SONOACE X8 Ultrasound System

DICOM Conformance Statement

Rev 1.0

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see it all
MEDISON

0 COVER PAGE

Company Name: MEDISON CO., LTD

Produce Name: SONOACE X8

Version: 1.0

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1 CONFORMANCE STATEMENT OVERVIEW

SONOACE X8 implements the necessary DICOM services to download worklists from information systems, save acquired US images and Structured Reports to a network storage device, CD or DVD, print to a networked hardcopy device and inform the information system about the work actually done.

Table 1-1 provides an overview of the network services supported by SONOACE X8.

Table 1-1

NETWORK SERVICES

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Ultrasound Image Storage	Yes	No
Ultrasound Multi-frame Image Storage	Yes	No
Comprehensive SR	Yes	No
Workflow Management		
Modality Worklist	Yes	No
Storage Commitment Push Model	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 SONOACE X8.

Table 1-2

MEDIA SERVICES

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
DVD – Rewritable		
STD-US-SC-MF-DVD	Yes	No

2 TABLE OF CONTENTS

3 INTRODUCTION

3.1 REVISION HISTORY

Document Version	Date of Issue	Author	Description
1.0 Draft	March 20, 2007	MEDISON	Draft Versoin
1.0 Draft Check	May 3, 2007	MEDISON	Checking Version of the draft
1.0 Trial-Use Draft	May 3, 2007	MEDISON	

3.2 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.

3.3 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 MEDISON and other vendor's Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [DICOM]. However, it is not guaranteed to ensure by itself 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 MEDISON and non – MEDISON equipment.

- Test procedures should be defined to validate the desired level of connectivity.

- The DICOM Standard will evolve to meet the users' future requirements. MEDISON is activity involved in developing the standard further and therefore reserves the right to make changes to its products or to discontinue their delivery.

3.4 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	DICOM Application Entity
AET	Application Entity Title
ASCE	Association Control Service Element
CD-R	Compact Disk Recordable
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
IOD	(DICOM) Information Object Definition
ISO	International Standard Organization
MPPS	Modality Performed Procedure Step
MSPS	Modality Scheduled Procedure Step
R	Required Key Attribute
O	Optional Key Attribute
PDU	DICOM Protocol Data Unit
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM server)
SOP	DICOM Service-Object Pair
U	Unique Key Attribute

3.5 REFERENCES

[DICOM] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1–3.18, 2007

4 NETWORKING

4.1 IMPLEMENTATION MODEL

4.1.1 Application Data Flow

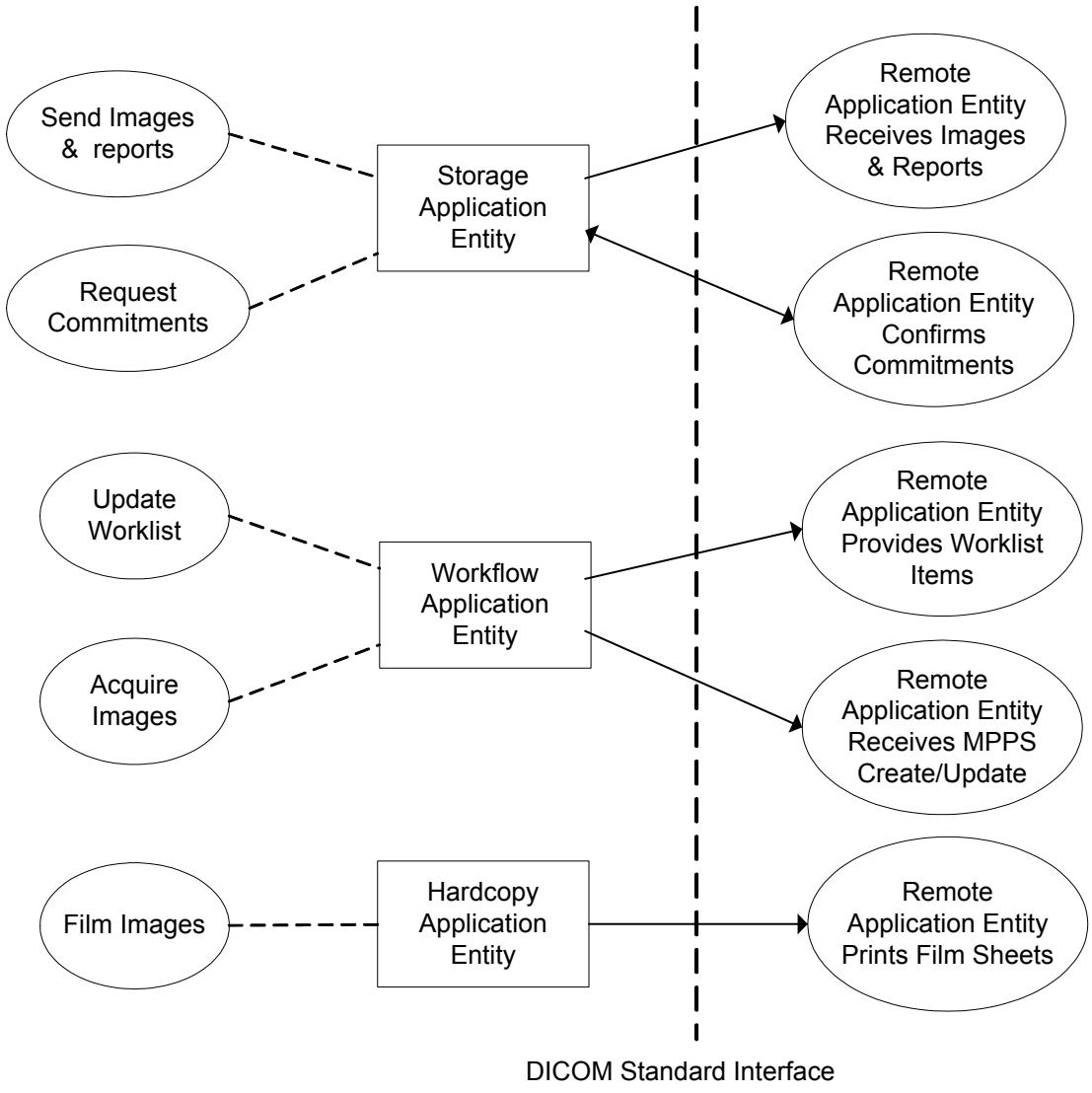

Figure 4.1-1
APPLICATION DATA FLOW DIAGRAM

- The Storage Application Entity sends images, Structured Reports and requests Storage Commitment to a remote AE. It is associated with the local real-world activities “Send Images & Reports” and “Request Commitments”. Methods to send images depend on user configuration, “Batch”, “Send As You Go” or

"Manual". "Manual" mode is performed upon user request for each study or for specific images selected. "Batch" mode starts to send images at End Exam for each study. "Send As You Go" mode starts when the first image is acquired for each study and images are transferred immediately after acquisition.

Structured Reports are only sent at End Exam for each study.

If the remote AE is configured as an archive device, the Storage AE will request Storage Commitment and if a commitment is successfully obtained, it will record this information in the local database and displayed it in the Exam List.

- The Workflow Application Entity receives Worklist information from and sends MPPS information to a remote AE. It is associated with the local real-world activities "Update Worklist" and "Acquire Images". When the "Update Worklist" local real-world activity is performed, the Workflow Application Entity 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 or can be performed automatically at specific time intervals. When the "Acquire Images" local real-world activity is performed, the Workflow Application Entity 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 at End Exam for each study.

- The Hardcopy Application Entity prints images on a remote AE (Printer). It is associated with the local real-world activity "Film Images". Methods to film Images depend on user configuration and are equal to the Sending images' of the Storage Application Entity.

4.1.2 Functional Definition of AE's

4.1.2.1 Functional Definition of Storage Application Entity

The existence of a send-job with associated network destination will activate the Storage AE. An association request is sent to the destination AEs and upon successful negotiation of a Presentation Context, the image transfer is started. If the association cannot be opened, the related send-job is set to an error state and can be restarted by the user via DICOM manager interface or automatically. An automatic retry (retry interval, retry count) can be configured using the Setup/DICOM Menu.

4.1.2.2 Functional Definition of Workflow Application Entity

Worklist Update attempts to download a Worklist from a remote node. If the Workflow AE establishes an association to a remote AE, it will transfer all matching worklist items via the open Association. By default,

Worklist Update use “US” for Modality, current date for Scheduled Procedure Step Start Date and blank for Scheduled Station AE-Title as query parameters. The results will be displayed in a separate list, which will be cleared with the next Worklist Update.

The Workflow AE performs the creation of an MPPS Instance automatically whenever the first image is acquired for each study. The MPPS “Complete” states can only be set by “End Exam” for each study.

4.1.2.3 Functional Definition of Hardcopy Application Entity

The existence of a print-job will activate the Hardcopy AE. An association is established with the printers 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, the print-job will set to an error state and can be restarted by the user via DICOM manager interface or automatically. An automatic retry (retry interval, retry count) can be configured using the Setup/DICOM Menu.

4.1.3 Sequencing of Real-World Activities

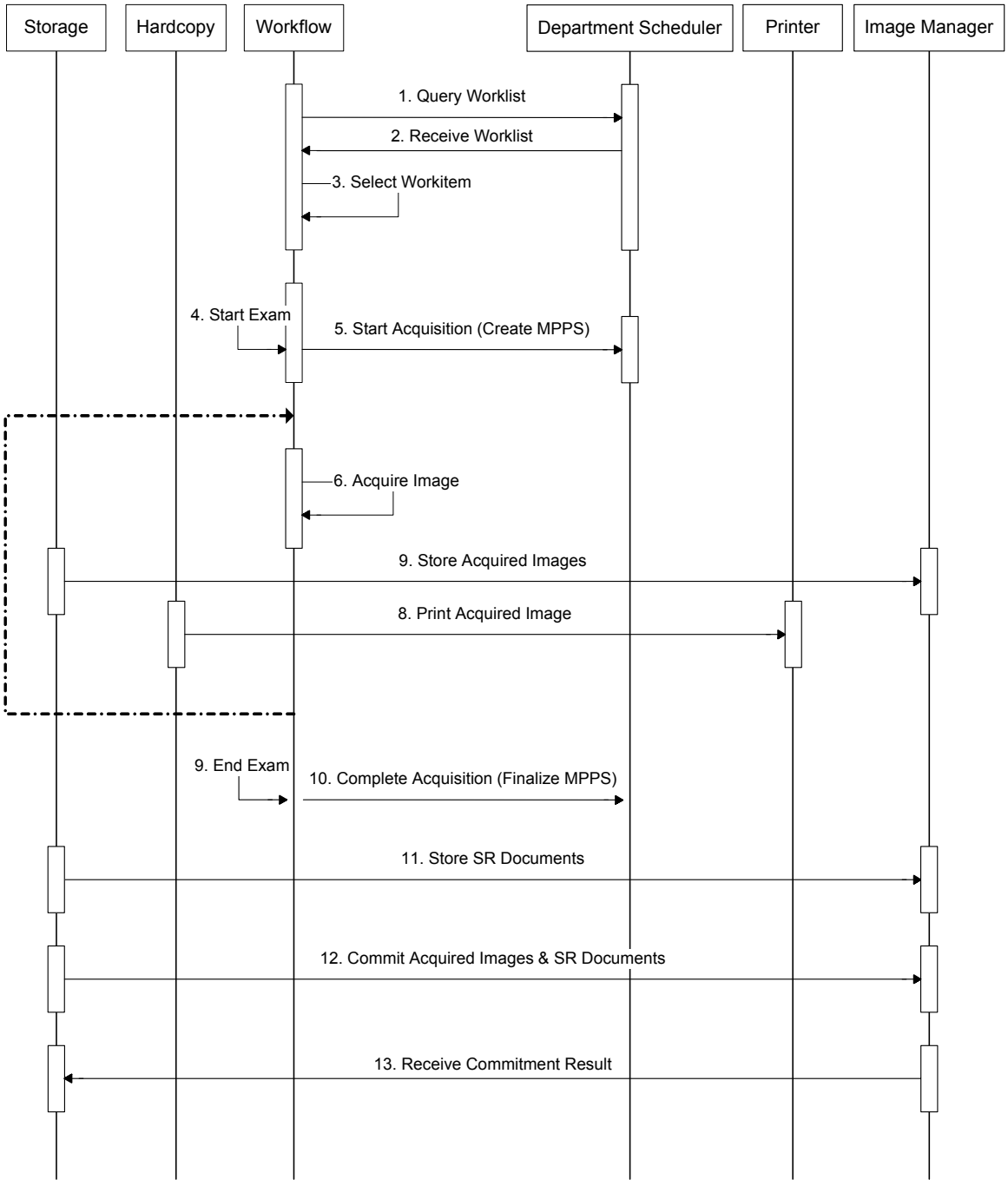

Figure 4.1-2
SEQUENCING CONTRAINTS – SEND AS YOU GO

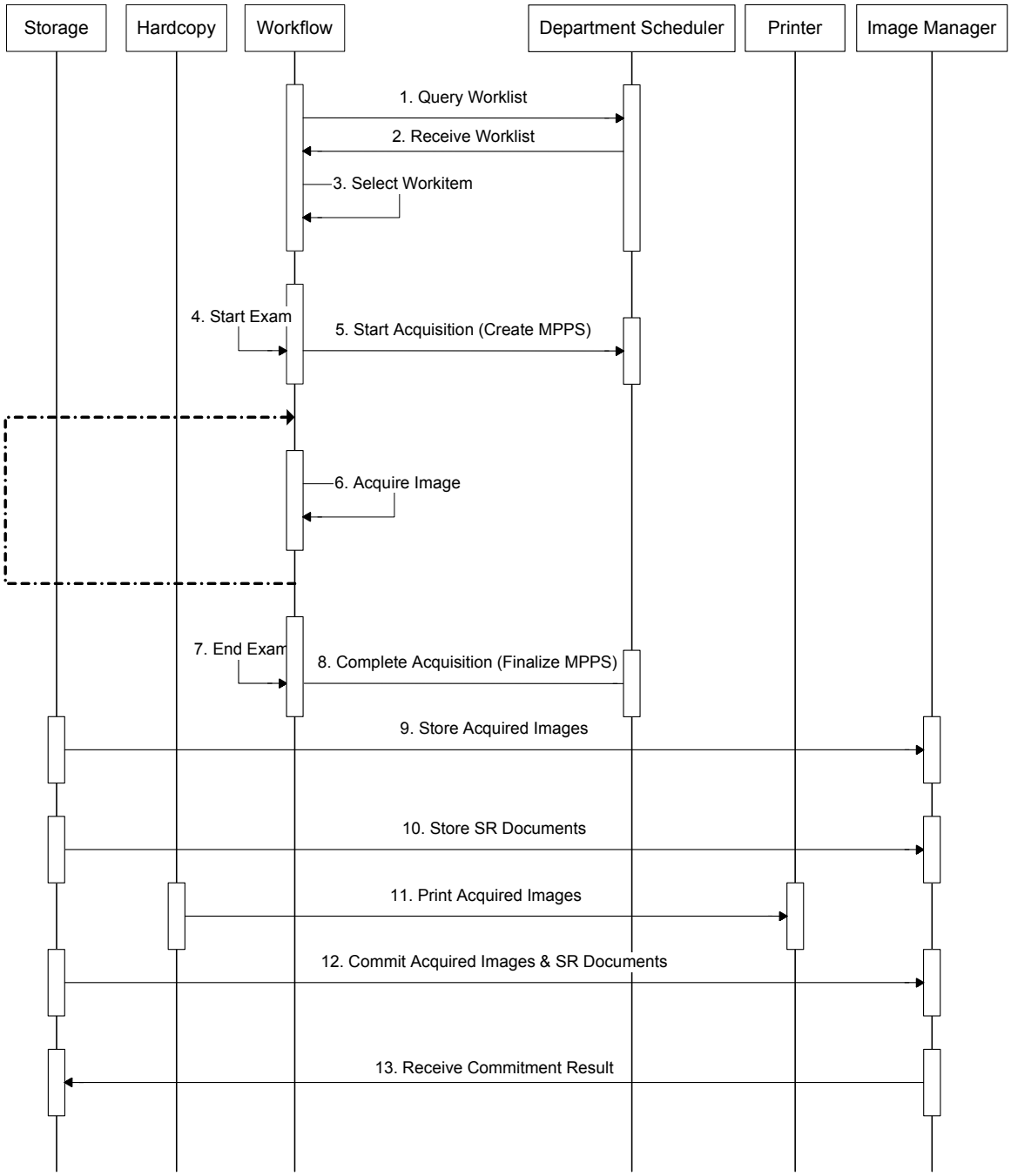

Figure 4.1-3
SEQUENCING CONSTRAINTS – BATCH MODE

Under normal scheduled workflow conditions, the sequencing constraints are illustrated in Figure 4.1-2 and Figure 4.1-3.

Other workflow situations (e.g. unscheduled procedure steps) will have other sequencing constraints. Printing could equally take place after the images acquired have been stored. Printing could be omitted completely if no printer is connected or hardcopies are not required.

4.2 AE SPECIFICATIONS

4.2.1 Storage Application Entity Specification

4.2.1.1 SOP Classes

SONOACE X8 provides Standard Conformance to the following SOP Classes:

Table 4.2-1

SOP CLASSES FOR AE STORAGE

SOP Classes	SOP Class UID	SCU	SCP
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	No
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
Comprehensive Structured Report Storage	1.2.840.10008.5.1.4.1.1.88.33	Yes	No
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No
Verification	1.2.840.10008.1.1	Yes	Yes

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 AE STORAGE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2 Number of Associations

SONOACE X8 can initiate one or more Associations at a time for each destination to which a transfer request is being processed in the active job queue list.

Table 4.2-3

NUMBER OF ASSOCIATIONS INITIATED FOR AE STORAGE

Maximum number of simultaneous Associations	Unlimited

SONOACE X8 accepts Associations to receive N-EVENT_REPORT notifications for the Storage Commitment Push Model SOP Class.

Table 4.2-4

NUMBER OF ASSOCIATIONS ACCEPTED FOR AE STORAGE

Maximum number of simultaneous Associations	Unlimited

4.2.1.2.3 Asynchronous Nature

SONOACE X8 does not support asynchronous communications (multiple outstanding transactions over a single Association).

Table 4.2-5

ASYNCHRONOUS NATURE AS A SCU FOR AE STORAGE

Maximum number of outstanding asynchronous transactions	1

4.2.1.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 4.2-6

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE STORAGE

Implementation Class UID	1.2.410.200001.1.0001
Implementation Version Name	P6A1_0

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – Send Images and Structured Reports and Requests Commitment

4.2.1.3.1.1 Description and Sequencing of Activities

A user can select exams or images and request them to be sent to some destination. Each request is forwarded to the job queue and processed individually. When the “Batch” or “Send As You Go” option is active, Stored images and reports will be forwarded to the network job queue for a pre-configured auto-send target destination

automatically. For “Batch” and “Manual” configuration, the system opens an association, sends all images in the study, and closes the association. If “Send As You Go” is selected, the system handles the association with the Storage SCP Server using the following method.

a. Open an Association when the first image is acquired, and keep association open until the study is closed.

b. If an error occurs while sending an image to the server because there is no longer an open association (server timed-out), attempt to re-establish the association.

c. When the study is closed, close the open association after images remained in that study are sent.

Structured Reports are only sent over a separate association at End Exam For.

If the remote AE is configured as an archive device, the Storage AE will, after all images and reports have been sent, transmit Storage Commitment request (N-ACTION) over a separate Association. The Storage AE can only receive an N-EVENT-REPORT request in a subsequent association initiated by the SCP.

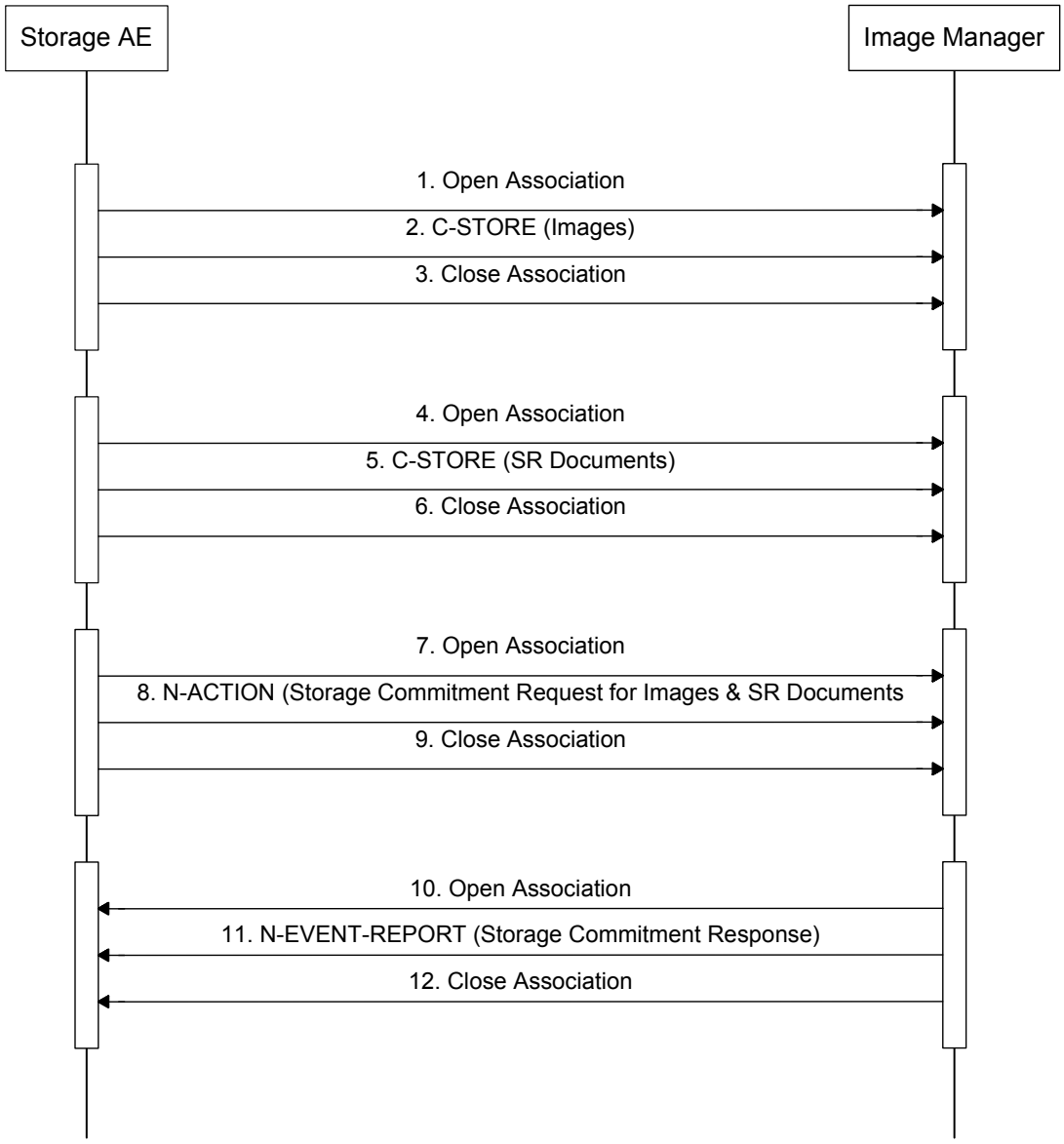

Figure 4.2-1
SEQUENCING OF ACTIVITY - SEND IMAGES

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

NOTE: The N-EVENT-REPORT must be sent over a separate association initiated by the Image Manager. (See Section 4.2.1.4)

4.2.1.3.1.2 Proposed Presentation Contexts

SONOACE X8 is capable of proposing the Presentation Contexts shown in the following table.

Table 4.2-7
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY SEND IMAGES

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossy Baseline	1.2.840.10008.1.2.4.50	SCU	None
Comprehensive Structured Report Storage	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None

Presentation Contexts for Ultrasound Image Storage and Ultrasound Multi-frame Image Storage will be proposed for the “Storage” device configured in Setup/DICOM.

A Presentation Context for Comprehensive Structured Report Storage will be proposed for the “Storage SR” device configured in Setup/DICOM.

A Presentation Context for Storage Commitment Push Model will be proposed for the “SC” device configured in Setup/DICOM.

A Presentation Context for Verification will be proposed when a user press the “Test” button for a configured device.

4.2.1.3.1.3 SOP Specific Conformance Image & Comprehensive Structured Report Storage SOP Classes

All Image & Structured Report Storage SOP Classes supported by the Storage AE exhibit the same behavior, except where stated, and are described together in this section.

Table 4.2-8

STORAGE C-STORE RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has successfully stored the SOP Instance. If all SOP Instances succeed, the job is marked as complete.
Refused	Out of Resources	A700-A7FF	The association is aborted using A-ABORT and the send job is marked as failed. The status is logged.
Error	Data Set does not match SOP Class	A900-A9FF	Same as "Refused" above.
Error	Cannot Understand	C000-CFFF	Same as "Refused" above.
Warning	Coercion of Data Elements	B000	Image transmission is considered successful.
Warning	Data Set does not match SOP Class	B007	Same as "Warning" above.
Warning	Elements Discards	B006	Same as "Warning" above.
*	*	Any other status code.	Same as "Refused" above.

The Behavior of Storage AE during communication failure is summarized in the Table below:

Table 4.2-9

STORAGE COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and the send job is marked as failed.
Association aborted by the SCP or network layers	The Send job is marked as failed.

A failed send job can be restarted by user interaction. The system can be configured to automatically resend failed

jobs if a transient status code is received. The delay between resending failed jobs and the number of retries is also configurable.

4.2.1.3.1.4 SOP Specific Conformance for Storage Commitment SOP Class

4.2.1.3.1.4.1 Storage Commitment Operations (N-ACTION)

The Storage AE will request storage commitment for the configured device for instances of the Ultrasound Image, Ultrasound Multi-frame Image and Structured Report Storage SOP Classes.

The Storage AE will consider Storage Commitment failed if no N-EVENT-REPORT is received for a Transaction UID within a configurable time period after receiving a successful N-ACTION response (duration of applicability for a Transaction UID).

The Storage AE does not send the optional Storage Media FileSet ID & UID Attributes or the Referenced Study Component Sequence Attribute in the N-ACTION

The Behavior of Storage AE when encountering status codes in an N-ACTION response is summarized in the Table below:

Table 4.2-10

STORAGE COMMITMENT N-ACTION RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The request for storage comment is considered successfully sent. The system waits for the association of the N-Event-Report.
*	*	Any other status code.	The Association is aborted using A-Abort and the request for storage comment is marked as failed

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

Table 4.2-11

STORAGE COMMITMENT COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and the storage commitment job is marked as failed.
Association aborted by the SCP or network layers	The storage commitment job is marked as failed.

4.2.1.3.1.4.2 Storage Commitment Notification (N-EVENT-REPORT)

The Storage AE is capable of receiving an N-EVENT-REPORT notification if it has successfully negotiated a Presentation Context for the Storage Commitment Push Model.

Upon receipt of an N-EVENT-REPORT the timer associated with the Transaction UID will be cancelled.

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

Table 4.2-12
STORAGE COMMITMENT N-EVENT-REPORT BEHAVIOR

Event Type Name	Event Type ID	Behavior
Storage Commitment Request Successful	1	The commit status is set to “Y” for each exam in the exam list. Auto deletion for committed exam is not supported.
Storage Commitment Request Complete – Failures Exists	2	The commit status is set to “N” for each exam in the exam list. The Referenced SOP Instances under Failed SOP Sequence (0008, 1198) are logged. A send job that failed storage commitment will not be automatically restarted but can be restarted by user interaction.

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

Table 4.2-13
STORAGE COMMITMENT N-EVENT-REPORT RESPONSE STATUS REASONS

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The Storage commitment result has been successfully received.
Failure	Unrecognized Operation	0211H	The Transaction UID in the N_EVENT_REPORT request is not (was never issued within an N_ACTION request)
Failure	No Such Event Type	0113H	An invalid Event Type ID was supplied in the

			N_EVENT_REPORT request
Failure	Processing Failure	0110H	An internal error occurred during processing of the N_EVENT_REPORT

4.2.1.3.1.5 SOP Specific Conformance for Verification

The Behavior when encountering status codes in a C-ECHO response is summarized in the Table below:

Table 4.2-14

VERIFICATION C-ECHO RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	Verification Status is set to 'Normal'
*	*	Any other status code	Verification Status is set to 'Failed'

The Behavior of Storage AE during communication failure is summarized in the Table below:

Table 4.2-15

VERIFICATION COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and the verification job is marked as failed.
Association aborted by the SCP or network layers	The verification job is marked as failed.

4.2.1.4 Association Acceptance Policy

4.2.1.4.1 Activity – Receive Storage Commitment Response

4.2.1.4.1.1 Description and Sequence of Activities

The Storage AE will accept associations in order to receive responses to a Storage Commitment Request.

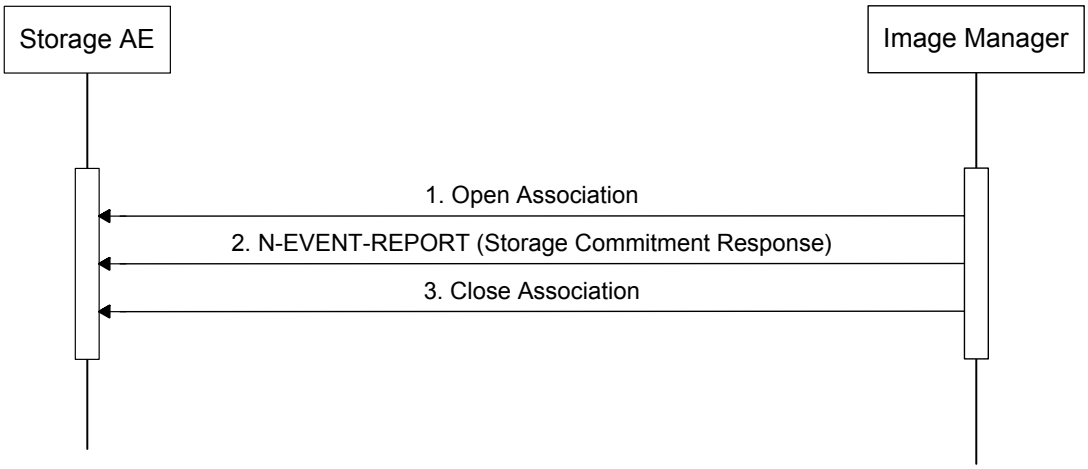

Figure 4.2-2
SEQUENCING OF ACTIVITY - RECEIVE STORAGE COMMITMENT RESPONSE

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

1. The Image Manager opens a new association with the Storage AE.

2. The Image Manager sends an N-EVENT-REPORT request notifying the Storage AE of the status of a previous Storage Commitment Request. The Storage AE replies with an N-EVENT-REPORT response confirming receipt.

3. The Image Manager closes the association with the Storage AE.

4.2.1.4.1.2 Accepted Presentation Contexts

The Storage AE will accept Presentation Contexts as shown in the Table below.

Table 4.2-16
ACCEPTABLE PRESENTATION CONTEXTS FOR ACTIVITY
RECEIVE STORAGE COMMITMENT RESPONSE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**
Name	**UID**	**Name List**	**UID List**		**Neg.**

Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCP	None

4.2.1.4.1.3 SOP Specific Conformance for Storage Commitment SOP Class

4.2.1.4.1.3.1 Storage Commitment Notifications (N-EVENT-REPORT)

Upon receipt of an N-EVENT-REPORT the timer associated with the Transaction UID will be cancelled.

The behavior of Storage AE when receiving Event Types within the N-EVENT_REPORT is summarized in Table 4.2-12.

The reasons for returning specific status codes in an N-EVENT-REPORT response are summarized in Table 4.2-13.

4.2.1.4.1.4 SOP Specific Conformance for Verification SOP Class

The Storage AE provides standard conformance to the Verification SOP Class as an SCP. If the C-ECHO request was successfully received, a 0000 (Success) status code will be returned in the C-ECHO response.

4.2.2 Workflow Application Entity Specification

4.2.2.1 SOP Classes

SONOACE X8 provides Standard Conformance to the following SOP Classes:

Table 4.2-17

SOP CLASSES FOR AE WORKFLOW

SOP Classes	SOP Class UID	SCU	SCP
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Yes	No
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Yes	No

4.2.2.2 Association Establishment Policy

4.2.2.2.1 General

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

Table 4.2-18

DICOM APPLICATION CONTEXT FOR AE WORKFLOW

Application Context Name	1.2.840.10008.3.1.1.1

4.2.2.2.2 Number of Associations

SONOACE X8 initiates one Association at a time for a Worklist request.

Table 4.2-19

NUMBER OF ASSOCIATIONS INITIATED FOR AE WORKFLOW

Maximum number of simultaneous Associations	1

4.2.2.2.3 Asynchronous Nature

SONOACE X8 does not support asynchronous communications (multiple outstanding transactions over a single Association)

Table 4.2-20

ASYNCHRONOUS NATURE AS A SCU FOR AE WORKFLOW

Maximum number of outstanding asynchronous transactions	1

4.2.2.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 4.2-21

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE WORKFLOW

Implementation Class UID	1.2.410.200001.1.0001
Implementation Version Name	P6A1_0

4.2.2.3 Association Initiation Policy

4.2.2.3.1 Activity – Worklist Update

4.2.2.3.1.1 Description and Sequencing of Activities

The request for a Worklist Update is initiated by user interaction or automatically at specific time intervals, configurable by the user.

The interactive Worklist Query will display a dialog for entering data as search criteria. When the Query is started on your request, only the data from the dialog will be inserted as matching keys into the query.

With automated worklist queries the SONOACE X8 always requests all items for a Scheduled Procedure Step Start Date (actual date), Modality (US) and Scheduled Station AE Title.

Upon initiation of the request, the SONOACE X8 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, SONOACE X8 will access the local database to add patient demographic data. The results will be displayed in a separate list, which will be cleared with the next worklist update.

SONOACE X8 will initiate an Association in order to issue a C-FIND request according to the Modality Worklist Information Model.

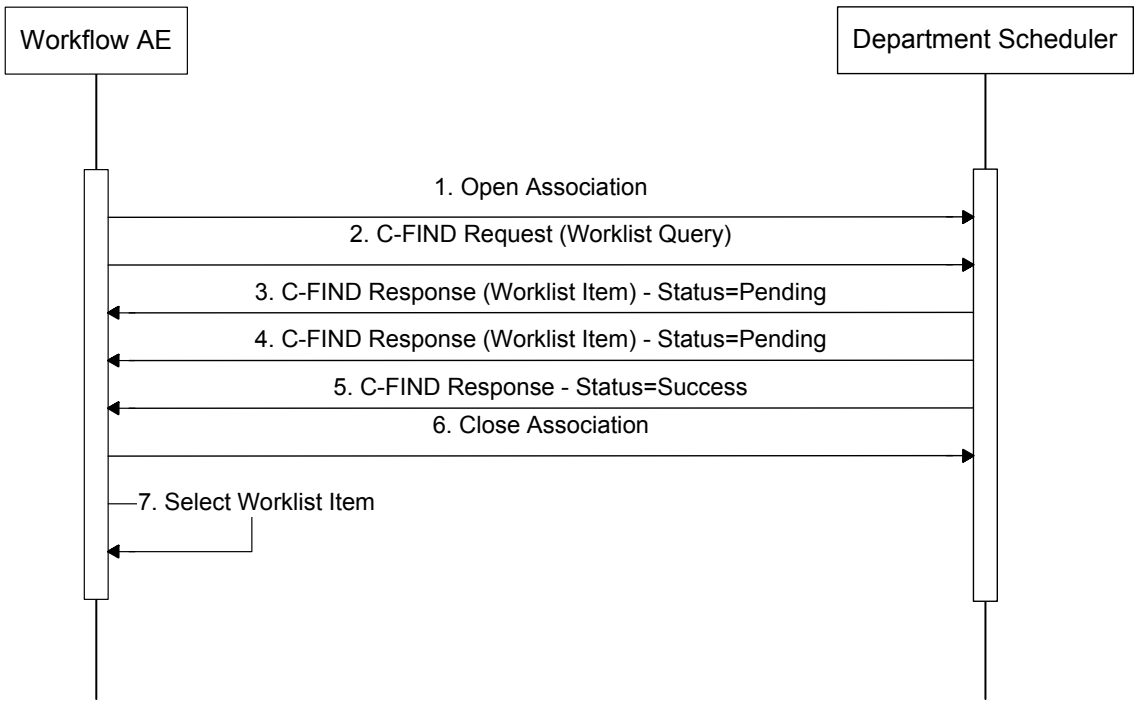

Figure 4.2-3
SEQUENCING OF ACTIVITY - WORKLIST UPDATE

A possible sequence of interactions between the Workflow AE and a Departmental 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:

4.2.2.3.1.2 Proposed Presentation Contexts

SONOACE X8 will propose Presentation Contexts as shown in the following table:

Table 4.2-22
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY WORKLIST UPDATE

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 Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008. 1.2.1	SCU	None

4.2.2.3.1.3 SOP Specific Conformance for Modality Worklist

The behavior of SONOACE X8 when encountering status codes in a Modality Worklist C-FIND response is summarized in the Table below. If any other SCP response status than “Success” or “Pending” is received by SONOACE X8, a message ”Query failed” will appear on the user interface.

Table 4.2-23

MODALITY WORKLIST C-FIND RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Matching is complete	0000	The SCP has Completed the operation successfully.
Pending	Matches are continuing	FF00	Continue.
Pending	Matches are continuing - Warning that one or more Optional Keys were not supported	FF01	Continue.
*	*	Any other status code.	The Association is aborted using A-Abort and the Worklist is marked as failed

The behavior of SONOACE X8 during communication failure is summarized in the Table below.

Table 4.2-24

MODALITY WORKLIST COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and the worklist query is marked as failed.
Association aborted by the SCP or network layers	The Worklist query is marked as failed.

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 SONOACE X8 Worklist Request Identifier and specifies the attributes that are copied into the images. Unexpected attributes returned in a C-FIND response are ignored.

Requested return attributes not supported by the SCP are set to have no value. Non-matching responses returned by the SCP due to unsupported optional matching keys are ignored. No attempt is made to filter out possible duplicate entries.

Table 4.2-25

WORKLIST REQUEST IDENTIFIER

Module Name Attribute Name	Tag	VR	M	R	Q	D	IOD
Scheduled Procedure Step							
Scheduled Procedure Step Sequence	0040,0100	SQ		x			
> Scheduled Station AET	0040,0001	AE	(S)	x	x		
> Scheduled Procedure Step Start Date	0040,0002	DA	S,R	x	x	x	
> Scheduled Procedure Step Start Time	0040,0003	TM		x		x	
> Modality	0008,0060	CS	S	x	x		
> Scheduled Performing Physician's Name	0040,0006	PN		x			
> Scheduled Procedure Step Description	0040,0007	LO		x		x	x
> Scheduled Station Name	0040,0010	SH		x			
> Scheduled Procedure Step Location	0040,0011	SH		x			
> Scheduled Protocol Code Sequence	0040,0008	SQ		x			x
> Scheduled Procedure Step ID	0040,0009	SH		x			x
Requested Procedure							
Requested Procedure ID	0040,1001	SH		x		x	x
Requested Procedure Description	0032,1060	LO		x			
Study Instance UID	0020,000D	UI		x			x
Referenced Study Sequence	0008,1110	SQ		x			x
Requested Procedure Code Sequence	0032,1064	SQ		x			x
Imaging Service Request							
Accession Number	0008,0050	SH		x		x	x
Requesting Physician	0032,1032	PN		x			
Referring Physician's Name	0008,0090	PN		x			x
Visit Status							
Current Patient Location	0038,0300	LO		x			
Patient Identification							
Patient’s Name	0010.0010	PN		x		x	x
Patient ID	0010,0020	LO		x		x	x
Patient Demographic							

Patient's Birth Date	0010,0030	DA		x		x	x
Patient's Sex	0010,0040	CS		x		x	x
Patient's Size	0010,1020	DS		x		x	x
Patient's Weight	0010,1030	DS		x		x	x

The above table should read as follows:

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

Attribute Name: Attributes supported to build an SONOACE X8 Worklist Request Identifier.

Tag: DICOM tag for this attribute.

VR: DICOM VR for this attribute.

M: Matching keys for (automatic) Worklist Update. An “S” indicates that SONOACE X8 supplies an attribute value for Single Value Matching or additional specific tags indicated by “(S)”; an “R” will indicate Range Matching.

R: Return keys. An ”X” will indicate that SONOACE X8 will supply this attribute as Return Key with zero length for Universal Matching.

Q: Interactive Query Key. An “X” will indicate that SONOACE X8 will supply this attribute as matching key, if entered in the Setup Dialog.

D: Displayed keys. An “X” indicates that this worklist attribute is displayed to the user during a patient registration dialog.

IOD: An “X” indicates that this Worklist attribute is included into all Object Instances created during performance of the related Procedure Step.

4.2.2.3.2 Activity – Acquire Images

4.2.2.3.2.1 Description and Sequencing of Activities

An Association to the configured MPPS SCP system is established immediately after the first image is acquired to send the MPPS N-Create message.

The “End Exam” button causes a “COMPLETED” message. An exam for which an MPPS instance is sent with a state of “COMPLETED” can no longer be updated.

The SONOACE X8 will support creation of “unscheduled cases” by allowing MPPS Instances to be communicated for locally registered Patients.

The SONOACE X8 only supports a 1-to-1 relationship between Scheduled and Performed Procedure Steps.

SONOACE X8 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.

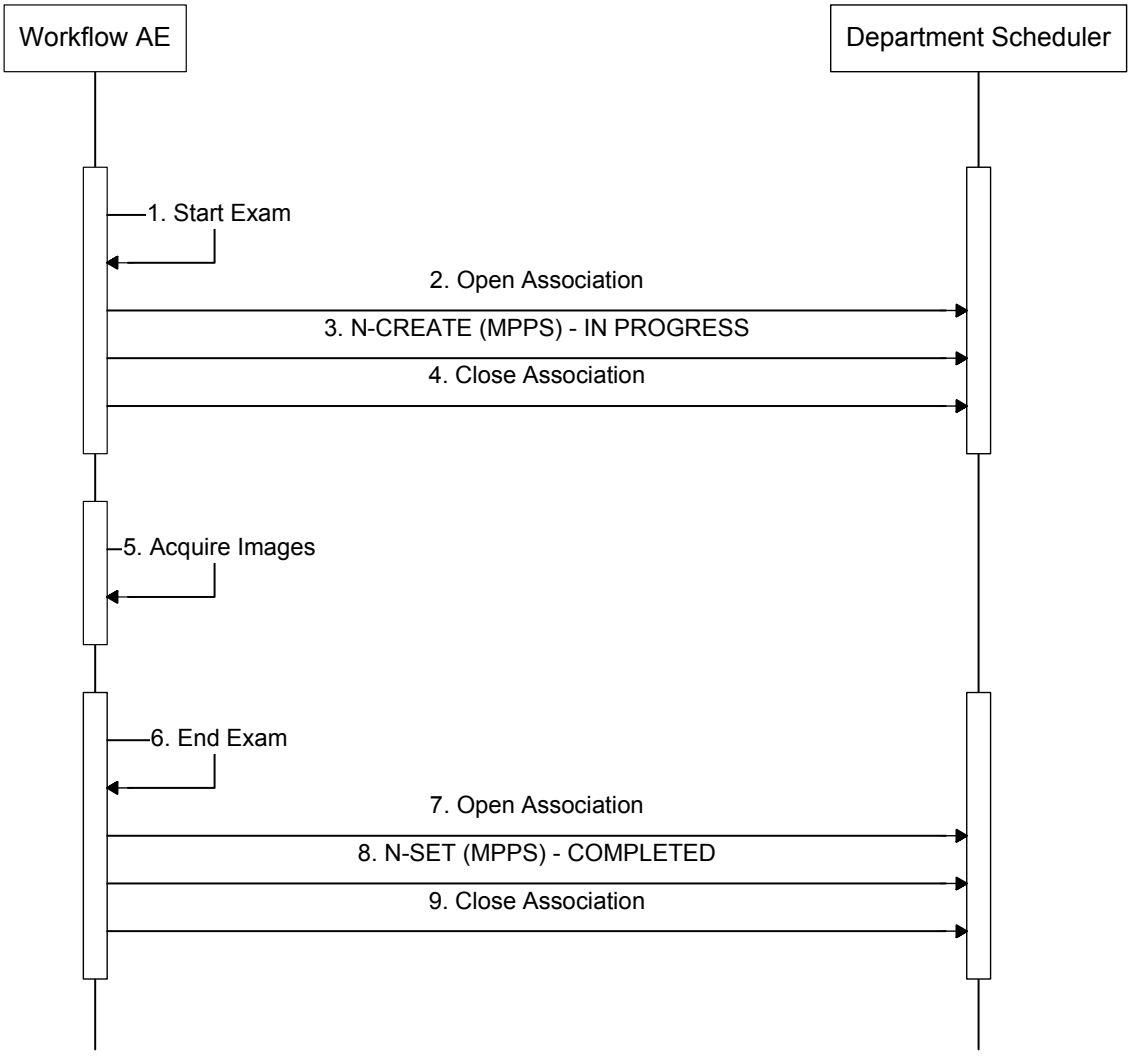

Figure 4.2-4
SEQUENCING OF ACTIVITY - ACQUIRE IMAGES

A possible sequence of interactions between the Workflow AE and a Departmental 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:

4.2.2.3.2.2 Proposed Presentation Contexts

SONOACE X8 will propose Presentation Contexts as shown in the following table:

Table 4.2-26

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 Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008. 1.2.1	SCU	None

4.2.2.3.2.3 SOP Specific Conformance for MPPS

The behavior of SONOACE X8 when encountering status codes in an MPPS N-CREATE or N-SET response is summarized in the Table below. If any other SCP response status than “Success” or “Warning” is received by SONOACE X8, a message “MPPS failed” will appear on the user interface.

Table 4.2-27

MPPS N-CREATE / N-SET RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has Completed the operation successfully.
Warning	Attribute Value Out of Range	0116H	The MPPS Operation is considered successful.
*	*	Any other status code.	The Association is aborted using A-Abort and the MPPS is marked as failed

The behavior of SONOACE X8 during communication failure is summarized in the table below:

Table 4.2-28

MPPS COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and the MPPS job is marked as failed.
Association aborted by the SCP or network layers	The MPPS job is marked as failed.

Table 4.2-29 provides a description of the MPPS N-CREATE and N-SET request identifiers send by SONOACE X8. Empty cells in the N-CREATE and N-SET columns indicate that the attribute is not sent.

Table 4.2-29

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 Attribute Sequence	0040,0270	SQ		
> Study Instance UID	0020,000D	UI	From MWL or generated by device	
> Referenced Study Sequence	0008,1110	SQ	From MWL	
>> Referenced SOP Class UID	0008.1150	UI	From MWL	
>> Referenced SOP Instance UID	0008,1155	UI	From MWL	
> Accession Number	0008,0050	SH	From MWL or user input	
> Requested Procedure ID	0040,1001	SH	From MWL	
> Requested Procedure Description	0032,1060	LO	From MWL	
> Scheduled Procedure Step ID	0040,0009	SH	From MWL	
> Scheduled Procedure Step Description	0040,0007	LO	From MWL	
> Scheduled Protocol Code Sequence	0040,0008	SQ	From MWL	
>> Code Value	0008,0100	SH	From MWL	
>> Coding Scheme Designator	0008,0102	SH	From MWL	
>> Coding Scheme Version	0008,0103	SH	From MWL	

>> Code Meaning	0008,0104	LO	From MWL	
Patient's Name	0010,0010	PN	From MWL or user input	
Patient ID	0010,0020	LO	From MWL or user input	
Patient's Birth Date	0010,0030	DA	From MWL or user input	
Patient's Sex	0010,0040	CS	From MWL or user input	
Referenced Patient Sequence	0008,1120	SQ	Zero length	
> Referenced SOP Class UID	0008,1150	UI	Zero length	
> Referenced Instance UID	0008,1155	UI	Zero length	
Performed Procedure Step Information				
Performed Procedure Step ID	0040,0253	SH	Generated by device (Study Date + Study Time)	
Performed Station AE Title	0040,0241	AE	From Modality Setup	
Performed Station Name	0040,0242	SH	Zero length	
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"	"DISCONTINUED" or "COMPLETED"
Performed Procedure Step Description	0040,0254	LO	From MWL or user input (Same as Study Description)	From MWL or user input (Same as Study Description)
Performed Procedure Type Description	0040,0255	LO	Zero length	Zero length
Procedure Code Sequence	0008,1032	SQ	From MWL	From MWL
> Code Value	0008,0100	SH	From MWL	From MWL
> Coding Scheme Designator	0008,0102	SH	From MWL	From MWL
> Coding Scheme Version	0008,0103	SH	From MWL	From MWL
> Code Meaning	0008,0104	LO	From MWL	From MWL
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	generated by device (Study Date + Study Time)	
Performed Protocol Code Sequence	0040,0260	SQ	Zero length	
Performed Series Sequence	0040,0340	SQ	Zero length	One or more items
> Performed Physician's Name	0008,1050	PN		From MWL
> Protocol Name	0018,1030	LO		"FreeForm" or staged protocol name (In case of Stress echo)
> Operator's Name	0008,1070	PN		From user input
> Series Instance UID	0020,000E	UI		generated by device
> Series Description	0008,103E	LO		Zero length
> Retrieve AE Title	0008,0054	AE		Zero length
> Referenced Image Sequence	0008,1140	SQ		From Modality
>> Referenced SOP Class UID	0008,1150	UI		From Modality
>> Referenced SOP Instance UID	0008,1155	UI		From Modality
> Referenced Non-Image Composite SOP Instance Sequence	0040,0220	SQ		From Modality
>> Referenced SOP Class UID	0008,1150	UI		From Modality
>> Referenced SOP Instance UID	0008,1155	UI		From Modality

4.2.2.4 Association Acceptance Policy

The Workflow Application Entity does not accept Associations.

4.2.3 Hardcopy Application Entity Specification

4.2.3.1 SOP Classes

SONOACE X8 provides Standard Conformance to the following SOP Classes:

Table 4.2-30

SOP CLASSES FOR AE HARDCOPY

SOP Classes	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

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 4.2-31

DICOM APPLICATION CONTEXT FOR AE HARDCOPY

Application Context Name	1.2.840.10008.3.1.1.1

4.2.3.2.2 Number of Association

SONOACE X8 can initiate one or more Associations at a time for each destination to which a transfer request is being processed in the active job queue list.

Table 4.2-32

NUMBER OF ASSOCIATIONS INITIATED FOR AE HARDCOPY

Maximum number of simultaneous Associations	Unlimited (number of configured hardcopy devices)

4.2.3.2.3 Asynchronous Nature

SONOACE X8 does not support asynchronous communications (multiple outstanding transactions over a single Association)

Table 4.2-33

ASYNCHRONOUS NATURE AS A SCU FOR AE HARDCOPY

Maximum number of outstanding asynchronous transactions	1

4.2.3.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 4.2-34

DICOM IMPLEMENTATION CLASS AND VERSION FOR AE HARDCOPY

Implementation Class UID	1.2.410.200001.1.0001
Implementation Version Name	P6A1_0

4.2.3.3 Association Initiation Policy

4.2.3.3.1 Activity – Film Images

4.2.3.3.1.1 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. Each print-job is forwarded to the job queue and processed individually.

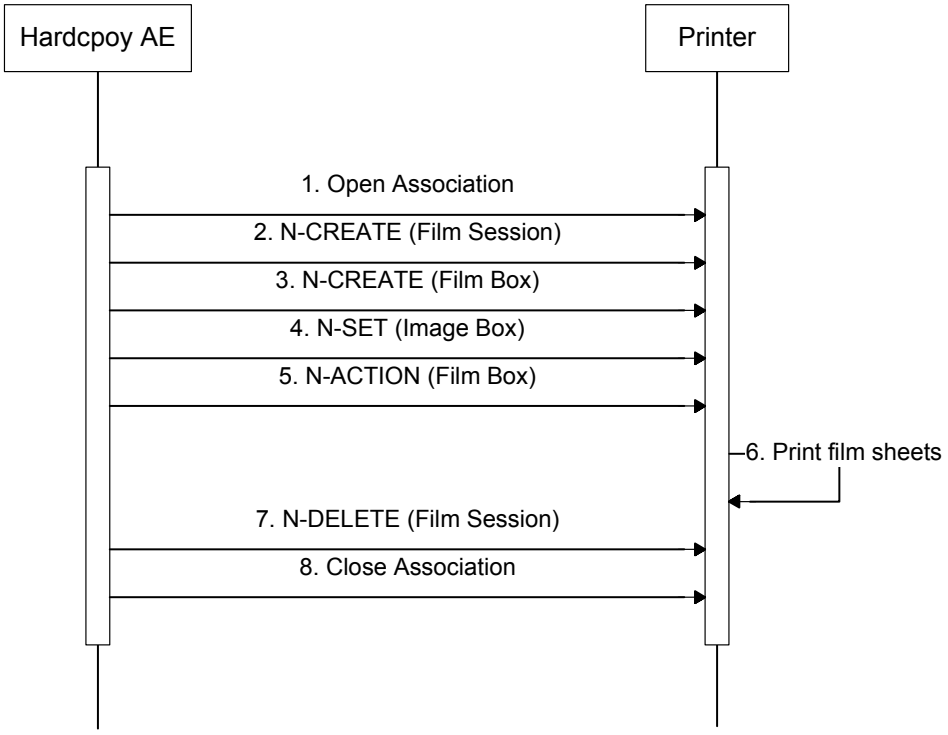

Figure 4.2-5

SEQUENCING OF ACTIVITY - FILM IMAGES

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

Association Initiation Policies for “Batch”, “Send As You Go” and “Manual” Mode are equal to the Sending images’ of the Storage Application Entity. (See 4.2.1.3.1.1)

Status of the print-job is reported through the job control interface. One or more job can be active at a time for each separate hardcopy device. If any response from the remote Application contains a status other than Success or Warning, the Association is aborted and the related job is switched to a failed state. It can be restarted any time by user interaction or, if configured, by automated retry.

4.2.3.3.1.2 Proposed Presentation Contexts

SONOACE X8 is capable of proposing the Presentation Contexts shown in the Table below:

Table 4.2-35
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY FILM IMAGES

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext.**
Name	**UID**	**Name List**	**UID List**		**Neg.**
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None

4.2.3.3.1.3 Common SOP Specific Conformance for all Print SOP Classes

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

Table 4.2-36
HARDCOPY COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and the print job is marked as failed.

Association aborted by the SCP or network layers	The print job is marked as failed.

4.2.3.3.1.4 SOP Specific Conformance for the Film Session SOP Class

Hardcopy AE supports the following DIMSE operations for the Film Session SOP Class:

- N-CREATE
- N-DELETE

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

4.2.3.3.1.4.1 Film Session SOP Class Operations (N-CREATE)

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

Table 4.2-37
FILM SESSION SOP CLASS N-CREATE REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Copies	2000,0010	IS	1..99	ALWAYS	USER
Print Priority	2000,0020	CS	HIGH, MED or LOW	ALWAYS	USER
Medium Type	2000,0030	CS	PAPER, CLEAR FILM, BLUE FILM, MAMMO CLEAR FILM or MAMMO BLUE FILM	ALWAYS	USER
Film Destination	2000,0040	CS	MAGAZINE or PROCESSOR	ALWAYS	USER

The Behavior of Hardcopy AE when encountering status codes in an N-CREATE response is summarized in the table below:

Table 4.2-38
FILM SESSION SOP CLASS N-CREATE RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has Completed the operation successfully.
Warning	Attribute Value Out	0116H	System continues operations.

	of Range		
Warning	Attribute List Error	0107H	Same as above
*	*	Any other status code.	The Association is aborted using A-Abort and the print-job is marked as failed

4.2.3.3.1.4.2 Film Session SOP Class Operations (N-DELETE)

The behavior of Hardcopy AE when encountering status codes in an N-DELETE response is summarized in the Table below:

Table 4.2-39
PRINTER SOP CLASS N-DELETE RESONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	
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

4.2.3.3.1.5 SOP Specific Conformance for the Film Box SOP Class

Hardcopy 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.

4.2.3.3.1.5.1 Film Box SOP Class Operations (N-CREATE)

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

Table 4.2-40

FILM BOX SOP CLASS N-CREATE REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Display Format	2010,0010	ST	"STANDARD\1, 1" , "STANDARD\1, 2" , "STANDARD\2, 2" , "STANDARD\2, 3" , "STANDARD\3, 3" , "STANDARD\3, 4" , "STANDARD\3, 5" , "STANDARD\4, 4" , "STANDARD\4, 5" or "STANDARD\4, 6"	ALWAYS	USER
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
Film Orientation	2010,0040	CS	PORTRAIT or LANDSCAPE	ALWAYS	USER
Film Size ID	2010,0050	CS	8INX10IN, 8_5INX11IN, 10INX12IN, 10INX14IN, 11INX14IN, 11INX17IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, A4, A3	ALWAYS	USER
Magnification Type	2010,0060	CS	REPLICATE, BILINEAR, CUBIC, NONE	ALWAYS	USER
Max Density	2010,0130	US	0 ~	ANAP	USER
Configuration Information	2010,0150	ST	Values are defined in Print Conformance Statement	ANAP	USER
Smoothing Type	2010,0080	CS	Values are defined in Print Conformance Statement	ANAP	USER

Border Density	2010,0100	CS	BLACK or WHITE	ALWAYS	USER
Empty Image Density	2010,0110	CS	BLACK or WHITE	ALWAYS	USER
Min Density	2010,0120	US	0 ~	ANAP	USER

The behavior of Hardcopy AE when encountering status codes in an N-CREATE responses is summarized in the table below:

Table 4.2-41

FILM BOX SOP CLASS N-CREATE RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has Completed the operation successfully.
Warning	Attribute Value Out of Range	0116H	System continues operations.
Warning	Attribute List Error	0107H	Same as above
Warning	Requested Min Density or Max Density outside of printer's operating range	B605H	Same as above
*	*	Any other status code.	The Association is aborted using A-Abort and the print-job is marked as failed

4.2.3.3.1.5.2 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 behavior of Hardcopy AE when encountering status codes in an N-ACTION responses is summarized in the table below:

Table 4.2-42

FILM BOX CLASS N-ACTION RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error 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

4.2.3.3.1.6 SOP Specific Conformance for the Film Box SOP Class

Hardcopy AE supports the following DIMSE operations for the Image Box SOP Class:

- N-SET

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

4.2.3.3.1.6.1 Image Box SOP Class Operations (N-SET)

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

Table 4.2-43
BASIC GRAYSCALE IMAGE BOX SOP CLASS N-SET REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	2020,0010	US	1 .. N (N = Row * Column of Film Box)	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	Number of Row Pixels of Image	ALWAYS	AUTO
> Columns	0028,0011	US	Number of Column Pixels of Image	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	Pixels of Image	ALWAYS	AUTO

Table 4.2-44

BASIC COLOR IMAGE BOX SOP CLASS N-SET REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	2020,0010	US	1 .. N (N = Row * Column of Film Box)	ALWAYS	AUTO
> Samples Per Pixel	0028,0002	US	3	ALWAYS	AUTO
> Photometric Interpretation	0028,0004	CS	RGB	ALWAYS	AUTO
> Planar Configuration	0028,0006	US	1	ALWAYS	AUTO
> Rows	0028,0010	US	Number of Row Pixels of Image	ALWAYS	AUTO
> Columns	0028,0011	US	Number of Column Pixels of Image	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	Pixels of Image	ALWAYS	AUTO

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

Table 4.2-45

IMAGE BOX SOP CLASS N-SET RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error 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

4.2.3.4 Association Acceptance Policy

The Hardcopy Application Entity does not accept Associations.

4.3 NETWORK INTERFACE

4.3.1 Physical Network Interface

SONOACE X8 supports a single network interface. One of the following physical network interfaces will be available depending on hardware options installed:

Table 4.3-1
SUPPORTED PHYSICAL NETWORK INTERFACES

Ethernet 100baseT
Ethernet 10baseT

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 Setup/DICOM Menu. All local DICOM services use the same AE Title. The system listens for Verification requests and Commitment reports on the configured Port.

4.4.1.2 Remote AE Title/Presentation Address Mapping

The AE Title, host names and port numbers of remote applications are configured using the SONOACE X8 Setup/DICOM Menu.

4.4.1.2.1 Storage

The Add button on the SONOACE X8 Setup/DICOM Menu must be used to set the AE Titles, port-numbers, IP addresses and capabilities for the remote Image Storage SCPs. Multiple remote Image Storage SCPs can be defined.

The Add button on the SONOACE X8 Setup/DICOM Menu must be used to set the AE Titles, port-numbers, IP addresses and capabilities for the remote Structured Report Storage SCP. Only a single remote Structured Report

Storage SCP can be defined.

The Add button on the SONOACE X8 Setup/DICOM Menu must be used to set the AE Titles, port-numbers, IP addresses and capabilities for the remote Storage Commitment SCP. Only a single remote Storage Commitment SCP can be defined and only one Image Storage SCP can be assigned for Storage Commitment.

4.4.1.2.2 Workflow

The Add button on the SONOACE X8 Setup/DICOM Menu must be used to set the AE Titles, port-numbers, IP addresses and capabilities for the remote Modality Worklist SCP. Only a single remote Modality Worklist SCP can be defined.

The Add button on the SONOACE X8 Setup/DICOM Menu must be used to set the AE Titles, port-numbers, IP addresses and capabilities for the remote MPPS SCP. Only a single remote MPPS SCP can be defined.

4.4.1.2.3 Hardcopy

The Add button on the SONOACE X8 Setup/DICOM Menu must be used to set the AE Titles, port-numbers, IP addresses and capabilities for the remote Print SCPs. Multiple remote Print SCPs can be defined.

4.4.2 Parameters

A number of parameters related to acquisition and general operation can be configured using the Setup/DICOM Menu. The Table below only shows those configuration parameters relevant to DICOM communications. See the SONOACE X8 Manual for details on general configuration capabilities.

Table 4.4-1

CONFIGURATION PARAMETERS TABLE

Parameter	Configurable (Yes/No)	Default Value
Local System Parameters		
AE Title (Local System AE Title)	Yes	“Set AE Title”
Station Name	Yes	“Set Station Name”
Port No. (Local Port Number)	Yes	104

Service Common Parameters		
Retry Interval	Yes	30 Sec.
Connect Timeout	Yes	15 Sec.
Maximum Retires	Yes	1
Storage Parameters		
Transfer Mode	Yes	“Batch”
Include 3D Volume	Yes	Checked
Window Center (VOI LUT)	Yes	128
Window Width (VOI LUT)	Yes	256
Storage Commitment Parameters		
Associated Storage Server	Yes	None
Worklist Modality Parameters		
Delay between automatic Worklist Updates	Yes	5 Min.
Query Worklist for specific Scheduled Station AE Title	Yes	Any
Query Worklist for specific Scheduled Modality Value	No.	“US” fixed
Query Worklist for Specific Start Date	Yes	Today
Print Parameters		
Transfer Mode	Yes	“Batch”
Color	Yes	“Grayscale”
Medium Type	Yes	“PAPER”
Format	Yes	1x1
Film Size	Yes	8 IN X 10 IN
Orientation	Yes	“PORTRAIT”
Destination	Yes	“MAGAZINE”
Magnification	Yes	“REPLICATE”
Smoothing Type	Yes	Blank
Border Density	Yes	“BLACK”
Empty Density	Yes	“BLACK”
Priority	Yes	“HIGH”
Min Density	Yes	Blank
Max Density	Yes	Blank
Copies	Yes	1
Configuration Info	Yes	Blank

5 MEDIA INTERCHANGE

5.1 IMPLEMENTATION MODEL

5.1.1 Application Data Flow

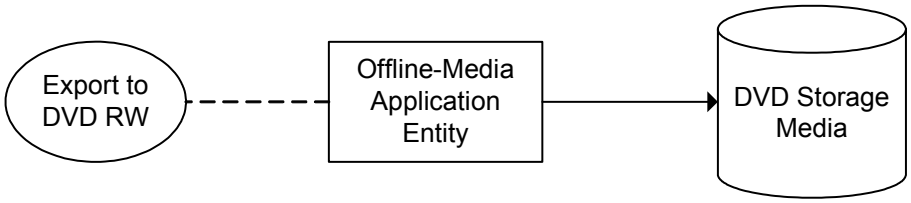

Figure 5.1-1
APPLICATION DATA FLOW DIAGRAM FOR MEDIA STORAGE

- The Offline-Media Application Entity exports images and Structured Report to a DVD Storage medium. It is associated with the local real-world activity “Export to DVD RW”, “Export to DVD RW” is performed upon user request for selected studies.

5.1.2 Functional Definition of AEs

5.1.2.1 Functional Definition of Offline-Media Application Entity

Activation of the “Export to DVD RW” menu entry will pass the currently selected studies to the Offline-Media Application Entity. The SOP Instances associated with the selection will be collected into one or more export jobs. The contents of each export job will be written to a single DVD media.

5.1.3 Sequencing of Real-World Activities

At least one study must exist and be selected before the Offline-Media Application Entity can be invoked. The operator can insert a new DVD media at any time before or after invocation of the Offline-Media Application Entity. If no DVD media is available the export job can be cancelled immediately.

5.1.4 File Meta Information Options

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

Table 5.1-1
DICOM IMPLEMENTATION CLASS AND VERSION FOR MEDIA STORAGE

Implementation Class UID	1.2.410.200001.1.0001
Implementation Version Name	P6A1_0

5.2 AE SPECIFICATIONS

5.2.1 Offline-Media Application Entity Specification

The Offline-Media Application Entity provides standard conformance to 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
STD-US-SC-MF-DVD	Export To DVD	FSC, FSU

5.2.1.1 File Meta Information for the Application Entity

The File-Set Identifier included in the File Meta Header is “MEDISON P6A”.

The Source Application Entity Title included in the File Meta Header is configurable using the Setup/DICOM Menu.

5.2.1.2 Real-World Activitiesdynamix0

5.2.1.2.1 Activity – Export to DVD

The Offline-Media Application Entity acts as an FSC and FSU when requested to export SOP Instances from the local database to a DVD medium.

If the contents of the current selection do not fit on a single media, a separation into multiple export jobs which can be adapted by the user will be suggested.

The user will be prompted to insert a DVD for each export job. The contents of the export job will be written together with a corresponding DICOMDIR to a DVD. Writing in multi-session mode is supported.

5.2.1.2.1.1 Media Storage Application Profiles

The Offline-Media Application Entity supports the STD-US-SC-MF-DVD Application Profile.

5.2.1.2.1.1.1 Options

The Media Application Entity supports the SOP Classes and Transfer Syntaxes listed in the table below:

Table 5.2-2

IODS, SOP CLASSES AND TRANSFER SYNTAXES FOR OFFLINE MEDIA

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
Media Storage Directory Storage	1.2.840.10008.1.3.10	Explicit VR Little Endian	1.2.840.10008.1.2.1
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
US Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	JPEG Baseline Lossy Compression	1.2.840.10008.1.2.4.50
Comprehensive Structured Report Storage	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian	1.2.840.10008.1.2.1

6 SUPPORT OF CHARACTER SETS

All SONOACE X8 DICOM applications support the

ISO_IR 100 (ISO 8859-1:1987 Latin Alphabet No. 1 supplementary set)

7 SECURITY

SONOACE X8 does not support any specific security measures.

It is assumed that SONOACE X8 is used within a secured environment. It is assumed that a secured environment includes as minimum:

a. Firewall or router protections to ensure that only approved external hosts have network access to SONOACE X8.

b. Firewall or router protections to ensure that SONOACE X8 has only network access to approved external hosts and services.

c. Any communication with external hosts and services outside the locally secured environment use appropriately secure network channels (e.g. such as a Virtual Private Network (VPN).

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 an Ultrasound Image transmitted by the SONOACE X8 storage applications.

Table 8.1-2 specifies the attributes of a Comprehensive Structured Reports transmitted by the SONOACE X8 storage applications.

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

VNAP	Value Not Always Present (attribute sends 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 the Modality Performed Procedure Step service
CONFIG	the attribute value source is a configurable parameter

NOTE: All dates and times are encoded in the local configured calendar and time. Date, Time and Time zones are configured using the Setup Menu.

8.1.1.1 US or US Multiframe Image IOD

Table 8.1-1

IOD OF CREATED US OR US MULTIFRAME SOP INSTANCES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-3	ALWAYS
Study	General Study	Table 8.1-4	ALWAYS

	Patient Study	Table 8.1-5	ALWAYS
Series	General Series	Table 8.1-6	ALWAYS
Equipment	General Equipment	Table 8.1-7	ALWAYS
Image	General Image	Table 8.1-8	ALWAYS
	Image Pixel	Table 8.1-9	ALWAYS
	Cine	Table 8.1-10	Only if US Multiframe
	Multi-Frame	Table 8.1-11	Only if US Multiframe
	US Region Calibration	Table 8.1-12	ANAP
	US Image	Table 8.1-13	ALWAYS
	VOI LUT	Table 8.1-14	ALWAYS
	SOP Common	Table 8.1-15	ALWAYS

8.1.1.2 Comprehensive Structured Report IOD

Table 8.1-2

IOD OF CREATED COMPREHENSIVE STRUCTURED REPORT SOP INSTANCES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-3	ALWAYS
Study	General Study	Table 8.1-4	ALWAYS
	Patient Study	Table 8.1-5	ALWAYS
Series	SR Document Series	Table 8.1-16	ALWAYS
Equipment	General Equipment	Table 8.1-7	ALWAYS
Document	SR Document General	Table 8.1-17	ALWAYS
	SR Document Content	Table 8.1-18	ALWAYS
	SOP Common	Table 8.1-19	ALWAYS

8.1.1.3 Common Modules

Table 8.1-3

PATIENT MODULE OF CREATED SOP INSTANCES

Attribute	Tag	VR	Value	Presence	Source

Name				of Value	
Patient's Name	0010,0010	PN	From MWL or User Input. Values supplied via Modality Worklist will be entered as received. Values supplied via user input will contain first 3 components (Last^First^Middle). Maximum 64 characters.	VNAP	MWL/USER
Patient ID	0010,0020	LO	From MWL, user input or generated by device. Maximum 64 characters.	ALWAYS	MWL/USER/AUTO
Patient's Birth Date	0010,0030	DA	From MWL or user input	VNAP	MWL/USER
Patient's Sex	0010,0040	CS	From MWL or user input	VNAP	MWL/USER

Table 8.1-4

GENERAL STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Instance UID	0020,000D	UI	From MWL or generated by device	ALWAYS	MWL/AUTO
Study Date	0008,0020	DA	<yyyymmdd>	ALWAYS	AUTO
Study Time	0008,0030	TM	<hhmmss>	ALWAYS	AUTO
Referring Physician's Name	0008,0090	PN	From MWL or user input	VNAP	MWL/USER
Study ID	0020,0010	SH	system generate : Study Date + Study Time <yyyymmddhhmmss>	ALWAYS	AUTO
Accession Number	0008,0050	SH	From MWL or user input	VNAP	MWL/USER
Study Description	0008,1030	LO	From MWL (Scheduled procedure step description) or user input	ANAP	MWL/USER

Referenced Study Sequence	0008,1110	SQ	From MWL	ANAP	MWL
> Referenced SOP Class UID	0008,1150	UI	From MWL	ANAP	MWL
> Referenced SOP Instance UID	0008,1155	UI	From MWL	ANAP	MWL
Procedure Code Sequence	0008,1032	SQ	From MWL	ANAP	MWL

Table 8.1-5

PATIENT STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Size	0010,1020	DS	From MWL or user input	ANAP	MWL/USER
Patient's Weight	0010,1030	DS	From MWL or user input	ANAP	MWL/USER

Table 8.1-6

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	Generated by device	ALWAYS	AUTO
Series Number	0020,0011	IS	"1"	ALWAYS	AUTO
Series Date	0008,0021	DA	<yyyymmdd>	ALWAYS	AUTO
Series Time	0008,0031	TM	<hhmmss>	ALWAYS	AUTO
Protocol Name	0018,1030	LO	"FreeForm"	ALWAYS	AUTO
Operators' Name	0008,1070	PN	From user input	ANAP	USER

Referenced Performed Procedure Step Sequence	0008,1111	SQ	Identifies the MPPS SOP Instance to which this image is related	ALWAYS	MPPS
> Referenced SOP Class UID	0008,1150	UI	MPPS SOP Class UID "1.2.840.10008.3.1.2.3.3"	ALWAYS	MPPS
> Referenced SOP Instance UID	0008,1155	UI	MPPS SOP Instance UID	ALWAYS	MPPS
Request Attributes Sequence	0040,0275	SQ	Zero or 1 item will be present	ANAP	AUTO
> Requested Procedure ID	0040,1001	SH	From MWL	ANAP	MWL
> Scheduled Procedure Step ID	0040,0009	SH	From MWL	ANAP	MWL
> Scheduled Procedure Step Description	0040,0007	LO	From MWL	ANAP	MWL
> Scheduled Protocol Code Sequence	0040.0008	SQ	From MWL	ANAP	MWL
Performed Procedure Step ID	0040,0253	SH	Same as MPPS	ALWAYS	MPPS
Performed Procedure Step Start Date	0040,0244	DA	Same as Study Date	ALWAYS	AUTO
Performed Procedure Step Start Time	0040,0245	TM	Same as Study Time	ALWAYS	AUTO
Performed Procedure Step Description	0040,0254	LO	Same as Study Description	ANAP	MWL/USER

Table 8.1-7

GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	"MEDISON"	ALWAYS	AUTO
Institution Name	0008,0080	LO	From user input	ANAP	CONFIG
Station Name	0008,1010	SH	From user input	ANAP	CONFIG
Manufacturer's Model Name	0008,1090	LO	"P6A"	ALWAYS	AUTO
Device Serial Number	0018,1000	LO	Generated by device	ALWAYS	AUTO
Software Versions	0018,1020	LO	Generated by device	ALWAYS	AUTO

8.1.1.4 US or US Multiframe Image Module

Table 8.1-8

GENERAL IMAGE MODULE OF CREATED US OR US MULTIFRAME SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	0020,0013	IS	Generated by device, increments from "1" in each series	ALWAYS	AUTO
Patient Orientation	0020,0020	CS	NULL		
Content Date	0008,0023	DA	<yyyymmdd>	ALWAYS	AUTO
Content Time	0008,0033	TM	<hhmmss>	ALWAYS	AUTO
Image Type	0008,0008	CS	"ORIGINAL" and "PRIMARY" and "" and ""	ALWAYS	AUTO
Lossy Image Compression	0028,2110	CS	US = "00" (uncompressed), US-MF = "01" (lossy compressed)	ALWAYS	AUTO
Lossy Image Compression Ratio	0028,2112	DS	Used if (0028, 2110) = "01", Calculated by device	ANAP	AUTO
Lossy Image Compression	0028,2114	CS	"ISO_10918_1", used if (0028,2001) = "01"	ANAP	AUTO

Method					

Table 8.1-9

IMAGE PIXEL MODULE OF CREATED US OR US MULTIFRAME SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	0028,0002	US	"3" for RGB	ALWAYS	AUTO
Photometric Interpretation	0028,0004	CS	"RGB"	ALWAYS	AUTO
Rows	0028,0010	US	US = "768", US-MF = "480"	ALWAYS	AUTO
Columns	0028,0011	US	US = "1024", US-MF = "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	OW or OB	Generated by device	ALWAYS	AUTO
Planar Configuration	0028,0006	US	"0"	ALWAYS	AUTO
Private Creator	7FE1,0010	LO	“MEDISON_US”	ANAP	AUTO
3D Volume	7FE1,1002	OB	3D Volume Data	ANAP	AUTO

Table 8.1-10

CINE MODULE OF CREATED US MULTIFRAME SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame Time	0018,1063	DS	Milliseconds	ANAP	AUTO
Cine Rate	0018,0040	IS	Frames per second	ANAP	AUTO

Table 8.1-11

MULTI-FRAME MODULE OF CREATED US MULTIFRAME SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Frames	0028,0008	IS	Numbers of Frames	ANAP	AUTO
Frame Increment Pointer	0028,0009	AT	"1577059" : (0018, 1063)	ANAP	AUTO

Table 8.1-12

US REGION CALIBRATION MODULE OF CREATED US OR US MULTIFRAME SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Sequence of Ultrasound Regions	0018,6011	SQ	Generated by device. A sequence is present for each region in the system display.	ANAP	AUTO
> Region Location Min x0	0018,6018	UL	Left position of region	ALWAYS	AUTO
> Region Location Min y0	0018,601A	UL	Top position of region	ALWAYS	AUTO
> Region Location Max x1	0018,601C	UL	Right position of region	ALWAYS	AUTO
> Region Location Max y1	0018,601E	UL	Bottom position of region	ALWAYS	AUTO
> Physical Units X Direction	0018,6024	US	2D Image : 0003H = cm M-Mode : 0004H = seconds Doppler : 0004H = seconds	ALWAYS	AUTO
> Physical Units Y Direction	0018,6026	US	2D Image : 0003H = cm M-Mode : 0003H = cm Doppler : 0005H = hertz or 0007H = cm/sec	ALWAYS	AUTO
> Physical Delta X	0018,602C	FD	The physical value per pixel increment	ALWAYS	AUTO

> Physical Delta Y	0018,602E	FD	The physical value per pixel increment	ALWAYS	AUTO
> Region Spatial Format	0018,6012	US	2D Tissue : 0001H M-Mode Tissue or flow : 0002H Spectral (CW or PW Doppler) : 0003H	ALWAYS	AUTO
> Region Data Type	0018,6014	US	Tissue : 0001H Color Flow : 0002H PW Spectral Doppler : 0003H CW Spectral Doppler : 0004H	ALWAYS	AUTO
> Region Flags	0018,6016	UL	See DICOM PS 3.3 C.8.5.5.1.3	ALWAYS	AUTO

Table 8.1-13

US IMAGE MODULE OF CREATED US OR US MULTIFRAME SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples Per Pixel	0028,0002	US	"3" for RGB	ALWAYS	AUTO
Photometric Interpretation	0028,0004	CS	"RGB"	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
Image Type	0008,0008	CS	"ORIGINAL" and "PRIMARY" and "" and ""	ALWAYS	AUTO
Lossy Image Compression	0028,2110	CS	US = "00" (uncompressed), US-MF = "01" (lossy compressed)	ALWAYS	AUTO

Table 8.1-14

VOI LUT MODULE OF CREATED US OR US MULTIFRAME SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Window Center	0028,1050	DS	default : "128"	ALWAYS	CONFIG
Window Width	0028,1051	DS	default : "256"	ALWAYS	CONFIG

Table 8.1-15

SOP COMMON MODULE OF CREATED US OR US MULTIFRAME SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
SOP Class UID	0008,0016	UI	US = "1.2.840.10008.5.1.4.1.1.6.1" US-MF = "1.2.840.10008.5.1.4.1.1.3.1"	ALWAYS	AUTO
SOP Instance UID	0008,0018	UI	Generated by device	ALWAYS	AUTO
Specific Character Set	0008,0005	CS	"ISO_IR 100"	ALWAYS	AUTO

8.1.1.5 Comprehensive Structured Report Modules

Table 8.1-16

SR DOCUMENT SERIES MODULE OF CREATED COMPREHENSIVE 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	Generated by device	ALWAYS	AUTO
Series Number	0020,0011	IS	"2"	ALWAYS	AUTO
Referenced Performed Procedure Step Sequence	0008,1111	SQ	Identifies the MPPS SOP Instance to which this image is related	ALWAYS	MPPS

> Referenced SOP Class UID	0008,1150	UI	MPPS SOP Class UID "1.2.840.10008.3.1.2.3.3"	ALWAYS	MPPS
> Referenced SOP Instance UID	0008,1155	UI	MPPS SOP Instance UID	ALWAYS	MPPS

Table 8.1-17

SR DOCUMENT GENERAL MODULE OF CREATED COMPREHENSIVE SR SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	0020,0013	IS	Generated by device, increments from "1" in each series	ALWAYS	AUTO
Completion Flag	0040,A491	CS	"PARTIAL"	ALWAYS	AUTO
Verification Flag	0040,A493	CS	"UNVERIFIED"	ALWAYS	AUTO
Content Date	0008,0023	DA	<yyyymmdd>	ALWAYS	AUTO
Content Time	0008,0033	TM	<hhmmss>	ALWAYS	AUTO
Referenced Request Sequence	0040,A370	SQ	1 item will be present	ALWAYS	AUTO
> Study Instance UID	0020,000D	UI	From MWL or generated by device	ALWAYS	MWL/AUTO
> Referenced Study Sequence	0008,1110	SQ	From MWL	ANAP	MWL
>> Referenced SOP Class UID	0008,1150	UI	From MWL	ANAP	MWL
>> Referenced SOP Instance UID	0008,1155	UI	From MWL	ANAP	MWL
> Accession Number	0008,0050	SH	From MWL or user input	VNAP	MWL/USER
> Placer Order Number/Imaging Service Request	0040,2016	LO	NULL	VNAP	AUTO

> Filler Order Number/Imaging Service Request	0040,2017	LO	NULL	VNAP	AUTO
> Requested Procedure ID	0040,1001	SH	From MWL	VNAP	MWL
> Requested Procedure Description	0032,1060	LO	From MWL	VNAP	MWL
> Requested Procedure Code Sequence	0032,1064	SQ	From MWL	VNAP	MWL
Performed Procedure Code Sequence	0040,A372	SQ	NULL	VNAP	AUTO

Table 8.1-18

SR DOCUMENT CONTENT MODULE OF CREATED COMPREHENSIVE SR SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Value Type	0040,A040	CS	"CONTAINER"	ALWAYS	AUTO
Concept Name Code Sequence	0040,A043	SQ	1 item will be present	ALWAYS	AUTO
> Include 'Code Sequence Macro'			"EV(125000, DCM, "OB-GYN Ultrasound Procedure Report" for OB-GYN	ALWAYS	AUTO
Include 'Container Macro'				ALWAYS	AUTO
Content Sequence	0040,A730	SQ	One or more items may be included in this sequence	ALWAYS	AUTO
> Relationship Type	0040,A010	CS	See …	ALWAYS	AUTO
> Include Document Relationship Macro			See …	ALWAYS	AUTO
> Include Document Content			See …	ALWAYS	AUTO

Macro					

Table 8.1-19
SOP COMMON MODULE OF CREATED COMPREHENSIVE SR SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
SOP Class UID	0008,0016	UI	"1.2.840.10008.5.1.4.1.1.88.33"	ALWAYS	AUTO
SOP Instance UID	0008,0018	UI	Generated by device	ALWAYS	AUTO
Specific Character Set	0008,0005	CS	"ISO_IR 100"	ALWAYS	AUTO

8.1.2 Used Fields in received IOD by application

The SonoAce X8 storage application does not receive SOP Instances. The usage of attributes received via Modality Worklist is described in section 4.2.2.3.1.3.

8.1.3 Attribute mapping

The relationships between attributes received via Modality Worklist, stored in acquired images and communicated via MPPS are summarized in the Table below. The format and conversions used in Table are the same as the corresponding table in IHE Technical Framework, Rev. 7.0 May 15, 2006, vol. II, Appendix A.

Table 8.1-20
ATTRIBUTE MAPPING BETWEEN MODALITY WORKLIST, IMAGE AND MPPS

Modality Worklist	Image IOD	MPPS IOD
Patient's Name	Patient's Name	Patient's Name
Patient ID	Patient ID	Patient ID
Patient's Birth Date	Patient's Birth Date	Patient's Birth Date
Patient's Sex	Patient's Sex	Patient's Sex
Patient's Size	Patient's Size	____
Patient's Weight	Patient's Weight	____
Referring Physician's Name	Referring Physician's Name	____
	____	Scheduled Step Attributes 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
Requested Procedure Description	____	> Requested Procedure Description
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	> Scheduled 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
____	____	Performed Series Sequence
Requested Procedure Code Sequence	Procedure Code Sequence	Procedure Code Sequence
____	Referenced Performed Procedure Step Sequence	____
____	> Referenced SOP Class UID	SOP Class UID
____	> Referenced SOP Instance UID	SOP Instance UID
____	Protocol Name	Protocol Name

8.1.4 Coerced/Modified Fields

The Modality Worklist AE will truncate attribute values received in the response to a Modality Worklist Query if the value length is longer than the maximum length permitted by the attribute's VR.

8.2 DATA DICTIONARY OF PRIVATE ATTRIBUTES

The Private Attributes added to create SOP Instances are listed in the Table below. SONOACE X8 reserves blocks of private attributes in groups 7FE1. Further details on usage of these private attributes are contained in Section 8.1

Table 8.2-1

DATA DICTIONALY OF PRIVATE ATTRIBUTES

Tag	Attribute Name	VR	VM
(7FE1, 0010)	Private Creator	LO	1
(7FE1, 1002)	3D Volume	OB	1

8.3 CODED TERMINOLOGY AND TEMPLATES

The Workflow AE is capable of supporting arbitrary coding schemes for Procedure and Protocol Codes. The contents of Requested Procedure Code Sequence (0032, 1064) and Scheduled Protocol Code Sequence (0040, 0008) supplied in Worklist Items will be mapped to Image IOD and MPPS attributes as described in Section 8.1.3

8.4 GRAYSCALE IMAGE CONSISTENCY

The high resolution display monitor attached to SONOACE X8 can be calibrated according to the Grayscale Standard Display Function (GSDF).

8.5 STANDARD EXTENDED / SPECIALIZED / PRIVATE SOP CLASSES

No Specialized or Private SOP Classes are supported.

8.5.1 US OR US MULTIFRAME IMAGE STORAGE SOP CLASS

The US or US Multiframe Image Storage SOP Classes are extended to create a Standard Extended SOP Class by addition of standard and private attributes to the created SOP Instances as documented in section 8.1

3D Volume Data is transferred to the configured Storage Server, if “Send 3D Volume” option is enabled in the Setup Dialog.

8.6 PRIVATE TRANSFER SYNTAXES

No Private Transfer Syntaxes are supported.

9 STRUCTURED REPORT TEMPLATES

9.1 TEMPLATES used in SONOACE X8

This Section uses the following forms for describing Structured Report Templates used in SONOACE X8.

	Rel with Parent	VT	Concept Name	Presence of Value	Comments
1					
2					

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-1								
A-2								

Rel with Parent	Relationship
VT	Value Type
Concept Name	Any constraints on Concept Name are specified in this filed as defined or enumerated coded entries, or as baseline or defined context groups.
Presence of Value	Ref. Section 8.1.1
Comments	Description about Reference section or used values.
NL	The nesting level of Content Items is denoted by “>” symbols
REL	Relationship
Unit/Code, Value	Applied unit, enumerated coded entries, or the reference of Context Group.
Ref TID	Referenced Template ID Number
Ref CID	Referenced Context ID Number. The left side of “/” shows a CID value applied in “Concept Name” column and the right side shows a CID value applied in “Unit/Code, Value” column. (e.g. 228/12012)

9.1.1 OB-GYN STRUCTURED REPORT TEMPLATE

9.1.1.1 OB-GYN Ultrasound Procedure Report (TID 5000)

Table 9.1-1
OB-GYN ULTRASOUND PROCEDURE REPORT TEMPLATE

	Rel with Parent	VT	Concept Name	Presence of Value	Comments
1		CONTAINER	EV (125000, DCM, "OB-GYN Ultrasound Procedure Report")	ALWAYS	
2	HAS CONCEPT MOD	INCLUDE	DTID (1204) Language of Content Item and Descendants		
3	HAS OBS CONTEXT	INCLUDE	DTID (1001) Observation Context	ANAP	Ref. Section 9.1.1.2
4	CONTAINS	INCLUDE	DTID (5001) Patient Characteristics	ANAP	Ref. Section 9.1.1.3
5	CONTAINS	CONTAINER	DT (111028, DCM, "Image Library")		
6	CONTAINS	IMAGE	No Purpose of reference		
7	CONTAINS	INCLUDE	DTID (5002) OB-GYN Procedure Summary Section	ANAP	Ref. Section 9.1.1.4
8	CONTAINS	INCLUDE	DTID (5004) Fetal Biometry Ratio Section	ANAP	Ref. Section 9.1.1.5
9	CONTAINS	INCLUDE	DTID (5005) Fetal Biometry Section	ANAP	Ref. Section 9.1.1.6
10	CONTAINS	INCLUDE	DTID (5006) Long Bones Section	ANAP	Ref. Section 9.1.1.7
11	CONTAINS	INCLUDE	DTID (5007) Fetal Cranium Section	ANAP	Ref. Section 9.1.1.8
12	CONTAINS	INCLUDE	DTID (5009) Fetal Biophysical Profile Section	ANAP	Ref. Section 9.1.1.9
13	CONTAINS	INCLUDE	DTID (5011) Early Gestation Section	ANAP	Ref. Section 9.1.1.11
14	CONTAINS	INCLUDE	DTID (5010) Amniotic Sac	ANAP	Ref. Section 9.1.1.10

			Section		
15	CONTAINS	INCLUDE	DTID (5015) Pelvis and Uterus Section	ANAP	Ref. Section 9.1.1.12
16	CONTAINS	INCLUDE	DTID (5012) Ovaries Section	ANAP	Ref. Section 9.1.1.13
17	CONTAINS	INCLUDE	DTID (5013) Follicles Section	ANAP	Ref. Section 9.1.1.14
18	CONTAINS	INCLUDE	DTID (5013) Follicles Section	ANAP	Ref. Section 9.1.1.15
19	CONTAINS	CONTAINER	EV (121070, DCM, "Findings")		
20	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, "Finding Site")		
21	CONTAINS	INCLUDE	DTID (5025) OB-GYN Fetal Vascular Measurement Group		
22	CONTAINS	CONTAINER	EV (121070, DCM, "Findings")		
23	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, "Finding Site")		
24	CONTAINS	INCLUDE	DTID (5026) OB-GYN Pelvic Vascular Measurement Group		

9.1.1.2 Observation Context (TID 1001)

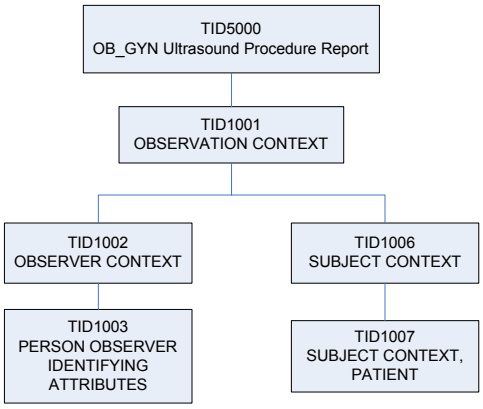

Figure 9.1-1
TEMPLATE HIERARCHY OF OBSERVATION CONTEXT IN OB-GYN SR

Table 9.1-2

OBSERVATION CONTEXT IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-1	>	HAS OBS CONTEXT	CODE	DCM 121005 Observer Type	DCM 121006 “Person“	1002	/270	This will have a value "Person".
A-2	>	HAS OBS CONTEXT	PNAME	DCM 121008 Person Observer Name		1003		Value is taken from "Ref. Physician" of Study Info dialog.
A-3	>	HAS OBS CONTEXT	CODE	DCM 121024 Subject Class	DCM 121025 "Patient”	1006	/271	This will have a value "Patient".
A-4	>	HAS OBS CONTEXT	PNAME	DCM 121029 Subject Name		1007		Value is taken from "Last Name" and "First Name" of Patient Manager dialog.
A-5	>	HAS OBS CONTEXT	DATE	DCM 121031 Subject Birth Date	yyyymmdd			Value is taken from "Birth" of Patient Manager dialog.
A-6	>	HAS OBS CONTEXT	CODE	DCM 121032 Subject Sex	DCM M Male DCM F Female DCM U Unknown sex		/7455	Value is taken from "Gender" of Patient Manager dialog.
A-7	>	HAS OBS CONTEXT	NUM	DCM 121033 Subject Age	UCUM mo month		7456	Not used

9.1.1.3 Patient Characteristics (TID 5001)

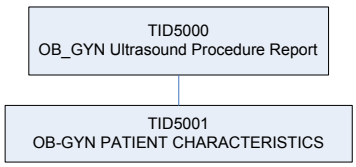

Figure 9.1-2

TEMPLATE HIERARCHY OF PATIENT CHARACTERISTICS IN OB-GYN SR

Table 9.1-3

PATIENT CARACTERISTICS IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-8	>	CONTAINS	CONTAINTER	DCM 121118 Patient Characteristics		5001		
A-8-1	>>	CONTAINS	TEXT	DCM 121106 Comment				Value is taken from "Description" of Study Info dialog.
A-8-2	>>	CONTAINS	NUM	LN 8302-2 Patient Height	UCUM cm centimeter UCUM mm millimeter			Value is taken from Patient Manager dialog.
A-8-3	>>	CONTAINS	NUM	LN 29463-7 Patient Weight	UCUM kg kilograms			Value is taken from Patient Manager dialog.
A-8-4	>>	CONTAINS	NUM	LN 11996-6 Gravida	UCUM 1 no units			Value is taken from Category OB of Study Info dialog.
A-8-5	>>	CONTAINS	NUM	LN 11977-6 Para	UCUM 1 no units			Value is taken from Category OB of Study Info dialog.
A-8-6	>>	CONTAINS	NUM	LN 11612-9 Aborta	UCUM 1 no units			Value is taken from Category OB of Study Info dialog.
A-8-7	>>	CONTAINS	NUM	LN 33065-4 Ectopic Pregnancies	UCUM 1 no units			Value is taken from Category OB of Study Info dialog.

9.1.1.4 OB-GYN Procedure Summary Section (TID 5002)

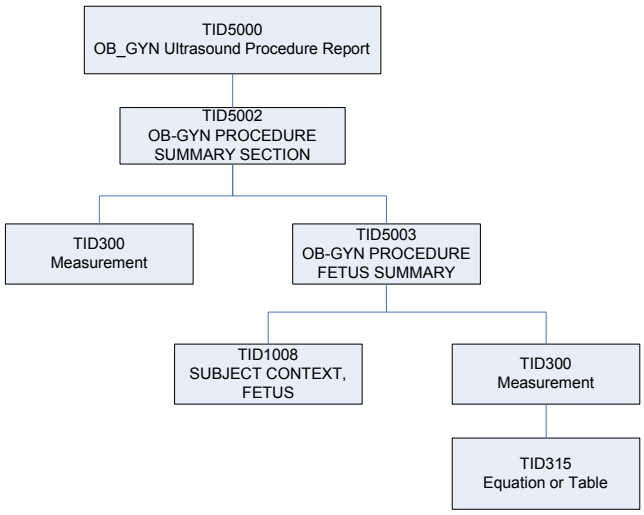

Figure 9.1-3
TEMPLATE HIERARCHY OF OB-GYN PROCEDURE SUMMARY SECTION

Table 9.1-4
OB-GYN PROCEDURE SUMMARY SECTION

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-10	>	CONTAINS	CONTAINER	DCM 121111 Summary		5002		
A-10-1	>>	CONTAINS	DATE	LN 11778-8 EDD	yyyymmdd		12003	Value is taken from Category OB of Study Info dialog. This Name for X8 is "Estab.DueDate".
				LN 11779-6 EDD from LMP	yyyymmdd			Value automatically calculated by the X8 based on the value entered for LMP.

								This Name for X8 is "EDD(LMP)"
				LN 11781-2 EDD from average ultrasound age	yyyymmdd			Value automatically calculated by the X8 based various measurements and on the LMP. If there is more than one fetus, the value used is EDD of Fetus A. This Name for X8 is "EDD(Average US GA)"
				LN 11955-2 LMP	yyyymmdd			Value is taken from Category OB of Study Info dialog.
				LN 11976-8 Ovulation date	yyyymmdd			Value is taken from Category OB of Study Info dialog. This Name for X8 is "Exp.Ovul.".
A-10-2	>>	CONTAINS	NUM	LN 11878-6 Number of Fetuses	UCUM 1 no units	300	12018	Value is taken from Category OB of Study Info dialog. This Name for X8 is "Gestations".
				LN 11886-9 Gestational Age by ovulation date				Not used
A-10-3	>>	CONTAINS	TEXT	DCM 121106 Comment		5002		This field is taken from "Comment" entered in the

								Report.
A-10-4	>>	CONTAINS	CONTAINER	DCM 125008 Fetus Summary		5003		This template is included 1 per fetus. X8 used this template to insert measurements from DCID 12019.
A-10-4-1	>>>	HAS OBS CONTEXT	TEXT	LN 11951-1 Fetus ID		1008		Value of "1, "2, "3 or "4 is used as identifier of the Fetus.
A-10-4-2	>>>	CONTAINS	NUM	LN 11878-6 Number of Fetuses				Not used
A-10-4-3	>>>	CONTAINS	NUM	LN 18185-9 Gestational Age	UCUM d days	300	12019	This is a system-calculated value. This name for X8 is "Average US GA"
				LN 11885-1 Gestational Age by LMP	UCUM d days			Value automatically calculated by the X8 based on the value entered for LMP.
A-10-4-4	>>>	CONTAINS	NUM	LN 11727-5 Estimated Weight	UCUM kg			This is a system-calculated value. This name for X8 is "EFW"
A-10-4-4-1	>>>>	INFERRED FROM	CODE	DCM 121420 Equation DCM 121424 Table of Values	Ref. Section 9.2.2 OB Fetal Body Weight Equations and Tables (Context ID	315	228 /12012(12014)	CID 12014 will be used.

					12014)			
A-10-4-5	>>>	CONTAINS	NUM	LN 11767-1 EFW percentile rank	UCUM percentile "percentile"	300	12019	This is a system-calculated value. This name for x8 is "Percentile (EFW)".
A-10-4-5-1	>>>>	INFERRED FROM	CODE	DCM 121420 Equation DCM 121424 Table of Values	Ref. Section 9.2.4 Estimated Fetal Weight Percentile Equations and Tables (Context ID 12016)	315	228 /12012(12016)	CID 12016 will be used.
A-10-4-6	>>>	CONTAINS	NUM	LN 11948-7 Fetal Heart Rate	UCUM bpm "bpm"	300	12019	This is a measured value. This name for X8 is "FHR"

9.1.1.5 Fetal Biometry Ratio Section (TID 5004)

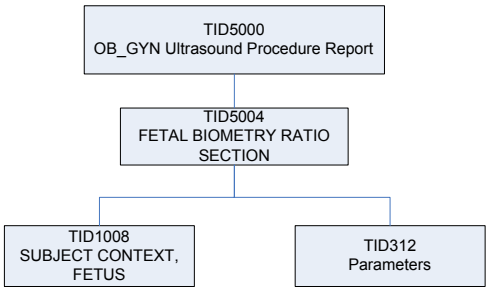

Figure 9.1-4
TEMPLATE HIERARCHY OF FETAL BIOMETRY RATIO SECTION IN OB-GYN SR

Table 9.1-5

FETAL BIOMETRY RATIO SECTION IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-11	>	CONTAINS	CONTAINER	DCM 125001 Fetal Biometry Ratios		5004		Measurements from CID 12004 are included.
A-11-1	>>	HAS OBS CONTEXT	TEXT	LN 11951-1 Fetus ID		1008		Value of "1, "2, "3, or "4 is used as identifier of the Fetus.
A-11-2	>>	CONTAINS	NUM	LN 11947-9 HC/AC	UCUM 1 no units	5004	12004	HC/AC
				LN 11871-1 FL/AC	UCUM % "%"			FL/AC
				LN 11872-9 FL/BPD	UCUM % "%"			FL/BPD
				LN 11823-2 Cephalic Index	UCUM % "%"			CI(BPD/OFD)
				LN 11873-7 FL/HC	UCUM % "%"			FL/HC

9.1.1.6 Fetal Biometry Section (TID 5005)

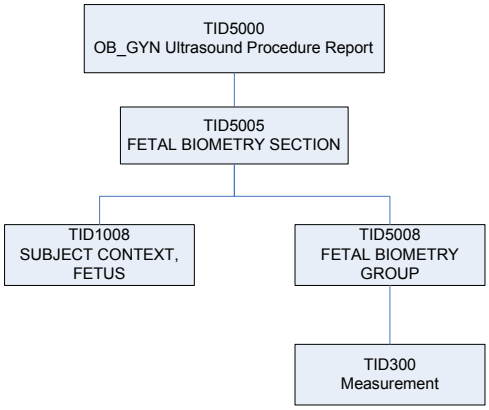

Figure 9.1-5
TEMPLATE HIERARCHY OF FETAL BIOMETRY SECTION IN OB-GYN SR

Table 9.1-6
FETAL BIOMETRY SECTION IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-12	>	CONTAINS	CONTAINER	DCM 125002 Fetal Biometry		5005		
A-12-1	>>	HAS OBS CONTEXT	TEXT	LN 11951-1 Fetus ID		1008		Will be present if more than one fetus.
A-12-2	>>	CONTAINS	CONTAINER	DCM 125005 Biometry Group		5008		Measurements from DCID 12005 are used to invoke this template one or more number of times.
A-12-2-1	>>>	CONTAINS	NUM	LN 11979-2 Abdominal Circumference	UCUM cm centimeter	300	12005	AC
				LN 11818-2 Anterior-Posterior Abdominal Diameter	UCUM cm centimeter			APD

				LN 11819-0 Anterior-Posterior Trunk Diameter	UCUM cm centimeter			APTD
				LN 11820-8 Biparietal Diameter	UCUM cm centimeter			BPD
				LN 11963-6 Femur Length	UCUM cm centimeter			FL
				LN 11965-1 Foot length	UCUM cm centimeter			Foot
				LN 11984-2 Head Circumference	UCUM cm centimeter			HC
				LN 11851-3 Occipital-Frontal Diameter	UCUM cm centimeter			OFD
				LN 11988-3 Thoracic Circumference	UCUM cm centimeter			ThC
				LN 33068-8 Thoracic Area	UCUM cm2 Square centimeter			ThA
				LN 11862-0 Tranverse Abdominal Diameter	UCUM cm centimeter			TAD
				LN 11864-6 Transverse Thoracic Diameter	UCUM cm centimeter			TTD
				LN 11834-9 Left Kidney length	UCUM cm centimeter			Lt. Kidney
				LN 11836-4 Right Kidney length	UCUM cm centimeter			Rt. Kidney

A-12-2-1-1	>>>>	HAS CONCEPT MOD	CODE	DCM 121401 Derivation	SRT R-002E1 Best value SRT R-00317 Mean		/3627	If user selects Avg. from the Report, this value will be a "Mean". Else this value will be a "Best value"
A-12-2-2	>>>	CONTAINS	NUM	LN 18185-9 Gestational Age	UCUM d days	5008		This value automatically calculates the GA based on GA equations and GA tables.
A-12-2-2-1	>>>>	INFERRED FROM	CODE	DCM 121420 Equation DCM 121424 Table of Values	Ref. Section 9.2.1 Gestational Age Equations and Tables (Context Group 12013)		228 /12013	CID 12013 will be used.
A-12-2-3	>>>	CONTAINS	NUM	DCM 125012 Growth Percentile Rank	UCUM percentile "percentile"		12017	This value automatically calculates the FG percentile based on FG equations and FG tables.
A-12-2-3-1	>>>>	INFERRED FROM	CODE	DCM 121420 Equation DCM 121424 Table of Values	Ref. Section 9.2.3 Fetal Growth Equations and Tables (Context ID 12015)		228 /12015	CID 12015 will be used.

9.1.1.7 Long Bones Section (TID 5006)

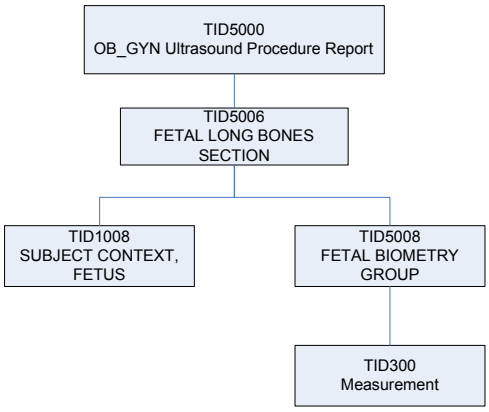

Figure 9.1-6
TEMPLATE HIERARCHY OF LONG BONES SECTION IN OB-GYN SR

Table 9.1-7
LONG BONES SECTION IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-13	>	CONTAINS	CONTAINER	DCM 125003 Fetal Long Bones		5006		
A-13-1	>>	HAS OBS CONTEXT	TEXT	LN 11951-1 Fetus ID		1008		Will be present if more than one fetus.
A-13-2	>>	CONTAINS	CONTAINER	DCM 125005 Biometry Group		5008		Measurements from DCID 12006 are used to invoke this template one or more number of times.
A-13-2-1	>>>	CONTAINS	NUM	LN 11966-9 Humerus length	UCUM cm centimeter	300	12006	HUM
				LN 11967-7 Radius length				RAD

				LN 11969-3 Ulna length				ULNA
				LN 11968-5 Tibia length				TIB
				LN 11964-4 Fibula length				FIB
				LN 11962-8 Clavicle length				CLAV
A-13-2-1-1	>>>>	HAS CONCEPT MOD	CODE	DCM 121401 Derivation	SRT R-002E1 Best value SRT R-00317 Mean	300	/3627	If user selects Avg. from the Report, this value will be a "Mean". Else this value will be a "Best value"
A-13-2-2	>>>	CONTAINS	NUM	LN 18185-9 Gestational Age	UCUM d day	5008		This value is automatically calculates the GA based on GA equations and GA tables.
A-13-2-2-1	>>>>	INFERRED FROM	CODE	DCM 121420 Equation DCM 121424 Table of Values	Ref. Section 9.2.1 Gestational Age Equations and Tables (Context Group 12013)		228 /12013	CID 12013 will be used.
A-13-2-3	>>>	CONTAINS	NUM	DCM 125012 Growth Percentile Rank	UCUM percentile "percentile"		12017	This value automatically calculates the FG percentile based on FG equations and FG tables.

A-13-2-3-1	>>>>	INFERRED FROM	CODE	DCM 121420 Equation DCM 121424 Table of Values	Ref. Section 9.2.3 Fetal Growth Equations and Tables (Context ID 12015)		228 /12015	CID 12015 will be used.

9.1.1.8 Fetal Cranium Section (TID 5007)

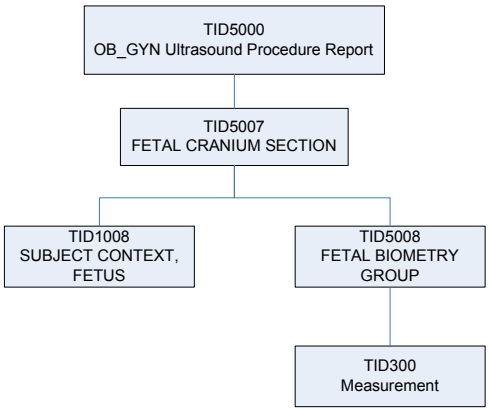

Figure 9.1-7
TEMPLATE HIERARCHY OF FETAL CRANIUM SECTION IN OB-GYN SR

Table 9.1-8
FETAL CRANIUM SECTION IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-14	>	CONTAINS	CONTAINER	DCM 125004 Fetal Cranium		5007		
A-14-1	>>	HAS OBS CONTEXT	TEXT	LN 11951-1 Fetus ID		1008		Will be present if more than one fetus.

A-14-2	>>	CONTAINS	CONTAINER	DCM 125005 Biometry Group		5008		Measurements from DCID 12007 are used to invoke this template one or more of times.
A-14-2-1	>>>	CONTAINS	NUM	LN 12171-5 Lateral Ventrical width	UCUM cm centimeter UCUM cm2 Square centimeter	300	12007	Lat Vent
				LN 11860-4 Cisterna Magna length				CM
				LN 12146-7 Nuchal Fold thickness				NF
				LN 33070-4 Inner Orbital Diameter				IOD
				LN 11629-3 Outer Orbital Diameter				OOD
				LN 11863-8 Trans Cerebellar Diameter				CEREB
				LN 33069-6 Nuchal Translucency				Nuchal Thickness
A-14-2-1-1	>>>>	HAS CONCEPT MOD	CODE	DCM 121401 Derivation	SRT R-002E1 Best value SRT R-00317 Mean		/3627	If user selects Avg. from the Report, this value will be a "Mean". Else this value will be a "Best value"
A-14-2-2	>>>	CONTAINS	NUM	LN 18185-9 Gestational Age	UCUM d day	5008		This value automatically calculates the GA based on GA equations and GA tables.

A-14-2-2-1	>>>>	INFERRED FROM	CODE	DCM 121420 Equation DCM 121424 Table of Values	Ref. Section 9.2.1 Gestational Age Equations and Tables (Context Group 12013)		228 /12013	CID 12013 will be used.
A-14-2-3	>>>	CONTAINS	NUM	DCM 125012 Growth Percentile Rank	UCUM percentile "percentile"		12017	This value automatically calculates the FG percentile based on FG equations and FG tables.
A-14-2-3-1	>>>>	INFERRED FROM	CODE	DCM 121420 Equation DCM 121424 Table of Values	Ref. Section 9.2.3 Fetal Growth Equations and Tables (Context ID 12015)		228 /12015	CID 12015 will be used.

9.1.1.9 Fetal Biophysical Profile Section (TID 5009)

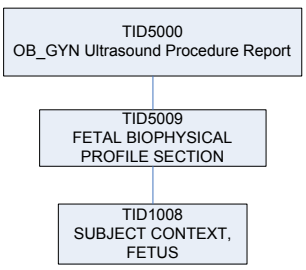

Figure 9.1-8
TEMPLATE HIERARCHY OF FETAL BIOPHYSICAL PROFILE SECTION IN OB-GYN SR

Table 9.1-9

FETAL BIOPHYSICAL PROFILE SECTION IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-16	>	CONTAINS	CONTAINER	DCM 125006 Biophysical Profile		5009		
A-16-1	>>	HAS OBS CONTEXT	TEXT	LN 11951-1 Fetus ID		1008		Will be present if more than one fetus.
A-16-2	>>	CONTAINS	NUM	LN 11631-9 Gross Body Movement	UCUM {0:2} "range 0:2"	5009		X8 uses the value as entered in the Report.
				LN 11632-7 Fetal Breathing				X8 uses the value as entered in the Report.
				LN 11635-0 Fetal Tone				X8 uses the value as entered in the Report.
				LN 11635-5 Fetal Heart Reactivity				X8 uses the value as entered in the Report.
				LN 11630-1 Amniotic Fluid Volume				X8 uses the value as entered in the Report.
				LN 11634-3 Biophysical Profile Sum Score	UCUM 1 no units			X8 automatically calculates the sum of the scores.

9.1.1.10Early Gestation Section (TID 5011)

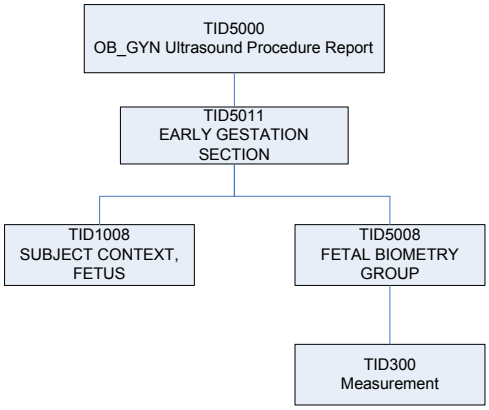

Figure 9.1-9
TEMPLATE HIERARCHY OF EARLY GESTATION SECTION IN OB-GYN SR

Table 9.1-10
EARLY GESTATION SECTION IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-15	>	CONTAINS	CONTAINER	DCM, 125009 Early Gestation		5011		
A-15-1	>>	HAS OBS CONTEXT	TEXT	LN 11951-1 Fetus ID		1008		Will be present if more than one fetus.
A-15-2	>>	CONTAINS	CONTAINER	DCM 125005 Biometry Group		5008		Measurements from DCID 12009 are used to invoke this template one or more number of times.
A-15-2-1	>>>	CONTAINS	NUM	LN 11957-8 Crown Rump Length	UCUM cm centimeter UCUM cm2 Square centimeter	300	12009	CRL
				LN 11850-5 Gestational Sac Diameter				GS
				LN 33071-2 Spine Length				SL

				LN 11816-6 Yolk Sac length				YS
A-15-2-1-1	>>>>	HAS CONCEPT MOD	CODE	DCM 121401 Derivation	SRT R-002E1 Best value SRT R-00317 Mean		/3627	If user selects Avg. from the Report, this value will be a "Mean". Else this value will be a "Best value"
A-15-2-2	>>>	CONTAINS	NUM	LN 18185-9 Gestational Age	UCUM d day	5008		This value is automatically calculates the GA based on GA equations and GA tables.
A-15-2-2-1	>>>>	INFERRED FROM	CODE	DCM 121420 Equation DCM 121424 Table of Values	Ref. Section 9.2.1 Gestational Age Equations and Tables (Context Group 12013)		228 /12013	CID 12013 will be used.
A-15-2-3	>>>	CONTAINS	NUM	DCM 125012 Growth Percentile Rank	UCUM percentile "percentile"		12017	This value automatically calculates the FG percentile based on FG equations and FG tables.
A-15-2-3-1	>>>>	INFERRED FROM	CODE	DCM 121420 Equation DCM 121424 Table of Values	Ref. Section 9.2.3 Fetal Growth Equations and Tables (Context ID 12015)		228 /12015	CID 12015 will be used.

9.1.1.11Amniotic Sac Section (TID 5010)

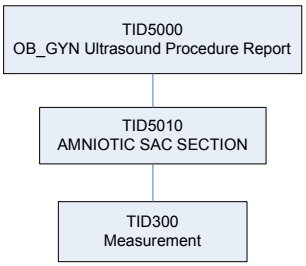

Figure 9.1-10
TEMPLATE HIERARCHY OF AMNIOTIC SAC SECTION IN OB-GYN SR

Table 9.1-11
AMNIOTIC SAC SECTION IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-17	>	CONTAINS	CONTAINER	DCM 121070 Findings		5010		
A-17-1	>>	HAS CONCEPT MOD	CODE	SRT G-C0E3 Finding Site	SRT T-F1300 ”Amniotic Sac”			DT (T-F1300, SRT, "Amniotic Sac")
A-17-2	>>	CONTAINS	NUM	LN 11627-7 Amniotic Fluid Index	UCUM cm centimeter	300		AFI
				LN 11624-4 First Quadrant Diameter			12008	Q1
				LN 11626-9 Second Quadrant Diameter				Q2
				LN 11625-1 Third Quadrant Diameter				Q3

				LN 11623-6 Fourth Quadrant Diameter				Q4

9.1.1.12Pelvis and Uterus Section (TID 5015)

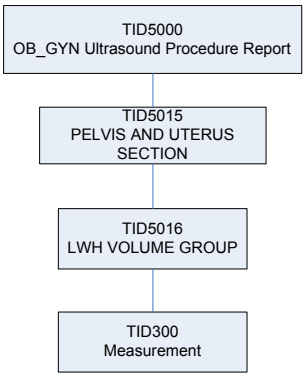

Figure 9.1-11
TEMPLATE HIERARCHY OF PELVIS AND UTERUS SECTION IN OB-GYN SR

Table 9.1-12
PELVIS AND UTERUS SECTION IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-18	>	CONTAINS	CONTAINER	DCM 125011 Pelvis and Uterus		5015		
A-18-1	>>	CONTAINS	CONTAINER	SRT T-83000 Uterus		5016		TID 5016(LWH Volume Group) is included. Group Name is "Uterus".
A-18-1-1	>>>	CONTAINS	NUM	LN 11865-3 Uterus Width	UCUM cm centimeter	300		This row is inserted as part of TID 300 invocation.
				LN 11842-2 Uterus Length				This row is inserted as part of TID 300 invocation.

				LN 11859-6 Uterus Height				This row is inserted as part of TID 300 invocation.
A-18-1-1-1	>>>>	HAS CONCEPT MOD	CODE	DCM 121401 Derivation	SRT R-002E1 Best value SRT R-00317 Mean		/3627	If user selects Avg. from the Report, this value will be a "Mean". Else this value will be a "Best value"
A-18-1-2	>>>	CONTAINS	NUM	LN 33192-6 Uterus Volume	UCUM cm3 Cubic centimeter			This row is inserted as part of TID 300 invocation. X8 automatically calculates the volume based on Length, Width and Height measurements.
A-18-2	>>	CONTAINS	NUM	LN 11961-0 Cervix Length LN 12145-9 Endometrium Thickness	UCUM cm centimeter		12011	This measurement is from CID 12011. This row is inserted as part of TID 300 invocation. Only Cervix Length and Endometrium Thickness from CID 12011 will be present.
A-18-2-1	>>>	HAS CONCEPT MOD	CODE	DCM 121401 Derivation	SRT R-002E1 Best value SRT R-00317 Mean		/3627	If user selects Avg. from the Report, this value will be a "Mean". Else this value will be a "Best value"

9.1.1.13Ovaries Section (TID 5012)

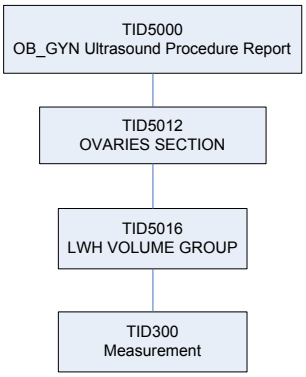

Figure 9.1-12
TEMPLATE HIERARCHY OF OVARIES SECTION IN OB-GYN SR

Table 9.1-13
OVARIES SECTION IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-19	>	CONTAINS	CONTAINER	DCM 121070 Findings		5012		
A-19-1	>>	HAS CONCEPT MOD	CODE	SRT G-C0E3 Finding Site	SRT T-87000 ”Ovary”			DT (T-87000, SRT, "Ovary")
A-19-2	>>	CONTAINS	CONTAINER	SRT T-87000 Ovary		5016		TID 5016(LWH Volume Group) is included. Left ovary volume, length and width measurements are inserted. Group Name is "Ovary".
A-19-2-1	>>>	CONTAINS	NUM	LN 11829-9 Left Ovary Width	UCUM cm centimeter	300		This row is inserted as part of TID 300 invocation.

				LN 11840-6 Left Ovary Length				This row is inserted as part of TID 300 invocation.
				LN 11857-0 Left Ovary Height				This row is inserted as part of TID 300 invocation.
A-19-2-1-1	>>>>	HAS CONCEPT MOD	CODE	DCM 121401 Derivation	SRT R-002E1 Best value SRT R-00317 Mean		/3627	If user selects Avg. from the Report, this value will be a "Mean". Else this value will be a "Best value"
A-19-2-2	>>>	CONTAINS	NUM	LN 12164-0 Left Ovary Volume	UCUM cm3 Cubic centimeter			This row is inserted as part of TID 300 invocation. X8 automatically calculated the volume based on Length, Width and Height measurements.
A-19-3	>>	CONTAINS	CONTAINER	SRT T-87000 Ovary		5016		Similarly TID 5016(LWH Volume Group) is included for Right Ovary Volume, length and width measurements.
A-19-3-1	>>>	CONTAINS		LN 11830-7 Right Ovary Width	UCUM cm centimeter			
				LN 11841-4 Right Ovary Length				
			NUM	LN 11858-8 Right Ovary Height				
A-19-3-1-1	>>>>	HAS CONCEPT MOD	CODE	DCM 121401 Derivation	SRT R-002E1 Best value SRT R-00317 Mean	300	/3627	
A-19-3-2	>>>	CONTAINS	NUM	LN 12165-7 Right Ovary Volume	UCUM cm3 Cubic			

					centimeter			

9.1.1.14Follicles Section - Left (TID 5013)

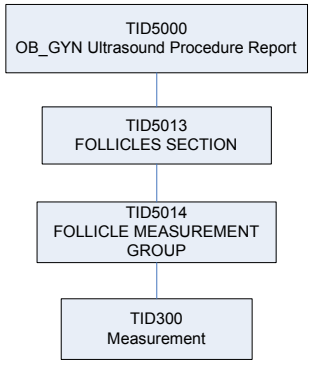

Figure 9.1-13
TEMPLATE HIERARCHY OF FOLLICLES SECTION (LEFT) IN OB-GYN SR

Table 9.1-14
FOLLICLES SECTION (LEFT) IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-20	>	CONTAINS	CONTAINER	DCM 121070 Findings		5013		
A-20-1	>>	HAS CONCEPT MOD	CODE	SRT G-C0E3 Finding Site	SRT T-87600 “Ovarian Follicle”			DT (T-87600, SRT, "Ovarian Follicle")
A-20-2	>>	HAS CONCEPT MOD	CODE	SRT G-C171 Laterality	SRT G-A101 Left			EV (G-A101, SRT, "Left")
A-20-3	>>	CONTAINS	NUM	LN 11879-4 Number of follicles in left ovary	UCUM 1 no units			
A-20-4	>>	CONTAINS	CONTAINER	DCM 125007 Measurement		5014		TID 5014 (Follicle Measurement

				Group				Group) is included.
A-20-4-1	>>>	HAS OBS CONTEXT	TEXT	DCM 12510 Identifier				Uses numbers "1, "2, "3 . up to "12 to identify the follicle.
A-20-4-2	>>>	CONTAINS	NUM	SRT GD705 Volume	UCUM cm3 Cubic centimeter	300		This is inserted as part of TID 300 invocation. X8 automatically calculates the volume based on the follicle diameter
A-20-4-3	>>>	CONTAINS	NUM	LN 11793-7 Follicle Diameter	UCUM cm centimeter			This is inserted as part of TID 300 invocation. This name for X8 is [1],[2],[3],...[12].
A-20-4-3-1	>>>>	HAS CONCEPT MOD	CODE	DCM 121401 Derivation	SRT R-002E1 Best value SRT R-00317 Mean		/3627	If user selects Avg. from the Report, this value will be a "Mean". Else this value will be a "Best value"

9.1.1.15Follicles Section – Right (TID 5013)

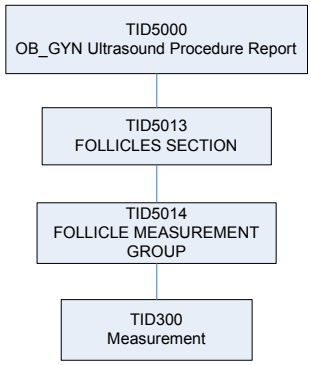

Figure 9.1-14
TEMPLATE HIERARCHY OF FOLLICLES SECTION (RIGHT) IN OB-GYN SR

Table 9.1-15
FOLLICLES SECTION (RIGHT) IN OB-GYN SR

	NL	REL	VT	Concept Name	Unit / CODE Value	Ref TID	Ref CID	Comments
A-21	>	CONTAINS	CONTAINER	DCM 121070 Findings		5013		
A-21-1	>>	HAS CONCEPT MOD	CODE	SRT G-C0E3 Finding Site	SRT T-87600 “Ovarian Follicle”			DT (T-87600, SRT, "Ovarian Follicle")
A-21-2	>>	HAS CONCEPT MOD	CODE	SRT G-C171 Laterality	SRT G-A100 “Right”			EV (G-A100, SRT, "Right")
A-21-3	>>	CONTAINS	NUM	LN 11880-2 Number of follicles in right ovary	UCUM 1 no units			
A-21-4	>>	CONTAINS	CONTAINER	DCM 125007 Measurement Group		5014		Similar TID 5014(Follicle Measurement Group) is included for follicles in right ovary diameter and volume.
A-21-4-1	>>>	HAS OBS CONTEXT	TEXT	DCM 12510 Identifier				
A-21-4-2	>>>	CONTAINS	NUM	SRT G-D705 Volume	UCUM cm3 Cubic centimeter	300		

A-21-4-3	>>>	CONTAINS	NUM	LN 11793-7 Follicle Diameter	UCUM cm centimeter			
A-21-4-3-1	>>>>	HAS CONCEPT MOD	CODE	DCM 121401 Derivation	SRT R-002E1 Best value SRT R-00317 Mean		/3627	

9.2 DCMR Context Groups used in SONOACE X8

9.2.1 Gestational Age Equations and Tables (Context Group 12013)

Table 9.2-1
GESTATIONAL AGE EQUATIONS AND TABLES

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
LN	11889-3	AC, Campbell 1975
LN	11892-7	AC, Hadlock 1984
LN	33076-1	AC, Shinozuka 1996
LN	11902-4	BPD, Hadlock 1984
LN	33538-0	BPD, Hansmann 1986
LN	11905-7	BPD, Jeanty 1984
LN	11906-5	BPD, Kurtz 1980
LN	33082-9	BPD, Osaka 1989
LN	11907-3	BPD, Sabbagha 1978
LN	33084-5	BPD, Shinozuka 1996
LN	33086-0	BPD-oi, Chitty 1997
LN	33087-8	BPD-oo, Chitty 1997
LN	33088-6	Clavical length,Yarkoni 1985
LN	11910-7	CRL, Hadlock 1992
LN	33540-6	CRL, Hansmann 1986
LN	11913-1	CRL, Nelson 1981
LN	33093-6	CRL, Osaka 1989
LN	33094-4	CRL, Rempen 1991

LN	11914-9	CRL, Robinson 1975
LN	33095-1	CRL, Shinozuka 1996
LN	33098-5	FL, Chitty 1997
LN	11920-6	FL, Hadlock 1984
LN	33541-4	FL, Hansmann 1986
LN	11922-2	FL, Hohler 1982
LN	11923-0	FL, Jeanty 1984
LN	33101-7	FL, Osaka 1989
LN	33102-5	FL, Shinozuka 1996
LN	11928-9	GS, Hellman 1969
LN	33107-4	GS, Nyberg 1992
LN	33108-2	GS, Tokyo 1986
LN	33110-8	HC measured, Chitty 1997
LN	33111-6	HC derived, Chitty 1997
LN	11932-1	HC, Hadlock 1984
LN	33543-0	HC, Hansmann 1986
LN	11936-2	Humerus, Jeanty 1984
LN	33117-3	Humerus Length, Osaka 1989
LN	33120-7	OFD, Hansmann 1986
LN	11941-2	Tibia, Jeanty 1984
LN	11944-6	Ulna, Jeanty 1984

9.2.2 OB Fetal Body Weight Equations and Tables (Context ID 12014)

Table 9.2-2
OB FETAL BODY WEIGHT EQUATIONS AND TABLES

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
LN	11756-4	EFW by AC, Campbell 1975
LN	11738-2	EFW by AC, BPD, Hadlock 1984
LN	11735-8	EFW by AC, BPD, FL, Hadlock 1985
LN	11732-5	EFW by AC, BPD, FL, HC, Hadlock 1985

LN	11751-5	EFW by AC, FL, Hadlock 1985
LN	11746-5	EFW by AC, FL, HC, Hadlock 1985
LN	33139-7	EFW by BPD, TTD, Hansmann 1986
LN	11739-0	EFW by AC and BPD, Shepard 1982
LN	33140-5	EFW by BPD, FTA, FL, Osaka 1990

9.2.3 Fetal Growth Equations and Tables (Context ID 12015)

Table 9.2-3
FETAL GROWTH EQUATIONS AND TABLES

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
LN	33145-4	AC by GA, ASUM 2000
LN	33146-2	AC by GA, Hadlock 1984
LN	33147-0	AC (measured) by GA, Chitty 1994
LN	33546-3	AC (derived) by GA, Chitty 1994
LN	33149-6	AC by GA, Shinozuka 1996
LN	33151-2	BPD by GA, ASUM 2000
LN	33198-3	BPD by GA, Hadlock 1984
LN	33556-2	BPD outer-inner by GA, Chitty 1994
LN	33152-0	BPD outer-outer by GA, Chitty 1994
LN	33156-1	BPD by GA, Shinozuka 1996
LN	33161-1	CRL by GA, Shinozuka 1996
LN	33164-5	Fibula by GA, Jeanty 1983
LN	33165-2	FL by GA, ASUM 2000
LN	33166-0	FL by GA, Hadlock 1984
LN	33167-8	FL by GA, Chitty 1994
LN	33170-2	FL by GA, Shinozuka 1996
LN	33172-8	HC by GA, ASUM 2000
LN	33173-6	HC by GA, Hadlock 1984
LN	33174-4	HC derived by GA, Chitty 1994
LN	33177-7	Humerus Length by GA, ASUM 2000
LN	33178-5	OFD by GA, ASUM 2000

LN	33180-1	Radius by GA, Jeanty 1983
LN	33181-9	TCD by GA Goldstein 1987

9.2.4 Estimated Fetal Weight Percentile Equations and Tables (Context ID 12016)

Table 9.2-4
ESTIMATED FETAL WEIGHT PERCENTILE EQUATIONS AND TABLES

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
LN	33183-5	FWP by GA, Hadlock 1991
LN	33184-3	FWP by GA, Williams, 1982
LN	33189-2	FWP by GA, Brenner 1976