANAP	MWL
>Referenced SOP Class UID	(0008,1150)	UI		ANAP	MWL
>Referenced SOP Instance UID	(0008,1155)	UI		ANAP	MWL

Table 8.1-7
Patient Study Module of created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Age	(0008,1010)	AS		ANAP	AUTO
Patient's Size	(0010,1020)	DS		ANAP	USER
Patient's Weight	(0010,1030)	DS		ANAP	USER

Table 8.1-8
General Series Module of created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	US	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS		ALWAYS	AUTO
Series Date	(0008,0021)	DA		ANAP	AUTO
Series Time	(0008,0031)	TM		ANAP	AUTO
Protocol Name	(0018,1030)	LO		ANAP	AUTO
Operator's Name	(0008,1070)	PN		ANAP	USER
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ		VNAP	AUTO
>Referenced SOP Class UID	(0008,1150)	UI		VNAP	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI		VNAP	AUTO
Request Attributes Sequence	(0040,0275)	SQ		ANAP	AUTO
>Requested Procedure ID	(0040,1001)	SH		ANAP	MWL
>Scheduled Procedure Step ID	(0040,0009)	SH		ANAP	MWL
>Scheduled Procedure Step Description	(0040,0007)	LO		ANAP	MWL
>Scheduled Protocol Code Sequence	(0040,0008)	SQ		ANAP	MWL
>>Code Value	(0008,0100)	SH		ANAP	MWL
>>Coding Scheme Designator	(0008,0102)	SH		ANAP	MWL
>>Code Meaning	(0008,0104)	LO		ANAP	MWL
Performed Procedure Step ID	(0040,0253)	SH		ANAP	AUTO
Performed Procedure Step Start Date	(0040,0244)	DA		ANAP	AUTO
Performed Procedure Step Start Time	(0040,0245)	TM		ANAP	AUTO
Performed Procedure Step Description	(0040,0254)	LO		ANAP	AUTO

Table 8.1-9
General Equipment Module of created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	(0008,0070)	LO	TOSHIBA_MEC	ALWAYS	AUTO
Institution Name	(0008,0080)	LO		ANAP	CONFIG
Station Name	(0008,1010)	LO		ANAP	CONFIG
Institutional Department Name	(0008,1040)	LO		ANAP	USER
Manufacturer's Model Name	(0008,1090)	LO	SSA-590A	ALWAYS	AUTO
Device Serial Number	(0018,1000)	LO		ALWAYS	AUTO
Software Version	(0018,1020)	LO	1.0	ALWAYS	AUTO

Table 8.1-10
General Image Module of created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS		ALWAYS	AUTO
Patient Orientation	(0020,0020)	CS		EMPTY	AUTO
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO
Image Type	(0008,0008)	CS		ANAP	AUTO
Image Comments	(0020,4000)	LT		ALWAYS	AUTO
Lossy Image Compression	(0028,2110)	CS		ANAP	AUTO

Table 8.1-11
Image pixel module of created SOP instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	(0028,0002)	US	3 or 1	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	"RGB", "YBR_FULL422", or "MONOCHROME2" Note: if "MONOCHROME2", then - (0028,0002) 1 - (0028,0006) Not Present	ALWAYS	CONFIG
Rows	(0028,0010)	US	480	ALWAYS	AUTO
Columns	(0028,0011)	US	640	ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
High Bit	(0028,0102)	US	7	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OB or OW		ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	0 or 1	ANAP	AUTO

8.1.1.6 US Region Calibration Module

Table 8.1-12
US region calibration module b-mode

Attribute Name	Tag	VR	Value	Presence of Value	Source
Sequence of Ultrasound Regions	(0018,6011)	SQ		ALWAYS	AUTO
>Region Spatial Format	(0018,6012)	US	1	ALWAYS	AUTO
>Region Data Type	(0018,6014)	US	1	ALWAYS	AUTO
>Region Flags	(0018,6016)	UL		ALWAYS	AUTO
>Region Location Min x0	(0018,6018)	UL		ALWAYS	AUTO
>Region Location Min y0	(0018,601A)	UL		ALWAYS	AUTO
>Region Location Max x1	(0018,601C)	UL		ALWAYS	AUTO
>Region Location Max y1	(0018,601E)	UL		ALWAYS	AUTO
>Reference Pixel x0	(0018,6020)	SL		ALWAYS	AUTO
>Reference Pixel y0	(0018,6022)	SL		ALWAYS	AUTO
>Physical Units X Direction	(0018,6024)	US		ALWAYS	AUTO
>Physical Units Y Direction	(0018,6026)	US		ALWAYS	AUTO
>Reference Pixel Physical Value X	(0018,6028)	FD		ALWAYS	AUTO
>Reference Pixel Physical Value Y	(0018,602A)	FD		ALWAYS	AUTO
>Physical Delta X	(0018,602C)	FD		ALWAYS	AUTO
>Physical Delta Y	(0018,602E)	FD		ALWAYS	AUTO
>Transducer Frequency	(0018,6030)	UL		ALWAYS	AUTO
>Steering Angle	(0018,6036)	FD		ANAP	AUTO

Table 8.1-13
US region calibration module bc-mode

Attribute Name	Tag	VR	Value	Presence of Value	Source
Sequence of Ultrasound Regions	(0018,6011)	SQ		ALWAYS	AUTO
>Region Spatial Format	(0018,6012)	US	1	ALWAYS	AUTO
>Region Data Type	(0018,6014)	US	2	ALWAYS	AUTO
>Region Flags	(0018,6016)	UL		ALWAYS	AUTO
>Region Location Min x0	(0018,6018)	UL		ALWAYS	AUTO
>Region Location Min y0	(0018,601A)	UL		ALWAYS	AUTO
>Region Location Max x1	(0018,601C)	UL		ALWAYS	AUTO
>Region Location Max y1	(0018,601E)	UL		ALWAYS	AUTO
>Reference Pixel x0	(0018,6020)	SL		ALWAYS	AUTO
>Reference Pixel y0	(0018,6022)	SL		ALWAYS	AUTO
>Physical Units X Direction	(0018,6024)	US		ALWAYS	AUTO
>Physical Units Y Direction	(0018,6026)	US		ALWAYS	AUTO
>Reference Pixel Physical Value X	(0018,6028)	FD		ALWAYS	AUTO
>Reference Pixel Physical Value Y	(0018,602A)	FD		ALWAYS	AUTO
>Physical Delta X	(0018,602C)	FD		ALWAYS	AUTO
>Physical Delta Y	(0018,602E)	FD		ALWAYS	AUTO
>Transducer Frequency	(0018,6030)	UL		ALWAYS	AUTO
>Pulse Repetition Frequency	(0018,6032)	UL		ALWAYS	AUTO
>Steering Angle	(0018,6036)	FD		ANAP	AUTO

Table 8.1-14
US region calibration module D-mode

Attribute Name	Tag	VR	Value	Presence of Value	Source
Sequence of Ultrasound Regions	(0018,6011)	SQ		ALWAYS	AUTO
>Region Spatial Format	(0018,6012)	US	3	ALWAYS	AUTO
>Region Data Type	(0018,6014)	US	3 or 4	ALWAYS	USER
>Region Flags	(0018,6016)	UL		ALWAYS	AUTO
>Region Location Min x0	(0018,6018)	UL		ALWAYS	AUTO
>Region Location Min y0	(0018,601A)	UL		ALWAYS	AUTO
>Region Location Max x1	(0018,601C)	UL		ALWAYS	AUTO
>Region Location Max y1	(0018,601E)	UL		ALWAYS	AUTO
>Reference Pixel x0	(0018,6020)	SL		ALWAYS	AUTO
>Reference Pixel y0	(0018,6022)	SL		ALWAYS	AUTO
>Physical Units X Direction	(0018,6024)	US		ALWAYS	AUTO
>Physical Units Y Direction	(0018,6026)	US		ALWAYS	AUTO
>Reference Pixel Physical Value X	(0018,6028)	FD		ALWAYS	AUTO
>Reference Pixel Physical Value Y	(0018,602A)	FD		ALWAYS	AUTO
>Physical Delta X	(0018,602C)	FD		ALWAYS	AUTO
>Physical Delta Y	(0018,602E)	FD		ALWAYS	AUTO
>Transducer Frequency	(0018,6030)	UL		ALWAYS	AUTO
>Pulse Repetition Frequency	(0018,6032)	UL		ALWAYS	AUTO
>Doppler Correction Angle	(0018,6034)	FD		ALWAYS	AUTO
>Steering Angle	(0018,6036)	FD		ALWAYS	AUTO
>Doppler Sample Volume X Position	(0018,6038)	UL		ALWAYS	AUTO
>Doppler Sample Volume Y Position	(0018,603A)	UL		ALWAYS	AUTO
>TM-Line Position x0	(0018,603C)	UL		ALWAYS	AUTO
>TM-Line Position y0	(0018,603E)	UL		ALWAYS	AUTO
>TM-Line Position x1	(0018,6040)	UL		ALWAYS	AUTO
>TM-Line Position y1	(0018,6042)	UL		ALWAYS	AUTO

Table 8.1-15
US region calibration module M-mode

Attribute Name	Tag	VR	Value	Presence of Value	Source
Sequence of Ultrasound Regions	(0018,6011)	SQ		ALWAYS	AUTO
>Region Spatial Format	(0018,6012)	US	2	ALWAYS	AUTO
>Region Data Type	(0018,6014)	US	1	ALWAYS	AUTO
>Region Flags	(0018,6016)	UL		ALWAYS	AUTO
>Region Location Min x0	(0018,6018)	UL		ALWAYS	AUTO
>Region Location Min y0	(0018,601A)	UL		ALWAYS	AUTO
>Region Location Max x1	(0018,601C)	UL		ALWAYS	AUTO
>Region Location Max y1	(0018,601E)	UL		ALWAYS	AUTO
>Reference Pixel x0	(0018,6020)	SL		ALWAYS	AUTO
>Reference Pixel y0	(0018,6022)	SL		ALWAYS	AUTO
>Physical Units X Direction	(0018,6024)	US		ALWAYS	AUTO
>Physical Units Y Direction	(0018,6026)	US		ALWAYS	AUTO
>Reference Pixel Physical Value X	(0018,6028)	FD		ALWAYS	AUTO
>Reference Pixel Physical Value Y	(0018,602A)	FD		ALWAYS	AUTO
>Physical Delta X	(0018,602C)	FD		ALWAYS	AUTO
>Physical Delta Y	(0018,602E)	FD		ALWAYS	AUTO
>Transducer Frequency	(0018,6030)	UL		ALWAYS	AUTO
>TM-Line Position x0	(0018,603C)	UL		ALWAYS	AUTO
>TM-Line Position y0	(0018,603E)	UL		ALWAYS	AUTO
>TM-Line Position x1	(0018,6040)	UL		ALWAYS	AUTO
>TM-Line Position y1	(0018,6042)	UL		ALWAYS	AUTO

8.1.1.7 SC Image Modules

Table 8.1-16
SOP common module of created SC image instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	(0008,0008)	CS	ISO_IR 100	ALWAYS	AUTO
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.7	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI		ALWAYS	AUTO

8.1.1.8 US Image Modules

Table 8.1-17
US Image module of created US image SOP instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	(0028,0002)	US	3 or 1	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	"RGB", "YBR_FULL422", or "MONOCHROME2" Note: if "MONOCHROME2", then - (0028,0002) 1 - (0028,0006) Not Present - (0028,0014) 0	ALWAYS	CONFIG
Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
High Bit	(0028,0102)	US	7	ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	0 or 1	ANAP	AUTO
Pixel Representation	(0028,0103)	US	0	ALWAYS	AUTO
Image Type	(0008,0008)	CS		EMPTY	AUTO
Lossy Image Compression	(0028,2110)	CS		ANAP	AUTO
Pixel Data	(7FE0,0010)	OB or OW		ALWAYS	AUTO
Ultrasound Color Data Present	(0028,0014)	US	1 or 0	ALWAYS	AUTO
Transducer Type	(0018,6031)	CS		ALWAYS	AUTO

Table 8.1-18
SOP common module of created US image SOP instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	(0008,0008)	CS	ISO_IR 100	ALWAYS	AUTO
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.6.1	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI		ALWAYS	AUTO

8.1.1.9 US Multi-frame Image Modules

Table 8.1-19
Cine module of created US multi-frame image SOP instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame Time	(0018,1063)	DS		ALWAYS	AUTO
Start Trim	(0008,2142)	IS		ALWAYS	AUTO
Stop Trim	(0008,2143)	IS		ALWAYS	AUTO
Recommended Display Frame Rate	(0008,2144)	IS		ALWAYS	CONFIG
Cine Rate	(0018,0040)	IS		ALWAYS	CONFIG
Frame Delay	(0018,1066)	DS		ALWAYS	AUTO
Effective Duration	(0018,0072)	DS		ALWAYS	AUTO
Actual Frame Duration	(0018,1242)	IS		ALWAYS	AUTO

Table 8.1-20
Multi-frame module of created US multi-frame image SOP instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Frames	(0028,0008)	IS		ALWAYS	USER
Frame Increment Pointer	(0028,0009)	AT		ALWAYS	AUTO

Table 8.1-21
US image module of created US multi-frame image SOP instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	(0028,0002)	US	3	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	RGB or YBR_FULL422	ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
High Bit	(0028,0102)	US	7	ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	0	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0	ALWAYS	AUTO
Frame Increment Pointer	(0028,0009)	AT		ALWAYS	AUTO
Image Type	(0008,0008)	CS		EMPTY	AUTO
Lossy Image Compression	(0028,2110)	CS		ANAP	AUTO
Number of Stages	(0008,2124)	IS		ANAP	AUTO
Number of Views in Stage	(0008,212A)	IS		ANAP	AUTO
Ultrasound Color Data Present	(0028,0014)	US	1	ALWAYS	AUTO
Stage Name	(0008,2120)	SH		ANAP	AUTO
Stage Number	(0008,2122)	IS		ANAP	AUTO
View Name	(0008,2127)	SH		ANAP	AUTO
View Number	(0008,2128)	IS		ANAP	AUTO
Heart Rate	(0008,1088)	IS		ANAP	AUTO
Transducer Type	(0018,6031)	CS		ALWAYS	AUTO

Table 8.1-22
SOP common module of created US multi-frame image SOP instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	(0008,0008)	CS	ISO_IR 100	ALWAYS	AUTO
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.3.1	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI		ALWAYS	AUTO

8.1.1.10 Enhanced SR Modules

Table 8.1-23
SR document series module of created enhanced SR SOP instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	SR	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS		ALWAYS	AUTO
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ		VNAP	AUTO
>Referenced SOP Class UID	(0008,1150)	UI		ANAP	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI		ANAP	AUTO

Table 8.1-24
SR document general module of created enhanced SR SOP instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS		ALWAYS	AUTO
Completion Flag	(0040,A491)	CS	COMPLETE	ALWAYS	AUTO
Verification Flag	(0040,A493)	CS	UNVERIFIED	ALWAYS	AUTO
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO

Table 8.1-25
SOP common module of created enhanced SR SOP instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	(0008,0008)	CS	ISO_IR 100	ALWAYS	AUTO
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.88.22	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI		ALWAYS	AUTO

8.1.1.10.1 Nemio MX Unit Measurement

Table 8.1-26

M-Mode Aortic Valve measurement

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
RVOTD	TSBus	02350003	RVOTD	SRT	T-35400	Aortic Valve												
AOD	LN	18015-8.	Aortic Root Diameter	SRT	T-35400	Aortic Valve							SRT	F-32011	End Diastole			
LAD	TSBus	02350005	Left atrial diameter	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			
AVD	TSBus	02350006	Aortic valve diameter	SRT	T-35400	Aortic Valve							SRT	F-32011	End Diastole			
ET	LN	18041-4	Aortic Valve Ejection Time	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			

Table 8.1-27
Doppler Mode Aortic Valve measurement

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
AoV VTI	LN	20354-7	Velocity Time Integral	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			
AoV VM	LN	11692-1	Time averaged peak velocity	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			
AoV VP	LN	11726-7	Peak Velocity	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			
AoV MPG	LN	122197	Gradient pressure, average	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			
AoV PPG	DCM	122198	Gradient Pressure, peak	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			
AoV Vel	TSBus	0259000F	AoV Vel	SRT	T-35400	Aortic Valve							SRT	F-32011	End Diastole			
AoV PG	TSBus	02590011	AoV PG	SRT	T-35400	Aortic Valve							SRT	F-32011	End Diastole			
LVOT VTI	LN	20354-7	Velocity Time Integral	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			
LVOT VM	LN	11692-1	Time averaged peak velocity	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			
LVOT VP	LN	11726-7	Peak Velocity	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			
LVOT MPG	DCM	122197	Gradient Pressure, average	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			
LVOT PPG	DCM	122198	Gradient Pressure, Peak	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			
LVOT Vel	TSBus	0259000D	LVOT Vel	SRT	T-35400	Aortic Valve							SRT	F-32011	End Diastole			
LVOT PG	DCM	122198	Gradient pressure, peak	SRT	T-35400	Aortic Valve							SRT	F-32011	End Diastole			
LVOT Diam	SRT	M02550	Diameter	SRT	T-35400	Aortic Valve							SRT	109070	End Systole			
HR	LN	8867-4	Heart Rate	SRT	T-35400	Aortic Valve							-	-	-			

Table 8.1-28
Doppler Mode Aortic Regurgitation measurement

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
AR Vmax	TSBus	0259001A	AR Vmax	SRT	T-35400	Aortic Valve							SRT	F-32011	End Diastole			
AR Ved	TSBus	0259001B	AR Vmax	SRT	T-35400	Aortic Valve							SRT	F-32011	End Diastole			
DcT	TSBus	02590022	DoT	SRT	T-35400	Aortic Valve							SRT	F-32011	End Diastole			
Decel Rate	TSBus	0259001C	DecelRate	SRT	T-35400	Aortic Valve							SRT	F-32011	End Diastole			

Table 8.1-29
Doppler Mode Tricuspid Measurement

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
TV VTI	LN	20354-7	Velocity Time Integral	SRT	T-35100	Tricuspid Valve												
TV VM	LN	11692-1	Time averaged peak velocity	SRT	T-35100	Tricuspid Valve												
TV VP	LN	11726-7	Peak Systolic Velocity	SRT	T-35100	Tricuspid Valve												
TV MPG	DCM	122197	Gadient Pressure,Aaverage	SRT	T-35100	Tricuspid Valve												
TV PPG	DCM	122198	Gradient Pressure, peak	SRT	T-35100	Tricuspid Valve												
TV Vel	LN	18031-5	Tricuspid Valve E Wave peak velocity	SRT	T-35100	Tricuspid Valve												
TV PG	TSBus	025B0011	TV PG	SRT	T-35100	Tricuspid Valve												

Table 8.1-30
Doppler Mode Tricuspid Regurgitation Measurement

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
TR VTI	LN	20354-7	Velocity Time Integral	SRT	T-35100	Tricuspid Valve												
TR VM	LN	11692-1	Time averaged peak velocity	SRT	T-35100	Tricuspid Valve												
TR VP	LN	11726-7	Peak Systolic Velocity	SRT	T-35100	Tricuspid Valve												
TR MPG	DCM	122197	Gadient Pressure,Aaverag e	SRT	T-35100	Tricuspid Valve												
TR PPG	DCM	122198	Gradient Pressure, Peak	SRT	T-35100	Tricuspid Valve												
RA Press	TSBus	025B0012	Estimated right atrial pressure	SRT	T-35100	Tricuspid Valve												

Table 8.1-31
2D Mode LV Biplane

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
LVALd	LN	G-0375	Left Ventricular Diastolic Area	SRT	T-32600	Left Ventricle										DCM	125204	Area-Length Biplane
LVAMd	LN	G-0375	Left Ventricular diastolic Area	SRT	T-32600	Left Ventricle										DCM	125204	Area-Length Biplane
LVIDd	TSBus	020B0005	shot-axis diameter	SRT	T-32600	Left Ventricle										DCM	125204	Area-Length Biplane
LVALs	SRT	G-0374	Left Ventricular Systolic Area	SRT	T-32600	Left Ventricle										DCM	125204	Area-Length Biplane
LVAMs	SRT	G0374	Left Ventricular Systolic Area	SRT	T-32600	Left Ventricle										DCM	125204	Area-Length Biplane
LVIDs	TSBus	020B0008	shot-axis diameter	SRT	T-32600	Left Ventricle										DCM	125204	Area-Length Biplane
EDV	LN	18026-5	Left Ventricular End Diastolic Volume	SRT	T-32600	Left Ventricle										DCM	125204	Area-Length Biplane
ESV	LN	18148-7	Left Ventricular End Systolic Volume	SRT	T-32600	Left Ventricle										DCM	125204	Area- Length Biplane
SV	SRT	F-32120	Stroke volume	SRT	T-32600	Left Ventricle										DCM	125204	Area-Length Biplane
CO	SRT	F-32100	Cardiac Output	SRT	T-32600	Left Ventricle										DCM	125204	Area-Length Biplane
EF	LN	18043-0	Left Ventricular Ejection Fraction	SRT	T-32600	Left Ventricle										DCM	125204	Area-Length Biplane
SI	SRT	F-00078	SV Index	SRT	T-32600	Left Ventricle										DCM	125204	Area-Length Biplane
CI	SRT	F-32110	CO Index	SRT	T-32600	Left Ventricle										DCM	125204	Area-Length Biplane
HR	LN	8867-4	Heart rate	SRT	T-32600	Left Ventricle												

Table 8.1-32
2D Mode LV Single Plane

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
LVALd	SRT	G-0375	Left Ventricular Diastolic Area	SRT	T-32600	Left Ventricle										DCM	125205	Area-Length Single Plane
LVLd	LN	18077-8	Left Ventricle diastolic major axis	SRT	T-32600	Left Ventricle										DCM	125205	Area-Length Single Plane
LVALs	SRT	G-0374	Left Ventricular Systolic Area	SRT	T-32600	Left Ventricle										DCM	125205	Area-Length Single Plane
LVLs	LN	18076-0	Left Ventricle systolic major axis	SRT	T-32600	Left Ventricle										DCM	125205	Area-Length Single Plane
EDV	LN	18026-5	Left Ventricular End Diastolic Volume	SRT	T-32600	Left Ventricle										DCM	125205	Area-Length Single Plane
ESV	LN	18148-7	Left Ventricular End systolic Volume	SRT	T-32600	Left Ventricle										DCM	125205	Area-Length Single Plane
SV	SRT	F-32120	Stroke volume	SRT	T-32600	Left Ventricle										DCM	125205	Area-Length Single Plane
CO	SRT	F-32100	Cardiac Output	SRT	T-32600	Left Ventricle										DCM	125205	Area-Length Single Plane
EF	LN	18043-0	Left Ventricular Ejection Fraction	SRT	T-32600	Left Ventricle										DCM	125205	Area-Length Single Plane
CI	SRT	F-32110	CO Index	SRT	T-32600	Left Ventricle										DCM	125205	Area-Length Single Plane
HR	LN	8867-4	Heart Rate															

Table 8.1-33
2D Mode LV Bullet

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
LVAMd	LN	29436-3	Left Ventricle Internal End Diastolic Dimension	SRT	T-32600	Left Ventricle										TSBus	03500000	Bullet Method
LVLd	LN	18077-8	Left Ventricle diastolic major axis	SRT	T-32600	Left Ventricle										TSBus	03500000	Bullet Method
LVAMs	LN	29438-9	Left Ventricle Internal Systolic Dimension	SRT	T-32600	Left Ventricle										TSBus	03500000	Bullet Method
LVLs	LN	18076-0	Left Ventricle systolic major axis	SRT	T-32600	Left Ventricle										TSBus	03500000	Bullet Method
EDV	LN	18026-5	Left Ventricular End Diastolic Volume	SRT	T-32600	Left Ventricle										TSBus	03500000	Bullet Method
ESV	LN	18148-7	Left Ventricular End systolic Volume	SRT	T-32600	Left Ventricle										TSBus	03500000	Bullet Method
SV	SRT	F-32120	Stroke volume	SRT	T-32600	Left Ventricle										TSBus	03500000	Bullet Method
CO	SRT	F-32100	Cardiac Output	SRT	T-32600	Left Ventricle										TSBus	03500000	Bullet Method
EF	LN	18043-0	Left Ventricular Ejection Fraction	SRT	T-32600	Left Ventricle										TSBus	03500000	Bullet Method
SI	SRT	F-00078	SV Index	SRT	T-32600	Left Ventricle										TSBus	03500000	Bullet Method
CI	SRT	F-32110	CO Index	SRT	T-32600	Left Ventricle										TSBus	03500000	Bullet Method
HR	LN	8867-4	Heart Rate															

Table 8.1-34
2D Mode LV Simpson

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
LVLd	LN	18077-8	Left Ventricle diastolic major axis	SRT	T-32600	Left Ventricle												
LVAMd	LN	29436-3	Left Ventricle Internal End Diastolic Dimension	SRT	T-32600	Left Ventricle												
LVAPd	TSBus	020F0005	LVAPd	SRT	T-32600	Left Ventricle												
LVLs	LN	18076-0	Left Ventricle systolic major axis	SRT	T-32600	Left Ventricle												
LVAMs	LN	29438-9	Left Ventricle Internal Systolic Dimension	SRT	T-32600	Left Ventricle												
LVAPs	TSBus	020F0008	LVAPs	SRT	T-32600	Left Ventricle												
EDV	LN	18026-5	Left Ventricular End Diastolic Volume	SRT	T-32600	Left Ventricle							SRT	F-32011	End Diastole			
ESV	LN	18148-7	Left Ventricular End Systolic Volume	SRT	T-32600	Left Ventricle							SRT	109070	End Systole			
SV	SRT	F-32120	Stroke volume	SRT	T-32600	Left Ventricle												
CO	SRT	F-32100	Cardiac Output	SRT	T-32600	Left Ventricle												
EF	LN	18043-0	Left Ventricular Ejection Fraction	SRT	T-32600	Left Ventricle												
SI	SRT	F-00078	SV Index	SRT	T-32600	Left Ventricle												
HR	LN	8867-4	Heart rate															

Table 8.1-35
2D Mode LV Simpson Singleplane

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
L(d)	LN	18077-8	Left Ventricle diastolic major axis	SRT	T-32600	Left Ventricle												
L(s)	LN	18076-0	Left Ventricle systolic major axis	SRT	T-32600	Left Ventricle												
A(d)	LN	29436-3	Left Ventricle Internal End Diastolic Dimension	SRT	T-32600	Left Ventricle												
A(s)	LN	29438-9	Left Ventricle Internal Systolic Dimension	SRT	T-32600	Left Ventricle												
EDV	LN	18026-5	Left Ventricular End Diastolic Volume	SRT	T-32600	Left Ventricle							SRT	F-32011	End Diastole			
ESV	LN	18148-7	Left Ventricular End Systolic Volume	SRT	T-32600	Left Ventricle							SRT	109070	End Systole			
SV	SRT	F-32120	Stroke volume	SRT	T-32600	Left Ventricle												
CO	SRT	F-32100	Cardiac volume	SRT	T-32600	Left Ventricle												
EF	LN	18043-0	Left Ventricular Ejection Fraction	SRT	T-32600	Left Ventricle												
SI	SRT	F-00078	SV Index	SRT	T-32600	Left Ventricle												
CI	SRT	F-32110	CO Index	SRT	T-32600	Left Ventricle												
HR	LN	8867-4	Heart rate															

Table 8.1-36
2D Mode LV Simpsons Biplane

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
L(d)4	LN	18077-8	4 chamber Left Ventricle diastolic major axis	SRT	T-32600	Left Ventricle				SRT	G-A19C	Apical four chamber	SRT	F-32011	End Diastole			
L(s)4	LN	18076-0	4 chamber Left Ventricle systolic major axis	SRT	T-32600	Left Ventricle				SRT	G-A19C	Apical four chamber	SRT	109070	End Systole			
A(d)4	SRT	G-0375	4 chamber Left Ventricular Diastolic Area	SRT	T-32600	Left Ventricle				SRT	G-A19C	Apical four chamber	SRT	F-32011	End Diastole			
A(s)4	SRT	G-0375	4 chamber Left Ventricular systolic Area	SRT	T-32600	Left Ventricle				SRT	G-A19C	Apical four chamber	SRT	109070	End Systole			
SI4	SRT	F-00078	SV Index for 4 chamber view	SRT	T-32600	Left Ventricle				SRT	G-A19C	Apical four chamber						
CI4	SRT	F-32110	CO Index for 4 chamber view	SRT	T-32600	Left Ventricle				SRT	G-A19C	Apical four chamber						
L(d)2	LN	18077-8	2 chamber Left Ventricle diastolic major axis	SRT	T-32600	Left Ventricle				SRT	G-A19B	Apical two chamber	SRT	F-32011	End Diastole			
L(s)2	LN	18076-0	2 chamber Left Ventricle systolic major axis	SRT	T-32600	Left Ventricle				SRT	G-A19B	Apical two chamber	SRT	109070	End Systole			
A(d)2	SRT	G-0375	2 chamber Left Ventricular Diastolic Area	SRT	T-32600	Left Ventricle				SRT	G-A19B	Apical two chamber	SRT	F-32011	End Diastole			

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
A(s)2	SRT	G-0375	2 chamber Left Ventricular systolic Area	SRT	T-32600	Left Ventricle				SRT	G-A19B	Apical two chamber	SRT	109070	End Systole			
SI2	SRT	F-00078	SV Index for 2 chamber view	SRT	T-32600	Left Ventricle				SRT	G-A19B	Apical two chamber						
CI2	SRT	F-32110	CO Index for 2 chamber view	SRT	T-32600	Left Ventricle				SRT	G-A19B	Apical two chamber						
EDV	LN	18026-5	Left Ventricular End Diastolic Volume	SRT	T-32600	Left Ventricle							SRT	F-32001	End Diastole			
ESV	LN	18148-7	Left Ventricular End Systolic Volume										SRT	109070	End Systole			
SV	SRT	F-32120	Stroke volume															
CO	SRT	F-32100	Cardiac Output															
EF	LN	18043-0	Left Ventricular Ejection Fraction															
SI	SRT	F-00078	SV Index															
CI	SRT	F-32110	CO Index															
EDV2	LN	18026-5	2 chamber Left Ventricular End Diastolic Volume							SRT	G-A19B	Apical two chamber	SRT	F-32001	End Diastole			
ESV2	LN	18148-7	2 chamber Left Ventricular End Systolic Volume							SRT	G-A19B	Apical two chamber	SRT	109070	End Systole			
SV2	SRT	F-32120	Stroke volume for 2 chanber							SRT	G-A19B	Apical two chamber						

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
CO2	SRT	F-32100	Cardiac Output for 2 chamber							SRT	G-A19B	Apical two chamber						
EF2	LN	18043-0	Left Ventricular Ejection Fraction for 2 chamber							SRT	G-A19B	Apical two chamber						
EDV4	LN	18026-5	4 chamber Left Ventricular End Diastolic Volume							SRT	G-A19C	Apical four chamber	SRT	F-32011	End Diastole			
ESV4	LN	18148-7	4 chamber Left Ventricular End Systolic Volume							SRT	G-A19C	Apical four chamber	SRT	109070	End Systole			
SV4	SRT	F-32120	Stroke volume for 4 chanber							SRT	G-A19C	Apical four chamber						
CO4	SRT	F-32100	Cardiac Output for 4 chamber							SRT	G-A19C	Apical four chamber						
EF4	LN	18043-0	Left Ventricular Ejection Fraction 4 chamber							SRT	G-19C	Apical four chamber						
diffD(2ch)	TSBus	02130026	diffD(2ch)															
diffS(2ch)	TSBus	02130028	diffS(2ch)															
HR	LN	8867-4	Heart rate															

Table 8.1-37
2D Mode LV Cube

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
IVSTd	LN	18154-5	Interventricular Septum Diastolic Thickness	SRT	T-32600	Left Ventricle												
LVIDd	TSBus	02030004	Short-axis diameter at end diastole	SRT	T-32600	Left Ventricle												
LVPWd	LN	18152-9	Left Ventricle Posterior Wall Diastolic Thickness	SRT	T-32600	Left Ventricle												
LVIDs	TSBus	02030007	Short-axis diameter at end systole	SRT	T-32600	Left Ventricle												
EDV	LN	18026-5	Left Ventricular End Diastolic Volume	SRT	T-32600	Left Ventricle							SRT	F-32011	End Diastole	DCM	125206	Cube Method
ESV	LN	18148-7	Left Ventricular End Systolic Volume	SRT	T-32600	Left Ventricle							SRT	109070	End Systole	DCM	125206	Cube Method
SV	SRT	F-32120	Stroke volume	SRT	T-32600	Left Ventricle										DCM	125206	Cube Method
CO	SRT	F-32100	Cardiac Output	SRT	T-32600	Left Ventricle										DCM	125206	Cube Method
EF	LN	18043-0	Left Ventricular Ejection Fraction	SRT	T-32600	Left Ventricle										DCM	125206	Cube Method
FS	LN	18051-3	Left Ventricular Fractional Shortening	SRT	T-32600	Left Ventricle										DCM	125206	Cube Method
SI	SRT	F-00078	SV Index	SRT	T-32600	Left Ventricle										DCM	125206	Cube Method
CI	SRT	F-32110	CO Index	SRT	T-32600	Left Ventricle										DCM	125206	Cube Method
HR	LN	8867-4	Heart rate	SRT	T-32600	Left Ventricle												

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
IVSTs	LN	18158-6	Interventricular Septum Systolic Thickness	SRT	T-32600	Left Ventricle												
LVPWs	LN	18156-0	Left Ventricle Posterior Wall Systolic Thickness	SRT	T-32600	Left Ventricle												

Table 8.1-38
2D Mode LV Teichholz

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
IVSTd	LN	18154-5	Interventricular Septum Diastolic Thickness	SRT	T-32600	Left Ventricle												
LVIDd	TSBus	02050004	Short-axis diameter at end diastole	SRT	T-32600	Left Ventricle												
LVPWd	LN	18152-9	Left Ventricle Posterior Wall Diastolic Thickness	SRT	T-32600	Left Ventricle												
IVSTs	LN	18158-6	Interventricular Septum Systolic Thickness	SRT	T-32600	Left Ventricle												
LVIDs	TSBus	02050007	Short-axis diameter at end systole	SRT	T-32600	Left Ventricle												
LVPWs	LN	18156-0	Left Ventricle Posterior Wall Systolic Thickess	SRT	T-32600	Left Ventricle												
EDV	LN	18026-5	Left Ventricular End Diastolic Volume	SRT	T-32600	Left Ventricle							SRT	F-32011	End Diastole	DCM	125209	Teichholz
ESV	LN	18148-7	Left Ventricular End Systolic Volume	SRT	T-32600	Left Ventricle							SRT	109070	End Systole	DCM	125209	Teichholz
SV	SRT	F-32120	Stroke volume	SRT	T-32600	Left Ventricle										DCM	125209	Teichholz
CO	SRT	F-32100	Cardiac Output	SRT	T-32600	Left Ventricle										DCM	125209	Teichholz
EF	LN	18043-0	Left Ventricular Ejection Fraction	SRT	T-32600	Left Ventricle										DCM	125209	Teichholz
FS	LN	18051-3	Left Ventricular FractionalShortening	SRT	T-32600	Left Ventricle										DCM	125209	Teichholz
SI	SRT	F-00078	SV Index	SRT	T-32600	Left Ventricle										DCM	125209	Teichholz
CI	SRT	F-32110	CO Index	SRT	T-32600	Left Ventricle										DCM	125209	Teichholz

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
HR	LN	8867-4	Heart rate															

Table 8.1-39
2D Mode LV Gibson

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
IVSTd	LN	18154-5	Interventricular Septum Diastolic Thickness	SRT	T-32600	Left Ventricle												
LVIDd	TSBus	02070004	Short-axis diameter at end diastole	SRT	T-32600	Left Ventricle												
LVPWd	LN	18152-9	Left Ventricle Posterior Wall Diastolic Thickness	SRT	T-32600	Left Ventricle												
IVSTs	LN	18158-6	Interventricular Septum Systolic Thickness	SRT	T-32600	Left Ventricle												
LVIDs	TSBus	02070007	Short-axis diameter at end systole	SRT	T-32600	Left Ventricle												
LVPWs	LN	18156-0	Left Ventricle Posterior Wall Systolic Thickness	SRT	T-32600	Left Ventricle												
EDV	LN	18026-5	Left Ventricular End Diastolic Volume	SRT	T-32600	Left Ventricle							SRT	F-32011	End Diastole			
ESV	LN	18148-7	Left Ventricular End Systolic Volume	SRT	T-32600	Left Ventricle												
SV	SRT	F-32120	Stroke volume	SRT	T-32600	Left Ventricle												
CO	SRT	F-32100	Cardiac Output	SRT	T-32600	Left Ventricle												
EF	LN	18043-0	Left Ventricular Ejection Fraction	SRT	T-32600	Left Ventricle												
FS	LN	18051-3	Left Ventricular Fractional Shortening	SRT	T-32600	Left Ventricle												
SI	SRT	F-00078	SV Index	SRT	T-32600	Left Ventricle												
CI	SRT	F-32110	CO Index															

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
HR	LN	8867-4	Heart rate															

Table 8.1-40
M Mode LV Cube

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
IVSTd	LN	18154-5	Interventricular Septum Diastolic Thickness	SRT	T-32600	Left Ventricle												
LVIDd	TSBus	02030004	Short-axis diameter at end diastole	SRT	T-32600	Left Ventricle												
LVPWd	LN	18152-9	Left Ventricle Posterior Wall Thickness	SRT	T-32600	Left Ventricle												
IVSTs	LN	18158-6	Interventricular Septum Systolic Thickness	SRT	T-32600	Left Ventricle												
LVIDs	TSBus	02030007	Short-axis diameter at end systole	SRT	T-32600	Left Ventricle												
LVPWs	LN	18156-0	Left Ventricle Posterior Wall Systolic Thickness	SRT	T-32600	Left Ventricle												
EDV	LN	18026-5	Left Ventricular End Diastolic Volume	SRT	T-32600	Left Ventricle							SRT	F-32011	End Diastole	DCM	125206	Cube Method
ESV	LN	18148-7	Left Ventricular End Systolic Volume	SRT	T-32600	Left Ventricle							SRT	109070	End Systole	DCM	125206	Cube Method
SV	SRT	F-32120	Stroke volume	SRT	T-32600	Left Ventricle										DCM	125206	Cube Method
CO	SRT	F-32100	Cardiac Output	SRT	T-32600	Left Ventricle										DCM	125206	Cube Method
EF	LN	18043-0	Left Ventricular Ejection Fraction	SRT	T-32600	Left Ventricle										DCM	125206	Cube Method
FS	LN	18051-3	Left Ventricular Fractional Shortening	SRT	T-32600	Left Ventricle										DCM	125206	Cube Method
SI	SRT	F-00078	SV Index	SRT	T-32600	Left Ventricle										DCM	125206	Cube Method
CI	SRT	F-32110	CO Index													DCM	125206	Cube Method

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
MVCF	TSBus	02030014	MVCF															

Table 8.1-41
M Mode LV Teichholz

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
IVSTd	LN	18154-5	Interventricular Septum Diastolic Thickness	SRT	T-32600	Left Ventricle												
LVIDd	TSBus	02050004	Short-axis diameter at end diastole	SRT	T-32600	Left Ventricle												
LPVWd	LN	18152-9	Left Ventricle Posterior Wall Diastolic Thickness	SRT	T-32600	Left Ventricle												
IVSTs	LN	18158-6	Interventricular Septum Systolic Thickness	SRT	T-32600	Left Ventricle												
LVIDs	TSBus	02050007	Short-axis diameter at end systole	SRT	T-32600	Left Ventricle												
LVPWs	LN	18156-0	Left Ventricle Posterior Wall Systolic Thickness	SRT	T-32600	Left Ventricle												
EDV	LN	18026-5	Left Ventricular End Diastolic Volume	SRT	T-32600	Left Ventricle							SRT	F-32011	End Diastole	DCM	125206	Teichholz
ESV	LN	18148-7	Left Ventricular End Systolic Volume	SRT	T-32600	Left Ventricle							SRT	109070	End Systole	DCM	125209	Teichholz
SV	SRT	F-32120	Stroke volume	SRT	T-32600	Left Ventricle										DCM	125209	Teichholz
CO	SRT	F-32100	Cardiac Output	SRT	T-32600	Left Ventricle										DCM	125209	Teichholz
EF	LN	18043-0	Left Ventricular Ejection Fraction	SRT	T-32600	Left Ventricle										DCM	125206	Teichholz
FS	LN	18051-3	Left Ventricular Fractional Shortening	SRT	T-32600	Left Ventricle										DCM	125209	Teichholz
SI	SRT	F-00078	SV Index	SRT	T-32600	Left Ventricle										DCM	125209	Teichholz
CI	SRT	F-32110	CO Index	SRT	T-32600	Left Ventricle										DCM	125209	Teichholz

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
MVCF	TSBus	02050014	MVCF	SRT	T-32600	Left Ventricle												
HR	LN	8867-4	Heart rate															

Table 8.1-42
M Mode LV Gibson

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
IVSTd	LN	18154-5	Interventricular Septum Diastolic Thickness	SRT	T-32600	Left Ventricle												
LVIDd	TSBus	02070004	Short-axis diameter at end diastole	SRT	T-32600	Left Ventricle												
LVPWd	LN	18152-9	Left Ventricle Posterior Wall Diastolic Thickness	SRT	T-32600	Left Ventricle												
IVSTs	LN	18158-6	Interventricular Septum Systolic Thickness	SRT	T-32600	Left Ventricle												
LVIDs	TSBus	02070007	Short-axis diameter at end systole	SRT	T-32600	Left Ventricle												
LVPWs	LN	18156-0	Left Ventricle Posterior Wall Systolic Thickness	SRT	T-32600	Left Ventricle												
EDV	LN	18026-5	Left Ventricular End Diastolic Volume	SRT	T-32600	Left Ventricle							SRT	F-32011	End Diastole			
ESV	LN	18148-7	Left Ventricular End Systolic Volume	SRT	T-32600	Left Ventricle							SRT	109070	End Systole			
SV	SRT	F-32120	Stroke volume	SRT	T-32600	Left Ventricle												
CO	SRT	F-32100	Cardiac Output	SRT	T-32600	Left Ventricle												
EF	LN	18043-0	Left Ventricular Ejection Fraction	SRT	T-32600	Left Ventricle												

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
FS	LN	18051-3	Left Ventricular Fractional Shortening	SRT	T-32600	Left Ventricle												
SI	SRT	F-00078	SV Index	SRT	T-32600	Left Ventricle												
CI	SRT	F-32110	CO Index															
MVCF	TSBus	02070014	MVCF															

Table 8.1-43
Doppler Mode Pulmonary valve

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
PV VTI	LN	20354-7	Velocity Time Integral	SRT	T-35200	Pulmonic Valve							SRT	109070	End Systole			
PV VM	LN	11692-1	Time averaged peak velocity	SRT	T-35200	Pulmonic Valve							SRT	109070	End Systole			
PV VP	LN	11726-7	Peak Systolic Velocity	SRT	T-35200	Pulmonic Valve							SRT	109070	End Systole			
PV MPG	DCM	122197	Gradient pressure, average	SRT	T-35200	Pulmonic Valve							SRT	109070	End Systole			
PV PPG	DCM	122198	Gradient pressure, peak	SRT	T-35200	Pulmonic Valve							SRT	109070	End Systole			
PV Vel	TSBus	025D000D	PV Vel	SRT	T-35200	Pulmonic Valve							SRT	109070	End Systole			
PV PG	TSBus	025D000E	PV PG	SRT	T-35200	Pulmonic Valve							SRT	109070	End Systole			
PV Diam	SRT	M-02550	Diameter	SRT	T-35200	Pulmonic Valve							SRT	109070	End Systole			
RV ET	DCM	122213	Right Ventricular Ejection Time	SRT	T-35200	Pulmonic Valve							SRT	109070	End Systole			
RV AcT	LN	20168-1	Acceleration Time	SRT	T-35200	Pulmonic Valve							SRT	109070	End Systole			
RV PEP	TSBus	025D000C	Doppler-mode time measurement	SRT	T-35200	Pulmonic Valve							SRT	109070	End Systole			
SV	SRT	F-32120	Stroke Volume	SRT	T-35200	Pulmonic Valve												
CO	SRT	F-32110	Cardiac Output	SRT	T-35200	Pulmonic Valve												
SI	SRT	F-00078	SV Index	SRT	T-35200	Pulmonic Valve												
CI	SRT	F-32110	CO Index	SRT	T-35200	Pulmonic Valve												

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
RV AcT/ET	SRT	G-0388	Ratio of Pulmonic Valve Accelaration Time to Ejection	SRT	T-35200	Pulmonic Valve												
RV STI	TSBus	025D0015	P_HT_STI	SRT	T-35200	Pulmonic Valve												
HR	LN	8867-4	Heart rate															

Table 8.1-44
Doppler Pulmonary vein

Label	TID (5203) Echo Measurement $Measurement			TID (5202) Echo Section Finding Site			TID (5202) Echo Section TID (5203) Echo Measurement Image Mode			TID (5203) Echo Measurement Image View			TID (5203) Echo Measurement Cardiac Phase			DTID (300) Measurement Measurement Method		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
S1 Vel	TSBus	025E0003	S1-wave velocity	SRT	T-48581	Pulmonary Venous Structure												
S2 Vel	LN	29450-4	Pulmonary Vein Systolic Peak Velocity	SRT	T-48581	Pulmonary Venous Structure												
D Vel	LN	29451-2	Pulmonary Vein Diastolic Peak Velocity	SRT	T-48581	Pulmonary Venous Structure												
DcT	LN	20217-6	Deceleration time	SRT	T-48581	Pulmonary Venous Structure												
PVA Vel	TSBus	025E000E	AR-wave velocity	SRT	T-48581	Pulmonary Venous Structure												
PVA Dur	SRT	G-038B	Pulmonary Vein A-wave Duration	SRT	T-48581	Pulmonary Venous Structure												
S VTI	SRT	G-038C	Pulmonary Vein S-wave Velocity Time Integral	SRT	T-48581	Pulmonary Venous Structure												
D VTI	SRT	G-038D	Pulmonary Vein D-wave Velocity Time Integral	SRT	T-48581	Pulmonary Venous Structure												
S2/D	LN	29452-0	Pulmonary Vein Systolic to Diastolic Ratio	SRT	T-48581	Pulmonary Venous Structure												
Sys Fract	TSBus	025E000B	PVein_SF	SRT	T-48581	Pulmonary Venous Structure												

Table 8.1-45
2D Mode OB measurements

Label	Measurement			Equation			Laterality			Anatomy Group		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
BPD	LN	11820-8	Biparietal Diameter	LN	33539-8	BPD, Jeanty 1982						
				LN	33138-9	Fetal Trunk Cross-Sectional Area, Osaka 1989						
				LN	11906-5	BPD-Kurtz 1980						
				LN	11907-3	BPD, Sabbagha 1978						
				LN	33081-1	BPD, Mertz 1988						
				LN	33538-0	BPD, Hansmann 1986						
				LN	33083-7	BPD, Rempen 1991						
GA	LN	18185-9	Gestational Age	LN	33087-8	BPD-oo, Chitty 1997						
				LN	33086-0	BPD-oi, Chitty 1997						
				TSBus	03510035	BPD, Shepard						
				LN	33085-2	BPD, Tokyo 1986						
				LN	33138-9	Fetal Trunk Cross-Sectional Area, Osaka 1989						
				LN	33082-9	BPD, Osaka 1989						
				LN	33138-9	Fetal Trunk Cross-Sectional Area, Osaka 1989						
				TSBus	03510032	BPD, ASUM 2001						
				LN	33138-9	Fetal Trunk Cross –Sectional Area, Osaka 1989						
				TSBus	03510033	BPD, JSUM						
				LN	33138-9	Fetal Trunk Cross-Sectional Area, Osaka 1989						
				LN	33138-9	Fetal Trunk Cross-Sectional Area, Osaka 1989						

Label	Measurement			Equation			Laterality			Anatomy Group		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
				LN	33138-9	Fetal Trunk Cross-Sectional Area, Osaka 1989						
				LN	33138-9	Fetal Trunk Cross-Sectional Area, Osaka 1989						
OFD	LN	11851-3	Occipital-Frontal Diameter	TSBus	03510045	OFD, Merz						
				LN	33120-7	OFD, Hansmann 1986						
GA	LN	18185-9	Gestational Age	TSBus	03510044	OFD, Chitty						
HC	LN	11984-2	Head Circumference	LN	11934-7	HC, Jeanty 1984						
				LN	33115-7	HC Merz, 1988						
				LN	33120-7	OFD, Hansmann 1986						
GA	LN	18185-9	Gestational Age	LN	33110-8	HC measured, Chitty 1997						
				LN	33111-6	HC derived, Chitty 1997						
				LN	33109-0	HC, ASUM 2000						
THD	LN	11864-6	Transverse Thoracic Diameter									
GA	Nil											
TAD	LN	11862-0	Tranverse Abdominal Diamter	TSBus	03510048	TAD, Merz						
GA	LN	18185-9										
TTD	LN	11864-6	Transverse Thoracic Diameter									
APAD	LN	11818-2	Anterior-Posterior Abdominal Diameter	TSBus	0351000C	GA APAD Merz						
GA	LN	18185-9	Gestational Age									
APTD	LN	11819-0	Anterior-Posterior Trunk Diameter									

Label	Measurement			Equation			Laterality			Anatomy Group		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
AC	LN	11979-2	Abdominal Circumference	LN	11893-5	AC, Jeanty 1984						
				LN	33075-3	AC, Mertz 1988						
				TSBus	0351002B	AC, Deter 1982						
				TSBus	0351002A	AC, Chitty Pltd						
				TSBus	03510029	AC, Chitty Drvd						
GA	LN	18185-9	Gestational Age	TSBus	0351002E	AC, Shepard						
				LN	11889-3	AC, Campbell 1975						
				TSBus	0351002F	AC, Tokyo 1996						
				TSBus	03510027	AC, Asum2001						
				TSBus	0351002C	AC, Jsum 2003						
FL	LN	11963-6	Femur Length	LN	11923-0	FL, Jeanty 1984						
				LN	11922-2	FL, Hohler 1982						
				TSBus	0351003E	FL, Merz 1991						
				LN	33541-4	FL, Hansmann 1986						
				TSBus	03510040	FL, O-Brien						
				LN	33098-5	FL, Chitty 1997						
GA	LN	18185-9	Gestational Age	LN	33103-3	FL, Tokyo 1986						
				TSBus	0351003B	FL, Asum 2001						
				TSBus	0351004	FL, JSUM						
				LN	33101-7	FL, Osaka 1989						
				TSBus	03510041	FL, Warda 1985						

Label	Measurement			Equation			Laterality			Anatomy Group		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
CRL	LN	11957-8	Crown Rump Length	LN	11917-2	CRL, Jeanty 1984						
				LN	11913-1	CRL, Nelson 1981						
				LN	11914-9	CRL, Robinson 1975						
				LN	33094-4	CRL, Rempen 1991						
				LN	33096-9	CRL, Tokyo 1986						
GA	LN	18185-9	Gestational Age	LN	33093-6	CRL, Osaka 1989						
				LN	33089-4	CRL, ASUM 1991						
				TSBus	0351003A	CRL, JSUM						
Humerus	LN	11966-9	Humerus length									
GA	LN	18185-9	Gestational Age									
Radius	LN	11967-7	Radius length	LN	11939-6	Radius, Merz 1987						
GA	LN	18185-9	Gestational Age									
Ulna	LN	11969-3	Ulna length	LN	11944-6	Ulna, Jeanty 1984						
GA	LN	18185-9	Gestational Age	LN	11945-3	Ulna, Merz 1987						
Tibia	LN	11968-5	Tibia length	LN	11941-2	Tibia, Jeanty 1984						
GA	LN	18185-9	Gestational Age	TSBus	03510049	TL, Merz						
Fibula	LN	11964-4	Fibula length	LN	11918-0	Fibula, Merz 1987						
GA	LN	18185-9	Gestational Age									
CER	LN	11863-8	Trans Cerebellar Diameter	TSBus	03510037	CER, Goldstein						
GA	LN	18185-9	Gestational Age	TSBus	03510038	CER, Hill						
Foot	LN	11965-1	Foot length	LN	11926-3	Foot Length, Mercer 1987						
GA	LN	18185-9	Gestational Age									
GS				LN	11929-7	GS, Rempen 1991						
				LN	11928-9	GS, Hellman 1969						
GA	LN	18185-9	Gestational Age	LN	33108-2	GS, Tokyo 1986						

Label	Measurement			Equation			Laterality			Anatomy Group		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
OOD	LN	11629-3	Outer Orbital Diameter									
GA	LN	18185-9	Gestational Age									
Fetal Kidney	TSBus	03330000	Fetal Kidney length	TSBus	0351001B	GA Fetal Kidney Bertagnoli						
GA	Nil											
HA	TSBus	03310000	Head Area	TSBus	0351001C	GA HA Chitty						
GA	LN	18185-9	Gestational Age									
AA	TSBus	03310001	Abdominal Area	TSBus	0351000B	GA AA Chitty						
GA	LN	18185-9	Gestational Age									
FTA	LN	33068-8	Thoracic Area									
GA	LN	18185-9	Gestational Age									
Clavicle	LN	11962-8	Clavicle length									
TC	LN	11988-3	Thoracic Circumference									
Ocular D	TSBus	03330001	Occular Diameter									
Cist.magna	LN	11860-4	Cisterna Magna									
Cervix Len	LN	11961-0	Cervix Length									
NT	LN	33069-6	Nuchal Translucency									
EFW	LN	11727-5	Estimated Weight									
CI	LN	11823-2	Cephalic Index									
AXT	TSBus	03330002	AXTArea									

Table 8.1-46
Doppler Mode OB measurements

Label	Measurement			Laterality			Anatomy Group		
	CSD	CV	CM	CSD	CV	CM	CSD	CV	CM
Umb A RI	TSBus	03350002	Resistivity Index				SRT	T-F1810	Umbilical Artery
Umb A PI	TSBus	03350000	Pulsatility Index				SRT	T-F1810	Umbilical Artery
MCA RI	TSBus	03350002	Resistivity Index_ED				SRT	T-45600	Middle Cerebral Artery
MCA PI	TSBus	03350000	Pulsatility Index_ED				SRT	T-45600	Middle Cerebral Artery
Rt Uterin RI	TSBus	03350002	Resistivity Index_ED				SRT	T-46820	Uterine Artery
Rt Uterin PI	TSBus	03350000	Pulsatility Index_ED				SRT	T-46820	Uterine Artery
Lt Uterin RI	TSBus	03350002	Resistivity Index_ED				SRT	T-46820	Uterine Artery
Lt Uterin PI	TSBus	03350000	Pulsatility Index_ED				SRT	T-46820	Uterine Artery
Fetal AO RI	TSBus	03350002	Resistivity Index_ED				SRT	T-42000	Aorta
Fetal AO PI	TSBus	03350000	Pulsatility Index_ED				SRT	T-42000	Aorta

8.1.2 Usage of Attributes from received IOD's

No SOP Class specific fields are required.

8.1.3 Attribute Mapping

The relationships between attributes received via Modality Worklist, stored in acquired images and communicated via MPPS are summarized in Table 8.1-47.

Table 8.1-47
Attribute mapping between modality Worklist, Image and MPPS

Modality Worklist	Image IOD	MPPS IOD
--	--	Scheduled Step Attribute Sequence
Study Instance UID	Study Instance UID	>Study Instance UID
Referenced Study Sequence	Referenced Study Sequence	>Referenced Study Sequence
Accession Number	Accession Number	>Accession Number
--	Request Attributes Sequence	--
Requested Procedure ID	>Requested Procedure ID	>Requested Procedure ID
Scheduled Procedure Step ID	>Scheduled Procedure Step ID	>Scheduled Procedure Step ID
Scheduled Procedure Step Description	>Scheduled Procedure Step Description	>Scheduled Procedure Step Description
Scheduled Protocol Code Sequence	>Scheduled Protocol Code Sequence	--
--	Performed Protocol Code Sequence	Performed Protocol Code Sequence
--	Study ID	Study ID
--	Performed Procedure Step ID	Performed Procedure Step ID
--	Performed Procedure Step Start Date	Performed Procedure Step Start Date
--	Performed Procedure Step Start Time	Performed Procedure Step Start Time
--	Performed Procedure Step Description	Performed Procedure Step Description
Requested Procedure Description		
Requested Procedure Code Sequence	Requested Procedure Code Sequence	Requested Procedure Code Sequence
--	Referenced Study Component Sequence	--
--	>Referenced SOP Class UID	SOP Class UID
--	>Referenced SOP Instance UID	SOP Instance UID
--	Protocol Name	Protocol Name
Patient Name	Patient Name	Patient Name
Patient's ID	Patient's ID	Patient's ID
Patient's Birth Date	Patient's Birth Date	Patient's Birth Date
Patient's Sex	Patient's Sex	Patient's Sex
Referring Physician's Name	Referring Physician's Name	--

8.1.4 Coerced/Modified Fields

Not applicable to this product.

8.2 Data dictionary of private attributes

Not applicable to this product.

8.3 Controlled terminology and templates

Not applicable to this product.

8.4 Grayscale image consistency

Not applicable to this product.

8.5 Standard extended/specialized/private SOP classes

Not applicable to this product.

8.6 Private transfer syntaxes

Not applicable to this product.