DICOM
Conformance Statement

WARRANTY

Datamed LLC ("*DLLC*") makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The software described herein is covered by DLLC's standard EULA, which is available on DLLC's website (www.datamed.com).

TABLE OF CONTENTS

Tables

CONFORMANCE STATEMENT OVERVIEW

The Datamed® Software Components (DMSCs) DatamedFT™, DatamedWL™, DatamedSnd™ DSND01 implement the necessary DICOM services to: (1) search and retrieve worklists (lists of orders) from information systems, (2) act as an SCP to provide worklist services from DICOM devices, (3) save ECG waveform objects to a file and/or network storage system, (4) inform the information system about the work done, and (5) receive ECG waveform objects from service users (electrocardiographs, monitors, etc). Table 1 provides an overview of the network services supported by DMSCs.

1. Network Services

The following network services are supported.

TABLE 1 - DMSC DICOM NETWORK SERVICES SUPPORTED

DICOM SOP Class Name	User of Service (SCU)	Provider of Service (SCP)
Transfer		
12-lead ECG Waveform Storage	Yes	Yes
General ECG Waveform Storage	Yes	Yes
Workflow Management		
Modality Worklist	Yes	Yes
Modality Performed Procedure Step	Yes	Yes

2. Media Services

DMSCs do not support any DICOM media services.

CHAPTER 1: INTRODUCTION

1.1. Audience

This document is the DICOM Conformance Statement for DMSCs with the DICOM Option. It is intended for use by hospital staff, health system integrators, software designers, or implementers. The reader of this document should have an understanding of DICOM.

1.2. Remarks

DMSCs support configuration parameters that will change the DICOM output based on the settings. The differences are indicated in the IOD module descriptions.

1.3. Definitions, Terms, and Abbreviations

DMSC	Datamed® Software Component
IOD	Information Object Definition
Modality	A device that communicates using the DICOM standard.
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

1.4. References

[DICOM] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-3.18, 2011

CHAPTER 2: NETWORKING

2.1. Implementation Model

2.1.1. Application Data Flow Diagram – SCU Role

When using ECG devices that do not support DICOM, the DMSC interacts with devices through non-DICOM methods and then acts as an SCU with respect to the DICOM storage/management system. For worklist services the operator of the ECG device makes a non-DICOM request to the DMSC, which in turn requests and retrieves the DICOM MWL and returns the information to the ECG device. For ECG storage, the ECG device acquires the ECG and sends it to the DMSC, which then translates the data and stores the ECG in the DICOM storage/management system. The following illustrates these functions.

FIGURE 1 - DMSC (AS SCU) DICOM NETWORK DATA FLOW DIAGRAM
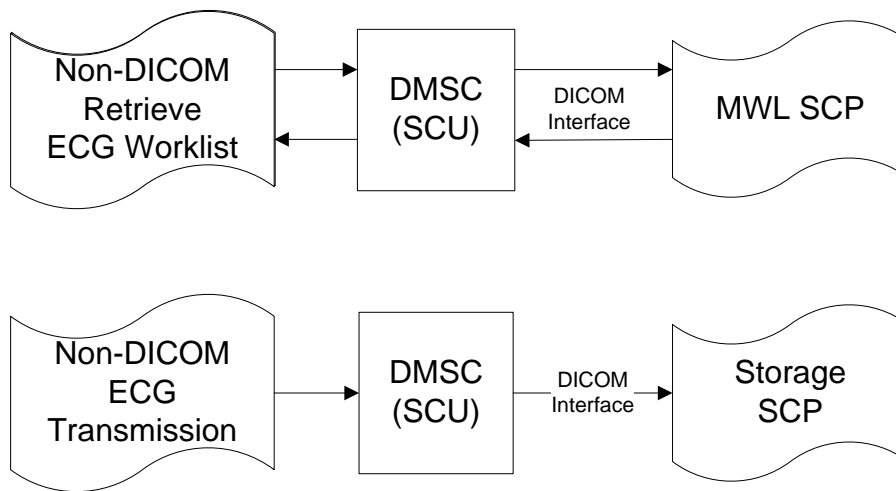
2.1.2.   Application Data Flow Diagram – SCP Role

When using ECG devices that support DICOM, the DMSC acts as an SCP for the devices and then communicates with the non-DICOM storage/management system through non-DICOM methods. For worklist services the operator of the ECG device makes a DICOM MWL request to the DMSC, which in turn requests and retrieves the worklist and returns the information to the ECG device in the MWL response. For ECG storage, the ECG device acquires the ECG and executes a DICOM store to transmit it to the DMSC, which then translates the data and stores the ECG in the storage/management system. The following illustrates these functions.

FIGURE 2 - DMSC (AS SCP) DICOM NETWORK DATA FLOW DIAGRAM
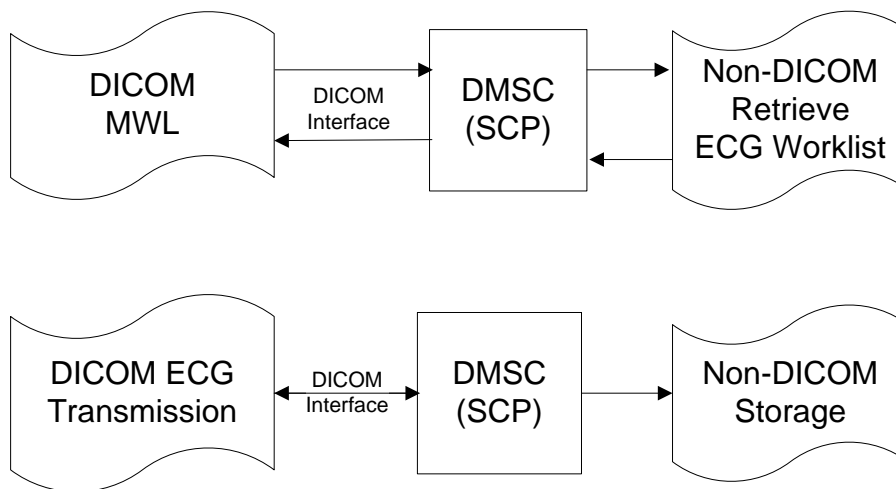
2.1.3.   Functional Definitions of Application Entities

2.1.3.1.   Functional Definition of DMSC Application Entity

Prior to acquiring ECGs using a machine that does not support a DICOM interface, the operator can request the orders for one or more patients by requesting the ECG worklist from a DICOM storage system using the DMSC as a pass-through intermediary. The operator can select an order and proceed to acquire ECGs for patients in the worklist. After acquisition of one or more ECGs, the operator will initiate a single or batch transmission of ECGs to a DICOM storage system by using the DMSC as a pass-through intermediary.

Prior to acquiring ECGs using a machine that supports a DICOM interface, the operator can request the order for one or more patients by requesting the ECG worklist from a non-DICOM storage system using the DMSC as a pass-through intermediary. The operator can select an order and proceed to acquire ECGs for patients in the worklist. After acquisition of one or more ECGs, the operator will initiate a single or batch transmission of ECGs to a non-DICOM storage system by using the DMSC as a pass-through intermediary.

When not using the worklist functionality, after acquiring one or more ECGs from a machine that does not support a DICOM interface, the operator can initiate a single or batch transmission of ECGs to a DICOM storage system by using the DMSC as a pass-through intermediary.

When not using the worklist functionality, after acquiring one or more ECGs from a machine that supports a DICOM interface, the operator can initiate a single or batch transmission of ECGs to a non-DICOM storage system by using the DMSC as a pass-through intermediary.

2.2. AE Specifications

2.2.1. ECG Storage Application Entity

2.2.1.1. SOP Classes

This Application Entity provides Standard Conformance to the following SOP Class:

TABLE 2 - STANDARD EXTENDED SOP CLASSES FOR DFTS

DICOM SOP Class Name	SOP Class UID	SCU	SCP
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	Yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	Yes

2.2.1.2. Association Policies

2.2.1.2.1. General

TABLE 3 - DICOM APPLICATION CONTEXT

Application Context Name	1.2.840.10008.3.1.1.1

2.2.1.2.2. Number of Associations

TABLE 4 - NUMBER OF ASSOCIATIONS AS AN INITIATOR FOR DMSC

Maximum number of simultaneous associations	1

TABLE 5 - NUMBER OF ASSOCIATIONS AS AN ACCEPTOR FOR DMSC

Maximum number of simultaneous associations	Unlimited

2.2.1.2.3. Asynchronous Nature

DMSCs do not support asynchronous communications (multiple outstanding transactions over a single Association).

TABLE 6 - ASYNCHRONOUS NATURE AS AN ASSOCIATION INITIATOR FOR DMSC

Maximum number of outstanding asynchronous transactions	0

2.2.1.2.4. Implementation Identifying Information

The implementation information for this Application Entity is:

TABLE 7 - IMPLEMENTATION IDENTIFYING INFORMATION

Implementation Class UID	1.3.6.1.4.1.29759.1001.31.1
Implementation Version Name	DLLCDCM02

2.2.1.3. Association Initiation Policy

2.2.1.3.1. Real-World Activity: Transmit ECGs

After receiving and translating an ECG, the DFTS will initiate transmission of the ECG. This causes the DMSC to store the ECG into the configured Storage SCP. ECGs are stored using the 12-Lead ECG Waveform Object or as a General ECG Waveform Object depending on the configuration settings.

2.2.1.3.1.1.   Proposed Presentation Context for DMSC

TABLE 8 - PROPOSED PRESENTATION CONTEXT FOR DFTS

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Extended Negotiation
Name	UID	Name List	UID List	Role	
12-Lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	DICOM Explicit VR Little Endian DICOM Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	DICOM Explicit VR Little Endian DICOM Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

2.2.1.4. Association Acceptance Policy

2.2.1.4.1. Real-World Activity: Receiving ECGs

The DFTS will act as a storage SCP for incoming 12-Lead ECG Waveform Object or General ECG Waveform Object transmissions. Following reception the DFTS will translate the ECG and transmit it to a non-DICOM host system.

2.2.1.4.1.1. Proposed Presentation Context for DFTS

TABLE 9 - PROPOSED PRESENTATION CONTEXT FOR DFTS

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Extended Negotiation
Name	UID	Name List	UID List	Role	
12-Lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	DICOM Explicit VR Little Endian DICOM Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	DICOM Explicit VR Little Endian DICOM Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None

2.2.2. Worklist Application Entity

2.2.2.1. SOP Classes

This Application Entity provides Standard Conformance to the following SOP Class:

TABLE 10 - STANDARD EXTENDED SOP CLASSES FOR DFTS

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

2.2.2.2. Association Policies

2.2.2.2.1. General

TABLE 11 - DICOM APPLICATION CONTEXT

Application Context Name	1.2.840.10008.3.1.1.1

2.2.2.2.2. Number of Associations

TABLE 12 - NUMBER OF ASSOCIATIONS AS AN INITIATOR FOR DMSC

Maximum number of simultaneous associations	Unlimited

TABLE 13 - NUMBER OF ASSOCIATIONS AS AN ACCEPTOR FOR DMSC

Maximum number of simultaneous associations	Unlimited

2.2.2.2.3. Asynchronous Nature

DMSCs do not support asynchronous communications (multiple outstanding transactions over a single Association).

TABLE 14 - ASYNCHRONOUS NATURE AS AN ASSOCIATION INITIATOR FOR DMSC

Maximum number of outstanding asynchronous transactions	0

2.2.2.2.4. Implementation Identifying Information

The implementation information for this Application Entity is:

TABLE 15 - IMPLEMENTATION IDENTIFYING INFORMATION

Implementation Class UID	1.3.6.1.4.1.29759.1001.31.1
Implementation Version Name	DLLCDCM02

2.2.2.3.   Association Initiation Policy

2.2.2.3.1. Real-World Activity: Worklist Request and MPPS

The operator of the non-DICOM cardiograph can choose to retrieve an up-to-date worklist to the cardiograph. To initiate this function, the operator will run a query from the cardiograph, with or without optional search criteria. When the operator starts the query process, a non-DICOM request is sent to the DMSC. The DMSC will query the DICOM Modality Worklist service provider for the Modality Worklist, using the search criteria if provided. The returned list of orders is passed through the DMSC to the cardiograph and displayed to the operator.

The operator of the cardiograph can select and perform one or more ECGs from the returned worklist and transmit it/them to the DMSC. The DMSC will translate the ECG and sent it to the DICOM storage/management system as described in section 2.2.1.3.1 (Transmit ECG). If MPPS functionality is turned on, the DMSC will also send an MPPS message of COMPLETED.

2.2.2.3.1.1.   Proposed Presentation Context for DMSC

TABLE 16 - PROPOSED PRESENTATION CONTEXT FOR DFTS

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Extended Negotiation
Name	UID	Name List	UID List	Role	
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	DICOM Explicit VR Little Endian DICOM 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	DICOM Explicit VR Little Endian DICOM Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCU	None

2.2.2.3.2. Real-World Activity: Worklist Response

The operator of a DICOM cardiograph can choose to retrieve an up-to-date worklist to the cardiograph. To initiate this function, the operator will run a query from the cardiograph, with or without optional search criteria. When the operator starts the query process and a DICOM MWL request is sent to the DMSC. The DMSC will query the non-DICOM storage/management system and retrieve the worklist, using the search criteria if provided. The returned list of orders is passed through the DMSC to the cardiograph as a Modality Worklist and displayed to the operator.

2.2.2.3.2.1. Proposed Presentation Context for DMSC

TABLE 17 - PROPOSED PRESENTATION CONTEXT FOR DFTS

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Extended Negotiation
Name	UID	Name List	UID List	Role	Negotiation
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	DICOM Explicit VR Little Endian DICOM Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	DICOM Explicit VR Little Endian DICOM Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2	SCP	None

2.3.   Network Interfaces

2.3.1.   Physical Network Interface

DMSCs support a single network interface. The physical network interface depends on the host server on which the DMSC is installed.

2.3.2.   Additional Protocols

None.

2.4.   Configuration

2.4.1.   AE Title/Presentation Address Mapping

2.4.1.1. Local AE Titles

All local applications use the AE Titles and TCP/IP Ports configured using the DMSC Configuration Utility. All local DICOM services use the same AE Title.

2.4.1.2. Remote AE Title/Presentation Address Mapping

The AE Title, host names and port numbers of remote applications are configured using the DMSC Configuration Utility.

2.4.1.2.1. Storage

Open the DMSC Configuration Utility to set the AE Titles, Port numbers, IP Addresses and capabilities for the remote ECG Storage SCPs.

2.4.2. Parameters

A number of parameters related to general operation can be configured using the DMSC Configuration Utility. The table below only shows those configuration parameters relevant to DICOM communications, grouped according the specific DMSC application. See the DMSC Manual on the application for details on general configuration capabilities.

The DMSC supports the following configuration parameters:

TABLE 18 - CONFIGURATION PARAMETERS

Parameter Description	Configurable (Yes/No)	Default Value
DatamedFT™ Parameters		
SOP Class	Yes	"Based on Lead Count", which means 12-Lead ECG Waveform for ECGs with only 12 leads, and General ECG Waveform for ECGs with more than 12 leads
Transfer Syntax	Yes	"Explicit VR Little Endian"
Nomenclature	Yes	"SCPECG, which means that SCPECG nomenclature codes will be used instead of MDC nomenclature codes.
DatamedWL™ Parameters		
SCU Worklist Retrieval Settings – Remote System Information for C-FIND		
AE Title	Yes	
Host Address	Yes	
Host Port	Yes	
SCU Record Storage Settings – Remote System Information for C-STORE		
AE Title	Yes	
Host Address	Yes	
Host Port	Yes	
General Settings		
SOP Class	Yes	"General ECG Waveform"
Transfer Syntax	Yes	"Explicit VR Little Endian"

AE Title (Local System)	Yes	"DatamedWL"
Modality (used in C_FIND)	Yes	"ECG"
Step Location (used in C_FIND)	Yes	"1"
Max PDU Size	Yes	"2048"
Timeout (for communications)	Yes	"30"
Use TLS	Yes	"No"
Enable MPPS Functionality	Yes	"No"
Server Port (for MPPS)	Yes	"0"
DatamedSnd™ DSND01 Parameters		
Local AE Title	Yes	"DATAMEDSND"
Remote AE Title	Yes	
IP Address	Yes	
Port	Yes	

CHAPTER 3: IOD MODULES

3.1. SOP Specific Conformance for ECG Waveform Storage

The DMSC receives or creates 12-lead or General ECG Waveform objects with the following DICOM attributes. All attributes conform to the 12-lead and General ECG Waveform Storage SOP class specification. Refer to Tables A.34.3-1 and A.34.4-1 in PS-3.

IE	Module	Document Reference	DICOM Reference (PS 3.3)	Usage
Patient	Patient	3.1.1	C.7.1.1	Always Present
	Clinical Trial Subject	N/A	C.7.1.3	Not Used
Study	General Study	3.1.2	C.7.2.1	Always Present
	Patient Study	3.1.3	C.7.2.2	Always Present
	Clinical Trials Study	N/A	C.7.2.3	Not Used
Series	General Series	3.1.4	C.7.3.1	Always Present
	Clinical Trial Series	N/A	C.7.3.2	Not Used
Frame of Reference	Synchronization	N/A	C.7.4.2	Not Used
Equipment	General Equipment	3.1.5	C.7.5.1	Always Present
Waveform	Waveform Identification	3.1.6	C.10.8	Always Present
	Waveform	3.1.7	C.10.9	Always Present
	Acquisition Context	3.1.8	C.7.6.14	Always Present
	Waveform Annotation	3.1.9	C.10.10	Present if annotation is available
	SOP Common	0	C.12.1	Always Present

3.1.1. Patient Module

Attribute Name	Tag	Type	Description / Value
Patient's Name	(0010,0010)	2	Patient's full name. (Patient FName/LName)
Patient ID	(0010,0020)	2	Primary hospital identification number or code for the patient. (Patient ID)
Patient's Birth Date	(0010,0030)	2	Birth date of the patient. (DateOfBirth)
Patient's Sex	(0010,0040)	2	Sex of the named patient. Enumerated Values: "M" = male; "F" = female; "O" = other. (Sex)
Other Patient Ids	(0010,1000)	3	Other identification numbers or codes used to identify the patient. (Secondary Patient ID)
Ethnic Group	(0010,2160)	3	Ethnic group or race of the patient. (Race)
Patient Comments	(0010,4000)	3	User-defined additional information about the patient. (UserText – input only)

3.1.2. General Study Module

Attribute Name	Tag	Type	Description / Value

Study Instance UID	(0020,000D)	1	Unique identifier for the Study. For output DFTS will use the source value from EKGUniqueID if it has a value, otherwise DFTS will generate this as:
			    DLLC prefix: 1.3.6.1.4.1.29759
			    DFTS Security Key S/N
			    Date and Time (YYYYMMDDHHMMSS)
			    Suffix: 1

Study Date	(0008,0020)	2	Date the Study started (Acquisition Date – output only)
Study Time	(0008,0030)	2	Time the Study started (Acquisition Time – output only)
Referring Physician's Name	(0008,0090)	2	Name of the patient's referring physician. (Referring Doctor Name)
Study ID	(0020,0010)	2	User or equipment generated Study identifier. For output this will be blank from DFTS.
Accession Number	(0008,0050)	2	A number that identifies the order for the study (Order Number)

Study Description	(0008,1030)	3	Institution-generated description or classification of the Study (component) performed. (Test Reason)
Physician(s) of Record	(0008,1048)	3	Names of the physician(s) who are responsible for overall patient care at time of Study (Attending Doctor Name)
Name of Physician(s) Reading Study	(0008,1060)	3	Names of the physician(s) reading the Study (Confirming Doctor Name)

3.1.3. Patient Study Module

Attribute Name	Tag	Type	Description / Value
Patient's Age	(0010,1010)	2	Age of the Patient. (Age)
Patient's Size	(0010,1020)	2	Length or size of the Patient, in meters. (Height)
Patient's Weight	(0010,1030)	2	Weight of the Patient, in kilograms. (Weight)
Admission ID	(0038,0010)	3	Identification number of the visit as assigned by the healthcare provider. (Encounter Number)

3.1.4. General Series Module

Attribute Name	Tag	Type	Description / Value
Modality	(0008,0060)	1	Type of equipment that originally acquired the data used to create the images in this Series. For output this will always be "ECG".
Series Instance UID	(0020,000E)	1	Unique identifier for the Series. DFTS will generate this as: DLLC prefix: 1.3.6.1.4.1.29759 DFTS Security Key S/N Date and Time (YYYYMMDDHHMMSS) Suffix: 1.1
Series Number	(0020,0011)	2	A number that identifies this Series. For output this will be blank from DFTS.
Laterality	(0020,0060)	2C	Laterality of (paired) body part examined. Required if

Attribute Name	Tag	Type	Description / Value
			the body part examined is a paired structure and Image Laterality (0020,0062) or Frame Laterality (0020,9072) are not sent. For output this will always be blank.
Performing Physicians' Name	(0008,1050)	3	Name of the physician(s) administering the Series. (Performing Doctor Name)
Operators' Name	(0008,1070)	3	Name(s) of the operator(s) supporting the Series. (Technician Name)
Performed Protocol Code Sequence	(0040,0260)	1	Needed to distinguish resting ECGs from other ECG types. ONLY PRESENT FOR GENERAL ECG WAVEFORM SOP CLASS OUTPUT.
> Code Value	(0008,0100)	1C	This will be "P2-3120A".
> Coding Scheme Designator	(0008,0102)	1C	This will be "SRT".
> Code Meaning	(0008,0104)	1C	This will be "12-lead ECG".

3.1.5. General Equipment Module

Attribute Name	Tag	Type	Description / Value
Manufacturer	(0008,0070)	2	Manufacturer of the equipment that produced the composite instances. When acting as an SCU, the DFTS will use the manufacturer of the originating equipment.
Institution Name	(0008,0080)	3	Institution where the equipment that produced the composite instances is located. (Institution Name)
Station Name	(0008,1010)	3	User defined name identifying the machine that produced the composite instances (Cart ID)
Institutional Department Name	(0008,1040)	3	Department in the institution where the equipment that produced the composite instances is located. (Department Name)
Manufacturer's Model Name	(0008,1090)	3	Manufacturer's model name of the equipment that produced the composite instances (Cart Model)
Device Serial Number	(0018,1000)	3	Manufacturer's serial number of the equipment that produced the composite instances. (Cart Serial Num)
Software Version(s)	(0018,1020)	3	Manufacturer's designation of software version of the equipment that produced the composite instances.

			(Cart Version)

3.1.6. Waveform Identification Module

Attribute Name	Tag	Type	Description / Value
Instance Number	(0020,0013)	1	A number that identifies this waveform. For output this will always be "1".
Content Date	(0008,0023)	1	The date the waveform data was created. (Acquisition Date)
Content Time	(0008,0033)	1	The time the Waveform data was created. (Acquisition Time)
Acquisition Datetime	(0008,002a)	1	The date and time that the acquisition of data that resulted in this waveform. (Acquisition Date/Time)

3.1.7. Waveform Module

Attribute Name	Tag	Type	Description / Value
Waveform Sequence	(5400,0100)	1	Sequence of one or more Items, each representing one waveform multiplex group. Ordering of Items in this Sequence is significant for external reference to specific multiplex groups. This will have 1 or 2 multiplex groups, one for rhythm data and one for median data (if present).
> Waveform Originality	(003A,0004)	1	This will be "ORIGINAL" for the rhythm data and "DERIVED" for median data.
> Number of Waveform Channels	(003A,0005)	1	Number of channels for this multiplex group. (Lead Count / Median Count)
> Number of Waveform Samples	(003A,0010)	1	Number of samples per channel in this multiplex group. (Lead Sample Count / Median Sample Count)
> Sampling Frequency	(003a,001a)	1	Frequency in Hz. (Sample Rate / Median Sample Rate)
> Multiplex Group Label	(003a,0020)	3	Label for multiplex group. This is "RHYTHM" for the

			first group and "MEDIAN BEAT" for the second group.
>> Channel Definition Sequence	(003a,0200)	1	Sequence of one or more Items, with one Item per channel. Ordering of Items in this Sequence is significant for reference to specific channels. There will be one item for each lead.
>> Channel Label	(003a,0203)	3	Text label for channel which may be used for display purposes. (Lead Name)
>> Channel Status	(003a,0205)	3	One or more values for the status of this channel within this SOP Instance. ONLY PRESENT FOR GENERAL ECG WAVEFORM SOP CLASS OUTPUT AND ALWAYS "OK".
>> Channel Source Sequence	(003a,0208)	1	Sequence of one or more Items which further qualify the Waveform Source. This will have one item for each lead.
>>> Code Value	(0008,0100)	1C	This is the code for the lead based on the Nomenclature setting – See PS3-16 - Context ID 3001 for a complete list. These are the standard leads: *Lead* *SCPECG* *MDC* Lead I "5.6.3-9-1" "2:1" Lead II "5.6.3-9-2" "2:2" Lead III "5.6.3-9-61" "2:61" Lead aVR "5.6.3-9-62" "2:62" Lead aVL "5.6.3-9-63" "2:63" Lead aVF "5.6.3-9-64" "2:64" Lead V1 "5.6.3-9-3" "2:3" Lead V2 "5.6.3-9-4" "2:4" Lead V3 "5.6.3-9-5" "2:5" Lead V4 "5.6.3-9-6" "2:6" Lead V5 "5.6.3-9-7" "2:7" Lead V6 "5.6.3-9-8" "2:8"
>>> Coding Scheme Designator	(0008,0102)	1C	SCPECG Nomenclature: This will be "SCPECG". MDC Nomenclature: This will be "MDC".
>>> Code Scheme Version	(0008,0103)	1C	SCPECG Nomenclature: This will be "1.3". MDC Nomenclature: This will not be present.
>>> Code Meaning	(0008,0104)	1C	This is the lead name.
>> Channel Sensitivity	(003a,0210)	1C	Nominal numeric value of unit quantity of sample. This is the LSB in microvolts and will always be 5.00.
>> Channel Sensitivity Units Sequence	(003a,0211)	1C	A coded descriptor of the Units of measure for the Channel Sensitivity. Only a single Item shall be permitted in this sequence.
>>> Code Value	(0008,0100)	1C	This will be "uV".

>>> Coding Scheme Designator	(0008,0102)	1C	This will be "UCUM".
>>> Code Scheme Version	(0008,0103)	1C	This will be "1.4".
>>> Code Meaning	(0008,0104)	1C	This will be "microvolt".
>> Channel Sensitivity Correction Factor	(003a,0212)	1C	Multiplier to be applied to encoded sample values to match units specified in Channel Sensitivity (003A,0210). This will be "1".
>> Channel Baseline	(003a,0213)	1C	Offset of encoded sample value 0 from actual 0 using the units defined in the Channel Sensitivity Units Sequence (003A,0211). This will be "0".
>> Channel Sample Skew	(003a,0215)	1C	Offset of first sample of channel from waveform multiplex group start time, in samples. This will be "0".
>> Waveform Bits Stored	(003a,021a)	1	Number of significant bits within the waveform samples. This will be "16".
>> Filter Low Frequency	(003a,0220)	3	Nominal 3dB point of lower frequency of pass band; in Hz. (High Pass Filter)
>> Filter High Frequency	(003a,0221)	3	Nominal 3dB point of higher frequency of pass band; in Hz. (Low Pass Filter)
>> Notch Filter Frequency	(003a,0222)	3	Center frequency of notch filter(s); in Hz. (AC Filter)
> Waveform Bits Allocated	(5400,1004)	1	Size of each waveform data sample within the waveform data. This will be "16".
> Waveform Sample Interpretation	(5400,1006)	1	Data representation of the waveform data points. This will be "SS".
> Waveform Data	(5400,1010)	1	Encoded data samples - channel multiplexed. Data values are encoded interleaved, incrementing by channel and then by sample (i.e., C1S1, C2S1, C3S1, … CnS1, C1S2, C2S2, C3S2, … CnSm), with no padding or explicit delimitation between successive samples.

3.1.8. Acquisition Context Module

Attribute Name	Tag	Type	Description / Value
Acquisition Context Sequence	(0040,0555)	2	A sequence of items that describes the conditions present during the acquisition of the data of the SOP instance. Zero or more items may be included in this sequence.
> Value Type	(0040,A040)	2	The type of the value encoded in this item. This will be "CODE".
> Concept Name Code Sequence	(0040,A043)	1	A concept that constrains the meaning of (i.e. defines the role of) observation value. The "Name" component of the Name/Value pair. This sequence shall contain exactly one item.
>> Code Value	(0008,0100)	1C	SCPECG Nomenclature: This will be "5.4.5-33-1" MDC Nomenclature: This will be "10:11345".
>> Coding Scheme Designator	(0008,0102)	1C	SCPECG Nomenclature: This will be "SCPECG". MDC Nomenclature: This will be "MDC".
>> Code Scheme Version	(0008,0103)	1C	SCPECG Nomenclature: This will be "1.3". MDC Nomenclature: This will not be present.
>> Code Meaning	(0008,0104)	1C	SCPECG Nomenclature: This will be "Electrode Placement". MDC Nomenclature: This will be "Lead System".
> Concept Code Sequence	(0040,A168)	1	This is the Value component of a Name/Value pair when the Concept implied by Concept Name Code Sequence (0040,A043) is a Coded Value. This sequence shall contain exactly one item. Required if Date (0040,A121), Time (0040,A122), Person Name (0040,A123), Text Value (0040,A160), and the pair of Numeric Value (0040,A30A) and Measurement Units Code Sequence (0040,08EA) are not present.
>> Code Value	(0008,0100)	1C	SCPECG Nomenclature: This will be "5.4.5-33-1-1" MDC Nomenclature: This will be "10:11265".
>> Coding Scheme Designator	(0008,0102)	1C	SCPECG Nomenclature: This will be "SCPECG". MDC Nomenclature: This will be "MDC".
>> Code Scheme Version	(0008,0103)	1C	SCPECG Nomenclature: This will be "1.3". MDC Nomenclature: This will not be present.
>> Code Meaning	(0008,0104)	1C	SCPECG Nomenclature: This will be "Standard 12-lead positions: limb leads placed at extremities". MDC Nomenclature: This will be "Standard 12-lead

			positions, electrodes placed individually".

3.1.9. Waveform Annotation Module

Attribute Name	Tag	Type	Description / Value
Waveform Annotation Sequence	(0040,B020)	1	Sequence of Annotation Items; one or more items shall be present.
For the Interpretation Statements the Annotation Group Number will be "0" and there will be one item per statement.			
> Annotation Group Number	(0040,A180)	1C	Number identifying associated annotations. This will be "0".
> Unformatted Text Value	(0070,0006)	1C	Text Observation Value (annotation). (Statements)
> Referenced Waveform Channels	(0040,A0B0)	1C	List of channels in waveform to which annotation applies. This will be "0001 0000" (1,0).
For the Global Measurements the Annotation Group Number will be "1" and there will be one item per measurement. Only measurements that have a value will be present.			
> Annotation Group Number	(0040,A180)	1C	Number identifying associated annotations. This will be "1".
> Concept Code Name Sequence	(0040,A043)	1C	Code representing the fully specified name of the NUMERIC measurement or CODED concept. This sequence shall contain exactly one item.
>> Code Value	(0008,0100)	1C	This is the code for the measurement. These are the possible values: *Name* *SCPECG* *MDC* VRate "5.10.2.5-1" "2:16016" ARate "5.10.2.5-3" "2:16020" RR Interval "5.10.2.1-3" "2:16168" PP Interval "5.10.2.1-5" "2:16140" PR Interval "5.13.5-7" "2:15872" P Duration "5.13.5-5" "2:16184" QRS Duration "5.13.5-9" "2:16156" QT Interval "5.13.5-11" "2:16160" QTc Interval "5.10.2.5-5" "2:15876" P Axis "5.10.3-11" "2:16128" QRS Axis "5.10.3-13" "2:16132" T Axis "5.10.3-15" "2:16136"

			Name Systolic "F-008EC" Diastolic "F-008ED"
>> Coding Scheme Designator	(0008,0102)	1C	For Systolic and Diastolic measurements, this will be "SRT". For all other measurements: SCPECG Nomenclature: This will be "SCPECG". MDC Nomenclature: This will be "MDC".
>> Code Scheme Version	(0008,0103)	1C	For Systolic and Diastolic measurements, this will not be present. For all other measurements: SCPECG Nomenclature: This will be "1.3". MDC Nomenclature: This will not be present.
>> Code Meaning	(0008,0104)	1C	This is the text name of the measurement. These are the possible values: VRate "Ventricular Heart Rate" ARate "Atrial Heart Rate" RR Interval "RR Interval" PP Interval "PP Interval" PR Interval "PR Interval" P Duration "P Duration" QRS Duration "QRS Duration" QT Interval "QT Interval" QTc Interval "QTc Interval" P Axis "P Axis" QRS Axis "QRS Axis" T Axis "T Axis" Systolic "Systolic blood pressure" Diastolic "Diastolic blood pressure"
> Numeric Value	(0040,A30A)	1C	Numeric measurement value or values.
> Measurement Units Code Sequence	(0040,08EA)	1C	Units of measurement. Coded entry sequence with one item only.
>> Code Value	(0008,0100)	1C	This is the measurement unit designator. These are the possible values: VRate "{H.B.}/min" ARate "{H.B.}/min" RR Interval "ms" PP Interval "ms" PR Interval "ms" P Duration "ms" QRS Duration "ms" QT Interval "ms" QTc Interval "ms" P Axis "deg" QRS Axis "deg" T Axis "deg"

			Systolic "mmHg" Diastolic "mmHg"
>> Coding Scheme Designator	(0008,0102)	1C	This will be "UCUM".
>> Code Scheme Version	(0008,0103)	1C	This will be "1.4".
>> Code Meaning	(0008,0104)	1C	This is the text name of the measurement unit. These are the possible values: VRate "heart beats per minute" ARate "heart beats per minute" RR Interval "millisecond" PP Interval "millisecond" PR Interval "millisecond" P Duration "millisecond" QRS Duration "millisecond" QT Interval "millisecond" QTc Interval "millisecond" P Axis "degrees" QRS Axis "degrees" T Axis "degrees" Systolic "millimeters Hg" Diastolic "millimeters Hg "
> Referenced Waveform Channels	(0040,A0B0)	1C	List of channels in waveform to which annotation applies. This will be "0001 0000" (1,0).
For the Global Position Markers the Annotation Group Number will be "2" and there will be one item per sample position. Only markers that have a value will be present.			
> Annotation Group Number	(0040,A180)	1C	Number identifying associated annotations. This will be "2".
> Concept Code Name Sequence	(0040,A043)	1C	Code representing the fully specified name of the NUMERIC measurement or CODED concept. This sequence shall contain exactly one item.
>> Code Value	(0008,0100)	1C	This is the code for the marker. These are the possible values: P Onset "5.10.3-1" P Offset "5.10.3-2" QRS Onset "5.10.3-3" Fiducial Point "5.7.1-3" QRS Offset "5.10.3-4" T Offset "5.10.3-5"
>> Coding Scheme Designator	(0008,0102)	1C	This will be "SCPECG".
>> Code Scheme Version	(0008,0103)	1C	This will be "1.3".

>> Code Meaning	(0008,0104)	1C	This is the text name of the marker. These are the possible values: P Onset — "P Onset" P Offset — "P Offset" QRS Onset — "QRS Onset" Fiducial Point — "Fiducial Point" QRS Offset — "QRS Offset" T Offset — "T Offset"
> Referenced Sample Positions	(0040,A132)	1C	List of samples within a multiplex group specifying temporal points for annotation. Position of first sample is 1. There will be only one sample position.
> Referenced Waveform Channels	(0040,A0B0)	1C	List of channels in waveform to which annotation applies. This will be "0001 0000" (1,0).
For the Pacing Markers the Annotation Group Number will be "3" and there will be one item per sample position.			
> Annotation Group Number	(0040,A180)	1C	Number identifying associated annotations. This will be "3".
> Concept Code Name Sequence	(0040,A043)	1C	Code representing the fully specified name of the NUMERIC measurement or CODED concept. This sequence shall contain exactly one item.
>> Code Value	(0008,0100)	1C	This is the code for the marker. This will be "5.10.1.2".
>> Coding Scheme Designator	(0008,0102)	1C	This will be "SCPECG".
>> Code Scheme Version	(0008,0103)	1C	This will be "1.3".
>> Code Meaning	(0008,0104)	1C	This is the text name of the marker. This will be "Pacemaker spike".
> Referenced Sample Positions	(0040,A132)	1C	List of samples within a multiplex group specifying temporal points for annotation. Position of first sample is 1. There will be only one sample position.
> Referenced Waveform Channels	(0040,A0B0)	1C	List of channels in waveform to which annotation applies. This will be "0001 0000" (1,0).

3.1.10. SOP Common Module

Attribute Name	Tag	Type	Description / Value
SOP Class UID	(0008,0016)	1	Uniquely identifies the SOP Class. This will be the 12-Lead ECG SOP Class "1.2.840.10008.5.1.4.1.1.9.1.1" or it will be the General ECG SOP Class "1.2.840.10008.5.1.4.1.1.9.1.2" depending on the configuration settings.
SOP Instance UID	(0008,0018)	1	Uniquely identifies the SOP Instance. DFTS will generate this as: DLLC prefix: 1.3.6.1.4.1.29759 DFTS Security Key S/N Date and Time (YYYYMMDDHHMMSS) Suffix: 1.1

3.1.11.   Additional Attributes

Attribute Name	Tag	Type	Description / Value
Specific Character Set	(0008,0005)	1	*[For Cerner output only]* This will be "ISO_IR 100".
Instance Creation Date	(0008,0012)	1	*[For Cerner output only]* This is the date the ECG was transmitted.
Instance Creation Time	(0008,0013)	1	*[For Cerner output only]* This is the time the ECG was transmitted.
Requesting Physician	(0032,1032)	3	Physician who requested the Service Request. (Requesting Doctor Name)
Patient's Institution Residence	(0038,0400)	3	*[For Cerner and INFINITT DICOM output only]* This comes from the Room field.
Visit Comments	(0038,4000)	3	*[For Cerner and INFINITT DICOM output only]* This comes from the UserText(1) field.
Reason for the Requested Procedure	(0040,1002)	3	*[For Cerner and INFINITT DICOM output only]* This contains the TestReason field.

3.1.12. Manufacturer-Specific – Mortara (Cerner)

The following manufacturer-specific fields are supported for Mortara input and Cerner output:

Attribute Name	Tag	Type	Description / Value
Manufacturer Name	(1455,0010)	3	This maps to the ManufacturerName field.
Social Security Number	(1455,1003)	3	This maps to the SSNumber field.
Attending Physician	(1455,1004)	3	This maps to the AttendingDoctorName field.
Note1	(1455,1006)	3	This maps to the UserText(2) field.
Note2	(1455,1007)	3	This maps to the UserText(3) field.
Order Number	(1455,1008)	3	This maps to the OrderNumber field.
Machine ID	(1455,1009)	3	*[For Cerner output only]* This is a binary structure created from the following fields: InstitutionID, DepartmentID, CartID, and CartModel.
Device Info	(1455,100B)	3	*[For Cerner output only]* This is a binary structure created from the following fields: CartSerialNum, LocalLanguage, OutputLeadFormat, PaperSpeed, TraceSensitivity, InstitutionName, and HeightUnits.

4.1.   SOP Specific Conformance for Modality Worklist

The DICOM attributes listed in 4.1.1 are taken from the Modality Worklist Information Model of DICOM PS 3.4, Annex K.6.1.2. The DMSC requests and receives orders using a subset of these attributes, as described in 4.1.2 and 4.2.3. This functionality utilizes parts of the following modules:

IE	Module	DICOM Reference (PS 3.3)
Patient	Patient Relationship	C.2.1
	Patient Identification	C.2.2
	Patient Demographic	C.2.3
	Patient Medical	C.2.4
Visit	Visit Relationship	C.3.1
	Visit Identification	C.3.2
	Visit Status	C.3.3
	Visit Admission	C.3.4
Procedure	Scheduled Procedure Step	C.4.10
	Requested Procedure	C.4.11

4.1.1.   Modality Worklist Information Model

Attribute Name	Tag	Matching Key Type	Return Key Type	Description / Value
Patient Relationship				
Referenced Study Sequence	(0008,1110)	O	3	Uniquely identifies the Study SOP Instances associated with the Patient SOP Instance. One or more Items may be included in this Sequence.
Referenced Visit Sequence	(0008,1125)	O	3	Uniquely identifies the Visit SOP Instances associated with this Patient SOP Instance. One or more Items may be included in this Sequence.
Referenced Patient Alias Sequence	(0038,0004)	O	3	Uniquely identifies any Patient SOP Instances that also describe this patient. These SOP Instances are aliases. Zero or

				more Items may be included in this Sequence.
Patient Identification				
Patient's Name	(0010,0010)	R	1	Patient Name shall be retrieved with Single Value Matching or Wild Card Matching.
Patient ID	(0010,0020)	R	1	Patient ID shall be retrieved with Single Value Matching.
Issuer of Patient ID	(0010,0021)	O	3	Identifier of the Assigning Authority (system, organization, agency, or department) that issued the Patient ID. Note: Issuer of Patient ID (0010,0021) is equivalent to HL7 v2 PID-3 component 4.
Other Patient IDs	(0010,1000)	O	3	Other identification numbers or codes used to identify the patient.
Other Patient IDs Sequence	(0010,1002)	O	3	A sequence of identification numbers or codes used to identify the patient, which may or may not be human readable, and may or may not have been obtained from an implanted or attached device such as an RFID or barcode.
>Patient ID	(0010,0020)	O	3	An identification number or code used to identify the patient
>Issuer of Patient ID	(0010,0021)	O	3	Identifier of the Assigning Authority that issued the Patient ID.
>Type of Patient ID	(0010,0022)	O	3	The type of identifier in this item. Defined Terms: TEXT RFID BARCODE Note: The identifier is coded as a string regardless of the type, not as a binary value.
Other Patient Names	(0010,1001)	O	3	Other names used to identify the patient.
Patient's Birth Name	(0010,1005)	O	3	Patient's birth name.
Patient's Mother's Birth Name	(0010,1060)	O	3	Birth name of patient's mother.
Medical Record Locator	(0010,1090)	O	3	An identifier used to find the patient's existing medical record (e.g. film jacket).

Patient Demographic				
Patient's Birth Date	(0010,0030)	O	2	Date of birth of the named patient
Patient's Sex	(0010,0040)	O	2	Sex of the named patient. Enumerated Values: M = male F = female O = other
Patient's Primary Language Code Sequence	(0010,0101)	O	3	The languages which can be used to communicate with the patient. If returned, the Patient's Primary Language Code Sequence shall contain one or more Items. The items are ordered by preference (most preferred language to least preferred language).
> Code Value	(0008,0100)	O	1	
> Coding Scheme Designator	(0008,0102)	O	1	
> Code Meaning	(0008,0104)	-	3C	
Patient's Primary Language Code Modifier Sequence	(0010,0102)	-	1	A modifier for a Patient's Primary Language. Can be used to specify a national language variant. Exactly one Item may be included in the sequence.
> Code Value	(0008,0100)	O	1	
> Coding Scheme Designator	(0008,0102)	O	1	
> Code Meaning	(0008,0104)	-	1	Code Meaning shall not be used as Matching Key.
Patient's Weight	(0010,1030)	O	2	Weight of the patient in kilograms
Confidentiality Constraint on Patient Data Description	(0040,3001)	O	2	Special indication to the modality operator about confidentiality of patient information (e.g., that he should not use the patients name where other patients are present).
Patient's Age	(0010,1010)	O	3	Age of the Patient.
Occupation	(0010,2180)	O	3	Occupation of the Patient.
Patient's Birth Time	(0010,0032)	O	3	Time of birth of the named patient
Patient's Insurance Plan Code Sequence	(0010,0050)	O	3	A sequence that conveys the patient's insurance plan. Zero or more Items may be included in this Sequence.

Patient's Size	(0010,1020)	O	3	Patient's height or length in meters
Patient's Address	(0010,1040)	O	3	Legal address of the named patient
Military Rank	(0010,1080)	O	3	Military rank of patient
Branch of Service	(0010,1081)	O	3	Branch of the military. The country allegiance may also be included (e.g. U.S. Army).
Country of Residence	(0010,2150)	O	3	Country in which patient currently resides
Region of Residence	(0010,2152)	O	3	Region within patient's country of residence
Patient's Telephone Numbers	(0010,2154)	O	3	Telephone numbers at which the patient can be reached
Ethnic Group	(0010,2160)	O	3	Ethnic group or race of patient
Patient's Religious Preference	(0010,21F0)	O	3	The religious preference of the patient
Patient Comments	(0010,4000)	O	3	User-defined comments about the patient
Responsible Person	(0010,2297)	O	3	Name of person with medical decision making authority for the patient.
Responsible Person Role	(0010,2298)	O	3	Relationship of Responsible Person to the patient. Defined Terms: OWNER
Responsible Organization	(0010,2299)	O	3	Name of organization with medical decision making authority for the patient.
Patient Species Description	(0010,2201)	O	3	The species of the patient.
Patient Species Code Sequence	(0010,2202)	O	3	The species of the patient.
Patient Breed Description	(0010,2292)	O	3	The breed of the patient.
Patient Breed Code Sequence	(0010,2293)	O	3	The breed of the patient.
Breed Registration Sequence	(0010,2294)	O	3	Information identifying an animal within a breed registry.
>Breed Registration Number	(0010,2295)	O	3	Identification number of a veterinary patient within the registry.
>Breed Registry Code Sequence	(0010,2296)	O	3	Identification of the organization with which an animal is registered.

Patient Medical				
Patient State	(0038,0500)	O	2	Description of patient state (comatose, disoriented, vision impaired, etc.)
Pregnancy Status	(0010,21C0)	O	2	Describes pregnancy state of patient. Enumerated Values: 0001 = not pregnant 0002 = possibly pregnant 0003 = definitely pregnant 0004 = unknown
Medical Alerts	(0010,2000)	O	2	Conditions to which medical staff should be alerted (e.g. contagious condition, drug allergies, etc.)
Allergies	(0010,2110)	O	2	Description of prior reaction to contrast agents, or other patient allergies or adverse reactions.
Special Needs	(0038,0050)	O	2	Medical and social needs (e.g. wheelchair, oxygen, translator, etc.)
Pertinent Documents Sequence	(0038,0100)	O	3	Pertinent Documents Sequence shall be retrieved with Universal Matching only
>Referenced SOP Class UID	(0008,1150)	-	1	
>Referenced SOP Instance UID	(0008,1155)	-	1	
>Purpose of Reference Code Sequence	(0040,A170)	-	2	Describes the purpose for which the document reference is made. Zero or more Items may be present.
>> Code Value	(0008,0100)	-	1	
>> Coding Scheme Designator	(0008,0102)	-	1	
>> Code Meaning	(0008,0104)	-	1	
>Document Title	(0042,0010)	-	2	Title of the referenced document.
Smoking Status	(0010,21A0)			Indicates whether patient smokes. Enumerated Values: YES NO UNKNOWN
Additional Patient History	(0010,21B0)			Additional information about the patient's medical history

Last Menstrual Date	(0010,21D0)			Date of onset of last menstrual period
Patient's Sex Neutered	(0010,2203)			Whether or not a procedure has been performed in an effort to render the patient sterile. Enumerated value: ALTERED = Altered/Neutered UNALTERED = Unaltered/intact
Patient Clinical Trial Participation Sequence	(0038,0502)			Sequence of identifiers for clinical trials in which the patient participates. Zero or more Items may be included in this sequence.
>Clinical Trial Sponsor Name	(0012,0010)			The name of the clinical trial sponsor, responsible for conducting the clinical trial and for defining the Clinical Trial Protocol.
>Clinical Trial Protocol ID	(0012,0020)			Identifier for the noted protocol, used by the Clinical Trial Sponsor to uniquely identify the investigational protocol.
>Clinical Trial Protocol Name	(0012,0021)			The name or title of the clinical trial protocol.
>Clinical Trial Site ID	(0012,0030)			The identifier, issued by the Clinical Trial Sponsor, of the site responsible for submitting clinical trial data.
>Clinical Trial Site Name	(0012,0031)			Name of the site responsible for submitting clinical trial data.
>Clinical Trial Subject ID	(0012,0040)			The assigned identifier for the patient as a clinical trial subject.
>Clinical Trial Subject Reading ID	(0012,0042)			Identifies the patient as a clinical trial subject for blinded evaluations.
Visit Identification				
Admission ID	(0038,0010)	O	2	Identification number of the visit as assigned by the healthcare provider
Institution Name	(0008,0080)	O	3	Institution where the equipment is located
Institution Address	(0008,0081)	O	3	Mailing Address of the institution where the equipment is located
Institution Code Sequence	(0008,0082)	O	3	A sequence that conveys the healthcare facility identification. Only a single Item shall be permitted in this Sequence.
Issuer of Admission ID	(0038,0011)	O	3	Name of healthcare provider which issued the Admission ID

Service Episode ID	(0038,0060)	O	3	Identifier of the Service Episode as assigned by the healthcare provider
Issuer of Service Episode ID	(0038,0061)	O	3	Name of healthcare provider that issued the Service Episode ID
Service Episode Description	(0038,0062)	o	3	Description of the type of service episode.

Visit Status

Current Patient Location	(0038,0300)	O	2	Describes the current known location of the patient
Visit Status ID	(0038,0008)	O	3	Identifies the state of the visit. Defined Terms: CREATED = Created but not yet scheduled SCHEDULED = Scheduled but not yet admitted ADMITTED = Patient admitted to institution DISCHARGED = Patient Discharged
Patient's Institution Residence	(0038,0400)	O	3	Primary location where patient resides (ward, floor, room, etc. or outpatient)
Visit Comments	(0038,4000)	O	3	User-defined comments about the visit

Visit Relationship

Referenced Patient Sequence	(0008,1120)	O	2	Uniquely identifies the Patient SOP Instance that relates to the Visit SOP Instance. Only a single Item shall be permitted in this Sequence.
>Referenced SOP Class UID	(0008,1150)	O	1	
>Referenced SOP Instance UID	(0008,1155)	O	1	
Referenced Study Sequence	(0008,1110)	O	3	Uniquely identifies the Study SOP Instances associated with the Visit SOP Instance. One or more Items may be included in this Sequence.

Visit Admission

Referring Physician's Name	(0008,0090)	O	3	Patient's primary referring physician for this visit
Referring Physician's	(0008,0092)	O	3	Referring physician's address

Address				
Referring Physician's Telephone Numbers	(0008,0094)	O	3	Referring physician's telephone numbers
Referring Physician Identification Sequence	(0008,0096)	O	3	Identification of the patient's referring physician. Only a single item shall be permitted in this sequence.
Admitting Diagnoses Description	(0008,1080)	O	3	Description of admitting diagnosis (diagnoses).
Admitting Diagnoses Code Sequence	(0008,1084)	O	3	A sequence that conveys the admitting diagnosis (diagnoses). One or more Items may be included in this Sequence.
Route of Admissions	(0038,0016)	O	3	Mode of admission: emergency, normal
Admitting Date	(0038,0020)	O	3	Date patient visit began
Admitting Time	(0038,0021)	O	3	Time patient visit began
Scheduled Procedure Step				
Scheduled Procedure Step Sequence	(0040,0100)	R	1	The Attributes of the Scheduled Procedure Step shall only be retrieved with Sequence Matching. The Scheduled Procedure Step Sequence shall contain only a single Item.
>Scheduled Station AE Title	(0040,0001)	R	1	The Scheduled station AE title shall be retrieved with Single Value Matching only.
>Scheduled Procedure Step Start Date	(0040,0002)			Scheduled Step Start Date shall be retrieved with Single Value Matching or Range Matching. See remark under Scheduled Procedure Step Start Time (0040,0003).
>Scheduled Procedure Step Start Time	(0040,0003)	R	1	Scheduled Step Start Time shall be retrieved with Single Value Matching or Range Matching. Scheduled Step Start Date and Scheduled Step Start Time are subject to Range Matching. If both keys are specified for Range Matching, e.g. the date range July 5 to July 7 and the time range 10am to 6pm specifies the time period starting on July 5, 10am until July 7, 6pm.
>Modality	(0008,0060)	R	1	The Modality shall be retrieved with Single Value Matching.
>Scheduled Performing Physician's Name	(0040,0006)	R	2	Scheduled Performing Physician's Name shall be retrieved with Single Value Matching or Wild Card Matching.

>Scheduled Procedure Step Description	(0040,0007)	O	1C	Either the Scheduled Procedure Step Description (0040,0007) or the Scheduled Protocol Code Sequence (0040,0008) or both shall be supported by the SCP.
>Scheduled Station Name	(0040,0010)	O	2	An institution defined name for the modality on which the Scheduled Procedure Step is scheduled to be performed.
>Scheduled Procedure Step Location	(0040,0011)	O	2	The location at which the Procedure Step is scheduled to be performed.
>Scheduled Protocol Code Sequence	(0040,0008)	O	1C	Either the Scheduled Procedure Step Description (0040,0007) or the Scheduled Protocol Code Sequence (0040,0008) or both shall be supported by the SCP. The Scheduled Protocol Code Sequence contains one or more Items.
>> Code Value	(0008,0100)	O	1	
>> Coding Scheme Designator	(0008,0102)	O	1	
>> Code Scheme Version	(0008,0103)	O	3	
>> Code Meaning	(0008,0104)	O	3C	
>>Protocol Context Sequence	(0040,0440)	-	3	The Protocol Context Sequence and its Items shall not be used for matching
>>>Value Type	(0040,A040)	-	1	
>>>Concept Name Code Sequence	(0040,A043)	-	1	
>>>> Code Value	(0008,0100)	-	1	
>>>> Coding Scheme Designator	(0008,0102)	-	1	
>>>> Code Scheme Version	(0008,0103)	-	3	
>>>> Code Meaning	(0008,0104)	-	1	
>>>DateTime	(0040,A120)	-	1C	Required if Value Type (0040,A040) is DATETIME.
>>>Person Name	(0040,A123)	-	1C	Required if Value Type (0040,A040) is PNAME.
>>>Text Value	(0040,A160)	-	1C	Required if Value Type (0040,A040) is

				TEXT.
>>>Concept Code Sequence	(0040,A168)	-	1C	Required if Value Type (0040,A040) is CODE.
>>>> Code Value	(0008,0100)	-	1	
>>>> Coding Scheme Designator	(0008,0102)	-	1	
>>>> Code Scheme Version	(0008,0103)	-	3	
>>>> Code Meaning	(0008,0104)	-	1	
>>>Numeric Value	(0040,A30A)	-	1C	Required if Value Type (0040,A040) is NUMERIC.
>>>Measurement Units	(0040,08EA)	-	1C	Required if Value Type (0040,A040) is NUMERIC.
>>>> Code Value	(0008,0100)	-	1	
>>>> Coding Scheme Designator	(0008,0102)	-	1	
>>>> Code Scheme Version	(0008,0103)	-	3	
>>>> Code Meaning	(0008,0104)	-	1	
>>>All other attributes from Protocol Context Sequence			3	
>Pre-Medication	(0040,0012)	O	2C	Required if Pre-Medication is to be applied to that Scheduled Procedure Step.
>Scheduled Procedure Step ID	(0040,0009)	O	1	Identifier that identifies the Scheduled Procedure Step.
>Requested Contrast Agent	(0032,1070)	O	2C	Required if Contrast Media is to be applied to that Scheduled Procedure Step.
>Scheduled Procedure Step Status	(0040,0020)	O	3	A real world condition that may affect the selection of the Scheduled Procedure Step. Defined Terms: SCHEDULED – Procedure Step scheduled ARRIVED – patient is available for the Scheduled Procedure Step READY – all patient and other necessary preparation for this step has been completed STARTED – at least one Performed

				Procedure Step has been created that references this Scheduled Procedure Step
>All other Attributes from the Scheduled Procedure Step Sequence		O	3	
Scheduled Specimen Sequence	(0040,0500)	O	3	One or more Items may be returned in this Sequence.
>Container Identifier	(0040,0512)	O	1	
>Container Type Code Sequence	(0040,0518)	-	2	Zero or one Item shall be returned in this Sequence.
>> Code Value	(0008,0100)	-	1	
>> Coding Scheme Designator	(0008,0102)	-	1	
>> Code Scheme Version	(0008,0103)	-	3	
>> Code Meaning	(0008,0104)	-	3C	
>Specimen Description Sequence	(0040,0550)	O	1	One or more Items may be returned in this Sequence.
>>Specimen Identifier	(0040,0551)	O	1	
>>Specimen UID	(0040,0554)	O	1	
>>All other Attributes from the Specimen Description Sequence		O	3	Specimen Preparation Sequence (0040,0610), if present, describes preparation steps already performed, not scheduled procedure steps
>All other Attributes from the Scheduled Specimen Sequence		O	3	
Requested Procedure				
Requested Procedure ID	(0040,1001)	O	1	Identifier that identifies the Requested Procedure in the Imaging Service Request.
Requested Procedure Description	(0032,1060)	O	1C	The Requested Procedure Description (0032,1060) or the Requested Procedure Code Sequence (0032,1064) or both shall be supported by the SCP.
Requested Procedure Code Sequence	(0032,1064)	O	1C	The Requested Procedure Description (0032,1060) or the Requested Procedure

				Code Sequence (0032,1064) or both shall be supported by the SCP. The Requested Procedure Code Sequence shall contain only a single Item.
> Code Value	(0008,0100)	O	1	
> Coding Scheme Designator	(0008,0102)	O	1	
> Code Scheme Version	(0008,0103)	O	3	
> Code Meaning	(0008,0104)	O	3C	
Study Instance UID	(0020,000D)	O	1	Unique identifier to be used to identify the Study
Study Date	(0008,0020)	O	3	Date the Study started, if any previous procedure steps within the same study have already been performed.
Study Time	(0008,0030)	O	3	Time the Study started, if any previous procedure steps within the same study have already been performed.
Referenced Study Sequence	(0008,1110)	O	2	Uniquely identifies the Study SOP Instances associated with this SOP Instance.
>Referenced SOP Class UID	(0008,1150)	O	1	
>Referenced SOP Instance UID	(0008,1155)	O	1	
Requested Procedure Priority	(0040,1003)	O	2	Requested Procedure Type Urgency. Defined Terms: STAT, HIGH, ROUTINE, MEDIUM, LOW
Patient Transport Arrangements	(0040,1004)	O	2	Mode of transportation of the patient to the location of examination.
Reason for the Requested Procedure	0040,1002)	O	3	(Reason for requesting this imaging procedure. Note: This reason is more specific to the requested procedure than the reason mentioned in the imaging service request (0040,2001).
Requested Procedure Comments	(0040,1400)	O	3	User-defined comments on the Requested Procedure.
Reason for Requested Procedure Code Sequence	(0040,100A)	O	3	Coded Reason for requesting this procedure. One or more sequence items may be present.

Requested Procedure Location	(0040,1005)	O	3	Physical location at which the Requested Procedure is to be performed.
Confidentiality Code	(0040,1008)	O	3	Confidentiality Constraints on the Requested Procedure by the party filling the order.
Reporting Priority	(0040,1009)	O	3	Requested Reporting Priority. Defined Terms: HIGH, ROUTINE, MEDIUM, LOW
Names of Intended Recipients of Results	(0040,1010)	O	3	Names of the physicians, who are intended recipients of results.
Intended Recipients of Results Identification Sequence	(0040,1011)	O	3	Identification of the physicians who are intended recipients of results. One or more items shall be included in this sequence. If more than one Item, the number and order shall correspond to the value of Names of Intended Recipients of Results (0040,1010), if present.

4.1.2. Search Criteria for MWL FIND

The following elements can be used as search criteria to filter the Modality Worklist. **NOTE: Not all search criteria are supported by each compatible device.**

Attribute Name	Tag	Description / Value
Accession Number	(0008,0050)	A number that identifies the order for the study (Order Number)
Modality	(0008,0060)	Type of equipment that originally acquired the data used to create the images in this Series. This is a configuration parameter and is defaulted to "ECG".
Institution Name	(0008,0080)	Institution where the equipment that produced the composite instances is located. (Institution Name)
Station Name	(0008,1010)	User defined name identifying the machine that produced the composite instances (Cart ID)
Institutional Department Name	(0008,1040)	Department in the institution where the equipment that produced the composite instances is located. (Department Name)
Patient's Name	(0010,0010)	Patient's full name. (Patient FName/MName/LName)
Patient ID	(0010,0020)	Primary hospital identification number or code for the patient. (Patient ID)
Patient's Birth Date	(0010,0030)	Date of birth of the named patient
Other Patient Ids	(0010,1000)	Other identification numbers or codes used to identify the patient. (Secondary Patient ID)
Requesting Physician	(0032,1032)	Name of the physician who requested the service.
Admission ID	(0038,0010)	Identification number of the visit as assigned by the healthcare provider (Encounter Number)
Current Patient Location	(0038,0300)	Describes the current known location of the patient. This is often used as the department for searching.
Patient's Institutional Residence	(0038,0400)	Primary location where patient resides. (Room)
Scheduled Procedure Step Start Date	(0040,0002)	Scheduled Step Start Date shall be retrieved with Single Value Matching or Range Matching. See remark under Scheduled Procedure Step Start Time (0040,0003).
Scheduled Procedure Step Start Time	(0040,0003)	Scheduled Step Start Time shall be retrieved with Single Value Matching or Range Matching. Scheduled Step Start Date and Scheduled Step Start Time are subject to Range Matching. If both keys are specified for Range Matching, e.g. the date range July 5 to July 7 and the time range 10am to 6pm

		specifies the time period starting on July 5, 10am until July 7, 6pm.
Scheduled Procedure Step Location	(0040,0011)	The location at which the Procedure Step is scheduled to be performed. This is a configuration parameter and is defaulted to "1".
Request Priority	(2200,0020)	Specifies the priority of the request. Defined Terms: STAT, HIGH, ROUTINE, MEDIUM, LOW

4.1.3. Data Returned from MWL FIND

The following elements can be returned by the Modality Worklist query. **NOTE: Not all elements can be returned by every storage/management system and not all elements are supported by each compatible device.**

Attribute Name	Tag	Description / Value
Accession Number	(0008,0050)	A number that identifies the order for the study (Order Number)
Modality	(0008,0060)	Type of equipment that originally acquired the data used to create the images in this Series. This is a configuration parameter and is defaulted to "ECG".
Institution Name	(0008,0080)	Institution where the equipment that produced the composite instances is located. (Institution Name)
Referring Physician's Name	(0008,0090)	Name of the patient's referring physician. (Referring Doctor Name)
Station Name	(0008,1010)	User defined name identifying the machine that produced the composite instances (Cart ID)
Study Description	(0008,1030)	Institution-generated description or classification of the Study (component) performed. (Order Reason)
Institutional Department Name	(0008,1040)	Department in the institution where the equipment that produced the composite instances is located. (Department Name)
Performing Physicians' Name	(0008,1050)	Name of the physician(s) administering the Series. (Performing Doctor Name)
Physician(s) of Record	(0008,1048)	Names of the physician(s) who are responsible for overall patient care at time of Study (Attending Doctor Name)
Operators' Name	(0008,1070)	Name(s) of the operator(s) supporting the Series. (Technician Name)
Patient's Name	(0010,0010)	Patient's full name. (Patient FName/MName/LName)

Patient ID	(0010,0020)	Primary hospital identification number or code for the patient. (Patient ID)
Patient's Birth Date	(0010,0030)	Date of birth of the named patient
Patient's Birth Time	(0010,0032)	Time of birth of the named patient

Patient's Sex	(0010,0040)	Sex of the named patient. Enumerated Values:
		
		    M = male
		    F = female
		    O = other

Other Patient Ids	(0010,1000)	Other identification numbers or codes used to identify the patient. (Secondary Patient ID)
Patient's Age	(0010,1010)	Age of the Patient. (Age)
Patient's Size	(0010,1020)	Patient's height or length in meters
Patient's Weight	(0010,1030)	Weight of the patient in kilograms
Ethnic Group	(0010,2160)	Ethnic group or race of patient. Values: 'ALEUT', 'AMERICAN INDIAN', 'ASIAN', 'BLACK', 'HAWAIIAN', 'HISPANIC', 'ORIENTAL', 'OTHER RACE', 'PACIFIC ISLANDER', 'WHITE', 'UNKNOWN'
Study Instance UID	(0020,000D)	Unique identifier for the Study. (Encounter Number, Record Unique ID)
Requesting Physician	(0032,1032)	Name of the physician who requested the service.
Current Patient Location	(0038,0300)	Describes the current known location of the patient.
Patient's Institutional Residence	(0038,0400)	Primary location where patient resides. (Room)
Scheduled Procedure Step Start Date	(0040,0002)	Scheduled Step Start Date shall be retrieved with Single Value Matching or Range Matching. See remark under Scheduled Procedure Step Start Time (0040,0003).
Scheduled Procedure Step Start Time	(0040,0003)	Scheduled Step Start Time shall be retrieved with Single Value Matching or Range Matching. Scheduled Step Start Date and Scheduled Step Start Time are subject to Range Matching. If both keys are specified for Range Matching, e.g. the date range July 5 to July 7 and the time range 10am to 6pm specifies the time period starting on July 5, 10am until July 7, 6pm.
Requested Procedure Priority	(0040,1003)	Requested Procedure Type Urgency. Defined Terms: STAT, HIGH, ROUTINE, MEDIUM, LOW.

4.1.4. MPPS Support

MPPS support is provided by wrapping the C-STORE transaction with the following sequence: NCreate, CStore, NAction, and NSet. The following elements are used for the specified MPPS transactions. See DICOM Reference PS 3.3 C.4.14.

Attribute Name	Tag	Description / Value
NCreate		
SOP Instance UID	(0008,0018)	Uniquely identifies the SOP Instance. DFTS will generate this as: DLLC prefix: 1.3.6.1.4.1.29759 DFTS Security Key S/N Date and Time (YYYYMMDDHHMMSS) Suffix: 1.1
Modality	(0008,0060)	Type of equipment that originally acquired the data used to create the images in this Series. This is a configuration parameter and is defaulted to "ECG".
ReferencedStudySequence	(0008,1110)	The study that we are processing
> Referenced SOP Class UID	(0008,1150)	Uniquely identifies the referenced SOP Class.
> Referenced SOP Instance UID	(0008,1155)	Uniquely identifies the referenced SOP Instance.
Referenced Patient Sequence	(0008,1120)	A sequence that provides reference to a Patient SOP Class/Instance pair. Only a single Item is permitted in this Sequence.
> Referenced SOP Class UID	(0008,1150)	Uniquely identifies the referenced SOP Class.
> Referenced SOP Instance UID	(0008,1155)	Uniquely identifies the referenced SOP Instance.
Referenced SOP Sequence	(0008,1199)	A sequence of Items where each Item references a single SOP Instance for which storage commitment is requested / or has been provided.
>Retrieve AE Title	(0008,0054)	Application Entity Title where the SOP Instance(s) may be retrieved via a network based retrieve service.
Patient's Name	(0010,0010)	Patient's full name. (Patient FName/LName)
Patient ID	(0010,0020)	Primary hospital identification number or code for the patient. (Patient ID)
Patient's Birth Date	(0010,0030)	Date of birth of the named patient
Patient's Sex	(0010,0040)	Sex of the named patient. Enumerated Values:

		M = male F = female O = other
Study Instance UID	(0020,000D)	Unique identifier to be used to identify the Study
Study ID	(0020,0010)	User or equipment generated Study identifier.
Requested Procedure Description	(0032,1060)	Institution-generated administrative description or classification of Requested Procedure.
Scheduled Procedure Step Description	(0040,0007)	Institution-generated description or classification of the Scheduled Procedure Step to be performed.
Scheduled Procedure Step ID	(0040,0009)	Identifier that identifies the Scheduled Procedure Step.
Performed Station AE Title	(0040,0241)	AE title of the modality on which the Performed Procedure Step was performed.
Performed Station Name	(0040,0242)	An institution defined name for the modality on which the Performed Procedure Step was performed.
Performed Location	(0040,0243)	Description of the location at which the Performed Procedure Step was performed.
Performed Procedure Step Start Date	(0040,0244)	Date on which the Performed Procedure Step started. Note: This value may be used to determine the earliest date to use as the Study Date (0008,0020) in composite instances and in updated Modality Scheduled Procedure Steps in order to allow Study level attributes to have consistent values if additional Procedure Steps are performed.
Performed Procedure Step Start Time	(0040,0245)	Time at which the Performed Procedure Step started. Note: This value may be used to determine the earliest time to use as the Study Time (0008,0030) in composite instances and in updated Modality Scheduled Procedure Steps in order to allow Study level attributes to have consistent values if additional Procedure Steps are performed.
Performed Procedure Step End Date	(0040,0250)	Date on which the Performed Procedure Step ended.
Performed Procedure Step End Time	(0040,0251)	Time at which the Performed Procedure Step ended.

Performed Procedure Step Status	(0040,0252)	Contains the state of the Performed Procedure Step. Set to "IN PROGRESS". Enumerated Values: IN PROGRESS = Started but not complete DISCONTINUED = Canceled or unsuccessfully terminated COMPLETED = Successfully completed
Performed Procedure Step ID	(0040,0253)	User or equipment generated identifier of that part of a Procedure that has been carried out within this step.
Performed Procedure Step Description	(0040,0254)	Institution-generated description or classification of the Procedure Step that was performed.
Scheduled Step Attributes Sequence	(0040,0270)	Sequence that contains the steps
>Accession Number	(0008,0050)	A number that identifies the order for the study (Order Number)
>Transaction UID	(0008,1195)	Uniquely identifies this Storage Commitment transaction.
>Study Instance UID	(0020,000D)	Unique identifier to be used to identify the Study
> Requested Procedure Description	(0032,1060)	Institution-generated administrative description or classification of Requested Procedure.
>Scheduled Procedure Step Description	(0040,0007)	Institution-generated description or classification of the Scheduled Procedure Step to be performed.
>Scheduled Procedure Step ID	(0040,0009)	Identifier that identifies the Scheduled Procedure Step.
>Performed Procedure Step ID	(0040,0253)	User or equipment generated identifier of that part of a Procedure that has been carried out within this step.
Performed Procedure Step Description	(0040,0254)	Institution-generated description or classification of the Procedure Step that was performed.
>Requested Procedure ID	(0040,1001)	Identifier that identifies the Requested Procedure in the Imaging Service Request. Required if procedure was scheduled. May be present otherwise.
Request Attributes Sequence	(0040,0275)	Sequence that contains attributes from the Imaging Service Request. One or more Items are permitted in this sequence.
>Scheduled Procedure Step Description	(0040,0007)	Institution-generated description or classification of the Scheduled Procedure Step to be performed.

>Scheduled Procedure Step ID	(0040,0009)	Identifier that identifies the Scheduled Procedure Step.
>Requested Procedure ID	(0040,1001)	Identifier that identifies the Requested Procedure in the Imaging Service Request. Required if procedure was scheduled. May be present otherwise.
Requested Procedure ID	(0040,1001)	Identifier that identifies the Requested Procedure in the Imaging Service Request. Required if procedure was scheduled. May be present otherwise.
NAction		
Referenced SOP Sequence	(0008,1199)	A sequence of Items where each Item references a single SOP Instance for which storage commitment is requested / or has been provided.
> Referenced SOP Class UID	(0008,1150)	Uniquely identifies the referenced SOP Class.
> Referenced SOP Instance UID	(0008,1155)	Uniquely identifies the referenced SOP Instance.
NSet		
Performed Procedure Step Status	(0040,0252)	Contains the state of the Performed Procedure Step. Set to "COMPLETED" if the CStore was successful, otherwise set to "DISCONTINUED". Enumerated Values: IN PROGRESS = Started but not complete DISCONTINUED = Canceled or unsuccessfully terminated COMPLETED = Successfully completed