DICOM

Conformance Statement

CX50 2.0.x

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PHILIPS

0.1 REVISION HISTORY

Document Version	Date of Issue	Author	Description
A	June 29, 2009	M. Leif	Initial Release

1 CONFORMANCE STATEMENT OVERVIEW

The Philips CX50 2.0.x Ultrasound system implements the necessary DICOM® services to download worklists from an information system, save acquired US Images and Structured Reports to a network storage device, CD/DVD or USB, print to a networked hardcopy device and inform the information system about the work actually done.

Table 1 provides an overview of the supported network services.

Table 1
NETWORK SERVICES

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

* Purchasable option.

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Table 2 below specifies the Media Storage Application Profiles supported.

Table 2
MEDIA SERVICES

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disk - Recordable		
STD-US-SC-MF[(1)]-CD-R for Ultrasound images, compressed and uncompressed	Yes / Yes[(2)]	Yes[(3)]
STD-GEN-CD for Structured Reports	Yes / Yes[(2)]	No
DVD		
STD-US-SC-MF[(1)]-DVD for Ultrasound images, compressed and uncompressed	Yes / Yes[(2)]	Yes[(3)]
STD-GEN-DVD for Structured Reports	Yes / Yes[(2)]	No
USB Devices		
STD-GEN-USB-JPEG for Ultrasound images, compressed and uncompressed and Structured Reports	Yes / Yes	Yes[(4)]

(1) Note that the "MF" designator includes both Single Frame (SF) and Mullti-frame (MF) ultrasound images.
(2) Only acts as a FSU for media that may be written to multiple times.
(3) Only reads and imports data from other Philips CX50 2.0.x systems of the same software version.
(4) Yes, but not for importing Structured Reports.

Table 3
SUPPORTED STRUCTURED REPORT TEMPLATES

Concept Name
OB-GYN Ultrasound Procedure Report (Template ID 5000)
Adult Echocardiography Procedure Report (Template ID 5200)

2 TABLE OF CONTENTS

3 INTRODUCTION

3.1 AUDIENCE

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

3.2 REMARKS

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

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

The scope of this Conformance Statement is to facilitate communication between the Philips Healthcare CX50 2.0.x ultrasound system and other vendors' Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [DICOM]. However, by itself it is not guaranteed to ensure the desired interoperability and successful interconnectivity.

The user should be aware of the following important issues:

— The comparison of different conformance statements is the first step towards assessing interconnectivity between Philips Healthcare and non - Philips Healthcare equipment.

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

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

3.3 IMPORTANT NOTE TO THE READER

Interoperability

Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment. It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.

Validation

Philips equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement. Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

New versions of the DICOM Standard

The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its

products or to discontinue its delivery. The user should ensure that any non-Philips provider linking to Philips equipment also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

3.4 DEFINITIONS, TERMS AND ABBREVIATIONS

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

Abbreviations and terms are as follows:

AE	DICOM Application Entity
AET	Application Entity Title
CD-R	Compact Disk Recordable
DICOM	Digital Imaging and Communications in Medicine
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
GSDF	Grayscale Standard Display Function
IOD	(DICOM) Information Object Definition
ISO	International Standard Organization
LOINC	Logical Observation Identifiers Names and Codes
MPPS	Modality Performed Procedure Step
MWL	Modality Worklist
R	Required Key Attribute for Modality Worklist Query Matching
O	Optional Key Attribute for Modality Worklist Query Matching
PDU	DICOM Protocol Data Unit
PDE	Patient Data Entry
SCP	DICOM Service Class Provider (DICOM server)
SCU	DICOM Service Class User (DICOM client)
SOP	DICOM Service-Object Pair
SNOMED	Systematized Nomenclature of Medicine (SRT)
U	Unique Key Attribute for Modality Worklist Query Matching, or Optional Attribute
US	Ultrasound

3.5 REFERENCES

[DICOM] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-3.18, 2008

Integrating the Healthcare Enterprise (IHE) Radiology Technical Framework, Vol. 1, Integration Profiles, Revision 8.0 Final Text, August 30, 2007

Integrating the Healthcare Enterprise (IHE) Radiology Technical Framework, Vol. 2, Transactions, Revision 8.0 Final Text, August 30, 2007

Integrating the Healthcare Enterprise (IHE) Radiology Technical Framework, Vol. 3, Transactions (Continued), Revision 8.0 Final Text August 30, 2007

Integrating the Healthcare Enterprise (IHE) Cardiology Technical Framework, Year 2: 2005-2006, Volume 1, Integration Profiles, Revision 2.1, June 9, 2006

Integrating the Healthcare Enterprise (IHE) Cardiology Technical Framework, Year 2: 2005-2006, Volume 2, Transactions, Revision 2.1, June 8, 2006

Integrating the Healthcare Enterprise (IHE) Cardiology Technical Framework, Supplement 2007, Evidence Documents Profile Cardiology Options: Stress Testing CT/MR Angiography, <Trial Implementation Version 0.06>, June 6, 2007

4 NETWORKING

4.1 IMPLEMENTATION MODEL

4.1.1 Application Data Flow

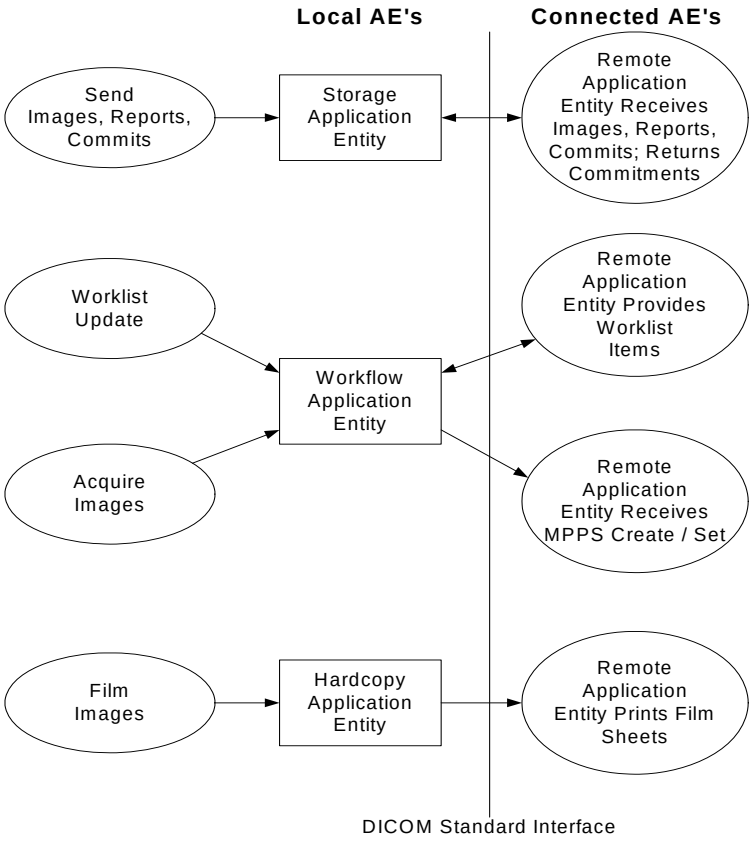


Figure 1
APPLICATION DATA FLOW DIAGRAM

— The **Storage Application Entity** sends **Images** to one or two remote AEs and **Structured Reports** to a single remote AE. Acquisition of images is associated with the local real-world activity “Freeze” then “Acquire” for single frame and “Acquire” for loops or clips. Sending or exporting of images depends on user configuration, either “Send as you go” or ”Batch” when End Exam is pressed, or Manual. An exam may be sent by user selection from “Review”. A storage commitment server is configured for one of the two image storage servers. Storage Commitment for Structured Reports requires a separate commit server configuration entry. If the remote AE is configured for **Storage Commitment**, the Storage AE will request Storage Commitment after successful storage of the image(s) and Structured Reports, if sent. If a commitment response is successfully obtained, there will be no job remaining in the queue (viewed using CNTL-J) signaling the Auto-delete function that the exam qualifies for deletion.

— The **Workflow Application Entity** receives Worklist information from and sends MPPS information to remote AEs. It is associated with the local real-world activities “Refresh Now” or automatic polling. When either the “Refresh Now” or automatic polling are performed, the Workflow Application Entity queries a remote AE for worklist items that provides the set of worklist items matching the query request.

Modality Performed Procedure Step (MPPS) messages are sent from the system under the following circumstances:

- MPPS N-Create, Status = IN PROGRESS:
  - Closing the Patient Data Entry screen will result in automated creation of an MPPS Instance managed by a remote AE.
- MPPS N-Set, Status = COMPLETE
  - Completion of the MPPS is performed as the result of an operator action of ending the exam.
- MPPS N-Set, Status = DISCONTINUED
  - "Cancel" causes the "Discontinued" status to be sent.

— An Ended Exam may be 'appended' with images and SRs within 24 hours of the beginning of the exam. There are two fundamental methods to perform append:

- *Note: The system will notify the user that it is "Restarting" the study. If beyond 24 hours, the system will not allow new images to be acquired.*

- Append from Patient Data Entry
  - Press the "Patient" hardkey. If Modality Worklist is configured, press the "Manual Entry" button and/or select the "Restart" button to get a list of exams that are less than 24 hours old. Select an exam and 'OK' to close Patient Data Entry to return to scanning.
- Append from Image Review
  - Press the "Review" hardkey then select the "Search for Study" icon to see the list of performed studies. Select the exam and hit "Open Study" to return to live scanning to acquire images and measurements.

— The **Hardcopy Application Entity** sends DICOM print pages to a remote AE (Printer or print server). It is associated with the local real-world activity Acquire when a DICOM Printer is configured for Batch Mode in the current preset, or "DICOM print" is selected with Right Button on the Exam in the system Patient Directory.

— Additionally, individual images can be selected in Review and sent with the selection of "Print selected still images to DICOM Printer" icon.

— Either action creates a print queue containing one or more virtual film sheets composed from images acquired by the user. It creates and sends fully rendered pages already containing the user's selected formatting choices. Only a single image object per sheet is sent to the printer. This print object is rather large compared to sending individual Image Box objects to the printer. If the user has both a BW and Color DICOM printer configured and selected, and is using "Send as you go", the images containing no Color Flow or Chroma data will be sent to the BW printer, all others will be sent to the Color printer.

— Exam data is sent to all selected Store, Print and Workflow destinations simultaneously in accordance with system configuration of "Send as you go" or "Batch" at end of exam or Manual.

4.1.2 Functional Definition of AEs

4.1.2.1 Functional Definition of Storage Application Entity

A Network Store queue with associated network destination will activate the Storage AE. An association request is sent to the destination AE and upon successful negotiation of a Presentation Context the image transfer is started. If the association cannot be opened, the related queue's Status is set to RETRY as displayed in the Job Manager (CNTL-J). The user may select "Retry Job" to attempt re-send.. After the automatic retries have failed, the job is set to ERROR. The user may "Delete Job" and re-send manually. Deleting a job does not remove the data, as it is still present on the system. Only the request to transfer the data is removed. Once any communication issues have been resolved, "Retry Job" may be selected or if the jobs were deleted, they may be queued again from the Review directory.

Storage Commitment messages are structured and sent depending on the user configuration for sending data. If the system is set for "Send as you go", then commit requests are sent when the images are exported. Several images

may be contained in a single request. When the system is set to “Batch mode” all images are exported at the end of the exam, a Storage Commitment queue is established and remains in the Job Manager window until the N-Event-Report-Request message is received.

Studies sent manually from “Review” will also send Storage Commitment requests.

4.1.2.2 Functional Definition of Workflow Application Entity

“Refresh Now” attempts to download a Modality Worklist from a Modality Worklist server with studies matching the search criteria by sending a C-Find Request containing user-definable Query parameters. Query parameters are stored in the “Advanced” tab adjacent to the MWL SCP selection in the “Servers and Roles” setup page. 10 Customizable Queries may be used, 5 are factory defaults.

Settings that may be customized are:

- Query Name (not sent in the DICOM data)
- Start Date (All Dates, Today or Date Range)
- AE Title (This system, Any or Another specific)
- Modality (Ultrasound or All Modalities)

When the Workflow AE establishes an association to a remote AE, a MWL C-Find-Rq message is sent to the MWL server. The server will transfer all matching worklist items via the open association. The results of a successful Worklist Update will overwrite the data in the Worklist display.

There is no queue management for Worklist.

The Workflow AE creates a MPPS Instance when the PDE (Patient Data Entry screen) is closed. An MPPS N-Create-Rq message is sent to the MPPS server with the status of “IN PROGRESS”. At the end of the exam, when “Completed” or “Cancel” are selected, an MPPS N-Set- Rq message is sent with “COMPLETED” or “DISCONTINUED” respectively. MPPS message queues are listed in the Job Manager (CNTL-J) window.

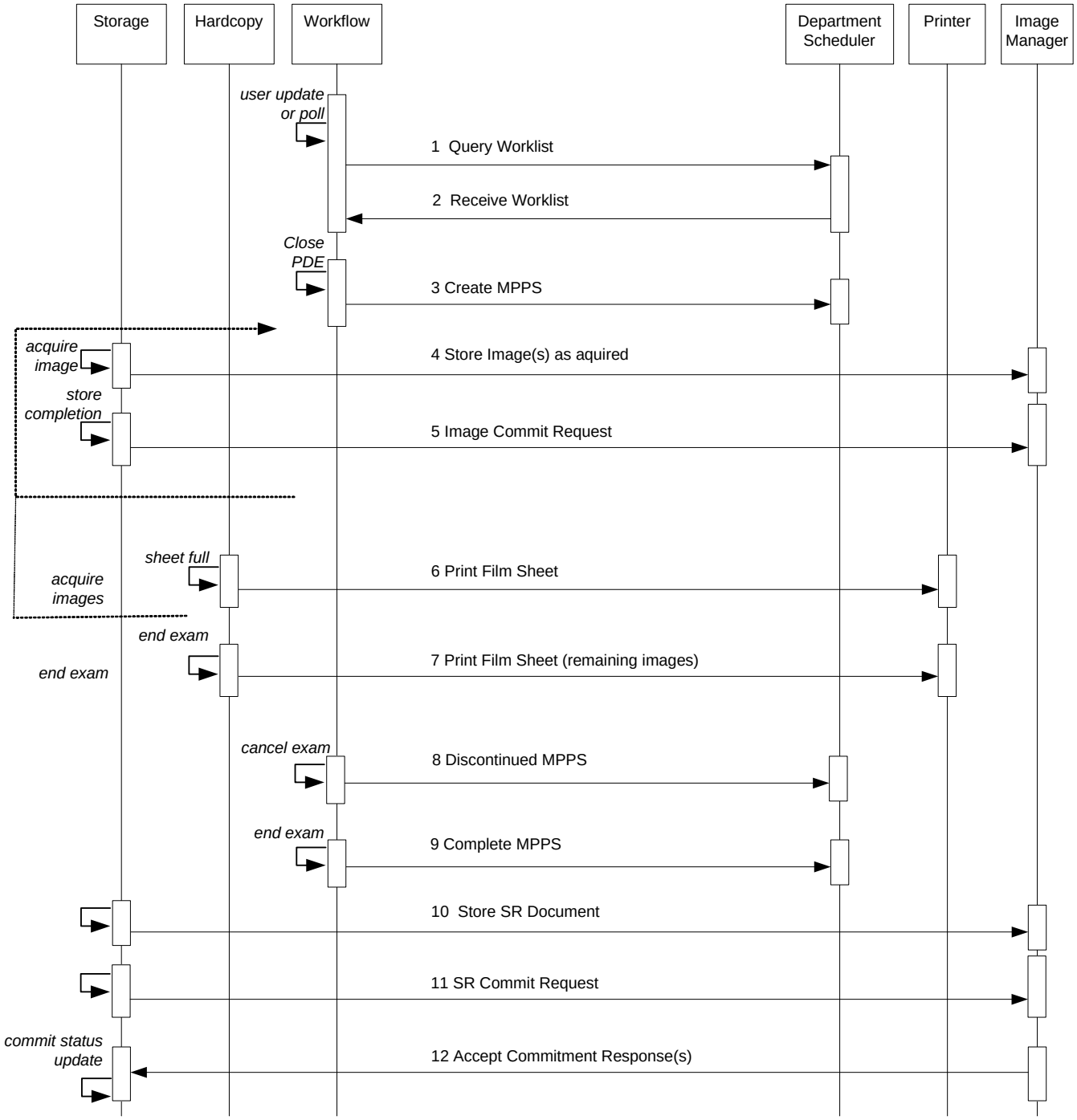
4.1.2.3 Functional Definition of Hardcopy Application Entity

A print queue will activate the Hardcopy AE. An association is established with the printer(s) and the printer’s status is determined. If the printer is operating normally, the film sheet print requests will be sent. If the printer is not operating normally, the print queue status is set to “Failed” and can be restarted by the user via the queue management interface.

When both a BW and a Color DICOM printer are configured, the images that contain color data, i.e., Color Flow Doppler or “Chroma” will be sent to the Color printer only, and all other images will be sent to the BW printer. Otherwise, all images will be sent to the selected printer.

There is an embedded retry mechanism that retries based on the individual server’s settings as configured by the user. Default values are: 3 Retries with 300 seconds (5 minutes) Interval.

Sequencing of Real-World Activities



Note: Step 8 may occur prior to acquisition of the first image if the exam is cancelled prior to first image.

FIGURE 2A:
SEQUENCING CONSTRAINTS – SEND AS YOU GO CONFIGURATION

Figures 2a and 2b illustrate normal scheduled workflow conditions.

Notes:

- Printing to DICOM printers may occur independent of any other DICOM activity.
- All selected store, print and workflow devices are sent data during the exam when configured for “Send as you go”, at the end of exam “Batch” or from Review when set for Manual.
- Selecting a study from Review for export will send to selected devices.

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

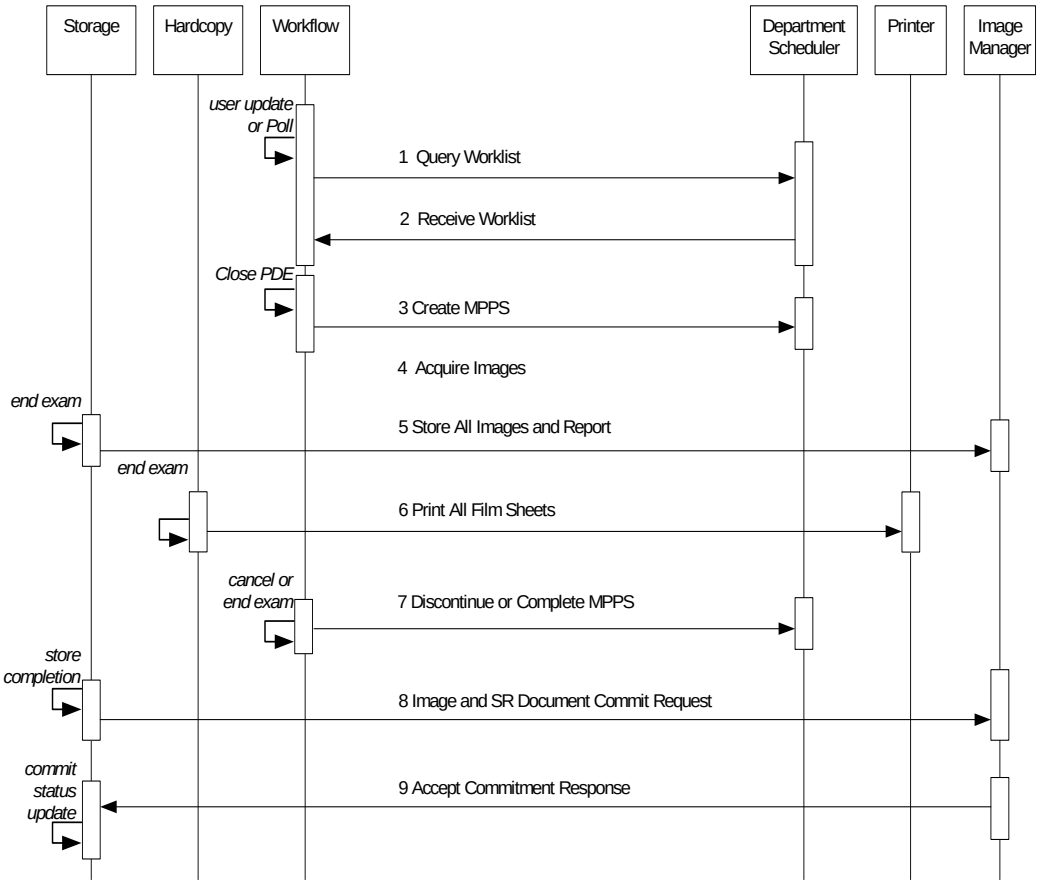


FIGURE 2B:
SEQUENCING CONSTRAINTS – END EXAM CONFIGURATION

4.2 AE SPECIFICATIONS

4.2.1 Storage Application Entity Specification

4.2.1.1 SOP Classes

CX50 2.0.x provides Standard Extended[1] Conformance to the following SOP Classes:

Table 3
SOP CLASSES FOR AE STORAGE

SOP Class Name	SOP Class UID	SCU	SCP
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	No
US Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
Comprehensive Structured Report Storage	1.2.840.10008.5.1.4.1.1.88.33	Yes	No
Storage Commitment Push Model	1.2.840.10008.1.20.1	Yes	No

4.2.1.2 Association Establishment Policy

4.2.1.2.1 General

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

Table 4
DICOM APPLICATION CONTEXT FOR AE STORAGE

Application Context Name	1.2.840.10008.3.1.1.1

The PDU size is configurable with a minimum size of 100 and a maximum size of 16,000. The default PDU size is 16,000.

4.2.1.2.2 Number of Associations

CX50 2.0.x initiates one Association at a time for each destination to which a transfer request is being processed in the active job queue list. Two Storage SCPs may be selected, but only one job will be active at a time, the other(s) remain pending until the active job is completed or failed.

Table 5
NUMBER OF ASSOCIATIONS INITIATED FOR AE STORAGE

Maximum number of simultaneous Associations	5, 1 for each configured storage device

One Primary Storage Server, one Secondary Storage Server, one Storage Commitment Server, one SR Storage Server and one SR Storage Commitment Server.

CX50 2.0.x accepts Associations for N-EVENT-REPORT notifications for the Storage Commitment Push Model SOP Class on a separate association.

Table 6
NUMBER OF ASSOCIATIONS ACCEPTED FOR AE STORAGE

Maximum number of simultaneous Associations	1

[1] See section 8.7 for information on the Standard Extended SOP Class

4.2.1.2.3 Asynchronous Nature

CX50 2.0.x does not support asynchronous communication (multiple outstanding transactions over a single Association).

Table 7
ASYNCHRONOUS NATURE AS A SCU FOR AE STORAGE

Maximum number of outstanding asynchronous transactions	1

4.2.1.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 8
DICOM IMPLEMENTATION CLASS AND VERSION FOR AE STORAGE

Implementation Class UID	1.3.46.670589.14.1000.200
Implementation Version Name	CX50_200

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – Store Images, Loops and Structured Reports

4.2.1.3.1.1 Description and Sequencing of Activities

Images and Reports may be sent from the selected studies from the Review directory. When the "Send as you go" option is active, the queue is serviced continuously during the exam. Each image is sent in its own association that is opened and closed. Additional images acquired during the exam will be sent using subsequent associations.

If the C-STORE response from the remote application contains a status other than Success or Warning, the association is retried until switched to a failed state.

When a system configured with network destinations is used without the network connected, it is considered to be in "Portable" mode. When returning from portable, reconnecting the network cable will initiate transfer.

The Storage Commitment service is implemented to handle image commitment separately from Structured Reports. For Images, only the Primary Store SCP may be associated with a commitment server. For Structured Reports, the SR Store SCP may be configured with its own commit server. In each case, the Storage AE will transmit a Storage Commitment request (N-ACTION) over a separate Association from the storage of image or report objects. Outstanding Commit Requests (those that have not received an N-Event-Report) will remain in the Job Manager (CNTL-J) until the report is received.

The Storage AE can only receive an N-EVENT-REPORT request in a separate subsequent association initiated by the SCP employing PDU 54H SCP/SCU Role Negotiation in the SCP's Association Request. It cannot receive N-Event-Report-Rq messages on the same association as the N-Action-Rq.

Structured Reports will contain only supported measurements and calculations created by CX50 2.0.x. This may exclude some entries displayed in the on-system report. Measurements or calculations that are not supported for export are listed in Appendix A.

The OB and Gyn Study types create OB-GYN Ultrasound Procedure Reports.

The Adult Echo Study type creates Adult Echocardiography Reports.

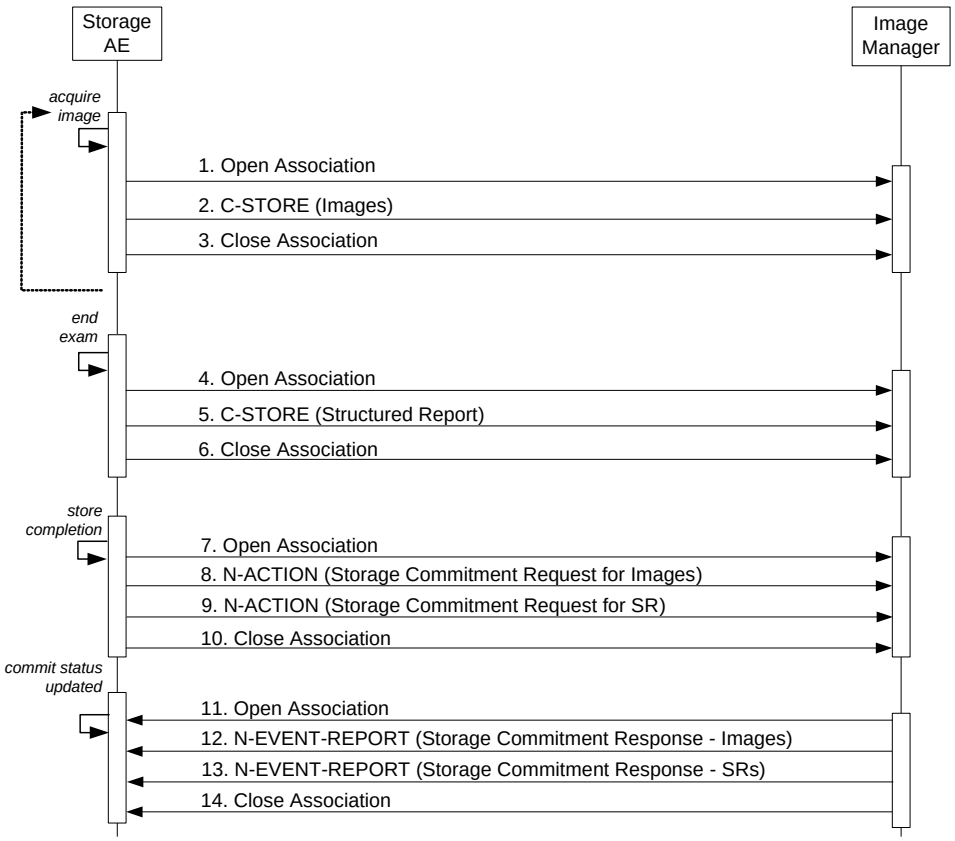


Figure 3
SEQUENCING OF ACTIVITY – SEND IMAGES AND STRUCTURED REPORT

The sequence of interactions between the Storage AE and an Image Manager is illustrated in Figure 3 for the “Store” configuration option “Send as you go.” The alternative option, “Batch mode” differs only in the removal of the loop symbol on the ‘acquire images’ activity

NOTES: The N-EVENT-REPORT must be sent over a separate association initiated by the Image Manager (see Section 4.2.1.4.1 on Activity – Receive Storage Commitment Response).

4.2.1.3.1.2 Proposed Presentation Contexts

CX50 2.0.x is capable of proposing the Presentation Contexts shown in the following table:

Table 9
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY SEND IMAGES

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian* Explicit VR Little Endian JPEG Lossy Baseline RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.5	SCU	None
US Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian Explicit VR Little Endian JPEG Lossy Baseline RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.5	SCU	None
Comprehensive Structured Report Storage	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None

*The following applies to both US Image and US Multiframe Images
JPEG used if image Photometric Interpretation is
YBR_FULL_422
RLE Lossless is used if image formats are any of
Palette Color, RLE Compressed
RGB, RLE Compressed
MONOCHROME2, RLE Compressed
Implicit Little Endian (ILE) transfer Syntax is used when:
Palette Color, Uncompressed ILE
RGB, Uncompressed ILE
MONOCHROME2, Uncompressed ILE
Explicit Little Endian (ELE) transfer syntax is used when:
Palette Color, Uncompressed ELE
RGB, Uncompressed ELE
MONOCHROME2, Uncompressed ELE

Storage Commitment N-Action Requests are only sent to the image storage device that is configured as the Storage Commitment server and associated with the Primary SCP. SRs are sent to their own configured SCP and Storage Commitment for SRs are handled separately from images.

4.2.1.3.1.3 SOP Specific Conformance for Image and Comprehensive Structured Report Storage SOP Classes

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

Table 10 describes C-Store response behavior.

The following Default Settings and Ranges may be used where applicable in Table 10:

Setting	Default	Range
Connect Timeout	30 sec	10 – 999 sec
Read Timeout	300 sec	30 – 999 sec
Write Timeout	300 sec	30 – 999 sec
Maximum Retries	3	0 – 999

Table 10
STORAGE C-STORE RESPONSE STATUS HANDLING BEHAVIOR

Establishing the Association with Default settings

Condition (After C-Store)	**Status Codes** (C-Store-RSP)	**Response**
Could not establish the association within 30-second time window (Connect Timeout) due to NO RESPONSE from the Storage Server	Not Applicable	The association attempt is aborted, and after 5-minutes a new association is attempted. CX50 2.0.x will make three attempts to open an association with the configured Storage SCP before aborting the storage request and placing the job in an error state. The user can then manually restart the job at some later date. The failure is logged to the DICOM log file as an error. The 5-minute timeout and the number of retries are configurable by the user from the DICOM Setup screens. The 5-minute timeout is mapped to the 'Retry Interval' input control on the DICOM Setup screen and the number of retries is mapped to 'Maximum Retries' on the DICOM Setup screen.
Refused	A7xx	If the Storage SCP server refuses the association, then the association attempt is aborted. CX50 2.0.x will wait 5-minutes and then reattempt the association. CX50 2.0.x will make three attempts to establish the association before aborting the storage request and placing the job in an error state. The user can then manually restart the job at some later date. The failure is logged to the DICOM log file as an error. As an example, the association would be refused if the storage server employs a high security mechanism whereby it only accepts association requests from DICOM Servers that it knows about and the CX50 2.0.x's AE Title was not in the PACS database. See the timeout and retry settings above.

During Image or SR Transfer

Service Status	Error Code	Behavior
After association has been accepted, there is no response to a request within 5-minute time window (Read Timeout).	Not Applicable	If the association is lost during active image transfer to the Storage SCP server, CX50 2.0.x will initiate a new association after 5 minutes, and attempt to store all the images. If during transfer, the association is again lost, CX50 2.0.x will wait another 5 minutes and try again. CX50 2.0.x will make three attempts to send all the images before aborting the storage request and placing the job in an error state. The user can then manually restart the job at some later date. The failure is logged to the DICOM log file as an error. See the timeout and retry settings above.
Error	A9xx, Cxxx, 0122, Other	CX50 2.0.x will treat all errors as failure of Storage request (also called as Job). A failed job is automatically retried after 5 minutes. If the job fails even after three attempts, CX50 2.0.x will abort this request and place the job in an Error state. The user can then manually restart the job at some later date. The failure is logged to the DICOM log file as an error.
Warning	D000, B000, B006, B007	If the Storage SCP issues a warning on a particular image (perhaps it had to use coercion), CX50 2.0.x logs the warning to the DICOM log file as an informational event and continues on as if the image was successfully stored to the PACS (see row below).
Success	0000	When an image is successfully stored to the Storage SCP (PACS), CX50 2.0.x will keep a record of the successful storage. If all the images in the job are successfully stored, CX50 2.0.x will notify the user (through an icon on the list of studies), and the job will be removed from the job manager.
*	Any other status code.	The Association is aborted using A-ABORT and the transfer fails. The status is logged.

The behavior of Storage AE during communication failure is summarized in Table 11.

Table 11
STORAGE COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	Same as Service Status timeouts in Table 10 above.
Association aborted by the SCP or network layers	Same as Service Status in Table 10 above.

The contents of US Image, US Multiframe Storage and Comprehensive Structured Report Storage SOP Instances conform to the DICOM IOD definitions described in Section 8.1.

4.2.1.3.1.4 SOP Specific Conformance for Storage Commitment Push Model SOP Class

4.2.1.3.1.4.1 Storage Commitment Operations (N-ACTION)

The Storage AE will request storage commitment for the configured device.

Table 12 summarizes the behavior of Storage AE when receiving response status codes.

Table 12

STORAGE COMMITMENT N-ACTION RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The system waits for the N-Event-Report.
*	*	Any other status code.	The commit status remains incomplete for all objects.

Table 13 summarizes the behavior of Storage AE during communication failure.

Table 13
STORAGE COMMITMENT COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	Same as non-success status in Table 12.
Association aborted by the SCP or network layers	Same as non-success status in Table 12.

4.2.1.3.1.4.2 Storage Commitment Tags (N-ACTION)

The Storage AE will request storage commitment using the following tags

NOTE: Storage Commitment may only be automatically requested by the system at the end of a study.

Table 13a
STORAGE COMMITMENT N-ACTION-REQUEST MESSAGE CONTENTS

Action Type Name	Action Type ID	Attribute	Tag	Requirement Type SCU
Request Storage Commitment	1	Transaction UID	(0008,1195)	1
		Referenced SOP Sequence	(0008,1199)	1
		>Referenced SOP Class UID	(0008,1150)	1
		>Referenced SOP Instance UID	(0008,1155)	1

Subsequently, CX50 2.0.x expects N-EVENT-REPORT messages from the storage commit server although CX50 2.0.x does not assume that the event will arrive at any particular time. CX50 2.0.x does not wait but will process the event whenever it arrives.

CX50 2.0.x might be either powered down or disconnected from the network and used in portable mode, it is possible for the N-EVENT-REPORT to arrive from the Storage Commitment SCP while CX50 2.0.x cannot receive it. If an outstanding N-EVENT-REPORT does not arrive within 96 hours, then CX50 2.0.x will reissue the same Storage Commitment request. When the event arrives, CX50 2.0.x returns an N-EVENT-REPORT response primitive with one of the following status codes.

4.2.1.3.1.4.3 Storage Commitment Notifications (N-EVENT-REPORT)

The Storage AE can receive an N-EVENT-REPORT notification received from the SCP via Reverse-role negotiation.

Table 14 summarizes the behavior of Storage AE when receiving Event Types within the N-EVENT-REPORT.

Table 14
STORAGE COMMITMENT N-EVENT-REPORT BEHAVIOUR

Event Type Name	Event Type ID	Behavior
Storage Commitment Request Successful	1	The commit status is set to complete for each object.
Storage Commitment Request Complete – Failures Exist	2	The commit status remains incomplete. The commit comment for each object is logged.

The reasons for returning specific status codes in an N-EVENT-REPORT response are summarized in Table 15.

Table 15
STORAGE COMMITMENT N-EVENT-REPORT RESPONSE STATUS REASONS

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

4.2.1.3.1.4.4 Storage Commitment Tags (N-EVENT-REPORT)

Tags supported for receiving an N-Event-Report message.

Table 16 lists the tags that may be received within the N-EVENT-REPORT.

Table 16
STORAGE COMMITMENT N-EVENT-REPORT MESSAGE CONTENTS

Event Type Name	Event Type ID	Attribute	Tag	Requirement Type SCP
Storage Commitment Request Successful	1	Transaction UID	(0008,1195)	1
		Retrieve AE Title	*(0008,0054)*	*3*
		Storage Media File-Set ID	*(0088,0130)*	*3*
		Storage Media File-Set UID	*(0088,0140)*	*3*
		Referenced SOP Sequence	(0008,1199)	1
		>Referenced SOP Class UID	(0008,1150)	1
		>Referenced SOP Instance UID	(0008,1155)	1
		>Retrieve AE Title	*(0008,0054)*	*3*
		>Storage Media File-Set ID	*(0088,0130)*	*3*
		>Storage Media File-Set UID	*(0088,0140)*	*3*
Storage Commitment Request Complete – Failures Exist	2	Transaction UID	(0008,1195)	1
		Retrieve AE Title	*(0008,0054)*	*3*
		Storage Media File-Set ID	*(0088,0130)*	*3*

		Storage Media File-Set UID	*(0088,0140)*	*3*
		Referenced SOP Sequence	(0008,1199)	1
		>Referenced SOP Class UID	(0008,1150)	1
		>Referenced SOP Instance UID	(0008,1155)	1
		>Retrieve AE Title	*(0008,0054)*	*3*
		>Storage Media File-Set ID	*(0088,0130)*	*3*
		>Storage Media File-Set UID	*(0088,0140)*	*3*
		Failed SOP Sequence	(0008,1198)	1
		>Referenced SOP Class UID	(0008,1150)	1
		>Referenced SOP Instance UID	(0008,1155)	1
		>Failure Reason	(0008,1197)	1

In Table 16 above, the attributes in *italics* may be sent from the server, handled and ignored by HD15.

4.2.1.4 Association Acceptance Policy

4.2.1.4.1 Activity – Receive Storage Commitment Response

4.2.1.4.1.1 Description and Sequencing of Activities

The Storage AE accepts associations for pending responses to a Storage Commitment Request only using SCP/SCU Role Negotiation; explicitly stating that the association is initiated by the SCP to the SCU. Any other will be rejected.

4.2.1.4.1.2 Accepted Presentation Contexts

Table 17 summarizes Presentation Contexts that the Storage AE accepts.

Table 17
ACCEPTABLE PRESENTATION CONTEXTS FOR
ACTIVITY RECEIVE STORAGE COMMITMENT RESPONSE

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

4.2.1.4.1.3 SOP Specific Conformance for Storage Commitment Push Model SOP Class

4.2.1.4.1.3.1 Storage Commitment Notifications (N-EVENT-REPORT)

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

Table 14 summarizes the behavior of Storage AE when receiving Event Types within the N-EVENT-REPORT.

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. 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 17b summarizes the reasons for returning specific status codes in an N-EVENT-REPORT response.

Table 17b
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. An association request with the same parameters 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. A successful association request will require configuration changes. This rejection reason normally occurs when the association initiator is incorrectly configured and attempts to address the association acceptor using the wrong AE Title. Make sure the Commit Server has the correct AE Title and IP Address for the ultrasound system.
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. Ensure there is no variation in Case in this system's AE Title on the Commit Server.
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.

4.2.2 Workflow Application Entity Specification

4.2.2.1 SOP Classes

CX50 2.0.x provides Standard Conformance to the following SOP Classes:

Table 18
SOP CLASSES FOR AE WORKFLOW

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

4.2.2.2 Association Establishment Policy

4.2.2.2.1 General

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

Table 19
DICOM APPLICATION CONTEXT FOR AE WORKFLOW

Application Context Name	1.2.840.10008.3.1.1.1

4.2.2.2.2 Number of Associations

CX50 2.0.x initiates one Association at a time for a Worklist request and a separate association for Modality Performed Procedure Step messages.

Table 20
NUMBER OF ASSOCIATIONS INITIATED FOR AE WORKFLOW

Maximum number of simultaneous Associations	2

4.2.2.2.3 Asynchronous Nature

CX50 2.0.x does not support asynchronous communication.

Table 21
ASYNCHRONOUS NATURE AS A SCU FOR AE WORKFLOW

Maximum number of outstanding asynchronous transactions	1

4.2.2.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 22
DICOM IMPLEMENTATION CLASS AND VERSION FOR AE WORKFLOW

Implementation Class UID	1.3.46.670589.14.1000.200
Implementation Version Name	CX50_200

4.2.2.3 Association Initiation Policy

4.2.2.3.1 Activity – Worklist Update

4.2.2.3.1.1 Description and Sequencing of Activities

Worklist queries for Modality (US) or All Modalities may be initiated by the user or will occur at a preset interval set as one of the following:

- The user may press “Refresh Now” to send a query: using search keys: Start Date, Modality and AE Title selections made in the Set Modality Worklist Queries configuration page.
- The user may configure the system to search for studies scheduled for its AE Title, or it may be set to search for a different AE Title’s studies, or all.
- The system may be set* to periodically poll the worklist server. Default is 10 minutes, adjustable in one minute increments from 1 to 32,767 minutes.

  * Follow Setups > System > DICOM > DICOM Preset > Change Settings for current preset > Modify in Roles > MWL SCP – Advanced > MWL Polling Frequency.

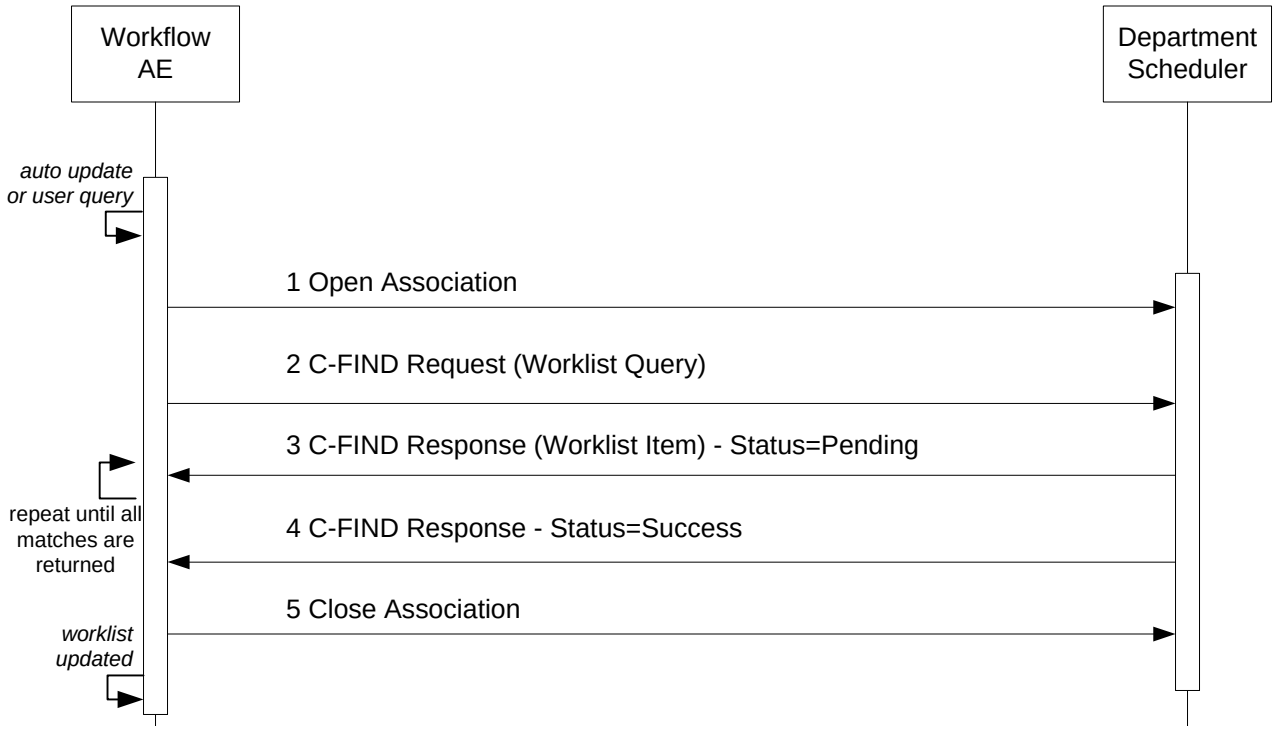


Figure 5
SEQUENCING OF ACTIVITY – WORKLIST UPDATE

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 MWL SOP Class as an SCP) is illustrated in Figure 5:

4.2.2.3.1.2 Proposed Presentation Contexts

CX50 2.0.x will propose Presentation Contexts as shown in the following table:

Table 23
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY WORKLIST UPDATE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**			
Name	**UID**	**Name List**	**UID List**	**Role**	**Ext. Neg.**
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Explicit VR Little Endian* Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

*Note: If the worklist server accepts Explicit VR Little Endian and Implicit VR Little Endian then CX50 2.0.x will use Explicit VR Little Endian Transfer Syntax.

4.2.2.3.1.3 SOP Specific Conformance for Modality Worklist

Table 24 summarizes the behavior of CX50 2.0.x when encountering status codes in a MWL C-FIND response.

A message “query failed” will appear on the user interface if CX50 2.0.x receives any other SCP response status than “Success” or “Pending.”

Table 24
MODALITY WORKLIST C-FIND RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Matching is complete	0000	The system replaced the worklist from the response.
Refused	Out of Resources	A700	The Association is aborted using A-ABORT. The worklist is not replaced.
Failed	Identifier does not match SOP Class	A900	Same as “Refused” above.
Failed	Unable to Process	C000 – CFFF	Same as “Refused” above.
Cancel	Matching terminated due to Cancel request	FE00	The retrieved items are ignored.
Pending	Matches are continuing	FF00	Continue.
Pending	Matches are continuing – Warning that one or more Optional Keys were not supported	FF01	Continue.
*	*	Any other status code.	Same as “Refused” above.

Table 25 summarizes the behavior of CX50 2.0.x during communication failure.

Table 25
MODALITY WORKLIST COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	Same as Service Status “Refused” in the table above.
Association aborted by the SCP or network layers	Same as Service Status “Refused” in the table above.

Table 26 describes the CX50 2.0.x Worklist Matching Keys and requested attributes. Unexpected attributes returned in a C-FIND response are ignored.

Non-matching responses returned by the SCP due to unsupported optional matching keys are ignored.

Table 26
WORKLIST MATCHING KEYS

Module Name Attribute Name	**Tag**	**VR**	**M**	**R**	**D**	**IOD**
Scheduled Procedure Step						
Scheduled Procedure Step Sequence	(0040,0100)	SQ		x		
> Scheduled Station AE Title	(0040,0001)	AE	S, *	x		x
> Scheduled Procedure Step Start Date	(0040,0002)	DA	S, R	x		x
> Scheduled Procedure Step Start Time	(0040,0003)	TM		x	x	x
> Scheduled Procedure Step End Date	(0040,0004)	DA		x		
> Scheduled Procedure Step End Time	(0040,0005)	TM		x		
> Modality	(0008,0060)	CS	S, *	x		x
> Scheduled Performing Physician’s Name[1]	(0040,0006)	PN		x		x
> Scheduled Procedure Step Description[2]	(0040,0007)	LO		x	x	x
> Scheduled Protocol Code Sequence[3]	(0040,0008)	SQ		x		x
> Scheduled Station Name	(0040,0010)	SH		x		
> Scheduled Procedure Step Location[4]	(0040,0011)	SH		x	x	x
> Pre-Medication	(0040,0012)	LO		x		
> Scheduled Procedure Step ID	(0040,0009)	SH		x		x
> Requested Contrast Agent	(0032,1070)	LO		x		
> Scheduled Procedure Step Status	(0040,0020)	CS		x		x
> Comments on the Scheduled Procedure Step	(0040,0400)	LT		x		
Requested Procedure						
Requested Procedure ID[5]	(0040,1001)	SH		x		x
Reason for the Requested Procedure[6]	(0040,1002)	LO		x		
Requested Procedure Description	(0032,1060)	LO		x		x
Study Instance UID	(0020,000D)	UI		x		x
Referenced Study Sequence	(0008,1110)	SQ		x		x
Requested Procedure Code Sequence	(0032,1064)	SQ		x		
Names of Intended Recipients of Results	(0040,1010)	PN		x		
Requested Procedure Comments	(0040,1400)	LT		x		
Imaging Service Request						
Accession Number[7]	(0008,0050)	SH		x	x	x
Requesting Physician	(0032,1032)	PN		x		
Requesting Service	(0032,1033)	LO		x		
Referring Physician's Name[8]	(0008,0090)	PN		x	x	x
Reason for the Imaging Service Request[9]	(0040,2001)	LO		x	x	
Imaging Service Request Comments	(0040,2400)	LT		x		

Module Name Attribute Name	Tag	VR	M	R	D	IOD
Visit Admission						
Current Patient Location	(0038,0300)	LO		x		
Patient Identification						
Patient's Name	(0010,0010)	PN		x	x	x
Patient ID	(0010,0020)	LO		x	x	x
Other Patient IDs[10]	(0010,1000)	LO		x	x	x
Patient Demographic						
Patient's Birth Date[11]	(0010,0030)	DA		x	x	x
Patient's Birth Time[11]	(0010,0032)	TM		x	x	
Patient's Sex[12]	(0010,0040)	CS		x	x	x
Patient's Age[13]	(0010,1010)	AS				
Patient Size[14]	(0010,1020)	DS		x	x	x
Ethnic Group	(0010,2160)	SH		x		
Patient's Weight[15]	(0010,1030)	DS		x	x	x
Patient Comments	(0010,4000)	LT		x	x	
Referenced Patient Sequence	(0008,1120)	SQ		x		x
Patient Medical						
Medical Alerts	(0010,2000)	LO		x		
Additional Patient's History	(0010,21B0)	LT		x		
Pregnancy Status	(0010,21C0)	US		x		

* = Wildcard matching

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 CX50 2.0.x Worklist Request Identifier.
Tag:	DICOM tag for this attribute.
VR:	DICOM VR for this attribute.
M:	Matching keys for (automatic) Worklist Update. An "S" indicates that CX50 2.0.x supplies an attribute value for Single Value Matching, "R" indicates a Range Value and "*" is for Wildcard matching. See section 4.2.2.3.1.1for setup location.
R:	Return keys. An "x" indicates that CX50 2.0.x supplies this attribute as a Return Key with zero length for Universal Matching.
D:	Displayed keys. An "x" indicates that this worklist attribute is displayed to the user in the Patient Data Entry screen or Worklist Directory.
IOD:	An "x" indicates that this Worklist attribute's data is included into applicable Image, SR or MPPS Object Instances created during performance of the related Procedure Step.
Notes:	
1	Scheduled Performing Physician's Name is set in MPPS, sets the "Performed by" field in the Patient ID screen.
2	Scheduled Procedure Step Description is set in MPPS and images. May be used to set "Description" field in the Patient Selection screen and is mapped to "Study Description" in images. 2nd Configuration choice for "Study Description" in images.
3	Returned Scheduled Protocol Code Sequence contents are mapped to Scheduled Action Item Code Sequence and Performed Action Item Code Sequence in MPPS. If Code Meaning is present it is the 3rd Configuration option for Study description in images.
4	Scheduled Procedure Step Location sets the "Location" field in the Patient Selection Screen.

5	Requested Procedure Description value is set in the “Description” field of the Patient Selection screen and “Study Description” of the Patient ID screen. Manual entry to Study Description field is also sent in Image and MPPS messages.
6	May be used to set “Indication” field on Patient Selection screen. 1st choice, configurable. Not exported in DICOM.
7	Displayed on Patient ID screen and sent in MPPS and Images.
8	Sets the “Referring Physician” in Patient ID and Patient Selection screens.
9	May be used to set “Indication” field on Patient Selection screen. 2nd choice, configurable.
10	Displayed in “Alternate ID Number” field of Patient ID screen. Sent only in Images.
11	Birth Date and Birth Time can populate the ‘DOB” field of Patient ID screen. Birth Date only is sent in MPPS messages.
12	Populates the “Gender” field in the Patient Selection screen.
13	Populates the “Age” field in the Patient Selection screen.
14	Populates “Height” fields in “Patient ID” and “Patient Selection” screens.
15	Populates “Weight” fields in “Patient ID” and “Patient Selection” screens.

4.2.2.3.2 Activity –Acquire Images

4.2.2.3.2.1 Description and Sequencing of Activities

An association to the configured MPPS SCP system is established immediately after the closing the Patient Data Entry screen, sending the MPPS N-Create message with status of “IN PROGRESS”.

The “End Exam” button causes a “COMPLETED” status in the N-Set message. An exam for which an MPPS Instance is sent with a state of “COMPLETED” can no longer be updated; however, it may be appended. See section 4.1.1, Application Data Flow for details on append.

Pressing the “Cancel” button causes a “DISCONTINUED” message. An exam for which an MPPS Instance is sent with a state of “DISCONTINUED” can also no longer be updated; however, it may be appended. See section 4.1.1, Application Data Flow for details on append.

The system supports creation of “unscheduled cases” by allowing MPPS instances to be communicated for locally registered Patients.

The system performs a single Performed Procedure Step at a time per Scheduled Procedure Step.

CX50 2.0.x 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 finalize the contents and state of the MPPS according to the SET Modality Performed Procedure Step Information operation.

The opening of a study marks the beginning of a new Modality Performed Procedure Step (MPPS). At this time, a MPPS record is created on the MPPS SCP through the use of the N-CREATE service. If the MPPS SCP is unavailable at this time, the request is queued and will be sent when the MPPS SCP is available.

When the user ends the scheduled procedure by closing the study and saving any changes, the MPPS status is “Completed”. Alternatively, the user may choose to cancel acquisition, the study is saved in local storage and the MPPS status becomes “Discontinued”. At this time, the Study Management AE attempts to modify the MPPS on the MPPS SCP through the use of the N-SET service. If the MPPS SCP is unavailable, the request is queued and will be sent when the MPPS SCP is available.

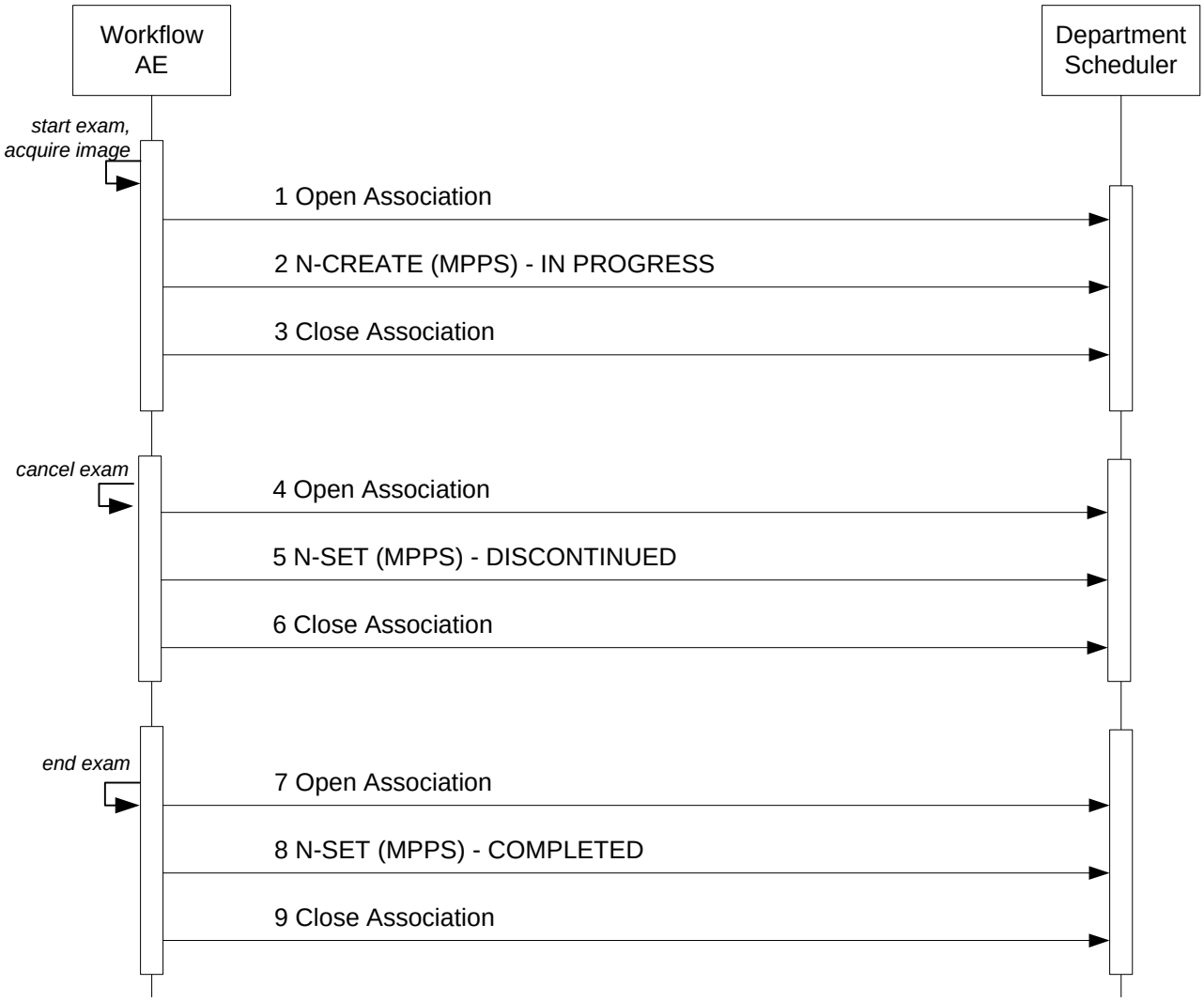


Figure 6
SEQUENCING OF ACTIVITY – ACQUIRE IMAGES

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 6.
Note: The Cancel and End Exam commands are mutually exclusive. They are both represented here for illustration purposes only. Actual workflow uses one or the other for a given exam.

4.2.2.3.2.2 Proposed Presentation Contexts

CX50 2.0.x will propose Presentation Contexts as shown in the following table:

Table 27
PROPOSED PRESENTATION CONTEXTS FOR REAL-WORLD ACTIVITY ACQUIRE IMAGES

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**			
Name	**UID**	**Name List**	**UID List**	**Role**	**Ext. Neg.**
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Explicit VR Little Endian* Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

*Note: If the worklist server accepts Explicit VR Little Endian and Implicit VR Little Endian then CX50 2.0.x will use Explicit VR Little Endian Transfer Syntax.

4.2.2.3.2.3 SOP Specific Conformance for MPPS

Table 28 summarizes the behavior of CX50 2.0.x when encountering status codes in an MPPS N-CREATE or N–SET response.

The updated attributes are shown in Table 30 below. The “N_CREATE Usage” column shows the attributes transmitted when the status of the study changes to “IN_PROGRESS”. The “N-SET Usage” column shows the attributes transmitted when the status of the study changes to “COMPLETED” or “DISCONTINUED”.

Note: The following fields are copied from the selected MWL entry to the Patient ID screen:

Accession Number

Patient’s Name

Patient’s ID

Patient’s Birth Date

Patient’s Sex

Referring Physician’s Name

Study description

Usually, the performing physician will accept the information in the Patient ID Screen, as is, however the physician has the option of editing the information before starting the study. If the physician edits this information then the MPPS N-CREATE command that is sent to the MPPS server on study start will use the edited information and not the original MWL information.

Table 28
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.
Warning	Attribute Value Out of Range	0116H	The error message is displayed.
*	*	Any other status code.	Same as “Failure” above.

Table 29 summarizes the behavior of CX50 2.0.x during communication failure.

Table 29
MPPS COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	Same as “Failure” above.
Association aborted by the SCP or network layers	Same as “Failure” above.

Table 30 provides a description of the MPPS N-CREATE and N-SET request identifiers. Empty cells in the N-CREATE and N-SET columns indicate that the attribute is not sent.

Table 30
MPPS N-CREATE / N-SET REQUEST IDENTIFIER

Attribute Name	Tag	VR	N-CREATE	N-SET
Specific Character Set	(0008,0005)	CS	See Section 6 for details.	
Modality	(0008,0060)	CS	US	
Referenced Patient Sequence	(0008,1120)	SQ	If available from MWL, else NULL	
> Referenced SOP Class UID	(0008,1150)	UI	1.2.840.10008.3.1.2.1.1 No value sent for unscheduled study.	
>Referenced SOP Instance UID	(0008,1155)	UI	No value sent for unscheduled study.	
Patient’s Name	(0010,0010)	PN	As received from MWL or entered in PDE.	
Patient ID	(0010,0020)	LO	From Modality Worklist or user input to the “MRN” field. MWL value may be edited.	
Patient’s Birth Date	(0010,0030)	DA	Same as above, except “Patient’s Birth Date” field.	
Patient’s Sex	(0010,0040)	CS	Same as above, except “Gender” field.	
Study ID	(0020,0010)	SH	System Generated, starting with 1 and incrementing for each study,	
Performed Station AE Title	(0040,0241)	AE	AE Title from configuration (requires power cycle to use updated setting)	
Performed Station Name	(0040,0242)	SH	Same as “Performed Station AE Title’ tag above.	
Performed Location	(0040,0243)	SH	If available from MWL, else NULL	
Performed Procedure Step Start Date	(0040,0244)	DA	Actual start date (on close of PDE screen)	

Attribute Name	Tag	VR	N-CREATE	N-SET
Performed Procedure Step Start Time	(0040,0245)	TM	Actual start time (on close of PDE screen)	
Procedure Code Sequence	(0008,1032)	SQ	Mapped from Requested Procedure Code Sequence (0032,1064) from MWL No value sent for unscheduled study.	As received from MWL No value sent for unscheduled study.
>Code Value	(0008,0100)	SH	As received from MWL No value sent for unscheduled study.	As received from MWL No value sent for unscheduled study.
>Coding Scheme Designator	(0008,0102)	SH	As received from MWL No value sent for unscheduled study.	As received from MWL No value sent for unscheduled study.
>Coding Scheme Version	(0008,0103)	SH	As received from MWL No value sent for unscheduled study.	As received from MWL No value sent for unscheduled study.
>Code Meaning	(0008,0104)	LO	As received from MWL No value sent for unscheduled study.	As received from MWL No value sent for unscheduled study.
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	COMPLETED or DISCONTINUED
Performed Procedure Step ID	(0040,0253)	SH	Auto generated in the format, <YYYYMMDD.HHMMSS>	
Performed Procedure Step Description	(0040,0254)	LO	Set from “Study Description” field in PDE, else mapped from Requested Procedure Description in MWL**.**	
Performed Procedure Type Description	(0040,0255)	LO	If present in MWL, else ”Indication” field in PDE.	
Performed Protocol Code Sequence	(0040,0260)	SQ	Zero length, or mapped from MWL Scheduled Protocol Code Sq (0040,0008)	Same
Scheduled Step Attributes Sequence	(0040,0270)	SQ		
> Accession Number	(0008,0050)	SH	From MWL or user PDE input. MWL value may be edited.	
> Referenced Study Sequence	(0008,1110)	SQ	One item per item in the MWL Reference Study Sequence. Absent if unscheduled.	
>> Referenced SOP Class UID	(0008,1150)	UI	Same value as in of the Reference Study Sequence in the MWL	

Attribute Name	Tag	VR	N-CREATE	N-SET
>> Referenced SOP Instance UID	(0008,1155)	UI	Same value as in of the Reference Study Sequence in the MWL	
> Study Instance UID	(0020,000D)	UI	Same value as in MWL attribute or auto generated	
> Requested Procedure Description	(0032,1060)	LO	Same value as in MWL attribute, 1st Choice, from "Study Description" in PDE, else NULL	
> Scheduled Procedure Step Description	(0040,0007)	LO	Same value as in MWL attribute, else NULL	
> Scheduled Protocol Code Sequence	(0040,0008)	SQ	Same value as in MWL attribute, else NULL	
> Scheduled Procedure Step ID	(0040,0009)	SH	Same value as in MWL attribute, else NULL	
> Requested Procedure ID	(0040,1001)	SH	Same value as in MWL attribute, else NULL	
Performed Series Sequence	(0040,0340)	SQ		One item per acquired series
> Retrieve AE Title	(0008,0054)	AE	Zero Length	Same
> Series Description	(0008,103E)	LO	Zero Length	Same
> Performing Physician's Name	(0008,1050)	PN	From the "Performed by" field in PDE	From the "Performed by" field in PDE
> Operator's Name	(0008,1070)	PN	From the "Performed by" field in PDE	Same
> Referenced Image Sequence	(0008,1140)	SQ	Zero Length	Zero Length
>> Referenced SOP Class UID	(0008,1150)	UI		
>> Referenced SOP Instance UID	(0008,1155)	UI		
> Protocol Name	(0018,1030)	LO	"Free Form"	"Free Form"
> Series Instance UID	(0020,000E)	UI	Auto Generated	Same
> Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)	SQ	Zero Length	Zero Length

4.2.2.4 Association Acceptance Policy

The Workflow Application Entity does not accept Associations.

4.2.3 Hardcopy Application Entity Specification

4.2.3.1 SOP Classes

CX50 2.0.x provides Standard Conformance to the following SOP Classes:

Table 31
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

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

- Basic Film Session SOP Class
- Basic Film Box SOP Class
- Basic Grayscale (or Color) Image Box SOP Class
- Printer SOP Class

Important note about printing by CX50 2.0.x:

- The number of Film Boxes per session is one
- The number of images per Film Box is one
- Most image formatting and layout is performed by CX50 2.0.x resulting in a single rather large dataset sent to the printer
- CX50 2.0.x will release the association after the print command (N-Action-Rq) is sent. It will not hold the association open to receive the printer's N-Event-Report message.

4.2.3.2 Association Establishment Policy

4.2.3.2.1 General

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

Table 32
DICOM APPLICATION CONTEXT FOR AE HARDCOPY

Application Context Name	1.2.840.10008.3.1.1.1

4.2.3.2.2 Number of Associations

CX50 2.0.x initiates one Association at a time for each configured hardcopy device. Multiple hardcopy devices can be configured.

Table 33
NUMBER OF ASSOCIATIONS INITIATED FOR AE HARDCOPY

Maximum number of simultaneous Associations	2

Note: One Black and White only Printer/Server and one Color Printer/Server.

4.2.3.2.3 Asynchronous Nature

CX50 2.0.x does not support asynchronous communication (multiple outstanding transactions over a single Association).

Table 34
ASYNCHRONOUS NATURE AS A SCU FOR AE HARDCOPY

Maximum number of outstanding asynchronous transactions	1

4.2.3.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 35
DICOM IMPLEMENTATION CLASS AND VERSION FOR AE HARDCOPY

Implementation Class UID	1.3.46.670589.14.1000.200
Implementation Version Name	CX50_200

4.2.3.3 Association Initiation Policy

4.2.3.3.1 Activity – Film Images

4.2.3.3.1.1 Description and Sequencing of Activities

The system composes images onto film sheets and sends print requests to job queue.

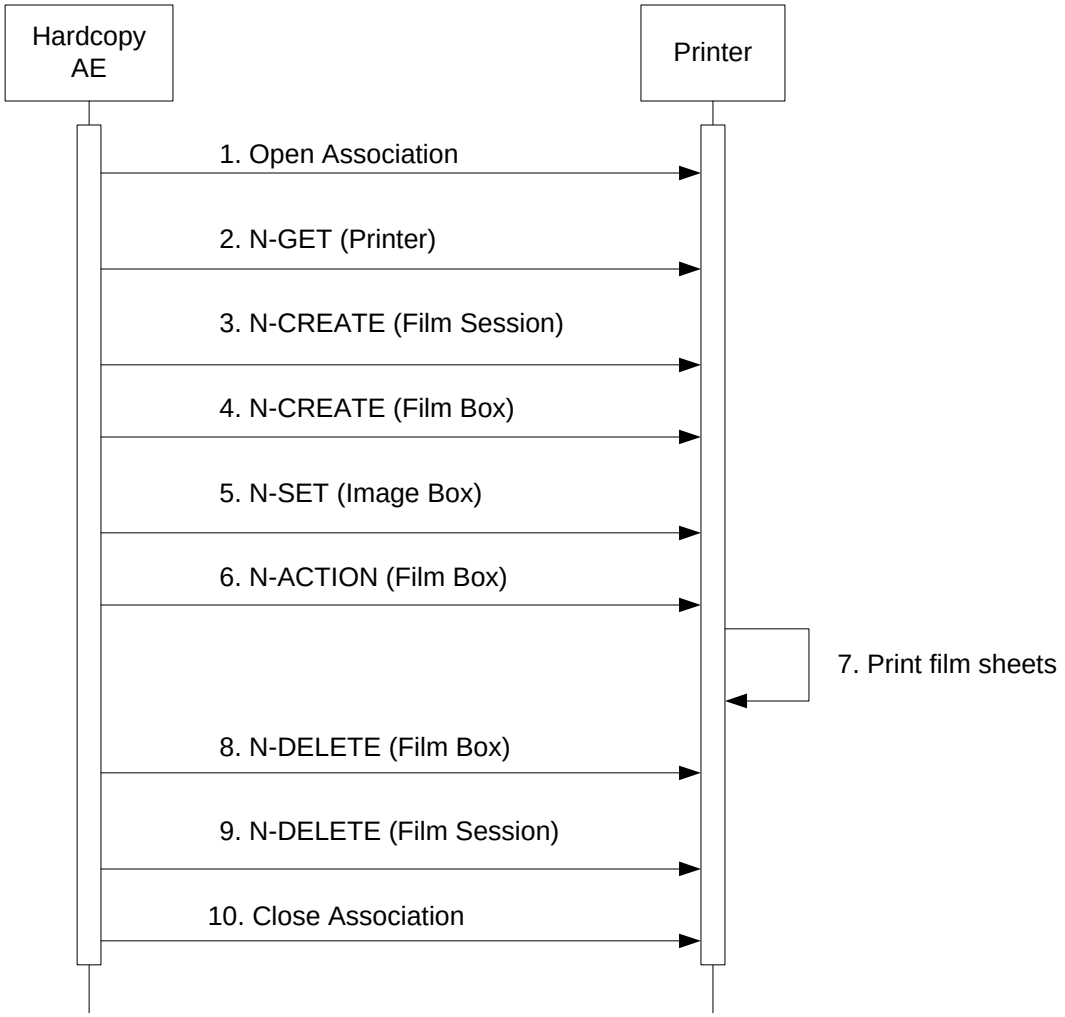


Figure 7
SEQUENCING OF ACTIVITY – PRINT IMAGES

Figure 7 illustrates a typical sequence of DIMSE messages sent over an association between Hardcopy AE and a Printer. Two DICOM Printers may be simultaneously configured, one for BW and one for Color prints.

If both BW and Color printers are configured and selected, the images that contain color data, i.e., Color Flow Doppler or “Chroma” will be sent to the Color printer, and all other images will be sent to the BW printer.

In “Send as you go”, images will be sent to the printer when the number needed to fill the configured format is met, until “End Exam” is pressed when page(s) that have not been exported will be sent. In “Batch mode” or “Manual”, each formatted page is sent as soon as it is composed by the system. If fewer images than a full page are sent, the remaining blank spaces will be sent black.

Status of the print-job is reported through the Job Manager (CNTL-J). Only one job will be active at a time for each separate hardcopy device. If any response from the remote application contains a status other than Success or Warning, the association is aborted and the related job is switched to a failed state. It can be restarted any time by user interaction.

4.2.3.3.1.2 Proposed Presentation Contexts

Table 36 shows the Presentation Contexts CX50 2.0.x is capable of proposing.

Table 36
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	Explicit VR Little Endian* Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	Explicit VR Little Endian* Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

* Note: If the worklist server accepts Explicit VR Little Endian and Implicit VR Little Endian then CX50 2.0.x will use Explicit VR Little Endian Transfer Syntax.

4.2.3.3.1.3 Common SOP Specific Conformance for all Print SOP Classes

Table 37 summarizes the general behavior of Hardcopy AE during communication failure. This behavior is common for all SOP Classes supported by Hardcopy AE.

Table 37
HARDCOPY COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The Association is aborted and reported as “Failed.”
Association aborted by the SCP or network layers	”Network Communication Failure” is reported.

4.2.3.3.1.4 SOP Specific Conformance for the Printer SOP Class

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

— N-GET

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

4.2.3.3.1.4.1 Printer SOP Class Operations (N-GET)

Hardcopy AE uses the Printer SOP Class N-GET operation to obtain information about the current printer status. Table 38 lists the attributes obtained via N-GET.

Table 38
PRINTER SOP CLASS N-GET RESPONSE ATTRIBUTES

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

The Printer Status information is evaluated as follows:

1. If Printer status (2110,0010) is NORMAL, the print-job continues to be printed.
2. If Printer status (2110,0010) is FAILURE, the print-job is retried as configured then is marked as failed.
3. If Printer status (2110,0010) is WARNING, the print-job continues to be printed.

Table 39 summarizes the behavior of Hardcopy AE when encountering status codes in an N-GET response.

Table 39
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.	Same as Timeout above.

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

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

Table 40 summarizes the behavior of Hardcopy AE when receiving Event Types within the N-EVENT-REPORT.

Table 40
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. For user-recoverable warnings, the job retries as configured. Then marked as failed.
Failure	3	The job retries as configured print then is marked as failed.
*	*	Status code of 0113H

Table 41 summarizes the reasons for returning specific status codes in an N-EVENT-REPORT response.

Table 41
PRINTER SOP CLASS N-EVENT-REPORT RESPONSE STATUS REASONS

Service Status	Further Meaning	Error Code	Reasons
Success	Success	0000	The notification event has been successfully received.

Failure	No Such Event Type	0113H	An invalid Event Type ID was supplied in the N-EVENT-REPORT request.
Failure	Processing Failure	0110H	An internal error occurred during processing of the N-EVENT-REPORT. A short description of the error will be returned in Error Comment (0000,0902).

4.2.3.3.1.5 SOP Specific Conformance for the Film Session SOP Class

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

— N-CREATE

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

4.2.3.3.1.5.1 Film Session SOP Class Operations (N-CREATE)

Table 42 lists the attributes supplied in an N-CREATE Request.

Table 42
FILM SESSION SOP CLASS N-CREATE REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Copies	(2000,0010)	IS	Default 1. Range is 1 – 99.	ALWAYS	USER
Print Priority	(2000,0020)	CS	HIGH	ALWAYS	AUTO
Medium Type	(2000,0030)	CS	BLUE FILM, CLEAR FILM or PAPER and 'Printer Specific' options*	VNAP	USER
Film Destination	(2000,0040)	CS	MAGAZINE or PROCESSOR and 'Printer Specific' options *	ANAP	USER
Film Session Label	(2000,0050)	LO	Philips Medical Systems	ALWAYS	AUTO

*Dependent on the specific printer selected

Table 43 summarizes the behavior of Hardcopy AE when encountering status codes in an N-CREATE response.

Table 43
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	System continues operations.
Warning	Attribute List Error	0107H	Same as above.
*	*	Any other status code.	The Association is aborted and the print-job fails.

4.2.3.3.1.5.2 Film Session SOP Class Operations (N-DELETE)

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

Table 44
PRINTER SOP CLASS N-DELETE RESPONSE STATUS HANDLING BEHAVIOR

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

4.2.3.3.1.6 SOP Specific Conformance for the Film Box SOP Class

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

— N-CREATE
— N-ACTION

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

4.2.3.3.1.6.1 Film Box SOP Class Operations (N-CREATE)

Table 47 lists the attributes supplied in an N-CREATE Request.

Table 47
FILM BOX SOP CLASS N-CREATE REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Display Format	(2010,0010)	ST	STANDARD\1,1	ALWAYS	AUTO
Referenced Film Session Sequence	(2010,0500)	SQ		ALWAYS	AUTO
>Referenced SOP Class UID	(0008,1150)	UI	1.2.840.10008.5.1.1.1	ALWAYS	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI	From created Film Session SOP Instance	ALWAYS	AUTO
Film Orientation	(2010,0040)	CS	Default = PORTRAIT, or LANDSCAPE	ALWAYS	AUTO/USER
Film Size ID	(2010,0050)	CS	Default – 8INX10IN and DICOM Defined Terms: 8INX10IN, 8_5INX11IN, 10INX12IN, 10INX14IN, 11INX14IN, 11INX17IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, A4, A3 and 'Printer Specific' options.	ALWAYS	AUTO/USER
Magnification Type	(2010,0060)	CS	NONE, CUBIC, BILINEAR, REPLICATE, 'Printer Specific' options	ANAP	USER
Min Density	(2010,0120)	US	User editable 0-999	ANAP	USER
Max Density	(2010,0130)	US	User editable 0-999	ANAP	USER
Trim	(2010,0140)	CS	NO	ALWAYS	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Configuration Information	(2010,0150)	ST	DICOM supports a “config ID#” or a “config string”. Check “Printer Catalog” for appropriate data.	ANAP	USER

Table 48 summarizes the behavior of Hardcopy AE when encountering status codes in an N-CREATE response.

Table 48
FILM BOX SOP CLASS N-CREATE RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
Warning	Requested Max Density outside of printer’s operating range	B605H	The N-CREATE operation is considered successful but the status meaning is logged.
*	*	Any other status code.	The Association is aborted and the job failed.

4.2.3.3.1.6.2 Film Box SOP Class Operations (N-ACTION)

The Hardcopy AE issues an N-ACTION Request to instruct the Print SCP to print the contents of the Film Box.

Table 49 summarizes the behavior of Hardcopy AE when encountering status codes in an N-ACTION response.

Table 49
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.
Warning	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	B603H	The Association is aborted and the job is failed.
Failure	Unable to create Print Job SOP Instance; print queue is full.	C602	Same as B603H above.
*	*	Any other status code.	Same as B603H above.

4.2.3.3.1.7 SOP Specific Conformance for the Image Box SOP Class

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

— N-SET

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

4.2.3.3.1.7.1 Image Box SOP Class Operations (N-SET)

Table 50 lists the attributes supplied in an N-SET Request.

Table 50
IMAGE BOX SOP CLASS N-SET REQUEST ATTRIBUTES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	(2020,0010)	US	1	ALWAYS	AUTO
Polarity	(2020,0020)	CS	NORMAL	ALWAYS	AUTO
Basic Grayscale Image Sequence	(2020,0110)	SQ	Used for BW (Monochrome2) print	ALWAYS*	AUTO
Basic Color Image Sequence	(2020,0111)	SQ	Used for Color (RGB) print	ALWAYS*	AUTO
>Samples Per Pixel	(0028,0002)	US	1 for Monochrome2 3 for RGB	ALWAYS	AUTO
>Photometric Interpretation	(0028,0004)	CS	MONOCHROME2 RGB	ALWAYS	AUTO
>Planar Configuration	(0028,0006)	US	“01” for Color-by-plane “00” for Color-by-Pixel, Used only for RGB print.	ANAP	USER
>Rows	(0028,0010)	US	Depends on film size	ALWAYS	See Printer Catalog
>Columns	(0028,0011)	US	Depends on film size	ALWAYS	See Printer Catalog
>Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
>Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
>High Bit	(0028,0102)	US	7	ALWAYS	AUTO
>Pixel Representation	(0028,0103)	US	0	ALWAYS	AUTO
>Pixel Data	(7FE0,0010)	OW	Pixels of rendered film sheet.	ALWAYS	AUTO

* Mutually exclusive attributes

Table 51 summarizes the behavior of Hardcopy AE when encountering status codes in an N-SET response.

Table 51
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.
Failure	Insufficient memory in printer to store the image.	C605	The Association is aborted and the job is failed.
*	*	Any other status code.	Same as C605 above.

4.2.3.4 Association Acceptance Policy

The Hardcopy Application Entity does not accept Associations.

4.2.4 Verification Application Entity specification

4.2.4.1 SOP Class

CX50 2.0.x provides Standard Conformance to the following SOP Class:

Table 51.1
SOP CLASSES FOR AE VERIFICATION

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	Yes

4.2.4.2 Association Establishment Policy

4.2.4.2.1 General

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

Table 51.2
DICOM APPLICATION CONTEXT FOR AE VERIFICATION

Application Context Name	1.2.840.10008.3.1.1.1

4.2.4.2.2 Number of Associations

CX50 2.0.x initiates one Association at a time for a Verification request.

Table 51.3
NUMBER OF ASSOCIATIONS INITIATED FOR AE VERIFICATION

Maximum number of simultaneous Associations	Up to 10, one for each configured remote device

Table 51.4
NUMBER OF ASSOCIATIONS ACCEPTED FOR AE VERIFICATION

Maximum number of simultaneous Associations	Unlimited - calling AE must be already configured in CX50 2.0.x.

4.2.4.2.3 Asynchronous Nature

CX50 2.0.x does not support asynchronous communication (multiple outstanding transactions over a single Association).

Table 51.5
ASYNCHRONOUS NATURE AS A SCU FOR AE VERIFICATION

Maximum number of outstanding asynchronous transactions	1

4.2.4.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 51.6
DICOM IMPLEMENTATION CLASS AND VERSION FOR AE VERIFICATION

Implementation Class UID	1.3.46.670589.14.1000.200
Implementation Version Name	CX50_200

4.2.4.3 Association Initiation Policy

4.2.4.3.1 Activity – Verify as SCU and SCP

4.2.4.3.2 Description and Sequencing of Activities

SCU: The user can verify the existence of a DICOM server on the hospitals network, through a button in the 'DICOM Setup' screen. When the user presses this button, CX50 2.0.x will initiate the association.

Only one association is established for each verification attempt. However, the proposed presentation contexts not only includes the 'Verification SOP class' but also includes all the SOP classes that CX50 2.0.x could possibly be connected to as Servers. This is done in order to retrieve the capabilities of the remote Server.

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Verification	1.2.840.10008.1.1	Explicit VR Little Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU /SCP	None
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian* Explicit VR Little Endian JPEG Lossy Baseline RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.5	SCU	None
US Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian Explicit VR Little Endian JPEG Lossy Baseline RLE Lossless	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.5	SCU	None
Comprehensive Structured Report Storage	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1	SCU	None
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Explicit VR Little Endian* Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Explicit VR Little Endian* Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Explicit VR Little Endian* Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	Explicit VR Little Endian* Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

CX50 2.0.x initiates an Association in order to issue:

— C-ECHO request according to the Verification SOP Class.

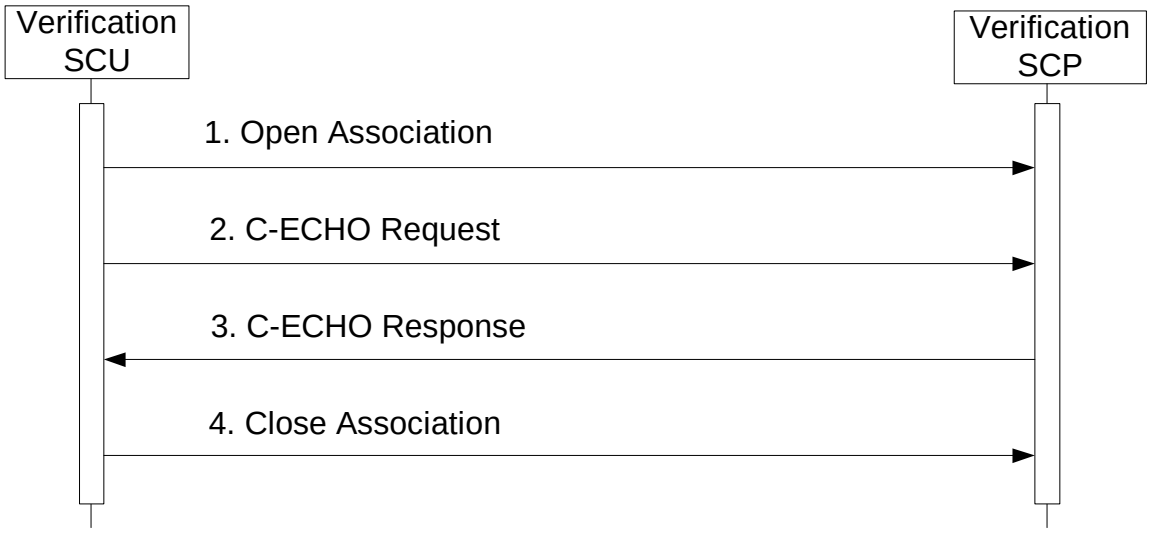


Figure 8a
SEQUENCING OF ACTIVITY – ISSUE VERIFY

SCP: The system listens on the port configured on the “This System” Configuration screen for Verification requests initiated by other remote devices. The calling device AE must already be configured as a remote device in CX50 2.0.x or the association is rejected.

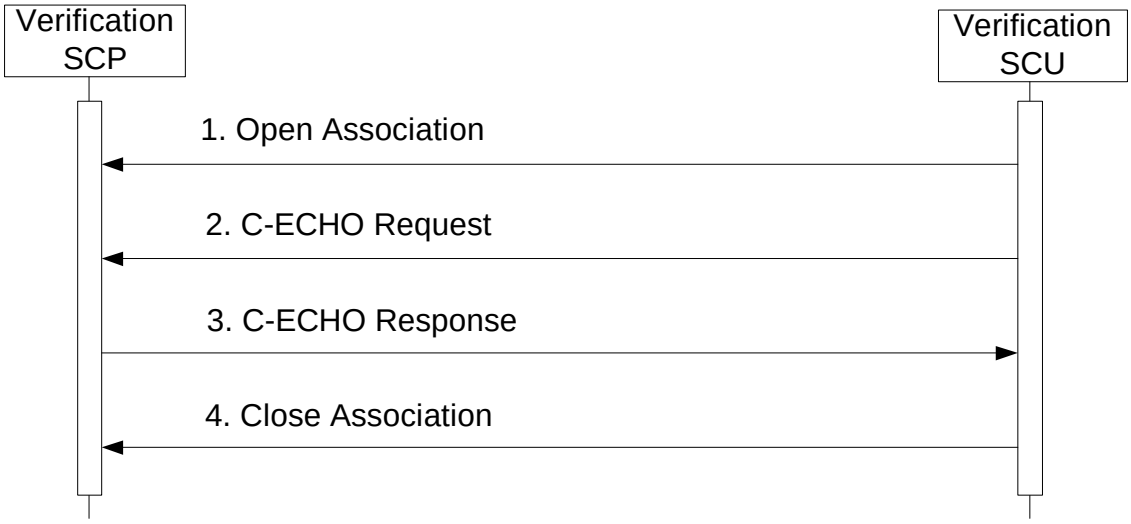


Figure 8b
SEQUENCING OF ACTIVITY – RECEIVE VERIFY

4.2.4.3.3 Proposed Presentation Contexts

CX50 2.0.x will propose Presentation Contexts as shown in the following table:

Table 51.7
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY VERIFICATION

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

4.2.4.3.4 SOP Specific Conformance for Verification

Table 51.8 summarizes the behavior of CX50 2.0.x when receiving status codes in a C-ECHO response.

A message will appear on the user interface if CX50 2.0.x receives any other SCP response status than “Success.”

Table 51.8
VERIFICATION C-ECHO RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success		0000	Device Status is set to: Verified
Refused	Out of Resources	A700	Device Status is set to: Not Verified
Failed	Unable to Process	C000 – CFFF	Same as “Refused” above.
*	*	Any other status code.	Same as “Refused” above.

4.2.4.3.4.1 Verification SOP Class Operations (C-ECHO)

4.2.4.3.5 Association Acceptance Policy

4.2.4.3.5.1 Verification SOP Class Notifications

Association Negotiation Request message contents for each DICOM device:

Device Type	SOP Classes Requested	Additional Notes
Primary or Secondary Storage SCP	US Image Storage US Multiframe Storage Verification	
Storage Commit SCP	Storage Commitment Verification	
SR Storage SCP	Comprehensive Structured Report Storage Verification	
SR Storage Commit SCP	Storage Commitment	

	Verification	
B&W Printer SCP	Basic Grayscale META Print Verification	Color images may be sent to a bw printer if it supports converting to BW.
Color Printer SCP	Basic Color META Print Verification	May be the same printer if color is also supported.
MWL SCP	Modality Worklist Verification	MWL query settings are located in Setups > System > DICOM > DICOM Preset > Change Settings for current preset > Modify in Roles > MWL SCP – Advanced > Set Modality Worklist Query page.
PPS SCP	Modality Performed Procedure Step Verification	

4.3 PHYSICAL NETWORK INTERFACES

4.3.1 Supported Communication Stacks

4.3.1.1 TCP/IP Stack

CX50 2.0.x provides DICOM TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.3.2 Physical Network Interface

CX50 2.0.x supports one network interface at a time. The following physical network interfaces are available:

Table 52
SUPPORTED PHYSICAL NETWORK INTERFACE

1) Ethernet 10/100/1000BaseT, RJ-45, UTP, STP; AutoDetect Speed, Full or Half Duplex
2) 802.11 b/g Wireless

4.4 CONFIGURATION

AE Title/Presentation Address Mapping

The DICOM setup screen allows the user to configure a significant number of options including (but not limited to):

- For the CX50 2.0.x system, it's AE Title, IP Address and Port number, Wired or wireless connection.
- For DICOM servers, their AE Title, Port number, IP address.
- For Storage SCP's and for media storage, the image format.

  Advanced settings (including Photometric Interpretation settings: MONOCHROME2, RGB, Palette color and YBR_FULL_422 and Transfer Syntaxes: Implicit Little Endian, Explicit Little Endian, RLE and JPEG for images), loop timing, pixel spacing, and display compensation.
- For DICOM Printers, many DICOM configuration settings
- For a MWL server, the query parameters: scheduled procedure start range, modality, AE Title.

CX50 2.0.x also supports QLAB where the user can perform QLAB quantification on the CX50 2.0.x system of images acquired by the system.

The Devices Configuration section allows the following device types to be configured:

Device Type	**Supported SOPs**
Primary or Secondary Storage SCP	Ultrasound Store Ultrasound Multiframe Store
Storage Commit SCP	Storage Commitment Push Model
SR Storage SCP	Comprehensive Structured Report Store
SR Storage Commit SCP	Storage Commitment Push Model
B&W Printer SCP	Basic Grayscale Print Meta
Color Printer SCP	Basic Color Print Meta
MWL SCP	Modality Worklist
PPS SCP	Modality Performed Procedure Step

To configure a single server that supports image store, commitment and PPS, then a "Server" entry must be configured under "Setups>DICOM…>Change Settings for DICOM Preset>Servers and Roles>Servers". Enter a Name (an 'alias' used in the system UI only), the appropriate AE Title, IP Address, Port number and timeout values. "Ping" sends an ICMP ping message to the address and a DICOM Verification Association message is sent to the Port and AE Title. A success message is displayed if all is configured correctly at this level. If

not, an error message dialog is displayed indicating possible reasons and suggested corrective actions. Hit "Done" to continue to Role definition.

Once the server data is defined, then its role and options are configured. For each role, as in Primary Storage SCP, MPPS SCP, etc, select the server's alias name from the list. If "Advanced" options are available, select the "Advanced" button to access them,

When Role configuration is completed and "Done" is selected under "Roles", then another set of Verification messages are sent to each server confirming network connectivity and DICOM role support. A dialog box updates as the tasks are in progress. No error messages indicates successful configuration.

4.4.1.1 Local AE Title

All local AEs use the same AE Title and TCP/IP Port configured via the Setups>DICOM…>Change Settings for DICOM Setup>This System screen. The system listens on the configured Port only for Verification requests and Storage Commitment N-Event reports. The system supports Static Addressing or DHCP to receive its IP Address, Subnet Mask and Default Gateway address.

4.4.1.2 Remote AE Title/Presentation Address Mapping

The AE Titles, IP Addresses and Port numbers of remote applications are manually configured using the Setups>DICOM…>Change Settings for DICOM Preset>Servers and Roles>. The remote system's IP Address may be entered manually if known or the Host Name of the remote device may be entered and resolved by the DNS if the network includes this service.

4.4.1.2.2 Workflow

Setup is used to set the AE Title, Port number and IP Address the remote MWL SCP. Multiple MWL SCPs may be defined, but only a single remote MWL SCP can be selected at a time.

The default MWL query uses Modality = "US". This may be changed in the "Set Modality Worklist Query Customizable Queries" definition page. Alternately, "ANY" modality may be selected.

"AE Title" may be selected as the system's or a custom query value may be defined for a different AE Title or for "ANY".

The Start Date defaults to "Today" but may be modified to be "All Dates", or a Date Range that may be 0 - 99 days (or hours) Prior plus the next 0 -99 days.

The automated polling interval range for sending MWL queries is between 1 and 32,767 minutes, defaulting to 10 minutes.

Setup is used to set the AE Title, Port number and IP Address of the remote MPPS SCP. Multiple MPPS SCPs may be defined, but only a single remote MPPS SCP can be selected at a time.

4.4.1.2.3 Hardcopy

Setup is used to set the AE Titles, Port numbers and IP Addresses for the remote Print SCPs.

Multiple remote Print SCPs can be defined, but up to one Grayscale and one Color Print SCP may be selected at a time.

Automatic sending of color images to the color printer and BW images to the BW printer is selectable in the Setups>DICOM…>Change Settings for DICOM Preset>Servers and Roles>BW or Color Printer SCP Advanced settings.

5 MEDIA STORAGE

5.1 IMPLEMENTATION MODEL

5.1.1 Application Data Flow

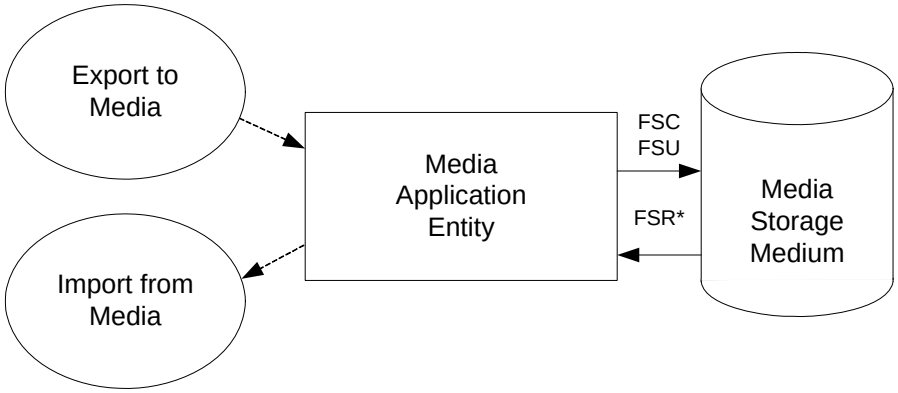


Figure 9
APPLICATION DATA FLOW DIAGRAM FOR MEDIA STORAGE

— The Media Application Entity exports Images and Structured Reports to a removable storage medium. It is associated with the local real-world activity “Export” using the configured export selection parameters for selected patients’ data (images and / or Structured Reports). For “Import”, the system will not read in Structured Reports.

— Throughout this section, the term “Media” refers to any of the media listed below which is in use.

CX50 2.0.x will support the use of most writable media including CD-R, CD-RW, DVD-R, DVD+R, DVD-RW, DVD+RW, and USB devices.. The DICOM structure will be the same regardless of media used.

5.1.2 Functional Definition of AEs

5.1.2.1 Functional Definition of Media Application Entity

Using ”Export” will pass the currently selected patients’ exams or individually selected images to the Media Application Entity. The contents of each export job will be written to the selected media destination. The size of the selected media is used to determine and display the number of media required for the export. When a device is filled to capacity, the system will prompt the user for addition media and continue.

5.1.3 Sequencing of Real-World Activities

At least one image must exist and be selected before the Media Application Entity can be invoked. The operator can insert new media at any time. The Media Application Entity will wait indefinitely for media to be inserted before starting to write to the device.

5.1.4 File Meta Information Options

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

Table 65
DICOM IMPLEMENTATION CLASS AND VERSION FOR MEDIA STORAGE

Implementation Class UID	1.3.46.670589.14.1000.200
Implementation Version Name	CX50_200

5.2 AE SPECIFICATIONS

5.2.1 Media Application Entity Specification

The Media Application Entity provides standard conformance to the DICOM Interchange Option of the Media Storage Service Class. The Application Profiles and roles are listed in

Table 66
APPLICATION PROFILES, ACTIVITIES AND ROLES FOR OFFLINE-MEDIA

Application Profiles Supported	Real World Activity	Role	SC Option
STD-US-SC-MF-CDR STD-GEN-CD*	Send to….Media	FSC	Interchange
STD-US-SC-MF-DVD STD-GEN-DVD STD-GEN-USB-JPEG		FSC, U**	
STD-US-SC-MF-CDR STD-US-SC-MF-DVD STD-GEN-USB-JPEG	Send to … Hard Disk	R***	

* Note that Ultrasound-specific Application Profiles do not include Structured Report SOP Class, necessitating addition of the STD-GEN CDR and DVD Application Profiles.
** Update functionality requires DVD+RW, or USB
*** File Set Reader functionality may be limited only to media created by other CX50 2.0.x systems.

For previously imported studies, CX50 2.0.x will export the IODs using the transfer syntax and tags that were used when CX50 2.0.x originally imported the study.

Transfer Syntax and Photometric Interpretation options for removable media

Transfer Syntax	Photometric Interpretation
Uncompressed (DICOM Explicit VR Little Endian)	Palette Color
Uncompressed (DICOM Explicit VR Little Endian)	RGB
Uncompressed (DICOM Explicit VR Little Endian)	MONOCHROME2
RLE (Lossless) Compression	Palette Color
RLE (Lossless) Compression	RGB
RLE (Lossless) Compression	MONOCHROME2
JPEG (Lossy) Compression	YBR_FULL_422

Reading a DICOM study from removable media

When requested to read the media directory, the CX50 2.0.x Application Entity acts as FSR using the Interchange Option.

The user choosing the Import operation from a menu initiates importing images. See the system user manuals for a description of the specific user interface capabilities. CX50 2.0.x doesn't support FSR role for DICOM SR.

5.2.1.1 File Meta Information for the Application Entity

The File-Set Identifier included in the File Meta Header is "".

5.2.1.2 Real-World Activities

5.2.1.2.1 Activity – Send to Media – "Export"

The Media Application Entity acts as an FSC using the interchange option when requested to export SOP Instances from the local database to media.

The contents of the export job will be written together with a corresponding DICOMDIR to media. The user can cancel an export job in the job queue.

5.2.1.2.2 Activity – Import from Media – "Import"

The Media Application Entity acts as an FSR using the interchange option when requested to import SOP Instances from media to the local database.

The Import Studies icon presents the directory of the system or the offline media. Selected exams are transferred from the media to the system for review. Objects transferred to the system retain their original SOP Instance UIDs.

Note: Structured Reports may not be read back into CX50 2.0.x.

5.2.1.2.3 Activity – Update to Media – Export"

The Media Application Entity acts as an FSU using the interchange option when requested to export SOP Instances from the local database to media upon which DICOM data already resides.

The system user selects exams from the system's directory for transfer to media that already contains data. The DICOMDIR is updated allowing access to original and new data.

5.2.1.2.3.1 Media Storage Application Profiles

See Table 66 for supported Application Profiles.

5.2.1.2.3.2 Options

The Media Application Entity supports the SOP Classes and Transfer Syntaxes listed in Table 67.

Table 67
IODS, SOP CLASSES AND TRANSFER SYNTAXES FOR OFFLINEMEDIA

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
Media Storage Directory Storage	1.2.840.10008.1.3.10	Explicit VR Little Endian	1.2.840.10008.1.2.1
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian JPEG Lossy Baseline RLE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.5
US Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian JPEG Lossy Baseline RLE	1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.5
Comprehensive Structured Report Storage*	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian	1.2.840.10008.1.2.1

* Export only.

Directory Information Module

All data elements are used as described in DICOM 3.0 Part 3 for Basic Directory Object Definitions. As stated in the Ultrasound Application Profile, "The (DICOMDIR) Directory shall include Directory Records of PATIENT, STUDY, SERIES, IMAGE and SR DOCUMENT corresponding to the information object files in the File-set". These are present when writing media. Given this requirement, CX50 2.0.x uses these directory records to identify the study to import with the exception of SR DOCUMENT. If there are DICOM image files on the import media that do not appear in the DICOMDIR Directory Information Module (either because references to these files were omitted or because the Directory Information Module, optional in DICOM but required in the Ultrasound Application Profile, does not exist), these files are not recognized by the system.

CX50 2.0.x ignores directory Record Types other than those above.

CX50 2.0.x also ignores the "File-set consistency Flag" (0004, 1212).

Patient Directory Record

Attribute Name	Tag	Type	Usage
Specific Character Set	0008,0005	1C	The default DICOM character set and optional set ISO-IR 100 (Latin 1) are supported. See Section 6 for details.
Patient Name	0010,0010	2	Displayed to help the user identify the patient folder in which to place the studies for this patient.
Patient ID	0010,0020	1	Displayed to help the user identify the patient folder in which to place the studies for this patient.

Study Directory Record

Attribute Name	Tag	Type	Usage
Specific Character Set	0008,0005	1C	The Default DICOM character set and optional set ISO-IR 100 (Latin 1) are supported. See Section 6 for details.
Study Date	0008,0020	1	Used in displaying list of studies to user
Study Time	0008,0030	1	Used in displaying list of studies to user
Accession Number	0008,0050	2	Stored in the system database
Study Description	0008,1030	2	Generated
Study Instance UID	0020,000D	1C	Stored in the system database
Study ID	0020,0010	1	Stored in the system database

Series Directory Record

Attribute Name	Tag	Type	Usage
Specific Character Set	0008,0005	1C	The default DICOM character set and optional set ISO-IR 100 (Latin 1) are supported. See Section 6 for details.
Modality	0008,0060	1	Only US is supported. Other modalities are ignored.
Series Instance UID	0020,000E	1	Stored
Series Description	0008,103E	3	Stored
Series Number	0020,0011	1	Stored

Image Directory Record

Attribute Name	Tag	Type	Usage
Specific Character Set	0008,0005	1C	The default DICOM character set and optional set ISO-IR 100 (Latin 1) are supported. See Section 6 for details.
Instance Number	0020,0013	1	Used
Referenced File ID	0004,1500	1C	Used
Referenced SOP Class UID in File	0004,1510	1C	Used
Referenced SOP UID in File	0004,1511	1C	Used
Referenced Transfer Syntax UID in File	0004,1512	1C	Used
Content Date	0008,0023	3	Used for ordering the thumbnail display. On Export, comes from the image.
Content Time	0008,0033	3	Used for ordering the thumbnail display. On Export, comes from the image.

SR Document Directory Record

Attribute Name	Tag	Type	Usage
Specific Character Set	0008,0005	1C	The default DICOM character set and optional set ISO-IR 100 (Latin 1) are supported. See Section 6 for details.
Instance Number	0020,0013	1	Used
Referenced File ID	0004,1500	1C	Used
Referenced SOP Class UID in File	0004,1510	1C	Used
Referenced SOP UID in File	0004,1511	1C	Used
Referenced Transfer Syntax UID in File	0004,1512	1C	Used
Content Date	0008,0023	3	Used for ordering the thumbnail display. On Export, comes from the image.
Content Time	0008,0033	3	Used for ordering the thumbnail display. On Export, comes from the image.
Concept Name Code Sequence	(0040,A043)	1	Code describing the concept represented by the root Content Item (Document Title).
>Code Value	0008,0100		Used to identify SR Template value
>Coding Scheme Designator	0008,0102		DCM
>Code Meaning	0008,0104		Name of the SR template
Completion Flag	0040,A491		“PARTIAL”
Verificaiton Flag	0040,A493		“UNVERIFIED”

6 SUPPORT OF CHARACTER SETS

All CX50 2.0.x DICOM applications support the

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

CX50 2.0.x will offer support for Chinese and Russian. This includes translating system text into these languages and allowing the user to input Chinese and Cyrillic characters into the system. One important aspect of this is that the user will be able to enter these special characters into the Patient ID screen.

The present DICOM standard allows Code Extension Techniques for multi-byte characters. Therefore, as well as the default character set (ISO-IR 6), CX50 2.0.x supports the following extended character sets:

ISO-IR 100	Latin Alphabet No. 1
ISO-IR 144	Russian Cyrillic

Important Note:

When an Application Entity which, does not support Code Extension Techniques, receives a Data Set, which includes multi-byte characters from a CX50 2.0.x system, misrepresentation of characters may occur.

The DICOM standard states that it is the responsibility of the Application Entity, which receives the Data Sets to take whatever action is considered necessary to minimize the effect of misrepresented characters. It is not the responsibility of the CX50 2.0.x system to take such action.

6.1 SUPPORT FOR RUSSIAN MARKETS

CX50 2.0.x uses "Code-extension techniques" to encode Russian Cyrillic characters in DICOM tags with value representations of SH, LO, ST, LT, UT, and PN.

The technique requires two things in a DICOM file that contains these characters:

1. Add the Optional Specific Character Set tag (0008,0005) and set the value to the list of identifiers for all the non-standard character sets that will appear in any string in the file separated by backslashes. For example:

   For Russian systems:
   (0008,0005) = "ISO 2022 IR 144\ISO 2022 IR 100"

   For English systems:
   (0008,0005) = "ISO 2022 IR 100"

2. Embed escape sequences in the strings that contain Cyrillic characters to cause the DICOM interpreting code to switch from one character set to another.

The escape sequences to be used are defined as:

"<ESC>(B" ISO - IR 6 ASCII - DICOM default character set

"<ESC>(J" ISO - IR 144 Russian Cyrillic

6.2 SUPPORT FOR CHINESE MARKETS

The current DICOM standard as of this release of CX50 2.0.x does not support Chinese character sets. CX50 2.0.x however provides support for Chinese customers so that they can enter text using Chinese characters.

If the system is set up for Chinese, then the user can enter just one version of the patient name. This would make Chinese systems work in the same way as Russian, English, French, Italian, and Spanish systems. The Chinese user will be able to enter the patient name using a combination of Chinese and Roman characters – all of the characters will appear wherever the system displays the patient name (image, report, Search for Study window, etc.).

Since the DICOM Standard does not offer support for Chinese characters, all Chinese characters entered into the Patient ID screen will be lost if a user exports or backs up a study to media. This will be noticed when the study is imported back into the system; upon import, each Chinese character will be replaced with a question mark (“?”) character. The question marks will make it obvious to the user that the characters were lost.

If the user enters a patient name that consists entirely of Chinese characters, then the name will come back as “??????”. In this case, the user will have to identify the study in the “Import Study” and “Search for Study” windows by the MRN. If the user enters a patient name that consists of a combination of Roman and Chinese characters, then Roman characters will be preserved, and the name will come back as something like “Lee ????????”. This will give users who like to back up their studies the flexibility of entering a patient name with a combination of Roman and Chinese characters, and have at least part of the name come back during import.

Note that the original Chinese name will be “burned into” study images that are exported to media. These Chinese characters will remain on the images when the studies are imported back into the system.

7 SECURITY

DICOM security is not implemented on CX50 2.0.x at this time.

CX50 2.0.x incorporates an internal firewall that only accepts incoming traffic on the designated listening port, as configured in the “This System” tab of the DICOM setups screen. Changes to this port value require a power cycle to become effective.

8 ANNEXES

8.1 CREATED IOD INSTANCES

Table 69 specifies the attributes of an Ultrasound Image transmitted by the CX50 2.0.x storage application.

Table 70 specifies the attributes of a Comprehensive Structured Reports transmitted by the CX50 2.0.x storage application. Please note that there are differences between which Structured Report Templates are used in each product.

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

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

The abbreviations used in the “Source” column:

MWL	the attribute value source Modality Worklist
	Unless otherwise noted, values returned from worklist may be overridden by User input.
USER	the attribute value source is from User input
AUTO	the attribute value is generated automatically
MPPS	the attribute value is the same as the Modality Performed Procedure Step service
CONFIG	the attribute value source is a configurable parameter

8.1.1 US or US Multiframe Image IOD

Table 69
IOD OF CREATED US OR US MULTIFRAME SOP INSTANCES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 71	ALWAYS
Study	General Study	Table 72	ALWAYS
	Patient Study	Table 73	ALWAYS
Series	General Series	Table 74	ALWAYS
Equipment	General Equipment	Table 75	ALWAYS
Image	General Image	Table 76	ALWAYS
	Image Pixel	Table 77	ALWAYS
	Palette Color Lookup Table	Table 77-a	ANAP

	Cine	Table 78	Only if Multi-frame
	Multi-frame	Table 79	Only if Multi-frame
	US Region Calibration	Table 80	ANAP
	US Image	Table 81	ALWAYS
	VOI LUT	Table 82	ANAP
	SOP Common	Table 83	ALWAYS

Comprehensive Structured Report IOD

Table 70
IOD OF CREATED COMPREHENSIVE STRUCTURED REPORT SOP INSTANCES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 71	ALWAYS
Study	General Study	Table 72	ALWAYS
	Patient Study	Table 73	ALWAYS
Series	SR Document Series	Table 84	ALWAYS
Equipment	General Equipment	Table 75	ALWAYS
Document	SR Document General	Table 85	ALWAYS
	SR Document Content	Table 86	ALWAYS
	SOP Common	Table 87	ALWAYS

8.1.3 Common Modules

Table 71
PATIENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	(0010,0010)	PN	Same attribute of MWL or PDE input	ALWAYS	MWL/ USER/ AUTO
Patient ID	(0010,0020)	LO	From MWL, user input or system generated.	ALWAYS	MWL/ USER/ AUTO
Patient's Birth Date	(0010,0030)	DA	Same attribute of MWL or PDE input	VNAP	MWL/ USER

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Sex	(0010,0040)	CS	Same attribute of MWL or PDE input User Input may be: M = male F = female O = other If "Unknown", an empty string is sent.	VNAP	MWL/ USER
Other Patient IDs	(0010,1000)	LO	Same attribute of MWL or PDE input to Alternate ID number.	ANAP	MWL/ USER

Table 72
GENERAL STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Instance UID	(0020,000D)	UI	Same value as in MWL or auto generated If non-Worklist, format is: 1.3.46.670589.14.1.1.0.4.<serno>.<date time>.<n> <serno> is system serial number <datetime> is date time when the uid was requested in yyyymmddhhmmss format <n> is the nth image generated at the <datetime>th second	ALWAYS	MWL/ AUTO
Study Date	(0008,0020)	DA	Study's Start Date (0040,0244).	ALWAYS	AUTO
Study Time	(0008,0030)	TM	Study's Start Time (0040,0245).	ALWAYS	AUTO
Referring Physician's Name	(0008,0090)	PN	User Input from Patient ID screen. From MWL, only Last, First and Middle names sent as "Last, First, Middle" in the Last name field.	VNAP	MWL/ USER
Study ID	(0020,0010)	SH	Auto-generated starting at 1	ALWAYS	AUTO
Accession Number	(0008,0050)	SH	Same attribute of MWL or user PDE input.	VNAP	MWL/ USER

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Description	(0008,1030)	LO	'Study Description' in PDE or, Configurable by the user through setup. Can either be a fixed list or (for users with a MWL server), can be obtained from the MWL Server. The string used will be the first non-empty string from the following list: Requested Procedure description tag (0032,1060), Scheduled Procedure Step description tag (0040,0007) Scheduled Procedure Step, "Code Meaning" tag (0008,0104) Reason for the requested procedure tag (0040,1002) Reason for imaging service request tag (0040,2001)	ANAP	MWL/ USER

Table 73
PATIENT STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient Size	(0010,1020)	DS	Same value as MWL attribute or PDE input.	VNAP	MWL/ USER
Patient's Weight	(0010,1030)	DS	Same value as MWL attribute or PDE input.	VNAP	MWL/ USER
Additional Patient's History	(0010,21B0)	LT	Only from User Input	VNAP	USER

Table 74
GENERAL SERIES MODULE OF CREATED IMAGE SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	"US"	ALWAYS	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Instance UID	(0020,000E)	UI	A system generated Unique Identifier of the form: 1.3.46.670589.14.1.1.0.3.<serno>.<datetime>.<n> <serno> is system serial number <datetime> is date time when the uid was requested in yyyymmddhhmmss format <n> is the nth image generated at the <datetime>th second Note: If a study is reopened, a new SeriesInstUID would be generated and all newly acquired images would be part of the new series. Also the MPPS messages (if applicable) that would be sent when the study is restarted would contain the newly generated SeriesInstUID.	ALWAYS	AUTO
Series Number	(0020,0011)	IS	Always 1 for images	ALWAYS	AUTO
Performing Physician's Name	(0008,1050)	PN	PDE input, 'Performed by'.	ANAP	USER
Protocol Name	(0018,1030)	LO	"Free Form" "Exercise 2 Stage" "Exercise 3 Stage" "Pharmacological 4 Stage" user defined	ALWAYS	AUTO
Series Description	(0008,103E)	LO	User entry in the 'Study Description' field of the Patient ID screen. If the user does not enter a value, this tag is not sent.	ANAP	MWL/ USER
Operator's Name	(0008,1070)	PN	User entry in the 'Performed by' field of the Patient ID screen. If the user does not enter a value, this tag is not sent.	ANAP	USER
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ	Identifies the MPPS SOP Instance this image is related to * Will be present when an MPPS Server is configured.	ANAP*	AUTO
>Referenced SOP Class UID	(0008,1150)	UI	PPS SOP Class = "1.2.840.10008.3.1.2.3.3" * Will be present when an MPPS Server is configured.	ANAP*	AUTO
>Referenced SOP Instance UID	(0008,1155)	UI	PPS Instance UID of the PPS generating this image * Will be present when an MPPS Server is configured.	ANAP*	AUTO
Request Attributes Sequence	(0040,0275)	SQ	This sequence will be present only for scheduled study. In case of unscheduled study, this sequence will not be present. This sequence will not be present if attributes 'Requested Procedure ID' and/or 'Scheduled Procedure Step ID' is/are missing.	ANAP	AUTO / MWL

Attribute Name	Tag	VR	Value	Presence of Value	Source
>Requested Procedure ID	(0040,1001)	SH	Auto-generated=Study ID or value from MWL. One item.	ANAP	AUTO / MWL
>Requested Procedure Description	0032,1060	LO	Set with the value entered or selected in “Study Description” field of Patient ID screen. If the study is started from MWL, the “Study Description” field of Patient ID screen is populated from ‘Requested Procedure Description” attribute of MWL. (1st choice, configurable)	ANAP	USER/ MWL
>Scheduled Procedure Step ID	(0040,0009)	SH	Auto-generated=Study ID or value from MWL. One item.	ALWAYS	AUTO / MWL
>Scheduled Procedure Step Description	(0040,0007)	LO	Same value as MWL attribute.	VNAP	MWL
>Scheduled Protocol Code Sequence	(0040,0008)	SQ	Same value as MWL attribute.	VNAP	MWL
Performed Procedure Step ID	(0040,0253)	SH	Set as current date and time in the format yyyymmdd.hhmmss.	ALWAYS	AUTO
Performed Procedure Step Start Date	(0040,0244)	DA	Date on which the Performed Procedure Step started on close of Patient Data Entry Screen	ALWAYS	AUTO
Performed Procedure Step Start Time	(0040,0245)	TM	Time on which the Performed Procedure Step started on close of Patient Data Entry Screen	ALWAYS	AUTO
Performed Procedure Step Description	(0040,0254)	LO	Set with the value entered or selected in ‘Study Description’ field of Patient ID screen. If the study is started from MWL, the “Study Description” field of Patient ID screen is populated from ‘Requested Procedure Description” attribute of MWL. (1st choice, configurable).	VNAP	USER / MWL
Performed Protocol Code Sequence	(0040,0260)	SQ	Zero length, or mapped from MWL Scheduled Protocol Code Sq (0040,0008)	VNAP	MWL

Table 75
GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	(0008,0070)	LO	Philips Medical Systems	ALWAYS	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Institution Name	(0008,0080)	LO	Entered by the user from the 'System' tab in the 'Setup' screen ('Top Border' button).Note: If the user imports an EnVisor or CX50 2.0.x study that was generated at another institution and opens the study the institution name displayed along the top border of the system screen is the institution viewing the images not the institution where the image was acquired. The institution name where the image was acquired can however be burned into the image. Also, if the user exports the study to removable media or to a networked PACS and changes the format of the image data in some way either by exporting it in a different image format from the internal format (Palette Color, RLE) or by applying a display compensation curve, then the institution name is changed to the current institution. 'Philips Healthcare' default.	VNAP	CONFIG
Station Name	(0008,1010)	SH	The AE Title of CX50 2.0.x system on which the image is acquired. The user can configure the AE Title of the system through 'Setup'. Note: The value of this tag is unchanged on export to a networked PACS or media, even in a different image format.	VNAP	CONFIG
Software Version(s)	(0018,1020)	LO	This is a multi-valued tag which contains the following components: Model Name Then the part number and version of PRINTERS Ultrasound Application COTS Operating System. The values listed match those displayed on-screen via "Setups > Options > Software Version"	ALWAYS	AUTO
Manufacturer's Model Name	(0008,1090)	LO	CX50	ALWAYS	AUTO

8.1.4 US or Multiframe Image Modules

Table 76
GENERAL IMAGE MODULE OF CREATED US SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS	Generated by device, increments from “1” in each series. Gaps in values may exist if images are deleted on the system prior to export.	ALWAYS	AUTO
Patient Orientation	(0020,0020)	CS	The system sends the empty tag for 2D/3D and is not used for PanView images.	VNAP	AUTO
Content Date	(0008,0023)	DA	<yyyymmdd>	ALWAYS	AUTO
Content Time	(0008,0033)	TM	<hhmmss>	ALWAYS	AUTO
Image Type	(0008,0008)	CS	The system computes this value as the four component multi-value attribute: “<Pixel Data Characteristics> / <Patient Examination Characteristics> / <Modality Specific Characteristics> / <Implementation Specific Identifiers>” <Pixel Data Characteristics> Palette Color & RGB: “ORIGINAL” denotes original source-data YBR: “DERIVED” denotes pixels that have been derived from the original – in this case by lossy compression. MONOCHROME2: “DERIVED” denotes pixels that have been derived from the original – in this case by grayscale transformations. <Patient Examination Characteristics> Always “PRIMARY” <Modality Specific Characteristics> This is based on the user-selected entry in the drop down list ‘Additional Data Type’ on the Patient Id screen. It is mapped to the most appropriate value from the DICOM standard (Ex: “ABDOMINAL”). <Implementation Specific Identifiers>” Always blank.	ALWAYS	CONFIG
Acquisition Date	(0008,0022)	DT	The system uses the same value as the Content Date, tag 0008,0023.	ALWAYS	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Acquisition Time	(0008,0032)	TM	The system uses the same value as the Content time, tag 0008,0033.	ALWAYS	AUTO
Acquisition Datetime	(0008,002A)	DT	The system generates this as a combination of Acquisition Date and Acquisition Time. The format is yyyymmddhhmmss.ffffff	ALWAYS	AUTO
Lossy Image Compression	(0028,2110)	CS	"01" if image is lossy compressed, "00" if not.	ALWAYS	AUTO
Image Comments	(0020,4000)	LT	Not used with images. For reports, contains: "Report Version x Page x of x"	ANAP	AUTO
Presentation LUT Shape	(2050,0020)	CS	"IDENTITY". Only if "Image Export Format" is GSDF.	ANAP	AUTO

Table 77
IMAGE PIXEL MODULE OF CREATED US OR US MULTIFRAME SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	(0028,0002)	US	1 for MONOCHROME2 1 for PALETTE COLOR 3 for RGB 3 for YBR_FULL_422	ALWAYS	CONFIG
Photometric Interpretation	(0028,0004)	CS	MONOCHROME2 PALETTE COLOR RGB YBR_FULL_422	ALWAYS	CONFIG
Rows	(0028,0010)	US	2D B/W & Color stills/loops, acquired with top & right border: 600 2D B/W & Color quad-sized loops from stress: 300 Reports: 600 QLAB from IMT plug-in: 600 QLAB (all others): 600	ALWAYS	CONFIG
Columns	(0028,0011)	US	2D B/W & Color stills/loops, acquired with top & right border: 800 2D B/W & Color quad-sized loops from stress: 336 Reports: 800 QLAB from IMT plug-in: 936 QLAB: 800	ALWAYS	CONFIG
Bits Allocated	(0028,0100)	US	Based on the 'Image Format' that is set by the user in DICOM Setup. Palette Color Mode:	ALWAYS	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
			2D B&W: 8 bits 2D Color, Reports & QLAB: 16 bits RGB Mode: 2D B&W,: 8 bits 2D Color, Reports & QLAB: 8 bits YBR_FULL_422 Mode: 2D B&W: 8 bits 2D Color, Reports & QLAB: 8 bits MONOCHROME2 Mode: 8 bits		
Bits Stored	(0028,0101)	US	Always the same numbers as Bits Allocated.	ALWAYS	AUTO
High Bit	(0028,0102)	US	The High Bit is always (Bits Allocated -1).	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	“0” pixels are Unsigned integers	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OW / OB		ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	Palette Color Images: Not present RGB Images: Zero (color-by-pixel) RGB Images: One (color-by-plane) YBR: Images: Always zero (color-by-pixel) MONOCHROME2 Images: Not present	ALWAYS	AUTO
Red Palette Color Lookup Table Descriptor	(0028,1101)	IC	See Table 77-a.	ANAP	CONFIG
Green Palette Color Lookup Table Descriptor	(0028,1102)	IC	See Table 77-a.	ANAP	CONFIG
Blue Palette Color Lookup Table Descriptor	(0028,1103)	IC	See Table 77-a.	ANAP	CONFIG
Red Palette Color Lookup Table Data	(0028,1201)	IC	See Table 77-a.	ANAP	CONFIG
Green Palette Color Lookup Table Data	(0028,1202)	IC	See Table 77-a.	ANAP	CONFIG
Blue Palette Color Lookup Table Data	(0028,1203)	IC	See Table 77-a.	ANAP	CONFIG

Table 77-a
PALETTE COLOR LOOKUP TABLE MODULE

Attribute Name	Tag	VR	Value	Presence of Value	Source
Red Palette Color Lookup Table Descriptor	(0028,1101)	US	Used only for 2D and REPORT acquired as image. B&W stills & loops: 256, 0, 16 Color stills & loops: 0, 0, 16 REPORT (acquired as image): xx, 0, 16 where 'xx' is a variable value.	VNAP	CONFIG
Green Palette Color Lookup Table Descriptor	(0028,1102)	US	Used only for 2D and REPORT acquired as image. B&W stills & loops: 256, 0, 16 Color stills & loops: 0, 0, 16 REPORT (acquired as image): xx, 0, 16 where 'xx' is a variable value.	VNAP	CONFIG
Blue Palette Color Lookup Table Descriptor	(0028,1103)	US	Used only for 2D and REPORT acquired as image. B&W stills & loops: 256, 0, 16 Color stills & loops: 0, 0, 16 REPORT (acquired as image): xx, 0, 16 where 'xx' is a variable value.	VNAP	CONFIG
Red Palette Color Lookup Table Data	(0028,1201)	OW	Used only for 2D and REPORT acquired as image.	ANAP	CONFIG
Green Palette Color Lookup Table Data	(0028,1202)	OW	Used only for 2D and REPORT acquired as image.	ANAP	CONFIG
Blue Palette Color Lookup Table Data	(0028,1203)	OW	Used only for 2D and REPORT acquired as image.	ANAP	CONFIG

Table 78
CINE MODULE OF CREATED US MULTIFRAME SOP

Attribute Name	Tag	VR	Value	Presence of Value	Source
Recommended Display Frame Rate	(0008,2144)	IS	Used for Multiframe	ANAP	AUTO
Cine Rate	(0018,0040)	IS	Used for Multiframe	ANAP	AUTO
Effective Series Duration	(0018,0072)	DS	Used for Multiframe	ANAP	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame Time	(0018,1063)	DS	Nominal time (in msec) per individual frame. Present if Frame Increment Pointer (0028,0009) points to Frame Time. Note: If you export a study to removable media using Average Frame Time, on import back into the system only the images up to but not including the loop will be imported. However the study on media is fine and can be imported onto a PACS without any problems.	ANAP	CONFIG
Frame Time Vector	(0018,1065)	DS	An array that contains the real time increments (in msec) between frames for a Multi-frame image. Present if Frame Increment Pointer (0028,0009) points to Frame Time Vector.	ANAP	CONFIG

Table 79
MULTI-FRAME MODULE OF CREATED US MULTIFRAME SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Frames	(0028,0008)	IS	# of frames in object	ANAP	AUTO
Frame Increment Pointer	(0028,0009)	AT	Configurable by the user in DICOM Setup. If the user selects a loop timing preference where each frame in a loop has the same duration then Frame Increment Pointer takes the value 0018,1063 (Frame Time). If the user selects a loop timing preference where each frame in a loop has the different duration then Frame Increment Pointer takes the value 0018,1065 (Frame Time Vector).	ANAP	CONFIG

Table 80
US REGION CALIBRATION MODULE OF CREATED US IMAGE OR US MULTIFRAME IMAGE SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Sequence of Ultrasound Regions	(0018,6011)	SQ	A sequence is present for each region on the system display	ANAP	AUTO
>Region Location Min x_0	(0018,6018)	UL	Top Left position of region.	ALWAYS	AUTO
>Region Location Min y_0	(0018,601A)	UL	Top Left position of region	ALWAYS	AUTO
>Region Location Max x_1	(0018,601C)	UL	Bottom Right position of region	ALWAYS	AUTO
>Region Location	(0018,601E)	UL	Bottom Right position of region	ALWAYS	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Max y_1					
>Physical Units X Direction	(0018,6024)	US	Enumerated Value. 2D Image = 0003H = CM MMode / Doppler = 0004H = SEC	ALWAYS	AUTO
>Physical Units Y Direction	(0018,6026)	US	Enumerated Value. 2D Image = 0003H = CM MMode = 0003H = CM Doppler = 0007H = CM / SEC	ALWAYS	AUTO
>Physical Delta X	(0018,602C)	FD	The physical value per pixel increment	ALWAYS	AUTO
>Physical Delta Y	(0018,602E)	FD	The physical value per pixel increment	ALWAYS	AUTO
>Reference Pixel X0	(0018,6020)	SL	The X pixel value of baseline, Doppler only	ALWAYS	AUTO
>Reference Pixel Y0	(0018,6022)	SL	The Y pixel value of baseline, Doppler only	ALWAYS	AUTO
>Reference Pixel Physical Value X	(0018,6028)	FD	For each region, the X coordinate of the reference point for measurements within that region.	ALWAYS	AUTO
>Reference Pixel Physical Value Y	(0018,602A)	FD	For each region, the Y coordinate of the reference point for measurements within that region.	ALWAYS	AUTO
>Region Spatial Format	(0018,6012)	US	Enumerated Value. 2D (tissue or flow) = 0001H MMode (tissue or flow) = 0002H Spectral (CW or PW Doppler) = 0003H ECG (waveform) = 0004H	ALWAYS	AUTO
>Region Data Type	(0018,6014)	US	Enumerated Value. Tissue = 0001H (2D only, MMode = 0000H) PW Spectral Doppler = 0000H CW Spectral Doppler = 0000H ECG (waveform) = 000AH	ALWAYS	AUTO
>Region Flags	(0018,6016)	UL	Always set to 3.	ALWAYS	AUTO

Table 81
US IMAGE MODULE OF CREATED US IMAGE OR US MULTIFRAME IMAGE SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples Per Pixel	(0028,0002)	US	See 'Image Pixel Module'	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	See 'Image Pixel Module'	ALWAYS	CONFIG
Bits Allocated	(0028,0100)	US	See 'Image Pixel Module'	ALWAYS	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Bits Stored	(0028,0101)	US	See 'Image Pixel Module'	ALWAYS	AUTO
High Bit	(0028,0102)	US	See 'Image Pixel Module'	ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	See 'Image Pixel Module'	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	"0" Pixels are Unsigned integers	ALWAYS	AUTO
Frame Increment Pointer	(0028,0009)	AT	(0018,1063) "Frame Time" or (0018,1065) "Frame Time Vector"	ANAP	CONFIG
Image Type	(0008,0008)	CS	See 'General Image Module'	ALWAYS	CONFIG
Lossy Image Compression	(0028,2110)	CS	"01" if image is lossy compressed, "00" if not.	ALWAYS	AUTO
Number of Stages	(0008,2124)	IS	1-n	ANAP	AUTO
Number of Views in Stage	(0008,212A)	IS	1-n	ANAP	AUTO
Ultrasound Color Data Present	(0028,0014)	US	0 or 1	ALWAYS	AUTO
Stage Name	(0008,2120)	SH	REST, PEAK, POST, IMPOST, BASE, LOW, user defined	ANAP	AUTO
Stage Number	(0008,2122)	IS	1-n	ANAP	AUTO
View Name	(0008,2127)	SH	LAX, SAX, AP4, AP2 and user defined	ANAP	AUTO
View Number	(0008,2128)	IS	1-n	ANAP	AUTO
Number of Event Timers	(0008,2129)	IS	1-n	ANAP	AUTO
Event Elapsed Time(s)	(0008,2130)	DS	nnn msec.	ANAP	AUTO
Event Timer Name(s)	(0008,2132)	LO	"Stress" , name that identifies the timer	ANAP	AUTO
Acquisition Datetime	(0008,002A)	DT	The date and time that the acquisition of data that resulted in this image started.	ALWAYS	AUTO
Heart Rate	(0018,1088)	IS	Beats per minute	ANAP	AUTO
Transducer Data	(0018,5010)	LO	Transducer name. VM = 3, the last two fields are written as "UNUSED".	ALWAYS	AUTO
Transducer Type	(0018,6031)	LO	SECTOR_PHASED, LINEAR, CURVED LINEAR Only used for 2D images; not used for Doppler-only images (i.e. pencil probes)	ANAP	AUTO
Processing Function	(0018,5020)	LO	The factory-defined exam/preset that was active when the image was acquired even if a user-defined preset.	ALWAYS	AUTO

Table 82
VOI LUT MODULE OF CREATED US SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Window Center	(0028,1050)	DS	2^{n-1} where n is the number of bits per pixel n = 8 Center = 128 n= 16 Center = 32768 Value only meaningful with MONOCHROME2.	ANAP	AUTO
Window Width	(0028,1051)	DS	2^{n} where n is the number of bits per pixel n = 8 Width = 256 n= 16 Width = 65336 Value only meaningful with MONOCHROME2.	ANAP	AUTO

Table 83
SOP COMMON MODULE OF CREATED US IMAGE OR US MULTIFRAME IMAGE SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.6.1 for US Image 1.2.840.10008.5.1.4.1.1.3.1 for US Multiframe Image	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	Generated by device in the format: 1.3.46.670589.14.1000.200.n.xxxxxx.yyyymmddhhmmsss.v where n is a value indicating the type of SOP Instance, x indicates the system serial number,then date and time and v is a counter of the instances.	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS	If provided the attribute contains all the character sets used (this is a multi-value attribute). See Section 6 for more information on the character sets that this system uses. The most likely scenario that would require a non Basic Character set would be when the system has been set to a locale that uses non Basic characters (e.g. Russia) AND the user has entered one of these characters into the Patient Identification screen,	ANAP	AUTO

Comprehensive Structured Report Modules

Table 84
SR DOCUMENT SERIES MODULE OF CREATED COMPREHENSIVE SR SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	"SR"	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	Auto-generated	ALWAYS	AUTO
Series Number	(0020,0011)	IS	A number unique within the Study starting with 2.	ALWAYS	AUTO
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ	Identifies the MPPS SOP Instance to which this image is related	ANAP	MPPS
>Referenced SOP Class UID	(0008,1150)	UI	PPS SOP Class = "1.2.840.10008.3.1.2.3.3"	ANAP	MPPS
> Referenced SOP Instance UID	(0008,1155)	UI	PPS Instance UID of the PPS generating this document	ANAP	MPPS

Table 85
SR DOCUMENT GENERAL MODULE OF CREATED COMPREHENSIVE SR SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS	Unique number starting with "0" zero.	ALWAYS	AUTO
Completion Flag	(0040,A491)	CS	PARTIAL	ALWAYS	AUTO
Verification Flag	(0040,A493)	CS	UNVERIFIED	ALWAYS	AUTO
Content Date	(0008,0023)	DA	Date content created.	ALWAYS	AUTO
Content Time	(0008,0033)	TM	Time content created.	ALWAYS	AUTO
Referenced Request Sequence	(0040,A370)	SQ	Identifies Requested Procedures being fulfilled (completely or partially) by creation of this Document.	ANAP	AUTO
>Study Instance UID	(0020,000D)	UI	Same value as in MWL or auto generated	ALWAYS	MWL/ AUTO
>Referenced Study Sequence	(0008,1110)	SQ	1 item per item in MWL, absent if unscheduled	ANAP	MWL
>>Referenced SOP Class UID	(0008,1150)	UI	Identifies the Referenced SOP Class	ANAP	MWL
>>Referenced SOP Instance UID	(0008,1155)	UI	Instance UID	ANAP	MWL
>Accession Number	(0008,0050)	SH	Same attribute of MWL or user PDE input.	VNAP	MWL/ USER

Attribute Name	Tag	VR	Value	Presence of Value	Source
>Placer Order Number/Imaging Service Request	(0040,2016)	LO	Order Number of Imaging Service Request assigned by placer	VNAP	MWL
>Filler Order Number/Imaging Service Request	(0040,2017)	LO	Order Number of Imaging Service Request assigned by filler	VNAP	MWL
>Requested Procedure ID	(0040,1001)	SH	1 item per item in MWL, absent if unscheduled	ANAP	MWL
>Requested Procedure Description	(0032,1060)	LO	1 item per item in MWL, absent if unscheduled	ANAP	MWL
>Requested Procedure Code Sequence	(0032,1064)	SQ	1 item per item in MWL, absent if unscheduled	ANAP	MWL

Table 86
SR DOCUMENT CONTENT MODULE OF CREATED COMPREHENSIVE SR SOP INSTANCES
This table describes the template-specific data summarized from the following tables in the DICOM Standard: Document Content Macro, Document Relationship Macro, Numeric Measurement Macro and Code Macro

Attribute Name	Tag	VR	Value	Presence of Value	Source
Content Template Sequence	(0040,A504)	SQ		ALWAYS	AUTO
>Template Identifier	(0040,DB00)	CS	The Root Content Item identifies TID 5000 (OB-GYN) 5200 (Adult Echo)	ALWAYS	AUTO
>Mapping Resource	(0008,0105)	CS	DCMR	ALWAYS	AUTO
Content Sequence	(0040,A730)	SQ		ALWAYS	AUTO
>Relationship Type	(0040,A010)	CS	*See Template ID 5000 for OB-GYN* *See Template ID 5200 for Adult Echo*	ALWAYS	AUTO
Document Relationship Macro Table			*See Template ID 5000 for OB-GYN* *See Template ID 5200 for Adult Echo*	ANAP	AUTO
Document Content Macro			*See Template ID 5000 for OB-GYN* *See Template ID 5200 for Adult Echo*	ALWAYS	AUTO
Value Type	(0040,A040)	CS	CONTAINER, always first tag of SR	ALWAYS	AUTO
Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>Code Value	(0008,0100)		125000 for OB-GYN 125200 for Adult Echo	ALWAYS	AUTO
>Coding Scheme Designator	(0008,0102)		DCM	ALWAYS	AUTO
>Code Meaning	(0008,0104)		“OB-GYN Procedure Report” “Adult Echocardiography Procedure Report”	ALWAYS	AUTO
Continuity of Content	(0040,A050)	CS	SEPARATE	ALWAYS	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Numeric Measurement Macro			*See Template ID 5000 for OB-GYN* *See Template ID 5200 for Adult Echo*	ALWAYS	AUTO
Code Macro			*See Template ID 5000 for OB-GYN* *See Template ID 5200 for Adult Echo*	ALWAYS	AUTO

Table 87
SOP COMMON MODULE OF CREATED COMPOSITE SR SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.88.33	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	Generated by device	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS	ISO_IR 100. See Section 6 for details.	ALWAYS	CONFIG

8.2 USED FIELDS IN RECEIVED IOD BY APPLICATION

The CX50 2.0.x storage applications do not receive SOP Instances. The usage of attributes received via MWL is described in section 4.2.2.3.1.3 SOP Specific Conformance for Modality Worklist.

8.3 ATTRIBUTE MAPPING

Table 88 summarizes the relationships between attributes received via MWL, stored in acquired images and communicated via MPPS. The format and conventions used in Table 88 are the same as the corresponding table in DICOM Part 4, Annex M.6

Table 88
ATTRIBUTE MAPPING BETWEEN MODALITY WORKLIST, IMAGE AND MPPS

Modality Worklist	Image IOD	MPPS IOD
Patient's Name	Patient's Name	Patient's Name
Patient ID	Patient ID	Patient ID
Patient's Birth Date	Patient's Birth Date	Patient's Birth Date
Patient's Sex	Patient's Sex	Patient's Sex
Patient's Weight	Patient's Weight	
Referring Physician's Name	Referring Physician's Name	
----	----	Scheduled Step Attributes Sequence
Study Instance UID	Study Instance UID	>Study Instance UID
Referenced Study Sequence	Referenced Study Sequence	>Referenced Study Sequence
Accession Number	Accession Number	>Accession Number
----	Request Attributes Sequence	----
Requested Procedure ID	>Requested Procedure ID	>Requested Procedure ID
Requested Procedure Description	>Requested Procedure Description	>Requested Procedure Description
Scheduled Procedure Step ID	>Scheduled Procedure Step ID	>Scheduled Procedure Step ID
Scheduled Procedure Step Description	>Scheduled Procedure Step Description > Study Description > Series Description > Performed Procedure Step Description	>Scheduled Procedure Step Description
Scheduled Protocol Code Sequence	>Scheduled Protocol Code Sequence	----
----	Performed Protocol Code Sequence	Performed Protocol Code Sequence
----	Study ID – Requested Procedure ID from MWL, else generated	Study ID – Requested Procedure ID from MWL, else generated
----	Performed Procedure Step ID	Performed Procedure Step ID
----	Performed Procedure Step Start Date	Performed Procedure Step Start Date
----	Performed Procedure Step Start Time	Performed Procedure Step Start Time
----	Performed Procedure Step Description	Performed Procedure Step Description

Modality Worklist	Image IOD	MPPS IOD
----	----	Performed Series Sequence
Requested Procedure Code Sequence	Procedure Code Sequence	Procedure Code Sequence
----	Referenced Performed Procedure Step Sequence	----
----	>Referenced SOP Class UID	SOP Class UID
----	>Referenced SOP Instance UID	SOP Instance UID
----	Protocol Name	Protocol Name

8.4 COERCED/MODIFIED FIELDS

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

8.5 CONTROLLED TERMINOLOGY

The Workflow AE is capable of supporting arbitrary coding schemes for Procedure and Protocol Codes. The contents of Requested Procedure Code Sequence (0032,1064) and Scheduled Protocol Code Sequence (0040,0008) supplied in Worklist Items will be mapped to Image IOD and MPPS attributes as described in Table 88.

Structured Reporting uses codes supplied by DCMR (DICOM Code Mapping Resource, PS 3-16), LOINC (Logical Observation Names and Codes), SRT (SNOMED – Systematized Nomenclature of Medicine) and 99PMSBLUS (Philips Private Codes for Ultrasound).

8.6 GRAYSCALE IMAGE CONSISTENCY

The high-resolution display monitor is calibrated according to the Grayscale Standard Display Function (GSDF).

8.7 EXTENSIONS / SPECIALIZATIONS / PRIVATIZATIONS

8.7.1 Standard Extended / Specialized / Private SOPs

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

Tag Number	Tag Name	Added to:
0028,0030	Pixel Spacing	Images with a single 2D region or dual 2D with same depth See details in Section 8.7.3
2050,0020	Presentation LUT Shape	Images when 'GSDF' output format is selected

8.7.2 2D

The Pixel Spacing tag is added to the exported DICOM file when the user has configured this tag to be included and the image contains only one 2D calibration region and no Doppler or M-Mode calibration regions.

Contain the Pixel Spacing tag: 2D still, 2D loop, 2D color still, 2D color loop, MMode Preview Still, PW Preview Still, CW Preview still, Dual with same calibration on both images.

Do NOT contain the Pixel Spacing tag: MMode live trace, MMode frozen trace, PW live trace, PW Frozen trace, CW live trace, CW frozen trace, Reports and dual images with different calibration on each image.

This attribute is system generated, if used.

Attribute Name	Tag	Type	VR	Description	Value
Pixel Spacing	0028,0030	3	DS	Physical distance in the patient between the center of each pixel, specified by a numeric pair adjacent row spacing (delimiter) adjacent column spacing (in mm).	Adjacent row spacing \ Adjacent column spacing (in mm)

8.7.4 Off-cart QLAB

QLAB is available on-cart for advanced quantification and analysis of images. It is also a stand-alone software product that provides advanced off-line ultrasound quantification capabilities. The user can use QLAB 7.0 and above to review and quantify CX50 2.0.x images. The CX50 2.0.x user can export images via DICOM network or in DICOM format to media in order to 'sneaker-net' those images to a PC running the QLAB 7.0 and above software.

8.7.4 PRIVATE TRANSFER SYNTAXES

There are no Private Transfer Syntaxes.

APPENDIX A – Structured Reports

A.1 STRUCTURED REPORTS

Note that all the concepts defined privately by Philips have the CSD value as '99PMSBLUS'.

Note that **the average value is the average of all instances for the measurement for the study.**

A.2 OB – GYN STRUCTURED REPORT TEMPLATE

CX50 2.0.x implements the OB-GYN Ultrasound Procedure Report Template (TID 5000) from the DICOM standard, part 16. This appendix describes the scope and manner that CX50 2.0.x measurements appear in DICOM SR.

Measurements and calculations performed for Obstetric and Gynecology studies will lead to creation of "OB-GYN Ultrasound Procedure Report" structured report document. Measurements can be performed by pressing the 'Calc' key on CX50 2.0.x control panel and selecting an OB of GYN analysis package. Measurements and calculations available in the menu can be configured through the setup application. It is also possible to configure the measurement unit (Metric or U.S).

All concepts with value type (VT) NUM will always have a 'MeasurementUnitCodeSequence' that specifies the unit of the measurement. The CSD for all units will be UCUM (Unified Code for Units) and CV and CM will be based on application configuration and will confirm to UCUM standards.

A.2.1 Template specific conformance for TID 5000

The template for the root of the content tree for TID 5000 and its use in the CX50 2.0.x context is described in the following table.

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	EV (125000, DCM, "OB-GYN Ultrasound Procedure Report")	This is the root 'CONTAINER'
2	>	CONTAINS	INCLUDE	DTID (5001) Patient Characteristics	Refer to A.2.1.1 for CX50 2.0.x usage of this.
3	>	CONTAINS	INCLUDE	DTID (5002) OB-GYN Procedure Summary Section	Refer to A.2.1.2 for CX50 2.0.x usage of this.
4	>	CONTAINS	INCLUDE	DTID (5004) Fetal Biometry Ratio Section	Concepts in CID 12004 will be used, refer to A.2.1.3 for CX50 2.0.x usage of this.
5	>	CONTAINS	INCLUDE	DTID (5005) Fetal Biometry Section	Concepts in CID 12005 will be used, refer to A.2.1.4 for CX50 2.0.x usage of this.
6	>	CONTAINS	INCLUDE	DTID (5006) Long Bones Section	Concepts in CID 12006 will be used, refer to A.2.1.5 for CX50 2.0.x usage of this.

7	>	CONTAINS	INCLUDE	DTID (5007) Fetal Cranium Section	Concepts in CID 12007 will be used, refer to A.2.1.6 for CX50 2.0.x usage of this.
8	>	CONTAINS	INCLUDE	DTID (5009) Biophysical Profile Section	Refer to A.2.1.7 for CX50 2.0.x usage of this.
9	>	CONTAINS	INCLUDE	DTID (5011) Early Gestation Section	Concepts in CID 12009 will be used, refer to A.2.1.8 for CX50 2.0.x usage of this.
10	>	CONTAINS	INCLUDE	DTID (5010) Amniotic Sac Section	Concepts in CID 12008 will be used, refer to A.2.1.9 for CX50 2.0.x usage of this.
11	>	CONTAINS	INCLUDE	DTID (5015) Pelvis and Uterus Section	Concepts in CID 12011 will be used, refer to A.2.1.10 for CX50 2.0.x usage of this.
12	>	CONTAINS	INCLUDE	DTID (5012) Ovaries Section	Refer to A.2.1.11 for CX50 2.0.x usage of this.
13	>	CONTAINS	INCLUDE	DTID (5013) Follicles Section	This section is used with concept modifier Laterality = Left. Refer to A.2.1.12 for CX50 2.0.x usage of this.
14	>	CONTAINS	INCLUDE	DTID (5013) Follicles Section	This section is used with concept modifier Laterality = Right. Refer to A.2.1.12 for CX50 2.0.x usage of this.
15	>	CONTAINS	CONTAINER	EV (121070, DCM, “Findings”)	This section (rows 15, 16, and 17) is used to include fetus vascular measurements. Refer to section A.2.1.13 for details. Measurements from DCID (12141), ‘Fetal Vasculature’ are used.
16	>>	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, “Finding Site”)	EV (T-F6800, SRT, “Embryonic Vascular Structure”)
17	>>	CONTAINS	INCLUDE	DTID (5025) OB-GYN Fetal Vascular Measurement Group)	$AnatomyGroup = DCID (12141) Fetal Vasculature). Refer to section A.2.1.13 for details of TID 5025.
18	>	CONTAINS	CONTAINER	EV (121070, DCM, “Findings”)	This section (rows 18, 19, and 20) is used to include pelvic vascular measurements. Refer to section A.2.1.14 for details. Measurements from DCID (12140), ‘Fetal Vasculature’ are used.
19	>>	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, “Finding Site”)	EV (T-D6007, SRT, “Pelvic Vascular Structure”)

20	>>	CONTAINS	INCLUDE	DTID (5026) OB-GYN Pelvic Vascular Measurement Group)	$AnatomyGroup = DCID (12140) Pelvic Vasculature Anatomical Location. Refer to section A.2.1.14 for details of TID 5026.

A.2.1.1 OB-GYN Patient Characteristics (TID 5001)

Use of the template TID 5001 in the context of CX50 2.0.x is described in the following table.

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	EV (121118, DCM, “Patient Characteristics”)	
2	>	CONTAINS	TEXT	EV (121106, DCM, “Comment”)	
3	>	CONTAINS	NUM	EV (8302-2, LN, “Patient Height”)	Value is taken from PDE (Patient Data Entry) screen or from the MWL.
4	>	CONTAINS	NUM	EV (29463-7, LN, “Patient Weight”)	Value is taken from PDE (Patient Data Entry) screen or from the MWL.
5	>	CONTAINS	NUM	EV (11996-6, LN, “Gravida”)	Value is taken from PDE (Patient Data Entry) screen.
6	>	CONTAINS	NUM	EV (11977-6, LN, “Para”)	Value is taken from PDE (Patient Data Entry) screen.
7	>	CONTAINS	NUM	EV (11612-9, LN, “Aborta”)	Value is taken from PDE (Patient Data Entry) screen.
8	>	CONTAINS	NUM	EV (33065-4, LN, “Ectopic Pregnancies”)	Value is taken from PDE (Patient Data Entry) screen.

A.2.1.2 OB-GYN Procedure Summary (TID 5002)

The following table describes the use of this template in the context of CX50 2.0.x.

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	DT (121111, DCM, “Summary”)	
2	>	CONTAINS	DATE	(11955-2, LN, “LMP”)	Value is taken from PDE (Patient Data Entry) screen. -- Row 2, 3 and 4 are concepts from DCID 12003, “OB-GYN Dates”

3	>	CONTAINS	DATE	(11779-6, LN, “EDD from LMP”)	Value automatically calculated by the CX50 2.0.x system based on the value entered for LMP.
4	>	CONTAINS	DATE	(11781-2, LN, “EDD from average ultrasound age”)	Value automatically calculated by the CX50 2.0.x system based various measurements and on the LMP. If there is more than one fetus, the value used is the earliest calculated EDD amongst all fetuses.
5	>	CONTAINS	NUM	(11878-6, LN, “Number of Fetuses”)	Value is taken from PDE (Patient Data Entry) screen. -- This value is actually inserted as invocation of TID 300 (Measurement) with concept(s) from DCID 12001, “OB-GYN summary” passed as parameters.
6	>	TEXT	CONTAINS	EV (121106, DCM, “Comment”)	
7	>	CONTAINS	INCLUDE	“OB-GYN Fetus Summary” (BTID 5003)	Refer to section A.2.1.2.1 for details of CX50 2.0.x usage of this. This template is included 1 per fetus.

A.2.1.2.1 OB-GYN Fetus Summary (TID 5003)

CX50 2.0.x uses this template to insert measurements from DCID 12019. CX50 2.0.x uses a private extension to DCID 12019 to define a new Fetus Summary measurement concept for ‘Peak-to-Peak time interval over two beats’.

Following table shows the extension to Fetus Summary (CID 12019) used by CX50 2.0.x.

CSD	CV	CM
99PMSBLUS	C12019-01	Peak-to-Peak time interval over two beats

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	DT (125008, DCM, “Fetus Summary”)	

2	>	HAS OBS CONTEXT	TEXT	EV (11951-1, LN, "Fetus ID")	Value of “1”, “2”, “3” or “4” is used as identifier of the Fetus. -- This value is actually inserted as invocation of TID 1008 (Subject context - Fetus) -- This is present only if the study has more than one fetus.
3	>	CONTAINS	TEXT	EV (121106, DCM, “Comment”)	This field contains all observations, findings (only the Finding text value preceded by the Finding Group Name) and the comments entered in the reporting screen on the CX50 2.0.x. In case of multiple fetuses, these observations are associated with the selected Fetus ID. For the Anatomy Visualized finding, a string ‘Seen’ will be displayed against the anatomy if the check box against the particular anatomy is checked in the reporting screen. A string ‘Not Seen’ will be displayed against the anatomy if the check box against the particular anatomy is not checked in the reporting screen.
4	>	CONTAINS	NUM	(11888-5, LN, “Composite Ultrasound Age”)	This is a system-calculated value. This attribute is used to convey the “Average Ultrasound Age”. -- This value is inserted as invocation of TID 300 (Measurement) with concepts from DCID 12019
5	>	CONTAINS	NUM	(11885-1, LN, “Gestational Age by LMP”)	This is a system-calculated value. -- This value is inserted as invocation of TID 300 (Measurement) with concepts from DCID 12019
6	>	CONTAINS	NUM	(11727-5, LN, “Estimated Weight”)	This is a system-calculated value. -- This value is inserted as invocation of TID 300 (Measurement) with concepts from DCID 12019
7	>>	HAS CONCEPT MOD	CODE	Equation or Table using (121424, DCM, “Table of Values”)	Concepts from CID 12014, OB Body Fetal Weight Equations and Tables will be used. Refer to section A.2.1.16 for concepts used in CX50 2.0.x.

8	>	CONTAINS	NUM	(99PMSBLUS, C12019-01, “Peak-to-Peak time interval over two beats”)	This value is inserted as invocation of TID 300 (Measurement) with concepts from DCID 12019. This concept is an extension of DCID 12019.
9	>	CONTAINS	NUM	(LN, 11948-7, “Fetal Heart Rate”)	Exported as “xxx {H.B.}/min (UCUM, Beats Per Minute) where xxx = number of beats

A.2.1.3 Fetal Biometry Ratio Section (TID 5004)

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	DT (125001, DCM, “Fetal Biometry Ratios”)	
2	>	HAS OBS CONTEXT	TEXT	EV (11951-1,LN, "Fetus ID”)	Value of “1”, “2”, “3” or “4” is used as identifier of the Fetus. -- This value is actually inserted as invocation of TID 1008 (Subject context - Fetus) -- This value is present only if more than one fetus exists.
3	>	CONTAINS	NUM	Measurements from CID 12004 (Fetal Biometry Ratios) are included.	These biometry measurements are added as part of invocation of Measurement (TID 300) template.

A.2.1.3.1 Fetal Biometry Ratios (CID 12004)

CX50 2.0.x defines an extension of CID 12004 to include HrtC / TC ratio as part of this context group. Following table shows the concepts in CID 12004 (including the private extension for CX50 2.0.x) that are used in CX50 2.0.x.

CSD	CV	Code Meaning
LN	11947-9	HC/AC
LN	11871-1	FL/AC
LN	11872-9	FL/BPD
LN	11823-2	Cephalic Index
99PMSBLUS	C12004-01	HrtC/TC (Heart Circumference/Thoracic Circumference)

A.2.1.4 Fetal Biometry Section (TID 5005)

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	DT (125002, DCM, ”Fetal Biometry”)	
2	>	HAS OBS CONTEXT	TEXT	EV (11951-1,LN, "Fetus ID”)	Will be present if more than one fetus.
3	>	CONTAINS	INCLUDE	Biometry Group (DTID 5008)	Measurements from DCID 12005 are used as ‘Biometry type’ to invoke this template one or more number of times. Refer to section A.2.1.6.1 for details of Biometry Group template usage.

A.2.1.4.1 Fetal Biometry Measurements (CID 12005)

CX50 2.0.x defines a private extension to CID 12005 to include measurements available on CX50 2.0.x but not (yet) defined in this context group. The following table shows the measurements from CID 12005 (including CX50 2.0.x private extensions) that are used in CX50 2.0.x. All private extensions will use the coding scheme designator as 99PMSBLUS.

CSD	CV	Code Meaning
LN	11979-2	Abdominal Circumference
LN	11818-2	Anterior-Posterior Abdominal Diameter
LN	11819-0	Anterior-Posterior Trunk Diameter
LN	11820-8	Biparietal Diameter
LN	11965-1	Foot Length
LN	11984-2	Head Circumference
LN	11851-3	Occipital-Frontal Diameter
LN	11988-3	Thoracic Circumference
LN	11862-0	Transverse Abdominal Diameter
LN	11864-6	Transverse Thoracic Diameter
99PMSBLUS	C12005-01	Ear Length
99PMSBLUS	C12005-02	Fetal Trunk Cross Sectional Area
99PMSBLUS	C12005-03	Heart Circumference
99PMSBLUS	C12005-04	Length of Middle Phalanx of the Fifth Digit
99PMSBLUS	C12005-05	Renal Width
99PMSBLUS	C12005-06	Renal Length

99PMSBLUS	C12005-07	Anterior-Posterior Thoracic Diameter
99PMSBLUS	C12005-08	Transverse Trunk Diameter
99PMSBLUS	C12005-10	APTD*TTD

A.2.1.5 Fetal Long Bones Section (TID 5006)

Fetal Long Bones section is inserted in the SR Document in the same way as Fetal Biometry Section (Refer section A.2.1.4) using "DT (125003, DCM," Fetal Long Bones")". $Biometry Type used to invoke the template TID 5008 is taken from the context group Fetal Long Bones Measurement (CID 12006). All the measurements in CID 12006 are available in CX50 2.0.x as described in the following table.

CSD	CV	Code Meaning
LN	11966-9	Humerus length
LN	11967-7	Radius length
LN	11969-3	Ulna length
LN	11968-5	Tibia length
LN	11964-4	Fibula length
LN	11962-8	Clavicle length
LN	11963-6	Femur Length

A.2.1.6 Fetal Cranium Section (TID 5007)

Fetal Cranium section is inserted in the SR Document in the same way as Fetal Biometry Section (Refer section A.2.1.4) using "DT (125004, DCM," Fetal Cranium")". $Biometry Type used to invoke the template TID 5008 is taken from the context group Fetal Cranium (CID 12007).

CX50 2.0.x defines a private extension to CID 12007 to include cranial measurements available in CX50 2.0.x but not (yet) defined in CID 12007. The following table shows the measurements from CID 12007 (including CX50 2.0.x private extensions) that are used in CX50 2.0.x. All private extensions will use the coding scheme designator as 99PMSBLUS.

CSD	CV	Code Meaning
LN	12171-5	Lateral Ventricle width
LN	11860-4	Cisterna Magna Length
LN	12146-7	Nuchal Fold thickness
LN	33070-4	Inner Orbital Diameter
LN	11629-3	Outer Orbital Diameter
LN	11863-8	Trans Cerebellar Diameter
LN	33197-5	Anterior Horn Lateral ventricular width
LN	33196-7	Postierior Horn Lateral ventricular width
LN	12170-7	Width of Hemisphere

99PMSBLUS	C12007-01	Diameter of First Orbit
99PMSBLUS	C12007-02	Diameter of Second Orbit
99PMSBLUS	C12007-03	Ratio of Posterior Horn Lateral ventricular width/Hemisphere

A.2.1.6.1 Fetal Biometry Group (TID 5008)

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	DT(125005, DCM, ”Biometry Group”)	
2	>	CONTAINS	NUM	Measurement of selected ‘Biometry Type’	This row and next two rows are inserted as part of TID 300 (Measurement) invocation. If multiple measurements are made of the same biometry type, these three rows will be repeated for each measurement instance.
3	>>	INFERRED FROM	IMAGE	Referenced Content Item Identifier	An ordered set of one or more integers that uniquely identify the Image in the ‘Image Library’ section of this SR document. This is the image from which the measurement is inferred. This item will not be present, if the measurement does not refer to any image.
4	>>	HAS CONCEPT MOD	CODE	EV (121401, DCM, “Derivation”)	If a user has performed more than one measurement then he / she can either use average (default) of these instances or he can specifically select one of the measured instances for using in calculations. If the selection is Average, then that average measurement instance will have a derivation modifier as (R-00317, SRT, “Mean”).
5	>>	HAS PROPERTIES	CODE	EV (121404, DCM, “Selection Status”)	This will have a value (121412, DCM, “Mean Value Chosen”) if the Derivation is ‘Mean’. In all other cases, this will have a value as (121410, DCM “User chosen value”).
6	>	CONTAINS	NUM	EV (18185-9, LN, ”Gestational Age”)	This will be present if user has selected the corresponding gestation age calculation. For example, if the biometry type is BPD and user has selected GA (BPD) as one of the calculations (from the analysis setup application), this row will be present. CX50 2.0.x system automatically calculates the GA based on standard (or user defined) equations and tables.

7	>>	INFERRED FROM	CODE	Equation or Table using (121424, DCM, “Table of Values”)	Concepts from CID 12013, Gestation age equations and tables will be used. Refer to section A.2.1.15 for concepts used in CX50 2.0.x.

A.2.1.7 Fetal Biophysical Profile Section (TID5009)

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	DT (125006, DCM, ”Biophysical Profile”)	
2	>	HAS OBS CONTEXT	TEXT	EV (11951-1, LN, "Fetus ID”)	Will be present if more than one fetus.
3	>	CONTAINS	NUM	EV (11631-9, LN, “Gross Body Movement”)	CX50 2.0.x uses the value as entered in the reporting screen.
4	>	CONTAINS	NUM	EV (11632-7, LN, “Fetal Breathing”)	CX50 2.0.x uses the value as entered in the reporting screen.
5	>	CONTAINS	NUM	EV (11635-0, LN, “Fetal Tone”)	CX50 2.0.x uses the value as entered in the reporting screen.
6	>	CONTAINS	NUM	EV (11630-1, LN, “Amniotic Fluid Volume”)	CX50 2.0.x uses the value as entered in the reporting screen.
7	>	CONTAINS	NUM	DT (11634-3, LN, “Biophysical Profile Sum Score”)	CX50 2.0.x automatically calculates the sum of all the scores.

A.2.1.8 Early Gestation Section (TID 5011)

Early Gestation section is inserted in the SR Document in the same way as Fetal Biometry Section (Refer section A.2.1.4) using “DT (125009, DCM,” Early Gestation”)”. $Biometry Type used to invoke the template TID 5008 is taken from the context group Early Gestation Biometry Measurements (CID 12009).

CSD	CV	Code Meaning
LN	11957-8	Crown Rump Length
LN	11850-5	Gestational Sac Diameter
LN	33071-2	Spine Length
LN	11816-6	Yolk Sac length

A.2.1.9 Amniotic Sac Section (TID 5010)

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	DT (121070, DCM, “Findings”)	
2	>	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, “Finding Site”)	DT (T-F1300, SRT, ”Amniotic Sac”)
3	>	CONTAINS	NUM	(11627-7, LN, “Amniotic Fluid Index”)	This is inserted as part of the invocation of template TID 300 (Measurement)
4	>	CONTAINS	NUM	(11624-4, LN, “First Quadrant Diameter”)	This is inserted as part of the invocation of template TID 300 (Measurement)
5	>	CONTAINS	NUM	(11626-9, LN, “Second Quadrant Diameter”)	This is inserted as part of the invocation of template TID 300 (Measurement)
6	>	CONTAINS	NUM	(11625-1, LN, “Third Quadrant Diameter”)	This is inserted as part of the invocation of template TID 300 (Measurement)
7	>	CONTAINS	NUM	(11623-6, LN, “Fourth Quadrant Diameter”)	This is inserted as part of the invocation of template TID 300 (Measurement)
8	>>	HAS CONCEPT MOD	CODE	EV (121401, DCM, “Derivation”)	This will have a value ‘Mean’ IFF average measurement instance is used in calculations.
9	>>	HAS PROPERTIES	CODE	EV (121404, DCM, “Selection Status”)	This will have a value ‘Mean Value Chosen’ if the Derivation is ‘Mean’. In all other cases, this will have a value, ‘User Chosen Value’.
10	>>	INFERRED FROM	IMAGE	Referenced Content Item Identifier	Refers to the image on which this measurement was done.

A.2.1.10 Pelvis and Uterus Section (TID 5015)

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	DT (125011, DCM, “Pelvis and Uterus”)	

2	>	CONTAINS	CONTAINER	EV (T-83000, SRT, “Uterus”)	DTID 5016 (LWH Volume Group) is included. Uterus volume, length and width measurements are inserted. Group Name is ‘Uterus’
3	>>	CONTAINS	NUM	(33192-6, LN, “Uterus Volume”)	This row is inserted as part of TID 300 (Measurement) invocation. CX50 2.0.x automatically calculates the volume based on L, W and H measurements.
4	>>	CONTAINS	NUM	(11842-2, LN, “Uterus Length”)	This row is inserted as part of TID 300 (Measurement) invocation. -- Similar to rows 4, 5 and 6, the concepts for Uterus Height and Uterus Width are added too. These concepts are: (11859-6, LN, “Uterus Height”) and (11865-3,LN, “ Uterus Width”)
5	>>>	HAS CONCEPT MOD	CODE	EV (121401, DCM, “Derivation”)	This will have a value ‘Mean’ IFF the average measurement instance is used in calculations.
6	>>>	HAS PROPERTIES	CODE	EV (121404, DCM, “Selection Status”)	This will have a value (121412, DCM, “Mean Value Chosen”) if the Derivation is ‘Mean’. In all other cases, this will have a value as (121410, DCM “User chosen value”).
7	>>>	INFERRED FROM	IMAGE	Referenced Content Item Identifier	Refers to the image on which this measurement was done.
8	>	CONTAINS	NUM	(11961-0, LN, “Cervix Length”)	This measurement is from CID 12011, “Ultrasound Pelvic and Uterus”. This is inserted as part of invocation of TID 300 (Measurement). Similar to other measurements, the concept modifier for ‘Derivation’, Selection Status and ‘Referenced Content Item’ would be present for this measurement. Note:- Only Cervix Length and Endometrium Thickness from CID 12011 will be present in rows 7 and 8. All bladder related measurements from CID 12011 will be present under the group ‘Bladder’ as shown in the rows from 9.
9	>	CONTAINS	NUM	(12145-9, LN, “Endometrium Thickness”)	This measurement is from CID 12011, “Ultrasound Pelvic and Uterus”.

10	>	CONTAINS	CONTAINER	EV (T-74000, SRT, “Bladder”)	DTID 5016 (LWH Volume Group) is included. Bladder volume, length and width measurements are inserted. Group Name is ‘Bladder’
11	>>	CONTAINS	NUM	(C12011-04, 99PMSBLUS, “Bladder Volume”)	This row is inserted as part of TID 300 (Measurement) invocation. CX50 2.0.x automatically calculates the volume based on L, W and H measurements.
12	>>	CONTAINS	NUM	(C12011-01, 99PMSBLUS, “Bladder Length”)	This row is inserted as part of TID 300 (Measurement) invocation. -- Similar to rows 11, 12 and 13, the concepts for Bladder Width and Bladder Height are added too. These concepts are: (C12011-02, 99PMSBLUS, “Bladder Width”) and (C12011-03, 99PMSBLUS, “Bladder Height”)
13	>>>	HAS CONCEPT MOD	CODE	EV (121401, DCM, “Derivation”)	This will have a value ‘Mean’ IFF the average measurement instance is used in calculations.
14	>>>	HAS PROPERTIES	CODE	EV (121404, DCM, “Selection Status”)	This will have a value (121412, DCM, “Mean Value Chosen”) if the Derivation is ‘Mean’. In all other cases, this will have a value as (121410, DCM “User chosen value”).
15	>>>	INFERRED FROM	IMAGE	Referenced Content Item Identifier	Refers to the image on which this measurement was done.
16	>	CONTAINS	CONTAINER	EV (T-74000, SRT, “Bladder”)	DTID 5016 (LWH Volume Group) is included. Post Void Bladder volume, length and width measurements are inserted. Group Name is ‘Bladder’
17	>>	CONTAINS	NUM	(C12011-08, 99PMSBLUS, “Post Void Bladder Volume”)	This row is inserted as part of TID 300 (Measurement) invocation. CX50 2.0.x automatically calculates the volume based on L, W and H measurements.

18	>>	CONTAINS	NUM	(C12011-05, 99PMSBLUS, “Post Void Bladder Length”)	This row is inserted as part of TID 300 (Measurement) invocation. -- Similar to rows 16, 17 and 18, the concepts for Post Void Bladder Width and Post Void Bladder Height are added too. These concepts are: (C12011-06, 99PMSBLUS, “Post Void Bladder Width”) and (C12011-07, 99PMSBLUS, “Post Void Bladder Height”)
19	>>>	HAS CONCEPT MOD	CODE	EV (121401, DCM, “Derivation”)	This will have a value ‘Mean’ IFF the average measurement instance is used in calculations.
20	>>>	HAS PROPERTIES	CODE	EV (121404, DCM, “Selection Status”)	This will have a value (121412, DCM, “Mean Value Chosen”) if the Derivation is ‘Mean’. In all other cases, this will have a value as (121410, DCM “User chosen value”).
21	>>>	INFERRED FROM	IMAGE	Referenced Content Item Identifier	Refers to the image on which this measurement was done.

A.2.1.10.1 CID 12011 Ultrasound Pelvis And Uterus

CX50 2.0.x uses a private extension to CID 12011 to define new concepts for Bladder related measurements. Following table shows the details.

CSD	**CV**	**CM**
LN	11961-0	Cervix Length
LN	12145-9	Endometrium Thickness
99PMSBLUS	C12011-01	Bladder Length
99PMSBLUS	C12011-02	Bladder Width
99PMSBLUS	C12011-03	Bladder Height
99PMSBLUS	C12011-04	Bladder Volume
99PMSBLUS	C12011-05	Post Void Bladder Length
99PMSBLUS	C12011-06	Post Void Bladder Width
99PMSBLUS	C12011-07	Post Void Bladder Height
99PMSBLUS	C12011-08	Post Void Bladder Volume

A.2.1.11 Ovaries Section (TID 5012)

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	DT (121070, DCM, “Findings”)	
2	>	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, “Finding Site”)	DT (T-87000, SRT, ”Ovary”)
3	>	CONTAINS	CONTAINER	EV (T-87000, SRT, ”Ovary”)	DTID 5016 (LWH Volume Group) is included. Left ovary volume, length and width measurements are inserted. Group name is ‘Ovary’.
4	>>	CONTAINS	NUM	EV (12164-0, LN, ”Left Ovary Volume”)	This row is inserted as part of TID 300 (Measurement) invocation. CX50 2.0.x automatically calculates the volume based on L, W and H measurements.
5	>>	CONTAINS	NUM	EV (11840-6, LN, ”Left Ovary Length”)	This row is inserted as part of TID 300 (Measurement) invocation. -- Similar to rows 5, 6 and 7, the concepts for Ovary Height and Ovary Width are added too. These concepts are: EV (11857-0, LN, ”Left Ovary Height”) and EV (11829-9,LN, ”Left Ovary Width”)
6	>>>	HAS CONCEPT MOD	CODE	EV (121401, DCM, “Derivation”)	This will have a value “Mean” IFF the average measurement instance is used in calculations.
7	>>>	HAS PROPERTIES	CODE	EV (121404, DCM, “Selection Status”)	This will have a value (121412, DCM, “Mean Value Chosen”) if the Derivation is ‘Mean’. In all other cases, this will have a value as (121410, DCM “User chosen value”).
8	>>>	INFERRED FROM	IMAGE	Referenced Content Item Identifier	Refers to the image on which this measurement was done.

					Similarly DTID 5016 (LWH Volume Group) is included for Right ovary volume, length and width measurements. The related concepts codes are – $GroupName = EV (T-87000, SRT, ”Ovary”) $Width = EV (11830-7, LN, ”Right Ovary Width”) $Length = EV (11841-4, LN, ”Right Ovary Length”) $Height = EV (11858-8, LN, ”Right Ovary Height”) $Volume= EV (12165-7, LN, ”Right Ovary Volume”)

A.2.1.12 Follicles Section (TID 5013)

SR Document may contain two instances of the Follicles section. First instance is included for left ovarian follicles and the second instance is included for right ovarian follicle. Laterality concept modifier will be used accordingly. Measurements for up to 16 follicles may be included in this section.

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	DT (121070, DCM, “Findings”)	
2	>	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, “Finding Site”)	DT (T-87600, SRT, “Ovarian Follicle”)
3	>	HAS CONCEPT MOD	CODE	EV (G-C171, SRT, “Laterality”)	EV (G-A101, SRT, “Left”) OR EV (G-A100, SRT, “Right”)
4	>	CONTAINS	NUM	EV (11879-4, LN, “Number of follicles in left ovary”) OR EV (11880-2, LN, “Number of follicles in right ovary”)	Number of follicles in the ovary.
5	>	CONTAINS	CONTAINER	EV (125007, DCM, “Measurement Group”)	Template TID 5014 (Follicle Measurement Group) is included.
6	>>	HAS OBS CONTEXT	TEXT	EV (12510, DCM, “Identifier”)	CX50 2.0.x uses numbers “1”, “2”, “3”…up to “16” to identify the follicle. -- Row 6, 7 and 8 are added per follicle measurement.

7	>>	CONTAINS	NUM	EV (G-D705, SRT, “Volume”)	This is inserted as part of TID 300 invocation. CX50 2.0.x automatically calculates the volume based on the follicle diameter.
8	>>	CONTAINS	NUM	(11793-7, LN, “Follicle diameter”)	This is inserted as part of TID 300 invocation.

A.2.1.13 OB-GYN Fetus Vascular Ultrasound Measurement Group (TID 5025)

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	EV (T-F6800, SRT, “Embryonic Vascular Structure”)	
2	>	HAS OBS CONTEXT	TEXT	EV (11951-1, LN, "Fetus ID”)	Will be present if more than one fetus.
3	>	CONTAINS	NUM	Measurement of selected fetal vascular anatomic location.	Measurement types from CID 12119 (Vascular Ultrasound Property) and CID 12121 (Vascular Indices and Ratios) for the anatomical locations specified in CID 12141 (Fetal Vasculature Anatomic Locations) are used.

A.2.1.13.1 Fetal Vascular Measurements

CX50 2.0.x uses a private extension to CID 12141 to define a new fetal vascular anatomical location for ‘Ductus Venosus’. Also, the anatomical locations ‘Umbilical Artery’ and ‘Uterine Artery’ defined in CID 12140 (‘Pelvic Vasculature Anatomic Location’) have been included in CID 12141 as CX50 2.0.x considers this as Fetal measurement rather than Pelvic measurement.

Following table shows the extension to Fetal Vasculature Anatomical Locations (CID 12141) used by CX50 2.0.x.

CSD	CV	CM
99PMSBLUS	C12141-01	Ductus Venosus
SRT	T-F1810	Umbilical Artery
SRT	T-46820	Uterine Artery*

* Uterine Artery for Fetal Vascular includes $LATERALITY=(G-A101, SRT, “Left”); (G-A100, SRT, “Right”)

The following table shows the fetal vascular measurements (and calculations) used in CX50 2.0.x as part of TID 5025.

Fetal Vascular Measurements

Measurement	Measurement Type from CID 12119 and it's includes.	Vascular Anatomic Location from CID 12141
Diastolic Velocity (Ductus Venosus)	(LN, 11653-3, End Diastolic Velocity)	(99PMSBLUS, C12141-01, Ductus Venosus)
Systolic Velocity (Ductus Venosus)	(LN, 11726-7, Peak Systolic Velocity)	(99PMSBLUS, C12141-01, Ductus Venosus)
Minimum Diastolic Velocity (Ductus Venosus)	(LN, 11665-7, Minimum Diastolic Velocity)	(99PMSBLUS, C12141-01, Ductus Venosus)
Time Averaged Peak Velocity (Ductus Venosus)	(LN, 11692-1, Time Averaged Peak Velocity)	(99PMSBLUS, C12141-01, Ductus Venosus)
Time Averaged Mean Velocity (Ductus Venosus)	(LN, 20352-1, Time Averaged Mean Velocity)	(99PMSBLUS, C12141-01, Ductus Venosus)
Acceleration Index (Ductus Venosus)	(LN, 20167-3, Acceleration Index)	(99PMSBLUS, C12141-01, Ductus Venosus)
Acceleration Time (Ductus Venosus)	(LN, 20168-1, Acceleration Time)	(99PMSBLUS, C12141-01, Ductus Venosus)
Velocity Time Integral (Ductus Venosus)	(LN, 20354-7, Velocity Time Integral)	(99PMSBLUS, C12141-01, Ductus Venosus)
Pulsatility Index (Ductus Venosus)	(LN, 12008-9, Pulsatility Index)	(99PMSBLUS, C12141-01, Ductus Venosus)
Resistivity Index (Ductus Venosus)	(LN, 12023-8, Resistivity Index)	(99PMSBLUS, C12141-01, Ductus Venosus)
Systolic to Diastolic Ratio (Ductus Venosus)	(LN, 12144-2, Systolic to Diastolic Velocity Ratio)	(99PMSBLUS, C12141-01, Ductus Venosus)
Diastolic to Systolic Velocity Ratio (Ductus Venosus)	(99PMSBLUS, C12121-01, Diastolic to Systolic Velocity Ratio)	(99PMSBLUS, C12141-01, Ductus Venosus)
Diastolic Velocity (Umbilical Artery)	(LN, 11653-3, End Diastolic Velocity)	(SRT, T-F1810, Umbilical Artery)
Systolic Velocity (Umbilical Artery)	(LN, 11726-7, Peak Systolic Velocity)	(SRT, T-F1810, Umbilical Artery)
Minimum Diastolic Velocity (Umbilical Artery)	(LN, 11665-7, Minimum Diastolic Velocity)	(SRT, T-F1810, Umbilical Artery)
Time Averaged Peak Velocity (Umbilical Artery)	(LN, 11692-1, Time Averaged Peak Velocity)	(SRT, T-F1810, Umbilical Artery)
Time Averaged Mean Velocity (Umbilical Artery)	(LN, 20352-1, Time Averaged Mean Velocity)	(SRT, T-F1810, Umbilical Artery)
Acceleration Index (Umbilical Artery)	(LN, 20167-3, Acceleration Index)	(SRT, T-F1810, Umbilical Artery)
Acceleration Time (Umbilical Artery)	(LN, 20168-1, Acceleration Time)	(SRT, T-F1810, Umbilical Artery)
Velocity Time Integral (Umbilical Artery)	(LN, 20354-7, Velocity Time Integral)	(SRT, T-F1810, Umbilical Artery)

Pulsatility Index (Umbilical Artery)	(LN, 12008-9, Pulsatility Index)	(SRT, T-F1810, Umbilical Artery)
Resistivity Index (Umbilical Artery)	(LN, 12023-8, Resistivity Index)	(SRT, T-F1810, Umbilical Artery)
Systolic to Diastolic Ratio (Umbilical Artery)	(LN, 12144-2, Systolic to Diastolic Velocity Ratio)	(SRT, T-F1810, Umbilical Artery)
Diastolic to Systolic Velocity Ratio (Umbilical Artery)	(99PMSBLUS, C12121-01, Diastolic to Systolic Velocity Ratio)	(SRT, T-F1810, Umbilical Artery)
Diastolic Velocity (Middle Cerebral Artery)	(LN, 11653-3, End Diastolic Velocity)	(SRT, T-45600, Middle Cerebral Artery)
Systolic Velocity (Middle Cerebral Artery)	(LN, 11726-7, Peak Systolic Velocity)	(SRT, T-45600, Middle Cerebral Artery)
Minimum Diastolic Velocity (Middle Cerebral Artery)	(LN, 11665-7, Minimum Diastolic Velocity)	(SRT, T-45600, Middle Cerebral Artery)
Time Averaged Peak Velocity (Middle Cerebral Artery)	(LN, 11692-1, Time Averaged Peak Velocity)	(SRT, T-45600, Middle Cerebral Artery)
Time Averaged Mean Velocity (Middle Cerebral Artery)	(LN, 20352-1, Time Averaged Mean Velocity)	(SRT, T-45600, Middle Cerebral Artery)
Acceleration Index (Middle Cerebral Artery)	(LN, 20167-3, Acceleration Index)	(SRT, T-45600, Middle Cerebral Artery)
Acceleration Time (Middle Cerebral Artery)	(LN, 20168-1, Acceleration Time)	(SRT, T-45600, Middle Cerebral Artery)
Velocity Time Integral (Middle Cerebral Artery)	(LN, 20354-7, Velocity Time Integral)	(SRT, T-45600, Middle Cerebral Artery)
Pulsatility Index (Middle Cerebral Artery)	(LN, 12008-9, Pulsatility Index)	(SRT, T-45600, Middle Cerebral Artery)
Resistivity Index (Middle Cerebral Artery)	(LN, 12023-8, Resistivity Index)	(SRT, T-45600, Middle Cerebral Artery)
Systolic to Diastolic Ratio (Middle Cerebral Artery)	(LN, 12144-2, Systolic to Diastolic Velocity Ratio)	(SRT, T-45600, Middle Cerebral Artery)
Diastolic to Systolic Velocity Ratio (Middle Cerebral Artery)	(99PMSBLUS, C12121-01, Diastolic to Systolic Velocity Ratio)	(SRT, T-45600, Middle Cerebral Artery)
Diastolic Velocity (Left Uterine Artery)	(LN, 11653-3, End Diastolic Velocity)	(SRT, T-46820, Uterine Artery) $Laterality= Left
Systolic Velocity (Left Uterine Artery)	(LN, 11726-7, Peak Systolic Velocity)	(SRT, T-46820, Uterine Artery) $Laterality= Left
Minimum Diastolic Velocity (Left Uterine Artery)	(LN, 11665-7, Minimum Diastolic Velocity)	(SRT, T-46820, Uterine Artery) $Laterality= Left
Time Averaged Peak Velocity (Left Uterine Artery)	(LN, 11692-1, Time Averaged Peak Velocity)	(SRT, T-46820, Uterine Artery) $Laterality= Left
Pulsatility Index (Left Uterine Artery)	(LN, 12008-9, Pulsatility Index)	(SRT, T-46820, Uterine Artery) $Laterality= Left
Resistivity Index (Left Uterine Artery)	(LN, 12023-8, Resistivity Index)	(SRT, T-46820, Uterine Artery) $Laterality= Left

Systolic to Diastolic Ratio (Left Uterine Artery)	(LN, 12144-2, Systolic to Diastolic Velocity Ratio)	(SRT, T-46820, Uterine Artery) $Laterality= Left
Diastolic Velocity (Right Uterine Artery)	(LN, 11653-3, End Diastolic Velocity)	(SRT, T-46820, Uterine Artery) $Laterality= Right
Systolic Velocity (Right Uterine Artery)	(LN, 11726-7, Peak Systolic Velocity)	(SRT, T-46820, Uterine Artery) $Laterality= Right
Minimum Diastolic Velocity (Right Uterine Artery)	(LN, 11665-7, Minimum Diastolic Velocity)	(SRT, T-46820, Uterine Artery) $Laterality= Right
Time Averaged Peak Velocity (Right Uterine Artery)	(LN, 11692-1, Time Averaged Peak Velocity)	(SRT, T-46820, Uterine Artery) $Laterality= Right
Pulsatility Index (Right Uterine Artery)	(LN, 12008-9, Pulsatility Index)	(SRT, T-46820, Uterine Artery) $Laterality= Right
Resistivity Index (Right Uterine Artery)	(LN, 12023-8, Resistivity Index)	(SRT, T-46820, Uterine Artery) $Laterality= Right
Systolic to Diastolic Ratio (Right Uterine Artery)	(LN, 12144-2, Systolic to Diastolic Velocity Ratio)	(SRT, T-46820, Uterine Artery) $Laterality= Right

A.2.1.14 OB-GYN Pelvic Vascular Ultrasound Measurement Group (TID 5026)

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	EV (T-D6007, SRT, “Pelvic Vascular Structure”)	
2	>	HAS CONCEPT MOD	CODE	EV (G-C171, SRT “Laterality”)	Laterality is used only if the measurement needs to be qualified with the laterality of the anatomy.
3	>	CONTAINS	NUM	Measurement of selected pelvic vascular anatomic location.	Measurement types from CID 12119 (Vascular Ultrasound Property) and CID 12121 (Vascular Indices and Ratios) for the anatomical locations specified in CID 12140 (Pelvic Vasculature Anatomic Locations) are used.

A.2.1.14.1 Pelvic Vascular Measurements

Following table shows the pelvic vascular measurements (and calculations) used in CX50 2.0.x as part of TID 5026.

Measurement	Measurement Type from CID 12119 and it’s includes.	Vascular Anatomic Location from CID 12140
Diastolic Velocity (Left Ovarian Artery)	(LN, 11653-3, End Diastolic Velocity)	(SRT, T-46980, Ovarian Artery) $Laterality = Left

Systolic Velocity (Left Ovarian Artery)	(LN, 11726-7, Peak Systolic Velocity)	(SRT, T-46980, Ovarian Artery) $Laterality = Left
Minimum Diastolic Velocity (Left Ovarian Artery)	(LN, 11665-7, Minimum Diastolic Velocity)	(SRT, T-46980, Ovarian Artery) $Laterality = Left
Time Averaged Peak Velocity (Left Ovarian Artery)	(LN, 11692-1, Time Averaged Peak Velocity)	(SRT, T-46980, Ovarian Artery) $Laterality = Left
Time Averaged Mean Velocity (Left Ovarian Artery)	(LN, 20352-1, Time Averaged Mean Velocity)	(SRT, T-46980, Ovarian Artery) $Laterality = Left
Acceleration Index (Left Ovarian Artery)	(LN, 20167-3, Acceleration Index)	(SRT, T-46980, Ovarian Artery) $Laterality = Left
Acceleration Time (Left Ovarian Artery)	(LN, 20168-1, Acceleration Time)	(SRT, T-46980, Ovarian Artery) $Laterality = Left
Velocity Time Integral (Left Ovarian Artery)	(LN, 20354-7, Velocity Time Integral)	(SRT, T-46980, Ovarian Artery) $Laterality = Left
Pulsatility Index (Left Ovarian Artery)	(LN, 12008-9, Pulsatility Index)	(SRT, T-46980, Ovarian Artery) $Laterality = Left
Resistivity Index (Left Ovarian Artery)	(LN, 12023-8, Resistivity Index)	(SRT, T-46980, Ovarian Artery) $Laterality = Left
Systolic to Diastolic Ratio (Left Ovarian Artery)	(LN, 12144-2, Systolic to Diastolic Velocity Ratio)	(SRT, T-46980, Ovarian Artery) $Laterality = Left
Diastolic to Systolic Ratio (Left Ovarian Artery)	(99PMSBLUS, C12121-01, Diastolic to Systolic Velocity Ratio)	(SRT, T-46980, Ovarian Artery) $Laterality = Left
Diastolic Velocity (Right Ovarian Artery)	(LN, 11653-3, End Diastolic Velocity)	(SRT, T-46980, Ovarian Artery) $Laterality = Right
Systolic Velocity (Right Ovarian Artery)	(LN, 11726-7, Peak Systolic Velocity)	(SRT, T-46980, Ovarian Artery) $Laterality = Right
Minimum Diastolic Velocity (Right Ovarian Artery)	(LN, 11665-7, Minimum Diastolic Velocity)	(SRT, T-46980, Ovarian Artery) $Laterality = Right
Time Averaged Peak Velocity (Right Ovarian Artery)	(LN, 11692-1, Time Averaged Peak Velocity)	(SRT, T-46980, Ovarian Artery) $Laterality = Right
Time Averaged Mean Velocity (Right Ovarian Artery)	(LN, 20352-1, Time Averaged Mean Velocity)	(SRT, T-46980, Ovarian Artery) $Laterality = Right
Acceleration Index (Right Ovarian Artery)	(LN, 20167-3, Acceleration Index)	(SRT, T-46980, Ovarian Artery) $Laterality = Right
Acceleration Time (Right Ovarian Artery)	(LN, 20168-1, Acceleration Time)	(SRT, T-46980, Ovarian Artery) $Laterality = Right
Velocity Time Integral (Right Ovarian Artery)	(LN, 20354-7, Velocity Time Integral)	(SRT, T-46980, Ovarian Artery) $Laterality = Right
Pulsatility Index (Right Ovarian Artery)	(LN, 12008-9, Pulsatility Index)	(SRT, T-46980, Ovarian Artery) $Laterality = Right
Resistivity Index (Right Ovarian Artery)	(LN, 12023-8, Resistivity Index)	(SRT, T-46980, Ovarian Artery) $Laterality = Right
Systolic to Diastolic Ratio (Right Ovarian Artery)	(LN, 12144-2, Systolic to Diastolic Velocity Ratio)	(SRT, T-46980, Ovarian Artery) $Laterality = Right

Diastolic to Systolic Ratio (Right Ovarian Artery)	(99PMSBLUS, C12121-01, Diastolic to Systolic Velocity Ratio)	(SRT, T-46980, Ovarian Artery) $Laterality = Right
Diastolic Velocity (Uterine Artery)	(LN, 11653-3, End Diastolic Velocity)	(SRT, T-46820, Uterine Artery)
Systolic Velocity (Uterine Artery)	(LN, 11726-7, Peak Systolic Velocity)	(SRT, T-46820, Uterine Artery)
Minimum Diastolic Velocity (Uterine Artery)	(LN, 11665-7, Minimum Diastolic Velocity)	(SRT, T-46820, Uterine Artery)
Time Averaged Peak Velocity (Uterine Artery)	(LN, 11692-1, Time Averaged Peak Velocity)	(SRT, T-46820, Uterine Artery)
Time Averaged Mean Velocity (Uterine Artery)	(LN, 20352-1, Time Averaged Mean Velocity)	(SRT, T-46820, Uterine Artery)
Acceleration Index (Uterine Artery)	(LN, 20167-3, Acceleration Index)	(SRT, T-46820, Uterine Artery)
Acceleration Time (Uterine Artery)	(LN, 20168-1, Acceleration Time)	(SRT, T-46820, Uterine Artery)
Velocity Time Integral (Uterine Artery)	(LN, 20354-7, Velocity Time Integral)	(SRT, T-46820, Uterine Artery)
Pulsatility Index (Uterine Artery)	(LN, 12008-9, Pulsatility Index)	(SRT, T-46820, Uterine Artery)
Resistivity Index (Uterine Artery)	(LN, 12023-8, Resistivity Index)	(SRT, T-46820, Uterine Artery)
Systolic to Diastolic Ratio (Uterine Artery)	(LN, 12144-2, Systolic to Diastolic Velocity Ratio)	(SRT, T-46820, Uterine Artery)
Diastolic to Systolic Ratio (Uterine Artery)	(99PMSBLUS, C12121-01, Diastolic to Systolic Velocity Ratio)	(SRT, T-46820, Uterine Artery)

A.2.1.15 Gestation Age Equations & Tables (CID 12013)

The following are the Gestation Age Equations and Tables supported by CX50 2.0.x:

CSD	CV	Code Meaning
LN	11885-1	Gestational Age by LMP
LN	11892-7	AC, Hadlock 1984
LN	33073-8	AC, Hansmann 1985
LN	33076-1	AC, Shinozuka 1996
LN	33086-0	BPD-oi, Chitty 1997
LN	11902-4	BPD, Hadlock 1984
LN	33538-0	BPD, Hansmann 1986
LN	11905-7	BPD, Jeanty 1984
LN	33082-9	BPD, Osaka 1989
LN	33084-5	BPD, Shinozuka 1996

LN	33085-2	BPD, Tokyo 1986
LN	33540-6	CRL, Hansmann 1986
LN	11917-2	CRL, Jeanty 1984
LN	33093-6	CRL, Osaka 1989
LN	33094-4	CRL, Rempen 1991
LN	11914-9	CRL, Robinson 1975
LN	33095-1	CRL, Shinozuka 1996
LN	33096-9	CRL, Tokyo 1986
LN	33098-5	FL, Chitty 1997
LN	11920-6	FL, Hadlock 1984
LN	33541-4	FL, Hansmann 1986
LN	11923-0	FL, Jeanty 1984
LN	33542-2	FL, Merz 1988
LN	33101-7	FL, Osaka 1989
LN	33102-5	FL, Shinozuka 1996
LN	33103-3	FL, Tokyo 1986
LN	33106-6	GS, Hansmann 1982
LN	11928-9	GS, Hellman 1969
LN	11929-7	GS, Rempen 1991
LN	33108-2	GS, Tokyo 1986
LN	33111-6	HC derived, Chitty 1997
LN	11932-1	HC, Hadlock 1984
LN	33543-0	HC, Hansmann 1986
LN	33115-7	HC Merz, 1988
LN	33117-3	Humerus Length, Osaka 1989
LN	11936-2	Humerus, Jeanty 1984
LN	33120-7	OFD, Hansmann 1986
LN	33127-2	Spine Length, Tokyo, 1989
LN	11941-2	Tibia, Jeanty 1984
LN	33138-9	Fetal Trunk Cross Sectional Area, Osaka 1989
LN	11944-6	Ulna, Jeanty 1984
99PMSBLUS	C12013-16	AC Merz 1991
99PMSBLUS	C12013-17	BPD Merz 1991
99PMSBLUS	C12013-18	Transverse Trunk Diameter Hansmann 1986
99PMSBLUS	C12013-19	CRL Robinson Fleming 1975

99PMSBLUS	C12013-21	APTDxTTD Shinozuka 2000
99PMSBLUS	C12013-22	CRL JSUM 2001
99PMSBLUS	C12013-23	TC Nimrod 1986

A.2.1.16 OB Fetal Body Weight Equations & Tables

CSD	CV	Code Meaning
LN	11738-2	EFW by AC, BPD, Hadlock 1984
LN	11735-8	EFW by AC, BPD, FL, Hadlock 1985
LN	11732-5	EFW by AC, BPD, FL, HC, Hadlock 1985
LN	11751-5	EFW by AC, FL, Hadlock 1985
LN	11746-5	EFW by AC, FL, HC, Hadlock 1985
LN	11739-0	EFW by AC and BPD, Shepard 1982
LN	33140-5	EFW by BPD, FTA, FL, Osaka 1990
LN	33144-7	EFW by BPD, APAD, TAD, FL, Tokyo 1987
LN	33143-9	EFW3 by Shinozuka 1996
99PMSBLUS	C12014-01	EFW by AC, BPD and FL Shinozuka 2000

A.3 ADULT ECHOCARDIOGRAPHY STRUCTURED REPORT TEMPLATE

CX50 2.0.x implements the Adult Echocardiography Template (TID 5200) from the DICOM standard, part 16. This appendix describes the scope and manner that CX50 2.0.x measurements appear in DICOM SR.

Measurements and calculations performed for cardiac studies will lead to creation of "Adult Echocardiography Procedure Report" structured report documents. Measurements can be performed by pressing the 'Calc' key on CX50 2.0.x control panel and selecting the Adult Echo analysis package. Measurements and calculations available in the menu can be configured through the setup application. It is also possible to configure the measurement unit (Metric or U.S).

All concepts with value type (VT) NUM will always have a 'MeasurementUnitCodeSequence' that specifies the unit of the measurement. The CSD for all units will be UCUM (Unified Code for Units) and CV and CM will be based on application configuration and will confirm to UCUM standards.

A.3.1 Template specific conformance for TID 5200

The template for the root of the content tree for TID 5200 and its use in the CX50 2.0.x context is described in the following table.

Note: Only the rows that apply to use by CX50 2.0.x are included.

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	EV (125200, DCM, "Adult Echocardiography Procedure Report")	This is the root 'CONTAINER'
2	>	CONTAINS	INCLUDE	DTID (5201) Echocardiography Patient Characteristics	Refer to A.3.2 for CX50 2.0.x usage of this.
3	>	CONTAINS	INCLUDE	DTID (T5200-03) Echo Procedure Summary Section	Refer to A.3.3 for CX50 2.0.x usage of this.
4	>	CONTAINS	INCLUDE	DTID (5202) Echo Section	Concepts in CID 12200 will be used with $SectionSubject = EV (T-32600, SRT, "Left Ventricle").
5	>	CONTAINS	INCLUDE	DTID (5202) Echo Section	Concepts in CID 12204 will be used with $SectionSubject = EV (T-32500, SRT, "Right Ventricle").
6	>	CONTAINS	INCLUDE	DTID (5202) Echo Section	Concepts in CID 12205 will be used with $SectionSubject = EV (T-32300, SRT, "Left Atrium").
7	>	CONTAINS	INCLUDE	DTID (5202) Echo Section	Concepts in CID 12206 will be used with $SectionSubject = EV (T-32200, SRT, "Right Atrium").
8	>	CONTAINS	INCLUDE	DTID (5202) Echo Section	Concepts in CID 12211 will be used with $SectionSubject = EV (T-35400, SRT, "Aortic Valve").
9	>	CONTAINS	INCLUDE	DTID (5202) Echo Section	Concepts in CID 12207 will be used with $SectionSubject = EV (T-35300, SRT, "Mitral Valve").

10	>	CONTAINS	INCLUDE	DTID (5202) Echo Section	Concepts in CID 12209 will be used with $SectionSubject = EV (T-35200, SRT, “Pulmonic Valve”).
11	>	CONTAINS	INCLUDE	DTID (5202) Echo Section	Concepts in CID 12208 will be used with $SectionSubject = EV (T-35100, SRT, “Tricuspid Valve”).
12	>	CONTAINS	INCLUDE	DTID (5202) Echo Section	Concepts in CID 12212 will be used with $SectionSubject = EV (T-42000, SRT, “Aorta”.
13	>	CONTAINS	INCLUDE	DTID (5202) Echo Section	Concepts in CID 12210 will be used with $SectionSubject = EV (T-44000, SRT, “Pulmonary artery”).
14	>	CONTAINS	INCLUDE	DTID (5202) Echo Section	Concepts in CID 12214 will be used with $SectionSubject = EV (T-48581, SRT, “Pulmonary Venous Structure”).
15	>	CONTAINS	CONTAINER	DTID (5202) Echo Section	Concepts in CID 12217 will be used with $SectionSubject = EV (P5-30031, SRT, “Cardiac Shunt Study”).
16	>	CONTAINS	CONTAINER	DTID (5204) Wall Motion Analysis	This section is used to include all Wall Motion Analysis related details. Refer to A.3.6 for more details.
17	>	CONTAINS	CONTAINER	DTID (T5200-01) Hepatic Veins Section	Concepts in CID 12216 will be used with $SectionSubject = EV (T5200-01, 99PMSBLUS, “Hepatic Veins”). Refer to A.3.7 for more details.

A.3.2 Echocardiography Patient Characteristics (TID 5201)

Use of the template TID 5201 in the context of CX50 2.0.x is described in the following table.

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	EV (121118, DCM, “Patient Characteristics”)	
2	>	CONTAINS	CODE	EV (121032, DCM, “Subject Sex”)	Value is taken from PDE (Patient Data Entry) screen or from the MWL and the corresponding Concepts are taken from the DCID 7455.
3	>	CONTAINS	NUM	EV (F-008EC, SRT, “Systolic Blood Pressure”)	Value is taken from PDE (Patient Data Entry) screen.
4	>	CONTAINS	NUM	EV (F-008ED, SRT, “Diastolic Blood Pressure”)	Value is taken from PDE (Patient Data Entry) screen.
5	>	CONTAINS	NUM	EV (8277-6, LN, “Body Surface Area”)	Value automatically calculated by the CX50 2.0.x system based on the Height and Weight values entered on PDE (Patient Data Entry) screen.

A.3.3 Echo Procedure Summary Section (TID 5200-03)

This is a privately defined template to put all the observations, findings and comments entered for the cardiac study in the reporting screen. The following table describes the use of this template in the context of CX50 2.0.x.

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	DT (121111, DCM, “Summary”)	
2	>	CONTAINS	TEXT	EV (121106, DCM, “Comment”)	This field contains all observations, findings and the comments entered in the reporting screen on the CX50 2.0.x. The format of the finding entry is “<FindingGroupName>space<FindingText>”, where FindingGroupName is the Anatomy name and FindingText is the text description of the finding.

A.3.4 Echo Section (TID 5202)

This template is invoked multiple times by passing different section subjects as ‘Finding Site’ value. Use of the template TID 5202 in the context of CX50 2.0.x is described in the following table.

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	EV(121070, DCM, ”Findings”)	
2	>	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, “Finding Site”)	Value passed in the parameter $SectionSubject is given here.
3	>	CONTAINS	CONTAINER	DT (125007, DCM, “Measurement Group”)	
4	>>	HAS CONCEPT MOD	CODE	EV(G-0373, SRT, ”Image Mode”)	The value is taken from BCID 12224.
5	>	CONTAINS	INCLUDE	DTID (5203) Echo Measurement	This template is invoked multiple times for all the measurements done on the $SectionSubject. Refer to section A.3.5 for details of CX50 2.0.x usage of this.

A.3.5 Echo Measurement (TID 5203)

Use of the template TID 5203 in the context of CX50 2.0.x is described in the following table.

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			INCLUDE	DTID (300) Measurement	
2	>>	HAS CONCEPT MOD	CODE	EV (G-C036, SRT, “Measurement Method")	This row is used only if the measurement or calculation this template is invoked with mandates it. Otherwise this row is not used. The values are taken from the BCID 12227.
3	>>	INFERRED FROM	SCOORD	Spatial Coordinate Macro	This gives information on measurements coordinates on the referenced image. Coordinate information is given in the form of Graphic Data and Graphic Type.
4	>>>	SELECTED FROM	IMAGE	Image Reference Macro	It refers to the single frame image on which this measurement is done. SOP Class UID and SOP Instance UID of the corresponding image will be present.
5	>>	INFERRED FROM	NUM	Referenced Content Item Identifier	This row is used only if the measurement or calculation this template is invoked with is of type MOD Volume measurements. In this case, reference to those twenty Left Ventricle MOD Diam entries, based on which this volume measurement is calculated is given here.
6	>>	HAS CONCEPT MOD	CODE	EV (121401, DCM, “Derivation”)	If a user has performed more than one measurement then he / she can either use average (default) of these instances or he can specifically select one of the measured instance for using in calculations. If the selection is Average, then that average measurement instance will have a derivation modifier as (R-00317, SRT, “Mean”).
7	>>	HAS PROPERTIES	CODE	EV (121404, DCM, “Selection Status”)	This will have a value ‘Mean Value Chosen’ if the Derivation is ‘Mean’. In all other cases, this will have a value, ‘User Chosen Value’.
8	>	HAS CONCEPT MOD	CODE	EV (G-C048, SRT, “Flow Direction”)	This row is used only if the measurement or calculation this template is invoked with mandates it. Otherwise this row is not used. The values are taken from the BCID 12221.
9	>	HAS CONCEPT MOD	CODE	EV (R-4089A, SRT, “Cardiac Cycle Point”)	IFF $Measurement = (99PMSBLUS, C12201-01, “Left Ventricle MOD Diam”). The values are taken from DCID 12233.
10	>	HAS CONCEPT MOD	CODE	EV (G-0373, SRT, “Image Mode”)	This row is used only if the measurement or calculation this template is invoked with mandates it. Otherwise this row is not used. The values are taken from the BCID 12224.

11	>	HAS CONCEPT MOD	CODE	EV (111031, DCM, “Image View”)	This row is used only if the measurement or calculation this template is invoked with mandates it. Otherwise this row is not used. The values are taken from the BCID 12226.
12	>	HAS CONCEPT MOD	TEXT	EV (99PMSBLUS, T5203-01, “Simpson's Disk Number”) = value	IFF $Measurement = (99PMSBLUS, C12201-01, “Left Ventricle MOD Diam”). The ‘value’ will be in the range, 1-20.

A.3.6 Wall Motion Analysis (TID 5204)

This template is invoked as many times as the number of the Wall Motion stages done for the stress study. Use of the template TID 5204 in the context of CX50 2.0.x is described in the following table.

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	EV (121070, DCM, ”Findings”)	
2	>	HAS CONCEPT MOD	CODE	EV (121058, DCM, ”Procedure reported”)	DT (P5-B3121, SRT, "Echocardiography for Determining Ventricular Contraction")
6	>	CONTAINS	NUM	DT (125202, DCM, “LV Wall Motion Score Index”)	CX50 2.0.x computes the Wall Motion Score index from the assessment done on the Wall segments for that particular stage.
7	>>	HAS CONCEPT MOD	CODE	EV (G-E048, SRT, “Assessment Scale”)	CX50 2.0.x uses the 5 Point Segment Finding Scale for Wall motion score index. Concept from BCID 12238 is used here.
8	>	CONTAINS	CONTAINER	EV (121070, DCM, "Findings")	
9	>>	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, “Finding Site”)	DT (T-D0772, SRT, ”Myocardial Wall”)
10	>>	CONTAINS	CODE	EV (LN, 18179-2, "Wall Segment”)	CX50 2.0.x performs Wall motion analysis based on 16-segment assessment. Concepts for the segments are taken from the BCID 3717.
11	>>>	HAS PROPERTIES	CODE	EV (F-32050, SRT, ”Cardiac Wall Motion”)	Concepts from DCID 3703 are used here. This row will be present only if row 12 is absent.
12	>>>	HAS PROPERTIES	CODE	EV (G-C504, SRT, "Associated Morphology")	Concepts from DCID 3704 are used here. This row will be present only if row 11 is absent.
13	>>>	HAS PROPERTIES	NUM	DT (G-C1E3, SRT, “Score”)	

A.3.7 Hepatic Veins (T5200-01)

This template is used for measurements of the Hepatic Veins. Use of the template T5200-01 in the context of CX50 2.0.x is described in the following table.

No	NL	REL WITH PARENT	VT	Concept Name	Comments
1			CONTAINER	EV (121070, DCM, ”Findings”)	
2	>	HAS CONCEPT MOD	CODE	EV (G-C0E3, SRT, “Finding Site”)	Value passed in the parameter $SectionSubject is given here.
3	>	CONTAINS	CONTAINER	DT (125007, DCM, “Measurement Group”)	
4	>>	HAS PROPERTIES	CODE	EV (121404, DCM, “Selection Status”)	This will have a value ‘Mean Value Chosen’ if the Derivation is ‘Mean’. In all other cases, this will have a value, ‘User Chosen Value’.
5	>>	CONTAINS	CODE	EV (29471-0, LN, “Hepatic Vein Systolic Peak Velocity”)	This value is taken from CID 12216.
6	>>	CONTAINS	CODE	EV (29474-4, LN, “Hepatic Vein Atrial Contraction Reversal Peak Velocity”)	This value is taken from CID 12216.
7	>>	CONTAINS	CODE	EV (C12216-01, 99PMSBLUS, “Hepatic Vein A-Wave Duration”)	This value is an extension to CID 122216.
8	>>	CONTAINS	CODE	EV (29472-8, LN, “Hepatic Vein Diastolic Peak Velocity”)	This value is taken from CID 12216.
9	>>	CONTAINS	CODE	EV (29473-6, LN “Hepatic Vein Systolic to Diastolic Ratio”)	This value is taken from CID 12216.

A.3.8 eDCS – Adult Echocardiography Template Support

The following list represents the Electronic DICOM Conformance Statement (eDCS) format for the Structured Report output for the Adult Echocardiography Procedure Report as supported on CX50 2.0.x.

This list is made up of 'signatures' that describe the group of codes used for each exported measurement and calculation result.

A 'signature' will contain the Label as displayed on the system user interface in the Calcs application and report pages, followed by the modifiers required by the DICOM SR Template and Structured Reporting SOP Class in order to include a given measurement or calculation value.

Some signatures will contain as few as two or as many as six modifiers.

In the table below, the following terms are used:

CSD	Coding Scheme Designator
CV	Code Value
CM	Code Meaning
Mod Type	Concept Modifier Type

"Mod Type" Field

App	Application or SR Template this measurement or calculation applies to
Site	The finding site as specified by the template
Concept	The code sequence as defined by the CSD
Mode	The imaging mode used for this value
Direction	Regurgitant or Antegrade flow
Method	Measurement or Calculation method used
Target	Location
View	Cardiac Imaging View

Following this list is a list of measurements that will not be exported.

A.3.8.1 eDCS Table

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
A Wave Amp	concept	99PMSBLUS	C12209-02	A Wave Amp
	mode	SRT	G-0394	M mode
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	cm	Centimeter
AI Acc Time	concept	LN	20168-1	Acceleration Time
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	sec	Seconds
AI Acc Time Slope	concept	99PMSBLUS	C12222-04	Acceleration Slope
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm/s2	Centimeter Per Second Square
AI Alias Vel	concept	99PMSBLUS	C12222-02	Alias Velocity
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm/s	Centimeter Per Second
AI Dec Slope	concept	LN	20216-8	Deceleration Slope
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	units	UCUM	cm/s2	Centimeter Per Second Square
AI Dec Slope Time	concept	LN	20217-6	Deceleration Time
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	sec	Seconds
AI End Dias Vel	concept	LN	11653-3	End Diastolic Velocity
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm/s	Centimeter Per Second
AI ERO	concept	SRT	G-038E	Cardiovascular Orifice Area
	direction	SRT	R-42E61	Regurgitant Flow
	method	DCM	125216	Proximal Isovelocity Surface Area
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm2	Square Centimeter
AI Flow Rate	concept	LN	34141-2	Peak Instantaneous Flow Rate
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	ml/sec	ml/sec
AI Fraction	concept	SRT	G-0390	Regurgitant Fraction
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	%	Percent
AI Max PG	concept	LN	20247-3	Peak Gradient
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
AI Mean PG	concept	LN	20256-4	Mean Gradient
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
AI P1/2t	concept	LN	20280-4	Pressure Half-Time
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	msec	Millisecond
AI Radius	concept	99PMSBLUS	C12222-01	Flow Radius
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm	Centimeter
AI Vmax	concept	LN	11726-7	Peak Velocity
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm/s	Centimeter Per Second
AI Vmean	concept	LN	20352-1	Mean Velocity
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm/s	Centimeter Per Second

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
AI Volume	concept	LN	33878-0	Volume Flow
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	ml	Milliliter
AI VTI	concept	LN	20354-7	Velocity Time Integral
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm	Centimeter
Ao Arch Diam	concept	LN	18011-7	Aortic Arch Diameter
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-42000	Aorta
	units	UCUM	cm	Centimeter
Ao Isthmus Diam	concept	LN	18014-1	Aortic Isthmus Diameter
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-42000	Aorta
	units	UCUM	cm	Centimeter
AoR Diam (2D)	concept	LN	18015-8	Aortic Root Diameter
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-42000	Aorta
	units	UCUM	cm	Centimeter
AoR Diam (MM)	concept	LN	18015-8	Aortic Root Diameter
	mode	SRT	G-0394	M mode
	site	SNM3	T-42000	Aorta
	units	UCUM	cm	Centimeter
Asc Ao Diam	concept	LN	18012-5	Ascending Aortic Diameter
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-42000	Aorta
	units	UCUM	cm	Centimeter
Associated Morphology	concept	SRT	G-C504	Associated Morphology
AV Acc Time	concept	LN	20168-1	Acceleration Time
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	sec	Seconds
AV Acc Time Slope	concept	99PMSBLUS	C12222-04	Acceleration Slope
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm/s2	Centimeter Per Second Square
AV Area	concept	SRT	G-038E	Cardiovascular Orifice Area
	method	DCM	125220	Planimetry
	mode	SRT	G-03A2	2D mode
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm2	Square Centimeter
AV Cusp Sep	concept	LN	17996-0	Aortic Valve Cusp Separation
	mode	SRT	G-0394	M mode
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm	Centimeter

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
AV Dec Time	concept	LN	20217-6	Deceleration Time
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	sec	Seconds
AV Max PG	concept	LN	20247-3	Peak Gradient
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
AV Mean PG	concept	LN	20256-4	Mean Gradient
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
AV R-R	concept	LN	8867-4	Heart rate
	site	SRT	T-35400	Aortic Valve
	units	UCUM	sec	Seconds
AV Vmax	concept	LN	11726-7	Peak Velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm/s	Centimeter Per Second
AV Vmean	concept	LN	20352-1	Mean Velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm/s	Centimeter Per Second
AV VTI	concept	LN	20354-7	Velocity Time Integral
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm	Centimeter
AVA (Vmax)	concept	SRT	G-038E	Cardiovascular Orifice Area
	method	DCM	125214	Continuity Equation by Peak Velocity
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm2	Square Centimeter
AVA (VTI)	concept	SRT	G-038E	Cardiovascular Orifice Area
	method	DCM	125215	Continuity Equation by Velocity Time Integral
	site	SRT	T-35400	Aortic Valve
	units	UCUM	cm2	Square Centimeter
B-C Slope	concept	99PMSBLUS	C12209-03	B-C Slope
	mode	SRT	G-0394	M mode
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	cm/s	Centimeter Per Second
Cardiac Wall Motion	concept	SRT	F-32050	Cardiac Wall Motion
CI (2D-Cubed)	concept	SRT	F-32110	Cardiac Index
	method	DCM	125206	Cube Method
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min/m2	l/min/m2
CI (2D-Teich)	concept	SRT	F-32110	Cardiac Index

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	method	DCM	125209	Teichholz
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min/m2	l/min/m2
CI (A/L)	concept	SRT	F-32110	Cardiac Index
	method	DCM	125226	Single Plane Ellipse
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min/m2	l/min/m2
CI (MM-Cubed)	concept	SRT	F-32110	Cardiac Index
	method	DCM	125206	Cube Method
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min/m2	l/min/m2
CI (MM-Teich)	concept	SRT	F-32110	Cardiac Index
	method	DCM	125209	Teichholz
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min/m2	l/min/m2
CI(MOD-bp)	concept	SRT	F-32110	Cardiac Index
	method	DCM	125207	Method of Disks, Biplane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min/m2	l/min/m2
CI(MOD-sp2)	concept	SRT	F-32110	Cardiac Index
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min/m2	l/min/m2
	view	SRT	G-A19B	Apical two chamber
CI(MOD-sp4)	concept	SRT	F-32110	Cardiac Index
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min/m2	l/min/m2
	view	SRT	G-A19C	Apical four chamber
CO (2D-Cubed)	concept	SRT	F-32100	Cardiac Output
	method	DCM	125206	Cube Method
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min	Litre Per Minute
CO (2D-Teich)	concept	SRT	F-32100	Cardiac Output
	method	DCM	125209	Teichholz
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min	Litre Per Minute

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
CO (A/L)	concept	SRT	F-32100	Cardiac Output
	method	DCM	125226	Single Plane Ellipse
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min	Litre Per Minute
CO (LVOT)	concept	SRT	F-32100	Cardiac Output
	site	SNM3	T-32600	Left Ventricle
	target	SNM3	T-32650	Left Ventricle Outflow Tract
	units	UCUM	l/min	Litre Per Minute
CO (MM-Cubed)	concept	SRT	F-32100	Cardiac Output
	method	DCM	125206	Cube Method
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min	Litre Per Minute
CO (MM-Teich)	concept	SRT	F-32100	Cardiac Output
	method	DCM	125209	Teichholz
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min	Litre Per Minute
CO (MV)	concept	SRT	F-32100	Cardiac Output
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	l/min	Litre Per Minute
CO (RVOT)	concept	SRT	F-32100	Cardiac Output
	site	SRT	T-32500	Right Ventricle
	target	SNM3	T-32550	Right Ventricle Outflow Tract
	units	UCUM	l/min	Litre Per Minute
CO (TV)	concept	SRT	F-32100	Cardiac Output
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	l/min	Litre Per Minute
CO(MOD-bp)	concept	SRT	F-32100	Cardiac Output
	method	DCM	125207	Method of Disks, Biplane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min	Litre Per Minute
CO(MOD-sp2)	concept	SRT	F-32100	Cardiac Output
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min	Litre Per Minute
	view	SRT	G-A19B	Apical two chamber
CO(MOD-sp4)	concept	SRT	F-32100	Cardiac Output
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	l/min	Litre Per Minute
	view	SRT	G-A19C	Apical four chamber

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
Desc Ao Diam	concept	LN	18013-3	Descending Aortic Diameter
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-42000	Aorta
	units	UCUM	cm	Centimeter
E/Lat E`	concept	SRT	G-037B	Ratio of MV Peak Velocity to LV Peak Tissue Velocity E-Wave
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	1	no units
E/Med E`	concept	SRT	G-037B	Ratio of MV Peak Velocity to LV Peak Tissue Velocity E-Wave
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	1	no units
E`/A` Lateral	concept	99PMSBLUS	C12203-09	Ratio of LV E to A Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	1	no units
E`/A` Medial	concept	99PMSBLUS	C12203-09	Ratio of LV E to A Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	1	no units
EDV (2D-Cubed)	concept	LN	18026-5	Left Ventricular End Diastolic Volume
	method	DCM	125206	Cube Method
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
EDV (2D-Teich)	concept	LN	18026-5	Left Ventricular End Diastolic Volume
	method	DCM	125209	Teichholz
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
EDV (A/L)	concept	LN	18026-5	Left Ventricular End Diastolic Volume
	method	DCM	125226	Single Plane Ellipse
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
EDV (MM-Cubed)	concept	LN	18026-5	Left Ventricular End Diastolic Volume
	method	DCM	125206	Cube Method
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
EDV (MM-Teich)	concept	LN	18026-5	Left Ventricular End Diastolic Volume
	method	DCM	125209	Teichholz
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	units	UCUM	ml	Milliliter
EDV(MOD-bp)	concept	LN	18026-5	Left Ventricular End Diastolic Volume
	method	DCM	125207	Method of Disks, Biplane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
EDV(MOD-sp2)	concept	LN	18026-5	Left Ventricular End Diastolic Volume
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm3	Cubic Centimeter
	view	SRT	G-A19B	Apical two chamber
EDV(MOD-sp4)	concept	LN	18026-5	Left Ventricular End Diastolic Volume
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm3	Cubic Centimeter
	view	SRT	G-A19C	Apical four chamber
EF (2D-Cubed)	concept	LN	18043-0	Left Ventricular Ejection Fraction
	method	DCM	125206	Cube Method
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
EF (2D-Teich)	concept	LN	18043-0	Left Ventricular Ejection Fraction
	method	DCM	125209	Teichholz
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
EF (A/L)	concept	LN	18043-0	Left Ventricular Ejection Fraction
	method	DCM	125226	Single Plane Ellipse
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
EF (Dumesnil)	concept	99PMSBLUS	C3467-04	Left Ventricular Ejection Fraction by Dumesnil 1995
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
EF (MM-Cubed)	concept	LN	18043-0	Left Ventricular Ejection Fraction
	method	DCM	125206	Cube Method
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
EF (MM-Teich)	concept	LN	18043-0	Left Ventricular Ejection Fraction
	method	DCM	125209	Teichholz
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
EF(MOD-bp)	concept	LN	18043-0	Left Ventricular Ejection Fraction
	method	DCM	125207	Method of Disks, Biplane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
EF(MOD-sp2)	concept	LN	18043-0	Left Ventricular Ejection Fraction
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
	view	SRT	G-A19B	Apical two chamber
EF(MOD-sp4)	concept	LN	18043-0	Left Ventricular Ejection Fraction
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
	view	SRT	G-A19C	Apical four chamber
ESV (2D-Cubed)	concept	LN	18148-7	Left Ventricular End Systolic Volume
	method	DCM	125206	Cube Method
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
ESV (2D-Teich)	concept	LN	18148-7	Left Ventricular End Systolic Volume
	method	DCM	125209	Teichholz
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
ESV (A/L)	concept	LN	18148-7	Left Ventricular End Systolic Volume
	method	DCM	125226	Single Plane Ellipse
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
ESV (MM-Cubed)	concept	LN	18148-7	Left Ventricular End Systolic Volume
	method	DCM	125206	Cube Method
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
ESV (MM-Teich)	concept	LN	18148-7	Left Ventricular End Systolic Volume
	method	DCM	125209	Teichholz
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
ESV(MOD-bp)	concept	LN	18148-7	Left Ventricular End Systolic Volume
	method	DCM	125207	Method of Disks, Biplane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	units	UCUM	ml	Milliliter
ESV(MOD-sp2)	concept	LN	18148-7	Left Ventricular End Systolic Volume
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm3	Cubic Centimeter
	view	SRT	G-A19B	Apical two chamber
ESV(MOD-sp4)	concept	LN	18148-7	Left Ventricular End Systolic Volume
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm3	Cubic Centimeter
	view	SRT	G-A19C	Apical four chamber
FS (2D-Cubed)	concept	LN	18051-3	Left Ventricular Fractional Shortening
	method	DCM	125206	Cube Method
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
FS (2D-Teich)	concept	LN	18051-3	Left Ventricular Fractional Shortening
	method	DCM	125209	Teichholz
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
FS (MM-Cubed)	concept	LN	18051-3	Left Ventricular Fractional Shortening
	method	DCM	125206	Cube Method
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
FS (MM-Teich)	concept	LN	18051-3	Left Ventricular Fractional Shortening
	method	DCM	125209	Teichholz
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
Hep. A Revs Dur Time	concept	99PMSBLUS	C12216-01	Hepatic Vein A-Wave Duration
	site	99PMSBLUS	T5200-01	Hepatic Veins
	units	UCUM	sec	Seconds
Hep. A Revs Vel	concept	LN	29474-4	Hepatic Vein Atrial Contraction Reversal Peak Velocity
	site	99PMSBLUS	T5200-01	Hepatic Veins
	units	UCUM	cm/s	Centimeter Per Second
Hepatic Dias Vel	concept	LN	29472-8	Hepatic Vein Diastolic Peak Velocity
	site	99PMSBLUS	T5200-01	Hepatic Veins
	units	UCUM	cm/s	Centimeter Per Second
Hepatic S/D	concept	LN	29473-6	Hepatic Vein Systolic to Diastolic Ratio
	site	99PMSBLUS	T5200-01	Hepatic Veins
	units	UCUM	1	no units
Hepatic Sys Vel	concept	LN	29471-0	Hepatic Vein Systolic Peak Velocity

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	site	99PMSBLUS	T5200-01	Hepatic Veins
	units	UCUM	cm/s	Centimeter Per Second
HR LV	concept	LN	8867-4	Heart rate
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	{H.B.}/min	Beats Per Minute
IVCT Time	concept	SRT	G-037E	Left Ventricular Isovolumic Contraction Time
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	sec	Seconds
IVRT Time	concept	LN	18071-1	Left Ventricular Isovolumic Relaxation Time
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	sec	Seconds
IVS % (2D)	concept	LN	18054-7	Interventricular Septum % Thickening
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
IVS % (MM)	concept	LN	18054-7	Interventricular Septum % Thickening
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
IVS/LVPW (2D)	concept	LN	18155-2	Interventricular Septum to Posterior Wall Thickness Ratio
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	1	no units
IVS/LVPW (MM)	concept	LN	18155-2	Interventricular Septum to Posterior Wall Thickness Ratio
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	1	no units
IVSd (2D)	concept	LN	18154-5	Interventricular Septum Diastolic Thickness
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
IVSd (MM)	concept	LN	18154-5	Interventricular Septum Diastolic Thickness
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
IVSs (2D)	concept	LN	18158-6	Interventricular Septum Systolic Thickness
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
IVSs (MM)	concept	LN	18158-6	Interventricular Septum Systolic Thickness
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
LA Dimen (2D)	concept	LN	29469-4	Left Atrium Antero-posterior Systolic Dimension
	mode	SRT	G-03A2	2D mode

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	site	SRT	T-32300	Left Atrium
	units	UCUM	cm	Centimeter
LA Dimen (MM)	concept	LN	29469-4	Left Atrium Antero-posterior Systolic Dimension
	mode	SRT	G-0394	M mode
	site	SRT	T-32300	Left Atrium
	units	UCUM	cm	Centimeter
LA/Ao (2D)	concept	LN	17985-3	Left Atrium to Aortic Root Ratio
	mode	SRT	G-03A2	2D mode
	site	SRT	T-32300	Left Atrium
	units	UCUM	1	no units
LA/Ao (MM)	concept	LN	17985-3	Left Atrium to Aortic Root Ratio
	mode	SRT	G-0394	M mode
	site	SRT	T-32300	Left Atrium
	units	UCUM	1	no units
Lat A` Area VTI	concept	99PMSBLUS	C12203-08	Area under LV A Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	cm	Centimeter
Lat A` Vel	concept	SRT	G-037C	LV Peak Diastolic Tissue Velocity During Atrial Systole
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	cm/s	Centimeter Per Second
Lat Acc Time	concept	LN	20168-1	Acceleration Time
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	sec	Seconds
Lat Dec Time	concept	LN	20217-6	Deceleration Time
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	sec	Seconds
Lat E` Area VTI	concept	99PMSBLUS	C12203-07	Area under LV E Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	cm	Centimeter
Lat E` Vel	concept	SRT	G-037A	Left Ventricular Peak Early Diastolic Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	cm/s	Centimeter Per Second
Lat IVCT Time	concept	SRT	G-037E	Left Ventricular Isovolumic Contraction Time
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	sec	Seconds
Lat IVRT Time	concept	LN	18071-1	Left Ventricular Isovolumic Relaxation Time
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	sec	Seconds
Lat S Vel	concept	SRT	G-037D	Left Ventricular Peak Systolic Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	cm/s	Centimeter Per Second
Late Dias Slope	concept	99PMSBLUS	C12209-01	Late Diastolic Slope
	mode	SRT	G-0394	M mode
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	cm/s	Centimeter Per Second
LPA Diam	concept	LN	18019-0	Left Pulmonary Artery Diameter
	mode	SRT	G-03A2	2D mode
	site	SRT	T-44000	Pulmonary artery
	units	UCUM	cm	Centimeter
LV Dp/dt	concept	LN	18035-6	Mitral Regurgitation dP/dt derived from Mitral Reg velocity
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	mm[Hg]/s	mmHg/s
LV ET Time	concept	99PMSBLUS	C12203-02	Eject Time
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	sec	Seconds
LV Mass (A/L)	concept	LN	18087-7	Left Ventricle Mass
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	g	Gram
LV Mass (Cubed)	concept	LN	18087-7	Left Ventricle Mass
	method	DCM	125206	Cube Method
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	g	Gram
LV Mass Index (A/L)	concept	99PMSBLUS	C12203-01	Left Ventricle Mass Index
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	g/m2	g/m2
LV Mass Index(Cubed)	concept	99PMSBLUS	C12203-01	Left Ventricle Mass Index
	method	DCM	125206	Cube Method
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	g/m2	g/m2
LV PEP Time	concept	99PMSBLUS	C12203-03	Pre-Eject Time

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	sec	Seconds
LV PEP/ET	concept	99PMSBLUS	C12203-04	PEP/ET
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	1	no units
LV R-R	concept	LN	8867-4	Heart rate
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	sec	Seconds
LV Wall Motion Score Index	concept	SRT	125202	LV Wall Motion Score Index
LVAd (A/L)	concept	SRT	G-0375	Left Ventricular Diastolic Area
	method	DCM	125226	Single Plane Ellipse
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm2	Square Centimeter
LVAd ap2	concept	SRT	G-0375	Left Ventricular Diastolic Area
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm2	Square Centimeter
	view	SRT	G-A19B	Apical two chamber
LVAd ap4	concept	SRT	G-0375	Left Ventricular Diastolic Area
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm2	Square Centimeter
	view	SRT	G-A19C	Apical four chamber
LVAd Sax Endo Area	concept	SRT	G-0375	Left Ventricular Diastolic Area
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm2	Square Centimeter
	view	SRT	G-039B	Parasternal short axis at the Papillary Muscle level
LVAd Sax Epi Area	concept	SRT	G-0379	Left Ventricle Epicardial Diastolic Area, psax pap view
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm2	Square Centimeter
	view	SRT	G-039B	Parasternal short axis at the Papillary Muscle level
LVAs (A/L)	concept	SRT	G-0374	Left Ventricular Systolic Area
	method	DCM	125226	Single Plane Ellipse
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm2	Square Centimeter
LVAs ap2	concept	SRT	G-0374	Left Ventricular Systolic Area
	method	DCM	125208	Method of Disks, Single Plane

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm2	Square Centimeter
	view	SRT	G-A19B	Apical two chamber
LVAs ap4	concept	SRT	G-0374	Left Ventricular Systolic Area
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm2	Square Centimeter
	view	SRT	G-A19C	Apical four chamber
LVIDd (2D)	concept	LN	29436-3	Left Ventricle Internal End Diastolic Dimension
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
LVIDd (MM)	concept	LN	29436-3	Left Ventricle Internal End Diastolic Dimension
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
LVIDs (2D)	concept	LN	29438-9	Left Ventricle Internal Systolic Dimension
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
LVIDs (MM)	concept	LN	29438-9	Left Ventricle Internal Systolic Dimension
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
LVLd (A/L)	concept	LN	18077-8	Left Ventricle diastolic major axis
	method	DCM	125226	Single Plane Ellipse
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
LVLd Apical	concept	LN	18077-8	Left Ventricle diastolic major axis
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
LVLs (A/L)	concept	LN	18076-0	Left Ventricle systolic major axis
	method	DCM	125226	Single Plane Ellipse
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
LVOT Acc Time	concept	LN	20168-1	Acceleration Time
	site	SNM3	T-32600	Left Ventricle
	target	SNM3	T-32650	Left Ventricle Outflow Tract
	units	UCUM	sec	Seconds
LVOT Acc Time Slope	concept	99PMSBLUS	C12222-04	Acceleration Slope
	site	SNM3	T-32600	Left Ventricle

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	target	SNM3	T-32650	Left Ventricle Outflow Tract
	units	UCUM	cm/s2	Centimeter Per Second Square
LVOT Area	concept	SRT	G-038E	Cardiovascular Orifice Area
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	target	SNM3	T-32650	Left Ventricle Outflow Tract
	units	UCUM	cm2	Square Centimeter
LVOT Diam	concept	SRT	G-038F	Cardiovascular Orifice Diameter
	site	SNM3	T-32600	Left Ventricle
	target	SNM3	T-32650	Left Ventricle Outflow Tract
	units	UCUM	cm	Centimeter
LVOT Max PG	concept	LN	20247-3	Peak Gradient
	site	SNM3	T-32600	Left Ventricle
	target	SNM3	T-32650	Left Ventricle Outflow Tract
	units	UCUM	mm[Hg]	Millimeters Of Mercury
LVOT Mean PG	concept	LN	20256-4	Mean Gradient
	site	SNM3	T-32600	Left Ventricle
	target	SNM3	T-32650	Left Ventricle Outflow Tract
	units	UCUM	mm[Hg]	Millimeters Of Mercury
LVOT Vmax	concept	LN	11726-7	Peak Velocity
	site	SNM3	T-32600	Left Ventricle
	target	SNM3	T-32650	Left Ventricle Outflow Tract
	units	UCUM	cm/s	Centimeter Per Second
LVOT Vmean	concept	LN	20352-1	Mean Velocity
	site	SNM3	T-32600	Left Ventricle
	target	SNM3	T-32650	Left Ventricle Outflow Tract
	units	UCUM	cm/s	Centimeter Per Second
LVOT VTI	concept	LN	20354-7	Velocity Time Integral
	site	SNM3	T-32600	Left Ventricle
	target	SNM3	T-32650	Left Ventricle Outflow Tract
	units	UCUM	cm	Centimeter
LVPW % (2D)	concept	LN	18053-9	Left Ventricle Posterior Wall % Thickening
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
LVPW % (MM)	concept	LN	18053-9	Left Ventricle Posterior Wall % Thickening
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	%	Percent
LVPWd (2D)	concept	LN	18152-9	Left Ventricle Posterior Wall Diastolic Thickness
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
LVPWd (MM)	concept	LN	18152-9	Left Ventricle Posterior Wall Diastolic Thickness
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	units	UCUM	cm	Centimeter
LVPWs (2D)	concept	LN	18156-0	Left Ventricle Posterior Wall Systolic Thickness
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
LVPWs (MM)	concept	LN	18156-0	Left Ventricle Posterior Wall Systolic Thickness
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	cm	Centimeter
Med A` Area VTI	concept	99PMSBLUS	C12203-08	Area under LV A Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	cm	Centimeter
Med A` Vel	concept	SRT	G-037C	LV Peak Diastolic Tissue Velocity During Atrial Systole
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	cm/s	Centimeter Per Second
Med Acc Time	concept	LN	20168-1	Acceleration Time
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	sec	Seconds
Med Dec Time	concept	LN	20217-6	Deceleration Time
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	sec	Seconds
Med E` Area VTI	concept	99PMSBLUS	C12203-07	Area under LV E Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	cm	Centimeter
Med E` Vel	concept	SRT	G-037A	Left Ventricular Peak Early Diastolic Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	cm/s	Centimeter Per Second
Med IVCT Time	concept	SRT	G-037E	Left Ventricular Isovolumic Contraction Time
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	sec	Seconds
Med IVRT Time	concept	LN	18071-1	Left Ventricular Isovolumic Relaxation Time
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	sec	Seconds
Med S Vel	concept	SRT	G-037D	Left Ventricular Peak Systolic Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	cm/s	Centimeter Per Second
MPA Diam	concept	LN	18020-8	Main Pulmonary Artery Diameter
	mode	SRT	G-03A2	2D mode
	site	SRT	T-44000	Pulmonary artery
	units	UCUM	cm	Centimeter
MR Alias Vel	concept	99PMSBLUS	C12222-02	Alias Velocity
	direction	SRT	R-42E61	Regurgitant Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s	Centimeter Per Second
MR ERO	concept	SRT	G-038E	Cardiovascular Orifice Area
	direction	SRT	R-42E61	Regurgitant Flow
	method	DCM	125216	Proximal Isovelocity Surface Area
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm2	Square Centimeter
MR Flow Rate	concept	LN	34141-2	Peak Instantaneous Flow Rate
	direction	SRT	R-42E61	Regurgitant Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	ml/sec	ml/sec
MR Fraction	concept	SRT	G-0390	Regurgitant Fraction
	direction	SRT	R-42E61	Regurgitant Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	%	Percent
MR Max PG	concept	LN	20247-3	Peak Gradient
	direction	SRT	R-42E61	Regurgitant Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
MR Mean PG	concept	LN	20256-4	Mean Gradient
	direction	SRT	R-42E61	Regurgitant Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
MR Radius	concept	99PMSBLUS	C12222-01	Flow Radius
	direction	SRT	R-42E61	Regurgitant Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm	Centimeter
MR Vmax	concept	LN	11726-7	Peak Velocity
	direction	SRT	R-42E61	Regurgitant Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s	Centimeter Per Second
MR Vmean	concept	LN	20352-1	Mean Velocity

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	direction	SRT	R-42E61	Regurgitant Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s	Centimeter Per Second
MR Volume	concept	LN	33878-0	Volume Flow
	direction	SRT	R-42E61	Regurgitant Flow
	method	DCM	125216	Proximal Isovelocity Surface Area
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	ml	Milliliter
MR VTI	concept	LN	20354-7	Velocity Time Integral
	direction	SRT	R-42E61	Regurgitant Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm	Centimeter
MV A Dur Time	concept	SRT	G-0385	Mitral Valve A-Wave Duration
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	sec	Seconds
MV A-C Interval Time	concept	99PMSBLUS	C12207-04	Mitral Valve A-C Interval
	mode	SRT	G-0394	M mode
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	sec	Seconds
MV Acc Time	concept	LN	20168-1	Acceleration Time
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	sec	Seconds
MV Acc Time Slope	concept	99PMSBLUS	C12222-04	Acceleration Slope
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s2	Centimeter Per Second Square
MV Alias Vel	concept	99PMSBLUS	C12222-02	Alias Velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s	Centimeter Per Second
MV Area (Planim)	concept	SRT	G-038E	Cardiovascular Orifice Area
	method	DCM	125220	Planimetry
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm2	Square Centimeter
MV D-E Exc Dist	concept	99PMSBLUS	C12207-01	Mitral Valve D-E Excursion
	mode	SRT	G-0394	M mode
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm	Centimeter
MV D-E Slope	concept	99PMSBLUS	C12207-02	Mitral Valve D-E Slope
	mode	SRT	G-0394	M mode
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s	Centimeter Per Second
MV Dec Slope	concept	LN	20216-8	Deceleration Slope
	direction	SRT	R-42047	Antegrade Flow

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s2	Centimeter Per Second Square
MV Dec Time	concept	LN	20217-6	Deceleration Time
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	sec	Seconds
MV Diam	concept	SRT	G-038F	Cardiovascular Orifice Diameter
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm	Centimeter
MV E/A	concept	LN	18038-0	Mitral Valve E to A Ratio
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	1	no units
MV E-E Sep	concept	99PMSBLUS	C12207-03	Mitral Valve E-E Separation
	mode	SRT	G-0394	M mode
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm	Centimeter
MV E-F Slope	concept	LN	18040-6	Mitral Valve E-F Slope by M-Mode
	mode	SRT	G-0394	M mode
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s	Centimeter Per Second
MV EPSS	concept	LN	18036-4	Mitral Valve EPSS, E wave
	mode	SRT	G-0394	M mode
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm	Centimeter
MV Max PG	concept	LN	20247-3	Peak Gradient
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
MV Mean PG	concept	LN	20256-4	Mean Gradient
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
MV P1/2t	concept	LN	20280-4	Pressure Half-Time
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	msec	Millisecond
MV P1/2t Vmax	concept	99PMSBLUS	C12222-03	Pressure Half-Time Peak velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s	Centimeter Per Second
MV Peak A Vel	concept	LN	17978-8	Mitral Valve A-Wave Peak Velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s	Centimeter Per Second
MV Peak E Vel	concept	LN	18037-2	Mitral Valve E-Wave Peak Velocity

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s	Centimeter Per Second
MV Radius	concept	99PMSBLUS	C12222-01	Flow Radius
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm	Centimeter
MV R-R	concept	LN	8867-4	Heart rate
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	sec	Seconds
MV Vmax	concept	LN	11726-7	Peak Velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s	Centimeter Per Second
MV Vmean	concept	LN	20352-1	Mean Velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm/s	Centimeter Per Second
MV VTI	concept	LN	20354-7	Velocity Time Integral
	direction	SRT	R-42047	Antegrade Flow
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm	Centimeter
MVA (P1/2t)	concept	SRT	G-038E	Cardiovascular Orifice Area
	method	DCM	125210	Area by Pressure Half-Time
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm2	Square Centimeter
MVA (PISA)	concept	SRT	G-038E	Cardiovascular Orifice Area
	method	DCM	125216	Proximal Isovelocity Surface Area
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm2	Square Centimeter
MVA (VTI)	concept	SRT	G-038E	Cardiovascular Orifice Area
	method	DCM	125215	Continuity Equation by Velocity Time Integral
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm2	Square Centimeter
PI End Dias PG	concept	LN	20247-3	Peak Gradient
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
PI End Dias Vel	concept	LN	11653-3	End Diastolic Velocity
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	cm/s	Centimeter Per Second
PISA (AI)	concept	99PMSBLUS	C12211-01	Aortic Valve Flow Area
	direction	SRT	R-42E61	Regurgitant Flow
	method	DCM	125216	Proximal Isovelocity Surface Area
	site	SRT	T-35400	Aortic Valve

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	units	UCUM	cm2	Square Centimeter
PISA (MR)	concept	99PMSBLUS	C12207-06	Mitral Valve Flow Area
	direction	SRT	R-42E61	Regurgitant Flow
	method	DCM	125216	Proximal Isovelocity Surface Area
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	cm2	Square Centimeter
PISA (TR)	concept	99PMSBLUS	C12208-05	Tricuspid Valve Flow Area
	direction	SRT	R-42E61	Regurgitant Flow
	method	DCM	125216	Proximal Isovelocity Surface Area
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm2	Square Centimeter
Pulm A Revs Dur Time	concept	SRT	G-038B	Pulmonary Vein A-Wave Duration
	site	SRT	T-48581	Pulmonary Venous Structure
	units	UCUM	sec	Seconds
Pulm A Revs Vel	concept	LN	29453-8	Pulmonary Vein Atrial Contraction Reversal Peak Velocity
	site	SRT	T-48581	Pulmonary Venous Structure
	units	UCUM	cm/s	Centimeter Per Second
Pulm Dias Vel	concept	LN	29451-2	Pulmonary Vein Diastolic Peak Velocity
	site	SRT	T-48581	Pulmonary Venous Structure
	units	UCUM	cm/s	Centimeter Per Second
Pulm S/D	concept	LN	29452-0	Pulmonary Vein Systolic to Diastolic Ratio
	site	SRT	T-48581	Pulmonary Venous Structure
	units	UCUM	1	no units
Pulm Sys Vel	concept	LN	29450-4	Pulmonary Vein Systolic Peak Velocity
	site	SRT	T-48581	Pulmonary Venous Structure
	units	UCUM	cm/s	Centimeter Per Second
PV Acc Time	concept	LN	20168-1	Acceleration Time
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	sec	Seconds
PV Acc Time Slope	concept	99PMSBLUS	C12222-04	Acceleration Slope
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	cm/s2	Centimeter Per Second Square
PV Max PG	concept	LN	20247-3	Peak Gradient
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
PV Mean PG	concept	LN	20256-4	Mean Gradient
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
PV R-R	concept	LN	8867-4	Heart rate
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	sec	Seconds
PV Vmax	concept	LN	11726-7	Peak Velocity

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	cm/s	Centimeter Per Second
PV Vmean	concept	LN	20352-1	Mean Velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	cm/s	Centimeter Per Second
PV VTI	concept	LN	20354-7	Velocity Time Integral
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	cm	Centimeter
PVA (Vmax)	concept	SRT	G-038E	Cardiovascular Orifice Area
	method	DCM	125214	Continuity Equation by Peak Velocity
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	cm2	Square Centimeter
PVA (VTI)	concept	SRT	G-038E	Cardiovascular Orifice Area
	method	DCM	125215	Continuity Equation by Velocity Time Integral
	site	SRT	T-35200	Pulmonic Valve
	units	UCUM	cm2	Square Centimeter
Qp/Qs	concept	LN	29462-9	Pulmonary-to-Systemic Shunt Flow Ratio
	site	SRT	P5-30031	Cardiac Shunt Study
	units	UCUM	1	no units
R to AV Closure	concept	99PMSBLUS	C12211-07	R Wave to Aortic Valve Closure Time
	site	SRT	T-35400	Aortic Valve
	units	UCUM	msec	Millisecond
R to AV Open	concept	99PMSBLUS	C12211-06	R Wave to Aortic Valve Opening Time
	site	SRT	T-35400	Aortic Valve
	units	UCUM	msec	Millisecond
R to MV Closure	concept	99PMSBLUS	C12207-42	R Wave to Mitral Valve Closure Time
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	msec	Millisecond
R to MV Open	concept	99PMSBLUS	C12207-41	R Wave to Mitral Valve Opening Time
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	msec	Millisecond
RA Pressure	concept	LN	18070-3	Right Atrium Systolic Pressure
	site	SRT	T-32200	Right Atrium
	units	UCUM	mm[Hg]	Millimeters Of Mercury
RPA Diam	concept	LN	18021-6	Right Pulmonary Artery Diameter
	mode	SRT	G-03A2	2D mode
	site	SRT	T-44000	Pulmonary artery
	units	UCUM	cm	Centimeter
RV ET Time	concept	99PMSBLUS	C12203-02	Eject Time
	mode	SRT	G-0394	M mode
	site	SRT	T-32500	Right Ventricle
	units	UCUM	sec	Seconds
RV PEP Time	concept	99PMSBLUS	C12203-03	Pre-Eject Time

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	mode	SRT	G-0394	M mode
	site	SRT	T-32500	Right Ventricle
	units	UCUM	sec	Seconds
RV PEP/ET	concept	99PMSBLUS	C12203-04	PEP/ET
	site	SRT	T-32500	Right Ventricle
	units	UCUM	1	no units
RVAWd (2D)	concept	LN	18153-7	Right Ventricular Anterior Wall Diastolic Thickness
	mode	SRT	G-03A2	2D mode
	site	SRT	T-32500	Right Ventricle
	units	UCUM	cm	Centimeter
RVAWd (MM)	concept	LN	18153-7	Right Ventricular Anterior Wall Diastolic Thickness
	mode	SRT	G-0394	M mode
	site	SRT	T-32500	Right Ventricle
	units	UCUM	cm	Centimeter
RVIDd (2D)	concept	LN	20304-2	Right Ventricular Internal Diastolic Dimension
	mode	SRT	G-03A2	2D mode
	site	SRT	T-32500	Right Ventricle
	units	UCUM	cm	Centimeter
RVIDd (MM)	concept	LN	20304-2	Right Ventricular Internal Diastolic Dimension
	mode	SRT	G-0394	M mode
	site	SRT	T-32500	Right Ventricle
	units	UCUM	cm	Centimeter
RVOT Area	concept	SRT	G-038E	Cardiovascular Orifice Area
	mode	SRT	G-03A2	2D mode
	site	SRT	T-32500	Right Ventricle
	target	SNM3	T-32550	Right Ventricle Outflow Tract
	units	UCUM	cm2	Square Centimeter
RVOT Diam	concept	SRT	G-038F	Cardiovascular Orifice Diameter
	mode	SRT	G-03A2	2D mode
	site	SRT	T-32500	Right Ventricle
	target	SNM3	T-32550	Right Ventricle Outflow Tract
	units	UCUM	cm	Centimeter
RVOT Max PG	concept	LN	20247-3	Peak Gradient
	site	SRT	T-32500	Right Ventricle
	target	SNM3	T-32550	Right Ventricle Outflow Tract
	units	UCUM	mm[Hg]	Millimeters Of Mercury
RVOT Mean PG	concept	LN	20256-4	Mean Gradient
	site	SRT	T-32500	Right Ventricle
	target	SNM3	T-32550	Right Ventricle Outflow Tract
	units	UCUM	mm[Hg]	Millimeters Of Mercury
RVOT Vmax	concept	LN	11726-7	Peak Velocity
	site	SRT	T-32500	Right Ventricle
	target	SNM3	T-32550	Right Ventricle Outflow Tract
	units	UCUM	cm/s	Centimeter Per Second
RVOT Vmean	concept	LN	20352-1	Mean Velocity
	site	SRT	T-32500	Right Ventricle

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	target	SNM3	T-32550	Right Ventricle Outflow Tract
	units	UCUM	cm/s	Centimeter Per Second
RVOT VTI	concept	LN	20354-7	Velocity Time Integral
	site	SRT	T-32500	Right Ventricle
	target	SNM3	T-32550	Right Ventricle Outflow Tract
	units	UCUM	cm	Centimeter
RVSP	concept	SRT	G-0380	Right Ventricular Peak Systolic Pressure
	site	SRT	T-32500	Right Ventricle
	units	UCUM	mm[Hg]	Millimeters Of Mercury
Score	concept	SRT	G-C1E3	Score
SI (2D-Cubed)	concept	SRT	F-00078	Stroke Index
	method	DCM	125206	Cube Method
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml/m2	ml/m2
SI (2D-Teich)	concept	SRT	F-00078	Stroke Index
	method	DCM	125209	Teichholz
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml/m2	ml/m2
SI (A/L)	concept	SRT	F-00078	Stroke Index
	method	DCM	125226	Single Plane Ellipse
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml/m2	ml/m2
SI (MM-Cubed)	concept	SRT	F-00078	Stroke Index
	method	DCM	125206	Cube Method
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml/m2	ml/m2
SI (MM-Teich)	concept	SRT	F-00078	Stroke Index
	method	DCM	125209	Teichholz
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml/m2	ml/m2
SI(MOD-bp)	concept	SRT	F-00078	Stroke Index
	method	DCM	125207	Method of Disks, Biplane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml/m2	ml/m2
SI(MOD-sp2)	concept	SRT	F-00078	Stroke Index
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml/m2	ml/m2
	view	SRT	G-A19B	Apical two chamber

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
SI(MOD-sp4)	concept	SRT	F-00078	Stroke Index
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml/m2	ml/m2
	view	SRT	G-A19C	Apical four chamber
SV (2D-Cubed)	concept	SRT	F-32120	Stroke Volume
	method	DCM	125206	Cube Method
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
SV (2D-Teich)	concept	SRT	F-32120	Stroke Volume
	method	DCM	125209	Teichholz
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
SV (A/L)	concept	SRT	F-32120	Stroke Volume
	method	DCM	125226	Single Plane Ellipse
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
SV (LVOT)	concept	SRT	F-32120	Stroke Volume
	site	SNM3	T-32600	Left Ventricle
	target	SNM3	T-32650	Left Ventricle Outflow Tract
	units	UCUM	ml	Milliliter
SV (MM-Cubed)	concept	SRT	F-32120	Stroke Volume
	method	DCM	125206	Cube Method
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
SV (MM-Teich)	concept	SRT	F-32120	Stroke Volume
	method	DCM	125209	Teichholz
	mode	SRT	G-0394	M mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
SV (MV)	concept	SRT	F-32120	Stroke Volume
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	ml	Milliliter
SV (RVOT)	concept	SRT	F-32120	Stroke Volume
	site	SRT	T-32500	Right Ventricle
	target	SNM3	T-32550	Right Ventricle Outflow Tract
	units	UCUM	ml	Milliliter
SV (TV)	concept	SRT	F-32120	Stroke Volume
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	ml	Milliliter
SV(MOD-bp)	concept	SRT	F-32120	Stroke Volume

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	method	DCM	125207	Method of Disks, Biplane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
SV(MOD-sp2)	concept	SRT	F-32120	Stroke Volume
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
	view	SRT	G-A19B	Apical two chamber
SV(MOD-sp4)	concept	SRT	F-32120	Stroke Volume
	method	DCM	125208	Method of Disks, Single Plane
	mode	SRT	G-03A2	2D mode
	site	SNM3	T-32600	Left Ventricle
	units	UCUM	ml	Milliliter
	view	SRT	G-A19C	Apical four chamber
Tei Index	concept	99PMSBLUS	C12207-05	Tei Index
	site	SNM3	T-35300	Mitral Valve
	units	UCUM	1	no units
Time to Lat E`	concept	99PMSBLUS	C12203-06	Time to LV E Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	sec	Seconds
Time to Lat S	concept	99PMSBLUS	C12203-05	Time to LV S Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0392	Lateral Mitral Annulus
	units	UCUM	sec	Seconds
Time to Med E`	concept	99PMSBLUS	C12203-06	Time to LV E Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	sec	Seconds
Time to Med S	concept	99PMSBLUS	C12203-05	Time to LV S Tissue Velocity
	mode	99PMSBLUS	T12224-02	Tissue Doppler Imaging
	site	SNM3	T-32600	Left Ventricle
	target	SRT	G-0391	Medial Mitral Annulus
	units	UCUM	sec	Seconds
TR Alias Vel	concept	99PMSBLUS	C12222-02	Alias Velocity
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm/s	Centimeter Per Second
TR ERO	concept	SRT	G-038E	Cardiovascular Orifice Area
	direction	SRT	R-42E61	Regurgitant Flow
	method	DCM	125216	Proximal Isovelocity Surface Area

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm2	Square Centimeter
TR Flow Rate	concept	LN	34141-2	Peak Instantaneous Flow Rate
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	ml/sec	ml/sec
TR Fraction	concept	SRT	G-0390	Regurgitant Fraction
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	%	Percent
TR Max PG	concept	LN	20247-3	Peak Gradient
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
TR Mean PG	concept	LN	20256-4	Mean Gradient
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
TR Radius	concept	99PMSBLUS	C12222-01	Flow Radius
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm	Centimeter
TR Vmax	concept	LN	11726-7	Peak Velocity
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm/s	Centimeter Per Second
TR Vmean	concept	LN	20352-1	Mean Velocity
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm/s	Centimeter Per Second
TR Volume	concept	LN	33878-0	Volume Flow
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	ml	Milliliter
TR VTI	concept	LN	20354-7	Velocity Time Integral
	direction	SRT	R-42E61	Regurgitant Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm	Centimeter
TV A-C Interval Time	concept	99PMSBLUS	C12208-04	Tricuspid Valve A-C Interval
	mode	SRT	G-0394	M mode
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	sec	Seconds
TV Acc Time	concept	LN	20168-1	Acceleration Time
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	sec	Seconds

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
TV Acc Time Slope	concept	99PMSBLUS	C12222-04	Acceleration Slope
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm/s2	Centimeter Per Second Square
TV Alias Vel	concept	99PMSBLUS	C12222-02	Alias Velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm/s	Centimeter Per Second
TV Area	concept	SRT	G-038E	Cardiovascular Orifice Area
	mode	SRT	G-03A2	2D mode
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm2	Square Centimeter
TV D-E Exc Dist	concept	99PMSBLUS	C12208-01	Tricuspid Valve D-E Excursion
	mode	SRT	G-0394	M mode
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm	Centimeter
TV D-E Slope	concept	99PMSBLUS	C12208-02	Tricuspid Valve D-E Slope
	mode	SRT	G-0394	M mode
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm/s	Centimeter Per Second
TV Diam	concept	SRT	G-038F	Cardiovascular Orifice Diameter
	mode	SRT	G-03A2	2D mode
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm	Centimeter
TV E/A	concept	LN	18039-8	Tricuspid Valve E to A Ratio
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	1	no units
TV E-F Slope	concept	99PMSBLUS	C12208-03	Tricuspid Valve E-F Slope
	mode	SRT	G-0394	M mode
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm/s	Centimeter Per Second
TV Max PG	concept	LN	20247-3	Peak Gradient
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
TV Mean PG	concept	LN	20256-4	Mean Gradient
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	mm[Hg]	Millimeters Of Mercury
TV Peak A Vel	concept	LN	18030-7	Tricuspid Valve A Wave Peak Velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm/s	Centimeter Per Second
TV Peak E Vel	concept	LN	18031-5	Tricuspid Valve E Wave Peak Velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35100	Tricuspid Valve

CX50 2.0.x Report Label	MOD Type	CSD	CV	CM
	units	UCUM	cm/s	Centimeter Per Second
TV Radius	concept	99PMSBLUS	C12222-01	Flow Radius
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm	Centimeter
TV R-R	concept	LN	8867-4	Heart rate
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	sec	Seconds
TV Vmax	concept	LN	11726-7	Peak Velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm/s	Centimeter Per Second
TV Vmean	concept	LN	20352-1	Mean Velocity
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm/s	Centimeter Per Second
TV VTI	concept	LN	20354-7	Velocity Time Integral
	direction	SRT	R-42047	Antegrade Flow
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm	Centimeter
TVA (PISA)	concept	SRT	G-038E	Cardiovascular Orifice Area
	method	DCM	125216	Proximal Isovelocity Surface Area
	site	SRT	T-35100	Tricuspid Valve
	units	UCUM	cm2	Square Centimeter
Wall Segment	concept	LN	18179-2	Wall Segment

A.3.9 Adult Echo Meas/Calcs NOT exported in Dicom

The following labels are not exported in DICOM Structured Reports for Adult Echo.

CX50 2.0.x Label
AI AT Max PG
AI AT Vmax
AI DS Max PG
AI DS P1/2t
AI DS Vmax
AI End Dias PG
AI P1/2t Max PG
AI P1/2t Slope
AI P1/2t Time
AI P1/2t Vmax
Ao Arch Area
Ao Isthmus Area
AoR Area
Asc Ao Area
AV Area Circ

AV AT Max PG
AV AT Vmax
AV DT Max PG
AV DT P1/2t
AV DT Slope
AV DT Vmax
B-C Slope Dist
B-C Time
Desc Ao Area
Hep. A Revs Dur Max PG
Hep. A Revs Dur P1/2t
Hep. A Revs Dur Slope
Hep. A Revs Dur Vmax
Hep. A Revs PG
Hepatic Dias PG
Hepatic Sys PG

IVCT P1/2t
IVCT Slope
IVCT Slope Max PG
IVCT Slope Vmax
IVRT P1/2t
IVRT Slope
IVRT Slope Max PG
IVRT Slope Vmax
LA Area
Lat A` Area Max PG
Lat A` Area Mean PG
Lat A` Area Vmax
Lat A` Area Vmean
Lat A` PG
Lat AT Max PG
Lat AT Slope

Lat AT Vmax
Lat DT Max PG
Lat DT P1/2t
Lat DT Slope
Lat DT Vmax
Lat E` Area Max PG
Lat E` Area Mean PG
Lat E` Area Vmax
Lat E` Area Vmean
Lat E` PG
Lat IVCT Max PG
Lat IVCT P1/2t
Lat IVCT Slope
Lat IVCT Vmax
Lat IVRT Max PG
Lat IVRT P1/2t
Lat IVRT Slope
Lat IVRT Vmax
Lat S PG
Late Dias Slope Dist
Late Dias Time
LPA Area
LV ET Dist
LV ET Slope
LV PEP Dist
LV PEP Slope
LVAd Sax Endo Circ
LVAd Sax Epi Circ
LVLd Apical Area
LVOT Area
LVOT AT Max PG
LVOT AT Vmax
Med A` Area Max PG
Med A` Area Mean PG
Med A` Area Vmax
Med A` Area Vmean
Med A` PG
Med AT Max PG
Med AT Slope

Med AT Vmax
Med DT Max PG
Med DT P1/2t
Med DT Slope
Med DT Vmax
Med E` Area Max PG
Med E` Area Mean PG
Med E` Area Vmax
Med E` Area Vmean
Med E` PG
Med IVCT Max PG
Med IVCT P1/2t
Med IVCT Slope
Med IVCT Vmax
Med IVRT Max PG
Med IVRT P1/2t
Med IVRT Slope
Med IVRT Vmax
Med S PG
MPA Area
MV A Dur MaxPG
MV A Dur P1/2t
MV A Dur Slope
MV A Dur Vmax
MV A-C Int Dist
MV A-C Int Slope
MV Area
MV Area
MV Area (Planim) Circ
MV AT MaxPG
MV AT Vmax
MV D-E Dist
MV D-E Exc Time
MV D-E Time
MV DS MaxPG
MV DS P1/2t
MV DS Time
MV DS Vmax
MV DT MaxPG

MV DT P1/2t
MV DT Slope
MV DT Vmax
MV E-F Dist
MV E-F Time
MV P1/2t MaxPG
MV P1/2t Slope
MV P1/2t Time
MV Peak A PG
MV Peak E PG
Pulm A Revs Dur Max PG
Pulm A Revs Dur P1/2t
Pulm A Revs Dur Slope
Pulm A Revs Dur Vmax
Pulm A Revs PG
Pulm Dias PG
Pulm Sys PG
PV AT Max PG
PV AT Vmax
RPA Area
RV ET Dist
RV ET Slope
RV PEP Dist
RV PEP Slope
RVOT Area
TV A-C Int Dist
TV A-C Int Slope
TV Area
TV AT Max PG
TV AT Vmax
TV D-E Dist
TV D-E Exc Time
TV D-E Time
TV E-F Dist
TV E-F Time
TV Peak A PG
TV Peak E PG

A.3.10 Units Codes

CX50 2.0.x makes use of the following codes for Units associated with the exported measurements.

CSD	CV	CM
UCUM	%	Percent
UCUM	{H.B}/min	Beats Per Minute
UCUM[1.4]	cm	Centimeter
UCUM[1.4]	cm/s	Centimeter Per Second
UCUM[1.4]	cm/s2	Centimeter Per Second Square
UCUM[1.4]	cm2	Square Centimeter
UCUM	cm3	Cubic Centimeter
UCUM[1.4}	g	Gram
UCUM[1.4}	g/m2	g/m2
UCUM[1.4]	l/min	Litre Per Minute
UCUM	l/min/m2	l/min/m2
UCUM[1.4]	ml	Milliliter
UCUM	ml/m2	ml/m2
UCUM[1.4]	mm[Hg]	Millimeters Of Mercury
UCUM	mm[Hg]/s	mmHg/s
UCUM[1.4]	msec	Millisecond
UCUM	sec	Seconds

APPENDIX B – BULK PRIVATE TAGS

B.1 BULK PRIVATE TAGS

The private tags listed below are intended to provide awareness of large data sets of private data from CX50 2.0.x datasets

Attribute Name	DICOM Tag	VR	Description
Private Data	200D,300E	OB	Bulk data
Private Data	200D,300B	OB	Bulk data
Private Data	200D,3CF3	OB	Bulk data

***** End of Document *****