ALPINION
MEDICAL SYSTEMS

DICOM Conformance Statement (Rev. 0)

E-CUBE i7 v1.x.x

ALPINION MEDICAL SYSTEMS
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Revision History

Revision	Date of Issue	Author	Description
0	2015-03-23	Hyun-deok Choi	Initial release

1 CONFORMANCE STATEMENT OVERVIEW

E-CUBE i7 Ultrasound system implements DICOM services to download work lists from an information system, save acquired US Images and Structured Reports to a network storage device or media, print to a networked hardcopy device and inform the information system about the work actually done.

Table 1 provides available network services.

Table 1 : NETWORK SERVICES

SOP Classes	User of Service(SCU)	Provider of Service (SCP)
Transfer		
Ultrasound Image Storage	Yes (see Note 1)	No
Ultrasound Image Storage (Retired)	Yes (see Note 1)	No
Ultrasound Multiframe Image Storage	Yes (see Note 1)	No
Ultrasound Multiframe Image Storage (Retired)	Yes (see Note 1)	No
Secondary Capture Image Storage	Yes (see Note 1)	No
Storage Commitment Push Model	Yes (see Note 1)	No
Comprehensive SR	Yes (see Note 2)	No
Workflow Management		
Modality Worklist	Yes (see Note 1)	No
Modality Performed Procedure Step	Yes (see Note 1)	No
Print Management		
Basic Grayscale Print Management	Yes (see Note 1)	No
Basic Color Print Management	Yes (see Note 1)	No
Verification		
Verification	Yes	No

NOTE 1 : Requires licensable option “DICOM 3.0 Connectivity”.

NOTE 2 : Requires licensable option “DICOM SR (OB)”.

Table 2 provides an overview of the Media Storage Application Profiles.

Table 2 : MEDIA SERVICES

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
STD-US-ID-SF-CDR	Yes / Yes	Yes
STD-US-ID-SF-DVD	Yes / Yes	Yes
STD-US-SC-SF&MF-CDR	Yes / Yes	Yes
STD-US-SC-SF&MF-DVD	Yes / Yes	Yes
STD-GEN-USB	Yes / No	Yes

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3 INTRODUCTION

3.1 AUDIENCE

This document is intended for understanding how the System will integrate into healthcare facilities. This includes both those responsible for overall imaging network policy and architecture, as well as integrators who need to have a detailed understanding of the DICOM features of the product.

3.2 REMARKS

The scope of this DICOM Conformance Statement is to facilitate integration between the E-CUBE i7 System and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard. DICOM by itself does not guarantee interoperability. The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.

This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

- The comparison of different Conformance Statements is just the first step towards assessing interconnectivity and interoperability between the product and other DICOM conformant equipment.
- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.

3.3 TERMS AND DEFINITIONS

Informal definitions are provided for the following terms used in this Conformance Statement. The DICOM Standard is the authoritative source for formal definitions of these terms.

Abstract Syntax – the information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.

Application Entity (AE) – an end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.

Application Entity Title – the externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network.

Application Context – the specification of the type of communication used between Application Entities.
Association – a network communication channel set up between Application Entities.

Attribute – a unit of information in an object definition; a data element identified by a tag. The information may be a complex data structure (Sequence), itself composed of lower level data elements.

Information Object Definition (IOD) – the specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The Attributes may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C). Examples: MR Image IOD, CT Image IOD, Print Job IOD.

Joint Photographic Experts Group (JPEG) – a set of standardized image compression techniques, available for use by DICOM applications.

Media Application Profile – the specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs)

Module – a set of Attributes within an Information Object Definition that are logically related to each other. Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.

Negotiation – first phase of Association establishment that allows Application Entities to agree on the types of data to be exchanged and how that data will be encoded.

Presentation Context – the set of DICOM network services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes.

Protocol Data Unit (PDU) – a packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.

Security Profile – a set of mechanisms, such as encryption, user authentication, or digital signatures, used by an Application Entity to ensure confidentiality, integrity, and/or availability of exchanged DICOM data

Service Class Provider (SCP) – role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity (Service Class User). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).

Service Class User (SCU) – role of an Application Entity that uses a DICOM network service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU).

Service/Object Pair (SOP) Class – the specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.

Service/Object Pair (SOP) Instance – an information object; a specific occurrence of information exchanged in a SOP Class.

Tag – a 32-bit identifier for a data element, represented as a pair of four digit hexadecimal numbers, the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) data element.

Transfer Syntax – the encoding used for exchange of DICOM information objects and messages. Examples: JPEG compressed (images), little Endean explicit value representation.

Unique Identifier (UID) – a globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier.

Value Representation (VR) – the format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

3.4 ABBREVIATIONS

AE	Application Entity
AET	Application Entity Title
CD-R	Compact Disk Recordable
DICOM	Digital Imaging and Communications in Medicine
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
HIS	Hospital Information System
IOD	Information Object Definition
ISO	International Organization for Standards
JPEG	Joint Photographic Experts Group
MF	Multi Frame

MPPS	Modality Performed Procedure Step
MTU	Maximum Transmission Unit (IP)
MWL	Modality Worklist
PDU	Protocol Data Unit
RIS	Radiology Information System
RLE	Run Length Encoding
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SF	Single Frame
SOP	Service-Object Pair
SR	Structured Reporting
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
US	Ultrasound
VR	Value Representation

3.5 REFERENCES

NEMA PS3 Digital Imaging and Communication in Medicine (DICOM) Standard, available at http://medical.nema.org/

4 NETWORKING

4.1 IMPLEMENTATION MODEL

4.1.1 Application Data Flow

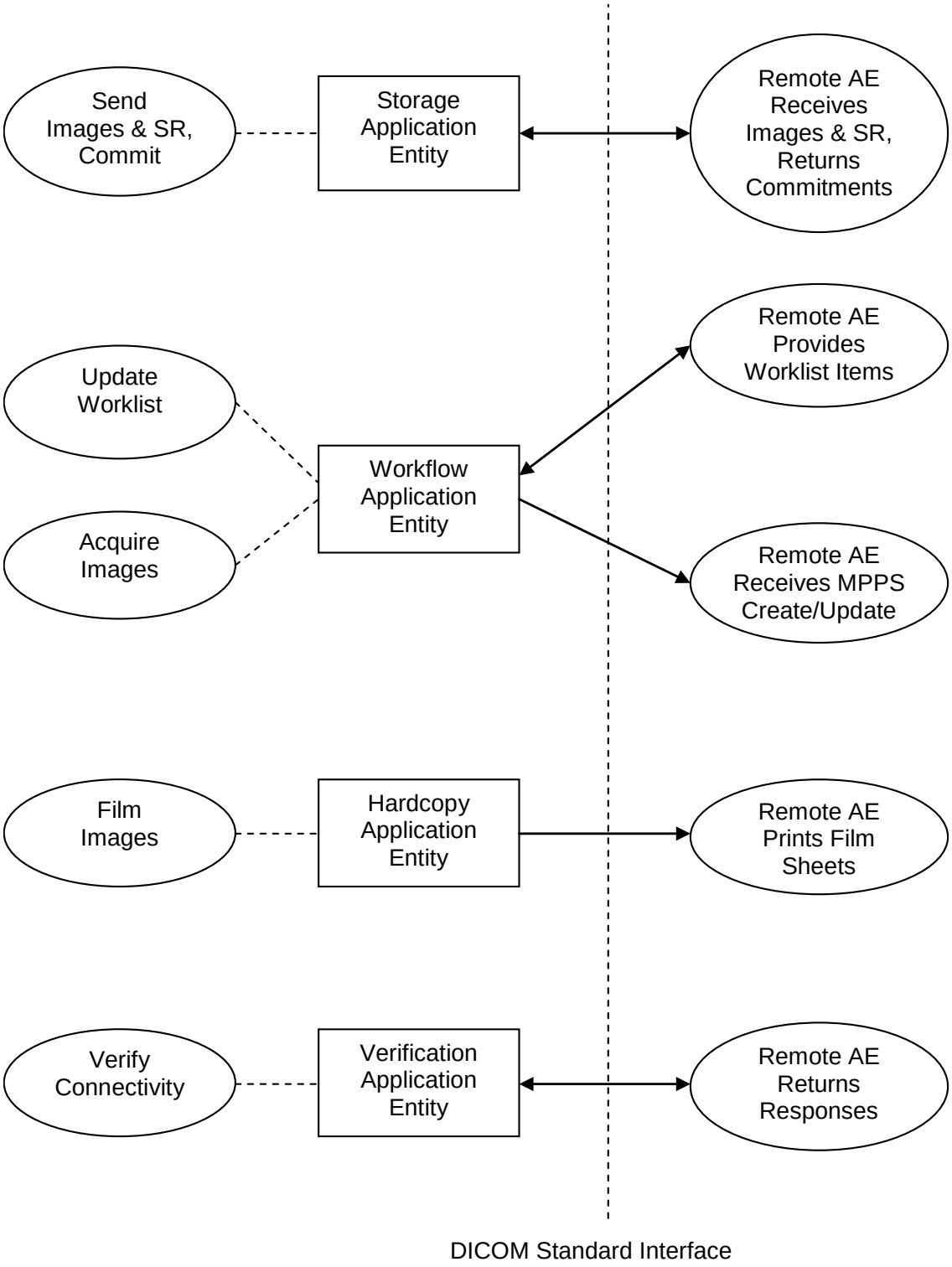

Figure 1 : APPLICATION DATA FLOW DIAGRAM

- **The Storage Application Entity** sends images and Structured Reports and requests Commitments to a remote AE. It is associated with the local real-world activity "Send Images & SR" and "Commit". "Send Images & SR" is performed upon user request for each study completed or for specific images selected (but, SR transfer is performed by End Exam only). When activated by user's settings ("Archive Option", auto-send option), each marked set of images and associated Presentation States can be immediately stored to a preferred destination whenever a Patient/Study is closed by the user. If the remote AE is configured as an archive device the Storage AE will request Storage Commitment. If a commitment response is obtained successfully, the information will be displayed the DICOM Spooler dialog.

- **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 MPPS instances managed by a remote AE. Acquisition of images will result in automated creation of an MPPS Instance. Completion of the MPPS is performed as the result of an operator action.

- **The Hardcopy Application Entity** prints images on a remote AE (Printer). It is associated with the local real-world activity "Film Images". "Film Images" creates a print-job within the print queue containing one or more virtual film sheets composed from images selected by the user.

- **The Verification Application Entity** verifies connectivity with the local and a remote AE. It is associated with the local activity "Verify". When the "Verify" local real-world activity is performed, the Verification Application Entity requests a response for connectivity on the remote AE and receives the response by the remote AE.

4.1.2 Functional Definition of AE's

4.1.2.1 Functional Definition of The Storage Application Entity

The Storage AE performs "Send Images & SR and Commit" to a remote AE by "Print", "Send to" and "End Exam" functions.

- Print : stores an acquired image in the local AE or sends it to a remote AE and receives Commitment, if the option is configured.
- Send to : stores selected images to a remote AE or media.
- End Exam : stores all acquired images in the local AE or send them to a remote AE.

4.1.2.2 Functional Definition of The Workflow Application Entity

The Workflow AE performs "Update Worklist and Acquire Images" to a remote AE by "Worklist or Query" and "Print, End Exam and Delete All" functions.

- Worklist or Query : receives worklist information as a result from a remote AE.
- Print : notifies a remote AE of N-CREATE, IN PROGRESS - MPPS status.
- End Exam : notifies a remote AE of N-SET, COMPLETE - MPPS status.
- Delete All : notifies a remote AE of N-SET, DISCONTINUED - MPPS status.

4.1.2.3 Functional Definition of The Hardcopy Application Entity

The Hardcopy AE performs "Film Images" to a remote AE by "Print" function only.

- Print : prints images to a remote AE when the queue which is configured as the format is full.

4.1.2.4 Functional Definition of The Verification Application Entity

The Verification AE performs "Verify Connectivity" to a remote AE by "Verify" function on each Connectivity configure UI.

- Verify : verifies the connection between the local AE and a remote AE.

4.1.3 Sequencing of Real-World Activities

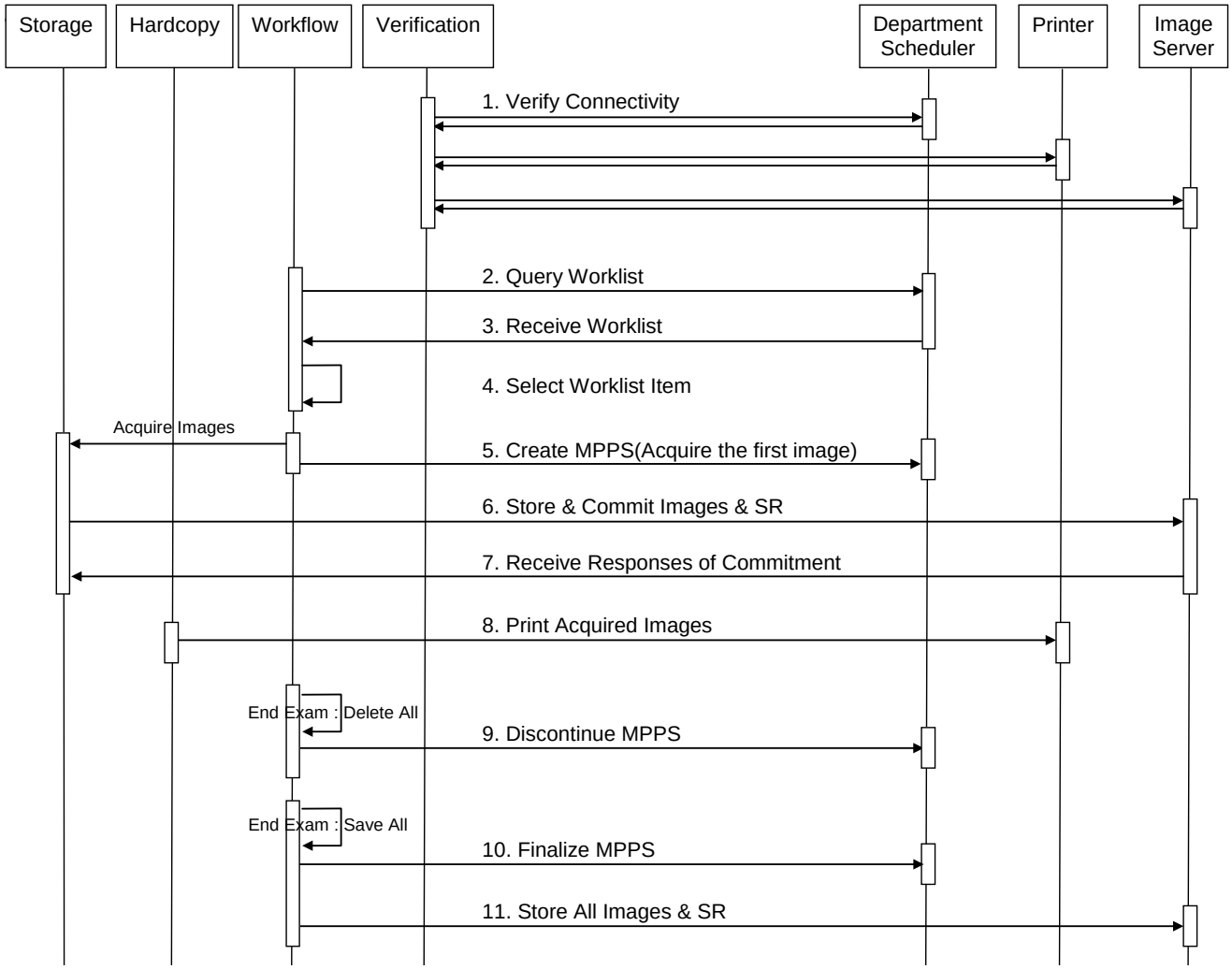

Figure 2 : SEQUENCING CONSTRAINTS

Under normal scheduled workflow conditions, the sequencing constraints illustrated in Figure 2 apply :

1. Verify Connectivity between AEs
2. Query Worklist
3. Receive Worklist as a result of conditions
4. Select one Item of Worklist
5. Acquire the first Image and Create MPPS(IN PROGRESS)
6. Acquire, Store and Commit Images & SR
7. Receive responses of Commitment, if requested
8. Print Acquired Images when the format queue is full
9. Discontinue MPPS(DISCONTINUED) by Delete All for End Exam
10. Finalize MPPS(COMPLETE) by Save All for End Exam
11. Store All Images & SR by Save All for End Exam, if Archive Option is configured

4.2 AE SPECIFICATIONS

4.2.1 Storage Application Entity Specification

4.2.1.1 SOP Class

The Storage AE provides Standard Conformance in the following SOP Classes.

Table 3 : SOP CLASSES FOR AE STORAGE

SOP Class Name	SOP Class UID	SCU	SCP
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	No
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Yes	No
Ultrasound Multiframe Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
Ultrasound Multiframe Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Comprehensive SR	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

4.2.1.2 Association Establishment Policy

4.2.1.2.1 General

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

Table 4 : 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

The Storage AE initiates one Association at a time for each destination to which a transfer request is being processed in the active job queue list. Only one job will be active at a time, the other remains pending until the active job is completed or failed.

Table 5 : NUMBER OF ASSOCIATIONS INITIATED FOR AE STORAGE

Maximum number of simultaneous Associations	1

The Storage AE accepts Associations to receive N-EVENT-REPORT notifications for the Storage Commitment Push Model SOP Class.

Table 6 : NUMBER OF ASSOCIATIONS ACCEPTED FOR AE STORAGE

Maximum number of simultaneous Associations	1

4.2.1.2.3 Asynchronous Nature

The Storage AE does not support asynchronous communication.

4.2.1.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 7 : DICOM IMPLEMENTATION CLASS AND VERSION FOR AE STORAGE

Implementation Class UID	1.2.410.114480.*ModelNumber.VersionNumber*
Implementation Version Name	E-CUBE *ModelNumber_VersionNumber*

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – Send Images and Structured Reports

4.2.1.3.1.1 Description and Sequencing of Activities

A user can select images and request them to be sent to multiple destinations. Each request is forwarded to the job queue and processed individually. When the "Archive Option" is configured as a Storage server, all acquired images and SR will be forwarded to the network job queue by implementing "End Exam". Additionally, when an image is acquired or captured with "Auto Archiving Patient Data" option active, it is sent to the destinations automatically.

The Storage AE attempts to initiate a new Association in order to issue C-STORE request. If the job contains multiple images, multiple C-STORE requests will be issued over the same Association.

If the Remote AE is configured as an archive device, the Storage AE will, after all images have been sent, transmit a single Storage Commitment request (N-ACTION) over the same Association. Upon receiving the N-ACTION response, the Storage AE will delay releasing the Association for a defined time. If no N-EVENT-REPORT is received within this time period, the Association will be immediately released (i.e. notification of Storage Commitment success or failure will be received over a separate association). However, the Storage AE is capable of receiving an N-EVENT-REPORT request at any time while an association provided a Presentation Context for the Storage Commitment Push Model has been successfully negotiated (i.e. the N-ACTION is sent at the end of one association and the N-EVENT-REPORT is received while an association initiated for a subsequent send job, or while an association initiated by the Remote AE for the specific purpose of sending the N-EVENT-REPORT).

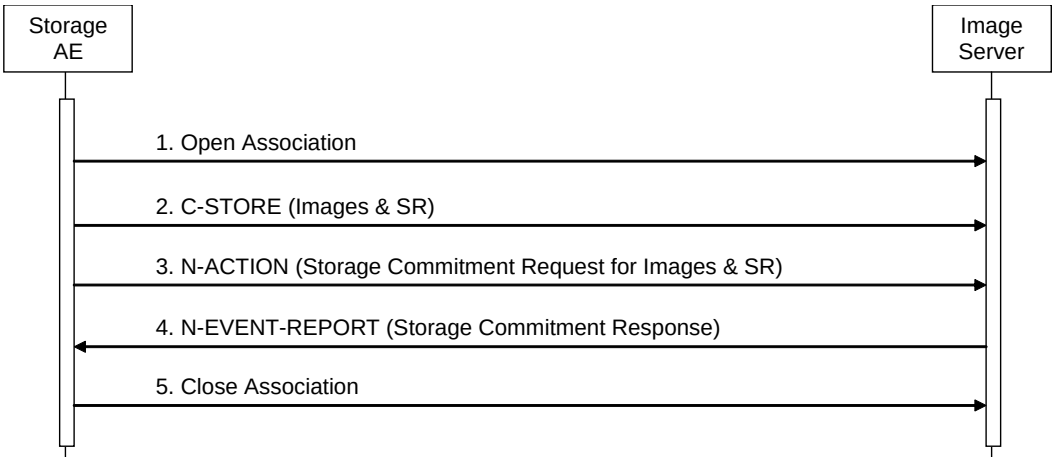

Figure 3 : SEQUENCING OF ACTIVITY – SEND IMAGES AND STRUCTURED REPORTS

A possible sequence of interactions between the Storage AE and an Image Server is illustrated in Figure 3 :

1. The Storage AE opens an association with the Image Server.
2. Acquired images and SR are transmitted to the Image Server using a C-STORE request and the Image Server replies with a C-STORE response (status success).
3. An N-ACTION request is transmitted to the Image Server to obtain storage commitment of previously transmitted images and SR. The Image Server replies with an N-ACTION response indicating the request has been received and is being processed.
4. The Image Server immediately transmits an N-EVENT-REPORT request notifying the Storage AE of the status of the Storage Commitment Request (sent in step 3 using the N-ACTION message). The Storage AE replies with an N-EVENT-REPORT response confirming receipt. The Image Server could send this message at any time, or omit it entirely in favor of transmitting the N-EVENT-REPORT over a separate dedicated association.
5. The Storage AE closes the association with the Image Server.

4.2.1.3.1.2 Proposed Presentation Contexts

The Storage AE is capable of proposing the Presentation Contexts shown in the following table :

Table 8 : PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY SEND IMAGES AND STRUCTURED REPORTS

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Ultrasound Image Storage or (Retired)	1.2.840.10008.5.1.4.1.1.6.1 or 1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		RLE Lossless	1.2.840.10008.1.2.5		
		JPEG Baseline (Process1) - Lossy	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57		
Ultrasound Multi-frame Image Storage or (Retired)	1.2.840.10008.5.1.4.1.1.3.1 or 1.2.840.10008.5.1.4.1.1.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		RLE Lossless	1.2.840.10008.1.2.5		
		JPEG Baseline (Process1) - Lossy	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57		
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		RLE Lossless	1.2.840.10008.1.2.5		
		JPEG Baseline (Process1) - Lossy	1.2.840.10008.1.2.4.50		
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57		
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

Presentation Contexts for US, US-MF, SC Image Storage provide the Monochrome conversion which has 3 options (Off, Monochrome or Color, Monochrome Only). If the option is set as "Monochrome or Color", the Monochrome is available in 2D mode only.

A Presentation Context for the Storage Commitment Push Model will only be proposed if the Remote AE is configured as an archive device.

4.2.1.3.1.3 SOP Specific Conformance for Image Storage and Structured Reporting SOP Classes

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

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

Table 9 : 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 in a send job have status success then the job is marked as completed.
*	*	Any other status code	The Association is aborted using A-ABORT and the send job is marked as failed. The status code is logged and the job failure is reported to the user via the job control application.

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

Table 10 : STORAGE COMMUNICATION FAILURE BEHAVIOR

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

A failed 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.

The more information, Storage IODs, is included in Section 8, ANNEX A - STORAGE IODS.

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 Image Storage and Structured Reporting SOP Class if the Remote AE is configured as an archive device and a presentation context for the Storage Commitment Push Model has been accepted.

Table 11 : 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. A timer is started which will expire if no N-EVENT-REPORT for the Transaction UID is received within a configurable timeout period.
*	*	Any other status code.	The Association is aborted using A-ABORT and the request for storage comment is marked as failed. The status meaning is logged and reported to the user.

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

Table 12 : STORAGE COMMITMENT COMMUNICATION FAILURE BEHAVIOR

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

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

Table 13 : STORAGE COMMITMENT N-EVENT-REPORT BEHAVIOR

Event Type Name	ID	Behavior
Storage Commitment Request Successful	1	The storage commitment request has been completed successfully.
Storage Commitment Request Complete – Failures Exist	2	The storage commitment request was failed.

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

Table 14 : STORAGE COMMITMENT N-EVENT-REPORT RESPONSE STATUS REASONS

Service Status	Further Meaning	Error Code	Reasons
Success	Success	0000	The storage commitment result has been successfully received.

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 Sequencing of Activities

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

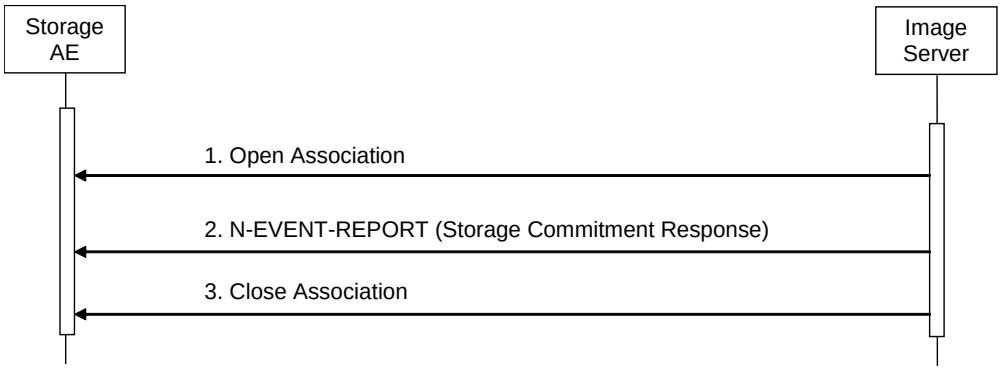

Figure 4 : SEQUENCING OF ACTIVITY - RECEIVE STORAGE COMMITMENT RESPONSE

A possible sequence of interactions between the Storage AE and an Image Server is illustrated in the Figure above:

1. The Image Server opens a new association with the Storage AE.
2. The Image Server 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 Server 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 15 : ACCEPTABLE PRESENTATION CONTEXTS FOR ACTIVITY RECEIVE STORAGE COMMITMENT RESPONSE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None

The Storage AE will prefer to select the Explicit VR Little Endian Transfer Syntax if multiple transfer syntaxes are offered. The Storage AE will only accept the SCU role (which must be proposed via SCP/SCU Role Selection Negotiation) within a Presentation Context for the Storage Commitment Push Model SOP Class.

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 a N-EVENT-REPORT the timer associated with the Transaction UID will be canceled.
The behavior of Storage AE when receiving Event Types within the N-EVENT-REPORT is summarized in Table 13.
The reasons for returning specific status codes in an N-EVENT-REPORT response are summarized in Table 14.

4.2.2 Workflow Application Entity Specification

4.2.2.1 SOP Classes

The Workflow AE provides Standard Conformance to the following SOP Classes :

Table 16 : SOP CLASSES FOR AE WORKFLOW

SOP Class Name	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 Policies

4.2.2.2.1 General

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

Table 17 : 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

The Workflow AE initiates one Association at a time for a Worklist request.

Table 18 : NUMBER OF ASSOCIATIONS INITIATED FOR AE WORKFLOW

Maximum number of simultaneous Associations	1

4.2.2.2.3 Asynchronous Nature

The Workflow AE does not support asynchronous communication.

Table 19 : ASYNCHRONOUS NATURE AS A SCU FOR AE STORAGE

Maximum number of outstanding asynchronous transactions	1

4.2.2.2.4 Implementation Identifying Information

The implementation information for this Application Entity is :

Table 20 : DICOM IMPLEMENTATION CLASS AND VERSION FOR AE WORKFLOW

Implementation Class UID	1.2.410.114480.*ModelNumber.VersionNumber*
Implementation Version Name	E-CUBE *ModelNumber_VersionNumber*

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, i.e. implementing the actions "Worklist Update" or "Patient Worklist Query". The result data of Worklist will display a dialog for search criteria which is configurable by a Service Engineer and located at "System Preset > Connectivity > Worklist".

Upon initiation of the request, the Workflow AE will build an identifier for the C-FIND request, will initiate an Association to send the request and will wait for Worklist responses. After retrieval of all responses, the Workflow AE will access the local database to add or update patient data. To protect the system from overflow, the Workflow AE will limit the number of processed worklist responses to a maximum defined number. During receiving the worklist response items are counted and the query processing is canceled by issuing a C-FIND-CANCEL if the configurable limit of items is reached. The results will be displayed in a separate list, which will be cleared with the next worklist update.
The Workflow AE will initiate an Association in order to issue a C-FIND request according to the Modality Worklist Information Model.

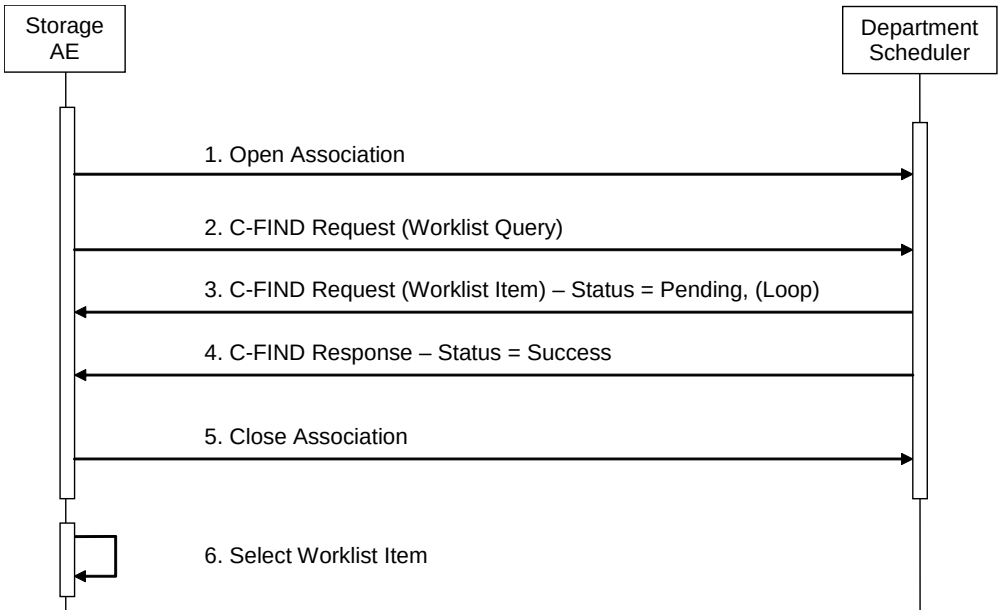

Figure 5 : SEQUENCING OF ACTIVITY – WORKLIST UPDATE

A possible sequence of interactions between the Workflow AE and Departmental Scheduler is illustrated in the Figure above :

1. The Worklist AE opens an association with the Departmental Scheduler.
2. The Worklist AE sends a C-FIND request to the Departmental Scheduler containing the Worklist Query attributes.

3. The Departmental Scheduler returns a C-FIND response containing the requested attributes of matching Worklist item repeatedly until matching Worklist items exist or the maximum number of Worklist responses exceeds.
4. The Departmental Scheduler returns another C-FIND response with status Success indicating that no further matching Worklist Items exist.
5. The Worklist AE closes the association with the Departmental Scheduler.
6. The user selects a Worklist item from the Worklist and prepares to acquire new images.

4.2.2.3.1.2 Proposed Presentation Contexts

The Workflow AE will propose Presentation Contexts as shown in the following table :

Table 21 : 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	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.2.3.1.3 SOP Specific Conformance for Modality Worklist

The behavior of the Workflow AE when encountering status codes in a Modality Worklist C-FIND response is summarized in the Table below.

Table 22 : 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 matches. Worklist items are available for display or further processing.
Refused	Out of Resources	A700	The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged.
Failed	Identifier does not match SOP Class	A900	The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged.

Failed	Unable to Process	C000 – CFFF	The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged.
Cancel	Matching terminated due to Cancel request	FE00	If the query was cancelled due to too may worklist items then the SCP has completed the matches. Worklist items are available for display or further processing. Otherwise, the Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query.
Pending	Matches are continuing	FF00	The worklist item contained in the Identifier is collected for later display or further processing.
Pending	Matches are continuing – Warning that one or more Optional Keys were not supported	FF01	The worklist item contained in the Identifier is collected for later display or further processing. The status meaning is logged only once for each C-FIND operation.
*	*	Any other status code	The Association is aborted using A-ABORT and the worklist is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged.

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

Table 23 : MODALITY WORKLIST COMMUNICATION FAILURE BEHAVIOR

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

The Table provides a description of the Worklist Request Identifier and specifies the attributes that are copied into 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.

The more information, Worklist Request Identifier, is included in Section 9, ANNEX B - WORKLIST REQUEST IDENTIFIER.

4.2.2.3.2 Activity – Acquire Images

4.2.2.3.2.1 Description and Sequencing of Activities

After Patient registration using Worklist, as acquiring the first image, an Association to the configured MPPS SCP System is established immediately and the related MPPS SOP Instance will be created ("IN-PROGRESS" state).

A manual update can be performed with the MPPS user interface where is possible to set the final state of "COMPLETE" or "DISCONTINUED".

The Workflow AE will support creation of "unscheduled cases" by allowing MPPS instances to be communicated for locally registered Patients and only supports a 1-1 relationship between Scheduled and Performed Procedure Steps.

The Workflow AE will initiate an Association to issue an :

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

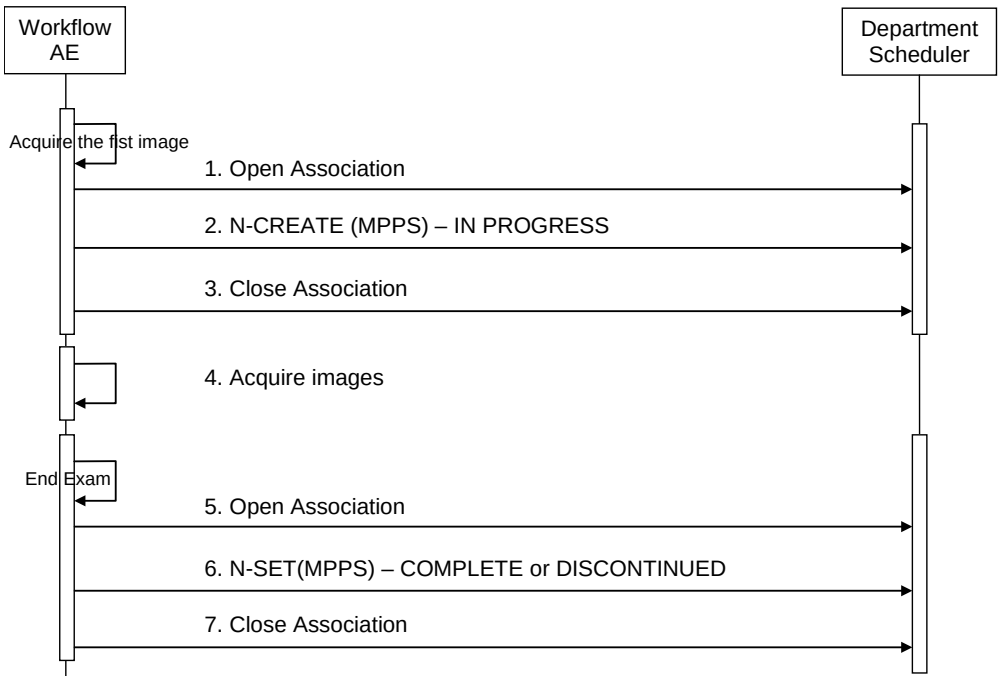

Figure 6 : SEQUENCING OF ACTIVITY – ACQUIRE IMAGES

A possible sequence of interactions between the Workflow AE and a Departmental Scheduler is illustrated in Figure 6 :

1. The Workflow AE opens an association with the Departmental Scheduler upon acquiring the first image.
2. The Workflow AE sends an N-CREATE request to the Departmental Scheduler to create an MPPS instance with status of "IN PROGRESS" and create all necessary attributes. The Departmental Scheduler acknowledges the MPPS creation with an N-CREATE response (status success).
3. The Workflow AE closes the association with the Departmental Scheduler.
4. All images are acquired and stored in the local storage.
5. The Workflow AE opens an association with the Departmental Scheduler upon implementing "End Exam" to set the final state.
6. The Workflow AE sends an N-SET request to the Departmental Scheduler to update an MPPS instance with status of "COMPLETE" to save all images or "DISCONTINUED" to delete all images and set all necessary attributes. The Departmental Scheduler acknowledges the MPPS update with an N-SET response (status success).
7. The Workflow AE closes the association with the Departmental Scheduler.

4.2.2.3.2.2 Proposed Presentation Contexts

The Workflow AE will propose Presentation Contexts as shown in the following table.

Table 24 : 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 the Workflow AE when encountering status codes in an MPPS N-CREATE or N-SET response is summarized in Table below.

Table 25 : 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.
Failure	Processing Failure – Performed Procedure Step Object may no longer be updated	0110	The Association is aborted using A-ABORT and the MPPS is marked as failed. The status meaning is logged and reported to the user. Additional information in the Response will be logged.
Warning	Attribute Value Out of Range	0116H	The MPPS operation is considered successful but the status meaning is logged. Additional information in the Response identifying the attributes out of range will be logged.
*	*	Any other status code.	The Association is aborted using A-ABORT and the MPPS is marked as failed. The status meaning is logged and reported to the user.

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

Table 26 : MPPS COMMUNICATION FAILURE BEHAVOR

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

The more information, MPPS Request Identifier, is included in Section 10, ANNEX C - MODALITY PERFORMED PROCEDURE STEP REQUEST IDENTIFIER.

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

Table 27 : SOP CLASSES FOR AE HARDCOPY

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

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 28 : DICOM APPLICATION CONTEXT FOR AE HARDCOPY

Application Context Name	1.2.840.10008.3.1.1.1

4.2.3.2.2 Number of Associations

The Hardcopy AE initiates one Association at a time for each configured hardcopy device.

Table 29 : NUMBER OF ASSOCIATIONS INITIATED FOR AE HARDCOPY

Maximum number of simultaneous Associations	1

4.2.3.2.3 Asynchronous Nature

The Hardcopy AE does not support asynchronous communication.

4.2.3.2.4 Implementation Identifying Information

The implementation information for this Application Entity is

Table 30 : DICOM IMPLEMENTATION CLASS AND VERSION FOR AE HARDCOPY

Implementation Class UID	1.2.410.114480.*ModelNumber.VersionNumber*
Implementation Version Name	E-CUBE *ModelNumber_VersionNumber*

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 film format and number of copies. Each print job is forwarded to the job queue and processed individually.

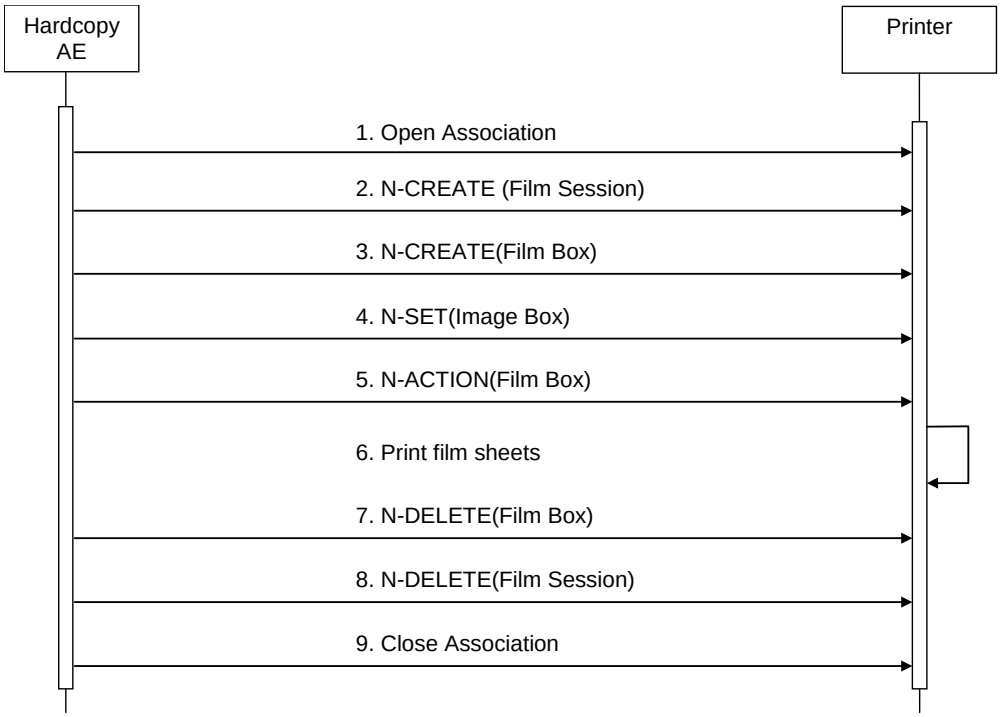

Figure 7 : SEQUENCING OF ACTIVITY – FILM IMAGES

A typical sequence of DIMSE messages sent over an association between Hardcopy AE and a Printer is illustrated in Figure 7 :

1. Hardcopy AE opens an association with the Printer.
2. N-CREATE on the Film Session SOP Class creates a Film Session.
3. N-CREATE on the Film Box SOP Class creates a Film Box linked to the Film Session. A single Image Box will be created as the result of this operation.
4. N-SET on the Image Box SOP Class transfers the contents of the film sheet to the printer.
5. N-ACTION on the Film Box SOP Class instructs the printer to print the Film Box.
6. The printer prints a requested number of film sheets.
7. N-DELETE on the Film Box SOP Class deletes the completed Film Box SOP Instance hierarchy.
8. N-DELETE on the Film Session SOP Class deletes the completed Film Session SOP Instance hierarchy.
9. Hardcopy AE closes the association with the Printer.

Status of the print-job is reported through the job control interface (DICOM Spooler). Only one job will 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

The Hardcopy AE is capable of proposing the Presentation Contexts shown in the Table below.

Table 31 : PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY FILM IMAGES

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	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 32 : HARDCOPY COMMUNICATION FAILURE BEHAVIOR

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

4.2.3.3.1.4 SOP Specific Conformance for the Printer SOP Class

Hardcopy AE does not support N-GET and N-REPORT.

4.2.3.3.1.5 SOP Specific Conformance for the Film Session SOP Class

Hardcopy AE support 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.

4.2.3.3.1.5.1 Film Session SOP Class Operations (N-CREATE)

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

Table 33 : FILM SESSION SOP CLASS N-CREATE REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Copies	(2000,0010)	IS	1 to 100	ALWAYS	User
Print Priority	(2000,0020)	CS	HIGH, MED or LOW	ALWAYS	User
Medium Type	(2000,0030)	CS	CLEAR FILM, PAPER or BLUE FILM	ALWAYS	User
Film Destination	(2000,0040)	CS	MAGAZINE or PROCESSOR	ALWAYS	User
Film Session Label	(2000,0050)	LO	User configurable	ALWAYS	User

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

Table 34 : 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 of Range	0116H	The N-CREATE operation is considered successful but the status meaning is logged. Additional information in the Response identifying the attributes out of range will be logged.
Warning	Attribute List Error	0107H	The N-CREATE operation is considered successful but the status meaning is logged. Additional information in the Response identifying the attributes will be logged.
*	*	Any other status code.	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged.

4.2.3.3.1.5.2 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 35 : PRINTER SOP CLASS N-DELETE 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. The status meaning is logged.

4.2.3.3.1.6 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.

4.2.3.3.1.6.1 Film Box SOP Class Operations (N-CREATE)

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

Table 36 : FILM BOX SOP CLASS N-CREATE REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Display Format	(2010,0010)	CS	STANDARD₩N,M (N : row and M : column)	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 by SCP	ALWAYS	Auto
Film Orientation	(2010,0040)	CS	PORTRAIT or LANDSCAPE	ALWAYS	User
Film Size ID	(2010,0050)	CS	8INX10IN, 10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN, 24CMX24CM or 24CMX30CM	ALWAYS	User
Magnification Type	(2010,0060)	CS	REPLICATE, BILINEAR, CUBIC or NONE	ALWAYS	User
Border Density	(2010,0100)	CS	BLACK or WHITE	ALWAYS	User
Max Density	(2010,0130)	US	User-configurable	ALWAYS	User
Min Density	(2010,0120)	US	User-configurable	ALWAYS	User
Configuration Information	(2010,0150)	ST	User-configurable	ALWAYS	User
Smoothing Type	(2010,0080)	CS	User-configurable	ALWAYS	User

Empty Image Density	(2010,0110)	CS	BLACK or WHITE	ALWAYS	User
Trim	(2010,0140)	CS	YES or NO	ALWAYS	User

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

Table 37 : 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	Requested Min Density or Max Density outside of printer's operating range	B605H	The N-CREATE operation is considered successful but the status meaning is logged.
*	*	Any other status code.	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged.

4.2.3.3.1.6.2 Film Box SOP Class Operations (N-ACTION)

An N-ACTION Request is issued to instruct the Print SCP to print the contents of the Film Box. The behavior of Hardcopy AE when encountering status codes in an N-ACTION response is summarized in the Table below.

Table 38 : FILM BOX SOP CLASS N-ACTION RESPONSE STATUS HANDLING BEHAVIOR

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

4.2.3.3.1.7 SOP Specific Conformance for the Image Box SOP Class

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

- N-SET

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

4.2.3.3.1.7.1 Image Box SOP Class Operations (N-SET)

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

Table 39 : IMAGE BOX SOP CLASS N-SET REQUEST ATTRIBURES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	(2020,0010)	US	1	ALWAYS	Auto
Basic Grayscale Image Sequence	(2020,0110)	SQ	Used for BW (Monochrome2) Print	ANAP	Auto
Basic Color Image Sequence	(2020,0111)	SQ	Used for Color (RGB) Print	ANAP	Auto
>Samples Per Pixel	(0028,0002)	US	1	ALWAYS	Auto
>Photometric Interpretation	(0028,0004)	CS	MONOCHROME2	ALWAYS	Auto
>Planar Configuration	(0028,0006)	US	0, used for BW Print	ANAP	Auto
>Rows	(0028,0010)	US	Depends on film size	ALWAYS	User
>Columns	(0028,0011)	US	Depends on film size	ALWAYS	User
>Pixel Aspect Ratio	(0028,0034)	IS	1₩1	ALWAYS	Auto
>Bits Allocated	(0028,0100)	US	8	ALWAYS	Auto
>Bits Stored	(0028,0101)	US	8	ALWAYS	Auto
>High Bit	(0028,0102)	US	7	ALWAYS	Auto
>Pixel Representation	(0028,0103)	US	0	ALWAYS	Auto
>Pixel Data	(7FE0,0010)	OB	Pixels of rendered film sheet	ALWAYS	Auto

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

Table 40 : 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. Image successfully stored in Image Box.
*	*	Any other status code	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged.

4.2.3.4 Association Acceptance Policy

The Hardcopy Application Entity does not accept Associations.

4.2.4 Verification Application Entity Specification

4.2.4.1 SOP Class

The Verification AE provides Standard Conformance to the following SOP Class :

Table 41 : SOP CLASS FOR AE VERIFICATION

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

4.2.4.2 Association Policies

4.2.4.2.1 General

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

Table 42 : NUMBER OF ASSOCIATIONS INITIATED FOR AE VERIFICATION

Application Context Name	1.2.840.10008.3.1.1.1

4.2.4.2.2 Number of Associations

The Verification AE initiates one Association at a time for a Verification request.

Table 43 : NUMBER OF ASSOCIATIONS INITIATED FOR AE VERIFICATION

Maximum number of simultaneous Associations	1

4.2.4.2.3 Asynchronous Nature

The Verification AE does not support asynchronous communication.

4.2.4.2.4 Implementation Identifying Information

The implementation information for this Application Entity is :

Table 44 : DICOM IMPLEMENTATION CLASS AND VERSION FOR AE VERIFICATION

Implementation Class UID	1.2.410.114480.*ModelNumber.VersionNumber*
Implementation Version Name	E-CUBE *ModelNumber_VersionNumber*

4.2.4.3 Association initiation Policy

4.2.4.3.1 Activity – Verify Connectivity

4.2.4.3.1.1 Description and Sequencing of Activities

A user can configure IP Address, Port number, and AE Title of a remote AE for networking (e.g. Storage, Worklist, MPPS) and verify connectivity with the remote AE. The request for connectivity is initiated by pressing "Verify" button at specific time intervals, which is configurable by the user. The result of response will be displayed as connectivity status (successful or failed) on the button.

The Verification AE attempts to initiate an association to issue a C-ECHO request to verify connectivity.

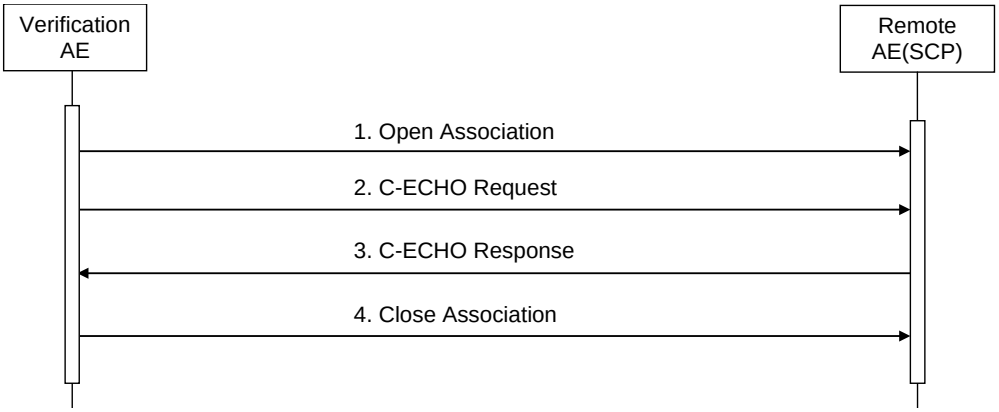

Figure 8 : SEQUENCING OF ACTIVITY – VERIFY CONNECTIVITY

A possible sequence of interactions between the Verification AE and Remote AE is illustrated in Figure 8 :

1. The Verification AE opens an association with the Remote AE.
2. The Verification AE sends a C-ECHO request to the Remote AE.
3. The Remote AE returns a C-ECHO response to the Verification AE.
4. The Verification AE closes the association with the Remote AE.

4.2.4.3.1.2 Proposed Presentation Contexts

The Verification AE is capable of proposing the Presentation Contexts shown in the following table :

Table 45 : PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY VERIFICATION

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg**
Name	**UID**	**Name List**	**UID List**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None

4.2.4.3.1.3 SOP Specific Conformance for Verification

The Verification AE provides Standard Conformance to the DICOM Verification Service class as an SCU. The status code for the C-ECHO is as follows :

Table 46 : VERIFICATION C-ECHO RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The C-ECHO request is accepted successfully.
*	*	Any other status code	The status meaning is logged.

4.3 NETWORK INTERFACES

4.3.1 Physical Network Interface

The E-CUBE i7 system supports a single network interface. One of the following physical network interfaces will be available depending on installed hardware options :

Table 47 : SUPPORTED PHYSICAL NETWORK INTERFACES

Ethernet 10baseT – Half or Full Duplex
Ethernet 100baseT – Half or Full Duplex
Auto Detect Speed

4.3.2 Additional Protocols

4.3.2.1 DHCP

DHCP can be used to obtain TCP/IP network configuration information. If DCHCP is not in use, TCP/IP network configuration information can be manually configured.

4.3.3 IPv4 and IPv6 Support

This product only supports IPv4 connections.

4.4 CONFIGURATION

4.4.1 AE Title/Presentation Address Mapping

4.4.1.1 Local AE Title

All local applications use the AE Titles and TCP/IP Ports configured via Connectivity Configuration dialog. The local AE Title used by each individual application can be configured independently of the AE Title used by other local applications. If so configured, all local AE's are capable of using the same AE Title.

4.4.1.2 Remote AE Title/Presentation Address Mapping

The AE Titles, Host names, and port numbers of remote applications are configured by using Connectivity Configuration dialog.

4.4.1.2.1 Storage

The Configuration must be used to set the AE Title, Host name, and port-number for the remote Storage and Commitment SCP. Associations will only be accepted from known AE Titles and associations from unknown AE Titles will be rejected. Any Storage SCP can be configured to be an "Archive" device causing storage commitment to be requested for images transmitted to the device.

4.4.1.2.2 Workflow

The Configuration must be used to set the AE Title, Host name, and port-number for the remote Modality Worklist and MPPS.

4.4.1.2.3 Hardcopy

The Configuration must be used to set the AE Title, Host name, and port-number for the remote Print SCP

4.4.2 Parameters.

The parameters for DICOM communication can be configured in the following table of Connectivity Configuration dialog :

Table 48 : CONFIGURATION PARAMETERS TABLE

Parameter	Configurable (Yes/No)	Default Value
Local Host Parameters		
Computer (System) Name	Yes	OEM-XXX
Device (Network) Name	No	Local Connection Area
AE Title	Yes	E7
Port No	Yes	104
DHCP / Manual IP Address, Subnet Mask and Default Gateway	Yes	DHCP
Network Speed	Yes	Auto Detect
Common DICOM Service Parameters		
Host Name	Yes	
IP Address	Yes	
AE Title	Yes	
Port No	Yes	
Retry	Yes	
Retry Interval	Yes	
Timeout	Yes	20 s
Storage Parameters		
Enable Structure Report (if checked, SR will be sent by End Exam)	Yes	Unchecked
Image Compression (None, RLE, JPEG Lossy, JPGE Lossless)	Yes	None
Image Quality (Compression JPEG Lossless only)	Yes	
Storage Commitment Parameters		
Associated Storage Server	Yes	
Accepter AE Title, Port No	No	Local AET, Port No

Parameter	Configurable (Yes/No)	Default Value
Accepter Timeout	Yes	60 s
Modality Worklist Parameters		
Worklist Max Result (30, 100, 500, 1000)	Yes	100
Full Screen Worklist (in the Patient Registration Dialog)	Yes	Unchecked
DICOM Tag & Value for Worklist Search Criteria	Yes	- Modality (0008,0060) : US - Scheduled Procedure Step Start Date(0040, 0002) : today
MPPS Parameters		
Same as Common DICOM Service Parameters	Yes all	
Print Parameters		
Properties (Format, Priority, Medium, Copies, Orientation, Film Size, Film Destination, Magnification, Trim, Empty Image, Color, Min & Max Density, Configure information, Film Session Label, Smoothing Type, Border)	Yes	

5 MEDIA INTERCHANGE

5.1 IMPLEMENTATION MODEL

5.1.1 Application Data Flow

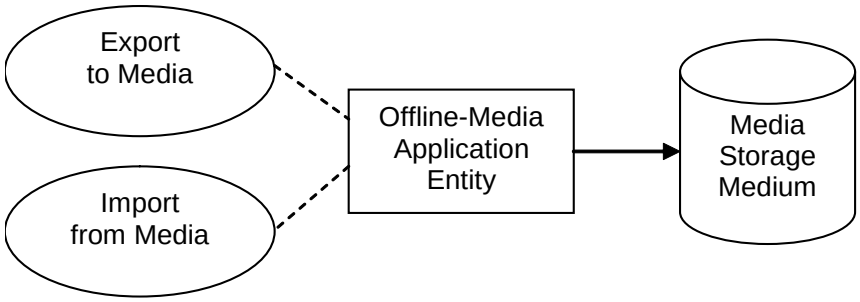

Figure 9 : APPLICATION DATA FLOW DIAGRAM FOR MEDIA STORAGE

- The Offline-Media Application Entity exports images to the Media Storage Medium (CD, DVD, and USB). It is associated with the local real-world activity "Export to Media" which is performed upon user request for selected patients, studies, or images.

- The Offline-Media Application Entity imports images from the Media Storage Medium (CD, DVD, and USB). It is associated with the local real-world activity "Import from Media" which is performed upon user request.

5.1.2 Functional Definition of AE's

5.1.2.1 Functional Definition of Offline-Media Application Entity

After implementing Export and Import, images can be written or updated to the Media or read from it. If the option, "Generate DICOMDIR file when export", is checked on the Export Dialog, DICOMDIR will be created to the Media.

5.1.3 Sequencing of Real-World Activities

The Media (USB, DVD and CD) must exist before the Offline-Media AE can be invoked. The user can insert a new CD/DVD or mount USB at any time before or after invocation of the Offline-Media AE. The Offline-Media AE will wait before starting to write to the device. If the Media faulty or the capacity is full, the job is canceled and the warning message is displayed.

5.1.4 File Meta Information Options

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

Table 49 : DICOM IMPLEMENTATION CLASS AND VERSION FOR MEDIA STORAGE

Implementation Class UID	1.2.410.114480.*ModelNumber.VersionNumber*
Implementation Version Name	E-CUBE *ModelNumber_VersionNumber*

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 50 : APPLICATION PROFILES, ACTIVITIES AND ROLES FOR OFFLINE-MEDIA

Application Profiles Supported	Real World Activity	Role	SC Option
STD-US-ID-SF-CDR	Export to Media	FSC, FSU	Interchange
STD-US-ID-SF-DVD			
STD-US-SC-SF&MF-CDR			
STD-US-SC-SF&MF-DVD			
STD-GEN-USB			
STD-US-ID-SF-CDR	Import from Media	FSR	
STD-US-ID-SF-DVD			
STD-US-SC-SF&MF-CDR			
STD-US-SC-SF&MF-DVD			
STD-GEN-USB			

5.2.1.1 Real-World Activities

5.2.1.1.1 Activity – Export to Media

The Offline-Media Application Entity acts as an FSC or an FSU when requested to export SOP Instances from the local database to a medium.
While exporting is proceeding, any operation is prohibited due to stability of data.

5.2.1.1.2 Activity – Import from Media

The Offline-Media Application Entity acts as an FSR when requested to export SOP Instances from the local database to a medium.
While importing is proceeding, any operation is prohibited due to data stability.

5.2.1.1.3 Media Storage Application Profiles

See Table 50.

5.2.1.1.4 Options

The Offline-Media Application Entity support the SOP Classes and Transfer Syntaxes listed in the Table below :

Table 51 : IODS, SOP CLASSES AND TRANSFER SYNTAXES FOR OFFLINEMEDIA

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
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
Ultrasound Multiframe Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	1.2.840.10008.1.2.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian	1.2.840.10008.1.2.1

5.3 AUGMENTED AND PRIVATE APPLICATION PROFILES

The Offline-Media AE does not support any augmented and private application profiles.

6 SUPPORT OF CHARACTER SETS

All DICOM applications of E-CUBE i7 System support the

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

7 SECURITY

The E-CUBE i7 System does not support any specific security measures.

It is assumed that the E-CUBE i7 System is used within a secured environment.

8 ANNEX A - STORAGE IODS

8.1 STORAGE IODS

The E-CUBE i7 System supports the Storage IODs (US, US MF or SC) as follows :

Table 52 : STORAGE IODS OF CREATED SOP INSTANCES

IE	Module	US Image IOD	US MF Image IOD	SC Image IOD
Patient	Patient	X	X	X
Study	General Study	X	X	X
	Patient Study	X	X	X
Series	General Series	X	X	X
Equipment	General Equipment	X	X	X
	SC Equipment			X
Image	General Image	X	X	X
	Image Pixel	X	X	X
	US Region Calibration	X	X	
	US Image	X	X	
	SC Image			X
	VOI LUT	X	X	X
	SOP Common	X	X	X
	Cine		X	
	Multi-frame		X	
Ext.	Patient Medical	X	X	X
	Private for E-CUBE System	X	X	X

8.1.1 Common Modules

Table 53 : COMMON MODULES OF CREATED SOP INSTANCES

Module	Attribute Name	Tag	VR	Type	Notes
Patient	Patient's Name	(0010,0010)	PN	2	From WML or user input
	Patient ID	(0010,0020)	LO	2	From MWL or user input
	Patient's Birth Date	(0010,0030)	DA	2	From MWL or user input
	Patient's Sex	(0010,0040)	CS	2	From MWL or user input
	Referenced Patient Sequence	(0008,1120)	SQ	3	From MWL
	>Referenced SOP Class UID	(0008,1150)	UI	1C	From MWL
	>Referenced SOP Instance UID	(0008,1155)	UI	1C	From MWL
	Other Patient IDs	(0010,1000)	LO	3	From MWL
	Other Patient Names	(0010,1001)	PN	3	From MWL
	Ethnic Group	(0010,2160)	SH	3	From MWL
	Patient Comments	(0010,4000)	LT	3	From MWL or user input
General Study	Study Instance UID	(0020,000D)	UI	1	From MWL or generated
	Study Date	(0008,0020)	DA	2	Generated
	Study Time	(0008,0030)	TM	2	Generated
	Referring Physician's Name	(0008,0090)	PN	2	From MWL or user input
	Study ID	(0020,0010)	SH	2	From MWL (Requested Procedure ID (0040,1001))
	Accession Number	(0008,0050)	SH	2	From MWL or user input
	Study Description	(0008,1030)	LO	3	From MWL (Scheduled Procedure Step Description (0040,0007), Study Description (0008,1030), Requested Procedure Description (0032,1060)) or user input
	Name of Physician(s) Reading Study	(0008,1060)	PN	3	User input (from Performed MD)
	Referenced Study Sequence	(0008,1110)	SQ	3	From MWL
	>Referenced SOP Class UID	(0008,1150)	UI	1C	From MWL
	>Referenced SOP Instance UID	(0008,1155)	UI	1C	From MWL
	Procedure Code Sequence	(0008,1032)	SQ	3	From MWL (Requested Procedure Code Sequence (0032,1064))
	>Code Value	(0008,0100)	SH	1C	
	>Coding Scheme Designator	(0008,0102)	SH	1C	
	>Coding Scheme Version	(0008,0103)	SH	1C	
	>Code Meaning	(0008,0104)	LO	1C	
Patient Study	Admitting Diagnoses Description	(0008,1080)	LO	3	From MWL
	Patient's Size	(0010,1020)	DS	3	From MWL or user input
	Patient's Weight	(0010,1030)	DS	3	From MWL or user input
	Additional Patient's History	(0010,21B0)	LO	3	From MWL
General Series	Modality	(0008,0060)	CS	1	'US'
	Series Instance UID	(0020,000E)	UI	1	Generated
	Series Number	(0020,0011)	IS	2	Generated as a unique number within a study
	Series Date	(0008,0021)	DA	3	Generated (the first image date)
	Series Time	(0008,0031)	TM	3	Generated (the first image time)
	Performing Physicians' Name	(0008,1050)	PN	3	From MWL (Scheduled Performing Physician's Name (0040,0006)) or user input
	Protocol Name	(0018,1030)	LO	3	Exam Information (Application/Preset)

Module	Attribute Name	Tag	VR	Type	Notes
	Series Description	(0008,103E)	LO	3	User selection from Application
	Operators' Name	(0008,1070)	PN	3	User input
	Referenced Performed Procedure Step Sequence	(0008,1111)	SQ	3	Generated if MPPS is used only
	>Referenced SOP Class UID	(0008,1150)	UI	1C	'1.2.840.10008.3.1.2.3.3'
	>Referenced SOP Instance UID	(0008,1155)	UI	1C	MPPS SOP Instance UID
	Request Attributes Sequence	(0040,0275)	SQ	3	From MWL
	>Requested Procedure ID	(0040,1001)	SH	1C	From MWL
	>Scheduled Procedure Step ID	(0040,0009)	SH	1C	From MWL
	>Scheduled Procedure Step Description	(0040,0007)	LO	3	From MWL
	>Scheduled Protocol Code Sequence	(0040,0008)	SQ	3	From MWL
	>>Include 'Code Sequence Macro'			1C	
	Performed Procedure Step ID	(0040,0253)	SH	3	From MPPS
	Performed Procedure Step Start Date	(0040,0244)	DA	3	From MPPS
	Performed Procedure Step Start Time	(0040,0245)	TM	3	From MPPS
	Performed Procedure Step Description	(0040,0254)	LO	3	From MPPS
	Performed Protocol Code Sequence	(0040,0260)	SQ	3	From MWL (Scheduled Protocol Code Sequence (0040,0008)
	>Include 'Code Sequence Macro'			1C	
General Equipment	Manufacturer	(0008,0070)	LO	2	'ALPINION'
	Institution Name	(0008,0080)	LO	3	From MWL or user input (from Hospital name)
	Station Name	(0008,1010)	SH	3	User input (from AE Title)
	Manufacturer's Model Name	(0008,1090)	LO	3	E-CUBE *ModelNumber*
	Device Serial Number	(0018,1000)	LO	3	SSN
	Software Versions	(0018,1020)	LO	3	From Software Version
General Image	Instance Number	(0020,0013)	IS	2	Generated as a unique number within a series
	Patient Orientation	(0020,0020)	CS	2C	Zero length
	Content Date	(0008,0023)	DA	2C	Generated
	Content Time	(0008,0033)	TM	2C	Generated
	Image Type	(0008,0008)	CS	3	Generated (See PS3.3 – 2008, C.8.5.6.1.1 Image Type for more information)
	Derivation Description	(0008,2111)	ST	3	Set to information for image compression
	Lossy Image Compression	(0028,2110)	CS	3	'00' – Uncompressed, '01' - Compressed
	Lossy Image Compression Ratio	(0028,2112)	DS	3	Used if compressed only.
Image Pixel	Samples per Pixel	(0028,0002)	US	1	Set to '1' if Photometric Interpretation(0028,0004) is 'MONOCHROME2', or set to '3'
	Photometric Interpretation	(0028,0004)	CS	1	'RGB' – Uncompressed (Color) 'YBR_FULL – Lossy Compressed (Color) 'MONOCHROME2' – Monochrome
	Rows	(0028,0010)	US	1	Generated
	Columns	(0028,0011)	US	1	Generated
	Bits Allocated	(0028,0100)	US	1	'8'
	Bits Stored	(0028,0101)	US	1	'8'
	High Bit	(0028,0102)	US	1	'7'

Module	Attribute Name	Tag	VR	Type	Notes
	Pixel Representation	(0028,0103)	US	1	'0'
	Pixel Data	(7FE0,0010)	OB	1	Set to Pixel data of image
	Planar Configuration	(0028,0006)	US	1C	'1' – RLE '0' – The others
VOI LUT	Window Center	(0028,1050)	DS	3	'127'
	Window Width	(0028,1051)	DS	3	'255'
SOP Common	SOP Class UID	(0008,0016)	UI	1	'1.2.840.10008.5.1.4.1.1.6.1' - US '1.2.840.10008.5.1.4.1.1.3.1' - US MF '1.2.840.10008.5.1.4.1.1.7' - SC
	SOP Instance UID	(0008,0018)	UI	1	Generated
	Specific Character Set	(0008,0005)	CS	1C	ISO_IR 100
	Instance Creation Date	(0008,0012)	DA	3	Generated
	Instance Creation Time	(0008,0013)	TM	3	Generated
Patient Medical	Medical Alerts	(0010,2000)	LO	3	From MWL
	Allergies	(0010,2110)	LO	3	From MWL
	Pregnancy Status	(0010,21C0)	US	3	From MWL
	Last Menstrual Date	(0010,21D0)	DA	3	From MWL or user input

8.1.2 US & MF Image Modules

Table 54 : US & MF IMAGE MODULES OF CREATED SOP INSTANCES

Module	Attribute Name	Tag	VR	Type	Notes
US Region Calibration	Sequence of Ultrasound Regions	(0018,6011)	SQ	1	One or more Items can be included in this Sequence.
	>Region Spatial Format	(0018,6012)	US	1	'0' - None or not applicable '1' - 2D(tissue or flow) '2' - M-Mode(tissue or flow) '3' - Spectral(CW or PW Doppler)
	>Region Data Type	(0018,6014)	US	1	'0' – None or not applicable '1' – Tissue '2' – Color Flow '3' – PW Spectral Doppler '4' – CW Spectral Doppler
	>Region Flags	(0018,6016)	UL	1	Generated (See PS3.3 – 2008, C.8.5.5.1.3 Region Flags for more information)
	>Region Location Min x0	(0018,6018)	UL	1	Generated
	>Region Location Min y0	(0018,601A)	UL	1	Generated
	>Region Location Max x1	(0018,601C)	UL	1	Generated
	>Region Location Max y1	(0018,601E)	UL	1	Generated
	>Reference Pixel x0	(0018,6020)	SL	3	Generated
	>Reference Pixel y0	(0018,6022)	SL	3	Generated
	>Physical Units X Direction	(0018,6024)	US	1	'3' - cm '4' - seconds
	>Physical Units Y Direction	(0018,6026)	US	1	'3' – cm '4' - seconds '7' - cm/seconds

Module	Attribute Name	Tag	VR	Type	Notes
	>Ref. Pixel Physical Value X	(0018,6028)	FD	3	Generated
	>Ref. Pixel Physical Value Y	(0018,602A)	FD	3	Generated
	>Physical Delta X	(0018,602C)	FD	1	Generated
	>Physical Delta Y	(0018,602E)	FD	1	Generated
	>Transducer Frequency	(0018,6030)	UL	3	Generated
	>Doppler Correction Angle	(0018,6034)	FD	3	Generated if Region Spatial Format is Spectral only
	>Doppler Sample Volume X Position	(0018,6039)	SL	3	Generated if Region Spatial Format is Spectral only
	>Doppler Sample Volume Y Position	(0018,603B)	SL	3	Generated if Region Spatial Format is Spectral only
	>TM-Line Position x0	(0018,603D)	SL	3	Generated if Region Spatial Format is M-Mode or Spectral only
	>TM-Line Position y0	(0018,603F)	SL	3	Generated if Region Spatial Format is M-Mode or Spectral only
	>TM-Line Position x1	(0018,6041)	SL	3	Generated if Region Spatial Format is M-Mode or Spectral only
	>TM-Line Position y1	(0018,6043)	SL	3	Generated if Region Spatial Format is M-Mode or Spectral only
US Image	Number of Stages	(0008,2124)	IS	2C	Generated if image was acquired in Staged protocol (ex-Stress Echo)
	Number of Views in Stage	(0008,212A)	IS	2C	Generated if image was acquired in Stage Protocol (ex-Stress Echo)
	R Wave Time Vector	(0018,6060)	FL	3	Generated if the ECG signal is detected
	Ultrasound Color Data Present	(0028,0014)	US	3	'0' or '1'
	Stage Name	(0008,2120)	SH	3	Generated if image was acquired in Stage Protocol (ex-Stress Echo)
	Stage Number	(0008,2122)	IS	3	Generated if image was acquired in Stage Protocol (ex-Stress Echo)
	View Name	(0008,2127)	SH	3	Generated if image was acquired in Stage Protocol (ex-Stress Echo)
	View Number	(0008,2128)	IS	3	Generated if image was acquired in Stage Protocol (ex-Stress Echo)
	Number of Event Timers	(0008,2129)	IS	3	Generated if image was acquired in Stage Protocol (ex-Stress Echo)
	Event Elapsed Time(s)	(0008,2130)	DS	3	Generated if image was acquired in Stage Protocol (ex-Stress Echo)
	Event Timer Name(s)	(0008,2132)	LO	3	Generated if image was acquired in Stage Protocol (ex-Stress Echo)
	Heart Rate	(0018,1088)	IS	3	Generated if the ECG signal is detected
	Transducer Data	(0018,5010)	LO	3	Transducer Name
Cine (MF Only)	Frame Time	(0018,1063)	DS	1C	Generated
	Frame Time Vector	(0018,1065)	DS	1C	Generated
	Start Trim	(0008,2142)	IS	3	Generated
	Stop Trim	(0008,2143)	IS	3	Generated
Multi-Frame (MF Only)	Number of Frames	(0028,0008)	IS	1	Generated
	Frame Increment Pointer	(0028,0009)	AT	1	Set to 'Frame Time (0018, 1063) or 'Frame Time Vector (0018,1065)' Pointer

8.1.3 SC Image Modules

Table 55 : SC IMAGE MODULES OF CREATED SOP INSTANCES

Module	Attribute Name	Tag	VR	Type	Notes
SC Equipment	Conversion Type	(0008,0064)	CS	1	'WSD'
SC Image	Date of Secondary Capture	(0018,1012)	DA	3	Generated
	Time of Secondary Capture	(0018,1014)	TM	3	Generated

8.1.4 Private for E-CUBE System Module

Table 56 : PRIVATE FOR E-CUBE SYSTEM MODULE OF CREATED SOP INSTANCES

Module	Attribute Name	Tag	VR	Type	Notes
Private for E-CUBE System	Private Related Application	(0029,0010)	LO	3	Generated if related to Third Party Application
	Private Colorization	(0029,0020)	LO	3	'COLORIZED' or 'MONOCHROME'
	Private Creator	(6003,0010)	LO	3	'THUMBNAIL_GROUP'
	Private Thumbnail Image Sequence	(6003,1010)	SQ	3	Generated by Thumbnail Image information
	>Samples Per Pixel	(0028,0002)	US	1	'3'
	>Photometric Interpretation	(0028,0004)	CS	1	'RGB'
	>Planar Configuration	(0028,0006)	US	1	'0'
	>Rows	(0028,0010)	US	1	Generated by rows size of Thumbnail
	>Columns	(0028,0011)	US	1	Generated by columns size of Thumbnail
	>Bits Allocated	(0028,0100)	US	1	'8'
	>Bits Stored	(0028,0101)	US	1	'8'
	>High Bit	(0028,0102)	US	1	'7'
	>Pixel Representation	(0028,0103)	US	1	'0'
	>Pixel Data	(7FE0,0010)	OB	1	Set to Pixel Data of Thumbnail
	Private 3D Application Name	(7FE3,1000)	LO	3	Generated if the image is 3D/4D only
	Private 3D Application Version	(7FE3,1001)	LO	3	Generated if the image is 3D/4D only
	Private 3D Volume TYPE	(7FE3,1013)	LO	3	Generated if the image is 3D/4D only : '1.2.840.10008.5.1.4.1.1.3.1' – 4D '1.2.840.10008.5.1.4.1.1.6.1' – 3D

9 ANNEX B – WORKLIST REQUEST IDENTIFIER

9.1 WORKLIST REQUEST IDENTIFIER

The following Table provides description for the Worklist Request Identifier and specifies the attributes that are copied into 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.

Table 57 : WORKLIST REQUESTED IDENTIFIER

Module / Attribute Name	Tag	VR	M	Q	R	D	IOD	A	Notes
SOP Common									
Specific Character Set	(0008,0005)	CS			X				
Study Description	(0008,1030)	LO			X				
Scheduled Procedure Step									
Scheduled Procedure Step Sequence	(0040,0100)	SQ			X		X		
>Scheduled Station AE Title	(0040,0001)	AE	X		X				
>Scheduled Procedure Step Start Date	(0040,0002)	DA	X	X	X				If the value of criteria is '**today**', the start date is set to present.
>Scheduled Procedure Step Start Time	(0040,0003)	TM	X		X				
>Modality	(0008,0060)	CS	X		X		X		
>Scheduled Performing Physician's Name	(0040,0006)	PN	X		X	X	X	X	Displayed in Performing MD. Applied to Performing Physician's name(0008,1050).
>Scheduled Procedure Step Description	(0040,0007)	LO	X		X		X	X	
>Scheduled Station Name	(0040,0010)	SH	X		X				
>Scheduled Procedure Step Location	(0040,0011)	SH	X		X				
>Scheduled Protocol Code Sequence	(0040,0008)	SQ			X		X	X	Applied in Request Attributes Sequence(0040,0275).
>>Code Value	(0008,0100)	SH			X		X		
>>Coding Scheme Version	(0008,0103)	SH			X		X		
>>Coding Scheme Designator	(0008,0102)	SH			X		X		
>>Code Meaning	(0008,0104)	LO			X		X		
>Scheduled Procedure Step ID	(0040,0009)	SH	X		X		X	X	Applied in Request Attributes Sequence(0040,0275)
Requested Procedure									
Requested Procedure ID	(0040,1001)	SH	X		X		X	X	Applied in Request Attributes Sequence(0040,0275)
Requested Procedure Description	(0032,1060)	LO	X		X		X	X	Same as above
Requested Procedure Code Sequence	(0032,1064)	SQ			X			X	Same as above
>Code Value	(0008,0100)	SH			X				
>Coding Scheme Designator	(0008,0102)	SH			X				
>Coding Scheme Version	(0008,0103)	SH			X				
>Code Meaning	(0008,0104)	LO			X				
Requested Procedure Comments	(0040,1400)	LT	X		X				

Module / Attribute Name	Tag	VR	M	Q	R	D	IOD	A	Notes
Study Instance UID	(0020,000D)	UI	X		X		X	X	
Referenced Study Sequence	(0008,1110)	SQ			X		X	X	
>Referenced SOP Class UID	(0008,1150)	UI			X		X	X	
>Referenced SOP Instance UID	(0008,1155)	UI			X		X	X	
Names of Intended Recipients of Results	(0040,1010)	PN	X		X			X	
Imaging Service Request									
Accession Number	(0008,0050)	SH	X	X	X	X	X	X	
Requesting Physician	(0032,1032)	PN	X		X			X	
Referring Physician's Name	(0008,0090)	PN	X		X			X	
Imaging Service Request Comments	(0040,2400)	LT	X		X				
Requesting Service	(0032,1033)	LO	X		X				
Visit Identification									
Admission ID	(0038,0010)	LO	X		X				
Institution Name	(0008,0080)	LO			X				
Visit Status									
Current Patient Location	(0038,0300)	LO	X		X				
Visit Relationship									
Referenced Patient Sequence	(0008,1120)	SQ			X		X	X	
>Referenced SOP Class UID	(0008,1150)	UI			X		X	X	
>Referenced SOP Instance UID	(0008,1155)	UI			X		X	X	
Visit Admission									
Admitting Diagnoses Description	0008,1080)	LO			X	X		X	Displayed in Indication.
Patient Identification									
Patient's Name	(0010,0010)	PN	X	X	X	X	X	X	
Patient ID	(0010,0020)	LO	X	X	X	X	X	X	
Other Patient Ids	(0010,1000)	LO	X		X			X	
Other Patient Names	(0010,1001)	PN			X			X	
Patient Demographic									
Patients Birth Date	(0010,0030)	DA	X		X	X	X	X	
Patient's Sex	(0010,0040)	CS	X		X	X	X	X	
Patient's Size	(0010,1020)	DS	X		X	X		X	
Patient's Weight	(0010,1030)	DS	X		X	X		X	
Ethnic Group	(0010,2160)	SH	X		X			X	
Patient Comments	(0010,4000)	LT	X		X	X		X	
Patient Medical									
Additional Patient History	(0010,21B0)	LO	X		X			X	
Pregnancy Status	(0010,21C0)	US	X		X			X	
Medical Alerts	(0010,2000)	LO	X		X			X	
Allergies	(0010,2110)	LO	X		X			X	
Last Menstrual Date	(0010,21D0)	DA			X	X		X	

The above table should be read as follows :

Module Name	- The name of the associated module for supported worklist attributes
Attribute Name	- Attributes supported to build an E-CUBE i7 System Worklist Requested Identifier
Tag	- DICOM tag for the attribute
VR	- DICOM VR for the attribute
M	- Matching Keys for Worklist Update (configurable in the System Configuration)
Q	- Interactive Query Keys (enterable in the Worklist Query Criteria dialog)
R	- Return Keys
D	- Displayed Keys
IOD	- An 'X' indicates that the Worklist attribute is included into all Object Instances created during performance of the related Procedure Step
A	- Keys Applied to Object Instances of Storage

10 ANNEX C – MODALITY PERFORMED PROCEDURE STEP REQUEST IDENTIFIER

10.1 MODALITY PERFORMED PROCEDURE STEP REQUEST IDENTIFIER

The following Table provides a description of the MPPS N-CREATE and N-SET request identifiers send by the E-CUBE i7 System. An empty cell indicates that the attribute is not sent.

Table 58 : MODALITY PERFORMED PROCEDURE STEP REQUEST IDENTIFIER

Moudle / Attribute Name	Tag	VR	Type	N-CREATE	N-SET
Performed Procedure Step Relationship					
Scheduled Step Attribute Sequence	(0040,0270)	SQ	1	Created	-
>Study Instance UID	(0020,000D)	UI	1	From MWL or created	-
>Referenced Study Sequence	(0008,1110)	SQ	2	From MWL	-
>>Referenced SOP Class UID	(0008,1150)	UI	1C	From MWL	-
>>Referenced SOP Instance UID	(0008,1155)	UI	1C	From MWL	-
>Accession Number	(0008,0050)	SH	2	From MWL or user input	-
>Requested Procedure ID	(0040,1001)	SH	2	From MWL	-
>Requested Procedure Description	(0032,1060)	LO	2	From MWL	-
>Scheduled Procedure Step ID	(0040,0009)	SH	2	From MWL	-
>Scheduled Procedure Step Description	(0040,0007)	LO	2	From MWL	-
>Scheduled Protocol Code Sequence	(0040,0008)	SQ	2	From MWL	-
>>Code Value	(0008,0100)	SH	1C	From MWL	-
>>Coding Scheme Designator	(0008,0102)	SH	1C	From MWL	-
>>Coding Scheme Version	(0008,0103)	SH	3	From MWL	-
>>Code Meaning	(0008,0104)	LO	3	From MWL	-
Patient's Name	(0010,0010)	PN	2	From MWL or user input	-
Patient ID	(0010,0020)	LO	2	From MWL or user input	-
Patient's Birth Date	(0010,0030)	DA	2	From MWL or user input	-
Patient's Sex	(0010,0040)	CS	2	From MWL or user input	-
Referenced Patient Sequence	(0008,1120)	SQ	2	From MWL	-
>Referenced SOP Class UID	(0008,1150)	UI	1C	From MWL	-
>Referenced SOP Instance UID	(0008,1155)	UI	1C	From MWL	-
Performed Procedure Step Information					
Performed Procedure Step ID	(0040,0253)	SH	1	Automatically created	-
Performed Station AE Title	(0040,0241)	AE	1	From AE Title in the system configuration	-
Performed Station Name	(0040,0242)	SH	2	From Hospital name in the system configuration	-
Performed Location	(0040,0243)	SH	2	Zero length	-
Performed Procedure Step Start Date	(0040,0244)	DA	1	Created	-
Performed Procedure Step Start Time	(0040,0245)	TM	1	Created	-
Performed Procedure Step Status	(0040,0252)	CS	1,3	IN PROGRESS	DISCONTINUED or COMPLETED
Performed Procedure Step Description	(0040,0254)	LO	2	From Scheduled Procedure Step Description (0040,0007)	Same
Performed Procedure Type Description	(0040,0255)	LO	2	Zero length	Zero length

Procedure Code Sequence	(0008,1032)	SQ	2	From MWL	From MWL
>Include 'Code Sequence Macro'			1C	Refer to Scheduled Protocol Code Sequence (0040,0008) on this table	Same
Performed Procedure Step End Date	(0040,0250)	DA	2	Zero length	Created
Performed Procedure Step End Time	(0040,0251)	TM	2	Zero length	Created
Image Acquisition Results					
Modality	(0008,0060)	CS	1	US	-
Study ID	(0020,0010)	UI	2	From Requested Procedure ID (0040,1001) or created	-
Performed Protocol Code Sequence	(0040,0260)	SQ	2,3	From Scheduled Protocol Code Sequence (0040,0008)	Same
>Include 'Code Sequence Macro'	(0008,0100)		1C	Refer to Scheduled Protocol Code Sequence (0040,0008) on this table	Same
Performed Series Sequence	(0040,0340)	SQ	2		
>Performing Physician's Name	(0008,1050)	PN	2C	From MWL or user input	From MWL or user input
>Protocol Name	(0018,1030)	LO	1C	Created	Created
>Operators' Name	(0008,1070)	PN	2C	From user input	From user input
>Series Instance UID	(0020,000E)	UI	1C	Created	Same
>Series Description	(0008,103E)	LO	2C	From user selection	From user selection
>Retrieve AE Title	(0008,0054)	AE	2C	From AET where images being stored	From AET where images being stored
>Referenced Image Sequence	(0008,1140)	SQ	2C	Zero length	Created
>>Referenced SOP Class UID	(0008,1150)	UI	1C		
>>Referenced SOP Instance UID	(0008,1155)	UI	1C		

11 ANNEX D - DICOMDIR IOD

11.1 DICOMDIR IOD

The E-CUBE i7 System supports the Modules for DICOMDIR IOD as follows :

Table 59 : BASIC DIRECTORY IOD MODULES

Module	Notes
File-set Identification	File-set identification information
Directory Information	Directory Information followed by a Sequence of Directory Records.

11.1.1 DICOMDIR Modules

The DICOMDIR File structure consists of the four levels (Patient – Study – Series – Image or SR) as follows :

Table 60 : DICOMDIR MODULES

Module	Attribute Name	Tag	VR	Type	Notes
File-set Identification	File-set ID	(0004,1130)		2	'APLINION_MEDIA'
	File-set Descriptor File ID	(0004,1141)	CS	3	'DICOMDIR'
	Specific Character Set of File-set Descriptor File	(0004,1142)	CS	1C	'ISO_IR 100'
Directory Information	Offset of the First Directory Record of the Root Directory Entity	(0004,1200)	UL	1	Generated
	Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)	UL	1	Generated
	File-set Consistency Flag	(0004,1212)	US	1	'0'
	Directory Record Sequence	(0004,1220)	SQ	1	
	>Offset of the Next Directory Record	(0004,1400)	UL	1	Generated
	>Record In-use Flag	(0004,1410)	US	1	'FFFF'
	>Offset of Referenced Lower-Level Directory Entity	(0004,1420)	UL	1	Generated
	>Directory Record Type	(0004,1430)	CS	1	PATIENT, STUDY, SERIES, IMAGE or SR DOCUMENTATION
	>Referenced File ID	(0004,1500)	CS	1C	Generated if Directory Record Sequence(0004,1220) is 'IMAGE' or 'SR DOCUMENTATION'
	>Referenced SOP Class UID in File	(0004,1510)	UI	1C	Generated if Directory Record Sequence(0004,1220) is 'IMAGE' or 'SR DOCUMENTATION'
	>Referenced SOP Instance UID in File	(0004,1511)	UI	1C	Generated if Directory Record Sequence(0004,1220) is 'IMAGE' or 'SR DOCUMENTATION'
	>Referenced Transfer Syntax UID in File	(0004,1512)	UI	1C	Generated if Directory Record Sequence(0004,1220) is 'IMAGE' or 'SR DOCUMENTATION'
	>Any other Attribute of Keys related to Directory Record Type				See Table below

11.1.1.1 DICOMDIR Keys

The DICOMDIR Key is used as an item for Directory Record Sequence (0004,1220).

Table 61 : DICOMDIR KEYS

Key	Attribute Name	Tag	VR	Type	Notes
Patient	Specific Character Set	(0008,0005)	UI	1C	ISO_IR
	Patient's Name	(0010,0010)	PN	2	From MWL or user input
	Patient ID	(0010,0020)	LO	1	From MWL or user input
	Patient's Birth Date	(0010,0030)	DA	3	From MWL or user input
	Patient's Sex	(0010,0040)	CS	3	From MWL or user input
	Referenced Patient Sequence	(0008,1120)	SQ	3	From MWL
	>Referenced SOP Class UID	(0008,1150)	UI	1C	From MWL
	>Referenced SOP Instance UID	(0008,1155)	UI	1C	From MWL
	Other Patient IDs	(0010,1000)	LO	3	From MWL
	Other Patient Names	(0010,1001)	PN	3	From MWL
	Ethnic Group	(0010,2160)	SH	3	From MWL
	Patient Comments	(0010,4000)	LT	3	From MWL
Study	Specific Character Set	(0008,0005)	UI	1C	ISO_IR 100
	Study Instance UID	(0020,000D)	UI	1	From MWL or generated
	Study Date	(0008,0020)	DA	1	From MWL
	Study Time	(0008,0030)	TM	1	From MWL
	Referring Physician's Name	(0008,0090)	PN	2	From MWL or user input
	Study ID	(0020,0010)	SH	2	From MWL or user input (Requested Procedure ID (0040, 1001))
	Accession Number	(0008,0050)	SH	2	From MWL or user input
	Study Description	(0008,1030)	LO	3	from MWL (Scheduled Procedure Step Description (0040,0007), Requested Procedure Description(0032,1060)) or user input
	Referenced Study Sequence	(0008,1110)	SQ	3	From MWL
	>Referenced SOP Class UID	(0008,1150)	UI	1C	From MWL
	>Referenced SOP Instance UID	(0008,1155)	UI	1C	From MWL
	Admitting Diagnoses Description	(0008,1080)	LO	3	From MWL
	Patient's Size	(0010,1020)	DS	3	From MWL or user input
	Patient's Weight	(0010,1030)	DS	3	From MWL or user input
	Additional Patient's History	(0010,21B0)	LO	3	From MWL
Series	Specific Character Set	(0008,0005)	UI	1C	ISO_IR 100
	Modality	(0008,0060)	CS	1	'US' or 'SR'
	Series Instance UID	(0020,000E)	UI	1	Generated

Key	Attribute Name	Tag	VR	Type	Notes
	Series Number	(0020,0011)	IS	2	Generated as a unique number within a study
	Series Date	(0008,0021)	DA	3	Generated (the first image date)
	Series Time	(0008,0031)	TM	3	Generated (the first image time)
	Performing Physicians' Name	(0008,1050)	PN	3	From MWL or user input
	Series Description	(0008,103E)	LO	3	User selection from Application
	Operators' Name	(0008,1070)	PN	3	User input
	Referenced Performed Procedure Step Sequence	(0008,1111)	SQ	3	From MWL
	>Referenced SOP Class UID	(0008,1150)	UI	1C	From MWL
	>Referenced SOP Instance UID	(0008,1155)	UI	1C	From MWL
	Request Attributes Sequence	(0040,0275)	SQ	3	From MWL
	>Requested Procedure ID	(0040,1001)	SH	1C	From MWL
	>Scheduled Procedure Step ID	(0040,0009)	SH	1C	From MWL
	>Scheduled Procedure Step Description	(0040,0007)	LO	3	From MWL
	>Scheduled Protocol Code Sequence	(0040,0008)	SQ	3	From MWL
	>Include 'Code Sequence Macro'			1C	
	Performed Procedure Step ID	(0040,0253)	SH	3	From MPPS
	Performed Procedure Step Start Date	(0040,0244)	DA	3	From MPPS
	Performed Procedure Step Start Time	(0040,0245)	TM	3	From MPPS
	Performed Procedure Step Description	(0040,0254)	LO	3	From MPPS
	Performed Protocol Code Sequence	(0040,0260)	SQ	3	From MWL (Scheduled Protocol Code Sequence (0040,0008)
	>Include 'Code Sequence Macro'			1C	
Image	Specific Character Set	(0008,0005)	UI	1C	ISO_IR 100
	Instance Number	(0020,0013)	IS	2	Generated as a unique number within a series
	Content Date	(0008,0023)	DA	2C	Generated
	Content Time	(0008,0033)	TM	2C	Generated
	Image Type	(0008,0008)	CS	3	Generated (See PS3.3 – 2008, C.8.5.6.1.1 Image Type for more information)
	Rows	(0028,0010)	US	1	Generated
	Columns	(0028,0011)	US	1	Generated
SR	Specific Character Set	(0008,0005)	UI	1C	ISO_IR_100
	Instance Number	(0020,0013)	IS	2	Generated as a unique number within a series
	Content Date	(0008,0023)	DA	2C	Generated
	Content Time	(0008,0033)	TM	2C	Generated
	Concept Name Code Sequence	(0040,A043)	SQ	1C	Generated
	>Code Value	(0008,0100)	SH	1C	'125000' or '125200'

Key	Attribute Name	Tag	VR	Type	Notes
	>Coding Scheme Designator	(0008,0102)	SH	1C	DCM
	>Code Meaning	(0008,0104)	LO	1C	'OB-GYN Ultrasound Procedure Report'
	Completion Flag	(0040,A491)	CS	1	'PARTIAL'
	Verification Flag	(0040,A493)	CS	1	'UNVERIFIED'

12 ANNEX E - STRUCTURED REPORTS

12.1 DICOM SR IOD

The DICOM SR File includes the following attributes :

Table 62 : DICOM STRUCTURED REPORT IOD

Module	Attribute Name	Tag	VR	Type	Notes
Patient	Patient's Name	(0010,0010)	PN	2	From WML or user input
	Patient ID	(0010,0020)	LO	2	From MWL or user input
	Patient's Birth Date	(0010,0030)	DA	2	From MWL or user input
	Patient's Sex	(0010,0040)	CS	2	From MWL or user input
	Referenced Patient Sequence	(0008,1120)	SQ	3	From MWL
	>Referenced SOP Class UID	(0008,1150)	UI	1C	From MWL
	>Referenced SOP Instance UID	(0008,1155)	UI	1C	From MWL
	Other Patient IDs	(0010,1000)	LO	3	From MWL
	Other Patient Names	(0010,1001)	PN	3	From MWL
	Ethnic Group	(0010,2160)	SH	3	From MWL
	Patient Comments	(0010,4000)	LT	3	From MWL
General Study	Study Instance UID	(0020,000D)	UI	1	From MWL or generated
	Study Date	(0008,0020)	DA	2	Generated
	Study Time	(0008,0030)	TM	2	Generated
	Referring Physician's Name	(0008,0090)	PN	2	From MWL or user input
	Study ID	(0020,0010)	SH	2	From MWL (Requested Procedure ID (0040,1001))
	Accession Number	(0008,0050)	SH	2	From MWL or user input
	Study Description	(0008,1030)	LO	3	From MWL (Scheduled Procedure Step Description (0040,0007), Study Description (0008,1030), Requested Procedure Description (0032,1060)) or user input
	Name of Physician(s) Reading Study	(0008,1060)	PN	3	User input (from Performed MD)
	Referenced Study Sequence	(0008,1110)	SQ	3	From MWL
	>Referenced SOP Class UID	(0008,1150)	UI	1C	From MWL
	>Referenced SOP Instance UID	(0008,1155)	UI	1C	From MWL
	Procedure Code Sequence	(0008,1032)	SQ	3	From MWL (Requested Procedure Code Sequence (0032,1064))
	>Code Value	(0008,0100)	SH	1C	
	>Coding Scheme Designator	(0008,0102)	SH	1C	
	>Coding Scheme Version	(0008,0103)	SH	1C	
	>Code Meaning	(0008,0104)	LO	1C	
SR Document Series	Modality	(0008,0060)	LO	1	'SR'
	Series Instance UID	(0020,000E)	UI	1	Generated
	Series Number	(0020,0011)	IS	1	Generated as a unique number within a study
	Referenced Performed Procedure Step Sequence	(0008,1111)	SQ	2	Zero length
General Equipment	Manufacturer	(0008,0070)	LO	2	'ALPINION'
	Institution Name	(0008,0080)	LO	3	From MWL or user input (from Hospital name)
	Station Name	(0008,1010)	SH	3	User input (from AE Title)

Module	Attribute Name	Tag	VR	Type	Notes
	Manufacturer's Model Name	(0008,1090)	LO	3	E-CUBE *ModelNumber*
	Device Serial Number	(0018,1000)	LO	3	SSN
	Software Versions	(0018,1020)	LO	3	From Software Version
SR Document General	Instance Number	(0020,0013)	IS	2	Generated as a unique number within a series
	Completion Flag	(0040,A491)	CS	1	'PARTIAL'
	Verification Flag	(0040,A493)	CS	1	'UNVERIFIED'
	Content Date	(0008,0023)	DA	2C	Generated
	Content Time	(0008,0033)	TM	2C	Generated
	Referenced Request Sequence	(0040,A370)	SQ	1C	From MWL
	>Study Instance UID	(0020,000D)	UI	1	From General Study Module
	>Accession Number	(0008,0050)	SH	2	From General Study Module
	>Requested Procedure ID	(0040,1001)	SH	2	From MWL
	>Requested Procedure Description	(0032,1060)	SH	2	From MWL
SR Document Content	Content Template Sequence	(0040,A504)	SQ	1C	Template ID
	>Include 'Template Identification Macro'			1C	
	Value Type	(0040,A040)	CS	1	CONTAINER
	Continuity of Content	(0040,A050)	CS	1C	SEPARATE
	Concept Name Code Sequence	(0040,A043)	SQ	1C	See Annex for "OB-GYN Ultrasound Procedure Report"
	>Include 'Code Sequence Macro'			1C	
	Content Sequence	(0040,A730)	SQ	1C	See Annex for "OB-GYN Ultrasound Procedure Report"
	>Relationship Type	(0040,A010)	CS	1	
SOP Common	SOP Class UID	(0008,0016)	UI	1	'1.2.840.10008.5.1.4.1.1.88.33' - SR
	SOP Instance UID	(0008,0018)	UI	1	Generated
	Specific Character Set	(0008,0005)	CS	1C	ISO_IR 100
	Instance Creation Date	(0008,0012)	DA	3	Generated
	Instance Creation Time	(0008,0013)	TM	3	Generated

12.2 OB-GYN ULTRASOUND PROCEDURE REPORT

OB-GYN Ultrasound procedure report is based on the PS3.3, PS3.16-2008, DICOM Supplement 26. Below items are included in OB-GYN Ultrasound procedure report. And we added a private tag, "ALPINION2011".

12.2.1 TID 5000 : OB-GYN Ultrasound Procedure Report

Table 63 : OB-GYN ULTRASOUND PROCEDURE REPORT

Label	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning (0008,0104)	Modifiers
OB-GYN Ultrasound Procedure Report	DCM	125000	OB-GYN Ultrasound Procedure Report	

12.2.2 TID 5001 : Patient Characteristics

Table 64 : PATIENT CHARACTERISTICS

Label	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning (0008,0104)	Modifiers
Patient Characteristics	DCM	121118	Patient Characteristics	
Patient's Name	DCM	T5201-01	Patient's Name	
Patient's ID	ALPINION2012	T5201-02	Patient's ID	
Patient's Sex	ALPINION2012	T5201-03	Patient's Sex	
Patient's Birth date	ALPINION2012	T5201-04	Patient's Birth date	
Comment	DCM	121106	Comment	
Sonographer	ALPINION2012	T5201-05	Sonographer	
Referring Physician	ALPINION2012	T5201-06	Referring Physician	
Exam date	ALPINION2012	T5201-07	Exam date	
Study date	ALPINION2012	T5201-08	Study date	
Height	LN	8302-2	Patient Height	
Weight	LN	29463-7	Patient Weight	
Gravida	LN	11996-6	Gravida	
Para	LN	11977-6	Para	
Aborta	LN	11612-9	Aborta	
Ectopic	LN	33065-4	Ectopic Pregnancies	

12.2.3 TID 5002 : OB-GYN Summary

Table 65 : OB-GYN SUMMARY

Label	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning (0008, 0104)	Modifiers
OB-GYN Summary	DCM	121111	Summary	
LMP	LN	11955-2	LMP	

12.2.4 TID 5003 : Fetus Summary

Table 66 : FETUS SUMMARY

Label	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning (0008, 0104)	Modifiers
Fetus Summary	DCM	125008	Fetus Summary	
EFW	LN	11727-5	Estimated Weight	
EFW GP	LN	11767-1	EFW percentile rank	
AUA	LN	11884-4	Average Ultrasound Age	
CUA	LN	11888-5	Composite Ultrasound Age	

12.2.4.1 EFW Authors

Table 67 : EFW AUTHORS

Label	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning (0008, 0104)	Modifiers
Hadlock (AC,FL)	LN	11751-5	EFW by AC, FL, Hadlock 1985	
Hadlock (AC,BPD)	LN	11738-2	EFW by AC, BPD, Hadlock 1984	
Hadlock (AC,BPD,FL)	LN	11735-8	EFW by AC, BPD, FL, Hadlock 1985	
Hadlock (AC,FL,HC)	LN	11746-5	EFW by AC, FL, HC, Hadlock 1985	
Hadlock (AC,BPD,FL,HC)	LN	11732-5	EFW by AC, BPD, FL, HC Hadlock 1985	
Campbell	LN	11756-4	EFW by AC, Campbell 1975	
Hansmann (BPD,TTD)	LN	33139-7	EFW by BPD, TTD, Hansmann 1986	
Merz (BPD, AC)	ALPINION2011	EFWMerz	EFW by AC, BPD, Merz	
Osaka (BPD, FTA, FL)	LN	33140-5	EFW by BPD, FTA, FL, Osaka 1990	

Persson	ALPINION2011	EFWPersson	EFW by, BPD, MAD, FL, Persson	
Schild	ALPINION2011	EFWSchild	EFW by HC,AC,FL, Schild	
Shepard	LN	11739-0	EFW by AC and BPD, Shepard 1982	
Shinozuka1	LN	33141-3	EFW1 by Shinozuka 1996	
Shinozuka2	LN	33142-1	EFW2 by Shinozuka 1996	
Shinozuka3	LN	33143-9	EFW3 by Shinozuka 1996	
Tokyo (BPD, APAD, TAD,FL)	LN	33144-7	EFW by BPD, APAD, TAD, FL, Tokyo 1987	

12.2.4.2 EFW GP Authors

Table 68: EFW GP AUTHORS

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

12.2.5 TID 5004 : Fetal Biometry Ratios

Table 69 : FETAL BIOMETRY RATIOS

Label	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning (0008, 0104)	Modifiers
Fetal Biometry Ratios	DCM	125001	Fetal Biometry Ratios	
CI	LN	11823-2	Cephalic Index	
	SRT	R-10041	Normal Range Lower Limit	
	SRT	R-0038B	Normal Range Upper Limit	
CTAR	APINION2011	CTAR	Cardiothoracic Area Ratio	
	APINION2011	CTAR_A1	CTAR, Cardiac Area	
	APINION2011	CTAR_A2	CTAR, Thoracic Area	
FL/BPD	LN	11872-9	FL/BPD	
	SRT	R-10041	Normal Range Lower Limit	
	SRT	R-0038B	Normal Range Upper Limit	
FL/AC	LN	11871-1	FL/AC	
	SRT	R-10041	Normal Range Lower Limit	
	SRT	R-0038B	Normal Range Upper Limit	
FL/HC	LN	11873-7	FL/HC	
	SRT	R-10041	Normal Range Lower Limit	
	SRT	R-0038B	Normal Range Upper Limit	
HC/AC	LN	11947-9	HC/AC	

	SRT	R-10041	Normal Range Lower Limit	
	SRT	R-0038B	Normal Range Upper Limit	

12.2.6 TID 5005 : Fetal Biometry Measurements

Table 70 : FETAL BIOMETRY MEASUREMENTS

Label	Author	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning (0008, 0104)	Modifiers
Fetal Biometry Measurements		DCM	125002	Fetal Biometry	
AC		LN	11979-2	Abdominal Circumference	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	ASUM	LN	33072-0	AC, ASUM 2000	
		SRT	R-00388	2 Sigma Lower Value of population	
		SRT	R-00387	2 Sigma Upper Value of population	
	CFEF	APINION2011	ACMACFEF	AC, CFEF	
	Chitty	APINION2011	ACMAChitty	AC, Chitty	
	Hadlock 82	APINION2011	ACMAHadlock82	AC, Hadlock82 1990	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Hadlock 84	LN	11892-7	AC, Hadlock 1984	
		SRT,	R-00388	2 Sigma Lower Value of population	
		SRT	R-00387	2 Sigma Upper Value of population	
	Hansmann	LN	33073-8	AC, Hansmann1985	
	Jeanty	LN	11893-5	AC, Jeanty 1984	
	JSUM	APINION2011	ACMAJSUM	AC, JSUM	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Kurmanavicius	APINION2011	ACMAKurmanavicius	AC, Kurmanavicius	
	Merz	LN	33075-3	AC, Mertz 1988	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Nicolaides	APINION2011	ACMANicolaides	AC, Nicolaides	
	Shinozuka	LN	33076-1	AC, Shinozuka 1996	
		SRT	R-00347	1 Sigma Lower Value of population	

		SRT	R-00346	1 Sigma Upper Value of population	
	Tokyo	APINION2011	ACMATokyo	AC, Tokyo	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
HC		LN	11984-2	Head Circumference	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	ASUM	LN	33109-0	HC, ASUM 2000	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	CFEF	APINION2011	HCMACFEF	HC, CFEF	
	Chitty	LN	33110-8	HC measured, Chitty 1997	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Hadlock 82	APINION2011	HCMAHadlock82	HC, Hadlock82 1990	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Hadlock 84	LN	11932-1	HC, Hadlock 1984	
		SRT	R-00388	2 Sigma Lower Value of population	
		SRT	R-00387	2 Sigma Upper Value of population	
	Hansmann	LN	33543-0	HC, Hansmann 1986	
	Jeanty	LN	11934-7	HC, Jeanty 1984	
	Johnsen	APINION2011	HCMAJohnsen	HC, Johnsen	
		SRT	R-00377	10th Percentile Value of population	
		SRT	R-00338	90th Percentile Value of population	
	Kurmanavicius	APINION2011	HCMAKurmanavicius	HC, Kurmanavicius	
	Merz	LN	33115-7	HC, Merz 1988	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Nicolaides	APINION2011	HCMANicolaides	HC, Nicolaides	
OFD(HC)		APINION2011	OFDHC	OFD(HC)	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
BPD		LN	11820-8	Biparietal Diameter	Maximum(SRT, G-A437)

	ASUM	LN	33079-5	BPD, ASUM 1989	Minimum(SRT, R-404FB) Mean(SRT, R-00317)
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	CFEF	APINION2011	BPDMACFEF	BPD CFEF	
	Hadlock 82	LN	11901-6	BPDa, Hadlock 1982	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Hadlock 84	LN	11902-4	BPD, Hadlock 1984	
		SRT,	R-00387	2 Sigma Upper Value of population	
		SRT	R-00388	2 Sigma Lower Value of population	
	Hansmann	LN	33538-0	BPD, Hansmann 1986	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Jeanty	LN	11905-7	BPD, Jeanty 1984	
	Johnsen	APINION2011	BPDMAJohnsen	BPD Johnsen	
		SRT	R-00377	10th Percentile Value of population	
		SRT	R-00338	90th Percentile Value of population	
	JSUM	ALPINION2011	BPDMAJSUM	BPD JSUM	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Kurtz	LN	11906-5	BPD, Kurtz 1980	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Kurmanavicius	ALPINION2011	BPDMAKurmanavicius	BPD Kurmanavicius	
	Marsal	ALPINION2011	BPDMAMarsal	BPD Marsal	
	Merz	LN	33081-1	BPD, Mertz 1988	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Nicolaides	APINION2011	BPDMANicolaides	BPD Nicolaides	
	Osaka	LN	33082-9	BPD, Osaka 1989	
	Sabbanha	LN	11907-3	BPD, Sabbagha 1978	

		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Shinozuka	LN	33084-5	BPD, Shinozuka 1996	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Tokyo	LN	33085-2	BPD, Tokyo 1986	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
OFD		LN	11851-3	Occipital-Frontal Diameter	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	ASUM	LN	33119-9	OFD, ASUM 2000	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Hansmann	LN	33120-7	OFD, Hansmann 1986	
	Jeanty	ALPINION2011	OFDMAJeanty	OFD, Jeanty	
	Kurmanavicius	ALPINION2011	OFDMAKurmanavicius	OFD, Kurmanavicius	
	Merz	ALPINION2011	OFDMAMerz	OFD, Merz	
	Nicolaides	ALPINION2011	OFDMANicolaides	OFD, Nicolaides	
MAD		ALPINION2011	MAD	Middle Abdominal Diameter	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	EIK-NES	ALPINION2011	MADMAEIKNES	MAD, EIK-NES	
	Kurmanavicius	ALPINION2011	MADMAKurmanavicius	MAD, Kurmanavicius	
FTA		LN	33068-8	Thoracic Area	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	Osaka	ALPINION2011	FTAMAOsaka	FTA, Osaka	
TAD		LN	11862-0	Tranverse Abdominal Diameter	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	CFEF	ALPINION2011	TADMACFEF	TAD CFEF	
	Merz	ALPINION2011	TADMAMerz	TAD Merz	
TTD		LN	11864-6	Transverse Thoracic Diameter	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	Hansmann	LN	33136-3	Transverse Thoracic Diameter, Hansmann 1985	
TC		LN	11988-3	Thoracic Circumference	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
APTD		LN	11819-0	Anterior-Posterior Trunk Diameter	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	Hansmann	ALPINION2011	APTDMAHansmann	APTD Hansmann	
TCD		LN	11863-8	Trans Cerebellar Diameter	Maximum(SRT, G-A437) Minimum(SRT, R-404FB)
	Chitty	LN	33132-2	TCD, Chitty 1994	

		SRT	R-00397	5th Percentile Value of population	Mean(SRT, R-00317)
		SRT	R-00337	95th Percentile Value of population	
	Hill	LN	33134-8	TCD, Hill 1990	
		SRT	R-00346	1 Sigma Upper Value of population	
		SRT	R-00347	1 Sigma Lower Value of population	
	Nicolaides	ALPINION2011	TCDMANicolaides	TCD Nicolaides	
APAD		LN	11818-2	Anterior-Posterior Abdominal Diameter	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
EL		ALPINION2011	EarDist	Ear Length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
Scapular		ALPINION2011	ScapularDimension	Scapular Dimension	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
FB		ALPINION2011	FetalBowel	Fetal Bowel Diameter	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
Foot		LN	11965-1	Foot length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
FK		LN	11834-9	Left Kidney length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
		LN	11836-4	Right Kidney length	
HA		ALPINION2011	HeartArea	Heart Area	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
LL		ALPINION2011	LiverDist	Liver Length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
RL		ALPINION2011	RibDist	Rib Length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
SC		ALPINION2011	SplenicCircumference	Splenic Circumference	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
AD		ALPINION2011	AbdominalDiameter	Abdominal Diameter	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
AA		ALPINION2011	AbdominalArea	Abdominal Area	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
APTD&TTD(AP		ALPINION2011	APTDnTTD_APTD	APTDnTTD, APTD	Maximum(SRT, G-A437)

TD)					Minimum(SRT, R-404FB) Mean(SRT, R-00317)
APTD&TTD(TTD)		ALPINION2011	APTDnTTD_TTD	APTDnTTD, TTD	
AxT(APTD)		ALPINION2011	AxT_APTD	AxT, APTD	
AxT(TTD)		ALPINION2011	AxT_TTD	AxT, TTD	
AxT		ALPINION2011	APTD_TTD	APTD * TTD	
	Shinozuka	LN	33078-7	AxT, Shinozuka 1996	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Tokyo	ALPINION2011	AXTMATokyo	AXT, Tokyo	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	

12.2.7 TID 5006 : Fetal Long Bones

Table 71 : FETAL LONG BONES

Label	Author	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning (0008, 0104)	Modifiers
Fetal Long Bones		DCM	125003	Fetal Long Bones	
CLAV		LN	11962-8	Clavicle length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	Yarkoni	LN	33088-6	Clavicle length, Yarkoni 1985	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
HL		LN	11966-9	Humerus length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	ASUM	LN	33116-5	Humerus Length, ASUM 2000	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Jeanty	LN	11936-2	Humerus, Jeanty 1984	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Merz	LN	11937-0	Humerus, Merz 1987	
	Osaka	LN	33117-3	Humerus Length, Osaka 1989	
FL		LN	11963-6	Femur Length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	ASUM	APINION2011	FLMAASUM	FL, ASUM	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	CFEF	APINION2011	FLMACFEF	FL, CFEF	
	Chitty	LN	33098-5	FL, Chitty 1997	

		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Hadlock 82	APINION2011	FLMAHadlock82	FL, Hadlock82 1990	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Hadlock 84	LN	11920-6	FL, Hadlock 1984	
		SRT	R-00388	2 Sigma Lower Value of population	
		SRT	R-00387	2 Sigma Upper Value of population	
	Hansmann	LN	33541-4	FL, Hansmann 1986	
	Hohler	LN	11922-2	FL, Hohler 1982	
		SRT	R-00388	2 Sigma Lower Value of population	
		SRT	R-00387	2 Sigma Upper Value of population	
	Jeanty	LN	11923-0	FL, Jeanty 1984	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	JSUM	ALPINION2011	FLMAJSUM	FL, JSUM	
		SRT	R-00346	1 Sigma Upper Value of population	
		SRT	R-00347	1 Sigma Lower Value of population	
	Kurmanavicius	ALPINION2011	FLMAKurmanavicius	FL, Kurmanavicius	
	Marsal	ALPINION2011	FLMAMarsal	FL, Marsal	
	Merz	LN	33542-2	FL, Merz 1988	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Nicolaides	APINION2011	FLMANicolaides	FL, Nicolaides	
	Obrien	APINION2011	FLMAOBrien	FL, OBrien	
	Osaka	LN	33101-7	FL, Osaka 1989	
	Shinozuka	LN	33102-5	FL, Shinozuka 1996	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Tokyo	LN	33103-3	FL, Tokyo 1986	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Warda	APINION2011	FLMAWarda	FL, Warda	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
RAD		LN	11967-7	Radius length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	Merz	LN	11939-6	Radius, Merz 1987	
ULNA		LN	11969-3	Ulna length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	Jeanty	LN	11944-6	Ulna, Jeanty 1984	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Merz	LN	11945-3	Ulna, Merz 1987	
TIB		LN	11968-5	Tibia length	Maximum(SRT, G-

	Jeanty	LN	11941-2	Tibia, Jeanty 1984	A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Merz	ALPINION2011	TIBMerz	TIB, Merz	
FIB		LN	11964-4	Fibula length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	Jeanty	LN	33164-5	Fibula by GA, Jeanty 1983	
NB		ALPINION2011	NasalBoneDist	Nasal bone Length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)

12.2.8 TID 5007 : Fetal Cranium

Table 72 : FETAL CRANIUM

Label	Author	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning (0008, 0104)	Modifiers
Fetal Cranium		DCM	125004	Fetal Cranium	
OOD		LN	11629-3	Outer Orbital Diameter	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
CM		LN	11860-4	Cisterna Magna	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)

12.2.9 TID 5010 : Amniotic Sac

Table 73 : AMNIOTIC SAC

Label	Sub Item	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning (0008, 0104)	Modifiers
Amniotic Sac		SRT	T-F1300	Amniotic Sac	
AFI	AFI1	LN	11624-4	First Quadrant Diameter	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	AFI2	LN	11626-9	Second Quadrant Diameter	
	AFI3	LN	11625-1	Third Quadrant Diameter	
	AFI4	LN	11623-6	Fourth Quadrant Diameter	
	AFI Sum	LN	11627-7	Amniotic Fluid Index	

12.2.10 TID 5011 : Early Gestation

Table 74 : EARLY GESTATION

Label	Author	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning (0008, 0104)	Modifiers
Early Gestation		DCM	125009	Early Gestation	
CRL		LN	11957-8	Crown Rump Length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	ASUM	LN	33090-2	CRL, ASUM 2000	
	Daya	LN	33091-0	CRL, Daya 1993	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Hadlock	LN	11910-7	CRL, Hadlock 1992	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Hansmann	LN	33540-6	CRL, Hansmann 1986	
		SRT	R-00388	2 Sigma Lower Value of population	
		SRT	R-00387	2 Sigma Upper Value of population	
	JSUM	ALPINION2011	CRLMAJSUM	CRL, JSUM 2001	
		SRT	R-00337	10th Percentile Value of population	
		SRT	R-00338	90th Percentile Value of population	
	Marsal	ALPINION2011	CRLMAMarsal	CRL, Marsal	
	Nelson	LN	11913-1	CRL, Nelson 1981	
	Osaka	LN	33093-6	CRL, Osaka 1989	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Rempen	LN	33094-4	CRL, Rempen 1991	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	
	Robinson	LN	11914-9	CRL, Robinson 1975	
		SRT	R-00388	2 Sigma Lower Value of population	
		SRT	R-00387	2 Sigma Upper Value of population	
	Shinozuka	LN	33095-1	CRL, Shinozuka 1996	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
	Tokyo	LN	33096-9	CRL, Tokyo 1986	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
GS		LN	11850-5	Gestational Sac Diameter	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	Hansmann	LN	33106-6	GS, Hansmann 1982	
	Hellman	LN	11928-9	GS, Hellman 1969	
	Hollander	ALPINION2011	GSMAHollander	GS, Hollander	
	Rempen	LN	11929-7	GS, Rempen 1991	
		SRT	R-00388	2 Sigma Lower Value of population	

		SRT	R-00387	2 Sigma Upper Value of population	
	Tokyo	LN	33108-2	GS, Tokyo 1986	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
SL		LN	33071-2	Spine Length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	Tokyo	LN	33127-2	Spine Length, Tokyo, 1989	
		SRT	R-00347	1 Sigma Lower Value of population	
		SRT	R-00346	1 Sigma Upper Value of population	
YS		LN	11816-6	Yolk Sac length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
NT		LN	33069-6	Nuchal Translucency	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
BOD		ALPINION2011	BOD	Binocular Distance	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	Jeanty	ALPINION2011	BODMAJeanty	BOD, Jeanty	
		SRT	R-00397	5th Percentile Value of population	
		SRT	R-00337	95th Percentile Value of population	

12.2.11 Private Section : Ovaries Section

Table 75 : PRIVATE SECTION : OVARIES SECTION

Label	Sub Item	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning	Modifiers
Ovaries Section		ALPINION2011	Ovaries	Ovaries Section	
OV	Lt OV L	LN	11840-6	Left Ovary Length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	Lt OV H	LN	11857-0	Left Ovary Height	
	Lt OV W	LN	11829-9	Left Ovary Width	
	Lt OV LHW	LN	12164-0	Left Ovary Volume	
	Lt OV Volume	ALPINION2011	LeftOvaryVolDist1	Left Ovary Volume: Distance1	
		ALPINION2011	LeftOvaryVolDist2	Left Ovary Volume: Distance2	
		ALPINION2011	LeftOvaryVolDist3	Left Ovary Volume: Distance3	
		LN	12164-0	Left Ovary Volume	
	Rt OV L	LN	11841-4	Right Ovary Length	
	Rt OV H	LN	11858-8	Right Ovary Height	
	Rt OV W	LN	11830-7	Right Ovary Width	
	Rt OV LHW	LN	12165-7	Right Ovary Volume	
	Rt OV Volume	ALPINION2011	RightOvaryVolDist1	Right Ovary Volume: Distance1	
		ALPINION2011	RightOvaryVolDist2	Right Ovary Volume: Distance2	
		ALPINION2011	RightOvaryVolDist3	Right Ovary Volume: Distance3	
		LN	12165-7	Right Ovary Volume	

12.2.12 Findings Site : Pelvic Vascular Structure

All labels have the same Sub-Items. The labels have each location information(off, prox, mid, dist) and side information(Lt, Rt). (All Sub-Items = PS, ED, MD, SD, DS, PI, RI, TAMAX, Accel, AT)

Table 76 : PELVIC VASCULAR STRUCTURE

Label	Sub-Item	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning	Modifiers
Pelvic Vascular Structure		SRT	T-D6007	Pelvic Vascular Structure	
	PS	LN	11726-7	Peak Systolic Velocity	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	ED	LN	11653-3	End Diastolic Velocity	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	MD	LN	11665-7	Minimum Diastolic Velocity	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	SD	LN	12144-2	Systolic to Diastolic Velocity Ratio	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	DS	LN	20216-8	Deceleration Slope	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	PI	LN	12008-9	Pulsatility Index	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	RI	LN	12023-8	Resistivity Index	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	TAMAX	LN	11692-1	Time averaged peak velocity	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	Accel	LN	20167-3	Acceleration Index	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	AT	LN	20168-1	Acceleration Time	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
Umbilical A	All Sub Items	SRT	T-F1810	Umbilical Artery	
UmbAD		SRT	T-F1810	Umbilical Artery - Vessel lumen diameter (SRT, G-0364)	
UmbVD		SRT	T-F1820	Umbilical Vein - Vessel lumen diameter (SRT, G-0364)	

Uterine A	All Sub Items (include location, side)	SRT	T-46820	Uterine Artery	
Ovarian A	All Sub Items (include location, side)	SRT	T-46980	Ovarian Artery (Laterality)	
Placenta	All Sub Items (include location)	SRT	T-F1412	Vitelline Artery of Placenta	
Ao	All Sub Items (include location)	SRT	T-42000	Aorta	

12.2.13 Findings Site : Embryonic Vascular Structure

All labels have the same Sub-Items. The labels have each location information (off, prox, mid, dist) and side information(Lt, Rt). (All Sub Items = PS, ED, MD, SD, DS, PI, RI, TAMAX, Accel, AT)

Table 77 : EMBRYONIC VASCULAR STRUCTURE

Label	Sub-Item	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning	Modifiers
Embryonic Vascular Structure		SRT	T-F6800	Finding Site : Embryonic Vascular Structure	
	PS	LN	11726-7	Peak Systolic Velocity	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	ED	LN	11653-3	End Diastolic Velocity	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	MD	LN	11665-7	Minimum Diastolic Velocity	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	SD	LN	12144-2	Systolic to Diastolic Velocity Ratio	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	DS	LN	20216-8	Deceleration Slope	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	PI	LN	12008-9	Pulsatility Index	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	RI	LN	12023-8	Resistivity Index	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	TAMAX	LN	11692-1	Time averaged peak velocity	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188)

					Distal (SRT G-A119)
	Accel	LN	20167-3	Acceleration Index	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
	AT	LN	20168-1	Acceleration Time	Proximal (SRT G-A118) Mid longitudinal (SRT G-A188) Distal (SRT G-A119)
DesAorta	All Sub Items (include location)	SRT	T-D0765	Descending Aorta	
MCA	All Sub Items	SRT	T-45600	Middle Cerebral Artery	
Ves	All Sub Items (include location, side)	ALPINION2011	Vessel	Vessel	
DV	All Sub Items (include location)	ALPINION2011	DV	Ductus Venosus	
HR (OB)		LN	11948-7	Fetal Heart Rate	
HR (GYN)		LN	8867-4	Heart Rate	

12.2.14 TID 5009 : Fetal Biophysical Profile Section

Table 78 : FETAL BIOPHYSICAL PROFILE SECTION

Label	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning (0008, 0104)	Modifiers
Biophysical Profile	DCM	125006	Biophysical Profile	
Gross Body Movement	LN	11631-9	Gross Body Movement	
Fetal Breathing	LN	11632-7	Fetal Breathing	
Fetal Tone	LN	11635-0	Fetal Tone	
Fetal Heart Reactivity	LN	11635-5	Fetal Heart Reactivity	
Amniotic Fluid Volume	LN	11630-1	Amniotic Fluid Volume	
Biophysical Profile Sum Score	LN	11634-3	Biophysical Profile Sum Score	

12.2.15 TID 5015 : Pelvis and Uterus (Gynecology Group)

Table 79 : PELVIS AND UTERUS

Label	Sub Item	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning	Modifiers
Pelvis and Uterus		DCM	125011	Pelvis and Uterus	
Cervix		LN	11961-0	Cervix Length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
Endo		LN	12145-9	Endometrium Thickness	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
UT		SRT	T-83000	Uterus	
	UT L	LN	11842-2	Uterus Length	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	UT H	LN	11859-6	Uterus Height	
	UT W	LN	11865-3	Uterus Width	
	UT LHW	LN	33192-6	Uterus Volume	
	UT Volume	ALPINION2011	UterusDistValue	Uterus Distance Volume	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
		ALPINION2011	UterusVolDist1	Uterus Volume: Distance1	
		ALPINION2011	UterusVolDist2	Uterus Volume: Distance2	
		ALPINION2011	UterusVolDist3	Uterus Volume: Distance3	
		LN	33192-6	Uterus Volume	
Bladder		ALPINION2011	Bladder	Bladder Section	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
	Bladder L	ALPINION2011	BladderLength	Bladder Length	
	Bladder H	ALPINION2011	BladderHeight	Bladder Height	
	Bladder W	ALPINION2011	BladderWidth	Bladder Width	
	Bladder LHW	ALPINION2011	BladderVolume	Bladder Volume	
	Bladder Volume	ALPINION2011	BladderDistanceVolume	Bladder Distance Volume	Maximum(SRT, G-A437) Minimum(SRT, R-404FB) Mean(SRT, R-00317)
		ALPINION2011	BladderVolDist1	Bladder Volume: Distance1	
		ALPINION2011	BladderVolDist2	Bladder Volume: Distance2	
		ALPINION2011	BladderVolDist3	Bladder Volume: Distance3	
		ALPINION2011	BladderVolume	Bladder Volume	

12.2.16 Private Section : Ovarian Follicle Section (Gynecology Group)

All Follicle labels have side(Lt, Rt) information. The each side has same the code meaning.

Table 80 : OVARIAN FOLLICLE

Label	Sub Item	Coding Scheme Designator (0008, 0102)	Code Value (0008, 0100)	Code Meaning	Modifiers
Ovarian Follicle Section		ALPINION2011	Follicles	Ovarian Follicle Section	
Follicle		APINION2011	Follicles	Ovarian Follicle Section	
	Follicle1	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle2	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle3	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle4	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle5	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle6	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle7	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle8	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle9	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)

		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle10	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle11	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle12	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle13	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle14	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)
	Follicle15	SRT	G-D705	Volume	
		APINION2011	follicle1d	Follicle 1st diameter	Maximum(SRT, G-A437)
		APINION2011	follicle2d	Follicle 2st diameter	Minimum(SRT, R-404FB)
		APINION2011	follicle3d	Follicle 3st diameter	Mean(SRT, R-00317)