esaote

MyLab

Ultrasound Scanners

DICOM Conformance Statement

Document Version 6.0

Date: FEB. 25, 2009

1 CONFORMANCE STATEMENT OVERVIEW

MyLab is a family of Ultrasound scanners made by Esaote; their software is based upon the Windows[®] XP Operating System. This DICOM[®] Conformance Statement (DCS) specifies the conformance to the DICOM standard[1] for the Esaote MyLab systems.

The MyLab systems implement the necessary DICOM services to download work lists from an information system, to save acquired Ultrasound images, clips and Structured Report objects[2] to a network storage device, to save them on a CD-R, DVD or USB connected removable device, or to print images to a networked hardcopy device.

Parts of this document are taken from the templates present in the DICOM standard document PS 3.2, [©] Copyright by the National Electrical Manufacturers Association.

Table 1 provides an overview of the network services supported by the MyLab systems.

Table 1
NETWORK SERVICES

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

(*)   Enabled by the purchasable DICOM option.
(**)   Not present in VET models.

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[1] DICOM is the registered trademark of the National Electrical Manufacturers Association for its standards publications relating to digital communications of medical information.

[2] DICOM Structured Report not available in VET models.

Table 2 provides an overview of the Media Storage Application Profiles supported by the MyLab systems.

Table 2
MEDIA SERVICES

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disk – Recordable		
General Purpose CD-R Interchange (STD-GEN-CD)	Yes	No
Ultrasound Spatial Calibration Single and Multiframe CD-R Interchange (STD-US-SC-MF-CDR)	Yes	No
DVD		
General Purpose DVD with Compression Interchange (STD-GEN-DVD-JPEG)	Yes	No
Ultrasound Spatial Calibration Single and Multiframe DVD Interchange (STD-US-SC-MF-DVD)	Yes	No
USB connected removable device		
General Purpose USB Media Interchange with JPEG (STD-GEN-USB-JPEG)	Yes	No

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3   INTRODUCTION

3.1 REVISION HISTORY

Table 3
REVISION HISTORY

Document Version	Date of Issue	Author	Description	Systems	SW Releases
6.0	February 25th, 2008	Luigi Pampana-Biancheri	- New sw releases and models. - MWL for VET models. - Comprehensive SR introduced for Echo-Cardio reports.	MyLab Five MyLab 25 MyLab 30 MyLab 40 MyLab 50	9.01 9.10 9.12 9.13
				MyLab 60 MyLab 70 MyLab 70 XVG	5.00 5.01 5.02 5.03

This document applies to the software releases of the MyLab systems indicated in the above table: always check for the latest version of it covering the desired systems and software versions. Foot page notes will appear indicating the differences among the various systems, if any. Some of the MyLab systems are intended for veterinary usage: these models are identified by the "VET" suffix; the differences between human and veterinary systems are explicitly described in this document. For systems with suffixes not indicated in the table above, please refer to the same model without any suffix.

For any other information, or for the latest version of this document, please contact us:

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NOTE: when in this document we refer to "Esaote", without any further specification, we mean the Esaote group:

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3.2 AUDIENCE

This document is written for the people that need to understand how the MyLab systems will integrate into their healthcare facility. 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 MyLab systems. This document contains some basic DICOM definitions so that any reader may understand how the MyLab systems implement DICOM features. However, integrators are expected to fully understand all the DICOM terminology, how the tables in this document relate to the product's functionality, and how that functionality integrates with other devices that support compatible DICOM features.

3.3 REMARKS

The scope of this DICOM Conformance Statement is to facilitate integration between the MyLab systems 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 Esaote 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.

— Some of the MyLab systems have participated in an industry-wide testing program sponsored by Integrating the Healthcare Enterprise (IHE). The IHE Integration Statement for these MyLab systems, together with the IHE Technical Framework, may facilitate the process of validation testing. See http://www.esaote.com/dicom.htm for the list of the systems that participated to IHE.

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

The DICOM functionalities given by the Esaote MyLab systems are implemented by means of the DCMLab Library, a DICOM software library which has been developed by the Esaote DICOM Management Group (EDMG), in order to offer to all the Esaote modalities and applications a common DICOM platform.

3.4 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*. Example: DICOM network protocol.

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. Examples:

Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

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.* Examples: a specific x-ray image.

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. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element]

Transfer Syntax – the encoding used for exchange of DICOM information objects and messages. Examples: *JPEG* compressed (images), little endian 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. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.

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.

3.5 BASICS OF DICOM COMMUNICATION

This section describes terminology used in this Conformance Statement for the non-specialist. The key terms used in the Conformance Statement are highlighted in *italics* below. This section is not a substitute for training about DICOM, and it makes many simplifications about the meanings of DICOM terms.

Two *Application Entities* (devices) that want to communicate with each other over a network using DICOM protocol must first agree on several things during an initial network "handshake". One of the two devices must initiate an *Association* (a connection to the other device), and ask if specific services, information, and encoding can be supported by the other device (*Negotiation*).

DICOM specifies a number of network services and types of information objects, each of which is called an *Abstract Syntax* for the Negotiation. DICOM also specifies a variety of methods for encoding data, denoted *Transfer Syntaxes*. The Negotiation allows the initiating Application Entity to propose combinations of Abstract Syntax and Transfer Syntax to be used on the Association; these combinations are called *Presentation Contexts.* The receiving Application Entity accepts the Presentation Contexts it supports.

For each Presentation Context, the Association Negotiation also allows the devices to agree on *Roles* – which one is the *Service Class User* (SCU - client) and which is the *Service Class Provider* (SCP - server). Normally the device initiating the connection is the SCU, i.e., the client system calls the server, but not always.

The Association Negotiation finally enables exchange of maximum network packet (*PDU*) size, security information, and network service options (called *Extended Negotiation* information).

The Application Entities, having negotiated the Association parameters, may now commence exchanging data. Common data exchanges include queries for worklists and lists of stored images, transfer of image objects and analyses (structured reports), and sending images to film printers. Each exchangeable unit of data is formatted by the sender in accordance with the appropriate *Information Object Definition*, and sent using the negotiated Transfer Syntax. There is a Default Transfer Syntax that all systems must accept, but it may not be the most efficient for some use cases. Each transfer is explicitly acknowledged by the receiver with a *Response Status* indicating success, failure, or that query or retrieve operations are still in process.

Two Application Entities may also communicate with each other by exchanging media (such as a CD-R). Since there is no Association Negotiation possible, they both use a *Media Application Profile* that specifies "pre-negotiated" exchange media format, Abstract Syntax, and Transfer Syntax.

3.6 ABBREVIATIONS

Abbreviations are as follows:

AE	Application Entity
AET	Application Entity Title
CAD	Computer Aided Detection
CDA	Clinical Document Architecture
CD-R	Compact Disk Recordable
CSE	Customer Service Engineer
CR	Computed Radiography
CT	Computed Tomography
DHCP	Dynamic Host Configuration Protocol
DICOM	Digital Imaging and Communications in Medicine
DIT	Directory Information Tree (LDAP)
DN	Distinguished Name (LDAP)
DNS	Domain Name System
DX	Digital X-ray
FSC	File-Set Creator

FSU	File-Set Updater
FSR	File-Set Reader
GSDF	Grayscale Standard Display Function
GSPS	Grayscale Softcopy Presentation State
HIS	Hospital Information System
HL7	Health Level 7 Standard
IHE	Integrating the Healthcare Enterprise
IOD	Information Object Definition
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISO	International Organization for Standards
IO	Intra-oral X-ray
JPEG	Joint Photographic Experts Group
LDAP	Lightweight Directory Access Protocol
LDIF	LDAP Data Interchange Format
LUT	Look-up Table
MAR	Medication Administration Record
MPEG	Moving Picture Experts Group
MG	Mammography (X-ray)
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance Imaging
MSPS	Modality Scheduled Procedure Step
MTU	Maximum Transmission Unit (IP)
MWL	Modality Worklist
NM	Nuclear Medicine
NTP	Network Time Protocol
O	Optional (Key Attribute)
OP	Ophthalmic Photography
OSI	Open Systems Interconnection
PACS	Picture Archiving and Communication System
PET	Positron Emission Tomography
PDU	Protocol Data Unit
R	Required (Key Attribute)
RDN	Relative Distinguished Name (LDAP)
RF	Radiofluoroscopy
RIS	Radiology Information System.
RT	Radiotherapy
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair

SPS   Scheduled Procedure Step

SR   Structured Reporting

TCP/IP   Transmission Control Protocol / Internet Protocol

U   Unique (Key Attribute)

UL   Upper Layer

US   Ultrasound

VL   Visible Light

VR   Value Representation

XA   X-ray Angiography

Some of the tables have a "**Presence of …**" column in which the following abbreviations are used, unless specified:

VNAP   Not Always Present (attribute sent zero length if no value is present)

ANAP   Not Always Present

ALWAYS   Always Present

EMPTY   Attribute is sent without a value

The abbreviations used in the "**Source**" column:

MWL   the attribute value source is the Modality Worklist

USER   the attribute value comes from the User input

AUTO   the attribute value is generated automatically

CONFIG   the attribute value is a configurable parameter

PROFILE   the attribute value is a parameter found in the profile chosen for the selected printer

3.7 REFERENCES

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

3.8 IMPLEMENTATION IDENTIFYING INFORMATION

The Implementation Class UID and Implementation Version Name for all the Application Entities can change according to the software release, and are described in the Table 4, that describes also the DCMLab releases present in the various MyLab software releases.

Table 4
IMPLEMENTATION IDENTIFYING INFORMATION

Model	Software release	DCMLab SW Release	Implementation Class UID	Implementation Version Name
MyLab Five / 25 / 30 / 40 / 50	9.01	2.7.2	1.3.76.2.2.2	MYLAB_7.0.162.0
	9.10	2.7.2.2	1.3.76.2.2.2	MYLAB_7.0.188.0
	9.12	2.7.2.2	1.3.76.2.2.2	MYLAB_7.0.206.0
	9.13	2.7.2.2	1.3.76.2.2.2	MYLAB_7.0.208.0
MyLab 60 / 70 / 70 XVG	5.00	2.7.2	1.3.76.2.3.2	MYLAB_7.0.165.0
	5.01	2.7.2.2	1.3.76.2.3.2	MYLAB_7.0.188.0
	5.02	2.7.2.2	1.3.76.2.3.2	MYLAB_7.0.206.0
	5.03	2.7.2.2	1.3.76.2.3.2	MYLAB_7.0.208.0

4   NETWORKING

4.1 IMPLEMENTATION MODEL

4.1.1   Application Data Flow [3]
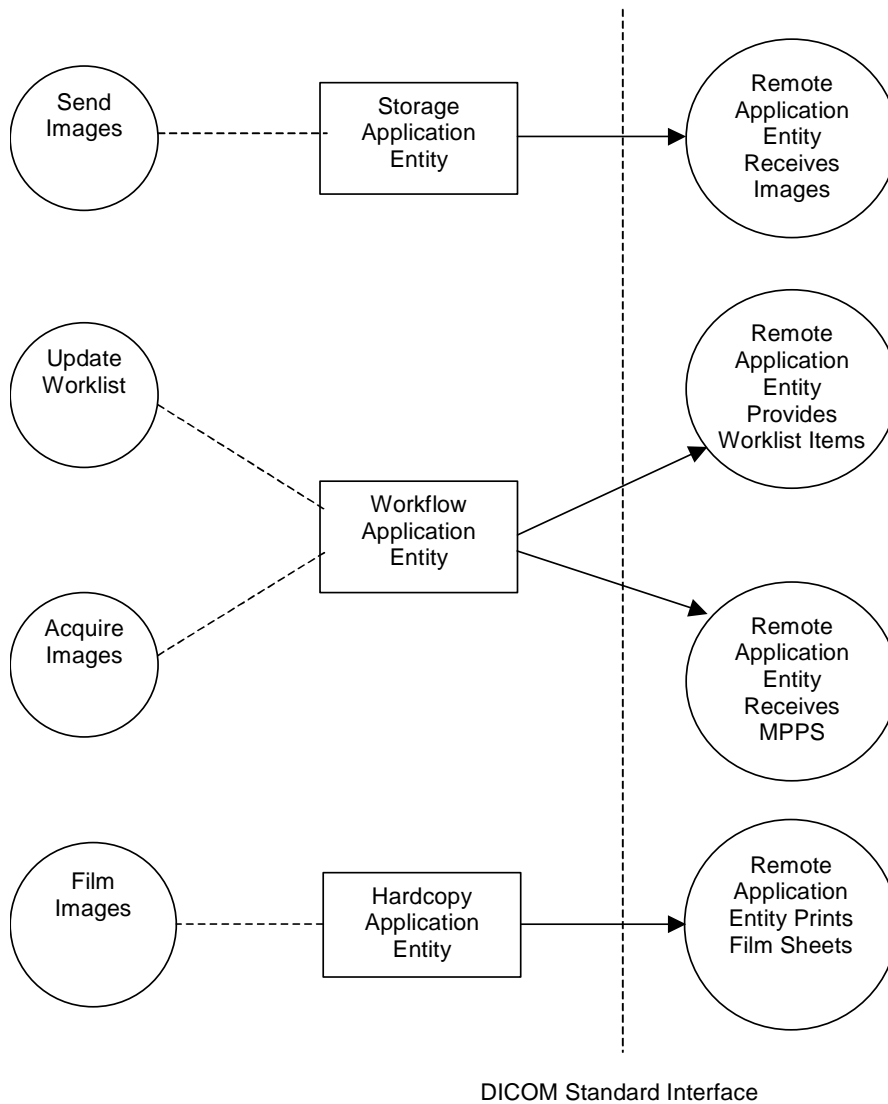
Figure 1
APPLICATION DATA FLOW DIAGRAM

— The Storage Application Entity sends images, clips and Structured Report objects[4] to a remote AE. It is associated with the local real-world activity "Send Images". "Send Images" is performed upon user request for each study when closing it, or for specific studies selected from the had disk database. If a remote AE is configured as a Storage Commitment server, the Storage AE will request Storage Commitment and if a commitment is successfully obtained will record this information in the local database.

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[3] Storage Commitment and MPPS SOP Classes not present in VET models.

[4] DICOM Structured Report not available in VET models.

— 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 when entering the Worklist panel for selecting the exam to execute. When the "Acquire Images" local real-world activity is performed the Workflow Application Entity creates and updates Modality Performed Procedure Step instances managed by a remote AE. Acquisition of images will result in automated creation of an MPPS Instance. Completion of the MPPS is performed as the result of an operator action.

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

4.1.2   Functional Definition of AEs

4.1.2.1 Functional Definition of Storage Application Entity

It is possible to activate the Storage Application Entity both when closing the current study, and from the database panel.

When closing the current study, a panel will allow the User to decide if and where to archive the images, clips and Structured Report objects[5], selecting among "ARCHIVE TO DB" (on the local Hard Disk), "ARCHIVE TO CD/DVD" (the CD-R or the DVD), "ARCHIVE TO USB" and "ARCHIVE TO DICOM SERVER". Selecting "DB" will store the acquired images in the local database, while selecting "CD/DVD" or "USB" or "DICOM SERVER" will store or send them in DICOM format to the selected destination (without keeping a copy in the local database).

From the local database panel, pressing the "DICOM" soft-key, a "DICOM PROCEDURE" panel will appear, allowing to choose between the following destinations: "CD/DVD" (the CD-R or the DVD), "USB" and "DICOM SERVER", storing or sending the selected studies (previously archived to the local database, see above), in DICOM format, to the selected destination.

When activating the above described functions choosing "DICOM SERVER", the SOP Instances associated with the selected study (or studies) will be collected into one send job. The existence of a send job queue entry with associated network destination will activate the Storage AE. An association request will be sent to the destination AE and upon successful negotiation of a Presentation Context the image transfer will be started. If the association cannot be opened, the related send job will be set to an error state and it will be possible to restarted it later by the user via job control interface. The Storage AE will not try to initiate another association for this send job automatically.

4.1.2.2 Functional Definition of Workflow Application Entity [6]

Worklist Update attempts to download a Worklist from a remote node. If the Workflow AE establishes an Association to a remote AE, it will transfer all worklist items via the open Association. The results will be displayed in a separate list, which will be cleared with the next Worklist Update, if successful. The previously obtained worklist will be kept if for any reason a new one cannot be received: this is done to enable the use of the device also when disconnected from the network.

The Workflow AE performs the creation of a MPPS Instance automatically whenever images are acquired. When closing the exam, the MPPS "Complete" or "Discontinued" states can only be set from the user interface.

4.1.2.3 Functional Definition of Hardcopy Application Entity

It is possible to activate the Hardcopy Application Entity both for printing images from the current Study, and for printing a set of images from the local database. In any case, the images belonging to the current Study will not be mixed in the same print-job with the images belonging to older Studies.

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[5] DICOM Structured Report not available in VET models.

[6] MPPS SOP Class not present in VET models.

On the MyLab keyboard, according to the model, there are two or three print keys labeled "1", "2" and "3" (if present); each one can be assigned to a given DICOM printing profile, that is to a given configuration for a given DICOM printer.

Pressing one of the assigned print keys will add the current visualized image to queue that will be used to compose the film sheet that will be printed according to the selected printing profile. There are different and separated queues for images belonging to the current Study (real-time display, and images selected from the "EXAM REV" environment), and for the images belonging to older Studies (images selected from the "ARCHIVE REV" environment).

When activating the above described keys, the preformatted grayscale or color image (according to the color capability of the corresponding printer) will be added to the print-job being prepared for the selected printing profile. When the number of images requested to fill the film sheet for that printing profile is reached, an association request will be sent to the destination AE, and upon successful negotiation of a Presentation Context the data transfer will be started. If the association cannot be opened, or if some fatal error occurs, the related print-job will be set to an error state, and it will be possible to restart it later by the user via job control interface. The Hardcopy AE will not try to initiate another association for this print-job automatically.

4.1.3   Sequencing of Real-World Activities [7]
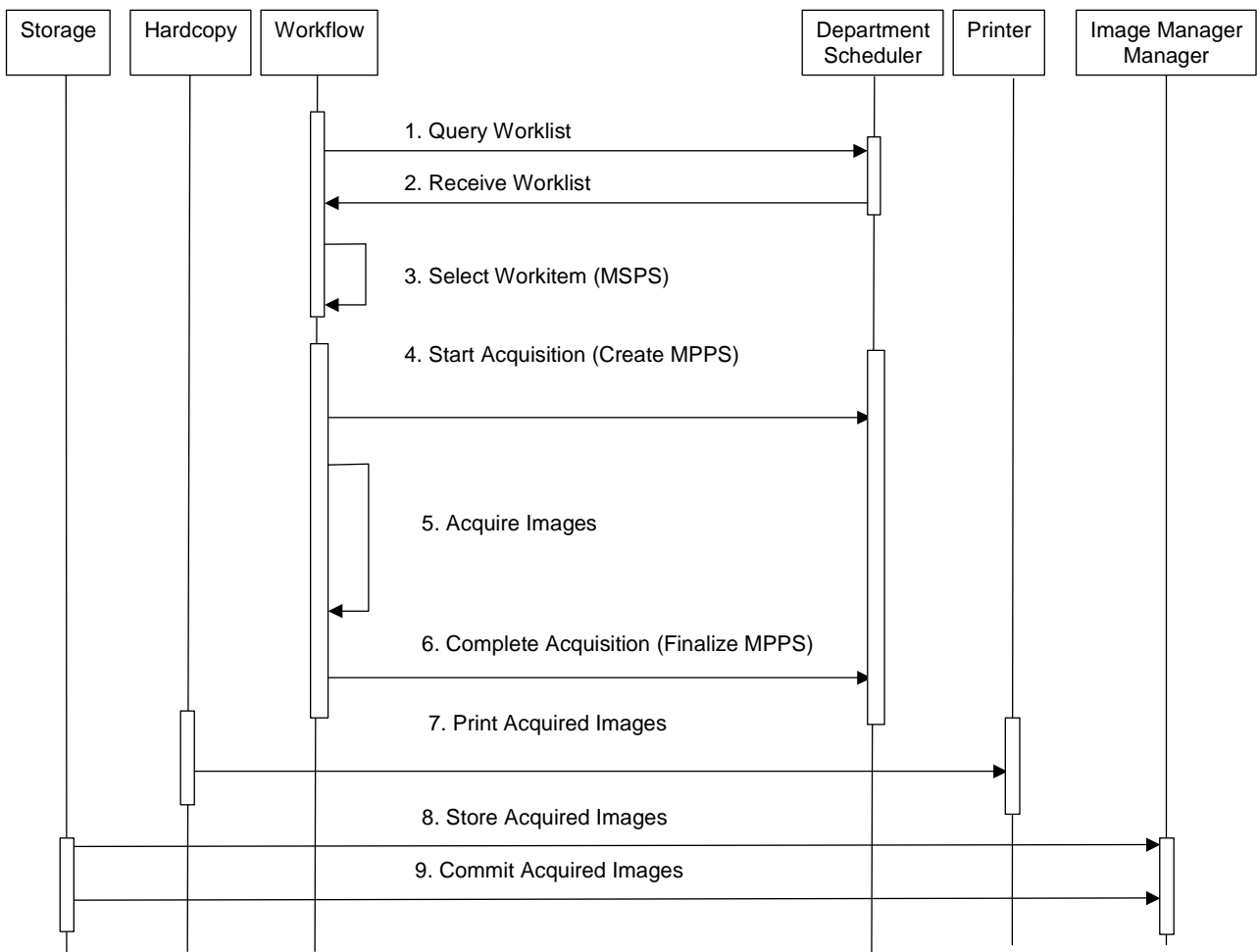
Figure 2
APPLICATION DATA FLOW DIAGRAM

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[7] Storage Commitment and MPPS SOP Classes not present in VET models.

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

1. Query Worklist.

2. Receive Worklist of Modality Scheduled Procedure Steps (MSPS).

3. Select Workitem (MSPS) from Worklist.

4. Start acquisition and create MPPS.

5. Acquire Images.

6. Complete acquisition and finalize MPPS.

7. Print acquired images (optional step).

8. Store acquired images, clips and created Structured Report objects.

9. If there is a Storage Commitment server configured and enabled, the Storage AE will request Storage Commitment for the images to it.

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

4.2 AE SPECIFICATIONS

4.2.1   Storage Application Entity Specification

4.2.1.1 SOP Classes

MyLab provides Standard Conformance to the following SOP Classes:

Table 5
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 Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Comprehensive SR Storage [8]	1.2.840.10008.5.1.4.1.1.88.33	Yes	No
Storage Commitment Push Model [9]	1.2.840.10008.1.20.1	Yes	No
Verification	1.2.840.10008.1.1	Yes	Yes [10]

4.2.1.2 Association Policies

4.2.1.2.1   General

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

Table 6
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

MyLab 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 7
NUMBER OF ASSOCIATIONS INITIATED FOR AE STORAGE

Maximum number of simultaneous Associations	Unlimited

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

4.2.1.2.3   Asynchronous Nature

MyLab does not support asynchronous communication (multiple outstanding transactions over a single Association).

Table 8
ASYNCHRONOUS NATURE AS A SCU FOR AE STORAGE

Maximum number of outstanding asynchronous transactions	1

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[8] Comprehensive SR Storage SOP Class not present in VET models.

[9] Storage Commitment SOP Class not present in VET models.

[10] Only active when the Storage Commitment is enabled.

4.2.1.2.4   Implementation Identifying Information

See section 3.8.

4.2.1.3 Association Initiation Policy

4.2.1.3.1   Activity – Connectivity Verification

4.2.1.3.1.1 Description and Sequencing of Activities

The Storage AE is invoked to perform a verification by the Storage SCP server configuration interface. The job consists of data describing the destination.

If a response to the C-ECHO-RQ is not received within a timeout, the Association will be aborted and an error will be reported to the User.
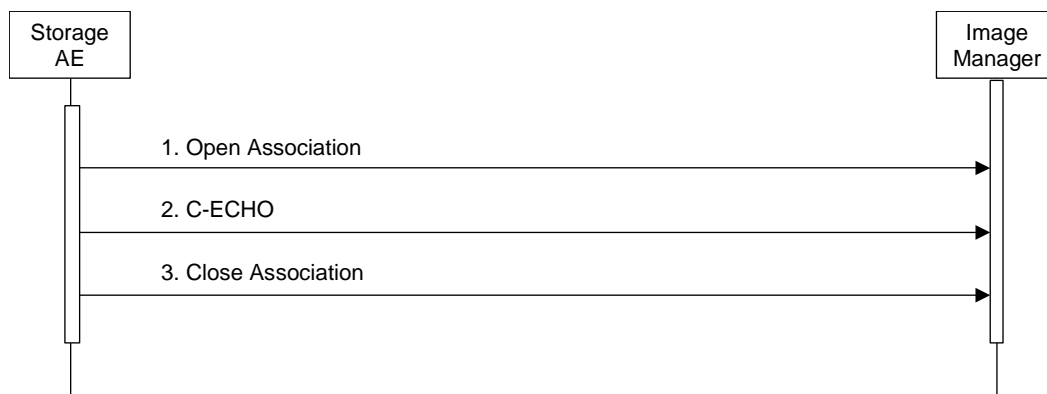
Figure 3
SEQUENCING OF ACTIVITY – CONNECTIVITY VERIFICATION

4.2.1.3.1.2 Proposed Presentation Context Table

The MyLab is capable of proposing the Presentation Contexts as shown in the following table:

Table 9
PROPOSED PRESENTATION CONTEXT FOR CONNECTIVITY VERIFICATION

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

4.2.1.3.1.3 SOP Specific Conformance for Connectivity Verification

The MyLab provides standard conformance to the DICOM Verification Service Class as an SCU. The status code for the C-ECHO is as follows:

Table 10
C-ECHO RESPONSE STATUS HANDLING BEHAVIOUR

Code	Status	Meaning
0000	Success	The C-ECHO request is accepted.

4.2.1.3.2   Activity – Send Images [11]

4.2.1.3.2.1 Description and Sequencing of Activities

The Storage AE is invoked to send images, clips and SR objects[12] by the job control interface that is responsible for processing network archival tasks. The job consists of data describing the instances marked for storage and the destination. An internal daemon process triggered by a job initiates the procedure to store the instances related to this job. If the process successfully establishes an Association to a remote Application Entity, it will transfer the instances, one after another, via the open Association. If the job contains multiple instances, then multiple C-STORE requests will be issued over the same Association. Status of the transfer is reported through the job control interface. If the Association cannot be established, or one or more C-STORE Responses from the remote Application contain a status other than Success, the related send job is switched to a failed state, deleting from it the images that were successfully sent; it can be restarted at any time by user interaction. If a response is not received within a timeout, the Association will be aborted and the sending of the current instances will be considered failed.

If there is a configured Storage Commitment SCP, the Storage AE will, after all images have been sent, transmit a single Storage Commitment request (N-ACTION) over another Association. Upon receiving the N-ACTION response the Storage AE will close the Association. However, the Storage AE is capable of receiving an N-EVENT-REPORT request at any time during 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 during an association initiated for a subsequent send job or during an association initiated by the Remote AE for the specific purpose of sending the N-EVENT-REPORT).
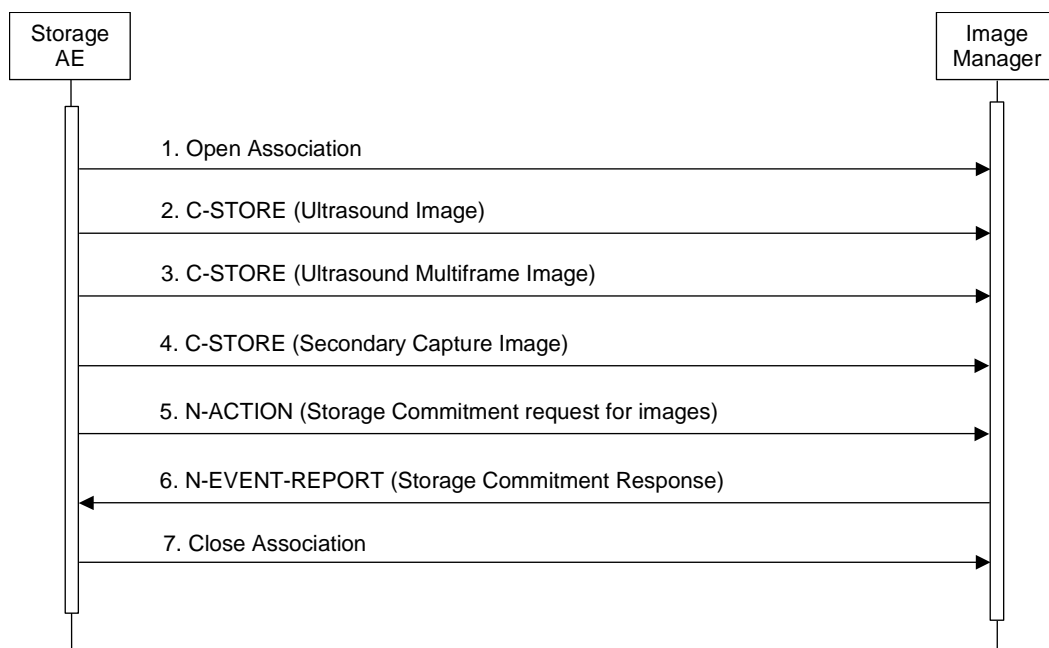
Figure 4
SEQUENCING OF ACTIVITY – SEND IMAGES

A possible sequence of interactions between the Storage AE and an Image Manager (e.g. a storage or archive device supporting the Storage and Storage Commitment SOP Classes as an SCP) is illustrated in Figure 4:

    1.   The Storage AE opens an association with the Image Manager.

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[11] Storage Commitment SOP Class not present in VET models.

[12] DICOM Structured Report not available in VET models.

2. A Storage SOP Instance (US, US-MF, SC or SR object) is transmitted to the Image Manager using a C-STORE request and the Image Manager replies with a C-STORE response (status success).

3. Another Storage SOP Instance is transmitted to the Image Manager using a C-STORE request and the Image Manager replies with a C-STORE response (status success).

4. Another Storage SOP Instance is transmitted to the Image Manager using a C-STORE request and the Image Manager replies with a C-STORE response (status success).

5. An N-ACTION request is transmitted to the Image Manager to obtain storage commitment of previously transmitted SOP Instances. The Image Manager replies with a N-ACTION response indicating the request has been received and is being processed.

6. The Image Manager immediately transmits an N-EVENT-REPORT request notifying the Storage AE of the status of the Storage Commitment Request (sent in step 5 using the N-ACTION message). The Storage AE replies with a N-EVENT-REPORT response confirming receipt. The Image Manager could send this message at any time or omit it entirely in favor of transmitting the N-EVENT-REPORT over a separate dedicated association (see note).

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

NOTE: Many other message sequences are possible depending on the number of Storage SOP Instances to be stored. The N-EVENT-REPORT can also be sent over a separate association initiated by the Image Manager (see Section 4.2.1.3.1 on Activity – Receive Storage Commitment Response). The Storage SCP and the Storage Commitment SCP can be different systems.

4.2.1.3.2.2 Proposed Presentation Contexts

MyLab is capable of proposing the Presentation Contexts shown in the following table:

Table 11
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY SEND IMAGES

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	JPEG lossy Baseline (Process 1)	1.2.840.10008.1.2.4.50	SCU	None
		RLE Lossless Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.5 1.2.840.10008.1.2.1 1.2.840.10008.1.2		
		Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2		
Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Implicit VR Little Endian [13]	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
		JPEG lossy Baseline (Process 1)	1.2.840.10008.1.2.4.50		
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	JPEG lossy Baseline (Process 1)	1.2.840.10008.1.2.4.50	SCU	None
		RLE Lossless Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.5 1.2.840.10008.1.2.1 1.2.840.10008.1.2		
		Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2		

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[13] Only available on MyLab 60 / 70 / 70 XVG.

Comprehensive SR Storage [14]	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Storage Commitment Push Model [15]	1.2.840.10008.1.2 0.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Presentation Context for Ultrasound and Secondary Capture Images can be changed from the User's Interface pressing the MENU button, selecting DICOM CONFIGURATION and entering the QUALITY tab of the configuration panel. The following choices are allowed for IMAGE QUALITY:

1. LOW (LOSSY JPEG): only the JPEG lossy Baseline (Process 1) will be offered;
2. MEDIUM (LOSSLESS RLE): the RLE, the Explicit VR Little Endian and the Implicit VR Little Endian will be offered;
3. HIGH (UNCOMPRESSED): the Explicit VR Little Endian and the Implicit VR Little Endian will be offered.

On the MyLab Five / 25 / 30 / 30 VET / 40 / 50 the Presentation Context for Ultrasound Multiframe Images will only propose the JPEG lossy Baseline (Process 1) Transfer Syntax. From the User's Interface pressing the MENU button, selecting DICOM CONFIGURATION and entering the QUALITY tab of the configuration panel, you will find three different settings for CLIP QUALITY; in any case the JPEG lossy Baseline (Process 1) will be offered, with three different compression levels.

On the MyLab 60 / 70 / 70 XVG the Presentation Context for Ultrasound Multiframe Images can be changed from the User's Interface pressing the MENU button, selecting DICOM CONFIGURATION and entering the QUALITY tab of the configuration panel. You will find four different settings for CLIP QUALITY; selecting LOW, MEDIUM and HIGH the JPEG lossy Baseline (Process 1) will be offered, with three different compression levels, while selecting UNCOMPRESSED the Explicit VR Little Endian and the Implicit VR Little Endian will be offered.

Please note that sending Ultrasound Multiframe Images without compressing them could produce very large files, and adversely affect the operation of the MyLab system, of the network and of the receiving system: this option has been added for testing purposes only, and should not be used for normal operations, especially with long clips.

If all the offered Presentation Contexts are not accepted, an error is generated; otherwise, an error is generated only if any of the images to be sent belong to a Presentation Context that has not been accepted. The job failure is logged and reported to the user via the job control application.

4.2.1.3.2.3 SOP Specific Conformance for Image Storage SOP Classes

All Image 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 12
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 complete.
Refused	Out of Resources	A700-A7FF	The send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job

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[14] Not present in VET models.

[15] Storage Commitment SOP Class not present in VET models.

Error	Data Set does not match SOP Class	A900-A9FF	The send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application.
Error	Cannot Understand	C000-CFFF	The send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application.
Warning	Coercion of Data Elements	B000	The send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application.
Warning	Data Set does not match SOP Class	B007	The send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application.
Warning	Elements Discarded	B006	The send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application.
*	*	Any other status code.	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 13
STORAGE COMMUNICATION FAILURE BEHAVIOR

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

A failed send job can be restarted by user interaction: only the failed images will be re-sent.

The contents of US Image, US Multiframe Image, Secondary Capture Image and Comprehensive SR Storage SOP Instances created by MyLab conform to the DICOM US, US Multiframe, Secondary Capture Image and Comprehensive SR IOD definitions and are described in section 8.1.

The report with the performed measures can be exported in several ways according to the configuration of the system and the kind of application used to produce it. From the User's Interface, pressing the MENU button, selecting DICOM CONFIGURATION and entering the REPORT tab of the configuration panel, under REPORT EXPORT, it is possible to select among the following choices:
1. EXPORT TO BIOPACS: this option is only intended to be used when the receiving application is an Esaote Org@nizer or BioPACS system; in this case the report will be put in proprietary attributes of one or more US images that have a dummy image plane: these images will be automatically discarded by the receiving Esaote Org@nizer-BioPACS application, after filling with the information present in the proprietary attributes the report attached to the received exam; this only works for applications supported by the Esaote Org@nizer-BioPACS (see its documentation), otherwise the information will be lost;
2. EXPORT TO OTHER SERVER: the report will be written in a human readable way into the pixels of one or more Secondary Capture images, that will be sent together with the exam;
3. DO NOT EXPORT: the report will not be sent at all;
4. EXPORT DICOM STRUCTURED REPORT[16]: a Comprehensive SR object will be created for applications

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[16] DICOM Structured Report not available in VET models.

that allow it (human "CARDIAC"), while the report will be written in the pixels of one or more Secondary Capture images for the other applications.

4.2.1.3.2.4 SOP Specific Conformance for Storage Commitment SOP Class [17]

4.2.1.3.2.4.1   Storage Commitment Operations (N-ACTION)

The Storage AE will request storage commitment for instances of the Ultrasound, Ultrasound Multiframe, Secondary Capture Image and Comprehensive SR[18] Storage SOP Classes if there is a Remote AE configured as a Storage Commitment server (SCP) and a presentation context for the Storage Commitment Push Model has been accepted.

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

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

The list of the jobs for which a Storage Commitment request (N-ACTION) has been successfully sent to the Storage Commitment SCP can be accessed right clicking the DICOM Network icon, and selecting (only in the Archive Review environment) STORAGE COMMITMENT SUMMARY. For each job there is a status that can be IN PROGRESS, FAILED or COMPLETED. Selecting one of the items of this list and clicking DETAILS opens a panel in which the complete list of the SOP Instance UIDs for that job is present.

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

Table 14
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 via the job control application.

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

Table 15
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 send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.

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[17] Storage Commitment SOP Class not present in VET models.

[18] DICOM Structured Report not available in VET models.

4.2.1.3.2.4.2   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 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 the Table below.

Table 16
STORAGE COMMITMENT N-EVENT-REPORT BEHAVIOUR

Event Type Name	Event Type ID	Behavior
Storage Commitment Request Successful	1	The Referenced SOP Instances under Referenced SOP Sequence (0008,1199) are marked within the STORAGE COMMITMENT SUMMARY list as "COMPLETED". Successfully committed SOP Instances are candidates for deletion from the local database.
Storage Commitment Request Complete – Failures Exist	2	The Referenced SOP Instances under Referenced SOP Sequence (0008,1199) are treated in the same way as in the success case (Event Type 1). The Referenced SOP Instances under Failed SOP Sequence (0008,1198) are marked within the STORAGE COMMITMENT SUMMARY - DETAILS as "FAILED". A send job that failed storage commitment will not be automatically restarted but can be restarted by user interaction.

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

Table 17
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.
Failure	Unrecognized Operation	0211H	The Transaction UID in the N-EVENT-REPORT request is not recognized (was never issued within an N-ACTION request).
Failure	Resource Limitation	0213H	The Transaction UID in the N-EVENT-REPORT request has expired (no N-EVENT-REPORT was received within a configurable time limit).
Failure	No Such Event Type	0113H	An invalid Event Type ID was supplied in the N-EVENT-REPORT request.
Failure	Processing Failure	0110H	An internal error occurred during processing of the N-EVENT-REPORT. A short description of the error will be returned in Error Comment (0000,0902).
Failure	Invalid Argument Value	0115H	One or more SOP Instance UIDs with the Referenced SOP Sequence (0008,1199) or Failed SOP Sequence (0008,1198) was not included in the Storage Commitment Request associated with this Transaction UID. The unrecognized SOP Instance UIDs will be returned within the Event Information of the N-EVENT-REPORT response.

4.2.1.3 Association Acceptance Policy [19]

4.2.1.3.1   Activity – Receive Storage Commitment Response

4.2.1.3.1.1   Description and Sequencing of Activities

The Storage AE will accept associations in order to receive responses to a Storage Commitment Request.
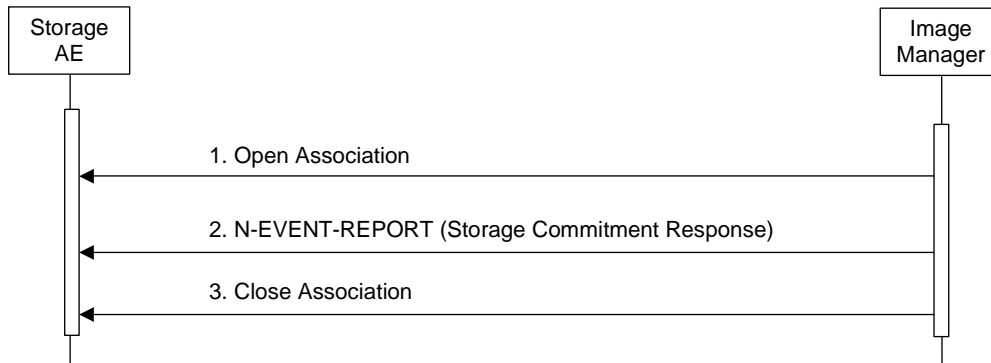
Figure 5
SEQUENCING OF ACTIVITY - RECEIVE STORAGE COMMITMENT RESPONSE

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

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

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

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

The Storage AE may reject association attempts as shown in the Table below. The Result, Source and Reason/Diag columns represent the values returned in the appropriate fields of an ASSOCIATE-RJ PDU (see PS 3.8, Section 9.3.4). The contents of the Source column is abbreviated to save space and the meaning of the abbreviations are:

a) 1 – DICOM UL service-user

b) 2 – DICOM UL service-provider (ASCE related function)

c) 3 – DICOM UL service-provider (Presentation related function)

Table 18
ASSOCIATION REJECTION REASONS

Result	Source	Reason/Diag	Explanation
2 – rejected-transient	c	2 – local-limit-exceeded	The (configurable) maximum number of simultaneous associations has been reached. An association request with the same parameters may succeed at a later time.
2 – rejected-transient	c	1 – temporary-congestion	No associations can be accepted at this time due to the real-time requirements of higher priority activities (e.g. during image acquisition no associations will be accepted) or because insufficient resources are available (e.g. memory, processes, threads). An association request with the same parameters

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[19] The Storage AE will not accept associations when Storage Commitment SOP Class not present or not enabled.

			may succeed at a later time.
1 – rejected-permanent	a	2 – application-context-name-not-supported	The association request contained an unsupported Application Context Name. An association request with the same parameters will not succeed at a later time.
1 – rejected-permanent	a	7 – called-AE-title-not-recognized	The association request contained an unrecognized Called AE Title. An association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the association initiator is incorrectly configured and attempts to address the association acceptor using the wrong AE Title.
1 – rejected-permanent	a	3 – calling-AE-title-not-recognized	The association request contained an unrecognized Calling AE Title. An association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the association acceptor has not been configured to recognize the AE Title of the association initiator.
1 – rejected-permanent	b	1 – no-reason-given	The association request could not be parsed. An association request with the same format will not succeed at a later time.

4.2.1.3.1.2   Accepted Presentation Contexts

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

Table 19
ACCEPTABLE PRESENTATION CONTEXTS FOR
ACTIVITY RECEIVE STORAGE COMMITMENT RESPONSE

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Ext.
Name	UID	Name List	UID List	Role	Neg.
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

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.

4.2.1.3.1.3   SOP Specific Conformance for Storage Commitment SOP Class

4.2.1.3.1.4   Storage Commitment Notifications (N-EVENT-REPORT)

Upon receipt of a N-EVENT-REPORT the timer associated with the Transaction UID will be canceled, and the job will be marked as "COMPLETED" in the STORAGE COMMITMENT SUMMARY list. Otherwise, when the timer reaches the configured timeout value before reaching any response, the job will be marked as "FAILED".

The behavior of Storage AE when receiving Event Types within the N-EVENT-REPORT is summarized in Table 17.

The reasons for returning specific status codes in a N-EVENT-REPORT response are summarized in Table 18.

4.2.2   Workflow Application Entity Specification [20]

4.2.2.1 SOP Classes

MyLab provides Standard Conformance to the following SOP Classes:

Table 20
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 [21]	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 21
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

MyLab initiates one Association at a time for a Worklist request.

Table 22
NUMBER OF ASSOCIATIONS INITIATED FOR AE WORKFLOW

Maximum number of simultaneous Associations	1

4.2.2.2.3   Asynchronous Nature

MyLab does not support asynchronous communication (multiple outstanding transactions over a single Association).

Table 23
ASYNCHRONOUS NATURE AS A SCU FOR AE WORKFLOW

Maximum number of outstanding asynchronous transactions	1

4.2.2.2.4   Implementation Identifying Information

See section 3.8.

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 (broad query), or automatically when starting an exam selected among the previously requested worklist items (narrow query). Pressing the "WORKLIST"

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[20] MPPS SOP Class not present in VET models.

[21] MPPS SOP Class not present in VET models.

soft key in the PATIENT DATA panel, the WORKLIST QUERY panel appears. Pressing the button "QUERY" in this panel issues a broad worklist query to the configured worklist server.

It is possible to configure the system to automatically execute the broad worklist query whenever the User opens the Worklist panel, by checking "QUERY AT START" in the panel itself. Otherwise, the results of the latest worklist query (if any) will appear until you press "QUERY".

The "SHOW QUERY PARAMETERS" in the WORKLIST QUERY panel will display a "QUERY PARAMETERS" panel for entering data as search criteria. When the QUERY is pressed, the data from the panel will be inserted as matching keys into the query. In the QUERY PARAMETERS panel there is a "RESET" button to reset the query parameters to the default (current day for the Scheduled Procedure Step Start Date, local AE Title of the MyLab for the Scheduled Station AE Title).

With broad worklist queries the MyLab system always requests all items that match the matching keys in the table below:

Table 24
BROAD WORKLIST QUERY MATCHING KEYS

Tag	Attribute	Contents
(0008,0050)	Accession Number	empty, can be set
(0008,0060)	Modality	always *US*
(0008,1050)	Performing Physician's Name	empty, can be set
(0010,0010)	Patient's Name	empty, can be set
(0010,0020)	Patient ID	empty, can be set
(0040,0002)	Scheduled Procedure Step Start Date	present date, can be modified
(0040,0001)	Scheduled Station AE Title	Local AE Title, can be modified
(0040,1001)	Requested Procedure ID	empty, can be set

Upon initiation of the request, the MyLab will build an Identifier for the C-FIND request, using the above matching keys and the return keys in Table 29. Then it will initiate an Association to send the request and will wait for Worklist responses. After retrieval of all responses, MyLab will display them in the WORKLIST QUERY panel, showing for each Scheduled Procedure Step the Patient Name, sex, Scheduled Performing Physician, Scheduled Procedure Step Start Date and Time, Scheduled Procedure Step ID, Accession Number, and a STATUS information flag that identifies with "WARNING" the received Scheduled Procedure Steps in which some for attributes that should be present are missing. For every item it is possible to show the other information received by selecting it and pressing "DETAILS". If some of the received Scheduled Procedure Step records do not contain information absolutely necessary to execute the exam, in the WORKLIST panel a red message will appear saying that some of the records are corrupted.

The results will be cleared with the next worklist update. In case of network error, or when the system is rebooted, the results of the latest successful query (if any) are kept, until a new day begins (the old worklist data are automatically deleted when crossing the midnight).

It is possible to configure the system to automatically execute a narrow worklist query whenever the User starts an exam, by checking "REFRESH DATA WHEN PERFORMING EXAMS" in the worklist panel itself. In this case each time a record is selected to use it for starting an exam using its data, a narrow query will be performed to verify that the information still corresponds to the selected record. In case of any difference, a broad query is automatically issued and the User is requested to select again the exam to start.

Table 25
NARROW WORKLIST QUERY MATCHING KEYS

Tag	Attribute	Contents	Matching Key Type
(0040,0002)	Scheduled Procedure Step Start Date	the same used in the broad query	R
(0008,0060)	Modality	always *MR*	R
(0010,0020)	Patient ID	from the selected result of the broad query	R
(0008,0050)	Accession Number	from the selected result of the broad query	O

Upon initiation of the request, the MyLab system will build an Identifier for the C-FIND request, using the above matching keys and the return keys in Table 29. Then it will initiate an Association to send the request and will wait for Worklist responses. After retrieval of all the responses, the MyLab system filters them for the same Patient ID, Accession Number, Scheduled Procedure Step Start Date, Scheduled Procedure Step Start Time, in order to identify the response that matches with the item selected in the broad query.

If from the narrow query, after filtering the responses as above, there are none or more than one matching the selected item, or some of the relevant information in the return keys have changed since the broad query, a warning message will be shown, a broad query will automatically be issued, and the User will be asked to select the exam again, to be sure all the information is coherent with the one contained in the Worklist Server.

For both the broad and narrow queries, the MyLab system will initiate an Association in order to issue a C-FIND request according to the Modality Worklist Information Model.
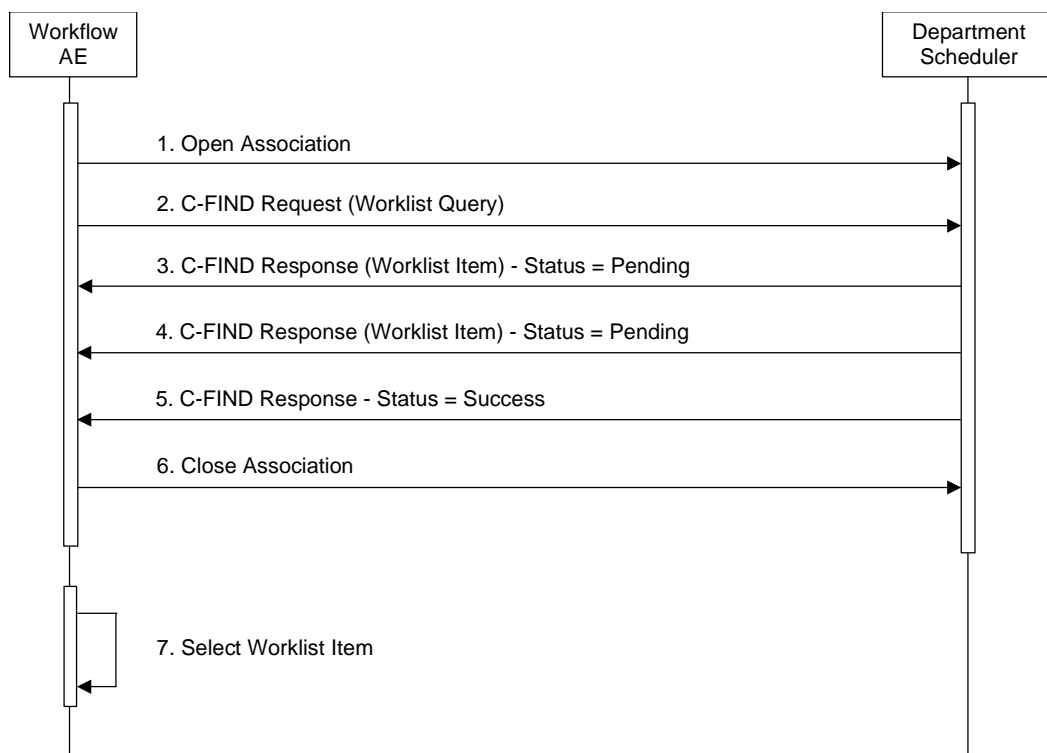

Figure 6
SEQUENCING OF ACTIVITY – WORKLIST UPDATE

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

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 the first matching Worklist Item.

4. The Departmental Scheduler returns another C-FIND response containing the requested attributes of the second matching Worklist Item.

5. The Departmental Scheduler returns another C-FIND response with status Success indicating that no further matching Worklist Items exist. This example assumes that only 2 Worklist items match the Worklist Query.

6. The Worklist AE closes the association with the Departmental Scheduler.

7. The user selects a Worklist Item from the Worklist and prepares to acquire new images.

4.2.2.3.1.2   Proposed Presentation Contexts

MyLab will propose Presentation Contexts as shown in the following table:

Table 26
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY WORKLIST UPDATE

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

4.2.2.3.1.3   SOP Specific Conformance for Modality Worklist

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

Table 27
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	FE00	If the query was cancelled due to too may worklist items then the

	terminated due to Cancel request		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 MyLab during communication failure is summarized in the Table below.

Table 28
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.

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

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

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

Table 29
WORKLIST REQUEST IDENTIFIER

Module Name Attribute Name	Tag	VR	M	R	Q	D	IOD
SOP Common Specific Character Set	(0008,0005)	CS	S				
Scheduled Procedure Step Scheduled Procedure Step Sequence	(0040,0100)	SQ					
> Scheduled Station AE Title	(0040,0001)	AE	S	x	x	d	
> Scheduled Procedure Step Start Date	(0040,0002)	DA	R		x	w	
> Scheduled Procedure Step Start Time	(0040,0003)	TM		x		w	
> Modality	(0008,0060)	CS	S			d	x
> Scheduled Performing Physician's Name	(0040,0006)	PN	*	x	x	x	
> Scheduled Procedure Step Description	(0040,0007)	LO		x		d	x
> Scheduled Protocol Code Sequence	(0040,0008)	SQ		x		d	x
> Scheduled Procedure Step ID	(0040,0009)	SH		x		w	x

Attribute Name	Tag	VR					
Requested Procedure							
Requested Procedure ID	(0040,1001)	SH		x	x	d	x
Requested Procedure Description	(0032,1060)	LO		x		d	x
Requested Procedure Code Sequence	(0032,1064)	SQ		x		d	x
Study Instance UID	(0020,000D)	UI		x			x
Referenced Study Sequence	(0008,1110)	SQ		x			x
Imaging Service Request							
Accession Number	(0008,0050)	SH		x	x	x	x
Requesting Physician	(0032,1032)	PN		x		d	
Referring Physician's Name	(0008,0090)	PN		x		x	x
Visit Identification							
Admission ID	(0038,0010)	LO		x		d	
Visit Status							
Current Patient Location	(0038,0300)	LO		x		d	
Visit Admission							
Admitting Diagnoses Description	(0008,1080)	LO		x		x	x
Patient Identification							
Patient's Name	(0010,0010)	PN	*	x	x	x, w	x
Patient ID	(0010,0020)	LO		x	x	x	x
Patient Demographic							
Patient's Birth Date	(0010,0030)	DA		x		x	x
Patient's Sex	(0010,0040)	CS		x		x, w	x
Patient's Weight	(0010,1030)	DS		x		d	x
Patient's Size	(0010,1020)	DS		x		d	x
Patient Comments	(0010,4000)	LT		x		d	
Patient Medical							
Patient State	(0038,0500)	LO		x		d	
Pregnancy Status	(0010,21C0)	US		x		d	
Medical Alerts	(0010,2000)	LO		x		d	
Contrast Allergies	(0010,2110)	LO		x		d	
Special Needs	(0038,0050)	LO		x		d	
Additional Patient History	(0010,21B0)	LT		x		d	

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 a MyLab Worklist Request Identifier.

Tag: DICOM tag for this attribute.

VR: DICOM VR for this attribute.

M: Matching keys for (default) Worklist Update. A "S" will indicate that the MyLab will supply an attribute value for Single Value Matching, a "R" will indicate Range Matching and a "*" will denote wildcard matching. The "Scheduled Station AE Title" is Matching Key with the Local AE Title when "This Unit" is selected. The "Modality" is always Matching Key set to "US". Please note that "Specific Character Set" is always set to "ISO_IR 100", and it is not intended to be a matching key.

R: Return keys. An "x" will indicate that the MyLab will supply this attribute as Return Key with zero length for Universal Matching. The "Scheduled Station AE Title" is Return Key with zero length for Universal Matching when "All Units" is selected.

Q: Interactive Query Key. An "x " will indicate that the MyLab will supply this attribute as matching key, if entered in the QUERY PARAMETERS panel. For the "Patient's Name" and "Scheduled Performing Physician's Name" only Last Name and First Name can be inserted, a wildcard will be added for the other components. The "Scheduled Station AE Title" is single value matching key when "Specific Unit" is selected and a AE Title is supplied.

D: Displayed keys. A "w" indicates that this worklist attribute is displayed to the user in the WORKLIST QUERY panel. An "x" indicates that this worklist attribute is displayed to the user in the patient registration dialog, when the corresponding worklist item is selected pressing "SELECT EXAM" from the WORKLIST QUERY panel. For example, Patient Name will be displayed when registering the patient prior to an examination. A "d" indicates that this worklist attribute is displayed to the user only when selecting a worklist item and pressing "DETAILS".

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

The default Query Configuration is set to "Modality" (US) and "Date" (date of today). Optionally, additional matching are configurable in the QUERY PARAMETERS panel, as described above.

4.2.2.3.2   Activity – Acquire Images

4.2.2.3.2.1   Description and Sequencing of Activities [22]

Selecting an item from in the WORKLIST QUERY panel, and pressing "SELECT EXAM", takes you back to the PATIENT DATA panel, already filled with all the data coming from the worklist. It is possible to modify or to input the Performing Physician, Height and Weight of the patient.

The trigger to create a MPPS SOP Instance is derived from pressing "OK" in the PATIENT DATA panel. An Association to the configured MPPS SCP system is established immediately and the related MPPS SOP Instance will be created.

When closing the current exam ("Start End" key) the MPPS will be set to the final state "COMPLETED". It is also possible to set it to "DISCONTINUED", by checking "MPPS DISCONTINUED" before pressing OK in the EXAM panel that appears when closing the exam.

Starting an exam for a locally registered Patient will create an "unscheduled cases", by allowing MPPS Instances to be communicated for locally registered Patients.

The MyLab only supports a 0-to-1 relationship between Scheduled and Performed Procedure Steps.

The MyLab will initiate an Association to issue an:

— N-CREATE request according to the CREATE Modality Performed Procedure Step SOP Instance operation or a

— N-SET request to update the contents and state of the MPPS according to the SET Modality Performed Procedure Step Information operation.

---

[22] MPPS SOP Class not present in VET models.
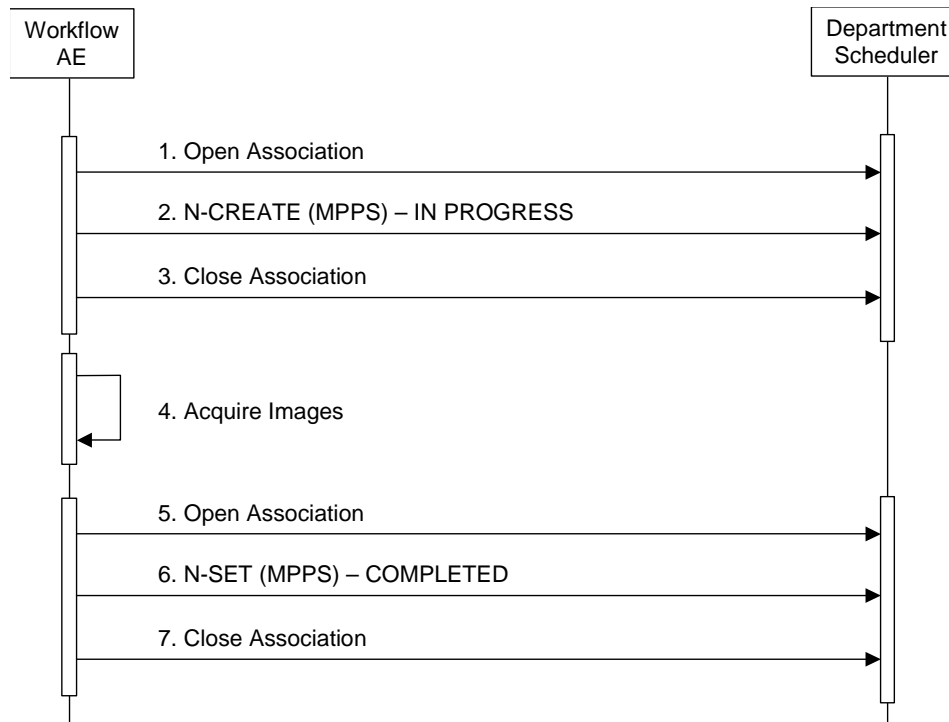
Figure 7
SEQUENCING OF ACTIVITY – ACQUIRE IMAGES

A possible sequence of interactions between the Workflow AE and a Departmental Scheduler (e.g. a device such as a RIS or HIS which supports the MPPS SOP Class as an SCP) is illustrated in Figure 7:

1. The Worklist AE opens an association with the Departmental Scheduler

2. The Worklist 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 Worklist AE closes the association with the Departmental Scheduler.

4. All images are acquired and stored in the local database.

5. The Worklist AE opens an association with the Departmental Scheduler.

6. The Worklist AE sends an N-SET request to the Departmental Scheduler to update the MPPS instance with status of "COMPLETED" and set all necessary attributes. The Departmental Scheduler acknowledges the MPPS update with an N-SET response (status success).

7. The Worklist AE closes the association with the Departmental Scheduler.

4.2.2.3.2.2   Proposed Presentation Contexts

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

Table 30
PROPOSED PRESENTATION CONTEXTS FOR REAL-WORLD ACTIVITY ACQUIRE IMAGES

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Ext. Neg.
Name	UID	Name List	UID List	Role	
Modality Performed Procedure Step [23]	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.2.3.2.3 SOP Specific Conformance for MPPS [24]

The behavior of the MyLab when encountering status codes in an MPPS N-CREATE or N–SET response is summarized in Table 31. If any other SCP response status than "Success" or "Warning" is received by the MyLab, a message "MPPS update failed" will appear on the user interface.

Table 31
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 (i.e. Error Comment and Error ID).
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 (i.e. Elements in the Modification List/Attribute List)
*	*	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 MyLab during communication failure is summarized in the Table below:

Table 32
MPPS COMMUNICATION FAILURE BEHAVIOR

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.

Table 33 provides a description of the MPPS N-CREATE and N-SET request identifiers sent by the MyLab. Empty cells in the N-CREATE and N-SET columns indicate that the attribute is not sent. A "Zero length" attribute will be sent with zero length.

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[23] MPPS SOP Class not present in VET models.

[24] MPPS SOP Class not present in VET models.

Table 33
MPPS N-CREATE / N-SET REQUEST IDENTIFIER

Attribute Name	Tag	VR	N-CREATE	N-SET
Specific Character Set	(0008,0005)	CS	"ISO_IR 100"	
Modality	(0008,0060)	CS	US	
Procedure Code Sequence	(0008,1032)	SQ	From Modality Worklist, contains the value of the Requested Procedure Code Sequence (0032,1064). Not present for unscheduled exams or if the User unchecks "ACCEPT REQUESTED PROCEDURE CODE SEQUENCE" in the WORKLIST QUERY panel.	
Referenced Patient Sequence	(0008,1120)	SQ	Zero length.	
Patient's Name	(0010,0010)	PN	From Modality Worklist (all 5 components) or user input. The user cannot modify values provided via Modality Worklist.	
Patient ID	(0010,0020)	LO	From Modality Worklist or user input. The user cannot modify values provided via Modality Worklist.	
Patient's Birth Date	(0010,0030)	DA	From Modality Worklist or user input. The user cannot modify values provided via Modality Worklist.	
Patient's Sex	(0010,0040)	CS	From Modality Worklist or user input. The user cannot modify values provided via Modality Worklist.	
Study ID	(0020,0010)	SH	Generated by the device. From Requested Procedure ID (0040,1001) on MyLab 60 / 70 / 70 XVG when Modality Worklist is enabled.	
Performed Station AE Title	(0040,0241)	AE	Local AE Title.	
Performed Station Name	(0040,0242)	SH	Zero length.	
Performed Location	(0040,0243)	SH	Zero length.	
Performed Procedure Step Start Date	(0040,0244)	DA	Generated by the device.	
Performed Procedure Step Start Time	(0040,0245)	TM	Generated by the device.	
Performed Procedure Step End Date	(0040,0250)	DA	Zero length.	Actual end date.
Performed Procedure Step End Time	(0040,0251)	TM	Zero length.	Actual end time.
Performed Procedure Step Status	(0040,0252)	CS	"IN PROGRESS".	"DISCONTINUED" or "COMPLETED".

Performed Procedure Step ID	(0040,0253)	SH	Generated by the device.	
Performed Procedure Step Description	(0040,0254)	LO	According to the chosen application.	According to the chosen application.
Performed Procedure Type Description	(0040,0255)	LO	Zero length.	Zero length.
Performed Protocol Code Sequence	(0040,0260)	SQ	Zero length.	
Scheduled Step Attributes Sequence	(0040,0270)	SQ		
> Accession Number	(0008,0050)	SH	From Modality Worklist or user input. The user cannot modify values provided via Modality Worklist.	
> Referenced Study Sequence	(0008,1110)	SQ	From Modality Worklist, empty for unscheduled exams.	
>> Referenced SOP Class UID	(0008,1150)	UI	From Modality Worklist.	
>> Referenced SOP Instance UID	(0008,1155)	UI	From Modality Worklist.	
> Study Instance UID	(0020,000D)	UI	From Modality Worklist, automatically generated for unscheduled exams.	
> Requested Procedure Description	(0032,1060)	LO	From Modality Worklist, Zero length for unscheduled exams.	
> Scheduled Procedure Step Description	(0040,0007)	LO	From Modality Worklist, Zero length for unscheduled exams.	
> Scheduled Protocol Code Sequence	(0040,0008)	SQ	From Modality Worklist, Zero length for unscheduled exams.	
> Scheduled Procedure Step ID	(0040,0009)	SH	From Modality Worklist, Zero length for unscheduled exams.	
> Requested Procedure ID	(0040,1001)	SH	From Modality Worklist, Zero length for unscheduled exams.	
Performed Series Sequence	(0040,0340)	SQ	Zero length.	One or more items.
> Retrieve AE Title	(0008,0054)	AE		Zero length.
> Series Description	(0008,103E)	LO		According to the chosen application.
> Performing Physician's Name	(0008,1050)	PN		From Modality Worklist (Scheduled Performing Phys. Name) or user input. The user can modify values provided via Modality Worklist.
> Operator's Name	(0008,1070)	PN		Generated by the device according to the login name used to access the system.
> Referenced Image Sequence	(0008,1140)	SQ		One or more items.
>> Referenced SOP	(0008,1150)	UI		Generated by the device.

Class UID				
>> Referenced SOP Instance UID	(0008,1155)	UI		Generated by the device.
> Protocol Name	(0018,1030)	LO		According to the chosen pre-set.
> Series Instance UID	(0020,000E)	UI		Generated by the device.
> Referenced Non-Image Composite SOP Instance Seq.	(0040,0220)	SQ		Zero length.

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

The MyLab provides Standard Conformance to the following SOP Classes:

Table 34
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 35
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

It is possible to simultaneously configure many hardcopy devices, and for each one of them it is possible to configure many different printing profiles. According to the MyLab model, two or three of these printing profiles (belonging to the same or to different hardcopy devices) can be assigned to the print keys "1", "2" and "3" (if present) of the MyLab keyboard.

There are two different printing environments, one for the images belonging to the current Study (and displayed in the real-time environment, or selected and displayed from the "EXAM REV." environment), and another for the images belonging to older Studies (and displayed from the "ARCHIVE REV." environment).

Every time a print key is pressed, the current image is added to the current film according to the print key and the environment, so it is possible to simultaneously compose up to four (or six, according to the model) films; whenever a film composing is completed, a print-job is prepared and the MyLab initiates the related Association.

Table 36
NUMBER OF ASSOCIATIONS INITIATED FOR AE HARDCOPY

Maximum number of simultaneous Associations	Unlimited.

MyLab does not accept Associations.

4.2.3.2.3 Asynchronous Nature

The MyLab does not support asynchronous communication (multiple outstanding transactions over a single Association).

Table 37
ASYNCHRONOUS NATURE AS A SCU FOR AE HARDCOPY

Maximum number of outstanding asynchronous transactions	1

4.2.3.2.4 Implementation Identifying Information

The implementation information for this Application Entity can be found in Table 4.

4.2.3.2.5   Printer configuration

The Service personnel, when configuring the MyLab for a given DICOM printer, must select a suitable printer configuration profile, according to the brand/model of the printer. In the printer configuration profile, compiled using the DICOM Conformance Statement of the printer, for every attribute that can be put in the N-CREATE of the Film Session SOP Class, in the N-CREATE of the Film Box SOP Class, and in the N-SET on the Image Box SOP Class, there is the complete list of accepted values, and the most suitable one (or a flag that says not to send this attribute, for the optional ones).

The Service personnel, according to the User's needs, must decide in which format(s) to print with that printer, preparing one or more printing profiles, in which some of the pre-defined attributes can be changed among the ones present in the pre-defined printer configuration profile, while for the others the most suitable one (or none) will be sent, according to the printer configuration profile. One of the configuration parameters is the color capability: for printers that accept both the Basic Grayscale and Basic Color Print Management Meta SOP Class, the Service personnel can decide in which way to print.

There is also a generic printer configuration profile, in which all the non-mandatory information (excepted the attributes directly managed from the User's interface) is marked not to be sent: this printer configuration profile can be used with unknown printers, leaving the printer software the burden to chose the most correct configuration parameters.

To use a configured printing profile, the User must tie it to one of the special print keys of the MyLab keyboard (labeled "1", "2", or "3" if present).

4.2.3.3 Association Initiation Policy

4.2.3.3.1.1   Activity – Connectivity Verification

4.2.3.3.1.2   Description and Sequencing of Activities

The Hardcopy AE is invoked to perform a verification by the Print SCP configuration interface. The job consists of data describing the destination.

If a response to the C-ECHO-RQ is not received within a timeout, the Association will be aborted and an error will be reported to the User.
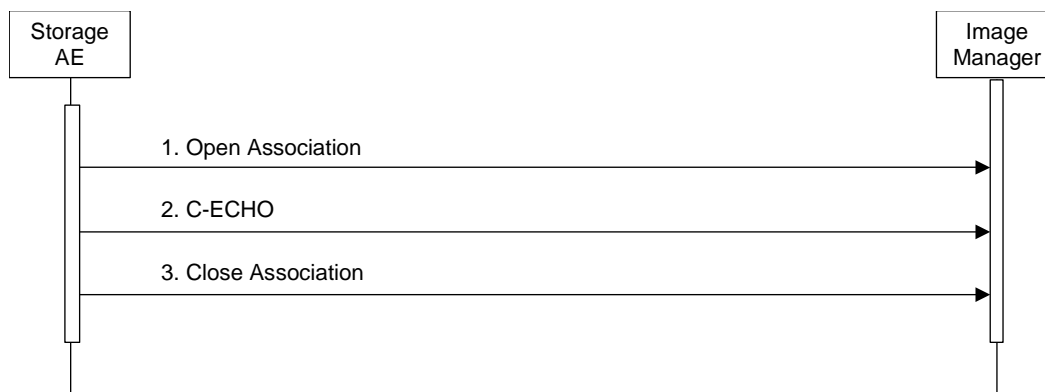
Figure 8
SEQUENCING OF ACTIVITY – CONNECTIVITY VERIFICATION

4.2.3.3.1.3   Proposed Presentation Context Table

The MyLab is capable of proposing the Presentation Contexts as shown in the following table:

Table 38
PROPOSED PRESENTATION CONTEXT FOR CONNECTIVITY VERIFICATION

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

4.2.3.3.1.4   SOP Specific Conformance for Connectivity Verification

The MyLab provides standard conformance to the DICOM Verification Service Class as an SCU. The status code for the C-ECHO is as follows:

Table 39
C-ECHO RESPONSE STATUS HANDLING BEHAVIOUR

Code	Status	Meaning
0000	Success	The C-ECHO request is accepted.

4.2.3.3.2   Activity – Film Images

4.2.3.3.2.1   Description and Sequencing of Activities

A user composes images onto one film sheet by pressing the printing key for every image that can be added to the related printing layout; when the number of allowed images has been reached, or by selecting the "PRINT NOW TO DICOM PRINTER" entry in the pop-up menu related to the desired printing layout, the print-job is forwarded to the job queue and processed individually. Pressing the "RESET ADDED IMAGES" entry in the above pop-up menu will delete all the already added images from the current print-job.

The Hardcopy AE is invoked by the job control interface that is responsible for processing network tasks. The job consists of data describing the images and graphics to be printed as well as the requested layout and other parameters. The film sheet is sent image by image. If no association to the printer can be established, or some error occurs, the print-job is switched to a failed state and the user informed.
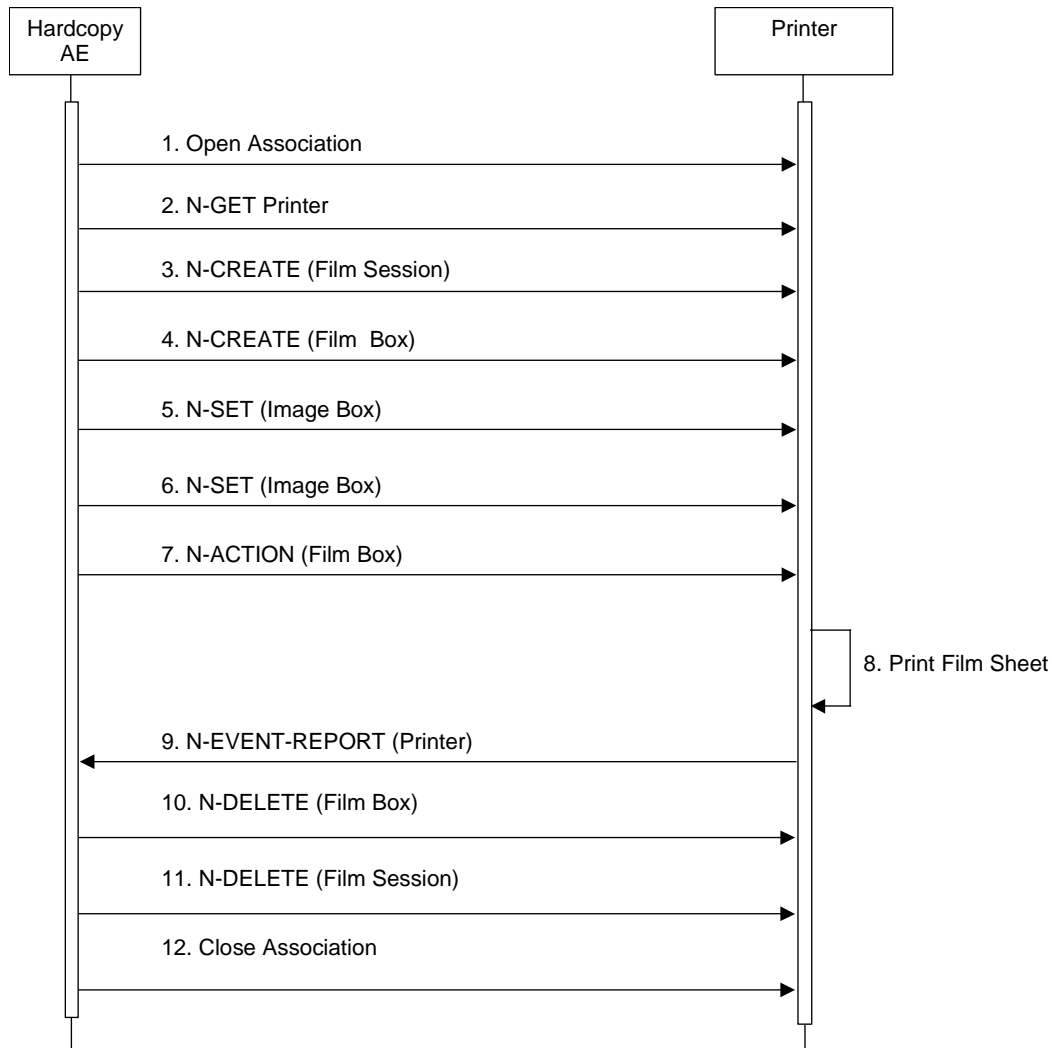
Figure 9
SEQUENCING OF ACTIVITY – FILM IMAGES

A typical sequence of DIMSE messages sent over an association between Hardcopy AE and a Printer is illustrated in Figure 9:

1. Hardcopy AE opens an association with the Printer, using the Basic Grayscale or Basic Color Print Management META SOP Class according to the configuration of the printing layout.

2. N-GET on the Printer SOP Class is used to obtain current printer status information. If the Printer reports a status of FAILURE, the print-job is switched to a failed state and the user informed.

3. N-CREATE on the Film Session SOP Class creates a Film Session.

4. N-CREATE on the Film Box SOP Class creates a Film Box linked to the Film Session.

5. N-SET on the Image Box SOP Class transfers the contents of the first image to the printer.

6. N-SET on the Image Box SOP Class transfers the contents of the other various images to the printer, or delete the unwanted ones from the Film Box.

7. N-ACTION on the Film Box SOP Class instructs the printer to print the Film Box already composed.

8. The printer prints the requested number of film sheets

9. The Printer asynchronously reports its status via N-EVENT-REPORT notification (Printer SOP Class). The printer can send this message at any time. Hardcopy AE does not require the N-EVENT-REPORT to be sent. Hardcopy AE is capable of receiving an N-EVENT-REPORT notification at any time during an association. If the Printer reports a status of FAILURE, the print-job is switched to a failed state and the user informed.

10. N-DELETE on the Film Box SOP Class deletes the Film Box SOP instance.

11. N-DELETE on the Film Session SOP Class deletes the complete Film Session SOP instance.

12. Hardcopy AE closes the association with the Printer

Status of the print-job is reported through the job control interface. 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.

4.2.3.3.2.2   Proposed Presentation Contexts

The MyLab is capable of proposing the Presentation Contexts shown in the Table below:

Table 40
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY FILM IMAGES

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

4.2.3.3.2.3   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 41
HARDCOPY COMMUNICATION FAILURE BEHAVIOR

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

4.2.3.3.2.4   SOP Specific Conformance for the Printer SOP Class

Hardcopy AE supports the following DIMSE operations and notifications for the Printer SOP Class:

— N-GET

— N-EVENT-REPORT

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

4.2.3.3.2.5 Printer SOP Class Operations (N-GET)

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

Table 42
PRINTER SOP CLASS N-GET REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Printer Status	(2110,0010)	CS	Provided by Printer	ALWAYS	Printer
Printer Status Info	(2110,0020)	CS	Provided by Printer	ALWAYS	Printer
Printer Name	(2110,0030)	LO	Provided by Printer (for logging purposes)	ALWAYS	Printer
Manufacturer	(0008,0070)	LO	Provided by Printer (for logging purposes)	ALWAYS	Printer
Manufacturer's Model Name	(0008,1090)	LO	Provided by Printer (for logging purposes)	ALWAYS	Printer
Software Version(s)	(0018,1020)	LO	Provided by Printer (for logging purposes)	ALWAYS	Printer

The Printer Status information is evaluated as follows:

1. If Printer status (2110,0010) is NORMAL, the print-job continues to be printed.

2. If Printer status (2110,0010) is FAILURE, the print-job is marked as failed. The contents of Printer Status Info (2110,0020) is logged and reported to the user.

3. If Printer status (2110,0010) is WARNING, the print-job continues to be printed. The contents of Printer Status Info (2110,0020) is logged.

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

Table 43
PRINTER SOP CLASS N-GET RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The request to get printer status information was success.
*	*	Any other status code.	The Association is aborted. The status meaning is logged and reported to the user.

4.2.3.3.2.6 Printer SOP Class Notifications (N-EVENT-REPORT)

Hardcopy AE is capable of receiving an N-EVENT-REPORT request at any time during an association.

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

Table 44
PRINTER SOP CLASS N-EVENT-REPORT BEHAVIOUR

Event Type Name	Event Type ID	Behavior
Normal	1	The print-job continues to be printed.
Warning	2	The print-job continues to be printed. The contents of Printer Status Info (2110,0020) is logged.
Failure	3	The print-job is marked as failed. The contents of Printer Status Info (2110,0020) is logged and reported to the user.

*	*	An invalid Event Type ID will cause a status code of 0113H to be returned in a N-EVENT-REPORT response.

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

Table 45
PRINTER SOP CLASS N-EVENT-REPORT RESPONSE STATUS REASONS

Service Status	Further Meaning	Error Code	Reasons
Success	Success	0000	The notification event has been successfully received.
Failure	No Such Event Type	0113H	An invalid Event Type ID was supplied in the N-EVENT-REPORT request.
Failure	Processing Failure	0110H	An internal error occurred during processing of the N-EVENT-REPORT. A short description of the error will be returned in Error Comment (0000,0902).

4.2.3.3.2.7 SOP Specific Conformance for the Film Session SOP Class

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

— N-CREATE

— N-DELETE

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

4.2.3.3.2.8 Film Session SOP Class Operations (N-CREATE)

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

Table 46
FILM SESSION SOP CLASS N-CREATE REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Copies	(2000,0010)	IS	Chosen by the User among the values in the Printer Profile.	ALWAYS	USER
Print Priority	(2000,0020)	CS	Pre-defined value from the Printer Profile.	ANAP	PROFILE
Medium Type	(2000,0030)	CS	Chosen by the User among the values in the Printer Profile.	ANAP	USER
Film Destination	(2000,0040)	CS	Pre-defined value from the Printer Profile.	ANAP	PROFILE
Film Session Label	(2000,0050)	LO	Pre-defined value from the Printer Profile.	ANAP	PROFILE
Memory Allocation	(2000,0060)	IS	Pre-defined value from the Printer Profile.	ANAP	PROFILE
Owner ID	(2100,0160)	SH	Pre-defined value from the Printer Profile.	ANAP	PROFILE

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

Table 47
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 and the user is notified that there was a warning. The status meaning and additional information in the Response identifying the attributes out of range will be logged (i.e. Elements in the Modification List/Attribute List).
Warning	Attribute List Error	0107H	The N-CREATE operation is considered successful and the user is notified that there was a warning. The status meaning and additional information in the Response identifying the attributes will be logged (i.e. Elements in the Attribute Identifier List).
*	*	Any other status code.	The Association is aborted and the print-job is marked as failed and the user is notified that there was an error. The status meaning is logged.

4.2.3.3.2.9 Film Session SOP Class Operations (N-DELETE)

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

Table 48
FILM SESSION 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 and the print-job is marked as failed and the user is notified that there was an error. The status meaning is logged.

4.2.3.3.2.10 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

— N-DELETE

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

4.2.3.3.2.11 Film Box SOP Class Operations (N-CREATE)

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

Table 49
FILM BOX SOP CLASS N-CREATE REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Display Format	(2010,0010)	CS	Chosen by the User among the STANDARD\c,r values in the Printer Profile.	ALWAYS	USER
Film Orientation	(2010,0040)	CS	Chosen by the User among the values in the Printer Profile.	ANAP	USER

Film Size ID	(2010,0050)	CS	Chosen by the User among the values in the Printer Profile.	ANAP	USER
Magnification Type	(2010,0060)	CS	Pre-defined value from the Printer Profile.	ANAP	PROFILE
Smoothing Type	(2010,0080)	CS	Pre-defined value from the Printer Profile.	ANAP	PROFILE
Border Density	(2010,0100)	CS	Pre-defined value from the Printer Profile.	ANAP	PROFILE
Empty Image Density	(2010,0110)	CS	Pre-defined value from the Printer Profile.	ANAP	PROFILE
Max Density	(2010,0130)	US	Pre-defined value from the Printer Profile.	ANAP	PROFILE
Min Density	(2010,0120)	US	Pre-defined value from the Printer Profile.	ANAP	PROFILE
Trim	(2010,0140)	CS	Pre-defined value from the Printer Profile.	ANAP	PROFILE
Configuration Information	(2010,0150)	ST	Pre-defined value from the Printer Profile.	ANAP	PROFILE
Referenced Film Session Sequence	(2010,0500)	SQ		ALWAYS	AUTO
>Referenced SOP Class UID	(0008,1150)	UI	1.2.840.10008.5.1.1.1	ALWAYS	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI	From created Film Session SOP Instance	ALWAYS	AUTO
Requested Resolution ID	(2020,0050)	CS	Pre-defined value from the Printer Profile.	ANAP	PROFILE

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

Table 50
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.
*	*	Any other status code.	The Association is aborted and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.3.3.2.12   Film Box SOP Class Operations (N-ACTION)

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

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

Table 51
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 and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.3.3.2.13 Film Box SOP Class Operations (N-DELETE)

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

Table 52
FILM BOX 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 and the print-job is marked as failed and the user is notified that there was an error. The status meaning is logged.

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

4.2.3.3.2.15 Image Box SOP Class Operations (N-SET)

The attributes supplied in an N-SET Request are listed in the Tables below, one for the Basic Grayscale Image Box SOP Class, and one for the Basic Color Image Box SOP Class:

Table 53
BASIC GRAYSCALE IMAGE BOX SOP CLASS N-SET REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	(2020,0010)	US	According to the place in the Film Box	ALWAYS	AUTO
Basic Grayscale Image Sequence	(2020,0110)	SQ		ALWAYS	AUTO
>Samples Per Pixel	(0028,0002)	US	1	ALWAYS	AUTO
>Photometric Interpretation	(0028,0004)	CS	MONOCHROME2	ALWAYS	AUTO
>Rows	(0028,0010)	US	According to the dimension of the preformatted image (the same for all the images in the same film)	ALWAYS	AUTO
>Columns	(0028,0011)	US	According to the dimension of the preformatted image (the same for all the images in the same film)	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	0000H = unsigned integer.	ALWAYS	AUTO
>Pixel Data	(7FE0,0010)	OB	Pixels of rendered image	ALWAYS	AUTO

Table 54
BASIC COLOR IMAGE BOX SOP CLASS N-SET REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	(2020,0010)	US	According to the place in the Film Box	ALWAYS	AUTO
Basic Color Image Sequence	(2020,0111)	SQ		ALWAYS	AUTO
>Samples Per Pixel	(0028,0002)	US	3	ALWAYS	AUTO
>Photometric Interpretation	(0028,0004)	CS	RGB	ALWAYS	AUTO
>Rows	(0028,0010)	US	According to the dimension of the preformatted image (the same for all the images in the same film)	ALWAYS	AUTO
>Columns	(0028,0011)	US	According to the dimension of the preformatted image (the same for all the images in the same film)	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	0000H = unsigned integer.	ALWAYS	AUTO
>Pixel Data	(7FE0,0010)	OB	Pixels of rendered image	ALWAYS	AUTO

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

Table 55
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 and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.3.4 Association Acceptance Policy

The Hardcopy Application Entity does not accept Associations.

4.3 NETWORK INTERFACES

4.3.1   Physical Network Interface

The MyLab supports a single network interface. One or both of the following physical network interfaces will be available depending on installed hardware options:

Table 56
SUPPORTED PHYSICAL NETWORK INTERFACES

Ethernet 100baseT
Ethernet 10baseT

4.3.2   Additional Protocols

The MyLab conforms to the System Management Profiles listed in the Table below. All requested transactions for the listed profiles and actors are supported. Support for optional transactions are listed in the Table below:

Table 57
SUPPORTED SYSTEM MANAGEMENT PROFILES

Profile Name	Actor	Protocols Used	Optional Transactions	Security Support
Network Address Management	DHCP Client	DHCP	N/A	
	DNS Client	DNS	N/A	

4.3.2.1 DHCP

DHCP can be used to obtain TCP/IP network configuration information. The default Windows XP DHCP client is used, if enabled by the System Administrator: please refer to the Windows XP documentation for further details.

4.3.2.2 DNS

DNS can be used for address resolution. If DHCP is not in use or the DHCP server does not return any DNS server addresses, the identity of the DNS servers can be configured by the System Administrator. If a DNS server is not in use, the numeric IP addresses need to be used.

4.4 CONFIGURATION

4.4.1   AE Title/Presentation Address Mapping

4.4.1.1 Local AE Titles and TCP Ports

All local applications use the AE Title, IP address, and listening TCP Port. The Default AE Title is "MYLAB", the default TCP Port is 6104, both can be changed from the DICOM configuration menu, the new values become effective after a reboot of the system.

4.4.1.2 Remote AE Title/Presentation Address Mapping

The AE Titles, host names or IP addresses, and TCP port numbers of remote applications can be configured from the DICOM configuration menu.

4.4.1.2.1   Storage AE

The MyLab User must set the AE Title, port-number, host-name for up to 5 remote Storage SCPs, enabling one or more of them.

The MyLab User must set the AE Title, port-number, host-name for up to 5 remote Storage Commitment SCPs, enabling only one of them at a given time [25].

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[25] Storage Commitment SOP Class not present in VET models.

4.4.1.2.2   Workflow AE

The MyLab User must set the AE Title, port-number, host-name for up to 5 remote MWL SCPs, enabling only one of them at a given time.

The MyLab User must set the AE Title, port-number, host-name for up to 5 remote MPPS SCPs, enabling only one of them at a given time [26].

4.4.1.2.3   Hardcopy AE

The MyLab User must set the AE Title, port-number, host-name and printer profile for up to 5 remote Print SCPs, enabling one or more of them. For every configured printer, one or more printing profile can be created, and tied to one of the printing keys.

4.4.2   Parameters

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

**Table 58
CONFIGURATION PARAMETERS TABLE**

Parameter	Configurable (Yes/No)	Default Value
General Parameters		
Max PDU Receive Size	No	28672 Bytes
Max PDU Send Size (larger PDUs will never be sent, even if the receiver supports a larger Max PDU Receive Size. If the receiver supports a smaller Max PDU Receive Size then the Max PDU Send Size will be reduced accordingly for the duration of the Association. Max PDU Receive Size information is exchanged during DICOM Association Negotiation in the Maximum Length Sub-Item of the A-ASSOCIATION-RQ and A-ASSOCIATE-AC)	No	28672 Bytes
Time-out waiting for a acceptance or rejection response to an Association Request (Application Level Timeout)	No	60 s
Time-out waiting for a response to an Association release request (Application Level Timeout)	No	60 s
Time-out waiting for completion of a TCP/IP connect request (Low-level timeout)	No	60 s
Time-out awaiting a Response to a DIMSE Request (Low-Level Timeout)	Yes	60 s
Time-out for waiting for data between TCP/IP-packets (Low Level Timeout)	No	60 s
Storage SCU Parameters		
Storage SCU time-out waiting for a response to a C-STORE-RQ	Yes	60 s
Number of times a failed send job may be retried	No	0 (Failed send jobs are not retried)
Delay between retrying failed send jobs	No	Not applicable
Maximum number of simultaneously initiated Associations by the Storage-SCU AE	No	1
Supported Transfer Syntaxes (separately configurable for each remote	No	See Table 11,

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[26] MPPS SOP Class not present in VET models.

Parameter	Configurable (Yes/No)	Default Value
AE)		not separately configurable
Storage Commitment Parameters		
Timeout waiting for a Storage Commitment Notification (maximum duration of applicability for a Storage Commitment Transaction UID).	Yes	600 s
Maximum number of simultaneously accepted Associations by the Storage AE.	No	1
Delay association release after sending a Storage Commitment Request (wait for a Storage Commitment Notification over the same association).	No	0 s
Modality Worklist Parameters		
Modality Worklist SCU time-out waiting for the final response to a C-FIND-RQ	Yes	60 s
Maximum number of Worklist Items	No	Unlimited
Supported Transfer Syntaxes for Modality Worklist	No	See Table 26.
Delay between automatic Worklist Updates	No	No automatic retry
Query Worklist for specific Scheduled Station AE Title	Yes	Local AE Title
Query Worklist for specific Modality Value	No	US
MPPS Parameters		
MPPS SCU time-out waiting for a response to a N-CREATE-RQ	No	60 s
MPPS SCU time-out waiting for a response to a N-SET-RQ	No	60 s
Supported Transfer Syntaxes for MPPS	No	See Table 30.
Print Parameters		
Print SCU time-out waiting for a response to a N-CREATE-RQ	Yes	60 s
Print SCU time-out waiting for a response to a N-SET-RQ	Yes	60 s
Print SCU time-out waiting for a response to a N-ACTION-RQ	Yes	60 s
Supported Transfer Syntaxes (separately configurable for each remote printer)	No	See Table 40, not separately configurable
Number of times a failed print-job may be retried	No	0 (Failed send jobs are not retried)
Delay between retrying failed print-jobs	No	Not applicable
Printer correction LUT (separately configurable for each remote printer)	No	Not applied

5   MEDIA INTERCHANGE

5.1 IMPLEMENTATION MODEL
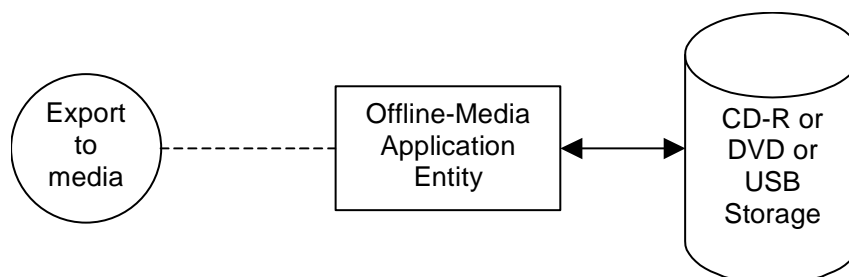
5.1.1   Application Data Flow

Figure 10
APPLICATION DATA FLOW DIAGRAM FOR MEDIA STORAGE

— Offline-Media Application Entity exports images, clips and SR objects[27] to a CD-R or a DVD or a USB
   Storage medium. It is associated with the local real-world activity "Archive". "Archive" (to CD-R or to
   DVD or to USB) is performed upon user request for each study when closing it, or for specific studies
   selected from the had disk database.

5.1.2   Functional Definition of AEs

5.1.2.1 Functional Definition of Offline-Media Application Entity

It is possible to activate the Offline-Media Application Entity entry both when closing the current study, and
from the database panel.

When closing the current study, a panel will allow the User to decide if and where to archive in DICOM the
images, clips and SR objects: the User should check "DICOM" and select among "CD/DVD" (the CD-R or
DVD), "USB", "*<DICOM SERVER 1>*", "*<DICOM SERVER 2>*", etc. Selecting "CD/DVD" or "USB" will store
the DICOM objects on the chosen medium, while selecting one of the configured DICOM servers ("*<DICOM
SERVER 1>*", "*<DICOM SERVER 2>*", etc.) will send them in DICOM format to the selected destination.
Please note that the current study will not be archived into the local database unless you also check "LOCAL
ARCHIVE".

From the local database panel, pressing the "DICOM" soft-key, a "DICOM PROCEDURE" panel will appear,
allowing to choose between the following destinations: "CD/DVD" (the CD-R or DVD), "USB" , "*<DICOM
SERVER 1>*", "*<DICOM SERVER 2>*", etc. In this way you can store or send the selected studies (previously
archived to the local database), in DICOM format, to the selected destination.

When activating the above described functions choosing "CD/DVD" or "USB", the SOP Instances associated
with the selected study (or studies) will be collected into one export job. The existence of an export job queue
entry will activate the Offline-Media AE.

If the required medium is not present, or cannot be accessed, the related export job will be set to an error
state and it will be possible to restarted it later by the user via job control interface. The Offline-Media AE will
not try to export again the instances automatically.

5.1.3   Sequencing of Real-World Activities

The operator can insert a new CD-R or DVD, or a USB storage media (according to the case), at any time
before the Offline-Media Application Entity activation. The CD-R or DVD will be formatted, while the USB

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[27] DICOM Structured Report not available in VET models.

storage media must be previously formatted using another computer. For CD-R and DVD a viewer will be automatically put into the media.

Please note that the USB storage media, to meet the DICOM standard, must be formatted selecting the FAT (and not FAT32) File System. For example, this is an option of the standard Windows XP Operating System formatting utility.

5.1.4   File Meta Information Options

See section 3.6 for the implementation information written to the File Meta Header in each file.

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 59
APPLICATION PROFILES, ACTIVITIES AND ROLES FOR OFFLINE-MEDIA

Application Profiles Supported	Real World Activity	Role
STD-GEN-CD	Export to CD-R	FSC
STD-GEN-DVD-JPEG	Export to DVD	FSC
STD-GEN-USB-JPEG	Export to USB	FSC, FSU
STD-US-SC-MF-CDR	Export to CD-R	FSC
STD-US-SC-MF-DVD	Export to DVD	FSC

5.2.1.1 File Meta Information for the Application Entity

The Source Application Entity Title included in the File Meta Header is configurable (see section 5.4).

5.2.1.2 Real-World Activities

5.2.1.2.1   Activity – Export to CD-R or DVD or USB

The Offline-Media Application Entity acts as an FSC when requested to export SOP Instances from the local database to a CD-R or DVD or USB medium. When exporting to USB the Offline-Media Application Entity can act as an FSU if a DICOMDIR is already present.

5.2.1.2.1.1   Media Storage Application Profiles

The Offline-Media Application Entity support the STD-GEN-CD, STD-GEN-DVD-JPEG, STD-GEN-USB-JPEG, STD-US-SC-MF-CDR, and the STD-US-SC-MF-DVD Application Profiles.

Please note that, to strictly follow the STD-GEN-CD application profile, the images must be exported in the uncompressed format, by selecting the appropriate configuration in the QUALITY tab of the DICOM CONFIGURATION panel (IMAGE QUALITY HIGH, CLIP QUALITY UNCOMPRESSED, when available, otherwise the patients must not contain any US-MF objects).

Please note that, to strictly follow the STD-GEN-DVD-JPEG and the STD-GEN-USB-JPEG application profiles, the single frame US or SC images must be exported in the uncompressed or JPEG lossy compressed format, by selecting the appropriate configuration in the QUALITY tab of the DICOM CONFIGURATION panel (IMAGE QUALITY LOW or IMAGE QUALITY HIGH).

Please note that, to strictly follow the STD-US-SC-MF-CDR and STD-US-SC-MF-DVD application profiles, the SC image or SR object export must be disabled, by selecting the appropriate configuration in the REPORT EXPORT tab of the DICOM CONFIGURATION panel (DO NOT EXPORT).

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

Table 60
IODS, SOP CLASSES AND TRANSFER SYNTAXES FOR OFFLINE MEDIA

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
Media Storage Directory Storage	1.2.840.10008.1.3.10	Explicit VR Little Endian	1.2.840.10008.1.2.1
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
		RLE Lossless	1.2.840.10008.1.2.5
		JPEG lossy Baseline (Process 1)	1.2.840.10008.1.2.4.50
Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian [28]	1.2.840.10008.1.2.1
		JPEG lossy Baseline (Process 1)	1.2.840.10008.1.2.4.50
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	1.2.840.10008.1.2.1
		RLE Lossless	1.2.840.10008.1.2.5
		JPEG lossy Baseline (Process 1)	1.2.840.10008.1.2.4.50
Comprehensive SR Storage [29]	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian	1.2.840.10008.1.2.1

The Transfer Syntax used for Ultrasound and Secondary Capture Images can be changed from the User's Interface pressing the MENU button, selecting DICOM CONFIGURATION and entering the QUALITY tab of the configuration panel. The following choices are allowed for IMAGE QUALITY:

1. LOW (LOSSY JPEG): the JPEG lossy Baseline (Process 1) Transfer Syntax will be used;
2. MEDIUM (LOSSLESS RLE): the RLE Transfer Syntax will be used;
3. HIGH (UNCOMPRESSED): the Explicit VR Little Endian Transfer Syntax will be used.

On the MyLab 25 / 30 / 30 / 40 / 50 the Transfer Syntax used for Ultrasound Multiframe Images will always be the JPEG lossy Baseline (Process 1). From the User's Interface pressing the MENU button, selecting DICOM CONFIGURATION and entering the QUALITY tab of the configuration panel, you will find three different settings for CLIP QUALITY; in any case the JPEG lossy Baseline (Process 1) will be used, with three different compression levels.

On the MyLab 60 / 70 / 70 XVG the Transfer Syntax used for Ultrasound Multiframe Images can be changed from the User's Interface pressing the MENU button, selecting DICOM CONFIGURATION and entering the QUALITY tab of the configuration panel. You will find four different settings for CLIP QUALITY; selecting LOW, MEDIUM and HIGH the JPEG lossy Baseline (Process 1) will be used, with three different compression levels, while selecting UNCOMPRESSED the Explicit VR Little Endian will be used.

Please note that archiving Ultrasound Multiframe Images without compressing them could produce very large files, and adversely affect the operation of the MyLab system and of the receiving system: this option has been added for testing purposes only, and should not be used for normal operations, especially with long clips.

The US Image, US Multiframe Image, Secondary Capture Image and Comprehensive SR Storage SOP Classes are extended to create Standard Extended SOP Classes by addition of standard and private attributes to the created SOP Instances as documented in Section 8.1.

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[28] Only available on MyLab 60 / 70 / 70 XVG.

[29] Not present in VET models.

Also the Media Storage Directory Storage SOP Class is extended, for supporting a larger number of attributes. The DICOMDIR file created includes the Basic Directory IOD containing Directory Records at the Patient and the subsidiary Study, Series and Image levels, appropriate to the SOP Classes in the corresponding File Set. All Type 1 and Type 2 attributes are included in the DICOMDIR. A few other attributes (Type 3 for the Basic Directory IOD), when present in the indexed objects, are also included in the DICOMDIR at the correct level.

5.2 AUGMENTED AND PRIVATE APPLICATION PROFILES

MyLab does not support any augmented for private application profiles.

5.3 MEDIA CONFIGURATION

All local applications use the AE Title configured by the Service personnel. The Application Entity Title configurable for Media Services is the same used for the network storage.

6   SUPPORT OF CHARACTER SETS

All MyLab DICOM applications support the

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

7   SECURITY

DICOM security is not implemented on the MyLab. It is assumed that MyLab is used within a secured environment. It is assumed that a secured environment includes at a minimum:

a. Firewall or router protections to ensure that only approved external hosts have network access to MyLab.
b. Firewall or router protections to ensure that MyLab only has network access to approved external hosts and services.
c. Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a Virtual Private Network (VPN))

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

8   ANNEXES

8.1 IOD CONTENTS

8.1.1   Created SOP Instances

Table 61 specifies the attributes of an US, US-MF or Secondary Capture Image transmitted by the MyLab storage application.

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

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

The abbreviations used in the "Source" column:

USER	the attribute value source is from User input
MWL	the attribute value source is from DICOM Modality Worklist Service
AUTO	the attribute value is generated automatically
CONFIG	the attribute value source is a configurable parameter

NOTE: All dates and times are encoded in the local configured calendar and time. Date, Time and Time zone are configured using the Service/Installation Tool.

8.1.1.1 US, US Multiframe and Secondary Capture Image IOD

Table 61
IOD OF US, US-MF AND SC CREATED SOP INSTANCES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 63	ALWAYS
Study	General Study	Table 64	ALWAYS
	Patient Study	Table 65	ALWAYS
Series	General Series	Table 66	ALWAYS
Equipment	General Equipment	Table 67	ALWAYS
	SC Equipment	Table 68	ANAP, only if SC.
Image	General Image	Table 69	ALWAYS
	Image Pixel	Table 70	ALWAYS
	US Region Calibration	Table 71	ANAP, only if US or US-MF (not present when depth changes are applied when acquiring US-MF).
	Cine	Table 72	ANAP, only if US-MF
	Multi-Frame	Table 73	ANAP, only if US-MF
	Frame Pointers	Table 74	ANAP, only if cardiac US-MF
	US Image	Table 75	ANAP, only if US or US-MF
	SC Image	= = =	EMPTY, can be present only for SC, but no attributes of this module are present.
	SOP Common	Table 80	ALWAYS

	Private Application	Table 81	ANAP, present only in special (blank) US images that carry the measures acquired, when "EXPORT TO BIOPACS" is selected in the REPORT EXPORT configuration panel.

8.1.1.2 Comprehensive Structured Report IOD [30]

Table 62
IOD OF SR CREATED SOP INSTANCES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 63	ALWAYS
Study	General Study	Table 64	ALWAYS
	Patient Study	Table 65	EMPTY
Series	SR Document Series	Table 76	ALWAYS
Equipment	General Equipment	Table 67	ALWAYS
Document	SR Document General	Table 78	ALWAYS
	SR Document Content	Table 79	ALWAYS
	SOP Common	Table 80	ALWAYS

8.1.1.3 Common Modules

Table 63
PATIENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	(0010,0010)	PN	From Modality Worklist or user input (in this case it accepts only the first three components). For VET systems, the first two of the five components in their order of occurrence are the Owner's name and the name of the animal. The remaining components are not present.	VNAP	MWL / USER
Patient ID	(0010,0020)	LO	From Modality Worklist or user input.	VNAP	MWL / USER
Patient's Birth Date	(0010,0030)	DA	From Modality Worklist or user input.	VNAP	MWL / USER
Patient's Sex	(0010,0040)	CS	From Modality Worklist or user input (accepts only *M* or *F*).	VNAP	MWL / USER
Patient Species Description (*)	(0010,2201)	LO	*CANINE, FELINE, EQUINE, BOVINE, OVINE, CAPRINE, PORCINE* or *UNKNOWN*.	VNAP (*)	USER
Patient Breed Description (*)	(0010,2292)	LO	From User input.	VNAP (*)	USER
Patient Breed Code Sequence (*)	(0010,2293)	SQ	Always empty.	EMPTY (*)	AUTO
Breed Registration Sequence (*)	(0010,2294)	SQ	Always empty.	EMPTY (*)	AUTO

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[30] DICOM Structured Report not available in VET models.

(*) Present only in SOP instances produced by a VET system.

Responsible Person (*)	(0010,2297)	PN	From User input, the Owner's Name.	VNAP (*)	USER
Responsible Person Role (*)	(0010,2298)	CS	Present if Responsible Person is not empty, in this case it is Always *OWNER*.	ANAP (*)	AUTO
Responsible Organization (*)	(0010,2299)	LO	Always empty.	EMPTY (*)	AUTO

Table 64
GENERAL STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Instance UID	(0020,000D)	UI	From Modality Worklist or generated by the device.	ALWAYS	MWL / AUTO
Study Date	(0008,0020)	DA	<yyyymmdd>	ALWAYS	AUTO
Study Time	(0008,0030)	TM	<hhmm>	ALWAYS	AUTO
Accession Number	(0008,0050)	SH	From Modality Worklist or user input.	VNAP	MWL / USER
Referring Physician's Name	(0008,0090)	PN	From Modality Worklist or user input.	VNAP	MWL / USER
Study ID	(0020,0010)	SH	Generated by the device. From Requested Procedure ID (0040,1001) on MyLab 60 / 70 / 70 XVG when Modality Worklist is enabled.	ALWAYS	AUTO / MWL
Study Description	(0008,1030)	LO	Generated by device according to the selected application (localized).	ALWAYS	AUTO
Referenced Study Sequence	(0008,1110)	SQ	From Modality Worklist, is the reference to the Study SOP Class/SOP Instance. Not present for unscheduled exams.	VNAP	MWL
Procedure Code Sequence	(0008,1032)	SQ	From Modality Worklist, contains the value of the Requested Procedure Code Sequence (0032,1064). Not present for unscheduled exams or if the User unchecks "ACCEPT REQUESTED PROCEDURE CODE SEQUENCE" in the WORKLIST QUERY panel.	VNAP	MWL

Table 65
PATIENT STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Admitting Diagnoses Description	(0008,1080)	LO	From Modality Worklist or user input.	VNAP	MWL / USER
Patient's Age	(0010,1010)	AS	From user input.	VNAP	USER
Patient's Size	(0010,1020)	DS	From Modality Worklist or user input (can be empty according to the selected application).	VNAP	MWL / USER
Patient's Weight	(0010,1030)	DS	From Modality Worklist or user input (can be empty according to the selected application).	VNAP	MWL / USER

Patient's Sex Neutered [*]	(0010,2203)	CS	*ALTERED, UNALTERED* or empty.	VNAP [*]	USER

Table 66
GENERAL SERIES MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	*US*	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	Generated by device.	ALWAYS	AUTO
Series Number	(0020,0011)	IS	Generated by device.	ALWAYS	AUTO
Laterality	(0020,0060)	CS	Always empty.	EMPTY	AUTO
Series Date	(0008,0021)	DA	<yyyymmdd>	ALWAYS	AUTO
Series Time	(0008,0031)	TM	<hhmm>	ALWAYS	AUTO
Series Description	(0008,103E)	LO	Generated by device according to the selected application (not localized).	ALWAYS	AUTO
Operators' Name	(0008,1070)	PN	Generated by the device according to the login name used to access the system.	ALWAYS	AUTO
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ	Identifies the Performed Procedure Step SOP Instance to which the Series is related. Not present if MPPS not enabled.	VNAP	AUTO
Protocol Name	(0018,1030)	LO	Generated by device according to the selected application (localized).	ALWAYS	AUTO
Performed Procedure Step ID	(0040,0253)	SH	Generated by device.	VNAP	AUTO
Performed Procedure Step Start Date	(0040,0244)	DA	Generated by device.	VNAP	AUTO
Performed Procedure Step Start Time	(0040,0245)	TM	Generated by device.	VNAP	AUTO
Performed Procedure Step Description	(0040,0254)	LO	Generated by device.	VNAP	AUTO
Request Attributes Sequence	(0040,0275)	SQ	From Modality Worklist, the whole sequence is not present for unscheduled exams.	VNAP	MWL
> Requested Procedure ID	(0040,1001)	SH	From Modality Worklist.	VNAP	MWL
> Requested Procedure Description	(0032,1060)	LO	From Modality Worklist.	VNAP	MWL
> Scheduled Procedure Step ID	(0040,0009)	SH	From Modality Worklist.	VNAP	MWL
> Scheduled Procedure Step Description	(0040,0007)	LO	From Modality Worklist.	VNAP	MWL
> Scheduled Protocol Code Sequence	(0040,0008)	SQ	From Modality Worklist.	VNAP	MWL

Table 67
GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

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[*] Present only in SOP instances produced by a VET system.

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	(0008,0070)	LO	*ESAOTE*	ALWAYS	AUTO
Institution Name	(0008,0080)	LO	The CENTER name input in the GENERAL PRESET configuration panel.	VNAP	CONFIG
Manufacturer's Model Name	(0008,1090)	LO	Internal model name: it can be *2750001* (MyLab 40), *2750002* (MyLab 40 VET), *6100* (MyLab 70 XVG), *6150* (MyLab 60 / 70), *7300001* (MyLab 30), *7300002* (MyLab 25), *7300003* (MyLab 30 VET), *7340001* (MyLab 30 Gold), *7340002* (MyLab 25 Gold), *7340003* (MyLab 30 VET Gold), *7341001* (MyLab Five), *7350001* (MyLab 50), *7350002* (MyLab 50 XV).	ALWAYS	AUTO
Device Serial Number	(0018,1000)	LO	Generated by device [31].	ALWAYS	AUTO
Software Version(s)	(0018,1020)	LO	Generated by device.	ALWAYS	AUTO

Table 68
SC EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Conversion Type	(0008,0064)	CS	*SYN*.	ALWAYS	AUTO

Table 69
GENERAL IMAGE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS	Generated by the device. Can be repeated when cloning one image from another (adding measures etc.)	ALWAYS	AUTO
Content Date	(0008,0023)	DA	<yyyymmdd>	ALWAYS	AUTO
Content Time	(0008,0033)	TM	<hhmm>	ALWAYS	AUTO
Patient Orientation	(0020,0020)	CS	Always empty.	EMPTY	AUTO
Image Type	(0008,0008)	CS	For JPEG lossy compressed images the first two fields are DERIVED\SECONDARY. The third and fourth are specified according to the standard for the US images. For the SC images the third field is the same of the corresponding US and US-MF images, the fourth field is absent.	ALWAYS	AUTO
Acquisition Date	(0008,0022)	DA	<yyyymmdd>	ALWAYS	AUTO
Acquisition Time	(0008,0032)	TM	<hhmm>	ALWAYS	AUTO

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[31] Instead of the Serial Number as marked on the product label, on the MyLab 60 / 70 / 70 XVG this attribute will contain the Hardware ID of the machine, that can be read pressing MENU, opening the LICENSES panel, and selecting the APPLICATIONS tab (for example, it is shown for the GENERAL IMAGING license). Anyway, it is a unique identifier in the machines of the same series.

Derivation Description	(0008,2111)	ST	Generated by the device for JPEG lossy compressed images.	ANAP	AUTO
Lossy Image Compression Ratio	(0028,2112)	DS	Generated by the device for JPEG lossy compressed images [32].	ANAP	AUTO
Lossy Image Compression	(0028,2110)	CS	*01* for JPEG lossy compressed images.	ANAP	AUTO
Lossy Image Compression Method	(0008,2114)	CS	*ISO_10918_1* for JPEG lossy compressed images.	ANAP	AUTO
Burned In Annotation	(0028,0301)	CS	*NO* (the images produced by the MyLab never contain burned in annotation that can be used to identify the patient and date the image was acquired; they can contain other burned in information about the acquisition, the measures, etc.).	ALWAYS	AUTO

Table 70
IMAGE PIXEL MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	(0028,0002)	US	3	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	*YBR_FULL_422* for JPEG lossy compressed images.	ALWAYS	AUTO
Rows	(0028,0010)	US	According to the image.	ALWAYS	AUTO
Columns	(0028,0011)	US	According to the image (normally 800).	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	0000H	ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	0	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OW	For the US and US-MF images, the Pixel Data contain burned-in text annotation (data describing the image acquisition parameters) and graphics. For the SC images, the Pixel Data contain the text of the report with the measures in a human readable format.	ALWAYS	AUTO

Table 71
US REGION CALIBRATION MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Sequence of Ultrasound	(0018,6011)	SQ		ALWAYS	AUTO

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[32] For JPEG lossy compressed US-MF images the User can select among three different compression factors.

Regions					
>Region Spatial Format	(0018,6012)	US	Generated by the device.	ALWAYS	AUTO
>Region Data Type	(0018,6014)	US	Generated by the device.	ALWAYS	AUTO
>Region Flags	(0018,6016)	UL	Generated by the device.	ALWAYS	AUTO
>Region Location Min x_0	(0018,6018)	UL	Generated by the device.	ALWAYS	AUTO
>Region Location Min y_0	(0018,601A)	UL	Generated by the device.	ALWAYS	AUTO
>Region Location Max x_1	(0018,601C)	UL	Generated by the device.	ALWAYS	AUTO
>Region Location Max y_1	(0018,601E)	UL	Generated by the device.	ALWAYS	AUTO
>Physical Units X Direction	(0018,6024)	US	Generated by the device.	ALWAYS	AUTO
>Physical Units Y Direction	(0018,6026)	US	Generated by the device.	ALWAYS	AUTO
>Physical Delta X	(0018,602C)	FD	Generated by the device.	ALWAYS	AUTO
>Physical Delta Y	(0018,602E)	FD	Generated by the device.	ALWAYS	AUTO
>Reference Pixel x_0	(0018,6020)	SL	Generated by the device.	ALWAYS	AUTO
>Reference Pixel y_0	(0018,6022)	SL	Generated by the device.	ALWAYS	AUTO
>Ref. Pixel Physical Value X	(0018,6028)	FD	Generated by the device.	ALWAYS	AUTO
>Ref. Pixel Physical Value Y	(0018,602A)	FD	Generated by the device.	ALWAYS	AUTO

Table 72
CINE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame Time	(0018,1063)	DS	Only if US-MF image, generated by the device.	ANAP	AUTO

Table 73
MULTI-FRAME MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Frames	(0028,0008)	IS	Only if US-MF image, generated by the device.	ANAP	AUTO

Table 74
FRAME POINTERS MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Representative Frame Number	(0028,6010)	US	Only if cardiac US-MF images, calculated by the device.	ANAP	AUTO
Frame Numbers Of Interest (FOI)	(0028,6020)	US	Only if cardiac US-MF images. The frame numbers of the frames to which the ECG R Waves belong, as calculated by the device from the ECG leads input.	ANAP	AUTO
Frame Of Interest Description	(0028,6022)	LO	Only if cardiac US-MF images. For each of the Frames Of Interest identified in (0028,6020), this attribute will contain "*R Wave number* n", where "n" is a progressive integer number starting from 1.	ANAP	AUTO
Frame of Interest Type	(0028,6023)	CS	Only if cardiac US-MF images, generated by the device. For each of the Frames Of Interest identified in (0028,6020), this attribute will contain "*RWAVE*".	ANAP	AUTO

Table 75
US IMAGE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Heart Rate	(0018,1088)	IS	Calculated by the device from the ECG leads input. Can be zero if impossible to determine (ECG signal not present, non cardiac images).	ALWAYS	AUTO
Frame Increment Pointer	(0028,0009)	AT	Contains the tag of the Frame Time attribute, (0018,1063). Only for US-MF images.	ANAP	AUTO
R Wave Time Vector	(0018,6060)	FL	Only for cardiac US-MF images, calculated by the device from the ECG leads input.	ANAP	AUTO

Table 76
SR DOCUMENT SERIES MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	*SR*	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	Generated by device.	ALWAYS	AUTO
Series Number	(0020,0011)	IS	Generated by device.	ALWAYS	AUTO
Series Date	(0008,0021)	DA	<yyyymmdd>	ALWAYS	AUTO
Series Time	(0008,0031)	TM	<hhmm>	ALWAYS	AUTO
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ	Identifies the Performed Procedure Step SOP Instance to which the Series is related. Not present if MPPS not enabled.	VNAP	AUTO

Table 78
SR DOCUMENT GENERAL MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS	Generated by the device.	ALWAYS	AUTO
Completion Flag	(0040,A491)	CS	*PARTIAL*	ALWAYS	AUTO

Verification Flag	(0040,A493)	CS	*UNVERIFIED*	ALWAYS	AUTO
Content Date	(0008,0023)	DA	<yyyymmdd>	ALWAYS	AUTO
Content Time	(0008,0033)	TM	<hhmm>	ALWAYS	AUTO
Performed Procedure Code Sequence	(0040,A372)	SQ	Always empty.	EMPTY	AUTO

Table 79
SR DOCUMENT CONTENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Content Template Sequence	(0040,A504)	SQ	Generated by the device.	ALWAYS	AUTO
>Mapping Resource	(0008,0105)	CS	*DCMR*	ALWAYS	AUTO
>Template Identifier	(0040,DB00)	CS	*5200* (for TID 5200, Adult Echocardiography Procedure Report).	ALWAYS	AUTO
Content Sequence	(0040,A730)	SQ	See Table 82 for TID 5200, Adult Echocardiography Procedure Report.		
Concept Name Code Sequence	(0040,A043)	SQ	Generated by the device.	ALWAYS	AUTO
>Code Value	(0008,0100)	SH	*125200*	ALWAYS	AUTO
>Coding Scheme Designator	(0008,0102)	SH	*DCM*	ALWAYS	AUTO
>Code Meaning	(0008,0104)	LO	*Adult Echocardiography Procedure Report*	ALWAYS	AUTO
Continuity of Content	(0040,A050)	CS	*SEPARATE*	ALWAYS	AUTO

Table 80
SOP COMMON MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	(0008,0005)	CS	*ISO_IR 100*	ALWAYS	AUTO
SOP Class UID	(0008,0016)	UI	According to the SOP Class (US, US-MF or SC)	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	Generated by the device.	ALWAYS	AUTO

Table 81
PRIVATE APPLICATION MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Private Creator	(6161,0010)	LO	*ReportEsa*	ALWAYS	AUTO
Report in Esaote proprietary format	(6161,1030)	OB	Variable length: contains the report in Esaote internal proprietary format.	ALWAYS	AUTO
Private Creator	(6161,0011)	LO	*XMLReport*	ALWAYS	AUTO

Report in Esaote proprietary XML format	(6161,1130)	OB	Variable length: contains the report with the measures in Esaote XML internal format.	ALWAYS	AUTO

8.1.2   Used Fields in received IOD by application

The MyLab storage application does not receive SOP Instances.

8.2 STRUCTURED REPORT MAPPING [33]

The mappings of the DICOM SR objects produced by the MyLab system are organized in a manner similar to the DICOM SR Templates as described in PS 3.16 of the DICOM Standard.

This appendix has the aim of finding, for a given measure in the MyLab system, its corresponding encoding in the produced SR object. The following table follows the same organization of the report that can be printed from the MyLab system itself, or exported as a series of Secondary Capture images. That is, the table is divided into various sections that correspond to the various sections of the report; each section is divided in subsections that correspond to the various subsections of the report; the first column of the table correspond to the measure name in the Esaote report. The other three columns contain the DICOM mapping of this measure, indicating the Base Measurement Concept Name, the Section, and the Concept or Acquisition Context Modifiers.

Table 82
ADULT ECHOCARDIOGRAPHY SR MAPPING

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
DOPPLER			
MITRAL			
MITRAL FLOW PROFILE	(20354-7,LN, "Velocity Time Integral")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MIT PEAK VEL E WAVE	(18037-2,LN, "Mitral Valve E-Wave Peak Velocity")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MIT PEAK VEL A WAVE	(17978-8,LN, "Mitral Valve A-Wave Peak Velocity")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MITRAL MEAN VELOCITY	(20352-1,LN, "Mean Velocity")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MITRAL MEAN GRADIENT	(20256-4,LN, "Mean Gradient")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MITRAL PHT	(20280-4,LN,	(T-35300,SRT,	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos

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[33] DICOM Structured Report not available in VET models.

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
	"Pressure Half-Time")	"Mitral Valve")	Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MITRAL VALVE AREA	(G-038E,SRT, "Cardiovascular Orifice Area")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125210,DCM, "Area by Pressure Half-Time") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MITRAL E/A RATIO	(18038-0,LN, "Mitral Valve E to A Ratio")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MIT E WAVE ACC TIME	(20168-1,LN, "Acceleration Time")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MIT E WAVE DEC TIME	(G-0384,SRT, "Mitral Valve E-Wave Deceleration Time")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MIT ISOV RELAX TIME	(18071-1,LN, "Left Ventricular Isovolumic Relaxation Time")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MIT ISOVOL CON TIME	(G-037E,SRT, "Left Ventricular Isovolumic Contraction Time")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
A WAVE DURATION	(G-0385,SRT, "Mitral Valve A-Wave Duration")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MYOCARD PERF INDEX	(G-037F,SRT, "Left Ventricular Index of Myocardial Performance")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MITRAL REGURGITATION			
MIT REG VELOCITY	(11726-7,LN, "Peak Velocity")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MIT REG GRADIENT	(20247-3,LN, "Peak Gradient")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
dP/dt	(8035-6,LN, "Mitral Regurgitation dP/dt derived from Mitral	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole")

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
	Reg.velocity")		(G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
PISA (MITRAL)			
MIT ALIASING VELOC	(11726-7,LN, "Peak Velocity")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E2,SRT, "Doppler Color Flow") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125216,DCM, "Proximal Isovelocity Surface Area") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MIT REG FLOW	(33878-0,LN, "Volume Flow")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MITRAL REG ORIFICE	(G-038E,SRT, "Cardiovascular Orifice Area")	(T-35300,SRT, "Mitral Valve")	(R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125216,DCM, "Proximal Isovelocity Surface Area") (G-C0E3, SRT, "Finding Site") = (T-35313,SRT, "Mitral Annulus") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MIT REG VOLUME	(33878-0,LN, "Volume Flow")	(T-35300,SRT, "Mitral Valve")	(R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125216,DCM, "Proximal Isovelocity Surface Area") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MITRAL TV			
MIT PEAK VEL E' WAVE	(G-037A,SRT, "Left Ventricular Peak Early Diastolic Tissue Velocity")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-35313,SRT, "Mitral Annulus") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MIT PEAK VEL A' WAVE	(G-037C,SRT, "LV Peak Diastolic Tissue Velocity During Atrial Systole")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C0E3, SRT, "Finding Site") = (T-35313,SRT, "Mitral Annulus") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MITRAL E'/A' RATIO	(G-037F,SRT, "Left Ventricular Index of Myocardial Performance")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-35313,SRT, "Mitral Annulus") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MITRAL E/E' RATIO	(G-037B,SRT, "Ratio of MV Peak Velocity to LV Peak Tissue Velocity E-Wave")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
MYOCARD PERF INDEX	(G-037F,SRT, "Left Ventricular Index of Myocardial Performance")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
AORTA			
AORTIC FLOW PROFILE	(20354-7,LN, "Velocity Time Integral")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta")

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
			(G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
AORTIC MEAN VELOCITY	(20352-1,LN, "Mean Velocity")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
AORTIC MEAN GRADIENT	(20256-4,LN, "Mean Gradient")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
AORTIC PEAK VELOCITY	(11726-7,LN, "Peak Velocity")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
AORTIC PEAK GRADIENT	(20247-3,LN, "Peak Gradient")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
AO DIASTOLIC VELOC	(11726-7,LN, "Peak Velocity")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
AO ACC TIME	(20168-1,LN, "Acceleration Time")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
EJECTION TIME	(18041-4,LN, "Aortic Valve Ejection Time")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
AO EFFECT VALVE AREA			
LVOT FLOW PROFILE	(20354-7,LN, "Velocity Time Integral")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (G-C0E3, SRT, "Finding Site") = (T-32650,SRT, "Left Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
LVOT PEAK VELOCITY	(11726-7,LN, "Peak Velocity")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-32650,SRT, "Left Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
LVOT DIAMETER	(G-038F,SRT,	(T-32600,SRT,	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode")

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
	"Cardiovascular Orifice Diameter")	"Left Ventricle")	(R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-32650,SRT, "Left Ventricle Outflow Tract") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
LVOT AREA (d)	(G-038E,SRT, "Cardiovascular Orifice Area")	(T-35400,SRT, "Aortic Valve")	(R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125205,DCM, "Area-Length Single Plane") (G-C0E3, SRT, "Finding Site") = (T-32650,SRT, "Left Ventricle Outflow Tract") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
AO EFFECT VALVE AREA	(G-038E,SRT, "Cardiovascular Orifice Area")	(T-35400,SRT, "Aortic Valve")	(R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125215,DCM, "Continuity Equation by Velocity Time Integral") (G-C0E3, SRT, "Finding Site") = (T-35410,SRT, "Aortic Valve Ring") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
AORTIC REGURGITATION			
AO REGURGE PHT	(20280-4,LN, "Pressure Half-Time")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125210,DCM, "Area by Pressure Half-Time") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
PISA (AORTA)			
AO ALIASING VELOC	(11726-7,LN, "Peak Velocity")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (R-409E2,SRT, "Doppler Color Flow") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125216,DCM, "Proximal Isovelocity Surface Area") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
AO REG VELOCITY	(11726-7,LN, "Peak Velocity")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-32650,SRT, "Left Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
AO REG ORIFICE	(G-038E,SRT, "Cardiovascular Orifice Area")	(T-35400,SRT, "Aortic Valve")	(R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125216,DCM, "Proximal Isovelocity Surface Area") (G-C0E3, SRT, "Finding Site") = (T-32650,SRT, "Left Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
AO REG VOLUME	(33878-0,LN, "Volume Flow")	(T-35400,SRT, "Aortic Valve")	(R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125216,DCM, "Proximal Isovelocity Surface Area") (G-C0E3, SRT, "Finding Site") = (T-32650,SRT, "Left Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-0395,SRT, "Apical long axis")
LVOT FLOW PROFILE			
LVOT MEAN VELOCITY	(20352-1,LN, "Mean Velocity")	(T-42000,SRT, "Aorta")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (G-C0E3, SRT, "Finding Site") = (T-32650,SRT, "Left Ventricle Outflow Tract") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
LVOT MEAN GRADIENT	(20256-4,LN, "Mean Gradient")	(T-42000,SRT, "Aorta")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (G-C0E3, SRT, "Finding Site") = (T-32650,SRT, "Left Ventricle Outflow

ESAOTE MEASURE	*BASE MEAS. CONCEPT NAME*	*SECTION*	*CONCEPT OR ACQUISITION CONTEXT MODIFIERS*
			Tract") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
LVOT PEAK GRADIENT	(20247-3,LN, "Peak Gradient")	(T-42000,SRT, "Aorta")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (G-C0E3, SRT, "Finding Site") = (T-32650,SRT, "Left Ventricle Outflow Tract") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
		TRICUSPID	
TRICUSP FLOW PROFILE	(20354-7,LN, "Velocity Time Integral")	(T-35100,SRT, "Tricuspid Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (G-C0E3, SRT, "Finding Site") = (T-35111,SRT, "Tricuspid Annulus") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
TRIC VEL E WAVE	(18031-5,LN, "Tricuspid Valve E Wave Peak Velocity")	(T-35100,SRT, "Tricuspid Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-35111,SRT, "Tricuspid Annulus") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
TRIC VEL A WAVE	(18030-7,LN, "Tricuspid Valve A Wave Peak Velocity")	(T-35100,SRT, "Tricuspid Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-35111,SRT, "Tricuspid Annulus") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
TRIC PEAK GRAD (E)	(20247-3,LN, "Peak Gradient")	(T-35100,SRT, "Tricuspid Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-35111,SRT, "Tricuspid Annulus") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
TRIC PEAK GRAD (A)	(20247-3,LN, "Peak Gradient")	(T-35100,SRT, "Tricuspid Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-35111,SRT, "Tricuspid Annulus") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
TRIC MEAN VELOCITY	(20352-1,LN, "Mean Velocity")	(T-35100,SRT, "Tricuspid Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (G-C0E3, SRT, "Finding Site") = (T-35111,SRT, "Tricuspid Annulus") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
TRIC MEAN GRADIENT	(20256-4,LN, "Mean Gradient")	(T-35100,SRT, "Tricuspid Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-35111,SRT, "Tricuspid Annulus") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
TRICUSPID E/A RATIO	(18039-8,LN, "Tricuspid Valve E to A Ratio")	(T-35100,SRT, "Tricuspid Valve")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-35111,SRT, "Tricuspid Annulus") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
		TRIC REGURGITATION	
TRIC REG VELOCITY	(11726-7,LN, "Peak Velocity")	(T-35100,SRT, "Tricuspid Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-35111,SRT, "Tricuspid Annulus") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")

ESAOTE MEASURE	*BASE MEAS. CONCEPT NAME*	*SECTION*	*CONCEPT OR ACQUISITION CONTEXT MODIFIERS*
TRIC REG GRADIENT	(20247-3,LN, "Peak Gradient")	(T-35100,SRT, "Tricuspid Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-35111,SRT, "Tricuspid Annulus") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
RV SYST PRESSURE	(G-0380,SRT, "Right Ventricular Peak Systolic Pressure")	(T-35100,SRT, "Tricuspid Valve")	(R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-35111,SRT, "Tricuspid Annulus") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
PULMONARY VEINS			
PV SYSTOLIC VELOCITY	(29450-4,LN, "Pulmonary Vein Systolic Peak Velocity")	(T-48581,SRT, "Pulmonary Venous Structure")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
PV DIAST VELOCITY	(29451-2,LN, "Pulmonary Vein Diastolic Peak Velocity")	(T-48581,SRT, "Pulmonary Venous Structure")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
REV ATRIAL VELOCITY	(29453-8,LN, "Pulmonary Vein Atrial Contraction Reversal Peak Velocity")	(T-48581,SRT, "Pulmonary Venous Structure")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
A WAVE DURATION	(G-038B,SRT, "Pulmonary Vein A-Wave Duration")	(T-48581,SRT, "Pulmonary Venous Structure")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
PV SYST / DIAST VEL	(29452-0,LN, "Pulmonary Vein Systolic to Diastolic Ratio")	(T-48581,SRT, "Pulmonary Venous Structure")	(G-0373, SRT, "Image Mode") = (R-409E4,SRT, "Doppler Pulsed") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
PULMONARY ARTERY			
PULM FLOW PROFILE	(20354-7,LN, "Velocity Time Integral")	(T-35200,SRT, "Pulmonic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (G-C0E3, SRT, "Finding Site") = (T-32550,SRT, "Right Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0398,SRT, "Parasternal short axis at the aortic valve level")
PULM MEAN VELOCITY	(20352-1,LN, "Mean Velocity")	(T-35200,SRT, "Pulmonic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (G-C0E3, SRT, "Finding Site") = (T-32550,SRT, "Right Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0398,SRT, "Parasternal short axis at the aortic valve level")
PULM MEAN GRADIENT	(20256-4,LN, "Mean Gradient")	(T-35200,SRT, "Pulmonic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-32550,SRT, "Right Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0398,SRT, "Parasternal short axis at the aortic valve level")

ESAOTE MEASURE	*BASE MEAS. CONCEPT NAME*	*SECTION*	*CONCEPT OR ACQUISITION CONTEXT MODIFIERS*
PULM PEAK VELOCITY	(11726-7,LN, "Peak Velocity")	(T-35200,SRT, "Pulmonic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-32550,SRT, "Right Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0398,SRT, "Parasternal short axis at the aortic valve level")
PULM PEAK GRADIENT	(20247-3,LN, "Peak Gradient")	(T-35200,SRT, "Pulmonic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-32550,SRT, "Right Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0398,SRT, "Parasternal short axis at the aortic valve level")
PULM ACC TIME	(20168-1,LN, "Acceleration Time")	(T-44000,SRT, "Pulmunary Artery")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-32550,SRT, "Right Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-039D,SRT, "Right Ventricular Outflow Tract View")
PULM REGURGITATION			
PULM REG PHT	(20280-4,LN, "Pressure Half-Time")	(T-35200,SRT, "Pulmonic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125210,DCM, "Area by Pressure Half-Time") (G-C0E3, SRT, "Finding Site") = (T-32550,SRT, "Right Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-039D,SRT, "Right Ventricular Outflow Tract View")
PULM PEAKDIAST VEL	(11726-7,LN, "Peak Velocity")	(T-35200,SRT, "Pulmonic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C0E3, SRT, "Finding Site") = (T-32550,SRT, "Right Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-039D,SRT, "Right Ventricular Outflow Tract View")
PULM ENDDIAST VEL	(11726-7,LN, "Peak Velocity")	(T-35200,SRT, "Pulmonic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C0E3, SRT, "Finding Site") = (T-32550,SRT, "Right Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-039C,SRT, "Right Ventricular Inflow Tract View")
PULM PEAKDIAST GRAD	(20247-3,LN, "Peak Gradient")	(T-44000,SRT, "Pulmunary Artery")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-32550,SRT, "Right Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-039D,SRT, "Right Ventricular Outflow Tract View")
PULM ENDDIAST GRAD	(20247-3,LN, "Peak Gradient")	(T-35200,SRT, "Pulmonic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C036, SRT, "Measurement Method") = (125218,DCM, "Simplified

ESAOTE MEASURE	*BASE MEAS. CONCEPT NAME*	*SECTION*	*CONCEPT OR ACQUISITION CONTEXT MODIFIERS*
			Bernoulli") (G-C0E3, SRT, "Finding Site") = (T-32550,SRT, "Right Ventricle Outflow Tract") (G-C048, SRT, "Flow Direction") = (R-42E61,SRT, "Regurgitant Flow") (111031, DCM, "Image View") = (G-039D,SRT, "Right Ventricular Outflow Tract View")
CARDIAC OUTPUT-LVOT			
STROKE VOLUME	(F-32120,SRT, "Stroke Volume")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (G-C036, SRT, "Measurement Method") = (125219,DCM, "Doppler Volume Flow") (G-C0E3, SRT, "Finding Site") = (T-32650,SRT, "Left Ventricle Outflow Tract") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
CARDIAC OUTPUT-AORTA			
AORTIC DIAMETER	(18015-8,LN, "Aortic Root Diameter")	(T-42000,SRT, "Aorta")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
AORTIC AREA (d)	(G-038E,SRT, "Cardiovascular Orifice Area")	(T-42000,SRT, "Aorta")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
STROKE VOLUME	(F-32100,SRT, "Cardiac Output")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (G-C036, SRT, "Measurement Method") = (125219,DCM, "Doppler Volume Flow") (G-C0E3, SRT, "Finding Site") = (T-32650,SRT, "Left Ventricle Outflow Tract") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
CARDIAC OUTPUT-PULM			
PA DIAMETER	(18020-8,LN, "Main Pulmonary Artery Diameter")	(T-44000,SRT, "Pulmunary Artery")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (111031, DCM, "Image View") = (G-0397,SRT, "Parasternal short axis")
STROKE VOLUME	(F-32120,SRT, "Stroke Volume")	(T-32500,SRT, "Right Ventricle")	(G-0373, SRT, "Image Mode") = (R-409E3,SRT, "Doppler Continuouos Wave") (G-C036, SRT, "Measurement Method") = (125219,DCM, "Doppler Volume Flow") (G-C0E3, SRT, "Finding Site") = (T-32550,SRT, "Right Ventricle Outflow Tract") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
B-MODE			
EF (SIMPSON)			
4C DIASTOLIC AREA	(G-0375,SRT, "Left Ventricular Diastolic Area")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C036, SRT, "Measurement Method") = (125207,DCM, "Method of Disks, Biplane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
4C SYSTOLIC AREA	(G-0374,SRT, "Left Ventricular Systolic Area")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole") (G-C036, SRT, "Measurement Method") = (125207,DCM, "Method of Disks, Biplane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
2C DIASTOLIC AREA	(G-0375,SRT, "Left Ventricular Diastolic Area")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C036, SRT, "Measurement Method") = (125207,DCM, "Method of Disks, Biplane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-A19B,SRT, "Apical two chamber")
2C SYSTOLIC AREA	(G-0374,SRT, "Left Ventricular Systolic	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole")

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
	Area")		(G-C036, SRT, "Measurement Method") = (125207,DCM, "Method of Disks, Biplane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-A19B,SRT, "Apical two chamber")
LV DIASTOLIC VOLUME	(18026-5,LN, "Left Ventricular End Diastolic Volume")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C036, SRT, "Measurement Method") = (125207,DCM, "Method of Disks, Biplane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle")
LV SYSTOLIC VOLUME	(18148-7,LN, "Left Ventricular End Systolic Volume")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole") (G-C036, SRT, "Measurement Method") = (125207,DCM, "Method of Disks, Biplane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle")
EJECTION FRACTION	(18043-0,LN, "Left Ventricular Ejection Fraction")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125207,DCM, "Method of Disks, Biplane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle")
STROKE VOLUME	(F-32120,SRT, "Stroke Volume")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C036, SRT, "Measurement Method") = (125207,DCM, "Method of Disks, Biplane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle")
HEART RATE	(8867-4,LN, "Heart rate")	(T-32600,SRT, "Left Ventricle")	(G-C036, SRT, "Measurement Method") = (125207,DCM, "Method of Disks, Biplane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle")
CARDIAC OUTPUT	(F-32100,SRT, "Cardiac Output")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C036, SRT, "Measurement Method") = (125207,DCM, "Method of Disks, Biplane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle")
EF (AREA-LENGTH)
LV DIASTOLIC AREA	(G-0375,SRT, "Left Ventricular Diastolic Area")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (G-C036, SRT, "Measurement Method") = (125205,DCM, "Area-Length Single Plane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
LV DIASTOLIC AXIS	(18077-8,LN, "Left Ventricle diastolic major axis")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
LV DIASTOLIC VOLUME	(18026-5,LN, "Left Ventricular End Diastolic Volume")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C036, SRT, "Measurement Method") = (125205,DCM, "Area-Length Single Plane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
LV SYSTOLIC AREA	(G-0374,SRT, "Left Ventricular Systolic Area")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole") (G-C036, SRT, "Measurement Method") = (125205,DCM, "Area-Length Single Plane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
LV SYSTOLIC AXIS	(29438-9,LN, "Left Ventricle Internal Systolic Dimension")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole") (G-C036, SRT, "Measurement Method") = (125204,DCM, "Area-Length Biplane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
LV SYSTOLIC VOLUME	(18148-7,LN, "Left Ventricular End Systolic Volume")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole") (G-C036, SRT, "Measurement Method") = (125205,DCM, "Area-Length Single Plane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle")

ESAOTE MEASURE	*BASE MEAS. CONCEPT NAME*	*SECTION*	*CONCEPT OR ACQUISITION CONTEXT MODIFIERS*
			(111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
EJECTION FRACTION	(18043-0,LN, "Left Ventricular Ejection Fraction")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C036, SRT, "Measurement Method") = (125204,DCM, "Area-Length Biplane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle")
STROKE VOLUME	(F-32120,SRT, "Stroke Volume")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C036, SRT, "Measurement Method") = (125205,DCM, "Area-Length Single Plane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
HEART RATE	(8867-4,LN, "Heart rate")	(T-32600,SRT, "Left Ventricle")	(G-C036, SRT, "Measurement Method") = (125205,DCM, "Area-Length Single Plane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle")
CARDIAC OUTPUT	(F-32100,SRT, "Cardiac Output")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C036, SRT, "Measurement Method") = (125205,DCM, "Area-Length Single Plane") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle")
LEFT VENTRICLE			
IV SEPTUM-DIASTOLE	(18154-5,LN, "Interventricular Septum Diastolic Thickness")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
LV DIAMETER-DIAST	(29436-3,LN, "Left Ventricle Internal End Diastolic Dimension")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
POST WALL-DIASTOLE	(18152-9,LN, "Left Ventricle Posterior Wall Diastolic Thickness")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
LV DIAMETER-SYST	(29438-9,LN, "Left Ventricle Internal Systolic Dimension")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
EJECTION FRACTION	(18043-0,LN, "Left Ventricular Ejection Fraction")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C036, SRT, "Measurement Method") = (125206,DCM, "Cube Method") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
LV FRACT SHORTENING	(18051-3,LN, "Left Ventricular Fractional Shortening")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
LV MASS	(18087-7,LN, "Left Ventricle Mass")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
AORTA			
AORTIC PLANIMETRY	(G-038E,SRT, "Cardiovascular Orifice Area")	(T-42000,SRT, "Aorta")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0397,SRT, "Parasternal short axis")
AORTIC VALVE OPENING	(17996-0,LN, "Aortic Valve Cusp Separation")	(T-42000,SRT, "Aorta")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
RIGHT VENTRICLE			
RV DIAMETER-DIAST	(20304-2,LN, "Right Ventricular Internal Diastolic Dimension")	(T-32500,SRT, "Right Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")

ESAOTE MEASURE	*BASE MEAS. CONCEPT NAME*	*SECTION*	*CONCEPT OR ACQUISITION CONTEXT MODIFIERS*
RV AREA	(17988-7,LN, "Right Atrium Systolic Area")	(T-32500,SRT, "Right Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
RV LONG AXIS	(20304-2,LN, "Right Ventricular Internal Diastolic Dimension")	(T-32500,SRT, "Right Ventricle")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32010,SRT, "Diastole") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
MITRAL				
MIT ANNULUS DIAMETER	(G-038F,SRT, "Cardiovascular Orifice Diameter")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C0E3, SRT, "Finding Site") = (T-35313,SRT, "Mitral Annulus") (111031, DCM, "Image View") = (G-0397,SRT, "Parasternal short axis")
MIT ANNULUS AREA	(G-038E,SRT, "Cardiovascular Orifice Area")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C0E3, SRT, "Finding Site") = (T-35313,SRT, "Mitral Annulus") (111031, DCM, "Image View") = (G-0397,SRT, "Parasternal short axis")
MITRAL AREA	(G-038E,SRT, "Cardiovascular Orifice Area")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (G-C0E3, SRT, "Finding Site") = (T-35313,SRT, "Mitral Annulus") (G-C048, SRT, "Flow Direction") = (R-42047,SRT, "Antegrade Flow") (111031, DCM, "Image View") = (G-0397,SRT, "Parasternal short axis")
LEFT ATRIUM				
LEFT ATRIUM AREA 4C	(17977-0,LN, "Left Atrium Systolic Area")	(T-32300,SRT, "Left Atrium")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
LEFT ATRIUM AREA 2C	(17977-0,LN, "Left Atrium Systolic Area")	(T-32300,SRT, "Left Atrium")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (111031, DCM, "Image View") = (G-A19B,SRT, "Apical two chamber")
LA DIAMETER	(29469-4,LN, "Left Atrium Antero-posterior Systolic Dimension")	(T-32300,SRT, "Left Atrium")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
LEFT ATRIUM VOLUME	(G-0383,SRT, "Left Atrium Systolic Volume")	(T-32300,SRT, "Left Atrium")	(G-0373, SRT, "Image Mode") = (G-03A2,SRT, "2D mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C036, SRT, "Measurement Method") = (125220,DCM, "Planimetry") (111031, DCM, "Image View") = (G-A19C,SRT, "Apical four chamber")
M-MODE				
LEFT VENTRICLE				
RV DIAMETER-DIAST	(20304-2,LN, "Right Ventricular Internal Diastolic Dimension")	(T-32500,SRT, "Right Ventricle")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
IV SEPTUM-DIASTOLE	(18154-5,LN, "Interventricular Septum Diastolic Thickness")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
LV DIAMETER-DIAST	(29436-3,LN, "Left Ventricle Internal End Diastolic Dimension")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
POST WALL-DIASTOLE	(18152-9,LN, "Left Ventricle Posterior Wall Diastolic Thickness")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32011,SRT, "End Diastole") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
IV SEPTUM-SYSTOLE	(18158-6,LN, "Interventricular Septum Systolic Thickness")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")

ESAOTE MEASURE	*BASE MEAS. CONCEPT NAME*	*SECTION*	*CONCEPT OR ACQUISITION CONTEXT MODIFIERS*
LV DIAMETER-SYST	(29438-9,LN, "Left Ventricle Internal Systolic Dimension")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
POST WALL-SYSTOLE	(18156-0,LN, "Left Ventricle Posterior Wall Systolic Thickness")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
EJECTION FRACTION	(18043-0,LN, "Left Ventricular Ejection Fraction")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (G-C036, SRT, "Measurement Method") = (125209,DCM, "Teichholz") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
LV FRACT SHORTENING	(18051-3,LN, "Left Ventricular Fractional Shortening")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
SEPTUM THICKENING	(18054-7,LN, "Interventricular Septum % Thickening")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
PW THICKENING	(18053-9,LN, "Left Ventricle Posterior Wall % Thickening")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
LV MASS	(18087-7,LN, "Left Ventricle Mass")	(T-32600,SRT, "Left Ventricle")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (G-C036, SRT, "Measurement Method") = (125221,DCM, "Left Ventricle Mass by M-mode") (G-C0E3, SRT, "Finding Site") = (T-32600,SRT, "Left Ventricle") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
AORTA/LEFT ATRIUM			
AORTIC DIAMETER	(18015-8,LN, "Aortic Root Diameter")	(T-42000,SRT, "Aorta")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
LEFT ATRIUM	(29469-4,LN, "Left Atrium Antero-posterior Systolic Dimension")	(T-32300,SRT, "Left Atrium")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
AORTIC VALVE OPENING	(17996-0,LN, "Aortic Valve Cusp Separation")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
EJECTION TIME	(18041-4,LN, "Aortic Valve Ejection Time")	(T-35400,SRT, "Aortic Valve")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (R-4089A, SRT, "Cardiac Cycle Point") = (F-32020,SRT, "Systole") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
LEFT ATRIUM/AO DIAM	(17985-3,LN, "Left Atrium to Aortic Root Ratio")	(T-32300,SRT, "Left Atrium")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (R-4089A, SRT, "Cardiac Cycle Point") = (109070,DCM, "End Systole") (G-C0E3, SRT, "Finding Site") = (T-42000,SRT, "Aorta") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")
MITRAL			
EF SLOPE	(18040-6,LN, "Mitral Valve E-F Slope by M-Mode")	(T-35300,SRT, "Mitral Valve")	(G-0373, SRT, "Image Mode") = (G-0394,SRT, "M mode") (G-C0E3, SRT, "Finding Site") = (T-35300,SRT, "Mitral Valve") (111031, DCM, "Image View") = (G-0396,SRT, "Parasternal long axis")

8.3 DATA DICTIONARY OF PRIVATE ATTRIBUTES

The Private Attributes added to created SOP Instances are listed in the Table below. The MyLab system reserves blocks of private attributes in group 6161. Further details on usage of these private attributes are contained in Section 8.1.

Table 83
DATA DICTIONARY OF PRIVATE ATTRIBUTES

Tag	Attribute Name	VR	VM
(6161,0010)	Private Creator	LO	1
(6161,1030)	Report in Esaote proprietary format	OB	1
(6161,0011)	Private Creator	LO	1
(6161,1130)	Report in Esaote proprietary XML format	OB	1

8.4 CODED TERMINOLOGY AND TEMPLATES

Not applicable.

8.5 STANDARD EXTENDED / SPECIALIZED / PRIVATE SOP CLASSES

No Specialized or Private SOP Classes are supported.

8.5.1 US, US Multiframe and Secondary Capture Image Storage SOP Classes

The US, US Multiframe and Secondary Capture Image Storage SOP Classes are extended to create Standard Extended SOP Classes by addition of standard and private attributes to the created SOP Instances as documented in Section 8.1.

8.6 PRIVATE TRANSFER SYNTAXES

No Private Transfer Syntaxes are supported.