Canon

No. 2G985-092EN

DICOM CONFORMANCE STATEMENT
FOR
RADIOLOGY INFORMATION SUPPORT APPLICATION

Vina Analytics

(SWVA-BASE)

V1.3 SP1000E OR LATER

CANON MEDICAL SYSTEMS CORPORATION

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1 CONFORMANCE STATEMENT OVERVIEW

This product provides the following overview of the network services.

Table 1-1
NETWORK SERVICES

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Verification		
Verification	No	Yes
Transfer		
X-Ray Radiation Dose SR Storage	No	Yes
Secondary Capture Image Storage	No	Yes*

* Receive only (No processing and no storing).

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3 INTRODUCTION

3.1. REVISION HISTORY

REV.	Date	Author	Description
	Dec. 14, 2022	Canon Medical Systems	Initial Version (V1.3 SP1000E)

3.2. AUDIENCE

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

3.3. 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 the intended information.
The scope of this Conformance Statement is to facilitate communication with Canon Medical Systems and other vendors' Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [DICOM]. However, by itself, this Conformance Statement does not guarantee the desired interoperability and successful interconnectivity.
The user should be aware of the following important issues:

— Comparison of the different conformance statements is the first step towards assessing the interconnectivity between Canon Medical Systems and non- Canon Medical Systems equipment.
— Test procedures should be defined to validate the desired level of connectivity.
— The DICOM standard is evolving to meet the future requirements of users. Canon Medical Systems Corporation is actively involved in developing the standard further and therefore reserves the right to make changes to its products or to discontinue them.

3.4. TERMS AND DEFINITIONS

Informal definitions are provided for the following terms used in this Conformance Statement. The DICOM Standard is the authoritative source for formal definitions of these terms.
Abstract Syntax – the information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.
Application Entity (AE) – an end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.
Application Entity Title – the externally known name of an *Application Entity*, used to identify a DICOM application to other DICOM applications on the network.
Application Context – the specification of the type of communication used between *Application Entities*. Example: DICOM network protocol.
Association – a network communication channel set up between *Application Entities*.
Attribute – – a unit of information in an object definition; a data element identified by a *tag*. The information may be a complex data structure (Sequence), itself composed of lower level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).
Information Object Definition (IOD) – the specified set of *Attributes* that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The *Attributes* may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C). Examples: MR Image IOD, CT Image IOD, Print Job IOD.

Joint Photographic Experts Group (JPEG) – a set of standardized image compression techniques, available for use by DICOM applications.
Module – a set of *Attributes* within an *Information Object Definition* that are logically related to each other. Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.
Negotiation – first phase of *Association* establishment that allows *Application Entities* to agree on the types of data to be exchanged and how that data will be encoded.
Presentation Context – the set of DICOM network services used over an *Association*, as negotiated between *Application Entities*; includes *Abstract Syntaxes* and *Transfer Syntaxes*.
Protocol Data Unit (PDU) – a packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.
Security Profile – a set of mechanisms, such as encryption, user authentication, or digital signatures, used by an *Application Entity* to ensure confidentiality, integrity, and/or availability of exchanged DICOM data
Service Class Provider (SCP) – role of an *Application Entity* that provides a DICOM network service; typically, a server that performs operations requested by another *Application Entity* (*Service Class User*). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).
Service Class User (SCU) – role of an *Application Entity* that uses a DICOM network service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU)
Service/Object Pair (SOP) Class – the specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.
Service/Object Pair (SOP) Instance – an information object; a specific occurrence of information exchanged in a *SOP Class*. Examples: a specific x-ray image.
Tag – a 32-bit identifier for a data element, represented as a pair of four-digit hexadecimal numbers, the “group” and the “element”. If the “group” number is odd, the tag is for a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element]
Transfer Syntax – the encoding used for exchange of DICOM information objects and messages. Examples: *JPEG* compressed (images), little endian explicit value representation.
Unique Identifier (UID) – a globally unique “dotted decimal” string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.
Value Representation (VR) – the format type of an individual DICOM data element, such as text, an integer, a person’s name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

3.5. BASICS OF DICOM COMMUNICATION

This section describes terminology used in this Conformance Statement for the non-specialist. The key terms used in the Conformance Statement are highlighted in italics below. This sections not a substitute for training about DICOM, and it makes many simplifications about the meanings of DICOM terms.
Two Application Entities (devices) that want to communicate with each other over a network using DICOM protocol must first agree on several things during an initial network “handshake”. One of the two devices must initiate an Association (a connection to the other device), and ask if specific services, information, and encoding can be supported by the other device (Negotiation).
DICOM specifies a number of network services and types of information objects, each of which is called an Abstract Syntax for the Negotiation. DICOM also specifies a variety of methods for encoding data, denoted Transfer Syntaxes. The Negotiation allows the initiating Application Entity to propose combinations of Abstract Syntax and Transfer Syntax to be used on the Association; these combinations are called Presentation Contexts. The receiving Application Entity accepts the Presentation Contexts it supports.
For each Presentation Context, the Association Negotiation also allows the devices to agree on Roles – which one is the Service Class User (SCU - client) and which is the Service Class Provider (SCP - server). Normally the device initiating the connection is the SCU, i.e., the client system calls the server, but not always.

3.6. ABBREVIATIONS

AE	Application Entity
AET	Application Entity Title
CR	Computed Radiography
CT	Computed Tomography
DICOM	Digital Imaging and Communications in Medicine
DX	Digital Radiography
IE	Information Entity
IOD	Information Object Definition
ISO	International Standards Organization
KO	Key Object Selection
MG	Mammography
NM	Nuclear Medicine
O	Optional Key Attribute
OCR	Optical Character Recognition
PDU	Protocol Data Unit
PET	Positron Emission Tomography
R	Required Key Attribute
RDSR	Radiation Dose Structured Report
RF	Radiofluoroscopy
PR	Presentation State
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
U	Unique Key Attribute
UID	Unique Identifier
VM	Value Multiplicity
VR	Value Representation
XA	X-Ray Angiography

3.7. REFERENCES

Digital Imaging and Communications in Medicine (DICOM) Standard, available free at https://www.dicomstandard.org/

4 NETWORKING

4.1. IMPLEMENTATION MODEL

4.1.1. Application Data Flow

This product has the DICOM interface of ECHO SCP and STORAGE SCP which can receive RDSR and SC. It can display X-ray radiation data extracted from RDSR for users. Although SC can accept to receive, no SC image is stored and even displayed as the data in this product.

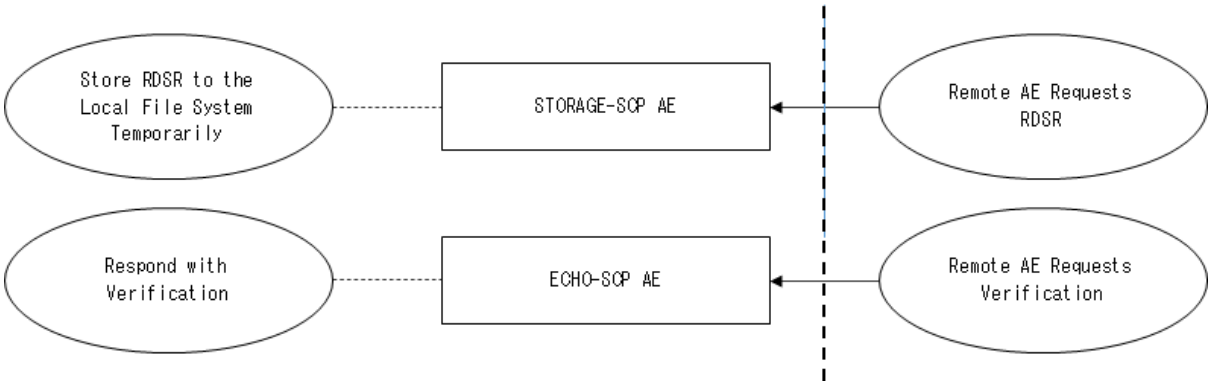

Figure 4.1-1
DICOM DATA FLOW DIAGRAM

4.1.2. Functional Definition of AEs

4.1.2.1. Functional Definition of STORAGE-SCP AE

The STORAGE-SCP AE continuously runs in background, waiting for connections and will accept Verification and X-Ray Radiation Dose SR Storage Presentation Contexts from association. It will store X-Ray Radiation Dose SR to the local disk temporarily and extract information of X-Ray irradiations from it. It describes it doesn't allow to receive DICOM files except RDSR and SC. SC will be accepted but it's not stored and even displayed as the data.

4.1.3. Sequencing of Real-World Activities

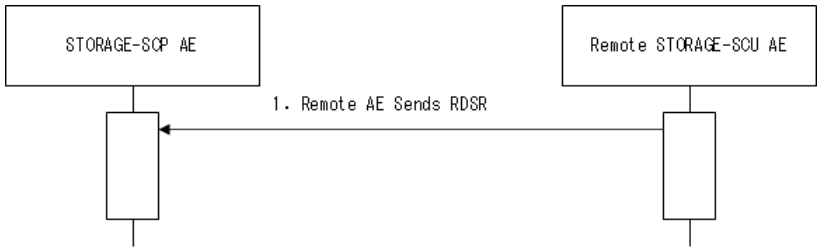

Figure 4.1-2
SEQUENCING CONSTRAINTS

4.2. AE SPECIFICATIONS

4.2.1. STORAGE-SCP AE Specification

4.2.1.1. SOP Classes

The STORAGE-SCP AE provides Standard Conformance to the following SOP Class:

Table 4-1
SOP CLASSES FOR TORAGE-SCP AE

SOP Class Name	SOP Class UID	SCU	SCP
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	No	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Yes

4.2.1.2. Association Policies

4.2.1.2.1. General

The DICOM standard Application Context Name for DICOM is always accepted.

Table 4-2
DICOM APPLICATION CONTEXT FOR STORAGE-SCP AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2. Number of Associations

The STORAGE-SCP AE can support up to 3 Associations at a time.

Table 4-3
NUMBER OF SIMULTANEOUS ASSOCIATIONS AS AN SCP FOR STORAGE-SCP AE

Maximum number of simultaneous associations requested by peer AEs	3 (Not Configurable)

4.2.1.2.3. Asynchronous Nature

The STORAGE-SCP AE does not support asynchronous communication.

4.2.1.2.4. Implementation Identifying Information

Table 4-4
DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE-SCP AE

Implementation Class UID	1.2.392.200036.9116.7.20.1
Implementation Version Name	CM_TRS_DCM_V1.0

.

4.2.1.3. Association Initiation Policy

The STORAGE-SCP AE does not initiate associations.

4.2.1.4. Association Acceptance Policy

When the STORAGE-SCP accepts an association, it will respond to storage requests.

4.2.1.4.1. Activity – Receive Storage Request

4.2.1.4.1.1. Description and Sequencing of Activity

As instances are received they are written to the local disk. If Presentation Contexts do not contain Verification, X-Ray Radiation Dose SR Storage or Secondary Capture Image Storage, this product rejects association. At a later time, the received DICOM instances will be parsed to extract information

of X-ray irradiations. Afterwards, the extracted DICOM instances will be deleted from the local disk. If the extracted DICOM instances are invalid, they are retained in the local disk. If the module to delete DICOM instances in the Windows Task Scheduler, the DICOM instances in the local disk will be deleted automatically.

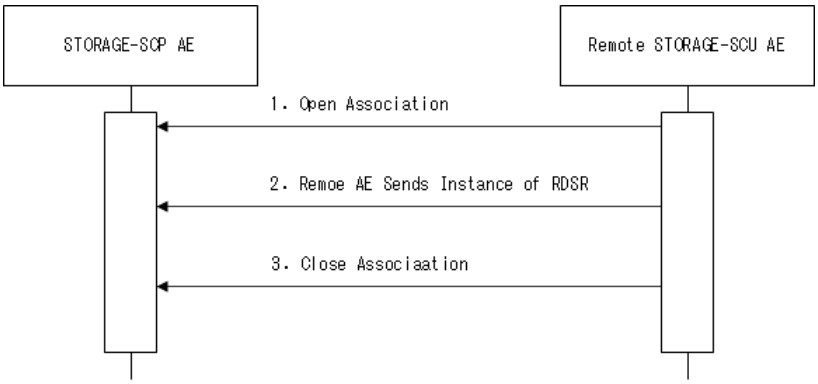

Figure 4.2-1
SEQUENCING OF ACTIVITY – RECEIVE STORAGE REQUEST

4.2.1.4.1.2. Accepted Presentation Contexts

The STORAGE-SCP AE will accept Presentation Contexts as shown in the following table.

Table 4-5
ACCEPTED PRESENTATION CONTEXTS BY THE STORAGE-SCP AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name**	**UID**		
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None

4.2.1.4.1.3. SOP Specific Conformance for Storage SOP Class

The associated Activity with the Storage service is the storage of RDSR data received over the network on a designated hard disk. The STORAGE-SCP AE will reject the instances other than RDSR and SC.

Table 4-6
STORAGE-SCP AE C-STORE RESPONSE STATUS RETURN REASONS

Service Status	Further Meaning	Error Code	Reason
Success	Success	0000	The Composite SOP Instance was successfully received, verified, and stored in the system database.

4.2.2. ECHO-SCP AE Specifications

4.2.2.1. SOP Class

The ECHO-SCP AE provides Standard Conformance to the following DICOM SOP classes:

Table 4-7
SOP CLASSES FOR ECHO-SCP AE

SOP Class	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	No	Yes

4.2.2.2. Association Policies

4.2.2.2.1. General

The ECHO-SCP AE accepts but never initiates associations.
The DICOM Standard Application Context Names for DICOM is always proposed.

Table 4-8
DICOM APPLICATION CONTEXTS FOR ECHO-SCP AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.2.2.2. Number of Associations

The ECHO-SCP AE can support up to 3 Associations at a time.

Table 4-9
NUMBERS OF ASSOCIATIONS FOR ECHO-SCP AE

Maximum Number of Simultaneous Associations	3 (Not Configurable)

4.2.2.2.3. Asynchronous Nature

The ECHO-SCP AE does not support asynchronous communication.

4.2.2.2.4. Implementation Identification Information

Table 4-10
DICOM IMPLEMENTATION CLASS AND VERSION FOR ECHO-SCP AE

Implementation Class UID	1.2.392.200036.9116.7.20.1
Implementation Version Name	CM_TRS_DCM_V1.0

All the product AEs have the same implementation version name. This version name is updated with each new software release; therefore, independent releases of different AE versions will not occur.

4.2.2.3. Association Initiation Policy

The ECHO-SCP AE does not initiate associations.

4.2.2.4. Association Acceptance Policy

4.2.2.4.1. Activity - Verify Connectivity

4.2.2.4.1.1. Destination and Sequencing of Activity

The ECHO-SCP AE accepts an association, it will respond to a verification request (C-ECHO).

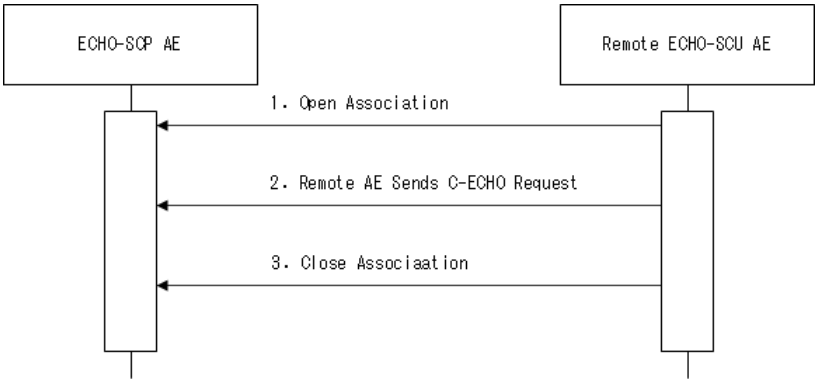

Figure 4.2-2
SEQUENCING OF ACTIVITY – ECHO

The following sequencing restrictions, illustrated in figure 4.2-2, apply when the ECHO-SCP AE:

1. The Remote ECHO-SCU AE opens a new association with the ECHO-SCP AE.
2. The Remote ECHO-SCU AE sends C-ECHO requests and the ECHO-SCP AE replies with a C-ECHO response (status success).
3. The Remote ECHO-SCU AE closes the Association.

4.2.2.4.1.2. Accepted Presentation Context

The ECHO-SCP AE is capable of proposing the Presentation Contexts shown in the following table:

Table 4-11
PROPOSED PRESENTATION CONTEXTS BY THE ECHO-SCP AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None

4.2.2.4.1.3. SOP Specific Conformance for Verification SOP Class

The ECHO-SCP AE provides standard conformance to the Verification Service Class as an SCP. The behavior of ECHO-SCP AE when encountering status codes in a C-ECHO response is summarized in the table below:

Table 4-12
ECHO-SCP AE C-ECHO RESPONSE STATUS ACTIONS

Service Status	Detailed Meaning	Error Code	Action
Success	Success	0000	No message is posted to the User Interface.

4.2.2.4.1.4. Presentation Context Acceptance Criteria

The ECHO-SCP AE will always accept any Presentation Context for the supported SOP Classes with the supported Transfer Syntaxes. More than one proposed Presentation Context will be accepted for the same Abstract Syntax if the Transfer Syntax is supported, whether or not it is the same as another Presentation Context.

4.2.2.4.1.5. Transfer Syntax Selection Policies

The ECHO-SCP AE will accept duplicate Presentation Contexts, that is, if it is offered multiple Presentation Contexts, each of which offers acceptable Transfer Syntaxes, it will accept all Presentation Contexts, applying the same priority for selecting the Transfer Syntax to each.

4.3. NETWORK INTERFACES

4.3.1. Physical Network Interface

This product supports a single network interface. One of the following physical network interfaces will be available depending on installed hardware options:

Table 4-13
SUPPORTED PHYSICAL NETWORK INTERFACES

Ethernet 1000BASE-T

4.3.2. Additional Protocols

None.

4.4. CONFIGURATION

4.4.1. AE Title/Presentation Address Mapping

4.4.1.1. Local AE Titles

The mapping from AE Title to TCP/IP addresses and ports is configurable and set at the time of installation by Installation Personnel.

Table 4-14
DEFAULT AE CHARACTERISTICS

AE	Default AE Title	Default TCP/IP Port
STORAGE-SCP	DOSEXROSSAE	3002
ECHO-SCP	DOSEXROSSAE	3002

4.4.1.2. Remote AE Title/Presentation Address Mapping

None.

4.4.2. Parameters

Table 4-15
CONFIGURATION PARAMETERS

Parameter	Configurable (Yes/No) [RANGE]	Default Value
General Parameters		
Maximum PDU size as a SCP	No	262144bytes
Time-out waiting for an acceptance or rejection response to an Association Request (Application Level Timeout)	No	60sec
STORAGE-SCP AE Parameters		
Maximum PDU Size	No	262144bytes
Maximum number of simultaneous Associations	No	3

5 MEDIA INTERCHANGE

This product does not support Media Storage.

6 SUPPORT OF EXTENDED CHARACTER SETS

This product supports the following character sets:

・ ISO-IR 6 (default) ISO 646
・ ISO-IR 87 (Japanese) JIS X 0208 (Kanji)

Character sets other than ISO-IR 6 can be handled as extended character sets in RDSR IOD listed in the Table below;
If the received RDSR includes characters other than above, these characters may be stored as garbled ones.

Table 6-1
ATTRIBUTES CAN BE HANDLED EXTENDED CHARACTER SETS IN RDSR IOD

Attribute Name	Tag	VR
Patient ID	(0010,0020)	LO
Patient's Name	(0010,0010)	PN
Institution Name	(0008,0080)	LO
Referring Physician Name	(0008,0090)	PN
Performing Physician Name	(0008,1050)	PN
Operators' Name	(0008,1070)	PN
Study Description	(0008,1030)	LO
Protocol Name	(0018,1030)	LO
The text value in EV (125203, DCM, "Acquisition Protocol")	(0040,A160)	UT

7 SECURITY

7.1. SECURITY PROFILES

This product does not support any specific security measures.
It is assumed that the product is used within a secured environment. It is assumed that a secured environment includes at a minimum:

a) Firewall or router protections to ensure that only approved external hosts have network access to the product.

b) Firewall or router protections to ensure that the product only has network access to approved external hosts and services.

c) Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a Virtual Private Network (VPN))

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

8 ANNEXES

8.1. IOD CONTENTS

8.1.1. STORAGE-SCP AE Element Use for RDSR

Table 8-1
SIGNIFICANT ELEMENTS OF PATIENT MODULE ATTRIBUTES IN RECEIVED SOP INSTANCE

Attribute Name	Tag ID	Significance	Remark
Patient's Name	(0010,0010)	Mandatory	
Patient ID	(0010,0020)	Mandatory	
Patient's Birth Date	(0010,0030)	Optional	When this is blank, this product cannot provide the analysis capability based on patient's age if (0010,1010) Patient's Age is also blank.
Patient's Age	(0010,1010)	Optional	When this is blank, this product cannot provide the analysis capability based on patient's age and (0008,0020) Study Date and (0008,0030) Study Time.
Patient's Sex	(0010,0040)	Optional	When this is blank, this product automatically recognizes as "O".
Patient's Size	(0010,1020)	Optional	
Patient's Weight	(0010,1030)	Optional	When this is blank, this product cannot provide the analysis capability based on patient's weight.

Table 8-2
SIGNIFICANT ELEMENTS OF GENERAL STUDY MODULE ATTRIBUTES IN RECEIVED SOP INSTANCE

Attribute Name	Tag ID	Significance	Remark
Study Instance UID	(0020,000D)	Mandatory	
Study Date	(0008,0020)	Mandatory	This product calculates exam time of the study based on (0008,0020) Study Date and (0008,0030) Study Time.
Study Time	(0008,0030)	Mandatory	This product calculates exam time of the study based on (0008,0020) Study Date and (0008,0030) Study Time.
Referring Physician's Name	(0008,0090)	Optional	
Accession Number	(0008,0050)	Optional	
Study Description	(0008,1030)	Mandatory	This product recognizes this value as protocol name for XA, RF and DX. When this is blank, protocol name for XA, RF and DX will be retrieved from (0018,1030) Protocol Name.

Table 8-3
SIGNIFICANT ELEMENTS OF SR DOCUMENT SERIES MODULE ATTRIBUTES IN RECEIVED SOP INSTANCE

Attribute Name	Tag ID	Significance	Remark
Performing Physician's Name	(0008,1050)	Optional	When this is blank, this product cannot provide the analysis capability based on performing physician's name.
Protocol Name	(0018,1030)	Optional	When RDSR doesn't have EV (125203, DCM, "Acquisition Protocol") tag, this product will use this as protocol name for CT and MG. When RDSR doesn't have (0008,1030) Study Description tag for XA, RF or DX, this product will use this as protocol name for XA, RF or DX.
Operator's Name	(0008,1070)	Optional	When this is blank, this product cannot provide the analysis capability based on operator's name.

Table 8-4
SIGNIFICANT ELEMENTS OF (ENHANCED) GENERAL EQUIPMENT MODULE ATTRIBUTES IN RECEIVED SOP INSTANCE

Attribute Name	Tag ID	Significance	Remark
Manufacturer	(0008,0070)	Optional	
Institution Name	(0008,0080)	Optional	
Station Name	(0008,1010)	Mandatory	When this is blank, this product cannot identify the modality equipment. However, if (0018,1000) Device Serial Number is unique although this is blank, this product will be able to identify the modality equipment.
Manufacturer's Model Name	(0008,1090)	Optional	
Device Serial Number	(0018,1000)	Mandatory	When this is blank, this product cannot identify the modality equipment. However, if (0008,1010) Station Name is unique although this is blank, this product will be able to identify the modality equipment.
Software Versions	(0018,1020)	Optional	

Table 8-5
SIGNIFICANT ELEMENTS OF TID 10001 PROJECTION X-RAY RADIATION DOSE IN RECEIVED SOP INSTANCE

Concept Name	Significance	Remark
EV (121058, DCM, “Procedure reported”)	Mandatory	This value should be DT (113704, DCM, “Projection X-Ray”) or DT (P5-40010, SCT, Mammography”) When this is blank or other than above value, this product cannot receive this RDSR.

Table 8-6
SIGNIFICANT ELEMENTS OF TID 10004 ACCUMULATED PROJECTION X-RAY DOSE IN RECEIVED SOP INSTANCE

Concept Name	Significance	Remark
EV (113722, DCM, “Dose Area Product Total”)	Optional	Units should be “Gy.m2” This product will calculate the DAP by summed up EV (122130, DCM, “Dose Area Product”) from irradiation events. When this is created from bi-plane equipment, EV (113764, DCM, “Acquisition Plane”) is necessary.
EV (113725, DCM, “Dose(RP) Total”)	Optional	Units should be “Gy” This product will calculate the Dose(RP) by summed up EV (113738, DCM, “Dose (RP)”) from irradiation events. When this is created from bi-plane equipment, EV (113764, DCM, “Acquisition Plane”) is necessary.
EV (113726, DCM, “Fluoro Dose Area Product Total”)	Optional	Units should be “Gy.m2” This product will calculate the Fluoro DAP by summed up EV (122130, DCM, “Dose Area Product”) from irradiation events in the case “Dose Area Product” has fluoroscopy event type. When this is created from bi-plane equipment, EV (113764, DCM, “Acquisition Plane”) is necessary.
EV (113728, DCM, “Fluoro Dose(RP) Total”)	Optional	Units should be “Gy” This product will calculate the Fluoro Dose(RP) by summed up EV (113738, DCM, “Dose (RP)”) from irradiation events in the case “Dose(RP)” has fluoroscopy event type. When this is created from bi-plane equipment, EV (113764, DCM, “Acquisition Plane”) is necessary.
EV (113730, DCM, “Total Fluoro Time”)	Mandatory	Units should be “s” This product will use this as fluoro time. When this is created from bi-plane equipment, EV (113764, DCM, “Acquisition Plane”) is necessary. When this is blank, this product cannot provide the analysis capability for time.
EV (113727, DCM, “Acquisition Dose Area Product Total”)	Optional	Units should be “Gy.m2” This product will calculate the Acquisition DAP by summed up “Dose Area Product” from irradiation events in the case EV (122130, DCM, “Dose Area Product”) doesn’t have fluoroscopy event type. When this is created from bi-plane equipment, EV (113764, DCM, “Acquisition Plane”) is necessary.

Concept Name	Significance	Remark
EV (113729, DCM, “Acquisition Dose(RP) Total”)	Optional	Units should be “Gy” This product will calculate the Acquisition Dose(RP) by summed up EV (113738, DCM, “Dose (RP)”) from irradiation events in the case EV (113738, DCM, “Dose (RP)”) doesn’t have fluoroscopy event type. When this is created from bi-plane equipment, EV (113764, DCM, “Acquisition Plane”) is necessary.
EV (113855, DCM, “Total Acquisition Time”)	Mandatory	Units should be “s” This product will use this as acquisition time. When this is created from bi-plane equipment, EV (113764, DCM, “Acquisition Plane”) is necessary. When this is blank, this product cannot provide the analysis capability for time.

Table 8-7
SIGNIFICANT ELEMENTS OF TID 10003 IRRADIATION EVENT X-RAY DATA IN RECEIVED SOP INSTANCE

Concept Name	Significance	Remark
EV (113764, DCM, “Acquisition Plane”)	Optional	This should be consistent to EV (113764, DCM, “Acquisition Plane”) in Accumulated Projection X-Ray Dose”.
EV (113769, DCM, “Irradiation Event UID”)	Mandatory	This product recognizes each irradiation event by this value.
EV (111526, DCM, “DateTime Started”)	Mandatory	This product calculates exam time for XA, RF, MG and DX by this value.
EV (113721, DCM, “Irradiation Even Type”)	Mandatory	This product uses this value to recognize fluoroscopy or acquisition
EV (125203, DCM, “Acquisition Protocol”)	Optional	When (0008,1030) “Study Description” and (0018,1030) “Protocol Name” are both blank, this should not be blank. Otherwise, protocol name will be defined as “Unknown”. See also Table 8-3.
EV (G-C171, SRT, “Laterality")	Optional	When this is blank, protocol name will be defined as “Unknown”.
EV (111031, DCM, “Image View”)	Optional	
EV (113743, DCM, “Patient Orientation”)	Optional	
EV (113744, DCM, “Patient Orientation Modifier”)	Optional	
EV (123014, DCM, “Target Region”)	Optional	When this is blank, this product cannot provide the analysis capability based on target region.
EV (122130, DCM, “Dose Area Product”)	Mandatory	Units should be “Gy.m2” When this is blank, this product cannot provide the analysis capability for dose. This product accumulates this value for all irradiations.
EV (111634, DCM, “Half Value Layer”)	Optional	Units should be “mm”
EV (111636, DCM, “Entrance Exposure at RP”)	Mandatory	Units should be “mGy” When this is blank, this product cannot provide the analysis capability for dose. This product displays this value in each irradiation event.

Table 8-8
SIGNIFICANT ELEMENTS OF TID 10003A IRRADIATION EVENT X-RAY DETECTOR DATA IN RECEIVED SOP INSTANCE

Concept Name	Significance	Remark
EV (113845, DCM, “Exposure Index”)	Optional	
EV (113846, DCM, “Target Exposure Index”)	Optional	
EV (113847, DCM, “Deviation Index”)	Optional	
EV (113795, DCM, “Acquired Image”)	Optional	

Table 8-9
SIGNIFICANT ELEMENTS OF TID 10003B IRRADIATION EVENT X-RAY SOURCE DATA IN RECEIVED SOP INSTANCE

Concept Name	Significance	Remark
EV (113738, DCM, “Dose (RP)”)	Mandatory	Units should be “Gy” When this is blank, this product cannot provide the analysis capability for dose. This product accumulates this value for all irradiations.
EV (111631, DCM, “Average Glandular Dose”)	Mandatory	Units should be “mGy” When this is blank, this product cannot provide the analysis capability for dose. This product displays this value in each irradiation event.
EV (113791, DCM, “Pulse Rate”)	Optional	Units should be “pulse/s”
EV (113768, DCM, “Number of Pulses”)	Optional	
EV (113793, DCM, “Pulse Width”)	Optional	Units should be “ms”
EV (113733, DCM, “KVP”)	Optional	Units should be “kV”
EV (113734, DCM, “X-Ray Tube Current”)	Optional	Units should be “mA”
EV (113824, DCM, “Exposure Time”)	Optional	Units should be “ms”
EV (111632, DCM, “Anode Target Material”)	Optional	
EV (113757, DCM, “X-Ray Filter Material”)	Optional	
EV (113790, DCM, “Collimated Field Area”)	Optional	Units should be “m2”

Table 8-10
SIGNIFICANT ELEMENTS OF TID 10003C IRRADIATION EVENT X-RAY MECHANICAL DATA IN RECEIVED SOP INSTANCE

Concept Name	Significance	Remark
EV (112011, DCM, “Positioner Primary Angle”)	Optional	Units should be “deg”
EV (112012, DCM, “Positioner Secondary Angle”)	Optional	Units should be “deg”
EV (113754, DCM, “Table Head Tilt Angle”)	Optional	Units should be “deg”
EV (113755, DCM, “Table Horizontal Rotation Angle”)	Optional	Units should be “deg”
EV (113756, DCM, “Table Cradle Tilt Angle”)	Optional	Units should be “deg”
EV (111633, DCM, “Compression Thickness”)	Optional	Units should be “mm”

Table 8-11
SIGNIFICANT ELEMENTS OF CID 10008 DOSE RELATED DISTANCE MEASUREMENTS IN RECEIVED SOP INSTANCE

Concept Name	Significance	Remark
EV (113748, DCM, “Distance Source to Detector”)	Optional	Units should be “mm”
EV (113751, DCM, “Table Longitudinal Position”)	Optional	Units should be “mm”
EV (113752, DCM, “Table Lateral Position”)	Optional	Units should be “mm”
EV (113753, DCM, “Table Height Position”)	Optional	Units should be “mm”

Table 8-12
SIGNIFICANT ELEMENTS OF TID 10011 CT RADIATION DOSE IN RECEIVED SOP INSTANCE

Concept Name	Significance	Remark
EV (121058, DCM, “Procedure reported”)	Mandatory	This value should be “EV (P5-08000, SRT, “Computed Tomography X-Ray”). When this is blank, this product cannot receive this RDSR.
EV (113809, DCM, “Start of X-Ray Irradiation”)	Mandatory	
EV (113810, DCM, “End of X-Ray Irradiation”)	Mandatory	

Table 8-13
SIGNIFICANT ELEMENTS OF TID 10013 CT IRRADIATION EVENT DATA IN RECEIVED SOP INSTANCE

Concept Name	Significance	Remark
EV (125203, DCM, “Acquisition Protocol”)	Mandatory	When this is blank, this product cannot provide the analysis capability. However, (0018,1030) Protocol Name has value although this is blank, this product will be able to define protocol name. See also **Table 8-3**.
EV (123014, DCM, “Target Region”)	Optional	When this is blank, this product cannot provide the analysis capability based on target region.
EV (113820, DCM, “CT Acquisition Type”)	Optional	
EV (113769, DCM, “Irradiation Event UID”)	Mandatory	This product recognizes each irradiation event by this value.
EV (113824, DCM, “Exposure Time”)	Mandatory	Units should be “s” When this is blank, this product cannot provide the analysis capability for time.
EV (113825, DCM, “Scanning Length”)	Optional	Units should be “mm”
EV (113827, DCM, “Nominal Total Collimation Width”)	Optional	Units should be “mm”
EV (113828, DCM, “Pitch Factor”)	Optional	Units should be “ratio”
EV (113823, DCM, “Number of X-Ray Sources”)	Optional	Units should be “X-Ray sources” This value should be integer
EV (113733, DCM, “KVP”)	Optional	Units should be “kV”
EV (113833, DCM, “Maximum X-Ray Tube Current”)	Optional	Units should be “mA”
EV (113734, DCM, “X-Ray Tube Current”)	Optional	Units should be “mA”
EV (113834, DCM, “Exposure Time per Rotation”)	Optional	Units should be “s”
EV (113830, DCM, “CTDIvol”)	Mandatory	Units should be “mGy”
EV (113835, DCM, “CTDIw Phantom Type”)	Optional	
EV (113838, DCM, “DLP”)	Mandatory	Units should be “mGy.cm2”
EV (113842, DCM, “X-Ray Modulation Type”)	Optional	

Table 8-14
SIGNIFICANT ELEMENTS OF TID 10015 CT DOSE CHECK DETAILS IN RECEIVED SOP INSTANCE

Concept Name	Significance	Remark
EV (113903, DCM, “DLP Alert Value”)	Optional	
EV (113904, DCM, “CTDIvol Alert Value”)	Optional	
EV (113911, DCM, “DLP Notification Value”)	Optional	
EV (113912, DCM, “CTDIvol Notification Value”)	Optional	

8.1.2. PRIORITY FOR PROTOCOL

Table 8-15
PRIORITY OF PROTOCOL

Modality	Priority
CT,MG	1. EV (125203, DCM, “Acquisition Protocol”) 2. (0018,1030) Protocol Name 3. (0008,1030) Study Description
XA,RF,DX	1. (0008,1030) Study Description 2. (0018,1030) Protocol Name 3. EV (125203, DCM, “Acquisition Protocol”)

8.2. DATA DICTIONARY OF PRIVATE ATTRIVUTES

Not applicable to this product.

8.3. CONTROLLED TERMINOLOGY AND TEMPLATES

Not applicable to this product

8.4. GRAYSCALE IMAGE CONSISTENCY

Not applicable to this product

8.5. STANDARD EXTENDED/SPECIALIZED/PRIVATE SOP CLASSES

Not applicable to this product

8.6. PRIVATE TRANSFER SYNTAXES

Not applicable to this product