



**MyLab 9, X5, X6/X7, X8, X9, X75, X90,
Omega and Sigma Platforms;
MyLab XPro30, MyLab XPro80**

Ultrasound Scanners

DICOM Conformance Statement

Document Version C7.13

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1 CONFORMANCE STATEMENT OVERVIEW

Systems belonging to the MyLab 9, X5, X6/X7, X8, X9, X75, X90, Omega and Sigma Platforms, MyLab XPro30, MyLab XPro80, are Ultrasound scanners made by Esaote; their software is based upon the Windows® 10 Operating System. This DICOM® Conformance Statement (DCS) specifies the conformance to the DICOM standard¹ for these Esaote MyLab systems having the covered SW builds.

The covered MyLab systems implement the necessary DICOM services to download work lists from an information system, to save acquired Ultrasound images, clips and Structured Report objects² to a network storage device, to save them on a CD-R, DVD, USB and Flash Memory, or to print images to a networked hardcopy device. It is also possible to retrieve and display Ultrasound, Ultrasound Multiframe and Secondary Capture objects from media and from a Query/Retrieve server.

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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 (*)	Yes (*) (***)
Ultrasound Multiframe Image Storage	Yes (*)	Yes (*) (***)
Secondary Capture Image Storage	Yes (*)	Yes (*) (***)
Comprehensive SR Storage	Yes (*) (**)	No
Query/Retrieve		
Study Root Information Model FIND	Yes (*) (***)	No
Study Root Information Model MOVE	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.

(***) Ultrasound, Ultrasound-Multiframe and Secondary Capture images only; other modalities are enabled by the purchasable Multimodality Archive and Query/Retrieve option.

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 (*)	Yes (*)(**)
Ultrasound Spatial Calibration Single and Multiframe CD-R Interchange (STD-US-SC-MF-CDR)	Yes (*)	Yes (*)
DVD		
General Purpose DVD with Compression Interchange (STD-GEN-DVD-JPEG)	Yes (*)	Yes (*)(**)
Ultrasound Spatial Calibration Single and Multiframe DVD Interchange (STD-US-SC-MF-DVD)	Yes (*)	Yes (*)
USB and Flash Memory		
General Purpose USB Media Interchange with JPEG (STD-GEN-USB-JPEG)	Yes (*)	Yes (*)(**)

(*) Enabled by the purchasable DICOM option.

(**) Ultrasound, Ultrasound-Multiframe and Secondary Capture images only; other modalities are enabled by the purchasable Multimodality Archive and Query/Retrieve option.

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3 INTRODUCTION

3.1 REVISION HISTORY

**Table 3
REVISION HISTORY**

Document Version	Date of Issue	Author	Description	Systems	SW build
C7.13	Jun. 21 th , 2022.	Luigi Pampana Biancheri	<ul style="list-style-type: none"> - New sw builds and model. - Changed tables 20, 23, 69 for new supported SOP Classes and Transfer Syntaxes. - Minor fixes. 	MyLab 9, X5, X6/X7, X8, X9, X75, X90, Omega and Sigma Platforms; MyLab XPro30, MyLab XPro80.	F11XXXX Q11XXXX ³

This document applies to all the software releases identified by the SW builds listed in the above table, for the MyLab systems indicated (please note that every “X” in the SW build column stay for a number); when not indicated, all the sw releases having the same build number share the same DICOM behaviour. Always check for the latest version of this document covering the desired system and software build. 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 any other information, or for the latest version of this document, please contact Esaote:

E-mail: dicom@esaote.com

Web site: <http://www.esaote.com/dicom.htm>

Please note that this document can be changed at any time without notice. Esaote provides this documentation without warranty of any kind.

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

<p>Esaote S.p.A. Via Melen 77 16152 Genova Italy</p>
--

<p>Esaote Europe B.V. Philipsweg 1 6227AJ Maastricht The Netherlands</p>
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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 Not all the sw builds are available for all the listed models.

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 build, and are described in the Table 4, that describes also the DCMLab releases present in the various MyLab software builds. Please note that any “X” in the Software build and Implementation Version Name columns stay for a number. Please note some of the listed systems and software builds can be available only for particular countries.

Table 4
IMPLEMENTATION IDENTIFYING INFORMATION

System	Software build	DCMLab SW Release	Implementation Class UID	Implementation Version Name
MyLab 9, X5, X6/X7, X8, X9, X75, X90, Omega and Sigma Platforms; MyLab XPro30, MyLab XPro80.	F11XXXX Q11XXXX⁴	3.4.8.X VC++ 14.0	1.3.76.2.3.3	X.XX.XX F11XXXX_ X.XX.XX Q11XXXX_

⁴ Not all the sw builds are available for all the listed models.

4 NETWORKING

4.1 IMPLEMENTATION MODEL

4.1.1 Application Data Flow ⁵

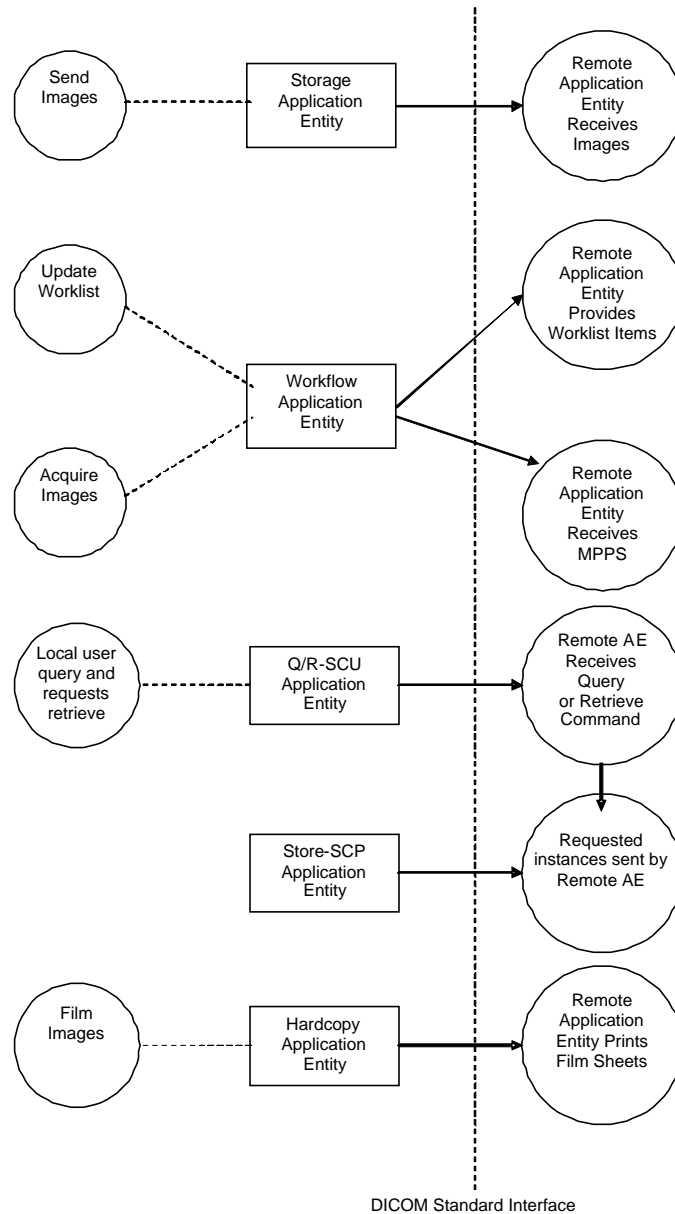


Figure 1
APPLICATION DATA FLOW DIAGRAM

— The Storage Application Entity sends images, clips and Structured Report objects ⁶ to a remote AE. It is associated with the local real-world activity "Send Images". "Send Images" is performed upon user

⁵ Storage Commitment and MPPS SOP Classes not present in in VET models.

⁶ DICOM Structured Report not available in VET models.

request for each study when closing it, or for specific studies selected from the hard disk database, or (according to the models) directly sending any image and clip as soon as it is acquired and stored into the local 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.

- The Workflow Application Entity receives Worklist information from and sends MPPS information ⁷ 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 Q/R-SCU Application Entity can query a DICOM Query/Retrieve SCP Application over the network, and then retrieve the instances to the local archive, from which they can be seen.
- The Store-SCP Application Entity can receive the images over the network from a Storage SCU, either requested using the Q/R-SCU Application Entity or unsolicited.
- 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 when closing the current study, from the database panel, or directly sending, over a separate association, any image and clip as soon as it is acquired and stored into the local database; in this case the clips acquired during a stress testing protocol and the measurement report (secondary capture images or structured report objects) are sent together, on a further separate association, when closing the study.

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 ⁸, 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 restart it later by the user via job control interface. The Storage AE will not try to initiate another association for this send job automatically.

⁷ MPPS SOP Class is not available in VET models.

⁸ DICOM Structured Report not available in VET models.

4.1.2.2 Functional Definition of Workflow Application Entity ⁹

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. In any case when a worklist item is used to start an exam it will be grayed, so the user, even when the worklist server is not available, can be aware of the already executed exams.

The Workflow AE performs the creation of a MPPS Instance automatically whenever the exam is started. When closing the exam, the MPPS "COMPLETE" or "DISCONTINUED" states can be chosen from the user interface. In case of automatic saving of the exam to a DICOM server, the MPPS message will be "COMPLETE" when one or more images have been acquired, "DISCONTINUED" otherwise.

4.1.2.3 Functional Definition of Store-SCP Application Entity

The Store-SCP waits in the background for connections and accepts associations with Presentation Contexts for the SOP Classes of the Storage Service Class. Instances received after sending a retrieve command to a remote Q/R SCP will be immediately added to the local database, where they may subsequently be listed and viewed through the user interface; unsolicited instances will be put in a temporary storage area, where they can be moved to the local database.

4.1.2.4 Functional Definition of Q/R-SCU Application Entity

A connection from the Q/R-SCU to the remote AE is established to execute a query of the remote archive using the decided criteria. When the user selects a study, a connection to the remote AE is established to initiate and monitor the retrieval: the Store-SCP AE receives the retrieved instances.

4.1.2.5 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.

On the MyLab keyboard, according to the model, there are one or more print keys; 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.

⁹ MPPS SOP Class not present in VET models.

4.1.3 Sequencing of Real-World Activities ¹⁰

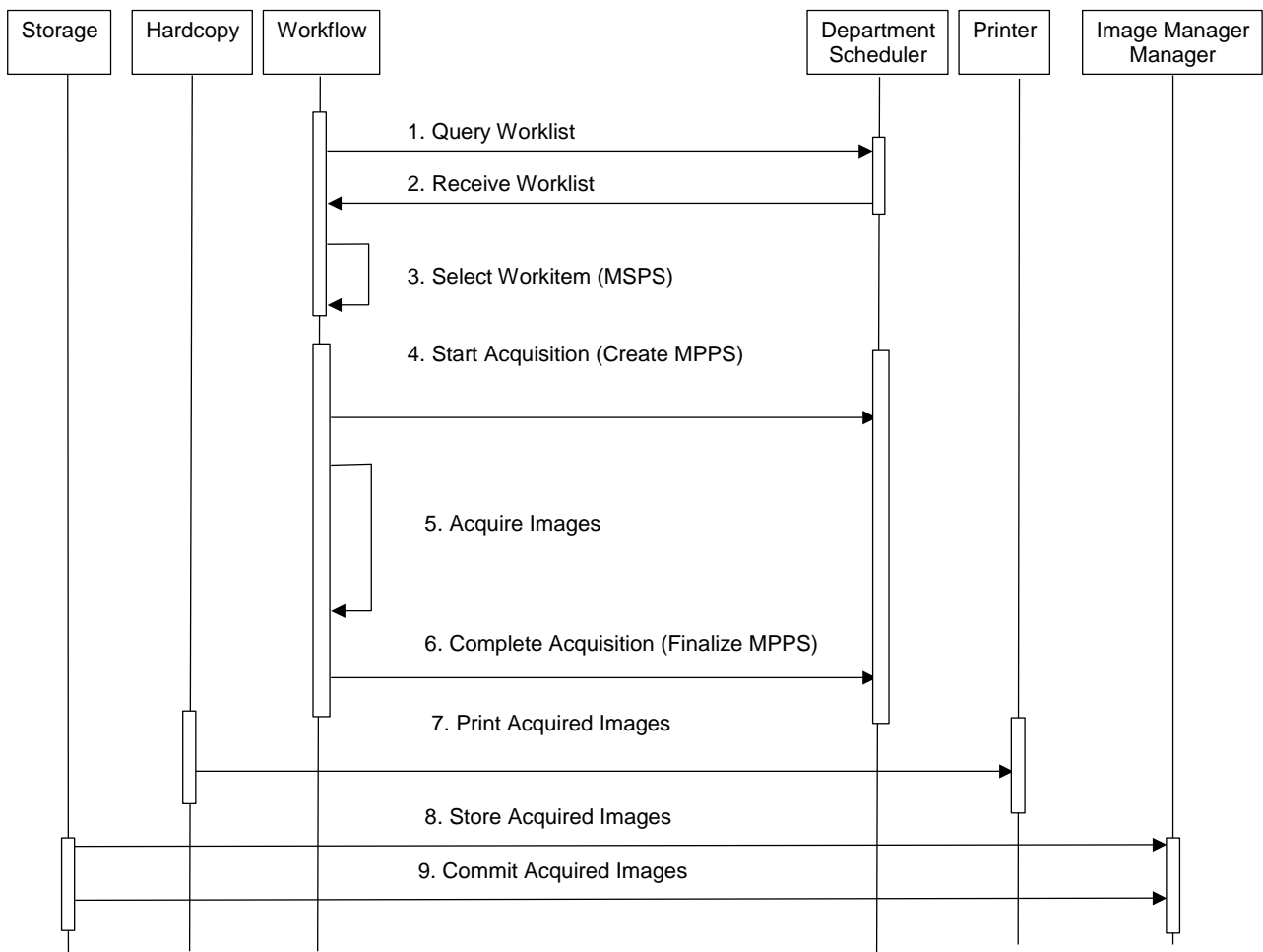


Figure 2
APPLICATION DATA FLOW DIAGRAM

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.

¹⁰ Storage Commitment and MPPS SOP Classes not present in VET models.

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.

Q/R-SCU and Store-SCP activities are performed in a completely independent way from the above activities. The Q/R-SCU activities are sequentially initiated in the user interface, and another activity may not be initiated until the prior activity has completed, including receiving the related images with the Store-SCP.

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 ¹¹	1.2.840.10008.5.1.4.1.1.88.33	Yes	No
Storage Commitment Push Model ¹²	1.2.840.10008.1.20.1	Yes	No
Verification	1.2.840.10008.1.1	Yes	Yes ¹³

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
---	---

¹¹ Comprehensive SR Storage SOP Class not present in VET models.

¹² Storage Commitment SOP Class not present in VET models.

¹³ Only active when the Storage Commitment and/or the Query/Retrieve are enabled.

4.2.1.2.4 Implementation Identifying Information

See section 3.8.

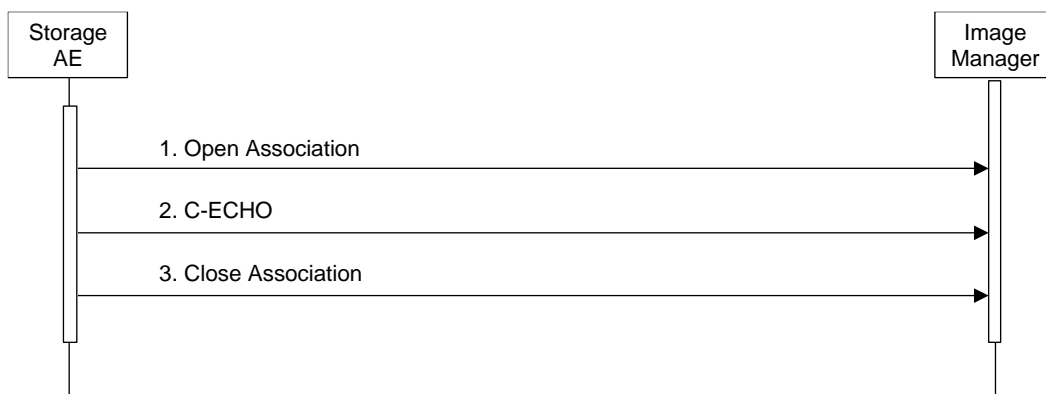
4.2.1.3 Association Initiation Policy

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. 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

4.2.1.3.1.3 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 ¹⁴

4.2.1.3.2.1 Description and Sequencing of Activities

The Storage AE is invoked to send images, clips and SR objects¹⁵ 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. In the configuration of the system for each DICOM Store SCP configured there is an AUTOMATIC RETRY check; when enabled, when the association cannot be established for a network problem, or because the server rejects it, or when a network error occurs when sending a file, before immediately switching the job to a failed state, it will be automatically re-sent after a configurable interval of time, for a configurable number of times; when the number of configured retries has expired without success, the job will be put to a failed state.

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).

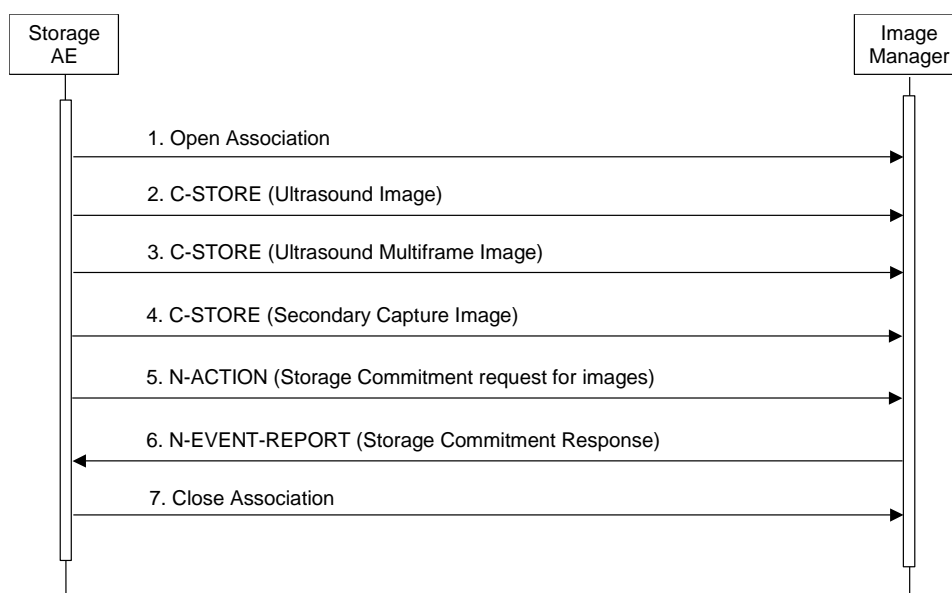


Figure 4
SEQUENCING OF ACTIVITY – SEND IMAGES

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:

¹⁴ Storage Commitment SOP Class not present in VET models.

¹⁵ DICOM Structured Report not available in VET models.

1. The Storage AE opens an association with the Image Manager.
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	JPEG lossy Baseline (Process 1)	1.2.840.10008.1.2.4.50	SCU	None
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		

Comprehensive SR Storage ¹⁶	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 ¹⁷	1.2.840.10008.1.20.1	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. For each Storage SCP destination, the following choices are allowed for IMAGE QUALITY:

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

The Presentation Context for Ultrasound Multiframe Images can be changed, for each Storage SCP destination, 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. It is also possible to completely disable the DICOM sending of the clips, to avoid errors with servers that do not support these objects. It is also possible to reduce the frame matrix of the exported clips: for MATRIX SIZE a slider allows to select SMALL, MEDIUM and FULL.

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 control application. This is a transient failure.
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.

¹⁶ Not present in VET models.

¹⁷ Storage Commitment SOP Class not present in VET models.

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.

A failed send job can be restarted by user interaction: only the failed images will be re-sent. In the configuration of the system for each DICOM Store SCP configured there is an AUTOMATIC RETRY check; when enabled, when the association cannot be established for a network problem, or because the server rejects it, or when a network error occurs when sending a file, before immediately switching the job to a failed state, it will be automatically re-sent after a configurable interval of time, for a configurable number of times; when the number of configured retries has expired without success, the job will be put to a failed state.

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, for each Storage SCP destination it is possible to select among the following choices:

1. STRUCTURED REPORT¹⁸: a Comprehensive SR object will be created for applications that allow it (human "CARDIAC", "VASCULAR", "ABDOMINAL", "OB-FETAL" and "GYNECOLOGY"), while the report will be written in the pixels of one or more Secondary Capture images for the other applications. By checking "ADD MEASUREMENT FILE" the report will also be added into the proprietary attributes contained in the SR object (when produced), in the original proprietary format; this is intended to provide specific applications supported by Esaote the way to get the complete report in the Esaote format;
2. DICOM VIEWER COMPATIBLE IMAGE: 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. NONE: the report will not be sent at all;

¹⁸ DICOM Structured Report not available in VET models.

4.2.1.3.2.4 SOP Specific Conformance for Storage Commitment SOP Class ¹⁹

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 SR²⁰ 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.

¹⁹ Storage Commitment SOP Class not present in VET models.

²⁰ 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

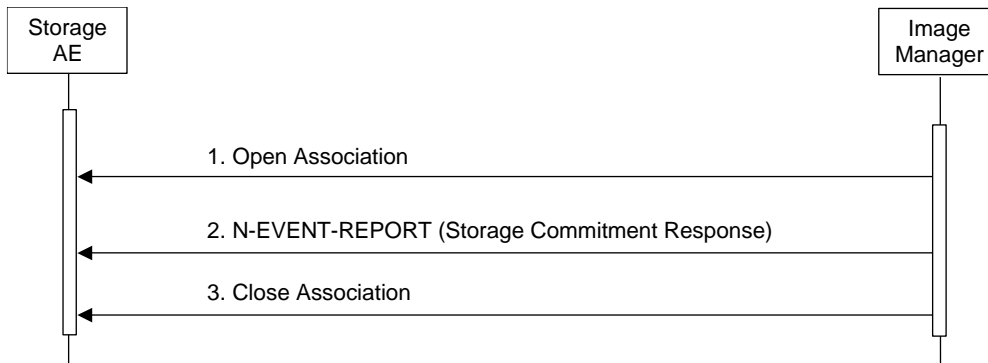
Service Status	Further Meaning	Error Code	Reasons
Success	Success	0000	The storage commitment result has been successfully received.
Failure	Unrecognized Operation	0211H	The Transaction UID in the N-EVENT-REPORT request is not recognized (was never issued within an N-ACTION request).
Failure	Resource 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 ²¹

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

²¹ The Storage AE will not accept associations when Storage Commitment SOP Class is 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		Role	Ext. Neg.
Name	UID	Name List	UID List		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
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 Store-SCP Application Entity Specification

4.2.2.1 SOP Classes

Store-SCP provide Standard Conformance to the following SOP Class(es):

Table 20
SOP CLASSES SUPPORTED BY STORE-SCP

SOP Class Name	SOP Class UID	SCU	SCP
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	No	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	No	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Yes
CT Image Storage (*)	1.2.840.10008.5.1.4.1.1.2	No	Yes
MR Image Storage (*)	1.2.840.10008.5.1.4.1.1.4	No	Yes
Nuclear Medicine Image Storage (*)	1.2.840.10008.5.1.4.1.1.20	No	Yes
Positron Emission Tomography Image Storage (*)	1.2.840.10008.5.1.4.1.1.128	No	Yes
Computed Radiography Image Storage (*)	1.2.840.10008.5.1.4.1.1.1	No	Yes
Digital X-Ray Image Storage - For Presentation (*)	1.2.840.10008.5.1.4.1.1.1.1	No	Yes
Digital Mammography X-Ray Image Storage - For Presentation (*)	1.2.840.10008.5.1.4.1.1.1.2	No	Yes
RT Structure Set Storage (*)	1.2.840.10008.5.1.4.1.1.481.3	No	Yes
Breast Tomosynthesis Image Storage (*)	1.2.840.10008.5.1.4.1.1.13.1.3	No	Yes
Enhanced MR Image Storage (*)	1.2.840.10008.5.1.4.1.1.4.1	No	Yes
X-Ray Angiographic Image Storage (*)	1.2.840.10008.5.1.4.1.1.12.1	No	Yes
Grayscale Softcopy Presentation State Storage (*)	1.2.840.10008.5.1.4.1.1.11.1	No	Yes

Please note the SOP Classes indicated with (*) are only enabled by the purchasable Multimodality Archive and Query/Retrieve option.

4.2.2.2 Association Policies

4.2.2.2.1 General

Store-SCP accepts but never initiates associations.

Table 21
MAXIMUM PDU SIZE RECEIVED AS A SCP FOR STORE-SCP

Maximum PDU size received	128 Kbytes
---------------------------	------------

4.2.2.2.2 Number of Associations

Table 22
NUMBER OF ASSOCIATIONS AS A SCP FOR STORE-SCP

Maximum number of simultaneous associations	1
---	---

4.2.2.2.3 Asynchronous Nature

Store-SCP will only allow a single outstanding operation on an Association. Therefore, Store-SCP will not perform asynchronous operations window negotiation.

4.2.2.2.4 Implementation Identifying Information

See Section 3.8.

4.2.2.3 Association Initiation Policy

Store-SCP does not initiate associations.

4.2.2.4 Association Acceptance Policy

When Store-SCP accepts an association, it will respond to storage requests. If the Called AE Title does not match the pre-configured AE Title, the association will be rejected. Unsolicited instances will only be accepted if the system is accordingly configured, otherwise only the instances requested by the Q/R-SCU AE will be accepted.

4.2.2.4.1 Activity – Receive Storage Request

4.2.2.4.1.1 Description and Sequencing of Activities

As instances are received they are copied to the local file system and a record inserted into the local database. If the received instance is a duplicate of a previously received instance, the new instance will be rejected. Instances received after sending a retrieve command to a remote Q/R SCP will be immediately added to the local database, where they may subsequently be listed and viewed through the user interface; unsolicited instances will be put in a temporary storage area, where they can be moved to the local database.

4.2.2.4.1.2 Accepted Presentation Contexts

Table 23
ACCEPTABLE PRESENTATION CONTEXTS FOR
STORE-SCP AND RECEIVE STORAGE REQUEST

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG lossy Baseline (Process 1)	1.2.840.10008.1.2.4.50	SCP	None
		RLE	1.2.840.10008.1.2.5	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG lossy Baseline (Process 1)	1.2.840.10008.1.2.4.50	SCP	None
		RLE	1.2.840.10008.1.2.5	SCP	None
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	JPEG lossy Baseline (Process 1)	1.2.840.10008.1.2.4.50	SCP	None
CT Image Storage (*)	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.90	SCP	None

		(Lossless Only)			
MR Image Storage (*)	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None
Nuclear Medicine Image Storage (*)	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None
Positron Emission Tomography Image Storage (*)	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None
Computed Radiography Image Storage (*)	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None
Digital X-Ray Image Storage - For Presentation (*)	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None

Digital Mammography X-Ray Image Storage - For Presentation (*)	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None
RT Structure Set Storage (*)	1.2.840.10008.5.1.4.1.1.481.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Breast Tomosynthesis Image Storage (*)	1.2.840.10008.5.1.4.1.1.13.1.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None
Enhanced MR Image Storage (*)	1.2.840.10008.5.1.4.1.1.4.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None
X-Ray Angiographic Image Storage (*)	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None
Grayscale Softcopy Presentation State Storage (*)	1.2.840.10008.5.1.4.1.1.11.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None

Please note the SOP Classes indicated with (*) are only enabled by the purchasable Multimodality Archive and Query/Retrieve option.

4.2.2.4.1.2.1. Extended Negotiation

No extended negotiation is performed, though Store-SCP:

- is a Level 2 Storage SCP (Full – does not discard any data elements)
- does not support digital signatures
- does not coerce any received data elements

4.2.2.4.1.3 SOP Specific Conformance**4.2.2.4.1.3.1. SOP Specific Conformance to Storage SOP Classes**

Store-SCP provides standard conformance to the Storage Service Class.

4.2.2.4.1.3.2. Presentation Context Acceptance Criterion

All the above listed presentation contexts will be accepted.

4.2.2.4.1.3.3. Transfer Syntax Selection Policies

The Store-SCP AE will place the highest priority on the first syntax listed in the Accepted Presentation Contexts Table above, and decreasing priority on the following syntaxes.

4.2.2.4.1.3.4. Response Status

Store-SCP will behave as described in the Table below when generating the C-STORE response command message.

**Table 24
RESPONSE STATUS FOR STORE-SCP AND RECEIVE STORAGE REQUEST**

Service Status	Further Meaning	Status Codes	Reason
Refused	Out of Resources	A7xx	Never sent
Error	Data Set does not match SOP Class	A9xx	Never sent – data set is not checked prior to storage
	Cannot understand	Cxxx	The request was not processed.
	Client not authorized	0100	Not authorized to store images.
	Instance already in archive	0110	Instances already in archive will be rejected.
Warning	Coercion of Data Elements	B000	Never sent - no coercion is ever performed
	Data Set does not match SOP Class	B007	Never sent - data set is not checked prior to storage
	Elements Discarded	B006	Never sent – all elements are always stored
Success		0000	

4.2.3 Q/R-SCU Application Entity Specification

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

Table 25
SOP CLASSES SUPPORTED BY Q/R-SCU

SOP Class Name	SOP Class UID	SCU	SCP
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No

4.2.3.1 Association Establishment Policies

4.2.3.1.1 General

Q/R-SCU initiates but never accepts associations. SOP class extended negotiation is not supported.

The configuration of the system defines all the Application Entity Titles with which this AE can establish associations. Included in the configuration are the different AE's IP host names and TCP port numbers on which the remote AE's are listening for incoming DICOM associations. If a particular remote AE definition in the configuration does not include a TCP port number, then Q/R-SCU AE can't request an association with the remote AE. The configuration allows also to change the port number used to listen for incoming stores after a retrieve request: this port is the same used by the Store-SCP AE.

4.2.3.1.2 Number of Associations

Only one association at the same time is allowed.

4.2.3.1.3 Asynchronous Nature

Q/R-SCU AE uses only synchronous mode of operation. If a remote AE specifies asynchronous operations in its association request, Q/R-SCU AE responds with no asynchronous operation's entry in the association response (this implies that only synchronous operations are supported).

4.2.3.1.4 Implementation Identifying Information

See Section 3.8.

4.2.3.2 Association Initiation Policy

Q/R-SCU AE uses a list of valid query/retrieve servers. User can select one of them, the system save these settings so the user does not need to set them for every request or after every startup.

Q/R-SCU AE starts an association for every request of query or retrieval.

4.2.3.2.1 Real-world Activity "query"

4.2.3.2.1.1 Associated Real-world Activity

The system initiates a query operation in response to user activity.

This operation will cause Q/R-SCU AE to:

- Build a list of identifiers to query
- initiate a DICOM association with the remote server
- send a C-FIND command with the identifiers and query level
- get the results and release the association.

4.2.3.2.1.2 Proposed Presentation Contexts

Q/R-SCU AE will propose the presentation contexts listed in the following Presentation Context Table for Query/Retrieve Service Class as Query SCU:

Table 26
Proposed Presentation Contexts for Q/R-SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

4.2.3.2.1.3 SOP Specific Conformance for Query SOP Classes

Q/R-SCU AE has the following behavior when querying a remote AE:

- Following the remote AE accepting the proposed association, it will send a C-FIND operation with the identifier list created from the user interface.
- Results list returned will be displayed to the user.
- The association will be released.

4.2.3.3 Real-world Activity “retrieve”

4.2.3.3.1 Associated Real-world Activity

The system initiates a retrieve operation in response to user activity.

This operation will cause Q/R-SCU AE to:

- Build a list of instances to retrieve
- initiate a DICOM association with the remote server
- create a thread to listen for C-STORE commands from the remote server
- send a C-MOVE command with the instances
- receive C-STORE commands from the remote server
- get the C-MOVE results and release the association.

4.2.3.3.2 Proposed Presentation Contexts

Q/R-SCU AE will propose the presentation context listed in the following Presentation Context Table for Query/Retrieve Service Class as Retrieve SCU:

Table 27
Proposed Presentation Contexts for Q/R-SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Study Root Query/Retrieve – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

4.2.3.3.3 SOP Specific Conformance for Retrieve SOP Classes

Q/R-SCU AE has the following behavior when retrieving images from storage on a remote AE:

- Following the remote AE accepting the proposed association, it will create a thread to listen for the C-STORE operations returning the images.
- AE will perform a C-MOVE operation sending the identifier list created from the user interface.
- Images stored to the listener thread will be displayed.

- When the C-MOVE command has received all results or been aborted, the listener thread will be terminated.
- The association will be released.

4.2.3.3.4 Association Acceptance Policy

Q/R-SCU AE accept associations only for retrieve purposes. Anyway, for the same TCP Port and AE Title, the Storage SCP AE is always listening for associations to receive solicited and unsolicited instances.

4.2.3.3.5 SOP Specific Conformance for Retrieve SOP Classes

Q/R-SCU AE will monitor the Store-SCP Application Entity to verify that the requested instances have been received, adding them to the local database.

4.2.4 Workflow Application Entity Specification ²²

4.2.4.1 SOP Classes

MyLab provides Standard Conformance to the following SOP Classes:

Table 28
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 ²³	1.2.840.10008.3.1.2.3.3	Yes	No

4.2.4.2 Association Policies

4.2.4.2.1 General

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

Table 29
DICOM APPLICATION CONTEXT FOR AE WORKFLOW

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

4.2.4.2.2 Number of Associations

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

Table 30
NUMBER OF ASSOCIATIONS INITIATED FOR AE WORKFLOW

Maximum number of simultaneous Associations	1
---	---

4.2.4.2.3 Asynchronous Nature

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

Table 31
ASYNCHRONOUS NATURE AS A SCU FOR AE WORKFLOW

Maximum number of outstanding asynchronous transactions	1
---	---

4.2.4.2.4 Implementation Identifying Information

See section 3.8.

4.2.4.3 Association Initiation Policy

4.2.4.3.1 Activity – Worklist Update

4.2.4.3.1.1 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”

²² MPPS SOP Class not present in VET models.

²³ 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 32
BROAD WORKLIST QUERY MATCHING KEYS

Tag	Attribute	Contents
(0008,0005)	Specific Character Set	Can be “ISO_IR 100”, “ISO_IR 144”, “ISO_IR 101”, “ISO_IR 192” or “GB18030” ²⁴
(0008,0050)	Accession Number	empty, can be set
(0008,0060)	Modality	pre-set to “US” but can be changed or blanked
(0040,0006)	Scheduled 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 38. 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 mandatory attributes are missing. For every item it is possible to show the other information received by selecting it and pressing “DETAILS”: in this panel, in case of missing mandatory attributes in the response, there will also be the list of them. Even if some information, while mandatory for the SCP, is not provided by it, the MyLab will allow executing it by using the values that would be used for an unscheduled exam. In case of corrupted C-FIND-RSP messages, in the WORKLIST panel a message will appear saying that some of the records are corrupted.

The results will be cleared with the next worklist update. 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

²⁴ Set to “ISO_IR 100” when the system is set to use a Latin keyboard, to “ISO_IR 144” when it is set to use a Cyrillic keyboard, to “ISO_IR 101” when it is set to use a Hungarian keyboard and to “ISO_IR 192” or “GB18030” (configurable) when it is set to use a Chinese keyboard. It is not intended to be a matching key. When any C-FIND-RSP contains a different character set of the one in the query, a warning will result, and the characters that cannot be mapped into the current character set will be substituted by a question mark “?”. When the any C-FIND-RSP does not contain the (0008,0005) Specific Character Set, the received data are treated as their (0008,0005) Specific Character Set correspond to the current settings of the MyLab.

disconnected from the network. In any case when a worklist item is used to start an exam it will be grayed, so the user, even when the worklist server is not available, can be aware of the already executed exams.

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 STARTING AN EXAM" in the worklist Worklist server configuration. 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.

It is also possible to configure the system to force the user to insert some details in the worklist query panel, to avoid getting too many responses from a worklist server that has a huge number of scheduled procedure steps registered. This can be done accessing the DICOM configuration panel: for each DICOM MWL SCP configured there is a "FORCE DETAILS" check; when checked the sw verifies that in the at least one among Patient Last Name, Patient ID and Accession number in the worklist panel contains a string. In case all these three attributes are empty, an error message appears.

Table 33
NARROW WORKLIST QUERY MATCHING KEYS

Tag	Attribute	Contents	Matching Key Type
(0008,0005)	Specific Character Ser	"ISO_IR 100", "ISO_IR 144", "ISO_IR 101", "ISO_IR 192" or "GB18030"	=
(0040,0002)	Scheduled Procedure Step Start Date	the same used in the broad query	R
(0008,0060)	Modality	the same used in the broad query	R
(0010,0020)	Patient ID	from the selected result of the broad query	R
(0040,0001)	Scheduled Station AE Title	from the selected result of the broad query	R
(0008,0050)	Accession Number	from the selected result of the broad query	O

It is also possible to configure the system to periodically query the worklist server in background, so that when opening the worklist panel you immediately get fresh data without having to wait.

Table 34
BACKGROUND WORKLIST QUERY MATCHING KEYS

Tag	Attribute	Contents
(0008,0005)	Specific Character Ser	"ISO_IR 100", "ISO_IR 144", "ISO_IR 101", "ISO_IR 192" or "GB18030"
(0008,0060)	Modality	pre-set to "US" but can be changed or blanked
(0040,0006)	Scheduled Performing Physician's Name	empty, can be set
(0040,0002)	Scheduled Procedure Step Start Date	present date
(0040,0001)	Scheduled Station AE Title	Local AE Title, can be modified

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

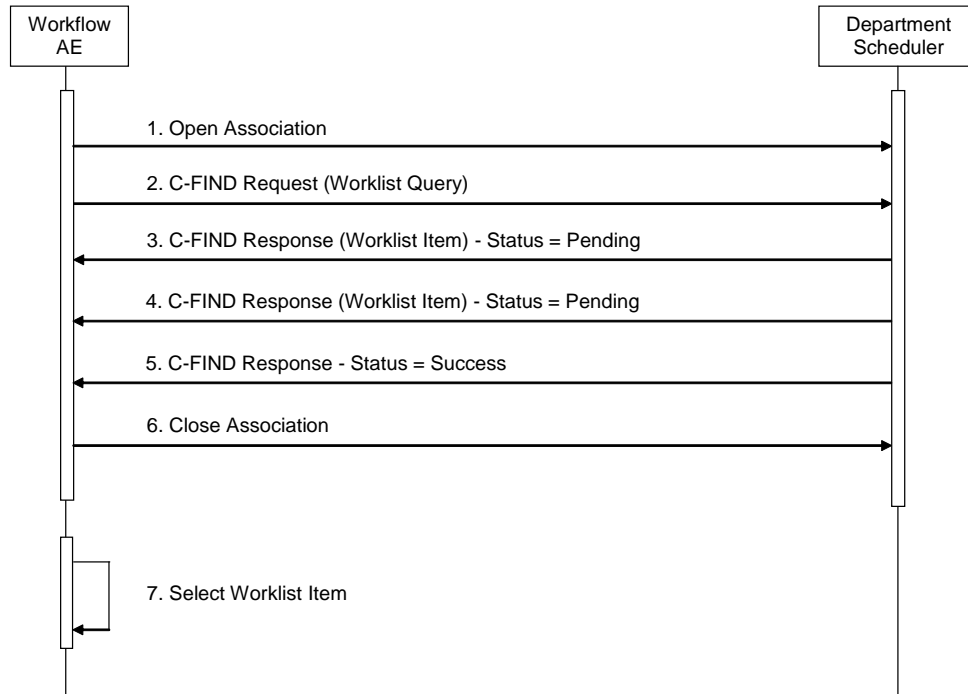


Figure 6
SEQUENCING OF ACTIVITY – WORKLIST UPDATE

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.

4.2.4.3.1.2 Proposed Presentation Contexts

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

Table 35
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY WORKLIST UPDATE

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

4.2.4.3.1.3 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 36
MODALITY WORKLIST C-FIND RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Matching is complete	0000	The SCP has completed the matches. Worklist items are available for display or further processing.
Refused	Out of Resources	A700	The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged.
Failed	Identifier does not match SOP Class	A900	The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged.
Failed	Unable to Process	C000 – CFFF	The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged.
Cancel	Matching terminated due to Cancel request	FE00	If the query was cancelled due to too many worklist items then the SCP has completed the matches. Worklist items are available for display or further processing. Otherwise, the Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query.
Pending	Matches are continuing	FF00	The worklist item contained in the Identifier is collected for later display or further processing.
Pending	Matches are continuing – Warning that one or more Optional Keys were not supported	FF01	The worklist item contained in the Identifier is collected for later display or further processing. The status meaning is logged only once for each C-FIND operation.
*	*	Any other status code.	The Association is aborted using A-ABORT and the worklist is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in

			the Response will be logged.
--	--	--	------------------------------

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

Table 37
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 to filter out possible duplicate entries.

Table 38
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	x ²⁵
> 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
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	

²⁵ The value received in the response can be changed from the User's interface; in the produced IOD it will be inserted in the (0008,1050) Performing Physicians' Name.

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 set to "US", by default, but can be changed or blanked. Please note that "Specific Character Set" is set to "ISO_IR 100" when the system is set to use a Latin keyboard, to "ISO_IR 144" when it is set to use a Cyrillic keyboard, to "ISO_IR 101" when it is set to use a Hungarian keyboard and to "ISO_IR 192" or "GB18030" (configurable) when it is set to use a Chinese keyboard, 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.

4.2.4.3.2 Activity – Acquire Images

4.2.4.3.2.1 Description and Sequencing of Activities ²⁶

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.

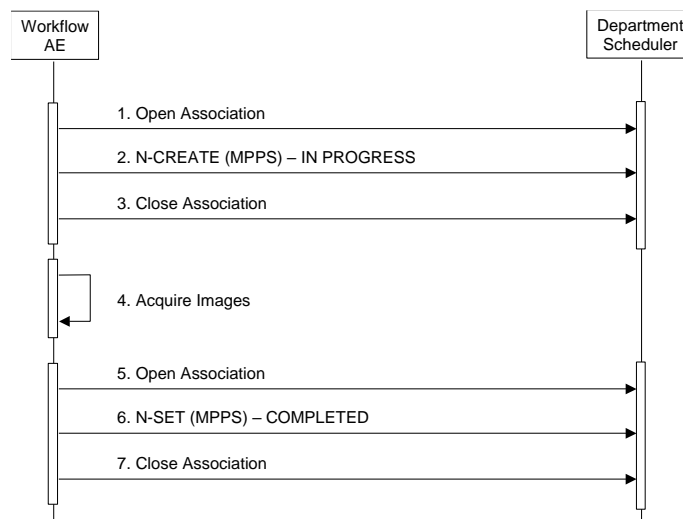
When closing the current exam ("Start End" key) the MPPS will be set to the final state "COMPLETED". It is also possible to set it to "DISCONTINUED", by checking "ABANDONED PROCEDURE" before pressing OK in the EXAM panel that appears when closing the exam. This check is pre-set when no images have been acquired, anyway can be unchecked if needed (for example, measures done without storing images). In case of automatic saving of the exam to a DICOM server, the MPPS message will be "COMPLETED" when one or more images have been acquired, "DISCONTINUED" otherwise.

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.



²⁶ 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.

4.2.4.3.2.2 Proposed Presentation Contexts

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

**Table 39
PROPOSED PRESENTATION CONTEXTS FOR REAL-WORLD ACTIVITY ACQUIRE IMAGES**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Modality Performed Procedure Step ²⁷	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.4.3.2.3 SOP Specific Conformance for MPPS ²⁸

The behavior of the MyLab when encountering status codes in an MPPS N-CREATE or N-SET response is summarized in Table 40. 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 40
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).

²⁷ MPPS SOP Class not present in VET models.

²⁸ MPPS SOP Class not present in VET models.

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 41
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 42 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.

Table 42
MPPS N-CREATE / N-SET REQUEST IDENTIFIER

Attribute Name	Tag	VR	N-CREATE	N-SET
Specific Character Set	(0008,0005)	CS	"ISO_IR 100", "ISO_IR 144", "ISO_IR 101", "ISO_IR 192" or "GB18030" ²⁹ .	
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 "PERFORM PROCEDURE AS REQUESTED" 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	

²⁹ "ISO_IR 100" is used when the system is set to use a Latin keyboard, "ISO_IR 144" when it is set to use a Cyrillic keyboard, "ISO_IR 101" when it is set to use a Hungarian keyboard and "ISO_IR 192" or "GB18030" (configurable) when it is set to use a Chinese keyboard.

			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) 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, as (0040,0006) Scheduled Performing Phys. Name, or from 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 Class UID	(0008,1150)	UI		Generated by the device.
>> 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.

4.2.4.4 Association Acceptance Policy

The Workflow Application Entity does not accept Associations.

4.2.5 Hardcopy Application Entity Specification

4.2.5.1 SOP Classes

The MyLab provides Standard Conformance to the following SOP Classes:

Table 43
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

4.2.5.2 Association Policies

4.2.5.2.1 General

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

Table 44
DICOM APPLICATION CONTEXT FOR AE HARDCOPY

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

4.2.5.2.2 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, one or more of these printing profiles (belonging to the same or to different hardcopy devices) can be assigned to the print keys (one or more according to the model).

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 several films; whenever a film composing is completed, a print-job is prepared and the MyLab initiates the related Association.

Table 45
NUMBER OF ASSOCIATIONS INITIATED FOR AE HARDCOPY

Maximum number of simultaneous Associations	Unlimited.
---	------------

MyLab does not accept Associations.

4.2.5.2.3 Asynchronous Nature

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

Table 46
ASYNCHRONOUS NATURE AS A SCU FOR AE HARDCOPY

Maximum number of outstanding asynchronous transactions	1
---	---

4.2.5.2.4 Implementation Identifying Information

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

4.2.5.2.5 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 choose the most correct configuration parameters.

To use a configured printing profile, the User must tie it to one of the special print keys.

4.2.5.3 Association Initiation Policy

4.2.5.3.1.1 Activity – Connectivity Verification

4.2.5.3.1.2 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.

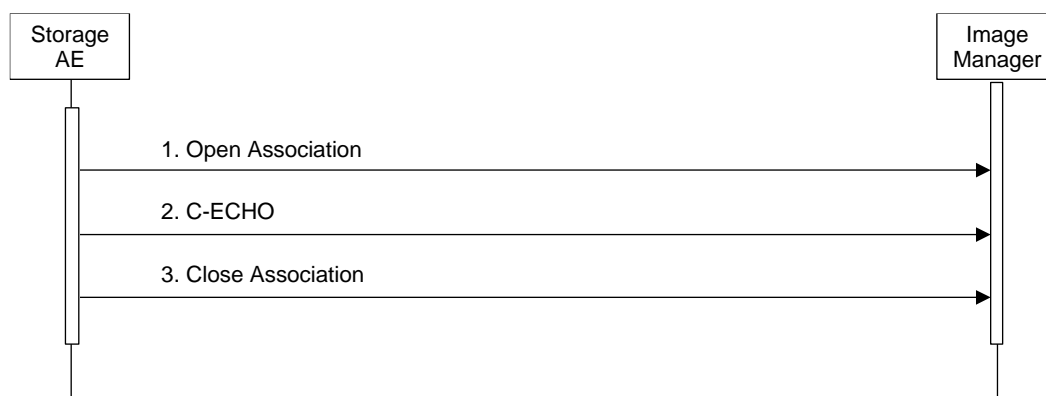


Figure 8
SEQUENCING OF ACTIVITY – CONNECTIVITY VERIFICATION

4.2.5.3.1.3 Proposed Presentation Context Table

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

Table 47
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

4.2.5.3.1.4 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 48
C-ECHO RESPONSE STATUS HANDLING BEHAVIOUR

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

4.2.5.3.2 Activity – Film Images

4.2.5.3.2.1 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.

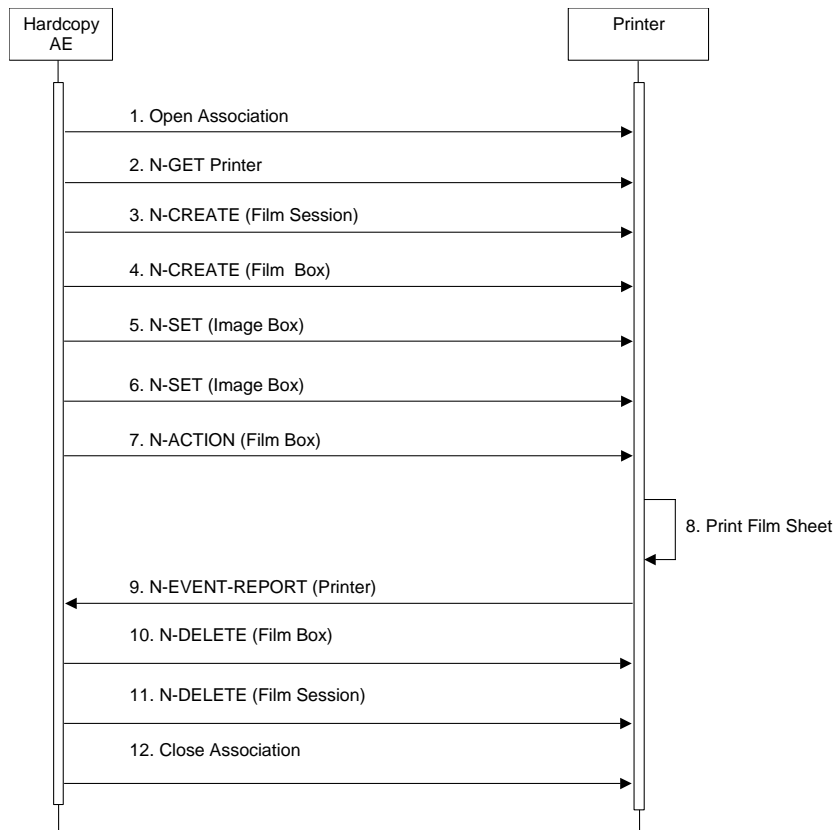


Figure 9
SEQUENCING OF ACTIVITY – FILM IMAGES

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.

4.2.5.3.2.2 Proposed Presentation Contexts

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

Table 49
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY FILM IMAGES

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	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

4.2.5.3.2.3 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 50
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.

4.2.5.3.2.4 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.

4.2.5.3.2.5 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 51
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 52
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.

4.2.5.3.2.6 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 53
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 54
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).

4.2.5.3.2.7 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.

4.2.5.3.2.8 Film Session SOP Class Operations (N-CREATE)

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

Table 55
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 56
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.

4.2.5.3.2.9 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 57
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.

4.2.5.3.2.10 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.

4.2.5.3.2.11 Film Box SOP Class Operations (N-CREATE)

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

Table 58
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 <i>STANDARD</i> _{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 59
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.

4.2.5.3.2.12 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 60
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.

4.2.5.3.2.13 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 61
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.

4.2.5.3.2.14 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.

4.2.5.3.2.15 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 62
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 63
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	<i>RGB</i>	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	<i>0000H</i> = 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 64
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.

4.2.5.4 Association Acceptance Policy

The Hardcopy Application Entity does not accept Associations.

4.3 NETWORK INTERFACES

4.3.1 Physical Network Interface

The MyLab supports both wired and wireless network interface as follows:

Table 65
SUPPORTED PHYSICAL NETWORK INTERFACES

Ethernet 10/100/1000 BaseT, RJ-45; Manual or AutoDetect Speed, Full or Half Duplex.
Wireless IEEE 802.11a/b/g/n/ac, using the internal wireless adapter.

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 66
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	
Time Synchronization	NTP Client	NTP	N/A	

4.3.2.1 DHCP

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

4.3.2.3 NTP

One or more NTP Servers can be configured. If no NTP Servers are identified and enabled then the local clock will be used as a time reference.

4.3.3 IPv4 and IPv6 Support

The MyLab supports only IPv4.

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 or 11112 according to the model, 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 Application Entity

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

The MyLab User must set the AE Title, port-number, host-name for remote Storage Commitment SCPs, enabling only one of them at a given time ³⁰.

4.4.1.2.2 Workflow Application Entity

The MyLab User must set the AE Title, port-number, host-name for 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 remote MPPS SCPs, enabling only one of them at a given time ³¹.

4.4.1.2.3 Hardcopy Application Entity

The MyLab User must set the AE Title, port-number, host-name and printer profile for 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 67
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)

³⁰ Storage Commitment SOP Class not present in VET models.

³¹ MPPS SOP Class not present in VET models.

Parameter	Configurable (Yes/No)	Default Value
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 AE)	No	See Table 11, 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 35.
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 39.
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 49, 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

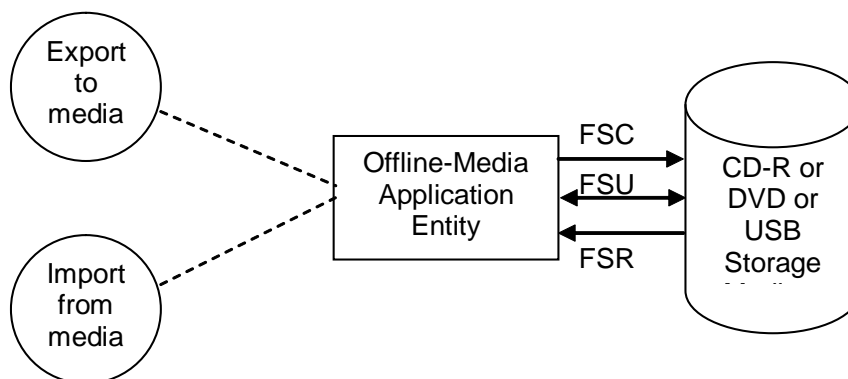


Figure 10
APPLICATION DATA FLOW DIAGRAM FOR MEDIA STORAGE

- Offline-Media Application Entity exports images, clips, Secondary Capture and SR objects³² 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. Offline-Media Application Entity import images, clips and Secondary Capture objects from a CD-R or a DVD or a USB Storage medium. It is associated with the local real-world activity “Import DICOM DB”.

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 for exporting 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.

³² DICOM Structured Report not available in VET models.

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 restart it later by the user via job control interface. The Offline-Media AE will not try to export again the instances automatically.

It is possible to activate the Offline-Media Application Entity entry for importing when the ARCHIVE environment is open. A softkey "IMPORT DICOM DB" appears, pressing it a list of available devices appears, selecting either USB or CD/DVD a list of the available studies is shown, you can select one or more to retrieve them into the local database.

5.1.3 Sequencing of Real-World Activities

For exporting, 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 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 FAT16 or FAT32 File System, while NTFS is not allowed. For example, these are options of the standard Windows Operating System formatting utility.

For importing, the operator can insert a CD-R or DVD, or a USB storage media (according to the case) at any time before the Offline-Media Application Entity activation.

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 68
APPLICATION PROFILES, ACTIVITIES AND ROLES FOR OFFLINE-MEDIA

Application Profiles Supported	Real World Activity	Role
STD-GEN-CD	Import/Export from/to CD-R	FRS, FSC
STD-GEN-DVD-JPEG	Import/Export from/to DVD	FRS, FSC
STD-GEN-USB-JPEG	Import/Export from/to USB	FRS, FSC, FSU
STD-US-SC-MF-CDR	Import/Export from/to CD-R	FRS, FSC
STD-US-SC-MF-DVD	Import/Export from/to DVD	FRS, 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 5.3).

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.

5.2.1.2.2 Activity – Import from CD-R or DVD or USB

The Offline-Media Application Entity acts as an FSR when requested to import SOP Instances from a CD-R or DVD or USB medium to the local database.

5.2.1.2.3 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, 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 (NONE).

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

Table 69
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	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
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
Comprehensive SR Storage (*)	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian	1.2.840.10008.1.2.1
CT Image Storage (*)	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
MR Image Storage (*)	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70

(*)		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
Positron Emission Tomography Image Storage (*)	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
Computed Radiography Image Storage (*)	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
Digital X-Ray Image Storage - For Presentation (*)	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
Digital Mammography X-Ray Image Storage - For Presentation (*)	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
RT Structure Set Storage (*)	1.2.840.10008.5.1.4.1.1.481.3	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
Breast Tomosynthesis Image Storage (*)	1.2.840.10008.5.1.4.1.1.13.1.3	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
Enhanced MR Image Storage (*)	1.2.840.10008.5.1.4.1.1.4.1	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
X-Ray Angiographic Image Storage (*)	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG lossless (Process 14)	1.2.840.10008.1.2.4.70
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
Grayscale Softcopy Presentation State Storage (*)	1.2.840.10008.5.1.4.1.1.11.1	Implicit VR Little Endian	1.2.840.10008.1.2
		Explicit VR Little Endian	1.2.840.10008.1.2.1

Please note the SOP Classes indicated with (*) are only enabled by the purchasable Multimodality Archive and Query/Retrieve option.

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

The Transfer Syntax used for Ultrasound Multiframe Images can be changed, for each different media destination (USB, CD/DVD, Network folder), 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. It is also possible to reduce the frame matrix of the exported clips: for MATRIX SIZE a slider allows to select SMALL, MEDIUM and FULL.

Please note that archiving Ultrasound Multiframe Images without compressing them could produce very large files: this option 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.

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 8859-1:1998 Latin Alphabet No. 1).

The MyLab models which can be configured to use a Cyrillic keyboard, when the Cyrillic keyboard is enabled will support

ISO_IR 144 (ISO 8859-5:1999 Latin/Cyrillic Alphabet).

The MyLab models which can be configured to use a Hungarian keyboard, when the Hungarian keyboard is enabled will support

ISO_IR 101 (ISO 8859-2:1999 Latin Alphabet No. 2).

The MyLab models which can be configured to use a Chinese keyboard, when the Chinese keyboard is enabled, will support one of the following (configurable):

ISO_IR 192 (Unicode in UTF-8);

GB18030 (Chinese).

In any case, the exams will be exported with the Specific Character Set that was in use in the system that acquired them at the moment they were acquired.

7 SECURITY

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.

7.1 ASSOCIATION LEVEL SECURITY

Any support for security at the Association level is provided.

7.2 APPLICATION LEVEL SECURITY

MyLab can be configured to require a password in order to access to the user interface functionalities.

7.3 SECURE TRANSPORT CONNECTION

MyLab supports secure DICOM communication in conformance with the Basic TLS Secure Transport Connection Profile³³. At default configuration the TLS option is deactivated.

Table 70
MECHANISM FOR TLS FEATURE

Supported TLS Feature	Minimum Mechanism
Entity Authentication	RSA based certificates
Exchange of Master Secrets	RSA
Data Integrity	SHA
Privacy	Triple DES EDE, DBC

When an integrity check fails, the connection will be dropped per the TLS protocol, causing both the sender and the receiver to issue an A-P-ABORT indication to the upper layers with an implementation-specific provider reason.

TLS authentication may only be used with TLS encryption.

Certificates are locally managed. The user may import certificates from media to the MyLab system for verifying incoming certificates.

³³ Present since build F10XXXX.

8 ANNEXES

8.1 IOD CONTENTS

8.1.1 Created SOP Instances

Table 71 specifies the attributes of an US, US-MF or Secondary Capture Image transmitted by the MyLab storage application. Table 72 specifies the attributes of a Structured Report object 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 71
IOD OF US, US-MF AND SC CREATED SOP INSTANCES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 73	ALWAYS
Study	General Study	Table 74	ALWAYS
	Patient Study	Table 75	ALWAYS
Series	General Series	Table 76	ALWAYS
Equipment	General Equipment	Table 77	ALWAYS
	SC Equipment	Table 78	ANAP, only if SC.
Image	General Image	Table 79	ALWAYS
	Image Pixel	Table 80	ALWAYS
	US Region Calibration	Table 81	ANAP, only if US or US-MF (not present when depth changes are applied when acquiring US-MF).
	Cine	Table 82	ANAP, only if US-MF
	Multi-Frame	Table 83	ANAP, only if US-MF
	Frame Pointers	Table 84	ANAP, only if cardiac US-MF
	US Image	Table 85	ANAP, only if US or US-MF

	Raw Data Private Application ³⁴	Table 91	ANAP, present only if US or US-MF when “Include raw data in images and clips” has been set.
	CnTI Private Application ³⁵	Table 92	ANAP, only if CnTI US-MF
	SC Image	===	EMPTY, can be present only for SC, but no attributes of this module are present.
	SOP Common	Table 89	ALWAYS

8.1.1.2 Comprehensive Structured Report IOD

Table 72
IOD OF SR CREATED SOP INSTANCES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 73	ALWAYS
Study	General Study	Table 74	ALWAYS
	Patient Study	Table 75	EMPTY
Series	SR Document Series	Table 86	ALWAYS
Equipment	General Equipment	Table 77	ALWAYS
Document	SR Document General	Table 87	ALWAYS
	SR Document Content	Table 88	ALWAYS
	SOP Common	Table 89	ALWAYS
	Report Private Application	Table 90	ANAP, present only when “ADD MEASUREMENTS FILE” has been set.

8.1.1.3 Description of the produced modules

Table 73
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 ³⁶ .	VNAP	MWL / USER

³⁴ Present since build F09XXXX.

³⁵ Present since build F065XXX.

³⁶ To avoid exporting studies with an empty Patient ID, when the worklist is not enabled and the user did not fill the Patient ID, the system will generate a DICOM Patient ID using “<Last Name><First Name><Middle Name><Gender char><Birth Date>”, to assign the same Patient ID to exams belonging to the same patient; when all this information is empty, to assign a different Patient ID to every exam produced, when no information about the patient has been inserted the system will use instead a progressive number; since build F11XXXX, it will use “<Device serial number>-<progressive number>”.

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.	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
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 74
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	<hhmmss>	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) when Modality Worklist is enabled.	ALWAYS	AUTO / MWL
Study Description	(0008,1030)	LO	From user input. When not input it will be automatically filled by the device according to the selected applications (localized), except when the image and clip sending as soon as they are acquired is enabled: in this case will remain empty.	ALWAYS	AUTO / USER
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

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

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 "PERFORM PROCEDURE AS REQUESTED" in the WORKLIST QUERY panel.	VNAP	MWL
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Table 75
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 76
GENERAL SERIES MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	US for US and US-MF images, DOC or US ³⁷ for Secondary Capture images.	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	<hhmmss>	ALWAYS	AUTO
Series Description	(0008,103E)	LO	Generated by device according to the selected application (not localized).	ALWAYS	AUTO
Performing Physicians' Name	(0008,1050)	PN	From Modality Worklist, as (0040,0006) Scheduled Performing Phys. Name, or from user input. The user can modify values provided via Modality Worklist.	VNAP	MWL / USER
Operators' Name	(0008,1070)	PN	Generated by the device according to the login name used to access the system, or from user input when security access is disabled.	VNAP	AUTO / USER

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

³⁷ The desired content can be chosen from the DICOM configuration.

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 available or 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
Performed Protocol Code Sequence	(0040,0260)	SQ	Normally absent; for cardiac US-MF images acquired in a Staged protocol (when available), it is automatically filled with the Ultrasound Stress Protocol Codes described in Table 115 ³⁸ ,	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
> Requested Procedure Code Sequence	(0032,1064)	SQ	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 77
GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

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 System Settings – Center ID configuration menu.	VNAP	CONFIG
Station Name	(0008,1010)	SH	The STATION NAME input in the System Settings – Center ID configuration menu.	VNAP	CONFIG

³⁸ This attribute will not be present unless the Stress Echo Preset has been created selecting the protocol among BICYCLE ERGOMETER, DIPYRIDAMOLE and DOBUTAMINE.

Institutional Department Name	(0008,1040)	LO	The DEPARTMENT name in the System Settings – Center ID configuration menu.	VNAP	CONFIG
Manufacturer's Model Name	(0008,1090)	LO	Internal model name.	ALWAYS	AUTO
Device Serial Number	(0018,1000)	LO	Generated by device.	ALWAYS	AUTO
Software Version(s)	(0018,1020)	LO	Generated by device.	ALWAYS	AUTO

Table 78
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 79
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	<hhmmss>	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 <i>DERIVED\SECONDARY</i> . The third and fourth are specified according to the standard for the US images. For IMT images the fourth component is absent. 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	<hhmmss>	ALWAYS	AUTO
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 ³⁹ .	ANAP	AUTO
Lossy Image Compression	(0028,2110)	CS	01 for JPEG lossy compressed images.	ANAP	AUTO
Lossy Image Compression Method	(0028,2114)	CS	ISO_10918_1 for JPEG lossy compressed images.	ANAP	AUTO

³⁹ For JPEG lossy compressed US-MF images the User can select among three different compression factors.

Burned In Annotation	(0028,0301)	CS	According to the configuration, the US, US-MF and SC objects produced by the MyLab can contain a burned in caption that identifies the patient and date the image was acquired etc.; US and US-MF images normally contain other burned in information about the acquisition, the measures, etc.	ALWAYS	AUTO
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Table 80
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	Always <i>RGB</i> , except <i>YBR_FULL_422</i> 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 81
US REGION CALIBRATION MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Sequence of Ultrasound Regions	(0018,6011)	SQ		ALWAYS	AUTO
>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, when appropriate for a given region.	VNAP	AUTO
>Reference Pixel y_0	(0018,6022)	SL	Generated by the device, when appropriate for a given region.	VNAP	AUTO
>Ref. Pixel Physical Value X	(0018,6028)	FD	Generated by the device, when appropriate for a given region.	VNAP	AUTO
>Ref. Pixel Physical Value Y	(0018,602A)	FD	Generated by the device, when appropriate for a given region.	VNAP	AUTO

Table 82
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 83
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 84
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	(0028,6023)	CS	Only if cardiac US-MF images, generated by	ANAP	AUTO

Interest Type			the device. For each of the Frames Of Interest identified in (0028,6020), this attribute will contain "RWAVE".		
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Table 85
US IMAGE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Stage Number	(0008,2122)	IS	Only for cardiac US-MF images acquired in a Staged protocol (when available), a number that identifies the stage, starting at one.	ANAP	AUTO
Number of Stages	(0008,2124)	IS	Only for cardiac US-MF images acquired in a Staged protocol (when available), the number of stages in the acquired protocol.	ANAP	AUTO
View Number	(0008,2128)	IS	Only for cardiac US-MF images acquired in a Staged protocol (when available), a number that identifies the View, starting at one.	ANAP	AUTO
Number of Views in Stage	(0008,212A)	IS	Only for cardiac US-MF images acquired in a Staged protocol (when available), the number of views in this Stage.	ANAP	AUTO
Stage Name	(0008,2120)	SH	Only for cardiac US-MF images acquired in a Staged protocol (when available), a defined term describing the performed Ultrasound Protocol Stage, according to Table 116 ⁴⁰ .	ANAP	AUTO
Stage Code Sequence	(0040,000A)	SQ	Only for cardiac US-MF images acquired in a Staged protocol (when available), the sequence describing the performed Ultrasound Protocol Stage. One Item is included in this sequence, according to the codes in Table 116 ⁴¹ .	ANAP	AUTO
View Name	(0008,2127)	SH	Only for cardiac US-MF images acquired in a Staged protocol (when available), a defined term describing the view of the patient anatomy in this image, according to the Table 117 ⁴² .	ANAP	AUTO
View Code Sequence	(0054,0220)	SQ	Only for cardiac US-MF images acquired in a Staged protocol (when available), the sequence describing the view of the patient anatomy in this image. One Item is included in this sequence, according to the codes in Table 117 ⁴³ .	ANAP	AUTO

⁴⁰ This attribute will not be present unless the Stress Echo Preset has been created selecting the protocol among BICYCLE ERGOMETER, DIPYRIDAMOLE and DOBUTAMINE.

⁴¹ This attribute will not be present unless the Stress Echo Preset has been created selecting the protocol among BICYCLE ERGOMETER, DIPYRIDAMOLE and DOBUTAMINE.

⁴² This attribute will not be present unless the Stress Echo Preset has been created selecting the protocol among BICYCLE ERGOMETER, DIPYRIDAMOLE and DOBUTAMINE.

⁴³ This attribute will not be present unless the Stress Echo Preset has been created selecting the protocol among BICYCLE ERGOMETER, DIPYRIDAMOLE and DOBUTAMINE.

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
Pixel Spacing	(0028,0030)	DS	Only present when "ADD PIXEL SPACING" is checked in the DICOM configuration and the US or US-MF image only contains a single spatial region.	ANAP	AUTO

Table 86
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, present even if MPPS is not enabled.	ALWAYS	AUTO

Table 87
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 88
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), 5100 (for TID 5100, Vascular Ultrasound Procedure Report) or 5000 (for TID 5000, OB-GYN Ultrasound Procedure Report).	ALWAYS	AUTO
Content Sequence	(0040,A730)	SQ	See section 8.2.1 for TID 5200, Adult Echocardiography Report and TID 5100, Vascular Ultrasound Procedure Report, and section 8.2.2 for TID 5000, OB-GYN Ultrasound Procedure Report.		
Concept Name Code Sequence	(0040,A043)	SQ	Generated by the device.	ALWAYS	AUTO
>Code Value	(0008,0100)	SH	125200 for Adult Echocardiography Procedure Report, 125001 for Vascular Ultrasound Procedure Report 125000 or for OB-GYN Ultrasound Procedure Report.	ALWAYS	AUTO
>Coding Scheme Designator	(0008,0102)	SH	DCM	ALWAYS	AUTO
>Code Meaning	(0008,0104)	LO	Adult Echocardiography Procedure Report or Vascular Ultrasound Procedure Report or OB-GYN Ultrasound Procedure Report.	ALWAYS	AUTO
Continuity of Content	(0040,A050)	CS	SEPARATE	ALWAYS	AUTO

Table 89
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", "ISO_IR 144", "ISO_IR 101", "ISO_IR 192" or "GB18030" ⁴⁴	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 90
REPORT PRIVATE APPLICATION MODULE OF CREATED SOP INSTANCES⁴⁵

Attribute Name	Tag	VR	Value	Presence of Value	Source
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 (Measures.xml).	ALWAYS	AUTO

⁴⁴ "ISO_IR 100" is used when the exam has been produced in a system set to use a Latin keyboard, "ISO_IR 144" when it has been produced in a system set to use a Cyrillic keyboard.

⁴⁵ Present only when "ADD MEASUREMENTS FILE" has been set.

List of the custom measures, in Esaote proprietary XML format ⁴⁶	(6161,1131)	OB	Variable length: contains the list of the custom measures defined for that exam, in XML internal format (cmmeasurecfg.xml).	ALWAYS	VNAP
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Table 91
RAW DATA PRIVATE APPLICATION MODULE OF CREATED SOP INSTANCES⁴⁷

Attribute Name	Tag	VR	Value	Presence of Value	Source
Private Creator	(6161,0013)	LO	<i>Esaote Raw Data</i>	ALWAYS	AUTO
Esaote raw data	(6161,1330)	OB	Variable length: contains the raw data used to produce the instance, in a compressed internal format.	ALWAYS	VNAP

Table 92
CNTI PRIVATE APPLICATION MODULE OF CREATED SOP INSTANCES⁴⁸

Attribute Name	Tag	VR	Value	Presence of Value	Source
Private Creator	(2FF1,0060)	LO	<i>Esaote Contrast Quantification</i>	ALWAYS	AUTO
Private Creator Data Version	(2FF1,6001)	LO	1.0	ALWAYS	AUTO
Contrast master gain	(2FF1,6031)	DS	Master Gain in dB as defined with the gain knob.	ALWAYS	AUTO
Anti-log law vector	(2FF1,6032)	IS	Inverse log-compression law for data linearization.	ALWAYS	AUTO
Gray Map curve data	(2FF1,6033)	IS	Direct Gray Map curve.	ALWAYS	AUTO
Palette name	(2FF1,6035)	LO	Name of Palette.	ALWAYS	AUTO
Contrast Red Palette Data	(2FF1,6036)	IS	Direct Palette Red curve.	ALWAYS	AUTO
Contrast Green Palette Data	(2FF1,6037)	IS	Direct Palette Green curve.	ALWAYS	AUTO
Contrast Blue Palette Data	(2FF1,6038)	IS	Direct Palette Blue curve.	ALWAYS	AUTO
Transducer name	(2FF1,6040)	LO	Transducer name.	ALWAYS	AUTO
Transducer frequency	(2FF1,6041)	DS	Transducer center frequency in MHz.	ALWAYS	AUTO
Vector of destruction-frame numbers	(2FF1,6050)	IS	Position of first destruction frame.	ALWAYS	AUTO
Number of destruction frames	(2FF1,6051)	IS	Length of destruction-frame vector.	ALWAYS	AUTO
Nonlinear Contrast Mode	(2FF1,6052)	CS	Operating Mode (i.e. CnTI).	ALWAYS	AUTO
Allow Quantification	(2FF1,6053)	LO	Allow Quantification Flag: <i>True</i> if the clip as been acquired to enable quantification. <i>False</i> otherwise.	ALWAYS	AUTO

⁴⁶ Only present for exams acquired with sw release 5.xx and later.

⁴⁷ Present only when "Include raw data in images and clips" has been set.

⁴⁸ Present only for CnTI clips.

8.1.2 Used Fields in received IOD by application

The MyLab storage application does not receive SOP Instances.

8.2 STRUCTURED REPORT MAPPING ⁴⁹

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 “CARDIAC” application will produce an Adult Echocardiography Procedure Report (TID 5200), the “VASCULAR” and “ABDOMINAL” applications will produce a Vascular Ultrasound Procedure Report (TID 5100), the “OB-FETAL” and “GYNECOLOGY” applications will produce a OB-GYN Ultrasound Procedure Report (TID 5000). All the other applications will not produce any Structured Report object, but the acquired measures will be exported in Secondary Capture images. If a given study contains more than one of the above supported applications, more than one Structured Report object will be produced.

8.2.1 Adult Echocardiography, Vascular and Abdominal SR mapping

Complete tables describe the mapping of the “CARDIAC” application to the DICOM Adult Echocardiography SR documents, and of the “VASCULAR” and “ABDOMINAL” applications to the DICOM Vascular SR documents. The tables are organized in the same way of the reports that can be printed from the MyLab system itself, or exported as a series of Secondary Capture images. The first three columns of the tables refer to the measure as identified in the MyLab system (Page, Measure, Sub-measure), 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.

As these tables are very long, to avoid a huge DICOM Conformance Statement, and to make more easy to use them for the integration of the MyLab systems, we will provide them in spreadsheet format (xls document): please write an e-mail to connectivity@esaote.com indicating the MyLab system and the software build, or the revision number of the present document.

8.2.2 OB-GYN SR mapping

The following tables describe the mapping of the “OB-FETAL” and “GYNECOLOGY” applications to the OB-GYN SR documents. The tables are organized in the same way of the reports that can be printed from the MyLab system itself, or exported as a series of Secondary Capture images.

That is, the tables are divided into various sections that correspond to the various sections of the reports; each section is divided in subsections that correspond to the various subsections of the reports; the first column of the table correspond to the measure name in the Esaote report. The other two or three columns contain the DICOM mapping of this measure, indicating the Base Measurement Concept Name, the Section (when applicable), and the Concept or Acquisition Context Modifiers.

Table 93
OB-GYN SR MAPPING – OBSTETRIC MEASUREMENTS AND CALCULATIONS

<i>ESAOTE MEASURE</i>	<i>BASE MEAS. CONCEPT NAME</i>	<i>CONCEPT OR ACQUISITION CONTEXT MODIFIERS</i>
COMMON MEASUREMENTS		
GRAVIDA	(11996-6, LN, “Gravida”)	== =
PARA	(11977-6, LN, “Para”)	== =
ABORTA	(11612-9, LN, “Aborta”)	== =
ECTOPIC	(33065-4, LN, “Ectopic Pregnancies”)	== =
EDD BY LMP	(11779-6, LN, “EDD from LMP”)	== =
LMP	(11955-2, LN, “LMP”)	== =
FIRST DGA DATE	(EV-17, ESAOTE_P1, “Date Of FDGA”)	== =
DGA BY FDGA	(EV-19, ESAOTE_P1, “DGA by FDGA”)	== =
FIRST DGA	(EV-20, ESAOTE_P1, “First DGA”)	== =

⁴⁹ DICOM Structured Report not available in VET models.

<i>ESAOTE MEASURE</i>	<i>BASE MEAS. CONCEPT NAME</i>	<i>CONCEPT OR ACQUISITION CONTEXT MODIFIERS</i>
B-Mode		
Biparietal Diam	(11820-8, LN, "Biparietal Diameter")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Head Circumference	(11984-2, LN, "Head Circumference")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Abdominal Circumf	(11979-2, LN, "Abdominal Circumference")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Femur Length	(11963-6, LN, "Femur Length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Occipit Frontal Diam	(11851-3, LN, "Occipital-Frontal Diameter")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Crown-Rump Length	(11957-8, LN, "Crown Rump Length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Gest Sac Diam	(11850-5, LN, "Gestational Sac Diameter")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Humerus Length	(11966-9, LN, "Humerus length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Ulna Length	(11969-3, LN, "Ulna length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Tibia Length	(11968-5, LN, "Tibia length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Estim Fetal Weight	(11863-8, LN, "Trans Cerebellar Diameter")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Transv Cereb Diam	(11964-4, LN, "Fibula length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Fibula Length	(11967-7, LN, "Radius length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Radio Length	(11862-0, LN, "Tranverse Abdominal Diameter")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Transv Abd Diam	(11860-4, LN, "Cisterna Magna length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Cisterna Magna	(EV-81, ESAOTE_P1, "APTD * TTD")	(121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
APTD X TTD	(33068-8, LN, "Thoracic Area")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Fetal Trunk Sect A	(EV-114, ESAOTE_P1, "Binocular Distance")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Binocular Distance	(11864-6, LN, "Transverse Thoracic Diameter")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Transv Trunk Diam	(11819-0, LN, "Anterior-Posterior Trunk Diameter")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Ant Post Trunk Diam	(33069-6, LN, "Nuchal Translucency")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Nuchal Translucency	(11818-2, LN, "Anterior-Posterior Abdominal Diameter")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Ant-Post Abd Diam	(11962-8, LN, "Clavicle length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Clavicula Length	(EV-113, ESAOTE_P1, "Length Of Vertebra")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Length of Vertebra	(11965-1, LN, "Foot length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Foot Length	(EV-117, ESAOTE_P1, "Nose Bone Length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Nose Bone Length	(11988-3, LN, "Thoracic Circumference")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Thoracic Circumference	(12146-7, LN, "Nuchal Fold thickness")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Nuchal Fold	(12171-5, LN, "Lateral Ventrical width")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Lateral Ventricle	(33070-4, LN, "Inner Orbital Diameter")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Interorbital Diam	(11629-3, LN, "Outer Orbital Diameter")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Outer Orbital Diam	(EV-82, ESAOTE_P1, "Max Amniotic Diameter")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Max Amniotic Diam	(EV-115, ESAOTE_P1, "Ear Length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")

<i>ESAOTE MEASURE</i>	<i>BASE MEAS. CONCEPT NAME</i>	<i>CONCEPT OR ACQUISITION CONTEXT MODIFIERS</i>
GA (LMP)	(11885-1, LN, "Gestational Age by LMP")	== =
AVERAGE ULTRASOUND AGE	(18185-9, LN, "Gestational Age")	== =
ESTIM FETAL WEIGHT	(11727-5, LN, "Estimated Weight")	== =
EFW GROWTH VALUE RANKING	(11767-1, LN, "EFW percentile rank")	== =
AMNIOTIC FLUID INDEX ⁵⁰		
QUADRANT 1	(11624-4, LN, "First Quadrant Diameter")	== =
QUADRANT 2	(11626-9, LN, "Second Quadrant Diameter")	== =
QUADRANT 3	(11625-1, LN, "Third Quadrant Diameter")	== =
QUADRANT 4	(11623-6, LN, "Fourth Quadrant Diameter")	== =
AMNIOTIC FLUID INDEX	(11627-7, LN, "Amniotic Fluid Index")	== =
Calculations		
Cephalic Index	(11823-2, LN, "Cephalic Index")	== =
FL/BPD	(11872-9, LN, "FL/BPD")	== =
BPD/FL	(EV-21, ESAOTE_P1, "BPD/FL")	== =
FL/AC	(11871-1, LN, "FL/AC")	== =
HC/AC	(11947-9, LN, "HC/AC")	== =
BIOPHYSICAL PROFILE		
FETAL BREATHING MOVEMENTS	(11632-7, LN, "Fetal Breathing")	== =
FETAL BODY MOVEMENTS	(11631-9, LN, "Gross Body Movement")	== =
FETAL TONE	(11635-0, LN, "Fetal Tone")	== =
FETAL REACTIVITY	(11635-5, LN, "Fetal Heart Reactivity")	== =
QUALITATIVE AFV ASSESSMENT	(11630-1, LN, "Amniotic Fluid Volume")	== =
TOTAL	(11634-3, LN, "Biophysical Profile Sum Score")	== =
FETAL MASS ⁵¹		
FETAL MASS <n>	(CN-28, ESAOTE_P1, "Mass ID") = "FETALMASS<n>"	== =
LENGTH	(MN-33, ESAOTE_P1, "Fetal Mass Length")	== =
HEIGHT	(MN-35, ESAOTE_P1, "Fetal Mass Height")	== =
WIDTH	(MN-31, ESAOTE_P1, "Fetal Mass Width")	== =
VOL	(MN-29, ESAOTE_P1, "Fetal Mass Volume")	== =

⁵⁰ The related percentiles and reference are not exported.

⁵¹ Up to 4 can be present in the report, numbered from FETAL MASS 1 to FETAL MASS 4. In the following, <n> will be substituted by 1, 2, 3 or 4 according to the case. Note that these measurements are repeated for each fetus if more than one fetus is present.

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
M-Mode		
Fetal Heart Rate (3) ⁵²	(11948-7, LN, "Fetal Heart Rate")	== = ⁵³

**Table 94
OB-GYN SR MAPPING – GYNECOLOGY**

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
COMMON MEASUREMENTS		
POST MENOPAUSE	(CN-22, ESAOTE_P1, "Post MenoPause")	== =
LMP DAYS	(CN-21, ESAOTE_P1, "Day of Cycle from LMP")	== =
LMP	(11955-2, LN, "LMP")	== =
Uterus		
Uterus Volume		
Length	(11842-2, LN, "Uterus Length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Height	(11859-6, LN, "Uterus Height")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Width	(11865-3, LN, "Uterus Width")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Uterus Volume	(33192-6, LN, "Uterus Volume")	(121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
UTERUS POSITION	(CN-25, ESAOTE_P1, "Uterus Position")	== =
UTERUS VERSION	(CN-26, ESAOTE_P1, "Uterus Version")	== =
Endometrium		
Endometrium	(12145-9, LN, "Endometrium Thickness")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Cervix Length		
Cervix Length	(11961-0, LN, "CervixLength")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Uterus Mass		
Fibroma 1 / 2 / 3 / 4 ⁵⁴		
Fibroma <n>	(CN-28, ESAOTE_P1, "Mass ID") = "FIBROMA<n>"	== =
Length	(MN-16, ESAOTE_P1, "Fibroma Length")	== =
Height	(MN-19, ESAOTE_P1, "Fibroma Height")	== =
Width	(MN-13, ESAOTE_P1, "Fibroma Width")	== =

⁵² The Fetal Heart Rate manually input in the OBSERVATIONS page (when available) will be the exported one. Otherwise, the Fetal Heart Rate acquired in Doppler mode will be the exported one, if acquired. When both are missing, the Fetal Heart Rate acquired in M-MODE will be exported, if acquired.

⁵³ When present, it is contained in the Ob-Gyn Procedure Fetus Summary.

⁵⁴ Up to 4 can be present in the report, numbered from Fibroma 1 to Fibroma 4. In the following, <n> will be substituted by 1, 2, 3 or 4 according to the case.

<i>ESAOTE MEASURE</i>	<i>BASE MEAS. CONCEPT NAME</i>	<i>CONCEPT OR ACQUISITION CONTEXT MODIFIERS</i>
Volume	(MN-22,ESAOTE_P1, "Fibroma Volume")	== =
MASS KIND	(CN-42, ESAOTE_P1, "Mass Kind")	== =
CHARACTERISTI CS	(CN-29, ESAOTE_P1, "Fibroma Characteristics")	== =
SITE	(CN-30, ESAOTE_P1, "Fibroma Site")	== =
L Ovary		
Length	(11840-6, LN, "Left Ovary Length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Height	(11857-0, LN, "Left Ovary Height")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Width	(11829-9, LN, "Left Ovary Width")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
L Ovary Volume	(12164-0, LN, "Left Ovary Volume")	(121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L CORPUS LUTEUM	(CN-40, ESAOTE_P1, "Corpus Luteum Left Ovary")	== =
L FOLLICLE <p> ⁵⁵	(12510, DCM, "Identifier") = "L_FOLLICLE<p>" (11793-7, SRT, "Follicle Diameter")	(G-C171, SRT, "Laterality")= (G-A101, SRT, "Left")
R Ovary		
Length	(11841-4, LN, "Right Ovary Length")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Height	(11858-8, LN, "Right Ovary Height")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
Width	(11830-7, LN, "Right Ovary Width")	(121401, DCM, "Derivation")=(R-41D41, SRT, "Measured")
R Ovary Volume	(12165-7, LN, "Right Ovary Volume")	(121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R CORPUS LUTEUM	(CN-41, ESAOTE_P1, "Corpus Luteum Right Ovary")	== =
R FOLLICLE <p> ⁵⁶	(12510, DCM, "Identifier") = "R_FOLLICLE<p>" (11793-7, SRT, "Follicle Diameter")	(G-C171, SRT, "Laterality")= (G-A100, SRT, "Right")
L Ovary Mass 1 / 2 / 3 / 4 ⁵⁷		
L Mass <n>	(CN-28, ESAOTE_P1, "Mass ID") = "MASS<n>L"	== =
Length	(MN-17, ESAOTE_P1, "Left Ovary Mass Length")	== =
Height	(MN-20, ESAOTE_P1, "Left Ovary Mass Height")	== =
Width	(MN-14, ESAOTE_P1, "Left Ovary Mass Width")	== =
Volume	(MN-23, ESAOTE_P1, "Left Ovary Mass Volume")	== =
CHARACTERISTI CS	(CN-31, ESAOTE_P1, "Ovary Mass Characteristics")	== =

⁵⁵ Up to 14 can be present in the report, identified from A to N. In these measures, <p> will be substituted by A, B, ..., N.

⁵⁶ Up to 14 can be present in the report, identified from A to N. In these measures, <p> will be substituted by A, B, ..., N.

⁵⁷ Up to 4 can be present in the report, numbered from L Mass 1 to L Mass 4. In the following, <n> will be substituted by 1, 2, 3 or 4 according to the case.

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
R Ovary Mass 1 / 2 / 3 / 4 ⁵⁸		
R Mass <n>	(CN-28,ESAOTE_P1,"Mass ID") = "MASS<n>R"	== =
Length	(MN-18,ESAOTE_P1, "Right Ovary Mass Length")	== =
Height	(MN-21,ESAOTE_P1, "Right Ovary Mass Height")	== =
Width	(MN-15,ESAOTE_P1, "RightOvary Mass Width")	== =
Volume	(MN-24,ESAOTE_P1, "Right Ovary Mass Volume")	== =
CHARACTERISTI CS	(CN-31, ESAOTE_P1, "Ovary Mass Characteristics")	== =

**Table 95
OB-GYN SR MAPPING – OB-GYN DOPPLER**

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
DOPPLER			
Mid Cerebral A			
MCA VTI	(20354-7,LN, "Velocity Time Integral")	(T-45600,SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MCA PSV	(11726-7,LN, "Peak Systolic Velocity")	(T-45600,SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MCA EDV	(11653-3,LN, "End Diastolic Velocity")	(T-45600,SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MCA Vmn	(20352-1,LN, "Time averaged mean velocity")	(T-45600,SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MCA HR	(EV-84,ESAOTE_P1, "Heart Beat")	(T-45600,SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MCA PI	(12008-9,LN, "Pulsatility Index")	(T-45600,SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MCA RI	(12023-8,LN, "Resistivity Index")	(T-45600,SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MCA S/D	(12144-2,LN, "Systolic to Diastolic Velocity Ratio")	(T-45600,SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Umbilical A			
Umb A VTI	(20354-7,LN, "Velocity Time Integral")	(T-F1810,SRT, "Umbilical Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Umb A PSV	(11726-7,LN,	(T-F1810,SRT,	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral")

⁵⁸ Up to 4 can be present in the report, numbered from R Mass 1 to R Mass 4. In the following, <n> will be substituted by 1, 2, 3 or 4 according to the case.

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
	"Peak Systolic Velocity")	"Umbilical Artery")	(121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Umb A EDV	(11653-3,LN, "End Diastolic Velocity")	(T-F1810,SRT, "Umbilical Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Umb A Vmn	(20352-1,LN, "Time averaged mean velocity")	(T-F1810,SRT, "Umbilical Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Umb A HR	(EV-84,ESAOTE_P1, "Heart Beat")	(T-F1810,SRT, "Umbilical Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Umb A PI	(12008-9,LN, "Pulsatility Index")	(T-F1810,SRT, "Umbilical Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Umb A RI	(12023-8,LN, "Resistivity Index")	(T-F1810,SRT, "Umbilical Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Umb A S/D	(12144-2,LN, "Systolic to Diastolic Velocity Ratio")	(T-F1810,SRT, "Umbilical Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Aorta			
Aorta VTI	(20354-7,LN, "Velocity Time Integral")	(T-42000,SRT, "Aorta")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
AV Vmax	(11726-7,LN, "Peak Systolic Velocity")	(T-42000,SRT, "Aorta")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Aortic EDV	(11653-3,LN, "End Diastolic Velocity")	(T-42000,SRT, "Aorta")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
AV Vmean	(20352-1,LN, "Time averaged mean velocity")	(T-42000,SRT, "Aorta")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Aorta HR	(EV-84,ESAOTE_P1, "Heart Beat")	(T-42000,SRT, "Aorta")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Aorta PI	(12008-9,LN, "Pulsatility Index")	(T-42000,SRT, "Aorta")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Aorta RI	(12023-8,LN, "Resistivity Index")	(T-42000,SRT, "Aorta")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Aorta S/D	(12144-2,LN, "Systolic to Diastolic Velocity Ratio")	(T-42000,SRT, "Aorta")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
TV			
TV VTI	(20354-7,LN, "Velocity Time Integral")	(T-35100,SRT, "Tricuspid Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
TV PSV	(11726-7,LN, "Peak Systolic Velocity")	(T-35100,SRT, "Tricuspid Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
TV EDV	(11653-3,LN, "End Diastolic Velocity")	(T-35100,SRT, "Tricuspid Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
TV Vmean	(20352-1,LN, "Time averaged mean velocity")	(T-35100,SRT, "Tricuspid Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
TV - HR	(EV-84,ESAOTE_P1, "Heart Beat")	(T-35100,SRT, "Tricuspid Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
TV PI	(12008-9,LN, "Pulsatility Index")	(T-35100,SRT, "Tricuspid Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral")

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
	"Pulsatility Index")	"Tricuspid Valve")	(121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
TV RI	(12023-8,LN, "Resistivity Index")	(T-35100,SRT, "Tricuspid Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
TV S/D	(12144-2,LN, "Systolic to Diastolic Velocity Ratio")	(T-35100,SRT, "Tricuspid Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MV			
MV VTI	(20354-7,LN, "Velocity Time Integral")	(T-35300,SRT, "Mitral Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MV PSV	(11726-7,LN, "Peak Systolic Velocity")	(T-35300,SRT, "Mitral Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MV EDV	(11653-3,LN, "End Diastolic Velocity")	(T-35300,SRT, "Mitral Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MV Vmean	(20352-1,LN, "Time averaged mean velocity")	(T-35300,SRT, "Mitral Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MV - HR	(EV-84,ESAOTE_P1, "Heart Beat")	(T-35300,SRT, "Mitral Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MV PI	(12008-9,LN, "Pulsatility Index")	(T-35300,SRT, "Mitral Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MV RI	(12023-8,LN, "Resistivity Index")	(T-35300,SRT, "Mitral Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
MV S/D	(12144-2,LN, "Systolic to Diastolic Velocity Ratio")	(T-35300,SRT, "Mitral Valve")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
Pulmonary A			
PA VTI	(20354-7,LN, "Velocity Time Integral")	(T-44000,SRT, "Pulmonary Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
PA Vmax	(11726-7,LN, "Peak Systolic Velocity")	(T-44000,SRT, "Pulmonary Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
PR Ved	(11653-3,LN, "End Diastolic Velocity")	(T-44000,SRT, "Pulmonary Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
PA Vmean	(20352-1,LN, "Time averaged mean velocity")	(T-44000,SRT, "Pulmonary Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
PA HR	(EV-84,ESAOTE_P1, "Heart Beat")	(T-44000,SRT, "Pulmonary Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
PA PI	(12008-9,LN, "Pulsatility Index")	(T-44000,SRT, "Pulmonary Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
PA RI	(12023-8,LN, "Resistivity Index")	(T-44000,SRT, "Pulmonary Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
PA S/D	(12144-2,LN, "Systolic to Diastolic Velocity Ratio")	(T-44000,SRT, "Pulmonary Artery")	(G-C171, SRT, "Laterality")=(G-A103,SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D,SRT, "Calculated")
R Renal A			

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
R RA VTI	(20354-7, LN, "Velocity Time Integral")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R RA PSV	(11726-7, LN, "Peak Systolic Velocity")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R RA EDV	(11653-3, LN, "End Diastolic Velocity")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R RA Vmn	(20352-1, LN, "Time averaged mean velocity")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R RA HR	(EV-84, ESAOTE_P1, "Heart Beat")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R RA PI	(12008-9, LN, "Pulsatility Index")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R RA RI	(12023-8, LN, "Resistivity Index")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R RA S/D	(12144-2, LN, "Systolic to Diastolic Velocity Ratio")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Renal A			
L RA VTI	(20354-7, LN, "Velocity Time Integral")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L RA PSV	(11726-7, LN, "Peak Systolic Velocity")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L RA EDV	(11653-3, LN, "End Diastolic Velocity")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L RA Vmn	(20352-1, LN, "Time averaged mean velocity")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L RA HR	(EV-84, ESAOTE_P1, "Heart Beat")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L RA PI	(12008-9, LN, "Pulsatility Index")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L RA RI	(12023-8, LN, "Resistivity Index")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L RA S/D	(12144-2, LN, "Systolic to Diastolic Velocity Ratio")	(T-46600, SRT, "Renal Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
Fetal Heart Rate			
Fetal Heart Rate (3) ⁵⁹	(11948-7, LN, "Fetal Heart Rate")	== =	== = ⁶⁰
R Middle Cerebral A			

⁵⁹ The Fetal Heart Rate manually input in the OBSERVATIONS page (when available) will be the exported one. Otherwise, the Fetal Heart Rate acquired in Doppler mode will be the exported one, if acquired. When both are missing, the Fetal Heart Rate acquired in M-MODE will be exported, if acquired.

⁶⁰ When present, it is contained in the Ob-Gyn Procedure Fetus Summary.

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
R MCA VTI	(20354-7, LN, "Velocity Time Integral")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R MCA PSV	(11726-7, LN, "Peak Systolic Velocity")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R MCA EDV	(11653-3, LN, "End Diastolic Velocity")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R MCA Vmn	(20352-1, LN, "Time averaged mean velocity")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R MCA HR	(EV-84, ESAOTE_P1, "Heart Beat")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R MCA PI	(12008-9, LN, "Pulsatility Index")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R MCA RI	(12023-8, LN, "Resistivity Index")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R MCA S/D	(12144-2, LN, "Systolic to Diastolic Velocity Ratio")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Middle Cerebral A			
L MCA VTI	(20354-7, LN, "Velocity Time Integral")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L MCA PSV	(11726-7, LN, "Peak Systolic Velocity")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L MCA EDV	(11653-3, LN, "End Diastolic Velocity")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L MCA Vmn	(20352-1, LN, "Time averaged mean velocity")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L MCA HR	(EV-84, ESAOTE_P1, "Heart Beat")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L MCA PI	(12008-9, LN, "Pulsatility Index")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L MCA RI	(12023-8, LN, "Resistivity Index")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L MCA S/D	(12144-2, LN, "Systolic to Diastolic Velocity Ratio")	(T-45600, SRT, "Middle Cerebral Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
Ductus Arteriosus			
DA VTI	(20354-7, LN, "Velocity Time Integral")	(T-F6845, LN, "Ductus Arteriosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DA PSV	(11726-7, LN, "Peak Systolic Velocity")	(T-F6845, LN, "Ductus Arteriosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")

<i>ESAOTE MEASURE</i>	<i>BASE MEAS. CONCEPT NAME</i>	<i>SECTION</i>	<i>CONCEPT OR ACQUISITION CONTEXT MODIFIERS</i>
DA EDV	(11653-3, LN, "End Diastolic Velocity")	(T-F6845, LN, "Ductus Arteriosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DA Vmn	(20352-1, LN, "Time averaged mean velocity")	(T-F6845, LN, "Ductus Arteriosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DA HR	(EV-84, ESAOTE_P1, "Heart Beat")	(T-F6845, LN, "Ductus Arteriosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DA PI	(12008-9, LN, "Pulsatility Index")	(T-F6845, LN, "Ductus Arteriosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DA RI	(12023-8, LN, "Resistivity Index")	(T-F6845, LN, "Ductus Arteriosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DA S/D	(12144-2, LN, "Systolic to Diastolic Velocity Ratio")	(T-F6845, LN, "Ductus Arteriosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
Ductus Venosus			
DV VTI	(MN-25, ESAOTE_P1, "Time Averaged Velocity")	(T-F6806, LN, "Ductus Venosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DV PSV	(11726-7, LN, "Peak Systolic Velocity")	(T-F6806, LN, "Ductus Venosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DV EDV	(11653-3, LN, "End Diastolic Velocity")	(T-F6806, LN, "Ductus Venosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DV Vmn	(20352-1, LN, "Time averaged mean velocity")	(T-F6806, LN, "Ductus Venosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DV HR	(EV-84, ESAOTE_P1, "Heart Beat")	(T-F6806, LN, "Ductus Venosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DV PI	(12008-9, LN, "Pulsatility Index")	(T-F6806, LN, "Ductus Venosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DV RI	(12023-8, LN, "Resistivity Index")	(T-F6806, LN, "Ductus Venosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
DV S/D	(12144-2, LN, "Systolic to Diastolic Velocity Ratio")	(T-F6806, LN, "Ductus Venosus")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
Doppl-Mot			
L Uterine A			
L Ut A VTI	(20354-7, LN, "Velocity Time Integral")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Ut A PSV	(11726-7, LN, "Peak Systolic Velocity")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Ut A EDV	(11653-3, LN, "End Diastolic Velocity")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Ut A Vmn	(20352-1, LN, "Time averaged")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
	mean velocity")		
L Ut A PI	(12008-9, LN, "Pulsatility Index")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Ut A RI	(12023-8, LN, "Resistivity Index")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Ut A S/D	(12144-2, LN, "Systolic to Diastolic Velocity Ratio")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Uterine A			
R Ut A VTI	(20354-7, LN, "Velocity Time Integral")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Ut A PSV	(11726-7, LN, "Peak Systolic Velocity")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Ut A EDV	(11653-3, LN, "End Diastolic Velocity")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Ut A Vmn	(20352-1, LN, "Time averaged mean velocity")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Ut A PI	(12008-9, LN, "Pulsatility Index")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Ut A RI	(12023-8, LN, "Resistivity Index")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Ut A S/D	(12144-2, LN, "Systolic to Diastolic Velocity Ratio")	(T-46820, SRT, "Uterine Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Ovary A VTI			
L Ov A vti	(20354-7, LN, "Velocity Time Integral")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Ov A PSV	(11726-7, LN, "Peak Systolic Velocity")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Ov A EDV	(11653-3, LN, "End Diastolic Velocity")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Ov A Vmn	(20352-1, LN, "Time averaged mean velocity")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Ovary A PI	(12008-9, LN, "Pulsatility Index")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Ov A RI	(12023-8, LN, "Resistivity Index")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
L Ovary A S/D	(12144-2, LN, "Systolic to Diastolic Velocity Ratio")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A101, SRT, "Left") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Ovary A VTI			
R Ov A VTI	(20354-7, LN, "Velocity Time Integral")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Ov A PSV	(11726-7, LN, "Peak Systolic Velocity")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")

ESAOTE MEASURE	BASE MEAS. CONCEPT NAME	SECTION	CONCEPT OR ACQUISITION CONTEXT MODIFIERS
R Ov A EDV	(11653-3, LN, "End Diastolic Velocity")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Ov A Vmn	(20352-1, LN, "Time averaged mean velocity")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Ov A PI	(12008-9, LN, "Pulsatility Index")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Ov A RI	(12023-8, LN, "Resistivity Index")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
R Ov A S/D	(12144-2, LN, "Systolic to Diastolic Velocity Ratio")	(T-46980, SRT, "Ovarian Artery")	(G-C171, SRT, "Laterality")=(G-A100, SRT, "Right") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
Spiral A			
Sp A VTI	(20354-7, LN, "Velocity Time Integral")	(EV-121, ESAOTE_P1, "Spiral Artery")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
Sp A PSV	(11726-7, LN, "Peak Systolic Velocity")	(EV-121, ESAOTE_P1, "Spiral Artery")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
Sp A EDV	(11653-3, LN, "End Diastolic Velocity")	(EV-121, ESAOTE_P1, "Spiral Artery")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
Sp A Vmn	(20352-1, LN, "Time averaged mean velocity")	(EV-121, ESAOTE_P1, "Spiral Artery")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
Sp A HR	(EV-84, ESAOTE_P1, "Heart Beat")	(EV-121, ESAOTE_P1, "Spiral Artery")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
Sp A PI	(12008-9, LN, "Pulsatility Index")	(EV-121, ESAOTE_P1, "Spiral Artery")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
Sp A RI	(12023-8, LN, "Resistivity Index")	(EV-121, ESAOTE_P1, "Spiral Artery")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")
Sp A S/D	(12144-2, LN, "Systolic to Diastolic Velocity Ratio")	(EV-121, ESAOTE_P1, "Spiral Artery")	(G-C171, SRT, "Laterality")=(G-A103, SRT, "Unilateral") (121401, DCM, "Derivation")=(R-41D2D, SRT, "Calculated")

Some of the obstetric measures (gestational age and growth) are calculated from other measures, according to a given equation or table, that can be chosen in the configuration of the MyLab. The following table shows the relationship between the selected equation or table and its encoding in the OB-GYN SR objects.

Table 96
OB-GYN SR MAPPING – EQUATIONS / TABLES

ESAOTE MEASURE	REFERENCE	EQUATION OR TABLE	EQUATION OR TABLE NAME
GESTATIONAL AGE			
ABDOMINAL CIRCUMF	Hadlock84	(121420, DCM, "Equation")	(11892-7, LN, "AC, Hadlock 1984")
	Hansmann	(121424, DCM, "Table of Values")	(33073-8, LN, "AC, Hansmann 1985")
	JSUM 2001	(121424, DCM, "Table of Values")	(EV-24, ESAOTE_P1, "AC, JSUM 2001")
	Merz	(121424, DCM, "Table of Values")	(33075-3, LN, "AC, Mertz 1988")
BIPARIETAL	Chitty O-O	(121424, DCM, "Table of Values")	(33087-8, LN, "BPD-oo, Chitty 1997")

<i>ESAOTE MEASURE</i>	<i>REFERENCE</i>	<i>EQUATION OR TABLE</i>	<i>EQUATION OR TABLE NAME</i>
DIAMETER	Hadlock	(121420,DCM, "Equation")	(11901-6,LN, "BPdA, Hadlock 1982")
	Hadlock84	(121420,DCM, "Equation")	(11902-4,LN, "BPD, Hadlock 1984")
	Hansmann	(121424,DCM, "Table of Values")	(11903-2,LN, "BPD, Hansmann 1985")
	Jeanty	(121424,DCM, "Table of Values")	(11905-7,LN, "BPD, Jeanty 1984")
	JSUM 2001	(121424,DCM, "Table of Values")	(EV-29,ESAOTE_P1, "BPD, JSUM")
	Merz	(121424,DCM, "Table of Values")	(33081-1,LN, "BPD, Mertz 1988")
	Osaka U	(121424,DCM, "Table of Values")	(33082-9,LN, "BPD, Osaka 1989")
	Rempen	(121424,DCM, "Table of Values")	(33083-7,LN, "BPD, Rempen 1991")
CROWN-RUMP LENGTH	Hadlock	(121420,DCM, "Equation")	(11910-7,LN, "CRL, Hadlock 1992")
	Hansmann	(121424,DCM, "Table of Values")	(11911-5,LN, "CRL, Hansmann 1985")
	JSUM 2001	(121424,DCM, "Table of Values")	(EV-31,ESAOTE_P1, "CRL, JSUM")
	Osaka U	(121424,DCM, "Table of Values")	(EV-30,ESAOTE_P1, "CRL, OsakaU 1983")
	Rempen	(121424,DCM, "Table of Values")	(33094-4,LN, "CRL, Rempen 1991")
	Robinson	(121420,DCM, "Equation")	(11914-9,LN, "CRL, Robinson 1975")
FEMUR LENGTH	Chitty	(121424,DCM, "Table of Values")	(33098-5,LN, "FL, Chitty 1997")
	Hadlock84	(121420,DCM, "Equation")	(11920-6,LN, "FL, Hadlock 1984")
	Hansmann	(121424,DCM, "Table of Values")	(11921-4,LN, "FL, Hansmann 1985")
	Jeanty	(121424,DCM, "Table of Values")	(11923-0,LN, "FL, Jeanty 1984")
	JSUM 2001	(121424,DCM, "Table of Values")	(EV-39,ESAOTE_P1, "FL, JSUM 2001")
	Merz	(121424,DCM, "Table of Values")	(33542-2,LN, "FL, Merz 1988")
	Osaka U	(121424,DCM, "Table of Values")	(EV-38,ESAOTE_P1, "FL, OsakaU 1983")
FETAL TRUNK SECT A	Osaka U	(121424,DCM, "Table of Values")	(EV-145,ESAOTE_P1, "FTA, Osaka")
GEST SAC DIAM	Hansmann	(121424,DCM, "Table of Values")	(EV-40,ESAOTE_P1, "GSD, Hansmann 1985")
	Rempen	(121424,DCM, "Table of Values")	(11929-7,LN, "GS, Rempen 1991")
HEAD CIRCUMFERENCE	Chitty	(121424,DCM, "Table of Values")	(33111-6,LN, "HC derived, Chitty 1997")
	Hadlock84	(121420,DCM, "Equation")	(11932-1,LN, "HC, Hadlock 1984")
	Hansmann	(121424,DCM, "Table of Values")	(33112-4,LN, "HC, Hansmann 1985")
	Merz	(121424,DCM, "Table of Values")	(33115-7,LN, "HC Merz, 1988")
HUMERUS LENGTH	Jeanty	(121424,DCM, "Table of Values")	(EV-148,ESAOTE_P1, "HL, Jeanty")
	Osaka U	(121424,DCM, "Table of Values")	(EV-146,ESAOTE_P1, "HL, Osaka")
OCCIP FRONTAL DIAM	Hansmann	(121424,DCM, "Table of Values")	(33544-8,LN, "OFD, Hansmann 1985")
TIBIA LENGTH	JEANTY84	(121424,DCM, "Table of Values")	(11941-2,LN, "Tibia, Jeanty 1984")
TRANSV CEREB DIAM	Goldstein	(121424,DCM, "Table of Values")	(33133-0,LN, "TCD, Goldstein 1987")
	Hill	(121420,DCM, "Equation")	(33134-8,LN, "TCD, Hill 1990")
TRANSV TRUNK DIAM	Hansmann	(121424,DCM, "Table of Values")	(33136-3,LN, "Transverse Thoracic Diameter, Hansmann 1985")

ESAOTE MEASURE	REFERENCE	EQUATION OR TABLE	EQUATION OR TABLE NAME
ULNA LENGTH	JEANTY84	(121424,DCM, "Table of Values")	(11944-6,LN, "Ulna, Jeanty 1984")
GROWTH			
ABDOMINAL CIRCUMF	CFEF	(121424,DCM, "Table of Values")	(EV-85,ESAOTE_P1, "AC by GA, CFEF")
	Chitty	(121424,DCM, "Table of Values")	(33546-3,LN, "AC (derived) by GA, Chitty 1994")
	Hadlock84	(121420,DCM, "Equation")	(33146-2,LN, "AC by GA, Hadlock 1984")
	Jeanty	(121424,DCM, "Table of Values")	(EV-147,ESAOTE_P1, "AC by GA, Jeanty")
	JSUM 2001	(121424,DCM, "Table of Values")	(EV-59,ESAOTE_P1, "JSUM 2001")
	Merz	(121424,DCM, "Table of Values")	(33148-8,LN, "AC by GA, Merz 1988")
	Nicolaides	(121424,DCM, "Table of Values")	(EV-86,ESAOTE_P1, "AC by GA, Nicolaides")
	PALADINI	(121424,DCM, "Table of Values")	(EV-122,ESAOTE_P1, "AC by GA, Paladini 2005")
ANT-POST ABD DIAM	Merz	(121424,DCM, "Table of Values")	(EV-123,ESAOTE_P1, "APAD by GA, Merz 1996")
BIPARIETAL DIAMETER	CFEF	(121424,DCM, "Table of Values")	(EV-90,ESAOTE_P1, "BPD by GA, CFEF")
	Chitty O-O	(121424,DCM, "Table of Values")	(33152-0,LN, "BPD outer-outer by GA, Chitty 1994")
	Hadlock84	(121420,DCM, "Equation")	(33198-3,LN, "BPD by GA, Hadlock 1984")
	Jeanty	(121424,DCM, "Table of Values")	(EV-139,ESAOTE_P1, "BPD by GA, Jeanty")
	JSUM 2001	(121424,DCM, "Table of Values")	(EV-91,ESAOTE_P1, "BPD by GA, JSUM 2001")
	Merz	(121424,DCM, "Table of Values")	(33154-6,LN, "BPD by GA, Merz 1988")
	Nicolaides	(121424,DCM, "Table of Values")	(EV-92,ESAOTE_P1, "BPD by GA, Nicolaides")
	Osaka U	(121424,DCM, "Table of Values")	(EV-62,ESAOTE_P1, "BPD by GA, OsakaU")
	PALADINI	(121424,DCM, "Table of Values")	(EV-124,ESAOTE_P1, "BPD by GA, Paladini 2005")
CISTERNA MAGNA	Nicolaides	(121424,DCM, "Table of Values")	(EV-93,ESAOTE_P1, "Cisterna Magna by GA, Nicolaides")
CROWN-RUMP LENGTH	Hadlock	(121420,DCM, "Equation")	(EV-94,ESAOTE_P1, "CRL by GA, Hadlock")
	Hansmann	(121424,DCM, "Table of Values")	(EV-63,ESAOTE_P1, "CRL by GA, Hansmann")
	JSUM 2001	(121424,DCM, "Table of Values")	(EV-95,ESAOTE_P1, "CRL by GA, JSUM 2001")
	Osaka U	(121424,DCM, "Table of Values")	(EV-64,ESAOTE_P1, "CRL by GA, OsakaU")
	Robinson	(121424,DCM, "Table of Values")	(EV-96,ESAOTE_P1, "CRL by GA, Robinson 1975")
AVERAGE ULTRASOUND AGE	Average Ultrasound Age	(121420, DCM, "Equation")	(11884-4, LN, "Average Ultrasound Age")
ESTIM FETAL WEIGHT ⁶¹	Shepard82	(121420,DCM, "Equation")	(11739-0, LN, "EFW by AC and BPD, Shepard 1982")
	Hadlock1	(121420,DCM, "Equation")	(11751-5, LN, "EFW by AC, FL, Hadlock 1985")
	Hansmann	(121420,DCM, "Equation")	(33139-7, LN, "EFW by BPD, TTD, Hansmann 1986")
	Hadlock3	(121420,DCM, "Equation")	(11735-8, LN, "EFW by AC, BPD, FL, Hadlock 1985")

⁶¹ The modifier will only be present when one of the listed equations is selected, otherwise it will be absent.

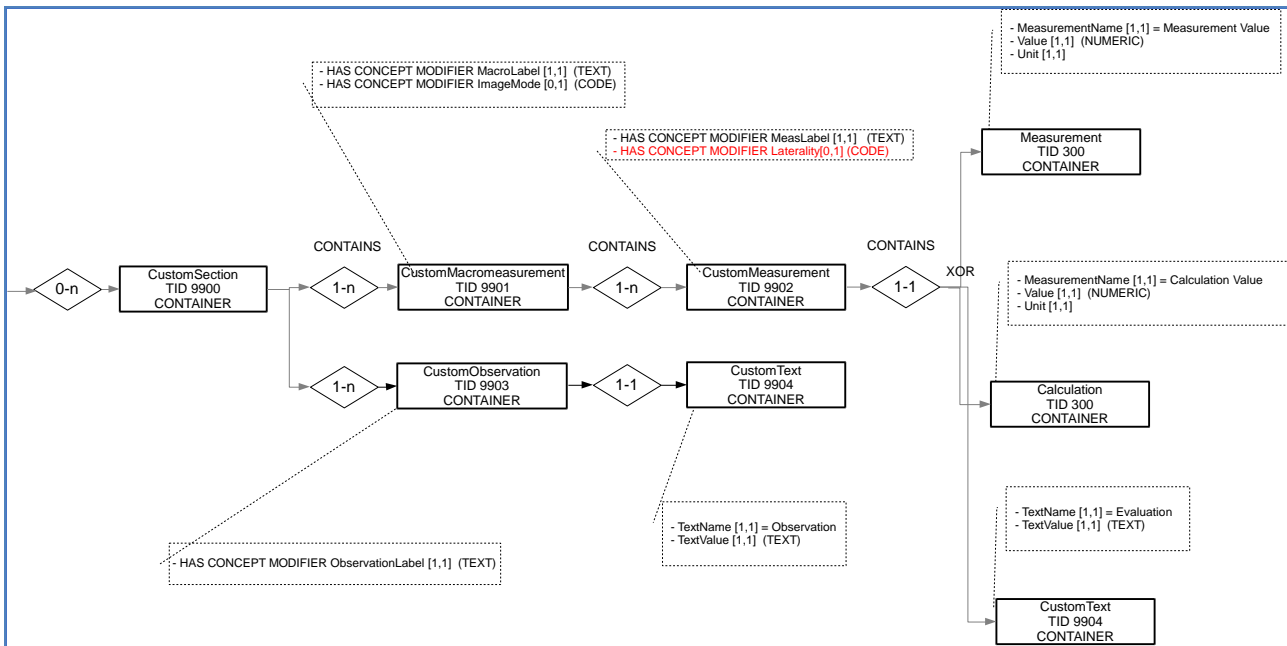
ESAOTE MEASURE	REFERENCE	EQUATION OR TABLE	EQUATION OR TABLE NAME
	Hadlock4	(121420,DCM, "Equation")	(11732-5, LN, "EFW by AC, BPD, FL, HC, Hadlock 1985")
	Persson1	(121420,DCM, "Equation")	(ESAOTE_P1, EV-125, "EFW by BPD, MAD, Persson")
	Persson2	(121420,DCM, "Equation")	(ESAOTE_P1, EV-126, "EFW by BPD, MAD, FL, Persson")
	Hadlock2	(121420,DCM, "Equation")	(11746-5, LN, "EFW by AC, FL, HC, Hadlock 1985")
EFW GROWTH VALUE RANKING	Hadlock	(121424, DCM, "Table of Values")	(33183-5, LN, "FWP by GA, Hadlock 1991")
FEMUR LENGTH	CFEF	(121424,DCM, "Table of Values")	(EV-98,ESAOTE_P1, "Femur length by GA, CFEF")
	Chitty	(121424,DCM, "Table of Values")	(33167-8, LN, "FL by GA, Chitty 1994")
	Hadlock84	(121420,DCM, "Equation")	(33166-0, LN, "FL by GA, Hadlock 1984")
	Jeanty	(121424,DCM, "Table of Values")	(EV-140,ESAOTE_P1, "FL by GA, Jeanty")
	JSUM 2001	(121424,DCM, "Table of Values")	(EV-66,ESAOTE_P1, "FL by GA, JSUM")
	Merz	(121424,DCM, "Table of Values")	(33169-4, LN, "FL by GA, Merz 1988")
	Nicolaides	(121424,DCM, "Table of Values")	(EV-67,ESAOTE_P1, "FL by GA, Nicolaides")
	Osaka U	(121424,DCM, "Table of Values")	(EV-65,ESAOTE_P1, "FL by GA, OsakaU")
	PALADINI	(121424,DCM, "Table of Values")	(EV-127,ESAOTE_P1, "FL by GA, Paladini 2005")
FETAL TRUNK SECT A	OSAKA U	(121424,DCM, "Table of Values")	(EV-69,ESAOTE_P1, "FTA by GA, OsakaU")
GEST SAC DIAM	Rempen	(121424,DCM, "Table of Values")	(33171-0, LN, "GS by GA, Rempen 1991")
HEAD CIRCUMFERENCE	CFEF	(121424,DCM, "Table of Values")	(EV-100,ESAOTE_P1, "HC by GA, CFEF")
	Chitty	(121424,DCM, "Table of Values")	(EV-72,ESAOTE_P1, "HC by GA, Chitty")
	Hadlock84	(121420,DCM, "Equation")	(33173-6, LN, "HC by GA, Hadlock 1984")
	Jeanty	(121424,DCM, "Table of Values")	(EV-141,ESAOTE_P1, "HC by GA, Jeanty")
	Merz	(121424,DCM, "Table of Values")	(33176-9, LN, "HC by GA, Merz 1988")
	Nicolaides	(121424,DCM, "Table of Values")	(EV-73,ESAOTE_P1, "HC by GA, Nicolaides")
	PALADINI	(121424,DCM, "Table of Values")	(EV-128,ESAOTE_P1, "HC by GA, Paladini 2005")
HUMERUS LENGTH	Jeanty	(121424,DCM, "Table of Values")	(EV-143,ESAOTE_P1, "HL by GA, Jeanty")
	Merz	(121424,DCM, "Table of Values")	(EV-142,ESAOTE_P1, "HL by GA, Merz")
	Osaka U	(121424,DCM, "Table of Values")	(EV-74,ESAOTE_P1, "HL by GA, OsakaU")
	PALADINI	(121424,DCM, "Table of Values")	(EV-129,ESAOTE_P1, "HL by GA, Paladini 2005")
OCCIP FRONTAL DIAM	Chitty	(121424,DCM, "Table of Values")	(33179-3, LN, "OFD by GA, Chitty 1994")
	Jeanty	(121424,DCM, "Table of Values")	(EV-144,ESAOTE_P1, "OFD by GA, Jeanty")
	Merz	(121424,DCM, "Table of Values")	(EV-77,ESAOTE_P1, "OFD by GA, Merz")
	Nicolaides	(121424,DCM, "Table of Values")	(EV-130,ESAOTE_P1, "OFD by GA, Nicolaides 1994 FG")
RADIO LENGTH	Merz	(121424,DCM, "Table of Values")	(EV-78,ESAOTE_P1, "RL by GA, Merz")
	PALADINI	(121424,DCM, "Table of Values")	(EV-131,ESAOTE_P1, "RL by GA, Paladini 2005")

<i>ESAOTE MEASURE</i>	<i>REFERENCE</i>	<i>EQUATION OR TABLE</i>	<i>EQUATION OR TABLE NAME</i>
TIBIA LENGTH	Jeanty	(121424,DCM, "Table of Values")	(EV-132,ESAOTE_P1, "TL by GA, Jeanty 1984")
	Merz	(121424,DCM, "Table of Values")	(EV-79,ESAOTE_P1, "TL by GA, Merz")
	PALADINI	(121424,DCM, "Table of Values")	(EV-133,ESAOTE_P1, "TL by GA, Paladini 2005")
TRANSV ABD DIAM	CFEF	(121424,DCM, "Table of Values")	(EV-106,ESAOTE_P1, "TAD by GA, CFEF")
	Merz	(121424,DCM, "Table of Values")	(EV-134,ESAOTE_P1, "TAD by GA, Merz 1996")
TRANSV CEREB DIAM	Goldstein	(121424,DCM, "Table of Values")	(33181-9,LN, "TCD by GA Goldstein 1987")
	Nicolaidis	(121424,DCM, "Table of Values")	(EV-135,ESAOTE_P1, "TCD by GA, Nicolaidis 1994")
ULNA LENGTH	Jeanty	(121424,DCM, "Table of Values")	(EV-108,ESAOTE_P1, "UL by GA, Jeanty 1984")
	Merz	(121424,DCM, "Table of Values")	(EV-80,ESAOTE_P1, "UL by GA, Merz")
	PALADINI	(121424,DCM, "Table of Values")	(EV-136,ESAOTE_P1, "UL by GA, Paladini 2005")

8.3 ECHO-CARDIO VASCULAR AND ABDOMINAL CUSTOM FINDINGS SECTION

8.3.1 Description

For Echo-Cardio, Vascular and Abdominal reports the user can include in the exported structured report the defined custom measurements, calculations and evaluations, grouped in macromeasurements. Custom measurements for the Abdominal reports are exported in the very same way of the Vascular reports, please refer to it. In order to export this custom information, also keeping the intended grouping, but without the need to define a local dictionary of codes, we introduced a generic structure that does not assign specific codes, but uses the labels given by the user. Please note that presently only one Custom Findings Section (or none) will be present; for future estensions more than one can be used.



**Figure 11
CUSTOM FINDINGS SECTION DIAGRAM**

8.3.2 Template definition

This section contains the definition of the private templates used, according to the conventions adopted by DICOM standard (see DICOM standard document PS 3.16).

8.3.2.1 Topmost template extensions

Both topmost templates (TID 5200 and TID 5100) are of Type: Extensible. We extend them according to the following tables.

**Table 97
TID 5200 – ECHOCARDIOGRAPHY PROCEDURE REPORT EXTENSION**

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (125200, DCM, "Adult Echocardiography Procedure Report")	1	M		Root node
	
25	>	CONTAINS	INCLUDE	DTID (9900) Custom Findings Section	1-n ⁶²	U		

⁶² Presently only one Custom Findings Section (or none) will be present; for future estensions more than one can be used.

Table 98
TID 5100 – VASCULAR ULTRASOUND REPORT EXTENSION ⁶³

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (125100, DCM, "Vascular Ultrasound Procedure Report")	1	M		
	
31	>	CONTAINS	INCLUDE	DTID (9900) Custom Findings Section	1-n ⁶⁴	U		

8.3.2.2 TID 9900 Custom Findings Section

For both TID 5200 and TID 5100 we add a Custom Findings Section (TID 9900) that contains the various Custom Macromasurement sections (TID 9901).

Type: Extensible
Order: Significant

Table 99
TID 9900 – CUSTOM FINDINGS SECTION

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	DT (CUSTOMFIND, 99ESA_C1, "Custom Findings")	1	M		
2	>	CONTAINS	INCLUDE	DTID (9901) , Custom Macromasurement	1-n	M		

8.3.2.3 TID 9901 Custom Macromasurement

Each Custom Macromasurement section (TID 9901) contains the custom macromasurement label, the Image Mode (for Echo-cardio reports only), and the Custom Sections (TID 9902) for the various measurements, calculations and evaluations included in that custom macromasurement.

Type: Extensible
Order: Significant

Table 100
TID 9901 – CUSTOM MACROMEASUREMENT

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	DT (MACROMEAS, 99ESA_C1, "Custom Macromasurement")	1	M		
2	>	HAS CONCEPT MOD	TEXT	DT (MACROLABEL, 99ESA_C1, "Macromasurement Label")	1	M		Free text
3	>	HAS CONCEPT MOD	CODE	EV (G-0373, SRT, "Image Mode") ⁶⁵	1	U		BCID (12224) Ultrasound Image Modes
4	>	CONTAINS	INCLUDE	DTID (9902) , Custom Measurement	1-n	M		

⁶³ Also valid for the Abdominal reports.

⁶⁴ Presently only one Custom Findings Section (or none) will be present; for future estensions more than one can be used.

⁶⁵ Although this template is used both for Echo-cardio (TID5200) and Vascular (TID5100) Structured Report, the field "Image Mode" is only used for Echo-cardio (TID5200).

8.3.2.4 TID 9902 Custom Measurement

Each Custom Measurement section (TID 9902) contains the custom label as given by the user, and the measurement, calculation or evaluation corresponding to that label.

Type: Extensible
Order: Significant

Table 101
TID 9902 – CUSTOM MEASUREMENT

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (MEAS, 99ESA_C1, "Custom Measurement")	1	M		
2	>	HAS CONCEPT MOD	TEXT	DT (MEASLABEL, 99ESA_C1, "Measurement Label")	1	M		Free text
3	>	HAS CONCEPT MOD	CODE	EV (G-C171, SRT, "Laterality") ⁶⁶	1	U		BCID(244) Laterality
4	>	CONTAINS	INCLUDE	DTID (300) Measurement	1	MC	XOR row 4,5	\$Measurement = EV (MEAS_VALUE, 99ESA_C1, "Measurement Value")
5	>	CONTAINS	INCLUDE	DTID (300) Measurement	1	MC	XOR row 3,5	\$Measurement = EV (CALC_VALUE, 99ESA_C1, "Calculation Value")
6	>	CONTAINS	INCLUDE	DTID (9903) , Custom Text	1	MC	XOR row 3,4	\$TextName = EV (EVAL_VALUE, 99ESA_C1, "Evaluation Value")

8.3.2.5 TID 9903 Custom Text

Each Custom Text section (TID 9903) contains the free text given by the user.

Type: Extensible
Order: Significant

Table 102
TID 9903 – CUSTOM TEXT

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			TEXT	\$TextName	1	M		

⁶⁶ Although this template is used both for Echo-cardio (TID5200) and Vascular (TID5100) Structured Report, the field "Laterality" is only used for Vascular (TID5100).

8.4 OB- GYN CUSTOM SECTIONS AND TABLES

8.4.1 Description

The user can define fetal, maternal, gynecological custom measurements, and Growth and GA estimations based on custom tables. In order to export this custom information, without the need to define a local dictionary of codes, we introduced a generic structure that does not assign specific codes, but uses the labels given by the user. See following figure for an overall of the Fetal, Maternal and Gyn Custom Sections, but refer to the tables for a complete description, as some of the details present in the figures are not implemented.

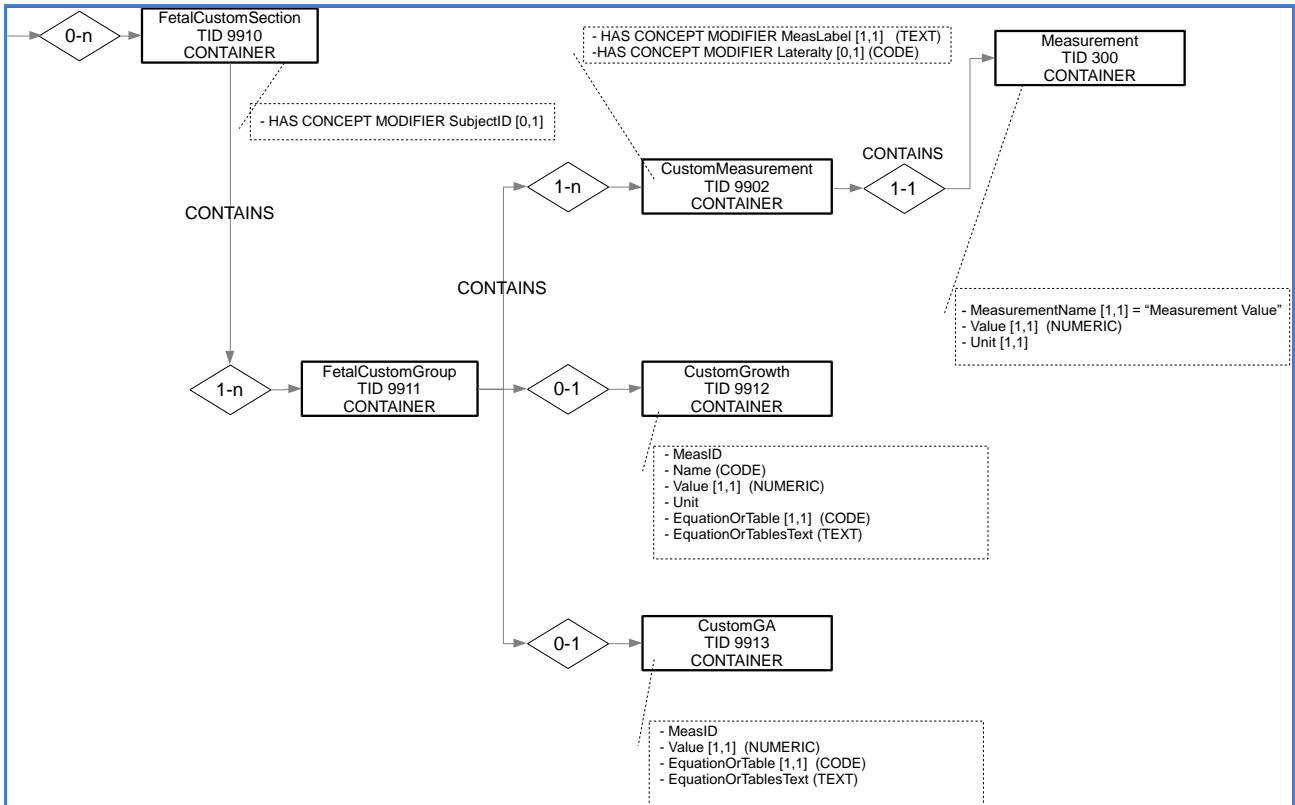


Figure 12
FETAL CUSTOM SECTION

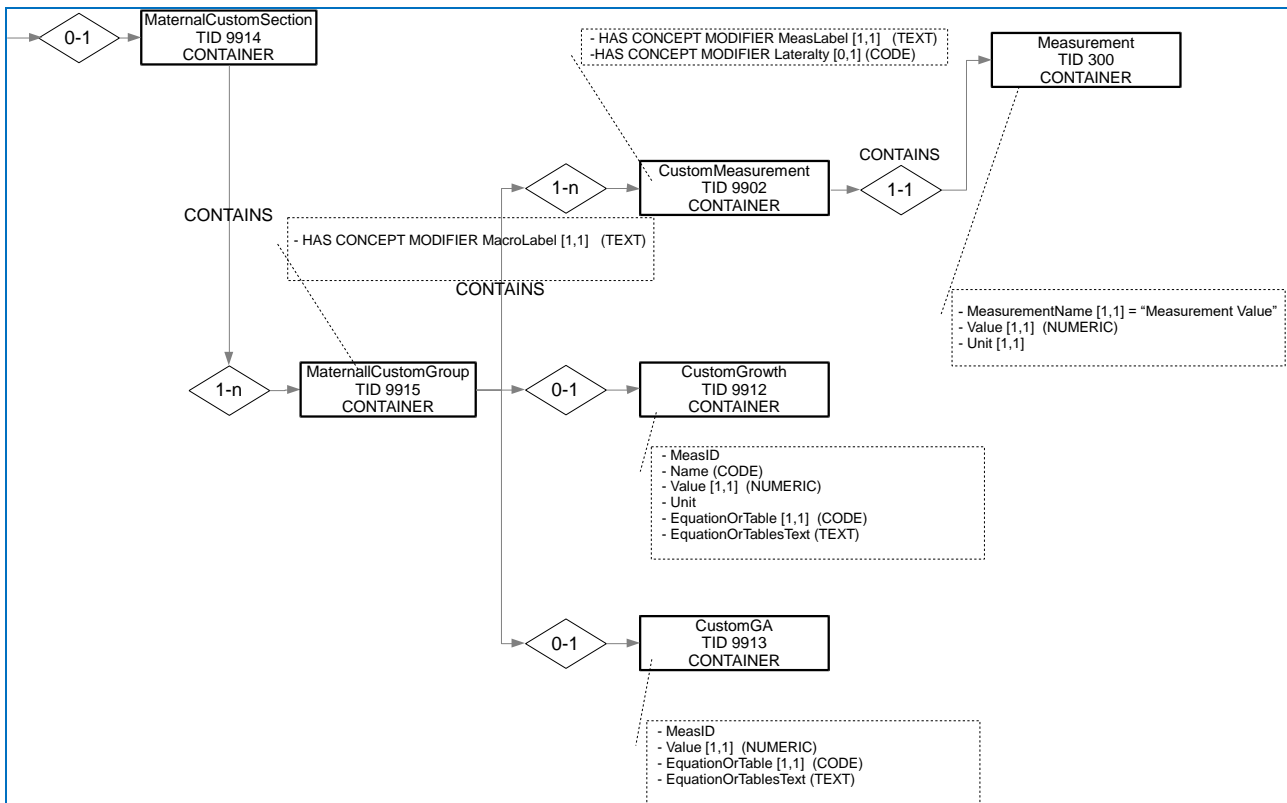


Figure 13
MATERNAL CUSTOM SECTION

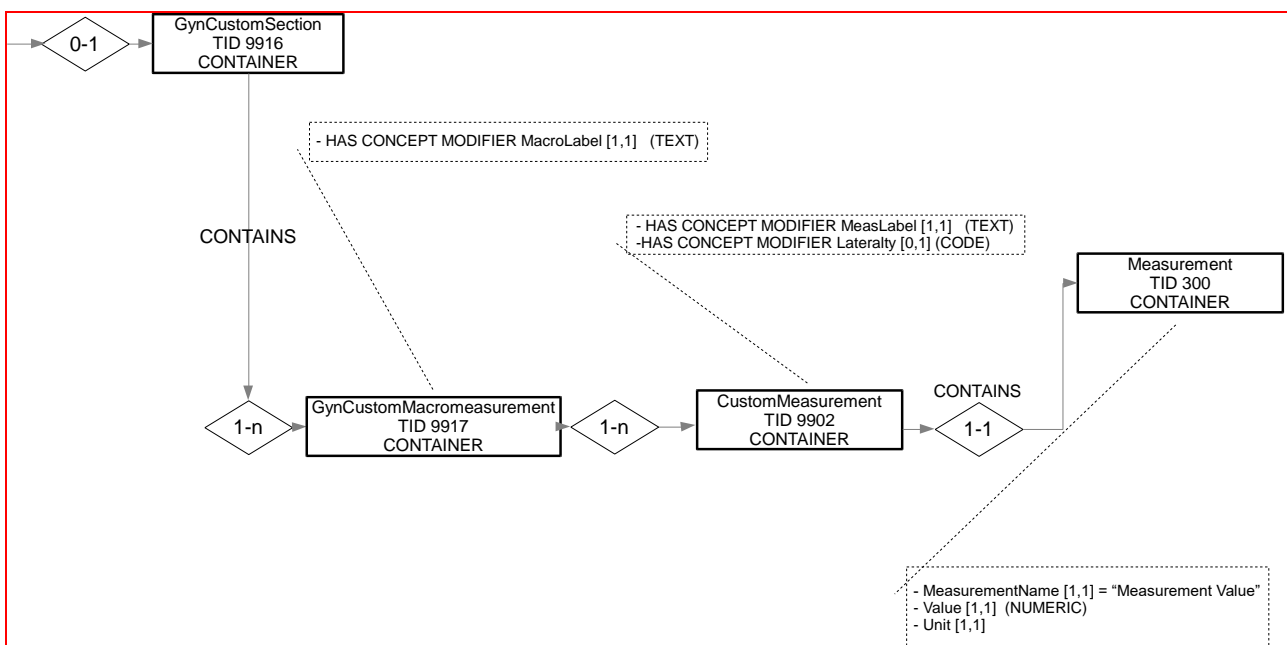


Figure 14
GYN CUSTOM SECTION

8.4.2 Template definition

This section contains the definition of the private templates used, according to the conventions adopted by DICOM standard (see DICOM standard document PS 3.16).

8.4.2.1 Topmost template extensions

Topmost template TID 5000 is of Type: Extensible. We extend it according to the following table.

Table 103
TID 5000 – OB-GYN ULTRASOUND PROCEDURE REPORT EXTENSION

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (125000, DCM, "OB-GYN Ultrasound Procedure Report")	1	M		Root node
	
25	>	CONTAINS	INCLUDE	DTID (9910) Fetal Custom Section	1-n	U		
26	>	CONTAINS	INCLUDE	DTID (9914) Maternal Custom Section	1	U		
27	>	CONTAINS	INCLUDE	DTID(9916) Gyn Custom Section	1	U		

8.4.2.2 TID 9910 Fetal Custom Section

For TID 5000 we add one or more Fetal Custom Section (TID 9910) that contains the various Fetal Custom Groups (TID 9911).

Type: Extensible
Order: Significant

Table 104
TID 9910 – FETAL CUSTOM SECTION

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	DT (CN-100, 99ESA_C1, "Fetal Custom Section")	1	M		
2		HAS CONCEPT MOD	CODE	EV (121030, DCM, "SubjectID")	1	U		Free text
3	>	CONTAINS	INCLUDE	DTID (9911) , FetalCustomGroup	1-n	M		

8.4.2.3 TID 9911 Fetal Custom Group

Each Fetal Custom Custom Group (TID 9911) contains one or more Custom Measurement, and possibly a Custom Growth / Custom Gestational Age estimation.

Type: Extensible
Order: Significant

Table 105
TID 9911 – FETAL CUSTOM GROUP

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	DT (CN-101, 99ESA_C1, "Fetal Custom Group")	1	M		
2	>	CONTAINS	INCLUDE	DTID (9902) , Custom Measurement	1-n	M		
3	>	CONTAINS	INCLUDE	DTID (9912) , CustomGrowth	0-1	U		
4	>	CONTAINS	INCLUDE	DTID (9913) , CustomGA	0-1	U		

8.4.2.4 TID 9914 Maternal Custom Section

For TID 5000 we add one Maternal Custom Section (TID 9914) that contains the various Maternal Custom Groups (TID 9915).

Type: Extensible
Order: Significant

Table 106
TID 9914 – MATERNAL CUSTOM SECTION

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	DT (CN-104, 99ESA_C1, "Maternal Custom Section")	1	M		
2	>	CONTAINS	INCLUDE	DTID (9915) , MaternalCustomGroup	1-n	M		

8.4.2.5 TID 9915 Maternal Custom Group

Each Maternal Custom Custom Group (TID 9915) contains one or more Custom Measurement, and possibly a Custom Growth / Custom Gestational Age estimation.

Type: Extensible
Order: Significant

Table 107
TID 9915 – MATERNAL CUSTOM GROUP

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	DT (CN-105, 99ESA_C1, "Maternal Custom Group")	1	M		
2	>	HAS CONCEPT MOD	TEXT	DT (MACROLABEL, 99ESA_C1, "Macromasurement Label")	1	M		
3	>	CONTAINS	INCLUDE	DTID (9902) , Custom Measurement	1-n	M		
4	>	CONTAINS	INCLUDE	DTID (9912) , CustomGrowth	0-1	U		
5	>	CONTAINS	INCLUDE	DTID (9913) , CustomGA	0-1	U		

8.4.2.6 TID 9916 Gyn Custom Section

For TID 5000 we add one Gyn Custom Section (TID 9916) that contains the various Gyn Custom Macromeasurements (TID 9917).

Type: Extensible
Order: Significant

Table 108
TID 9916 – GYN CUSTOM SECTION

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	DT (CN-106, 99ESA_C1, "Gyn Custom Section")	1	M		
2	>	CONTAINS	INCLUDE	DTID (9917) , GynCustomMacromeasur ent	1-n	M		

8.4.2.7 TID 9917 Gyn Custom Macromeasurement

Each Gyn Custom Macromeasurement (TID 9917) contains one or more Custom Measurement.

Type: Extensible
Order: Significant

Table 109
TID 9917 – GYN CUSTOM MACROMEASUREMENT

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	DT (CN-107, 99ESA_C1, "Gyn Custom Macrommeasurement")	1	M		
2	>	HAS CONCEPT MOD	TEXT	DT (MACROLABEL, 99ESA_C1, "Macrommeasurement Label")	1	M		Free text
3	>	CONTAINS	INCLUDE	DTID (9902) , Custom Measurement	1-n	M		

8.4.2.8 TID 9902 Custom Measurement

Each Custom Measurement section (TID 9902) contains the custom label as given by the user, and the measurement, calculation or evaluation corresponding to that label.

Type: Extensible
Order: Significant

Table 110
TID 9902 – CUSTOM MEASUREMENT

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (MEAS, 99ESA_C1, "Custom Measurement")	1	M		
2	>	HAS CONCEPT MOD	TEXT	DT (MEASLABEL, 99ESA_C1, "Measurement Label")	1	M		Free text
3	>	CONTAINS	INCLUDE	DTID (300) Measurement	1	MC	XOR row 4,5	\$Measurement = EV (MEAS_VALUE, 99ESA_C1, "Measurement Value")

8.4.2.9 TID 9912 Custom Growth

Each Fetal Custom Group (TID 9911) can contains the Custom Growth percentile rank, and the reference to the table of values used to estimate it.

Type: Extensible
Order: Significant

Table 111
TID 9912 – CUSTOM GROWTH

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	DT (CN-103, 99ESA_C1, "Custom Growth")	1	M		
2	>	CONTAINS	NUM	DT (125012,DCM,"Growth Percentile Rank")	1	M		
2	>	INFERRED FROM	TEXT	DT (121424,DCM,"Table of Values)	0-1	O		

8.4.2.10 TID 9913 Custom GA

Each Fetal Custom Group (TID 9911) can contains the Custom Gestational Age, and the reference to the table of values used to estimate it.

Type: Extensible
Order: Significant

Table 112
TID 9913 – CUSTOM GA

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	DT (CN-102, 99ESA_C1, "Custom GA")	1	M		
2	>	CONTAINS	NUM	DT (18185-9, LN, "Gestational Age")	1	M		
2	>	INFERRED FROM	TEXT	DT (121424, DCM, "Table of Values")	0-1	O		

8.4.3 Fetal biometry group extension to include Custom Growth and GA

The user can define Growth and GA estimations based on custom tables, not only for custom measurements, but also for standard measurements. In order to export this custom information, we extend the Fetal Biometry Group (TID 5008) inserting TID 9912 CustomGA and TID 9913 CustomGrowth defined above, as described in the table below (see text in boldface).

Table 113
TID 5508 – FETAL BIOMETRY GROUP EXTENSION

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	DT (125005, DCM, "Biometry Group")	1	M		
2	>	CONTAINS	INCLUDE	DTID 300 "Measurement"	1-n	MC	At least one of row 2 and 3 shall be present	\$BiometryType \$Derivation = DCID 3627 "Measurement Type"
3	>	CONTAINS	NUM	EV (18185-9, LN, "Gestational Age")	1	MC	At least one of row 2 and 3 shall be present	UNITS = EV (d, UCUM, "days")
4	>>	INFERRED FROM	CODE	DCID 228 "Equation or Table"	1	U		DCID 12013 "Gestational Age Equations and Tables"
5	>>	R-INFERRED FROM	NUM		1-n	U		
6	>>	HAS PROPERTIES	NUM	DCID 226 "Population Statistical Descriptors"	1-n	U		
	>	CONTAINS	INCLUDE	DTID (9913) , CustomGA	0-1	U		
7	>	CONTAINS	NUM	DCID 12017 "Growth Distribution Rank"	1	U		
8	>>	INFERRED FROM	CODE	DCID 228 "Equation or Table"	1	U		DCID 12015 "Fetal Growth Equations and Tables"
	>	CONTAINS	INCLUDE	DTID (9912) , CustomGrowth	0-1	U		

8.5 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 groups 2FF1 and 6161. Further details on usage of these private attributes are contained in Section 8.1.

Table 114
DATA DICTIONARY OF PRIVATE ATTRIBUTES

Tag	Attribute Name	VR	VM
(2FF1,0060)	Private Creator	LO	1
(2FF1,6001)	Private Creator Data Version	LO	1
(2FF1,6031)	Contrast master gain	DS	1
(2FF1,6032)	Anti-log law vector	IS	256
(2FF1,6033)	Gray Map curve data	IS	256
(2FF1,6035)	Palette name	LO	1
(2FF1,6036)	Contrast Red Palette Data	IS	256
(2FF1,6037)	Contrast Green Palette Data	IS	256
(2FF1,6038)	Contrast Blue Palette Data	IS	256
(2FF1,6040)	Transducer name	LO	1
(2FF1,6041)	Transducer frequency	DS	1
(2FF1,6050)	Vector of destruction-frame numbers	IS	1-n
(2FF1,6051)	Number of destruction frames	IS	1-n
(2FF1,6052)	Nonlinear Contrast Mode	CS	1
(2FF1,6053)	Allow Quantification	LO	1
(6161,0011)	Private Creator	LO	1
(6161,0013)	Private Creator	LO	1
(6161,1130)	Report, in Esaote proprietary XML format	OB	1
(6161,1131)	List of the custom measures, in Esaote proprietary XML format	OB	1
(6161,1330)	Esaote raw data	OB	1

8.6 CODED TERMINOLOGY AND TEMPLATES

The Workflow AE is capable of supporting arbitrary coding schemes for Procedure and Protocol Codes: the value of the Code Meaning will be displayed. The contents of Requested Procedure Code Sequence (0032,1064) and Scheduled Protocol Code Sequence (0040,0008) supplied in Worklist Items will be mapped to Image IOD and MPPS attributes as described in Table 38 and Table 42.

The contents of the Performed Protocol Code Sequence (0040,0260) for cardiac US-MF images acquired in a Staged protocol (when available) are automatically filled with the codes listed in the following table, subset of Context ID 12001, Ultrasound Protocol Types.

Table 115
CODES USED FOR PERFORMED PROTOCOL CODE SEQ. FOR STAGED PROTOCOL

ESAOTE terminology	Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)
BICYCLE ERGOMETER	P2-31102	SRT	Stress test using Bicycle Ergometer
DIPYRIDAMOLE	P2-3110A	SRT	Dipyridamole Stress protocol
DOBUTAMINE	P2-31108	SRT	Dobutamine Stress protocol

The contents of the Stage Code Sequence (0040,000A) for cardiac US-MF images acquired in a Staged protocol (when available) are automatically filled with the codes listed in the following table, subset of Context ID 12002 Ultrasound Protocol Stage Types. For Stage Name (0008,2120) a corresponding defined term is adopted.

Table 116
CODES USED FOR STAGE CODE SEQ. FOR STAGED PROTOCOL

ESAOTE terminology	Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)	Stage Name (0008,2120)	
				Protocol Type	
				Dipyridamole or Dobutamine	Bicycle
BASELINE STATE	F-01604	SRT	Resting state	BASELINE	PRE-EXERCISE
STRESS STATE	F-05019	SRT	Cardiac stress state	LOW DOSE	PEAK-EXERCISE
PEAK STRESS STATE	F-05028	SRT	Peak cardiac stress state	PEAK DOSE	PEAK-EXERCISE
CARDIAC RECOVERY STATE	F-05018	SRT	Cardiac stress recovery state	RECOVERY	POST-EXERCISE

The contents of the View Code Sequence (0054,0220) for cardiac US-MF images acquired in a Staged protocol (when available) are automatically filled with the codes listed in the following table, subset of Context ID 12226 Echocardiography Image View. For View Name (0008,2127) a corresponding defined term is adopted.

Table 117
CODES USED FOR VIEW CODE SEQ. FOR STAGED PROTOCOL

ESAOTE terminology	Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)	View Name (0008,2127)
LAX	G-0396	SRT	Parasternal long axis	LAX
SAX PM	G-039B	SRT	Parasternal short axis at the Papillary Muscle level	SAX_PM
A4C	G-A19C	SRT	Apical four chamber	A4C
A2C	G-A19B	SRT	Apical two chamber	A2C
SAX MV	G-039A	SRT	Parasternal short axis at the Mitral Valve level	SAX_MV
SAX AP	G-0398	SRT	Parasternal short axis at the aortic valve level	SAX_AP
ALAX	G-0395	SRT	Apical long axis	ALAX

Structured Reporting uses codes supplied by DCMR (DICOM Code Mapping Resource, PS 3-16), LOINC, SRT and, for Vascular and OB-GYN SR, ESAOTE_P1 (Esaote Private Codes for Ultrasound), 99ESA_P1 (Esaote Private Codes for Ultrasound, alternate set) and 99ESA_C1 (Esaote Private Codes for Custom Ultrasound measurements). See Table 118 for the list of the available ESAOTE_P1, 99ESA_P1 and 99ESA_C1 codes (please note that not all the items of this table are actually used in the produced SR documents).

Table 118
ESAOTE PRIVATE CODES FOR ULTRASOUND

Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)
CN-02	ESAOTE_P1	Cervix
CN-03	ESAOTE_P1	Fundus
CN-04	ESAOTE_P1	Left Adnexa
CN-05	ESAOTE_P1	Right Adnexa
CN-06	ESAOTE_P1	Head
CN-07	ESAOTE_P1	Cord Insertion
CN-08	ESAOTE_P1	Spine
CN-09	ESAOTE_P1	Cord Vessels
CN-10	ESAOTE_P1	Heart Chambers
CN-11	ESAOTE_P1	Bowel
CN-12	ESAOTE_P1	Thorax
CN-13	ESAOTE_P1	Left Kidney
CN-14	ESAOTE_P1	Right Kidney
CN-15	ESAOTE_P1	Stomach
CN-16	ESAOTE_P1	Bladder
CN-17	ESAOTE_P1	Heart Rhythm
CN-18	ESAOTE_P1	Placenta Grade
CN-19	ESAOTE_P1	Placenta Location H
CN-20	ESAOTE_P1	Placenta Location V
CN-24	ESAOTE_P1	Fetal Position
CN-25	ESAOTE_P1	Uterus Position
CN-26	ESAOTE_P1	Uterus Version
CN-29	ESAOTE_P1	Fibroma Characteristics
CN-30	ESAOTE_P1	Fibroma Site
CN-31	ESAOTE_P1	Ovary Mass Characteristics
CN-40	ESAOTE_P1	Corpus Luteum Left Ovary
CN-41	ESAOTE_P1	Corpus Luteum Right Ovary
CN-42	ESAOTE_P1	Mass Kind
CN-43	ESAOTE_P1	Fetal Mass Section
EV-01	ESAOTE_P1	Anterior
EV-02	ESAOTE_P1	Posterior
EV-03	ESAOTE_P1	Mid
EV-04	ESAOTE_P1	Low
EV-05	ESAOTE_P1	Previa
EV-06	ESAOTE_P1	Fundus
EV-07	ESAOTE_P1	Yes
EV-08	ESAOTE_P1	No
EV-09	ESAOTE_P1	Undefined
EV-10	ESAOTE_P1	Fetal Age
EV-11	ESAOTE_P1	Fetal Growth
EV-12	ESAOTE_P1	Cephalic

Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)
EV-13	ESAOTE_P1	Transverse
EV-14	ESAOTE_P1	Oblique
EV-15	ESAOTE_P1	Breecch
EV-16	ESAOTE_P1	EDD by DGA
EV-17	ESAOTE_P1	Date Of FDGA
EV-18	ESAOTE_P1	DGA by EDD
EV-19	ESAOTE_P1	DGA by FDGA
EV-20	ESAOTE_P1	First DGA
EV-21	ESAOTE_P1	BPD/FL
EV-22	ESAOTE_P1	AC, Nicolaidides 1993
EV-23	ESAOTE_P1	AC, Chitty 1994
EV-24	ESAOTE_P1	AC, JSUM 2001
EV-25	ESAOTE_P1	AFI, Moore Cayle
EV-26	ESAOTE_P1	BPD, Campbell 1991
EV-27	ESAOTE_P1	BPD, Yale 1983
EV-28	ESAOTE_P1	BPD, Nicolaidides
EV-29	ESAOTE_P1	BPD, JSUM
EV-30	ESAOTE_P1	CRL, OsakaU 1983
EV-31	ESAOTE_P1	CRL, JSUM
EV-32	ESAOTE_P1	FL, Nicolaidides 1993
EV-33	ESAOTE_P1	FL, OBrien 1981
EV-34	ESAOTE_P1	FL, Chitty 1994
EV-35	ESAOTE_P1	FL, Mertz 1991
EV-36	ESAOTE_P1	FL, Quennan 1981
EV-37	ESAOTE_P1	FL, Campbell
EV-38	ESAOTE_P1	FL, OsakaU 1983
EV-39	ESAOTE_P1	FL, JSUM 2001
EV-40	ESAOTE_P1	GSD, Hansmann 1985
EV-41	ESAOTE_P1	HC, Campbell 1991
EV-42	ESAOTE_P1	HC, Hadlock 1982
EV-43	ESAOTE_P1	HC, Nicolaidides 1993
EV-44	ESAOTE_P1	HC, Hoffbauer 1979
EV-45	ESAOTE_P1	HL, OsakaU 1988
EV-46	ESAOTE_P1	MAD, Rempen
EV-47	ESAOTE_P1	OFD, Nicolaidides 1994
EV-48	ESAOTE_P1	OFD, Chitty 1994
EV-49	ESAOTE_P1	OFD, Merz 1991
EV-50	ESAOTE_P1	TDC, Bernascheck 1997
EV-51	ESAOTE_P1	TCD, Hill 1983
EV-52	ESAOTE_P1	TL, Jeanty 1984
EV-53	ESAOTE_P1	FTA, Osaka 1984

Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)
EV-54	ESAOTE_P1	EFW, Warsof
EV-55	ESAOTE_P1	EFW, German
EV-56	ESAOTE_P1	EFW, Todai 1996
EV-57	ESAOTE_P1	EFW, OsakaU
EV-58	ESAOTE_P1	EFW, JSUM
EV-59	ESAOTE_P1	JSUM 2001
EV-60	ESAOTE_P1	BPD by GA, Chitty
EV-61	ESAOTE_P1	BPD by GA, Todai 1996
EV-62	ESAOTE_P1	BPD by GA, OsakaU
EV-63	ESAOTE_P1	CRL by GA, Hansmann
EV-64	ESAOTE_P1	CRL by GA, OsakaU
EV-65	ESAOTE_P1	FL by GA, OsakaU
EV-66	ESAOTE_P1	FL by GA, JSUM
EV-67	ESAOTE_P1	FL by GA, Nicolaides
EV-68	ESAOTE_P1	FOL by GA, Mercer 1987
EV-69	ESAOTE_P1	FTA by GA, OsakaU
EV-70	ESAOTE_P1	GSD by GA, Nyberg 1987
EV-71	ESAOTE_P1	HC by GA, Tamura 1995
EV-72	ESAOTE_P1	HC by GA, Chitty
EV-73	ESAOTE_P1	HC by GA, Nicolaides
EV-74	ESAOTE_P1	HL by GA, OsakaU
EV-75	ESAOTE_P1	HL by GA, Jeanty Romero
EV-76	ESAOTE_P1	OFD by GA, Chitty
EV-77	ESAOTE_P1	OFD by GA, Merz
EV-78	ESAOTE_P1	RL by GA, Merz
EV-79	ESAOTE_P1	TL by GA, Merz
EV-80	ESAOTE_P1	UL by GA, Merz
EV-81	ESAOTE_P1	APTD * TTD
EV-82	ESAOTE_P1	Max Amniotic Diameter
EV-83	ESAOTE_P1	Amniotic Fluid Index
EV-84	ESAOTE_P1	Heart Beat
EV-85	ESAOTE_P1	AC by GA, CFEF
EV-86	ESAOTE_P1	AC by GA, Nicolaides
EV-87	ESAOTE_P1	AFI by GA, Moore Cayle
EV-88	ESAOTE_P1	Binocular Distance by GA, Bernascheck
EV-89	ESAOTE_P1	Binocular Distance by GA, Merz 1995
EV-90	ESAOTE_P1	BPD by GA, CFEF
EV-91	ESAOTE_P1	BPD by GA, JSUM 2001
EV-92	ESAOTE_P1	BPD by GA, Nicolaides
EV-93	ESAOTE_P1	Cisterna Magna by GA, Nicolaides
EV-94	ESAOTE_P1	CRL by GA, Hadlock

Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)
EV-95	ESAOTE_P1	CRL by GA, JSUM 2001
EV-96	ESAOTE_P1	CRL by GA, Robinson 1975
EV-97	ESAOTE_P1	Ear Length by GA, Lettieri
EV-98	ESAOTE_P1	Femur length by GA, CFEF
EV-99	ESAOTE_P1	Fibula Length by GA, Merz 1988
EV-100	ESAOTE_P1	HC by GA, CFEF
EV-101	ESAOTE_P1	Interocular Distance by GA, Bernascheck
EV-102	ESAOTE_P1	Interocular Distance by GA, Merz 1995
EV-103	ESAOTE_P1	Lateral Ventricle by GA, Pretorius
EV-104	ESAOTE_P1	Nose Bone Length by GA, Guisville
EV-105	ESAOTE_P1	OFD by GA, Jeanty Romero
EV-106	ESAOTE_P1	TAD by GA, CFEF
EV-107	ESAOTE_P1	TAD by GA, Eriksen
EV-108	ESAOTE_P1	UL by GA, Jeanty 1984
EV-109	ESAOTE_P1	APAD, Eriksen 1985
EV-110	ESAOTE_P1	BPD, Bessis
EV-111	ESAOTE_P1	FL, Bessis
EV-112	ESAOTE_P1	Length of Vertebra, Todai
EV-113	ESAOTE_P1	Length Of Vertebra
EV-114	ESAOTE_P1	Binocular Distance
EV-115	ESAOTE_P1	Ear Length
EV-116	ESAOTE_P1	Interocular Distance
EV-117	ESAOTE_P1	Nose Bone Length
EV-118	ESAOTE_P1	EFW by GA, Hadlock 1982
EV-119	ESAOTE_P1	YES
EV-120	ESAOTE_P1	NO
EV-121	ESAOTE_P1	Spiral Artery
EV-122	ESAOTE_P1	AC by GA, Paladini 2005
EV-123	ESAOTE_P1	APAD by GA, Merz 1996
EV-124	ESAOTE_P1	BPD by GA, Paladini 2005
EV-125	ESAOTE_P1	EFW by BPD, MAD, Persson
EV-126	ESAOTE_P1	EFW by BPD, MAD, FL, Persson
EV-127	ESAOTE_P1	FL by GA, Paladini 2005
EV-128	ESAOTE_P1	HC by GA, Paladini 2005
EV-129	ESAOTE_P1	HL by GA, Paladini 2005
EV-130	ESAOTE_P1	OFD by GA, Nicolaidis 1994 FG
EV-131	ESAOTE_P1	RL by GA, Paladini 2005
EV-132	ESAOTE_P1	TL by GA, Jeanty 1984
EV-133	ESAOTE_P1	TL by GA, Paladini 2005
EV-134	ESAOTE_P1	TAD by GA, Merz 1996
EV-135	ESAOTE_P1	TCD by GA, Nicolaidis 1994

Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)
EV-136	ESAOTE_P1	UL by GA, Paladini 2005
EV-137	ESAOTE_P1	TCD, Goldstein 1987
EV-138	ESAOTE_P1	TCD, Hill 1990
EV-139	ESAOTE_P1	BPD by GA, Jeanty
EV-140	ESAOTE_P1	FL by GA, Jeanty
EV-141	ESAOTE_P1	HC by GA, Jeanty
EV-142	ESAOTE_P1	HL by GA, Merz
EV-143	ESAOTE_P1	HL by GA, Jeanty
EV-144	ESAOTE_P1	OFD by GA, Jeanty
EV-145	ESAOTE_P1	FTA, Osaka
EV-146	ESAOTE_P1	HL, Osaka
EV-147	ESAOTE_P1	AC by GA, Jeanty
EV-148	ESAOTE_P1	HL, Jeanty
MN-04	ESAOTE_P1	Acceleration
MN-11	ESAOTE_P1	Reflux Duration Time
MN-13	ESAOTE_P1	Fibroma Width
MN-14	ESAOTE_P1	Left Ovary Mass Width
MN-15	ESAOTE_P1	RightOvary Mass Width
MN-16	ESAOTE_P1	Fibroma Length
MN-17	ESAOTE_P1	Left Ovary Mass Length
MN-18	ESAOTE_P1	Right Ovary Mass Length
MN-19	ESAOTE_P1	Fibroma Height
MN-20	ESAOTE_P1	Left Ovary Mass Height
MN-21	ESAOTE_P1	Right Ovary Mass Height
MN-22	ESAOTE_P1	Fibroma Volume
MN-23	ESAOTE_P1	Left Ovary Mass Volume
MN-24	ESAOTE_P1	Right Ovary Mass Volume
MN-25	ESAOTE_P1	Time Averaged Velocity
MN-26	ESAOTE_P1	Vessel Thickness
MN-27	ESAOTE_P1	Reverse Velocity
MN-28	ESAOTE_P1	Diastolic To Systolic Velocity Ratio
MN-29	ESAOTE_P1	Fetal Mass Volume
MN-30	ESAOTE_P1	Mass Volume
MN-31	ESAOTE_P1	Fetal Mass Width
MN-32	ESAOTE_P1	Mass Width
MN-33	ESAOTE_P1	Fetal Mass Length
MN-34	ESAOTE_P1	Mass Length
MN-35	ESAOTE_P1	Fetal Mass Height
MN-36	ESAOTE_P1	Mass Height
FS-01	99ESA_P1	Dialysis Graft
AG-01	99ESA_P1	Superficial Vein

Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)
AG-02	99ESA_P1	Deep Vein
AG-03	99ESA_P1	Segmental Artery 1
AG-04	99ESA_P1	Segmental Artery 2
AG-05	99ESA_P1	Arterial Vessel
AG-06	99ESA_P1	Arterial Anastomosis
AG-07	99ESA_P1	Arterial Graft
AG-08	99ESA_P1	Not Applicable
AG-09	99ESA_P1	III Ventricular
AG-10	99ESA_P1	Venous Vessel
AG-11	99ESA_P1	Puncture1
AG-12	99ESA_P1	Puncture2
AG-13	99ESA_P1	Puncture3
AG-14	99ESA_P1	Venous Junction
AG-15	99ESA_P1	Outflow Vessel
TM-01	99ESA_P1	Upper Pole
TM-02	99ESA_P1	Lower Pole
RM-01	99ESA_P1	Superior Mesenteric Artery/Aorta Velocity Ratio
RM-02	99ESA_P1	Proximal Renal Artery/Aorta Velocity Ratio
RM-03	99ESA_P1	Distal Renal Artery/Aorta Velocity Ratio
RM-04	99ESA_P1	Mid Renal Artery/Aorta Velocity Ratio
MFS-01	99ESA_P1	Anterior Mitral Annulus
MFS-02	99ESA_P1	Inferior Mitral Annulus
MFS-03	99ESA_P1	Septal Mitral Annulus
MN-100	99ESA_P1	QAS Diameter Distension
MN-101	99ESA_P1	QAS Diameter Distension Standard Deviation
MN-102	99ESA_P1	QAS Mean Diameter
MN-103	99ESA_P1	QAS Mean Diameter Standard Deviation
MN-104	99ESA_P1	QAS Brachial Pressure
MN-105	99ESA_P1	Quality Intima Media Thickness
MN-106	99ESA_P1	Quality Intima Media Thickness Standard Deviation
MN-107	99ESA_P1	QIMT Diameter
MN-108	99ESA_P1	QIMT Diameter Standard Deviation
MN-109	99ESA_P1	QIMT ROI Width
MN-110	99ESA_P1	Delta CSA
MN-111	99ESA_P1	III Ventricular Width
MN-112	99ESA_P1	Venous Hemodynamic Insufficiency Severity Score
MN-113	99ESA_P1	Chronic Cerebrospinal Venous Insufficiency
MN-114	99ESA_P1	Min Velocity
MN-115	99ESA_P1	Max Velocity
MN-116	99ESA_P1	QSC Compliance Coefficient
MN-117	99ESA_P1	QSC Distensibility Coefficient

Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)
MN-118	99ESA_P1	QSC Alpha Coefficient
MN-119	99ESA_P1	QSC Beta Coefficient
MN-120	99ESA_P1	QSC Pulse Wave Velocity
MN-121	99ESA_P1	DWC Local Systolic Pressure
MN-122	99ESA_P1	DWC Local Diastolic Pressure
MN-123	99ESA_P1	DWC Isovolumetric Contraction Period
MN-124	99ESA_P1	DWC Ejection Duration
MN-125	99ESA_P1	DWC Inflection Point P_T1
MN-126	99ESA_P1	DWC Augmentation Index
MN-127	99ESA_P1	DWC Augmented Pressure
MN-128	99ESA_P1	Expected QIMT
MN-129	99ESA_P1	Aortic Area To BSA Ratio
MN-130	99ESA_P1	LV Diastolic Volume To BSA Ratio
MN-131	99ESA_P1	LV Systolic Volume To BSA Ratio
MN-132	99ESA_P1	IVC Size To BSA Ratio
MN-133	99ESA_P1	Left Atrium Length
MN-134	99ESA_P1	Left Atrium Systolic Volume To BSA Ratio
MN-135	99ESA_P1	Aortic Coaptation Line
MN-136	99ESA_P1	Aortic Excentricity Index
MN-137	99ESA_P1	Aortic Permeability Index
MN-138	99ESA_P1	Aortic Valve Area by Continuity
MN-139	99ESA_P1	Aortic Valve Area by Continuity To BSA Ratio
MN-140	99ESA_P1	Aortic Valve Closure Time
MN-141	99ESA_P1	Aortic Valve Opening Time
MN-142	99ESA_P1	Aortic Valve PreEjection Time
MN-143	99ESA_P1	A-Wave Peak Gradient
MN-144	99ESA_P1	A'-Wave Peak Velocity
MN-145	99ESA_P1	DVI_LVOT Peak Velocity To Aorta Peak Velocity Ratio
MN-146	99ESA_P1	Ejection Time
MN-147	99ESA_P1	E-Septum Distance
MN-148	99ESA_P1	E'-Wave Peak Velocity
MN-149	99ESA_P1	Inferior Vena Cava Collapsability Index
MN-150	99ESA_P1	Interventricular Mechanical Delay
MN-151	99ESA_P1	IVC Max Diameter To IVC Min Diameter Ratio
MN-152	99ESA_P1	Left Ventricle Mass To BSA Ratio
MN-153	99ESA_P1	Mean Lateral-Septal Early Diastolic Tissue Velocity
MN-154	99ESA_P1	Mean Lateral-Septal Tissue Velocity During Atrial Systole
MN-155	99ESA_P1	Mitral Annular Plane Systolic Excursion
MN-156	99ESA_P1	Mitral Valve Closure Time
MN-157	99ESA_P1	Mitral Valve Coaptation Depth
MN-158	99ESA_P1	Mitral Valve Opening Time

Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)
MN-159	99ESA_P1	Mitral Valve Tenting Area
MN-160	99ESA_P1	PDA Patent Ductus Arteriosus
MN-161	99ESA_P1	Post Peak Velocity
MN-162	99ESA_P1	Post Peak Velocity To Rest Peak Velocity Ratio
MN-163	99ESA_P1	Pulmonary Artery Area
MN-164	99ESA_P1	Pulmonary Artery Diameter
MN-165	99ESA_P1	Pulmonary Artery Pressure Offset
MN-166	99ESA_P1	Pulmonary Mitral A-wave Duration Difference
MN-167	99ESA_P1	Pulmonary Valve PreEjection Time
MN-168	99ESA_P1	Ratio Of LV Peak Tissue Velocity E To LV Peak Tissue Velocity A
MN-169	99ESA_P1	Ratio Mean LV Peak Tissue Vel E To Mean LV Peak Tissue Vel A
MN-170	99ESA_P1	Ratio Of MV Peak Velocity To Mean LV Peak Tissue Velocity E-Wave
MN-171	99ESA_P1	Ratio Of RV Peak Tissue Velocity E To RV Peak Tissue Velocity A
MN-172	99ESA_P1	Ratio Tricuspid Peak Vel To RV Peak Tissue Vel E-Wave
MN-173	99ESA_P1	Rest Peak Velocity
MN-174	99ESA_P1	Right Atrium Length
MN-175	99ESA_P1	Right Atrium Volume
MN-176	99ESA_P1	Right Ventricle Outflow Tract Area
MN-177	99ESA_P1	Right Ventricle Outflow Tract Diameter
MN-178	99ESA_P1	Right Ventricular Area
MN-179	99ESA_P1	Right Ventricular Basal Dimension
MN-180	99ESA_P1	Right Ventricular Fractional Area Change
MN-181	99ESA_P1	Right Ventricular Longitudinal Dimension
MN-182	99ESA_P1	Right Ventricular Mid Cavity Dimension
MN-183	99ESA_P1	Right Ventricular Volume
MN-184	99ESA_P1	RV Diameter To LV Diameter Ratio
MN-185	99ESA_P1	Septum To Posterior Wall Delay
MN-186	99ESA_P1	S'-Wave Peak Velocity
MN-187	99ESA_P1	S-Wave Peak Velocity
MN-188	99ESA_P1	Time To Onset Anterior Wall
MN-189	99ESA_P1	Time To Onset Inferior Wall
MN-190	99ESA_P1	Time To Onset Lateral Wall
MN-191	99ESA_P1	Time To Onset Septal Wall
MN-192	99ESA_P1	Time To Peak Anterior Wall
MN-193	99ESA_P1	Time To Peak Inferior Wall
MN-194	99ESA_P1	Time To Peak Lateral Wall
MN-195	99ESA_P1	Time To Peak Septal Wall
MN-196	99ESA_P1	Tricuspid Annular Plane Systolic Excursion
MN-197	99ESA_P1	E-Wave Peak Gradient
MN-198	99ESA_P1	LV Diastolic Area To BSA Ratio
ABD-01	99ESA_P1	Anatomic Structures

Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)
ABD-02	99ESA_P1	Anatomic Structures (unilateral)
ABD-03	99ESA_P1	Kidney mass 1
ABD-04	99ESA_P1	Kidney mass 2
ABD-04A	99ESA_P1	Kidney cyst 1
ABD-05	99ESA_P1	Kidney cyst 2
ABD-06	99ESA_P1	Kidney calculi 1
ABD-07	99ESA_P1	Kidney calculi 2
ABD-08	99ESA_P1	Kidney pelvis
ABD-09	99ESA_P1	Cortex/Medulla RT
ABD-10	99ESA_P1	Ureter wall
ABD-11	99ESA_P1	Ureter calculi 1
ABD-12	99ESA_P1	Ureter calculi 2
ABD-13	99ESA_P1	Adrenal cranial pole
ABD-14	99ESA_P1	Adrenal gland mass 1
ABD-15	99ESA_P1	Adrenal gland mass 2
ABD-16	99ESA_P1	Urinary bladder wall
ABD-17	99ESA_P1	Urinary bladder calc 1
ABD-18	99ESA_P1	Urinary bladder calc 2
ABD-19	99ESA_P1	Urinary bladder mass 1
ABD-20	99ESA_P1	Urinary bladder mass 2
ABD-21	99ESA_P1	Post void bladder volume
ABD-22	99ESA_P1	Pancreas body
ABD-23	99ESA_P1	Pancreas lobe
ABD-24	99ESA_P1	Pancreas duct
ABD-25	99ESA_P1	Pancreas mass 1
ABD-26	99ESA_P1	Pancreas mass 2
ABD-27	99ESA_P1	Pancreas cyst 1
ABD-28	99ESA_P1	Pancreas cyst 2
ABD-29	99ESA_P1	Spleen mass 1
ABD-30	99ESA_P1	Spleen mass 2
ABD-31	99ESA_P1	Stomach body
ABD-32	99ESA_P1	Stomach fundus
ABD-33	99ESA_P1	Stomach pylorus
ABD-34	99ESA_P1	Mucosa
ABD-35	99ESA_P1	Muscularis
ABD-36	99ESA_P1	Pyl mucosa/musc
ABD-37	99ESA_P1	Liver mass 1
ABD-38	99ESA_P1	Liver mass 2
ABD-39	99ESA_P1	Gallbladder wall
ABD-40	99ESA_P1	Gallbladder calculi 1
ABD-41	99ESA_P1	Gallbladder calculi 2

Code Value (0008,0100)	Coding Scheme designator (0008,0102)	Code Meaning (0008,0104)
ABD-42	99ESA_P1	Prostate lobe
ABD-43	99ESA_P1	Cortex
ABD-44	99ESA_P1	Medulla
ABD-45	99ESA_P1	Urinary bladder
ABD-46	99ESA_P1	Ratio distance
CALC_VALUE	99ESA_C1	Calculation Value
CUSTOMFIND	99ESA_C1	Custom Findings
EVAL_VALUE	99ESA_C1	Evaluation Value
MEAS	99ESA_C1	Custom Measurement
MACROMEAS	99ESA_C1	Custom Macromasurement
MACROLABEL	99ESA_C1	Macromasurement Label
MEASLABEL	99ESA_C1	Measurement Label
MEAS_VALUE	99ESA_C1	Measurement Value
CN-100	99ESA_C1	Fetal Custom Section
CN-101	99ESA_C1	Fetal Custom Group
CN-102	99ESA_C1	Custom GA
CN-103	99ESA_C1	Custom Growth
CN-104	99ESA_C1	Maternal Custom Section
CN-105	99ESA_C1	Maternal Custom Group
CN-106	99ESA_C1	Gyn Custom Section
CN-107	99ESA_C1	Gyn Custom Macromasurement

8.7 STANDARD EXTENDED / SPECIALIZED / PRIVATE SOP CLASSES

No Specialized or Private SOP Classes are supported.

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

The US, US Multiframe and Secondary Capture Image Storage, 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.

8.8 PRIVATE TRANSFER SYNTAXES

No Private Transfer Syntaxes are supported.