



*Carestream DirectView CR System*  
**Software Version 5.7**

**DICOM Conformance Statement**

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# 1 Introduction

## 1.1 Executive Overview

This document applies to all *Carestream Health DirectView* CR products utilizing the version 5.7 software.

## 1.2 Supported DICOM SOP Classes

**Table 1.2A Supported DICOM SOP Classes for Verification**

SOP Class Name	SOP Class UID	Service Class Role
Verification SOP Class	1.2.840.10008.1.1	SCU, SCP

**Table 1.2B Supported DICOM SOP Classes for Image Delivery**

SOP Class Name	SOP Class UID	Service Class Role
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	SCU
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	SCU
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	SCU
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	SCU
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	SCU
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	SCU
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	SCU

**Table 1.2C Supported DICOM SOP Classes for Modality Work List**

SOP Class Name	SOP Class UID	Service Class Role
Modality Work List Information Model – FIND	1.2.840.10008.5.1.4.31	SCU

**Table 1.2D Supported DICOM SOP Classes for MPPS**

SOP Class Name	SOP Class UID	Service Class Role
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	SCU

**Table 1.2E Supported DICOM SOP Classes for Storage Commit**

SOP Class Name	SOP Class UID	Service Class Role
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	SCU

**Table 1.2F Supported DICOM SOP Classes for Prior Image Recall Feature Only**

SOP Class Name	SOP Class UID	Service Class Role
Study Root Query Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	SCU
Study Root Query Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	SCU
Computed Radiography Image Storage SOP Class UID	1.2.840.10008.5.1.4.1.1.1.1	SCP
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1	SCP
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	SCP
Digital Mammography Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	SCP

**Table 1.2G Supported DICOM SOP Classes for Dose SR Storage**

SOP Class Name	SOP Class UID	Service Class Role
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	SCU

### 1.3 Scope and Field of Application

This document describes the DICOM functionality of the *Carestream Health DirectView* CR systems. The CR System covered by this document is a family of laser scanners capable of reading the latent image formed on a storage phosphor imaging plate resulting in the production of a digital image. While the various products making up this family of scanners may vary in performance or other specific user features, the information in this document applies to all unless otherwise stated. Throughout the remainder of this document the term DirectView CR System applies to all members of the CR product family.

The *DirectView* CR System acts as a DICOM Service Class User (SCU) that performs transactions over a TCP/IP network via the DICOM messages exchange protocol.

### 1.4 Important Considerations for the Reader

This DICOM Conformance Statement by itself is not sufficient to guarantee successful connectivity between the *DirectView* CR System and equipment from other vendors. The following considerations should be made:

- The integration of equipment from different vendors (including Carestream) goes beyond the scope of the DICOM 3.0 standard and the DICOM Conformance Statements from Carestream and other vendors. It is the responsibility of the user (or user's agent) to assess the application requirements and to design a solution that integrates Carestream equipment with equipment from other vendors.
- When the comparison of this DICOM Conformance Statement with a DICOM Conformance Statement from another vendor indicates that connectivity should be possible, it is the responsibility of the user (or user's agent) to verify this by carrying out validation tests and to check whether all required functionality is met.
- With regard to the future evolution of the DICOM 3.0 standard Carestream, Inc. reserves the right to make changes to the *DirectView* CR System architecture described in this document. The user (or user's agent) should ensure that any equipment connected via DICOM to Carestream equipment also follows the future evolution of the DICOM 3.0 standard. Failure to do so may result in (partial) loss of connectivity.

### 1.5 Accessing this Conformance Statement on the World Wide Web

As the *DirectView* CR System product changes, changes to this DICOM Conformance Statement are inevitable. To obtain the most recent revision of this DICOM Conformance Statement, access the following URL: <http://www.carestream.com/dicom.html>

## 1.6 Definitions, Acronyms, Abbreviations

The following symbols and abbreviations are used in this document.

ASCII	American Standard Code for Information Interchange
AE	Application Entity
CR	Computed Radiography
CR X-ray interface	An accessory product that allows the CR to receive exposure information from specific mammography systems
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DR	Digital Radiography
DX	Digital X-Ray
GSPS	Grayscale Softcopy Presentation State
HIS/RIS	Hospital Information System / Radiology Information System.
IHE	Integrating the Healthcare Enterprise – initiative by healthcare professionals and industry to improve the way computer systems in healthcare share information
ISO	International Standards Organization
LUT	Look-up Table
MG	Mammography
MPPS	Modality Performed Procedure Step
MWL	Modality Work List
PDU	Protocol Data Unit
PLUT	Presentation Look-up Table
RDSR	Radiation Dose Structured Report
REM	Radiation Exposure Monitoring
SC	Secondary Capture
SCU	Service Class User

SCP	Service Class Provider
SCPM	Storage Commitment Push Model SOP Class
SOP	Service-Object Pair
SR	Structured Report
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier



## 2 Implementation Model

This implementation model uses the DICOM Basic Print Management Meta SOP Class to deliver studies to remote printers. Basic Work List Management service is used for the acquisition of patient demographics. DICOM Query/Retrieve service is used to retrieve prior images. The X-Ray Radiation Dose SR SOP Class is used to deliver dose information to archives and dose information consumers.

The following SOP Classes may be used to deliver images to store devices:

- Computed Radiography Image Storage
- Digital X-Ray Image Storage - For Presentation
- Digital X-Ray Image Storage - For Processing
- Digital Mammography Image Storage - For Presentation
- Digital Mammography Image Storage - For Processing

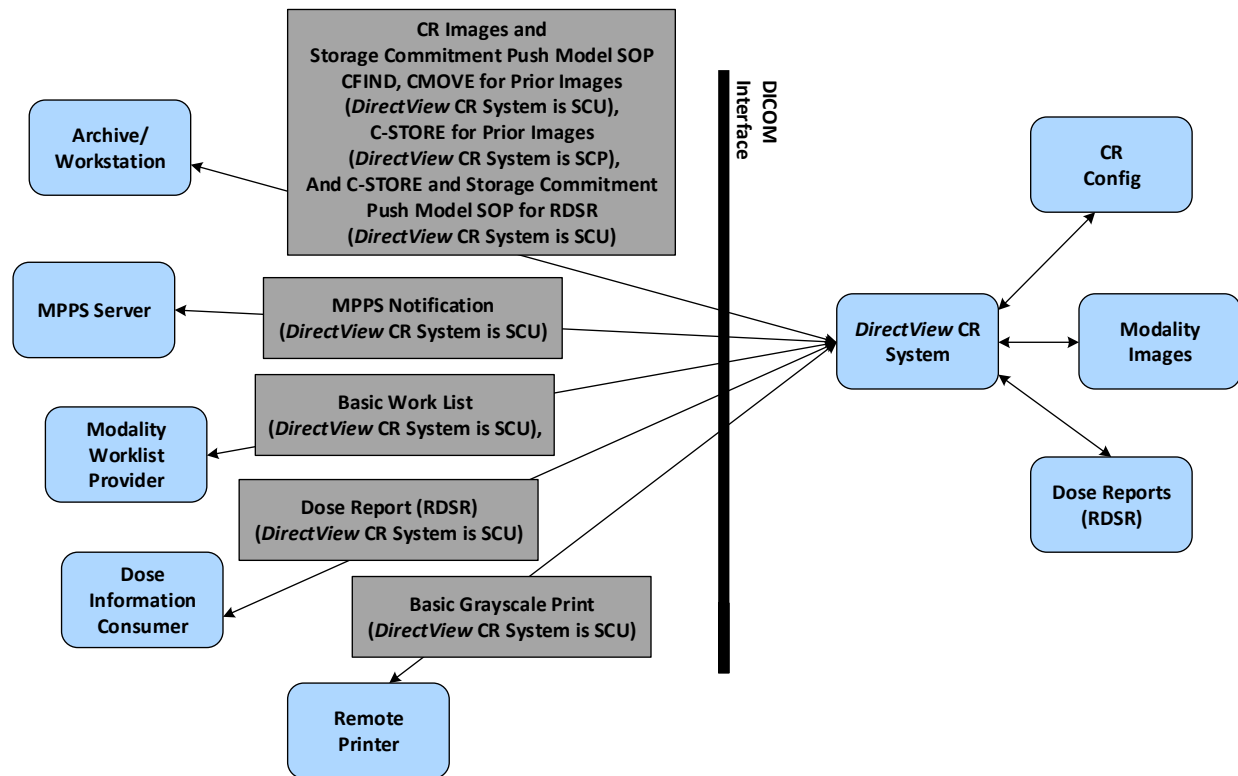


Figure 2.1 Implementation Model

## 2.1 Functional Definitions

The *DirectView* CR System is a projection radiographic image acquisition product utilizing storage phosphor technology. The system allows the technologist to acquire and identify images, review images for placement and motion, add markers, adjust image processing, manipulate images (flip, rotate, etc.), pan/zoom and route images to their final destinations. The system is capable of obtaining patient demographic information manually from the user interface, the *Carestream Health DirectView* Remote Operations Panel (ROP), the Remote Patient Data Entry System (RPDES) or via a DICOM Worklist. The ROP is a standalone, network-enabled product that provides a fully functional interface to the device that can be located remotely as needed. The RPDES allows patient demographic data to be entered from remote computers for sites that do not support the DICOM Worklist.

The system is capable of automatic or on demand querying for and retrieving of prior radiographic images for any exams in the DICOM Work List and displaying those images to the technologist. The *DirectView* CR System is also capable of collecting individual procedure dose information related to specific patients and storing this dose information to Image Archive/Image Manager and/or Dose Information Consumers.

## 2.2 Sequencing of Real-World Activities

All SCP activities are performed asynchronously in the background and are not dependent on any sequencing.

All SCU activities are sequentially initiated in the user interface. The task of sending images does not need to complete before initiating another task. The task of manually querying the Worklist SCP is required to complete before the user can perform another task at the user interface.

If a Modality Worklist SCP is present, the CR System can be configured to query the Worklist SCP automatically, at a specified interval, in order to update the system's patient database. In this mode of operation, a user action is not required to initiate a query of the Worklist SCP.

# 3 Application Entity Specifications

The *DirectView* CR System provides Standard Conformance to the SOP Classes described in Section [1.2](#) as an SCU.

## 3.1 Association Establishment Policies

### 3.1.1 General

#### 3.1.1.1 Delivery

An Association may be attempted whenever a valid destination is selected and at least one image has been acquired.

The maximum PDU size, which the *DirectView* CR System will negotiate, is 128 Kbytes.

### **3.1.1.2 HIS/RIS**

The *DirectView* CR System may be configured to poll the HIS/RIS broker at periodic intervals and/or asynchronously on demand from the user. If periodic polling is enabled, an association for Basic Work List will be attempted when the *DirectView* CR System application is started and then periodically thereafter.

### **3.1.1.3 Query/Retrieve (Priors)**

The *DirectView* CR System may be configured to retrieve Prior images from the PACS as soon as the HIS/RIS record is retrieved, when the exam is started, or only when specifically requested by the Technologist.

### **3.1.1.4 Structured Reports**

The *DirectView* CR System may be configured to deliver dose information to a PACS or any other system configured to receive Radiation Dose Structured Reports at the completion or discontinuation of an exam where irradiation events occurred.

The RDSR will be composed and sent on the completion or discontinuation of a procedure step not upon the completion of an irradiation event.

If an irradiation event occurs after the completion of an existing procedure step, the procedure step will be re-opened and a new RDSR will be composed and sent on the completion or discontinuation of the amended procedure step. The irradiation events will duplicate events reported in the subsequent RDSR, but this can be detected by a PACS or any other system configured to receive the RDSR since the same irradiation event UID will appear in both RDSR's that were sent.

## **3.1.2 Number of Associations**

### **3.1.2.1 Delivery**

Associations are initiated with the default limitation that no more than three total SCU delivery associations may be open at any given time to a print or a store destination. The default limitation for each class of destination may be increased to 6 by the service provider.

### **3.1.2.2 HIS/RIS**

Two associations may be initiated at a time. The *DirectView* CR System will close each association after receiving a C-FIND response.

### **3.1.2.3 Query/Retrieve (Priors)**

One C-FIND associations may be initiated at a time. The *DirectView* CR System will close each association after receiving a C-FIND response.

Two C-MOVE associations may be initiated at a time. The *DirectView* CR System will close each association after receiving a C-MOVE response.

#### **3.1.2.4 Storage Commitment**

Associations are initiated with the default limitation that no more than three total SCU storage commitment associations may be open at any given time. The default limitation may be increased to 6 by the service provider.

The *DirectView* CR System can be configured to support the use of multiple associations for the sending of the storage commitment request and the reception of the success/failure notification.

#### **3.1.3 Asynchronous Nature**

The *DirectView* CR System allows up to 1 invoked and 1 performed operation on an Association (it is synchronous).

#### **3.1.4 Implementation Identifying Information**

The *DirectView* CR System provides the Implementation Class UID of “1.2.840.113564.3.4.1”.

The implementation version name attribute is optional and is not used by the *DirectView* CR System.

The *DirectView* CR System establishes an Association using its network node name for the calling DICOM Application Entity title. The network node name is configurable through the *DirectView* CR System Service Application.

The *DirectView* CR System stores a called DICOM Application Entity Title and socket number for each DICOM compatible network destination it knows about.

### **3.2 Association Initiation Policy**

#### **3.2.1 Associated Real-World Activity**

##### **3.2.1.1 Delivery**

The *DirectView* CR System initiates Associations for the purpose of sending images and associated information for printing to a Basic Grayscale Print Management SCP and archiving to an SC Image Storage SCP.

The default and well-known socket 5040 will be used for making the Association, unless a product service provider configures a different one.

##### **3.2.1.2 HIS/RIS**

The *DirectView* CR System initiates Associations for the purpose of obtaining the current Modality Work List IOD.

### **3.2.1.3 Query/Retrieve (Priors)**

The *DirectView* CR System initiates Associations for the purpose of determining whether there are any prior images to be retrieved. If the *DirectView* CR System determines that there are prior images to be retrieved then another association is initiated for each image that is actually to be retrieved.

### **3.2.1.4 Structured Reports**

The *DirectView* CR System initiates Associations for the purpose of sending Radiation Dose Structured Reports.

### **3.2.2 Presentation Context Table**

The *DirectView* CR System proposes the Presentation Contexts shown in Table [3.1](#).

#### **Table 3.1 Presentation Context Table**

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Ext.
Name	UID	Name List	UID	Role	Negot
Verification	1.2.840.10008.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Grayscale Print Management	1.2.840.10008.5.1.1.9	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 Work List	1.2.840.10008.5.1.4.31	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	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
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	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
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1. 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
Digital Mammograp hy X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	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
Digital Mammograph y X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1. 2.1	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
Modality Performed Procedure Step SOP Class	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
Storage Commitment Push Model	1.2.840.10008.1.20.1	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Ext.
SOP Class		DICOM Implicit VR Little Endian	1.2.840.10008.1.2		
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	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
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.6 7	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
Study Root Query/Retrie ve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2. 1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Query/Retrie ve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2. 2	DICOM Implicit VR Little Endian		SCU	None
Computed Radiography Image Storage SOP Class UID	1.2.840.10008.5.1.4.1.1.1	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
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1. 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
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	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
Digital Mammograph y Image Storage – For	1.2.840.10008.5.1.4.1.1.1. 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

Presentation Context Table				
Abstract Syntax		Transfer Syntax		Ext.
Presentation				

### 3.2.3 SOP Specific Conformance

#### 3.2.3.1 Verification

The *DirectView* CR System provides standard conformance to the DICOM Verification Service Class:

- When prompted by a user, the *DirectView* CR System will request verification of communication to a remote DICOM AE using the C-ECHO primitive.
- Upon receipt from an SCU of a verification of communication request, the *DirectView* CR System will issue confirmation.

#### 3.2.3.2 Delivery

Association attempts will be retried if the SCP rejects the request with the RESULT = 2 (rejected transient) and the REASON = 1 (temporary congestion). If all Association attempts fail, then the user will be notified and the Film Session or Study is saved for resending or deletion. No undelivered image files are deleted without manual user direction.

### 3.3 Association Acceptance Policy

Upon receipt from an SCU of a verification of communication request, the CR will issue confirmation.

### 3.4 Basic Print Management Meta SOP Class

The Meta SOP Class is defined by the set of supported SOP Classes depicted in Table [3.2](#).

**Table 3.2 Meta SOP Class**

SOP Class	UID Value
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4
Printer SOP Class	1.2.840.10008.5.1.1.16



### 3.4.1 Basic Film Session SOP Class

#### 3.4.1.1 DIMSE Service N-CREATE

**Table 3.3 Basic Film Session SOP Class – Supported Attributes**

Attribute	SCU Usage	Tag	Possible Values
Number of Copies	U	(2000,0010)	1 -> 99
Print Priority	U	(2000,0020)	HIGH, MED, LOW
Medium Type	U	(2000,0030)	PAPER, CLEAR FILM, BLUE FILM, NONE
Film Destination	U	(2000,0040)	MAGAZINE, PROCESSOR, BIN_n (where n=1 to 9)
Film Session Label	U	(2000,0050)	Up to 64 characters may be provided
Memory Allocation	U	(2000,0060)	Not used

#### 3.4.1.2 DIMSE Service N-Action

The *DirectView* CR System uses the N-ACTION to instruct the SCP to print all films in the session. The *DirectView* CR System is configurable (when the destination is installed) to issue the N-ACTION at the Film Session for destinations known to support this optional service. If the destination is not known to support collation, the *DirectView* CR System will only issue the N-ACTION on the Film Box. For Print SCPs that conform to the N-ACTION specification in Part 4 section H.4.1.2.4 of the DICOM standard, the *DirectView* CR System expects that all film boxes will be collated when printed.

#### 3.4.1.3 DIMSE Service N-SET

This service is not used.

#### 3.4.1.4 DIMSE Service N-DELETE

This service is not used.

### 3.4.2 Basic Film Box SOP Class

#### 3.4.2.1 DIMSE Service N-CREATE

**Table 3.4 Basic Film Box SOP Class – Supported Attributes**

Attribute	SCU Usage	Tag	Possible Values
Image Display Format	M	(2010,0010)	<u>Single image prints with page annotation will use:</u> <u>ROW\1,1</u> <u>All other prints, including multi-format prints will use:</u> <u>STANDARD\1,1</u>
Referenced Film Session Sequence	M	(2010,0500)	
>Referenced SOP Class UID	M	(0008,1150)	
>Referenced SOP Instance UID	M	(0008,1155)	
Referenced Basic Image Box Sequence	-	(2010,0510)	Not sent.
Referenced Basic Annotation Box Sequence	-	(2010,0520)	Not used.
Film Orientation	U	(2010,0040)	PORTRAIT, LANDSCAPE
Film Size ID	U	(2010,0050)	8INX10IN 8.5INX11IN 8.5INX12IN 10INX12IN 11INX14IN 14INX14IN 14INX17IN 10INX12IN A4
Magnification Type	U	(2010,0060)	REPLICATE, BILINEAR, CUBIC, NONE Will be constant for the entire Film Box.
Max Density	U	(2010,0130)	0-450 Configurable for Destination
Configuration Information	U	(2010,0150)	Not used.
Annotation Display Format ID	U	(2010,0030)	Not used
Smoothing Type	U	(2010,0080)	NORMAL (minimum cubic convolution error) ENHANCED ENHANCED1 Valid only for Magnification Type CUBIC. 0-15
Border Density	U	(2010,0100)	410 Configurable for Destination
Empty Image Density	U	(2010,0110)	Not used
Min Density	U	(2010,0120)	0-410 (Value must be less than Max Density (2010,0130)) Configurable for Destination
Illumination	MC	(2010,015E)	Positive integer in units of $\text{cd/m}^2$ Configurable for Destination
Reflective Ambient Light	MC	(2010,0160)	Positive integer in units of $\text{cd/m}^2$ Configurable for Destination

Attribute	SCU Usage	Tag	Possible Values
Trim	U	(2010,0140)	YES and NO

### 3.4.2.2 DIMSE Service N-ACTION

The *DirectView* CR System uses the N-ACTION to instruct the SCP to print the current film in the session.

### 3.4.2.3 DIMSE Service N-SET

This service is not used.

### 3.4.2.4 DIMSE Service N-DELETE

This service is not used.

## 3.4.3 Basic Image Box SOP Class

### 3.4.2.5 DIMSE Service N-SET

**Table 3.5 Basic Image Box SOP Class – Supported Attributes**

Attribute & Usage	SCU Usage	Tag	Supported Values
Image Position	M	(2020,0010)	All values within the range of Image Display Format
Preformatted Grayscale Image Sequence	M	(2020,0110)	
>Samples Per Pixel	M	(0028,0002)	1
>Photometric Interpretation	M	(0028,0004)	MONOCHROME1, MONOCHROME2  (If the image space configured on the destination is set to density, MONOCHROME1 is set. If the image space configured on the destination is p-values or luminance, MONOCHROME2 is set.  See section 5.1.3 for more information.
>Rows	M	(0028,0010)	Minimum Value 64  Maximum Values: Known for all <i>Carestream</i> printers, configurable for others. The aspect ratio is used with the printer's page extents, display format, etc. to calculate this value.
>Columns	M	(0028,0011)	Minimum Value 64  Maximum Values: Known for all <i>Carestream</i> printers, configurable for others. The aspect ratio is used with the printer's page extents, display format, etc. to calculate this value.

Attribute & Usage	SCU Usage	Tag	Supported Values
>Pixel Aspect Ratio	MC	(0028,0034)	R/C R, C = 1 to 9999 (Integer) <b>Note:</b> This attribute is always included, even if it is 1\1. It's value will always be 1\1 if Magnification Type is NONE
>Bits Allocated	M		16
>Bits Stored	M	(0028,0101)	12
>High Bit	M	(0028,0102)	Bits Stored -1
>Pixel Representation	M	(0028,0103)	0000H (unsigned integer)
>Pixel Data	M	(7FE0,0010)	All values consistent with Bits Stored
Polarity	U	(2020,0020)	NORMAL
Magnification Type	U	(2010,0060)	REPLICATE, BILINEAR, CUBIC,NONE <b>Note:</b> Is always the same as the Magnification Type specified for the Film Box.
Smoothing Type	U	(2010,0080)	NORMAL, ENHANCED, ENHANCED1 Valid only for Magnification Type CUBIC. 0-15 Must be the same as the Smoothing Type specified for the Film Box.
Configuration Information	U	(2010,0150)	Not used.
Requested Image Size	U	(2020,0030)	Row length in mm up to the size of the printable image, which is a function of Image Display Format and Film Size ID.

### 3.4.4 Printer SOP Class

#### 3.4.4.1 DIMSE Service N-EVENT-REPORT

The *DirectView* CR System will process the indication of the N-EVENT-REPORT operation. Any string sent by the SCP is accepted and displayed on the *DirectView* CR System user interface. In this translation, all characters that are not space characters or in the ASCII range “A” - “Z” are stripped.

The *DirectView* CR System translates Attributes as described in Table 3.6. Other strings are not translated but may be displayed on a *DirectView* CR System user interface.

**Table 3.6 Basic Image Box SOP Class – Supported Attributes**

Attribute	SCU Usage	Tag	Expected Values
Printer Status	U	(2110,0010)	NORMAL WARNING FAILURE
Printer Status Info	U	(2110,0020)	Any valid string including the following. for NORMAL conditions: “NORMAL” for WARNING conditions: “RECEIVER FULL”, “FILM JAM”, “PRINTER NOT RDY”, “PROCESSOR DOWN”, “CHECK PROCESSOR”, “PROC NOT READY”, “NO RECEIVE MGZ”, “NO SUPPLY MGZ”, “NO TONER”, “NO STATE”, “CHECK RIBBON”, “PRINTER BUSY”, “OFFLINE”, “PRINTER STOPPED”, “CHECK SUPPLY MAG”, “COVER OPEN”, “PRINTER OFFLINE”, “EXPOSURE FAILURE”, “CHECK R MAG”, “PROC NOT RDY”, “STATE UNKNOWN”, "CHECK INK CART", "INK OUT", "QUEUED", "SUPPLY EMPTY", "SUPPLY LOW", "BAD RECEIVE MGZ", "BAD SUPPLY MGZ", "FILM TRANSP ERR", "CHECK CHEMISTRY", "CHECK SORTER", "CHEMICALS LOW", "CHEMICALS EMPTY",

Attribute	SCU Usage	Tag	Expected Values
Printer Status Info (continued from previous page)			"FINISHER EMPTY", "FINISHER ERROR", "FINISHER LOW", "CHECK PROC", "PRINTER BUSY", "PROC DOWN", "PROC INIT", "PROC OVERFLOW FL", "PROC OVERFLOW HI", "PRINTER DOWN", "PRINTER INIT", "CALIBRATING", "CALIBRATION ERR", "ELEC CONFIG ERR", "ELEC DOWN", "ELEC SW ERROR", "EXPOSURE FAILURE", "REQ MED NOT INST", "REQ MED NOT AVAI", "RIBBON ERROR", "NO RIBBON", "UNKNOWN"  for FAILURE conditions: "FATAL", "INVALID PAGE DES", "INSUFFIC MEMORY", "FATAL ERROR", "CHECK PRINTER", "PRINTER DOWN",  "NO RESPONSE", "RIBBON MISMATCH", "TIME OUT", "UNKNOWN STATUS"
Printer Name	U	(2110,0030)	Any valid string
Printer Manufacturer	U	(0008,0070)	Any valid string
Printer Manufacturer Model Name	U	(0008,1090)	Any valid string
Printer Device Serial Number	U	(0018,1000)	Any valid string
Software Version	U	(0018,1020)	Any valid string
Date of Last Calibration	U	(0018,1200)	Ignored
Time of Last Calibration	U	(0018,1201)	Ignored

### 3.5 Store Service Classes

Section [1.2](#) lists all the Storage SOP Classes that are supported by the DirectView CR. The following tables list, for each Storage SOP Class, the attributes that the DirectView supports.

### 3.5.1 Digital X-Ray SOP Class

The DirectView CR provides standard conformance to the Digital X-Ray Image Storage SOP Class as an SCU.

**Table 3.7 Digital X-Ray Image SOP Class – For Presentation**

SOP Class	SOP Class UID
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1

**Table 3.8 Digital X-Ray Image SOP Class – For Processing**

SOP Class	SOP Class UID
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1

**Table 3.9 Digital X-Ray Image SOP Class – Supported Attributes**

Attribute Name	Tag	DICOM Type	Supported Values/ Comments
<b>Patient Module</b>			
Patient Name	(0010,0010)	2	Refer to <a href="#">Addendum B</a>
Patient ID	(0010,0020)	2	Refer to <a href="#">Addendum B</a>
Patient Birth Date	(0010,0030)	2	Refer to <a href="#">Addendum B</a>
Patient Sex	(0010,0040)	2	Refer to <a href="#">Addendum B</a>
Patient Birth Time	(0010,0032)	3	
Other Patient IDs	(0010,1000)	3	This value will be sent only if it has been received from the DICOM modality work list (MWL).
Other Patient Names	(0010,1001)	3	This value will be sent only if it has been received from the DICOM modality work list (MWL).
Ethnic Group	(0010,2160)	3	This value will be sent only if it has been received from the DICOM modality work list (MWL).
Patient Comments	(0010,4000)	3	Refer to <a href="#">Addendum B</a>
Allergies	(0010,2110)	3	
<b>General Study</b>			
Study Instance UID	(0020,000D)	1	
Study Date	(0008,0020)	2	Refer to <a href="#">Addendum B</a>
Study Time	(0008,0030)	2	Refer to <a href="#">Addendum B</a>

Attribute Name	Tag	DICOM Type	Supported Values/ Comments
Referring Physician Name	(0008,0090)	2	Refer to <a href="#">Addendum B</a>
Study ID	(0020,0010)	2	
Accession Number	(0008,0050)	2	Refer to <a href="#">Addendum B</a>
Study Description	(0008,1030)	3	Refer to <a href="#">Addendum B</a>
Referenced Study Sequence	(0008,1110)	3	
>Referenced SOP Class UID	(0008,1150)	1C	
>Referenced SOP Instance UID	(0008,1155)	1C	
Procedure Code Sequence	(0008,1032)	3	Refer to <a href="#">Addendum B</a>
> Code Value	(0008,0100)	1C	
> Coding Scheme Designator	(0008,0102)	1C	
> Coding Scheme Version	(0008,0103)	1C	
> Code Meaning	(0008,0104)	1C	
<b>Patient Study</b>			
Admitting Diagnoses Description	(0008,1080)	3	
Patient's Age	(0010,1010)	3	Refer to <a href="#">Addendum B</a>
Patient's Size	(0010,1020)	3	<b>Patient Size Indexing</b> will automatically select the appropriate Pediatric Chest or Pediatric Abdomen View based off of the Patient Size information (Patient Size field and/or Age/Weight).
Patient's Weight	(0010,1030)	3	
Occupation	(0010,2180)	3	
Additional Patient's History	(0010,21B0)	3	
<b>General Series</b>			
Modality	(0008,0060)	1	DX
Series Instance UID	(0020,000E)	1	A series may contain a single or multiple images depending on configuration specified by Key Operator
Series Number	(0020,0011)	2	
Laterality	(0020,0060)	2C	L R  Refer to <a href="#">Addendum B</a>



Attribute Name	Tag	DICOM Type	Supported Values/ Comments
Series Date	(0008,0021)	3	
Protocol Name	(0008,1030)	3	
Series Time	(0008,0031)	3	
Series Description	(0008,103E)	3	Same value as tag (0018,5101)
Operator Name	(0008,1070)	3	Refer to <a href="#">Addendum B</a>
Body Part Examined	(0008,0015)	3	Refer to <a href="#">Addendum B</a>
Performed Procedure Step Start Date	(0040,0244)	3	Refer to <a href="#">Addendum B</a>
Performed Procedure Step Start Time	(0040,0245)	3	Refer to <a href="#">Addendum B</a>
Performed Procedure Step ID	(0040,0253)	3	
Performed Procedure Step Description	(0040,0254)	3	Refer to <a href="#">Addendum B</a>
Performed Protocol Code Sequence	(0040,0260)	3	
>Code Value	(0008,0100)	1C	
>Coding Scheme Designator	(0008,0102)	1C	
>Coding Scheme Version	(0008,0103)	1C	
>Code Meaning	(0008,0104)	1C	
Request Attributes Sequence	(0040,0275)	3	
>Requested Procedure Description	(0032,1060)	3	
>Reason for the Requested Procedure	(0040,1002)	3	
>Scheduled Procedure Step Description	(0040,0007)	3	
>Scheduled Protocol Code Sequence	(0040,0008)	3	
>> Code Value	(0008,0100)	1C	
>> Coding Scheme Designator	(0008,0102)	1C	
>> Coding Scheme Version	(0008,0103)	1C	
>> Code Meaning	(0008,0104)	1C	
>Scheduled Procedure Step ID	(0040,0009)	1C	
>Requested Procedure ID	(0040,1001)	1C	Refer to <a href="#">Addendum B</a>
<b>DX Series</b>			
Modality	(0008,0060)	1	DX

<b>Attribute Name</b>	<b>Tag</b>	<b>DICOM Type</b>	<b>Supported Values/ Comments</b>
Referenced Performed Procedure Step Sequence	(0008,1111)	1C	
>Referenced SOP Class UID	(0008,1150)	1C	
>Referenced SOP Instance UID	(0008,1155)	1C	
Presentation Intent Type	(0008,0068)	1	Enumerated Values: FOR PRESENTATION, FOR PROCESSING
<b>General Equipment</b>			
Manufacturer	(0008,0070)	2	CARESTREAM
Institution Name	(0008,0080)	3	Configuration item entered by Key Operator
Institution Address	(0008,0081)	3	Configuration item entered by Key Operator
Station Name	(0008,1010)	3	This is the computer name that is Input by Service
Institutional Department Name	(0008,1040)	3	Refer to <a href="#">Addendum B</a>
Manufacturer Model Name	(0008,1090)	3	
Device Serial Number	(0018,1000)	3	
Software Versions	(0018,1020)	3	
<b>General Image</b>			
Instance Number	(0020,0013)	2	Within a series, the instance number may be configured by the Key Operator to be 1 or a unique value.
Patient Orientation	(0020,0020)	2C	Value specified per view and cannot be modified by site or  Key operator may select "L/F" for all images
Image Type	(0008,0008)	3	
Content Date	(0008,0023)	2C	
Content Time	(0008,0033)	2C	
Acquisition Number	(0020,0012)	3	
Acquisition Date	(0008,0022)	3	
Acquisition Time	(0008,0032)	3	
Referenced Image Sequence	(0008,1140)	3	

Attribute Name	Tag	DICOM Type	Supported Values/ Comments
> Referenced SOP Class UID	(0008,1150)	1C	Only populated for companion images and will contain Referenced SOP Class UID of the standard image associated with the companion image.
> Referenced SOP Instance UID	(0008,1155)	1C	Only populated for companion images and will contain Referenced SOP Instance UID of standard image associated with the companion image.
Derivation Description	(0008,2111)	3	
Source Image Sequence	(0008,2112)	3	Note: This is sent for the FOR_PRESENTATION image, with the UID to the FOR_PROCESSING image, even if the FOR_PROCESSING image was not sent to store destination.
>Referenced SOP Class UID	(0008,1150)	1C	
>Referenced SOP Instance UID	(0008,1155)	1C	
Images In Acquisition	(0020,1002)	3	
Image Comments	(0020,4000)	3	Refer to <a href="#">Addendum B</a>
Lossy Image Compression	(0028,2110)	3	00 = No Compression
Irradiation Event UID	(0008,3010)	3	If the IHE Dose Reporting Option is enabled on the system, the value for this field will be sent.  This field represents the unique identification of the irradiation event(s) associated with the acquisition of this image. It will be used by receiving systems to determine duplicate events reported in a Dose Report for a particular procedure step/study.
<b>Image Pixel</b>			
Samples per Pixel	(0028,0002)	1	1

Attribute Name	Tag	DICOM Type	Supported Values/ Comments
Photometric Interpretation	(0028,0004)	1	MONOCHROME1 MONOCHROME2 (If the image space configured on the destination is set to density, MONOCHROME1 is set. If the image space configured on the destination is p-values or luminance, MONOCHROME2 is set. See section 5.1.3 for more information.
Planar Configuration	(0028,0006)	1C	
Rows	(0028,0010)	1	1250 1792 2048 2200 2355 2392 2400 2500 2600 3000 3548 4330 4784 4800 6000 Supported values are model dependent. If the user crops the image, or auto-cropping is enabled, the supported values may be less than the max values listed above.

Attribute Name	Tag	DICOM Type	Supported Values/ Comments
Columns	(0028,0011)	1	1250 1792 2048 2200 2355 2392 2400 2500 2600 3000 3548 4330 4784 4800 6000  Supported values are model dependent  If the user crops the image, or auto-cropping is enabled, the supported values may be less than the max values listed above
Pixel Aspect Ratio	(0028,0034)	1C	1\1
Bits Allocated	(0028,0100)	1	16
Bits Stored	(0028,0101)	1	12
High Bit	(0028,0102)	1	11
Pixel Representation	(0028,0103)	1	0
Smallest Image Pixel Value	(0028,0106)	1	0
Largest Image Pixel Value	(0028,0107)	1	4095
Pixel Data	(7FE0,0010)	1	
<b>Contrast/Bolus</b>			
Contrast/Bolus Agent	(0028,0010)	2	Refer to <a href="#">Addendum B</a>
<b>DX Anatomy Imaged</b>			
Image Laterality	(0020,0062)	1	L R

Attribute Name	Tag	DICOM Type	Supported Values/ Comments
Anatomic Region Sequence	(0008,2218)	2	Refer to <a href="#">Context Identifier 4031</a> in Addendum A for supported SNOMED Code Values
>Code Value	(0008,0100)	1C	
>Coding Scheme Designator	(0008,0102)	1C	
>Coding Scheme Version	(0008,0103)	1C	
>Code Meaning	(0008,0104)	1C	
>Mapping Resource	(0008,0105)	1C	
>Context Group Version	(0008,0106)	1C	
>Context Identifier	(0008,010f)	3	
<b>DX Image</b>			
Image Type	(0008,0008)	1	
Samples per Pixel	(0028,0002)	1	1
Photometric Interpretation	(0028,0004)	1	MONOCHROME1 MONOCHROME2  (If the image space configured on the destination is set to density, MONOCHROME1 is set. If the image space configured on the destination is p-values or luminance, MONOCHROME2 is set.  See section 5.1.3 for more information.
Bits Allocated	(0028,0100)	1	16
Bits Stored	(0028,0101)	1	12
High Bit	(0028,0102)	1	11
Pixel Representation	(0028,0103)	1	0
Pixel Intensity Relationship	(0028,1040)	1	LOG
Pixel Intensity Relationship Sign	(0028,1041)	1	1
Rescale Intercept	(0028,1052)	1	0
Rescale Slope	(0028,1053)	1	1
Rescale Type	(0028,1054)	1	US
Presentation LUT Shape	(2050,0020)	1	If FOR_PRESENTATION image, IDENTITY  If FOR_PROCESSING image, INVERSE

Attribute Name	Tag	DICOM Type	Supported Values/ Comments
Lossy Image Compression	(0028,2110)	1	00 = No compression
Derivation Description	(0008,2111)	3	
Acquisition Device Processing Description	(0018,1400)	3	
Acquisition Device Processing Code	(0018,1401)	3	
Patient Orientation	(0020,0020)	1	Value specified per view and cannot be modified by site or  Key operator may select "L/F" for all images
Calibration Image	(0050,0004)	3	
Burned In Annotation	(0028,0301)	1	NO
VOI LUT Sequence	(0028,3010)	1C	Based on destination configuration, either the LUT or window/level values, but never both, will be sent
>LUT Descriptor	(0028,3002)	1C	
>LUT Explanation	(0028,3003)	3	
>LUT Data	(0028,3006)	1C	
Window Center	(0028,1050)	1C	
Window Width	(0028,1051)	1C	
Window Center & Width Explanation	(0028,1055)	3	
<b>DX Detector</b>			
Detector Type	(0018,7004)	2	STORAGE
Detector ID	(0018,700A)	3	CR Plate ID value
Imager Pixel Spacing	(0018,1164)	1	0.168\0.168 0.171\0.171 0.115\0.115 0.097\0.097 0.0485\0.0485
Detector Configuration	(0018,7005)	3	AREA
Detector Manufacturer Name	(0018,702A)	3	CARESTREAM
Field of View Shape	(0018,1147)	3	RECTANGLE
Field of View Dimension(s)	(0018,1149)	3	
<b>X-Ray Collimator</b>			
Collimator Shape	(0018,1700)	1	RECTANGLE

Attribute Name	Tag	DICOM Type	Supported Values/ Comments
Vertices of the Polygonal Collimator	(0018,1720)	1C	RECTANGLE
<b>DX Positioning</b>			
View Position	(0018,5101)	3	
View Code Sequence	(0054,0220)	3	Refer to <a href="#">Context Identifier 4010</a> in Addendum A for supported SNOMED Code Values
>Code Value	(0008,0100)	1C	
>Coding Scheme Designator	(0008,0102)	1C	
>Coding Scheme Version	(0008,0103)	1C	
>Code Meaning	(0008,0104)	1C	
>Mapping Resource	(0008,0105)	1C	
>Context Group Version	(0008,0106)	1C	
>Context Identifier	(0008,010f)	3	
>View Modifier Code Sequence	(0054,0222)	2	Refer to <a href="#">Context Identifier 4010</a> in Addendum A for supported SNOMED Code Values
>>Code Value	(0008,0100)	1C	
>>Coding Scheme Designator	(0008,0102)	1C	
>>Code Meaning	(0008,0104)	1C	
>>Mapping Resource	(0008,0105)	1C	
>>Context Group Version	(0008,0106)	1C	
>>Context Identifier	(0008,010f)	3	
Patient Orientation Code Sequence	(0054,0410)	3	Refer to <a href="#">Context Identifier 19</a> in Addendum A for supported SNOMED Code Values
>Code Value	(0008,0100)	1C	
>Coding Scheme Designator	(0008,0102)	1C	
>Code Meaning	(0008,0104)	1C	
>Mapping Resource	(0008,0105)	1C	
>Context Group Version	(0008,0106)	1C	
>Context Identifier	(0008,010f)	3	
>Patient Orientation Modifier Code Sequence	(0054,0412)	2	Refer to <a href="#">Context Identifier 20</a> in Addendum A for supported SNOMED Code Values



Attribute Name	Tag	DICOM Type	Supported Values/ Comments
>>Code Value	(0008,0100)	1C	
>>Coding Scheme Designator	(0008,0102)	1C	
>>Code Meaning	(0008,0104)	1C	
>>Mapping Resource	(0008,0105)	1C	
>>Context Group Version	(0008,0106)	1C	
>>Context Identifier	(0008,010f)	3	
Positioner Type	(0018,1508)	2	
<b>X-Ray Acquisition Dose</b>			
KVP	(0018,0060)	3	
X-Ray Tube Current	(0018,1151)	3	
Exposure Time	(0018,1150)	3	
Exposure	(0018,1152)	3	
Exposure in $\mu$ As	(0018,1153)	3	
Distance Source to Detector	(0018,1110)	3	
Distance Source to Patient	(0018,1111)	3	
Image and Fluoroscopy Area Dose Product	(0018,115E)	3	
Relative X-Ray Exposure	(0018,1405)	3	
Exposure Index	(0018,1411)	3	Defined in IEC 62494-1
Target Exposure Index	(0018,1412)	3	Defined in IEC 62494-1
Deviation Index	(0018,1413)	3	Defined in IEC 62494-1
Entrance Dose	(0040,0302)	3	<p>This value will be calculated if Image Area Dose is available, otherwise a value of zero will be sent.</p> <p>It will be measured at reference point “In Detector Plane” when Distance Source to Detector and Distance Source to Patient are NOT available.</p> <p>Refer to <a href="#">Addendum B</a></p>

Attribute Name	Tag	DICOM Type	Supported Values/ Comments
Entrance Dose in mGy	(0040,8302)	3	This value will be calculated if Image Area Dose is available, otherwise value will be zero.  It will be measured at reference point "In Detector Plane" when Distance Source to Detector and Distance Source to Patient are NOT available.  Refer to <a href="#">Addendum B</a>
Exposed Area	(0040,0303)	3	
Distance Source to Entrance	(0040,0306)	3	
Anode Target Material	(0018,1191)	3	
Filter Material	(0018,7050)	3	
Filter Thickness Minimum	(0018,7052)	3	
Filter Thickness Maximum	(0018,7054)	3	
Rectification Type	(0018,1156)	3	
<b>X-Ray Filtration</b>			
Filter Type	(0018,1160)	3	
Filter Material	(0018,7050)	3	
Filter Thickness Minimum	(0018,7052)	3	
Filter Thickness Maximum	(0018,7054)	3	
<b>VOI LUT</b>			
VOI LUT Sequence	(0028,3010)	3	
>LUT Descriptor	(0028,3002)	1C	
>LUT Explanation	(0028,3003)	1C	
>LUT Data	(0028,3006)	1C	
Window Center	(0028,1050)	1C	2048
Window Width	(0028,1051)	1C	4096
<b>Acquisition Context</b>			
Acquisition Context Sequence	(0040,0555)	2	Empty Sequence
<b>SOP Common</b>			
SOP Class UID	(0008,0016)	1	
SOP Instance UID	(0008,0018)	1	
Specific Character Set	(0008,0005)	1C	

### 3.5.2 Digital Mammography X-Ray Image Storage

The DirectView CR provides standard conformance to the Digital Mammography X-Ray Image Storage SOP Class as an SCU.

**Table 3.10 Digital Mammography X-Ray Image SOP Class – For Presentation**

SOP Class	SOP Class UID
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2

**Table 3.11 Digital Mammography X-Ray Image SOP Class – For Processing**

SOP Class	SOP Class UID
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1

**Table 3.12 Digital Mammography X-Ray Image SOP Class – Supported Attributes**

Attribute Name	Tag	DICOM Type	Supported Values/ Comments
<b>Patient Module</b>			
Patient Name	(0010,0010)	2	Refer to <a href="#">Addendum B</a>
Patient ID	(0010,0020)	2	Refer to <a href="#">Addendum B</a>
Patient Birth Date	(0010,0030)	2	Refer to <a href="#">Addendum B</a>
Patient Sex	(0010,0040)	2	Refer to <a href="#">Addendum B</a>
Patient Birth Time	(0010,0032)	3	
Other Patient IDs	(0010,1000)	3	Only sent if received from modality worklist
Other Patient Names	(0010,1001)	3	Only sent if received from modality worklist
Ethnic Group	(0010,2160)	3	Only sent if received from modality worklist
Patient Comments	(0010,4000)	3	
Allergies	(0010,2110)	3	
<b>General Study</b>			
Study Instance UID	(0020,000D)	1	
Study Date	(0008,0020)	2	Refer to <a href="#">Addendum B</a>
Study Time	(0008,0030)	2	Refer to <a href="#">Addendum B</a>
Referring Physician Name	(0008,0090)	2	Refer to <a href="#">Addendum B</a>
Study ID	(0020,0010)	2	
Accession Number	(0008,0050)	2	Refer to <a href="#">Addendum B</a>
Study Description	(0008,1030)	3	Refer to <a href="#">Addendum B</a>
Referenced Study Sequence	(0008,1110)	3	

Attribute Name	Tag	DICO M Type	Supported Values/ Comments
>Referenced SOP Class UID	(0008,1150)	1C	
>Referenced SOP Instance UID	(0008,1155)	1C	
Procedure Code Sequence	(0008,1032)	3	Refer to <a href="#">Addendum B</a>
> Code Value	(0008,0100)	1C	
> Coding Scheme Designator	(0008,0102)	1C	
> Coding Scheme Version	(0008,0103)	1C	
> Code Meaning	(0008,0104)	1C	
<b>Patient Study</b>			
Admitting Diagnoses Description	(0008,1080)	3	
Patient's Age	(0010,1010)	3	Refer to <a href="#">Addendum B</a>
Patient's Size	(0010,1020)	3	<b>Patient Size Indexing</b> will automatically select the appropriate Pediatric Chest or Pediatric Abdomen View based off of the Patient Size information (Patient Size field and/or Age/Weight).
Patient's Weight	(0010,1030)	3	
Occupation	(0010,2180)	3	
Additional Patient's History	(0010,21B0)	3	
<b>General Series</b>			
Modality	(0008,0060)	1	MG
Series Instance UID	(0020,000E)	1	
Series Number	(0020,0011)	2	
Laterality	(0020,0060)	2C	L R Refer to <a href="#">Addendum B</a>
Series Date	(0008,0021)	3	
Protocol Name	(0008,1030)	3	
Series Time	(0008,0031)	3	
Series Description	(0008,103E)	3	Same value as tag (0018,5101)
Operator Name	(0008,1070)	3	Refer to <a href="#">Addendum B</a>
Body Part Examined	(0008,0015)	3	Refer to <a href="#">Addendum B</a>
Performed Procedure Step Start Date	(0040,0244)	3	Refer to <a href="#">Addendum B</a>

Attribute Name	Tag	DICO M Type	Supported Values/ Comments
Performed Procedure Step Start Time	(0040,0245)	3	Refer to <a href="#">Addendum B</a>
Performed Procedure Step ID	(0040,0253)	3	
Performed Procedure Step Description	(0040,0254)	3	Refer to <a href="#">Addendum B</a>
Performed Protocol Code Sequence	(0040,0260)	3	
>Code Value	(0008,0100)	1C	
>Coding Scheme Designator	(0008,0102)	1C	
>Coding Scheme Version	(0008,0103)	1C	
>Code Meaning	(0008,0104)	1C	
Request Attributes Sequence	(0040,0275)	3	
>Requested Procedure Description	(0032,1060)	3	
>Reason for the Requested Procedure	(0040,1002)	3	
>Scheduled Procedure Step Description	(0040,0007)	3	
>Scheduled Protocol Code Sequence	(0040,0008)	3	
>> Code Value	(0008,0100)	1C	
>> Coding Scheme Designator	(0008,0102)	1C	
>> Coding Scheme Version	(0008,0103)	1C	
>> Code Meaning	(0008,0104)	1C	
>Scheduled Procedure Step ID	(0040,0009)	1C	
>Requested Procedure ID	(0040,1001)	1C	Refer to <a href="#">Addendum B</a>
<b>DX Series</b>			
Modality	(0008,0060)	1	MG
Referenced Performed Procedure Step Sequence	(0008,1111)	1C	
>Referenced SOP Class UID	(0008,1150)	1C	
>Referenced SOP Instance UID	(0008,1155)	1C	
Presentation Intent Type	(0008,0068)	1	Enumerated Values: FOR PRESENTATION, FOR PROCESSING

Attribute Name	Tag	DICO M Type	Supported Values/ Comments
<b>Mammography Series</b>			
Modality	(0008,0060)	1	MG
Request Attributes Sequence	(0040,0275)	3	
>Requested Procedure ID	(0040,1001)	1	
>Scheduled Procedure Step ID	(0040,0009)	1	
>Scheduled Procedure Step Description	(0040,0007)	3	
>Scheduled Protocol Code Sequence	(0040,0008)	3	
>> Code Value	(0008,0100)	1C	
>> Coding Scheme Designator	(0008,0102)	1C	
>> Coding Scheme Version	(0008,0103)	1C	
>> Code Meaning	(0008,0104)	1C	
<b>General Equipment</b>			
Manufacturer	(0008,0070)	2	CARESTREAM
Institution Name	(0008,0080)	3	Configuration item entered by Key Operator
Institution Address	(0008,0081)	3	Configuration item entered by Key Operator
Station Name	(0008,1010)	3	This is the computer name that is Input by Service
Institutional Department Name	(0008,1040)	3	Refer to <a href="#">Addendum B</a>
Manufacturer Model Name	(0008,1090)	3	
Device Serial Number	(0018,1000)	3	
Software Versions	(0018,1020)	3	
<b>General Image</b>			
Instance Number	(0020,0013)	2	Within a series, the instance number may be configured by the Key Operator to be 1 or a unique value.
Patient Orientation	(0020,0020)	2C	Value specified per view and cannot be modified by site or Key operator may select "L/F" for all images
Image Type	(0008,0008)	3	
Content Date	(0008,0023)	2C	

Attribute Name	Tag	DICOM Type	Supported Values/ Comments
Content Time	(0008,0033)	2C	
Acquisition Number	(0020,0012)	3	
Acquisition Date	(0008,0022)	3	
Acquisition Time	(0008,0032)	3	
Referenced Image Sequence	(0008,1140)	3	
> Referenced SOP Class UID	(0008,1150)	1C	Only populated for companion images and will contain Referenced SOP Class UID of the standard image associated with the companion images.
> Referenced SOP Instance UID	(0008,1155)	1C	Only populated for companion images and will contain Referenced SOP Instance UID of standard image associated with the companion image.
Derivation Description	(0008,2111)	3	
Source Image Sequence	(0008,2112)	3	Note: This is sent for the FOR_PRESENTATION image, with the UID to the FOR_PROCESSING image, even if the FOR_PROCESSING image was not sent to store destination.
>Referenced SOP Class UID	(0008,1150)	1C	
>Referenced SOP Instance UID	(0008,1155)	1C	
>Spatial Locations Preserved	(0028,135A)	3	
Images In Acquisition	(0020,1002)	3	
Image Comments	(0020,4000)	3	Refer to <a href="#">Addendum B</a>
Lossy Image Compression	(0028,2110)	3	00 = No compression

Attribute Name	Tag	DICO M Type	Supported Values/ Comments
Irradiation Event UID	(0008,3010)	3	<p>If the IHE Dose Reporting Option is enabled on the system, the value for this field will be sent.</p> <p>This field represents the unique identification of the irradiation event(s) associated with the acquisition of this image. It will be used by receiving systems to determine duplicate events reported in a Dose Report for a particular procedure step/study.</p>
<b>Image Pixel</b>			
Samples per Pixel	(0028,0002)	1	1
Photometric Interpretation	(0028,0004)	1	<p>MONOCHROME1 MONOCHROME2</p> <p>(If the image space configured on the destination is set to density, MONOCHROME1 is set. If the image space configured on the destination is p-values or luminance, MONOCHROME2 is set.</p> <p>See section 5.1.3 for more information.</p>
Planar Configuration	(0028,0006)	1C	
Rows	(0028,0010)	1	<p>3584 4784 4800 6000</p> <p>If the user crops the image, or auto-cropping is enabled, the supported values may be less than the max values listed above</p>



Attribute Name	Tag	DICO M Type	Supported Values/ Comments
Columns	(0028,0011)	1	3584 4784 4800 6000  If the user crops the image, or auto-cropping is enabled, the supported values may be less than the max values listed above
Pixel Aspect Ratio	(0028,0034)	1C	
Bits Allocated	(0028,0100)	1	16
Bits Stored	(0028,0101)	1	12
High Bit	(0028,0102)	1	11
Pixel Representation	(0028,0103)	1	0
Smallest Image Pixel Value	(0028,0106)	1	0
Largest Image Pixel Value	(0028,0107)	1	4095
Pixel Data	(7FE0,0010)	1	
<b>Contrast/Bolus</b>			
Contrast/Bolus Agent	(0028,0010)	2	Refer to <a href="#">Addendum B</a>
<b>DX Anatomy Imaged</b>			
Image Laterality	(0020,0062)	1	L R
Anatomic Region Sequence	(0008,2218)	2	Refer to <a href="#">Context Identifier 4031</a> in <a href="#">Addendum A</a> for supported SNOMED Code Values
>Code Value	(0008,0100)	1C	
>Coding Scheme Designator	(0008,0102)	1C	
>Coding Scheme Version	(0008,0103)	1C	
>Code Meaning	(0008,0104)	1C	
>Mapping Resource	(0008,0105)	1C	
>Context Group Version	(0008,0106)	1C	
>Context Identifier	(0008,010f)	3	
<b>DX Image</b>			
Image Type	(0008,0008)	1	

Attribute Name	Tag	DICOM Type	Supported Values/ Comments
Samples per Pixel	(0028,0002)	1	
Photometric Interpretation	(0028,0004)	1	MONOCHROME1 MONOCHROME2 (If the image space configured on the destination is set to density, MONOCHROME1 is set. If the image space configured on the destination is p-values or luminance, MONOCHROME2 is set. See section 5.1.3 for more information.
Bits Allocated	(0028,0100)	1	16
Bits Stored	(0028,0101)	1	12
High Bit	(0028,0102)	1	11
Pixel Representation	(0028,0103)	1	0
Pixel Intensity Relationship	(0028,1040)	1	LOG
Pixel Intensity Relationship Sign	(0028,1041)	1	1
Rescale Intercept	(0028,1052)	1	0
Rescale Slope	(0028,1053)	1	
Rescale Type	(0028,1054)	1	US
Presentation LUT Shape	(2050,0020)	1	If FOR_PRESENTATION image, IDENTITY  If FOR_PROCESSING image, INVERSE
Lossy Image Compression	(0028,2110)	1	00 = No compression
Derivation Description	(0008,2111)	3	
Acquisition Device Processing Description	(0018,1400)	3	
Acquisition Device Processing Code	(0018,1401)	3	
Patient Orientation	(0020,0020)	1	Value specified per view and cannot be modified by site or  Key operator may select "L/F" for all images
Calibration Image	(0050,0004)	3	
Burned In Annotation	(0028,0301)	1	NO

Attribute Name	Tag	DICO M Type	Supported Values/ Comments
VOI LUT Sequence	(0028,3010)	1C	Based on destination configuration, either the LUT or window/level values, but never both, will be sent
>LUT Descriptor	(0028,3002)	1C	
>LUT Explanation	(0028,3003)	3	
>LUT Data	(0028,3006)	1C	
Window Center	(0028,1050)	1C	
Window Width	(0028,1051)	1C	
Window Center & Width Explanation	(0028,1055)	3	
<b>DX Detector</b>			
Detector Type	(0018,7004)	2	STORAGE
Detector ID	(0018,700A)	3	CR Plate ID value
Imager Pixel Spacing	(0018,1164)	1	0.097\0.097 0.0485\0.0485
Detector Configuration	(0018,7005)	3	AREA
Field of View Shape	(0018,1147)	3	RECTANGLE
Field of View Dimension(s)	(0018,1149)	3	
<b>DX Positioning</b>			
View Position	(0018,5101)	3	
View Code Sequence	(0054,0220)	3	Refer to <a href="#">Context Identifier 4010</a> in Addendum <a href="#">A</a> for supported SNOMED Code Values
>Code Value	(0008,0100)	1C	
>Coding Scheme Designator	(0008,0102)	1C	
>Coding Scheme Version	(0008,0103)	1C	
>Code Meaning	(0008,0104)	1C	
>Mapping Resource	(0008,0105)	1C	
>Context Group Version	(0008,0106)	1C	
>Context Identifier	(0008,010f)	3	
>View Modifier Code Sequence	(0054,0222)	2	Refer to <a href="#">Context Identifier 4010</a> in Addendum <a href="#">A</a> for supported SNOMED Code Values
>>Code Value	(0008,0100)	1C	
>>Coding Scheme Designator	(0008,0102)	1C	

Attribute Name	Tag	DICO M Type	Supported Values/ Comments
>>Code Meaning	(0008,0104)	1C	
>>Mapping Resource	(0008,0105)	1C	
>>Context Group Version	(0008,0106)	1C	
>>Context Identifier	(0008,010f)	3	
Patient Orientation Code Sequence	(0054,0410)	3	Refer to <a href="#">Context Identifier 19</a> in Addendum A for supported SNOMED Code Values
>Code Value	(0008,0100)	1C	
>Coding Scheme Designator	(0008,0102)	1C	
>Code Meaning	(0008,0104)	1C	
>Mapping Resource	(0008,0105)	1C	
>Context Group Version	(0008,0106)	1C	
>Context Identifier	(0008,010f)	3	
>Patient Orientation Modifier Code Sequence	(0054,0412)	2	Refer to <a href="#">Context Identifier 20</a> in Addendum A for supported SNOMED Code Values
>>Code Value	(0008,0100)	1C	
>>Coding Scheme Designator	(0008,0102)	1C	
>>Code Meaning	(0008,0104)	1C	
>>Mapping Resource	(0008,0105)	1C	
>>Context Group Version	(0008,0106)	1C	
>>Context Identifier	(0008,010f)	3	
Positioner Type	(0018,1508)	2	
<b>X-Ray Acquisition Dose</b>			
KVP	(0018,0060)	3	Refer to <a href="#">Addendum B</a> May be received from CR X-ray interface depending on equipment
X-Ray Tube Current	(0018,1151)	3	May be received from CR X-ray interface depending on equipment
Exposure Time	(0018,1150)	3	May be received from CR X-ray interface depending on equipment

Attribute Name	Tag	DICO M Type	Supported Values/ Comments
Exposure	(0018,1152)	3	Refer to <a href="#">Addendum B</a> May be received from CR X-ray interface depending on equipment
Exposure in $\mu$ As	(0018,1153)	3	
Distance Source to Detector	(0018,1110)	3	Refer to <a href="#">Addendum B</a> May be received from CR X-ray interface depending on equipment
Distance Source to Patient	(0018,1111)	3	Refer to <a href="#">Addendum B</a> May be received from CR X-ray interface depending on equipment
Image and Fluoroscopy Area Dose Product	(0018,115E)	3	May be received from CR X-ray interface depending on equipment
Body Part Thickness	(0018,11A0)	3	Refer to <a href="#">Addendum B</a> May be received from CR X-ray interface depending on equipment
Focal Spot	(0018,1190)	3	May be received from CR X-ray interface depending on equipment
Relative X-Ray Exposure	(0018,1405)	3	
Exposure Index	(0018,1411)	3	Defined in IEC 62494-1
Target Exposure Index	(0018,1412)	3	Defined in IEC 62494-1
Deviation Index	(0018,1413)	3	Defined in IEC 62494-1
Entrance Dose	(0040,0302)	3	This value will be calculated if Image Area Dose is available, otherwise a value of zero will be sent.  It will be measured at reference point "In Detector Plane" when Distance Source to Detector and Distance Source to Patient are NOT available.  Note: If the system user manually enters the value for this field it is assumed to be measured at the surface of the patient.  Refer to <a href="#">Addendum B</a> .

Attribute Name	Tag	DICO M Type	Supported Values/ Comments
Entrance Dose in mGy	(0040,8302)	3	<p>This value will be calculated if Image Area Dose is available, otherwise value will be zero.</p> <p>It will be measured at reference point “In Detector Plane” when Distance Source to Detector and Distance Source to Patient are NOT available.</p> <p>Note: If the system user manually enters the value for this field it is assumed to be measured at the surface of the patient.</p> <p>Refer to <a href="#">Addendum B</a>.</p>
Exposed Area	(0040,0303)	3	
Distance Source to Entrance	(0040,0306)	3	
Organ Dose	(0040,0316)	3	May be received from CR X-ray interface depending on equipment
Anode Target Material	(0018,1191)	3	<p>Refer to <a href="#">Addendum B</a></p> <p>May be received from CR X-ray interface depending on equipment</p>
Filter Material	(0018,7050)	3	<p>Refer to <a href="#">Addendum B</a></p> <p>May be received from CR X-ray interface depending on equipment</p>
Filter Thickness Minimum	(0018,7052)	3	
Filter Thickness Maximum	(0018,7054)	3	
Rectification Type	(0018,1156)	3	
<b>Mammography Image</b>			
Positioner Type	(0018,1508)	1	
Distance Source to Detector	(0018,0110)	3	<p>Refer to <a href="#">Addendum B</a></p> <p>May be received from CR X-ray interface depending on equipment</p>
Distance Source to Patient	(0018,0111)	3	<p>Refer to <a href="#">Addendum B</a></p> <p>May be received from CR X-ray interface depending on equipment</p>

Attribute Name	Tag	DICO M Type	Supported Values/ Comments
Positioner Primary Angle	(0018,1510)	3	Refer to <a href="#">Addendum B</a> May be received from CR X-ray interface depending on equipment
Image Laterality	(0020,0062)	1	
Implant Present	(0028,1300)	3	Will be included if Breast Implant view is used
Organ Exposed	(0040,0318)	1	
View Code Sequence	(0054,0220)	1	Refer to <a href="#">Context Identifier 4014</a> in Addendum <a href="#">A</a> for supported SNOMED Code Values
>Code Value	(0008,0100)	1C	
>Coding Scheme Designator	(0008,0102)	1C	
>Coding Scheme Version	(0008,0103)	1C	
>Code Meaning	(0008,0104)	1C	
>Mapping Resource	(0008,0105)	1C	
>Context Group Version	(0008,0106)	1C	
>Context Identifier	(0008,010f)	3	
>View Angulation Modifier Code Sequence	(0054,0222)	2	Refer to <a href="#">Context Identifier 4015</a> in Addendum <a href="#">A</a> for supported SNOMED Code Values
>>Code Value	(0008,0100)	1C	
>>Coding Scheme Designator	(0008,0102)	1C	
>>Coding Scheme Version	(0008,0103)	1C	
>>Code Meaning	(0008,0104)	1C	
>>Mapping Resource	(0008,0105)	1C	
>>Context Group Version	(0008,0106)	1C	
>>Context Identifier	(0008,010f)	3	
Anatomic Region Sequence	(0008,2218)	1	Refer to <a href="#">Context Identifier 4031</a> in Addendum <a href="#">A</a> for supported SNOMED Code Values
>Code Value	(0008,0100)	1C	
>Coding Scheme Designator	(0008,0102)	1C	
>Coding Scheme Version	(0008,0103)	1C	
>Code Meaning	(0008,0104)	1C	
>Mapping Resource	(0008,0105)	1C	

Attribute Name	Tag	DICO M Type	Supported Values/ Comments
>Context Group Version	(0008,0106)	1C	
>Context Identifier	(0008,010f)	3	
<b>VOI LUT</b>			
VOI LUT Sequence	(0028,3010)	3	Based on destination configuration, either the LUT or window/level values, but never both, will be sent
>LUT Descriptor	(0028,3002)	1C	
>LUT Explanation	(0028,3003)	1C	
>LUT Data	(0028,3006)	1C	
Window Center	(0028,1050)	1C	2048
Window Width	(0028,1051)	1C	4096
<b>Acquisition Context</b>			
Acquisition Context Sequence	(0040,0555)	2	Empty Sequence
<b>SOP Common</b>			
SOP Class UID	(0008,0016)	1	
SOP Instance UID	(0008,0018)	1	
Specific Character Set	(0008,0005)	1C	

### 3.5.3 Computed Radiography Image Storage

The DirectView CR provides standard conformance to the Computed Radiography Image Storage SOP Class as an SCU.

**Table 3.13 Computed Radiography Image SOP Class**

SOP Class	SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1

**Table 3.14 Computed Radiography Image SOP Class – Supported Attributes**

Attribute Name	Tag	DICOM Type	Supported Values/Comments
<b>Patient Module</b>			
Patient Name	(0010,0010)	2	Refer to <a href="#">Addendum B</a>
Patient ID	(0010,0020)	2	Refer to <a href="#">Addendum B</a>
Patient Birth Date	(0010,0030)	2	Refer to <a href="#">Addendum B</a>
Patient Sex	(0010,0040)	2	Refer to <a href="#">Addendum B</a>



Attribute Name	Tag	DICOM Type	Supported Values/Comments
Patient Birth Time	(0010,0032)	3	
Other Patient IDs	(0010,1000)	3	This value will be sent only if it has been received from the DICOM modality work list (MWL).
Other Patient Names	(0010,1001)	3	This value will be sent only if it has been received from the DICOM modality work list (MWL).
Ethnic Group	(0010,2160)	3	This value will be sent only if it has been received from the DICOM modality work list (MWL).
Patient Comments	(0010,4000)	3	
Allergies	(0010,2110)	3	
<b>General Study</b>			
Study Instance UID	(0020,000D)	1	
Study Date	(0008,0020)	2	Refer to <a href="#">Addendum B</a>
Study Time	(0008,0030)	2	Refer to <a href="#">Addendum B</a>
Referring Physician Name	(0008,0090)	2	Refer to <a href="#">Addendum B</a>
Study ID	(0020,0010)	2	
Accession Number	(0008,0050)	2	Refer to <a href="#">Addendum B</a>
Study Description	(0008,1030)	3	Refer to <a href="#">Addendum B</a>
Referenced Study Sequence	(0008,1110)	3	
>Referenced SOP Class UID	(0008,1150)	1C	
>Referenced SOP Instance UID	(0008,1155)	1C	
Procedure Code Sequence	(0008,1032)	3	Refer to <a href="#">Addendum B</a>
> Code Value	(0008,0100)	1C	
> Coding Scheme Designator	(0008,0102)	1C	
> Coding Scheme Version	(0008,0103)	1C	
> Code Meaning	(0008,0104)	1C	
<b>Patient Study</b>			
Admitting Diagnoses Description	(0008,1080)	3	
Patient's Age	(0010,1010)	3	

Attribute Name	Tag	DICOM Type	Supported Values/Comments
Patient's Size	(0010,1020)	3	<b>Patient Size Indexing</b> will automatically select the appropriate Pediatric Chest or Pediatric Abdomen View based off of the Patient Size information (Patient Size field and/or Age/Weight).
Patient's Weight	(0010,1030)	3	
Occupation	(0010,2180)	3	
Additional Patient's History	(0010,21B0)	3	
<b>General Series</b>			
Modality	(0008,0060)	1	CR
Series Instance UID	(0020,000E)	1	
Series Number	(0020,0011)	2	
Laterality	(0020,0060)	2C	L R Refer to <a href="#">Addendum B</a>
Series Date	(0008,0021)	3	
Protocol Name	(0008,1030)	3	
Series Time	(0008,0031)	3	
Operator Name	(0008,1070)	3	Refer to <a href="#">Addendum B</a>
Performed Procedure Step Start Date	(0040,0244)	3	Refer to <a href="#">Addendum B</a>
Performed Procedure Step Start Time	(0040,0245)	3	Refer to <a href="#">Addendum B</a>
Performed Procedure Step ID	(0040,0253)	3	
Performed Procedure Step Description	(0040,0254)	3	Refer to <a href="#">Addendum B</a>
Performed Protocol Code Sequence	(0040,0260)	3	
>Code Value	(0008,0100)	1C	
>Coding Scheme Designator	(0008,0102)	1C	
>Coding Scheme Version	(0008,0103)	1C	
>Code Meaning	(0008,0104)	1C	
Request Attributes Sequence	(0040,0275)	3	
>Requested Procedure Description	(0032,1060)	3	
>Reason for the Requested Procedure	(0040,1002)	3	

Attribute Name	Tag	DICOM Type	Supported Values/Comments
>Scheduled Procedure Step Description	(0040,0007)	3	
>Scheduled Protocol Code Sequence	(0040,0008)	3	
>> Code Value	(0008,0100)	1C	
>> Coding Scheme Designator	(0008,0102)	1C	
>> Coding Scheme Version	(0008,0103)	1C	
>> Code Meaning	(0008,0104)	1C	
>Scheduled Procedure Step ID	(0040,0009)	1C	
>Requested Procedure ID	(0040,1001)	1C	Refer to <a href="#">Addendum B</a>
<b>CR Series</b>			
Body Part Examined	(0018,0015)	2	Refer to <a href="#">Addendum B</a>
View Position	(0018,5101)	2	Refer to <a href="#">Addendum B</a>
<b>General Equipment</b>			
Manufacturer	(0008,0070)	2	CARESTREAM
Institution Name	(0008,0080)	3	For this value to be populated and sent, the <i>CR System</i> user needs to enter the value on the <i>Delivery Preferences</i> screen.
Institution Address	(0008,0081)	3	For this value to be populated and sent, the <i>CR System</i> user needs to enter the value on the <i>Delivery Preferences</i> screen.
Station Name	(0008,1010)	3	This is the computer name that is Input by Service
Institutional Department Name	(0008,1040)	3	Refer to <a href="#">Addendum B</a>
Manufacturer Model Name	(0008,1090)	3	
Device Serial Number	(0018,1000)	3	
Software Versions	(0018,1020)	3	
<b>General Image</b>			
Instance Number	(0020,0013)	2	Within a series, the instance number may be configured by the Key Operator to be 1 or a unique value.
Patient Orientation	(0020,0020)	2C	Value specified per view and cannot be modified by site or Key operator may select "L/F" for all images

Attribute Name	Tag	DICOM Type	Supported Values/Comments
Image Type	(0008,0008)	3	
Content Date	(0008,0023)	2C	
Content Time	(0008,0033)	2C	
Acquisition Number	(0020,0012)	3	
Acquisition Date	(0008,0022)	3	
Acquisition Time	(0008,0032)	3	
Referenced Image Sequence	(0008,1140)	3	
> Referenced SOP Class UID	(0008,1150)	1C	Only populated for companion images and will contain Referenced SOP Class UID of the standard image associated with the companion image.
> Referenced SOP Instance UID	(0008,1155)	1C	Only populated for companion images and will contain Referenced SOP Instance UID of standard image associated with the companion image.
Derivation Description	(0008,2111)	3	
Images In Acquisition	(0020,1002)	3	
Image Comments	(0020,4000)	3	Refer to <a href="#">Addendum B</a>
Lossy Image Compression	(0028,2110)	3	00 = No Compression
Irradiation Event UID	(0008,3010)	3	<p>If the IHE Dose Reporting Option is enabled on the <i>DR System</i>, the value for this field will be sent.</p> <p>This field represents the unique identification of the irradiation event(s) associated with the acquisition of this image. It will be used by receiving systems to determine duplicate events reported in a Dose Report for a particular procedure step/study.</p>
<b>Image Plane</b>			
Pixel Spacing	(0028,0030)	3	0.168\0.168 0.171\0.171 0.115\0.115 0.097\0.097

Attribute Name	Tag	DICOM Type	Supported Values/Comments
<b>Image Pixel</b>			
Samples per Pixel	(0028,0002)	1	1
Photometric Interpretation	(0028,0004)	1	MONOCHROME1 MONOCHROME2  P-values and Luminance always use monochrome 2  Density always uses monochrome 1
Planar Configuration	(0028,0006)	1C	
Rows	(0028,0010)	1	1250 1792 2048 2200 2355 2392 2400 2500 2600 3548 4330  Supported values are model dependent  If the user crops the image, or auto-cropping is enabled, the supported values may be less than the max values listed above

Attribute Name	Tag	DICOM Type	Supported Values/Comments
Columns	(0028,0011)	1	1250 1792 2048 2200 2355 2392 2400 2500 2600 3548 4330  Supported values are model dependent  If the user crops the image, or auto-cropping is enabled, the supported values may be less than the max values listed above
Pixel Aspect Ratio	(0028,0034)	1C	
Bits Allocated	(0028,0100)	1	16
Bits Stored	(0028,0101)	1	12
High Bit	(0028,0102)	1	11
Pixel Representation	(0028,0103)	1	0
Smallest Image Pixel Value	(0028,0106)	1	0
Largest Image Pixel Value	(0028,0107)	1	4095
Pixel Data	(7FE0,0010)	1	
<b>CR Image</b>			
KVP	(0018,0060)	3	Refer to <a href="#">Addendum B</a>
Plate ID	(0018,1004)	3	Refer to <a href="#">Addendum B</a>
Distance Source to Detector	(0018,1110)	3	Refer to <a href="#">Addendum B</a>
Distance Source to Patient	(0018,1111)	3	Refer to <a href="#">Addendum B</a>
Exposure	(0018,1152)	3	Refer to <a href="#">Addendum B</a>
Imager Pixel Spacing	4 (0018,1164)	3	“0.168\0.168” “0.171\0.171” “0.115\0.115” “0.097\0.097”

Attribute Name	Tag	DICOM Type	Supported Values/Comments
Cassette Orientation	(0018,1402)	3	LANDSCAPE PORTRAIT
Cassette Size	(0018,1403)	3	15CMX30CM 18CMX24CM 24CMX30CM 35CMX35CM 35CMX43CM The term "COMPOSITE" will be used for the cassette size of a combined image.
Relative X-Ray Exposure	(0018,1405)	3	0 to 4095
<b>Contrast/Bolus</b>			
Contrast/Bolus Agent	(0018,0010)	2	Refer to <a href="#">Addendum B</a>
<b>VOI LUT</b>			
VOI LUT Sequence	(0028,3010)	3	Based on destination configuration, either the LUT or window/level values, but never both, will be sent
>LUT Descriptor	(0028,3002)	1C	
>LUT Explanation	(0028,3003)	1C	
>LUT Data	(0028,3006)	1C	
Window Center	(0028,1050)	1C	
Window Width	(0028,1051)	1C	
<b>SOP Common</b>			
SOP Class UID	(0008,0016)	1	
SOP Instance UID	(0008,0018)	1	
Specific Character Set	(0008,0005)	1C	

### 3.5.4 Grayscale Softcopy Presentation State IOD

The DirectView CR provides standard conformance to the Grayscale Softcopy Presentation State Storage SOP Class as an SCU.

**Table 3.15 Grayscale Softcopy Presentation State SOP Class**

SOP Class	SOP Class UID
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1

**Table 3.16 Grayscale Softcopy Presentation State SOP Class Attributes**

Attribute Name	Tag	DICOM Type	Supported Values
<b>Patient Module</b>			
Patient Name	(0010,0010)	2	Refer to <a href="#">Addendum B</a>
Patient ID	(0010,0020)	2	Refer to <a href="#">Addendum B</a>
Patient Birth Date	(0010,0030)	2	Refer to <a href="#">Addendum B</a>
Patient Sex	(0010,0040)	2	Refer to <a href="#">Addendum B</a>
Patient Birth Time	(0010,0032)	3	
Other Patient IDs	(0010,1000)	3	Only sent if received from modality worklist
Other Patient Names	(0010,1001)	3	Only sent if received from modality worklist
Ethnic Group	(0010,2160)	3	Only sent if received from modality worklist
Patient Comments	(0010,4000)	3	Refer to <a href="#">Addendum B</a>
Allergies	(0010,2110)	3	
<b>General Study</b>			
Study Instance UID	(0020,000D)	1	
Study Date	(0008,0020)	2	Refer to <a href="#">Addendum B</a>
Study Time	(0008,0030)	2	Refer to <a href="#">Addendum B</a>
Referring Physician Name	(0008,0090)	2	Refer to <a href="#">Addendum B</a>
Study ID	(0020,0010)	2	
Accession Number	(0008,0050)	2	Refer to <a href="#">Addendum B</a>
Study Description	(0008,1030)	3	Refer to <a href="#">Addendum B</a>
Referenced Study Sequence	(0008,1110)	3	
>Referenced SOP Class UID	(0008,1150)	1C	
>Referenced SOP Instance UID	(0008,1155)	1C	
Procedure Code Sequence	(0008,1032)	3	Refer to <a href="#">Addendum B</a>
> Code Value	(0008,0100)	1C	
> Coding Scheme Designator	(0008,0102)	1C	
> Coding Scheme Version	(0008,0103)	1C	
> Code Meaning	(0008,0104)	1C	
<b>Patient Study</b>			
Admitting Diagnoses Description	(0008,1080)	3	
Patient's Age	(0010,1010)	3	Refer to <a href="#">Addendum B</a>



Attribute Name	Tag	DICOM Type	Supported Values
Patient's Size	(0010,1020)	3	<b>Patient Size Indexing</b> will automatically select the appropriate Pediatric Chest or Pediatric Abdomen View based off of the Patient Size information (Patient Size field and/or Age/Weight).
Patient's Weight	(0010,1030)	3	
Occupation	(0010,2180)	3	
Additional Patient's History	(0010,21B0)	3	
<b>General Series</b>			
Modality	(0008,0060)	1	PR
Series Instance UID	(0020,000E)	1	
Series Number	(0020,0011)	2	
Laterality	(0020,0060)	2C	L R Refer to <a href="#">Addendum B</a>
Series Date	(0008,0021)	3	
Protocol Name	(0008,1030)	3	
Series Time	(0008,0031)	3	
Operator Name	(0008,1070)	3	Refer to <a href="#">Addendum B</a>
Performed Procedure Step Start Date	(0040,0244)	3	Refer to <a href="#">Addendum B</a>
Performed Procedure Step Start Time	(0040,0245)	3	Refer to <a href="#">Addendum B</a>
Performed Procedure Step ID	(0040,0253)	3	
Performed Procedure Step Description	(0040,0254)	3	Refer to <a href="#">Addendum B</a>
Request Attributes Sequence	(0040,0275)	3	
>Requested Procedure Description	(0032,1060)	3	
>Reason for the Requested Procedure	(0040,1002)	3	
>Scheduled Procedure Step Description	(0040,0007)	3	
>Scheduled Protocol Code Sequence	(0040,0008)	3	
>> Code Value	(0008,0100)	1C	
>> Coding Scheme Designator	(0008,0102)	1C	

Attribute Name	Tag	DICOM Type	Supported Values
>> Coding Scheme Version	(0008,0103)	1C	
>> Code Meaning	(0008,0104)	1C	
>Scheduled Procedure Step ID	(0040,0009)	1C	
>Requested Procedure ID	(0040,1001)	1C	Refer to <a href="#">Addendum B</a>
<b>Presentation Series</b>			
Modality	(0008,0060)	1	
View Position	(0018,5101)	2	
<b>General Equipment</b>			
Manufacturer	(0008,0070)	2	CARESTREAM
Institution Name	(0008,0080)	3	Configuration item entered by Key Operator
Institution Address	(0008,0081)	3	Configuration item entered by Key Operator
Station Name	(0008,1010)	3	This is the computer name that is Input by Service
Institutional Department Name	(0008,1040)	3	Refer to <a href="#">Addendum B</a>
Manufacturer Model Name	(0008,1090)	3	
Device Serial Number	(0018,1000)	3	
Software Versions	(0018,1020)	3	
<b>Presentation State</b>			
Instance Number	(0020,0013)	1	Within a series, the instance number may be configured by the Key Operator to be 1 or a unique value.
Content Label	(0070,0080)	1	
Content Description	(0070,0081)	2	
Presentation Creation Date	(0070,0082)	1	
Presentation Creation Time	(0070,0083)	1	
Content Creator's Name	(0070,0084)	2	
Reference Series Sequence	5 (0008,1115)	1	
> Series Instance UID	(0020,000E)	1	
> Referenced Image Sequence	(0008,1140)	1	
>> Referenced SOP Class UID	(0008,1150)	1	

Attribute Name	Tag	DICOM Type	Supported Values
>> Referenced SOP Instance UID	(0008,1155)	1	
>> Referenced Frame Number	(0008,1160)	1	
Shutter Presentation Value	(0018,1622)	1C	0
<b>Display Shutter</b>			
Shutter Shape	(0018,1600)	1	POLYGONAL
Vertices of the Polygonal Shutter	(0018,1620)	1C	
Shutter Presentation Value	(0018,1622)	3	0
<b>Overlay Plane</b>			
			This information is only sent for measurement tool overlays
Overlay Rows	(60xx,0010)	1	
Overlay Columns	(60xx,0011)	1	
Overlay Type	(60xx,0040)	1	
Overlay Origin	(60xx,0050)	1	
Overlay Bits Allocated	(60xx,0040)	1	
Overlay Bit Position	(60xx,0102)	1	
Overlay Data	(60xx,3000)	1C	
<b>Displayed Area</b>			
			Dimensions of entire image always sent
Displayed Area Selection Sequence	(0070,005A)	1	
> Referenced Image Sequence	(0008,1140)	1C	
>> Referenced SOP Class UID	(0008,1150)	1C	
>> Referenced SOP Instance UID	(0008,1155)	1C	
>> Referenced Frame Number	(0008,1160)	1C	
> Displayed Area Top Left Hand Corner	(0070,0052)	1	1\1
> Displayed Area Bottom Hand Corner	(0070,0053)	1	
> Presentation Size Mode	(0070,0100)	1	SCALE TO FIT
> Presentation Pixel Spacing	(0070,0101)	1C	Imager Pixel spacing value
> Presentation Pixel Aspect Ratio	(0070,0102)	1C	Never sent

Attribute Name	Tag	DICOM Type	Supported Values
<b>Graphic Annotation</b>			
<b>Spatial Transformation</b>			
Image Rotation	(0070,0042)	1	Always 0 (no rotation)
Image Horizontal Flip	(0070,0041)	1	Always N (no flip)
<b>Softcopy VOI LUT</b>			
Softcopy VOI LUT Sequence	(0028,3110)	1	
> Referenced Image Sequence	(0008,1140)	1C	
>> Referenced SOP Class UID	(0008,1150)	1C	
>> Referenced SOP Instance UID	(0008,1155)	1C	
>> Referenced Frame Number	(0008,1160)	1C	
> VOI LUT Sequence	(0028,3010)	1C	
>> LUT Descriptor	(0028,3002)	1C	
>> LUT Explanation	(0028,3003)	3	
>> LUT Data	(0028,3006)	1C	
> Window Center	(0028,1050)	1C	
> Window Width	(0028,1051)	1C	
<b>Softcopy Presentation LUT</b>			
Presentation LUT Sequence	(2050,0010)	1C	
Presentation LUT Shape	(2050,0020)	1C	IDENTITY
<b>SOP Common</b>			
SOP Class UID	(0008,0016)	1	
SOP Instance UID	(0008,0018)	1	
Specific Character Set	(0008,0005)	1C	

### 3.5.5 X-Ray Radiation Dose SR

The DirectView CR provides standard conformance to the X-Ray Radiation Dose SR SOP Class as an SCU.

**Table 3.17 X-Ray Radiation Dose SR SOP Class**

SOP Class	SOP Class UID
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X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67
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**Table 3.18 X-Ray Radiation Dose SR SOP Class – Supported Attributes**

Attribute Name	Tag	DICOM Type	Supported Values
<b>Patient Module</b>			
Patient Name	(0010,0010)	2	Refer to <a href="#">Addendum B</a>
Patient ID	(0010,0020)	2	Refer to <a href="#">Addendum B</a>
Patient Birth Date	(0010,0030)	2	Refer <a href="#">Addendum B</a>
Patient Sex	(0010,0040)	2	Refer to <a href="#">Addendum B</a>
Patient Birth Time	(0010,0032)	3	
Other Patient IDs	(0010,1000)	3	This value will be sent only if it has been received from the DICOM modality work list (MWL).
Other Patient Names	(0010,1001)	3	This value will be sent only if it has been received from the DICOM modality work list (MWL).
Ethnic Group	(0010,2160)	3	This value will be sent only if it has been received from the DICOM modality work list (MWL).
Patient Comments	(0010,4000)	3	Refer to <a href="#">Addendum B</a>
Allergies	(0010,2110)	3	
<b>General Study</b>			
Study Instance UID	(0020,000D)	1	
Study Date	(0008,0020)	2	Refer to <a href="#">Addendum B</a>
Study Time	(0008,0030)	2	Refer to <a href="#">Addendum B</a>
Referring Physician Name	(0008,0090)	2	Refer to <a href="#">Addendum B</a>
Study ID	(0020,0010)	2	
Accession Number	(0008,0050)	2	Refer to <a href="#">Addendum B</a>
Study Description	(0008,1030)	3	Refer to <a href="#">Addendum B</a>
Referenced Study Sequence	(0008,1110)	3	
>Referenced SOP Class UID	(0008,1150)	1C	
>Referenced SOP Instance UID	(0008,1155)	1C	
Procedure Code Sequence	(0008,1032)	3	
> Code Value	(0008,0100)	1C	Refer to <a href="#">Addendum B</a>
> Coding Scheme Designator	(0008,0102)	1C	
> Code Meaning	(0008,0104)	1C	
<b>Patient Study</b>			

Attribute Name	Tag	DICOM Type	Supported Values
Admitting Diagnoses Description	(0008,1080)	3	
Patient's Age	(0010,1010)	3	Refer to <a href="#">Addendum B</a>
Patient's Size	(0010,1020)	3	
Patient's Weight	(0010,1030)	3	
Occupation	(0010,2180)	3	
Additional Patient's History	(0010,21B0)	3	
<b>SR Document Series</b>			
Modality	(0008,0060)	1	SR
Series Instance UID	(0020,000E)	1	
Series Number	(0020,0011)	2	1
Series Date	(0008,0021)	3	Populated with current date of creation. The date the procedure step/study was ended.
Series Time	(0008,0031)	3	Populated with current time of creation. The time the procedure step/study was ended.
Series Description	(0008,103E)	3	Radiation Dose Information This will be translated.
Referenced Performed Procedure Step Sequence	(0008,1111)	2	
>Referenced SOP Class UID	(0008,1150)	1C	1.2.840.10008.3.1.2.3.3
>Referenced SOP Instance UID	(0008,1155)	1C	
<b>General Equipment</b>			
Manufacturer	(0008,0070)	2	CARESTREAM
Institution Name	(0008,0080)	3	For this value to be populated and sent, the CR System user needs to enter the value on the Delivery Preferences screen.
Institution Address	(0008,0081)	3	For this value to be populated and sent, the CR System user needs to enter the value on the Delivery Preferences screen.
Station Name	(0008,1010)	3	This is the computer name that is Input by Service.
Institutional Department Name	(0008,1040)	3	Refer to <a href="#">Addendum B</a>
Manufacturer Model Name	(0008,1090)	3	

Attribute Name	Tag	DICOM Type	Supported Values
Device Serial Number	(0018,1000)	3	
Software Versions	(0018,1020)	3	
Gantry ID	(0018,1008)	3	
<b>SR Document General</b>			
Instance Number	(0020,0013)	1	1
Completion Flag	(0040,A491)	1	This field defines the estimated degree of completeness of the SR document content of the Dose Report.  We populate this field with a value of "COMPLETE" when a procedure step/study is ended.
Verification Flag	(0040,A493)	1	We do not provide a means to verify the content of the Dose Report.  Therefore, we populate this field with a value of "UNVERIFIED".
Content Date	(0008,0023)	1	Populated with current date of creation.  The date the procedure step/study was ended.
Content Time	(0008,0033)	1	Populated with current time of creation.  The time the procedure step/study was ended.
Predecessor Documents Sequence	(0040,A360)	1C	This field may be present if the Dose Report includes content from a previously delivered Dose Report.
Referenced Request Sequence	(0040,A370)	1C	
>Accession Number	(0008,0050)	2	Refer to <a href="#">Addendum B</a>
>Referenced Study Sequence	(0008,1110)	2	
>Study Instance UID	(0020,000D)	1	
>Requested Procedure Description	(0032,1060)	2	
>Requested Procedure Code Sequence	(0032,1064)	2	
>Requested Procedure ID	(0040,1001)	2	
>Placer Order Number / Imaging Service Request	(0040,2016)	2	
>Filler Order Number / Imaging Service Request	(0040,2017)	2	



Attribute Name	Tag	DICOM Type	Supported Values
Performed Procedure Code Sequence	(0040,A372)	2	
>Code Value	(0008,0100)	1C	Refer to <a href="#">Addendum B</a>
>Coding Scheme Designator	(0008,0102)	1C	
>Code Meaning	(0008,0104)	1C	
<b>SR Document Content</b>			
Value Type	(0040,A040)	1	CONTAINER
Concept Name Code Sequence	(0040,A043)	1C	
>Code Value	(0008,0100)	1C	113701
>Coding Scheme Designator	(0008,0102)	1C	DCM
>Code Meaning	(0008,0104)	1C	X-Ray Radiation Dose Report
Continuity of Content	(0040,A050)	1	SEPARATE
Content Template Sequence	(0040,A504)	1C	
>Mapping Resource	(0008,0105)	1	DCMR
>Template Identifier	(0040,DB00)	1	10001
Content Sequence	(0040,A730)	1C	
<b>SOP Common Module</b>			
SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.88.67
SOP Instance UID	(0008,0018)	1	
Specific Character Set	(0008,0005)	1C	

### 3.6 Basic Worklist Service

The C-FIND request for a Modality Worklist sends an Identifier object that contains all the attributes of the Modality Worklist Information Model. Table 3.17 shows the Matching Key attributes that may optionally contain a non-NULL value in the request.

**Table 3.17 Matching Key Attributes**

Attribute name	Tag
6 Accession Number	(0008,0050)
Modality	(0008,0060)
Patient's Name	(0010,0010)
Patient ID	(0010,0020)
Scheduled Station AE Title	(0040,0001)
Scheduled Procedure Step Start Date	(0040,0002)

Attribute name	Tag
Scheduled Procedure Step Start Time	(0040,0003)
Requested Procedure ID	(0040,0101)
Scheduled Station Name	(0040,0010)

This is intended to produce a series of responses from the Worklist SCP for all matching Scheduled Procedures on the said Station.

The system can be configured to send this request periodically at an interval of 1 to 720 minutes. The user may also issue a non-periodic C-FIND request to obtain information for a patient recently added by the site's information system.

### 3.6.1 Modality Worklist IOD

The DirectView CR provides standard conformance to the Modality Worklist Information Model – FIND SOP Class as an SCU.

For additional information on the Modality Worklist Information Model, refer to the DICOM specification, Part 4, Table K.6-1. The CR will accept any valid character set for the Specific Character Set attribute (0008,0005).

**Table 3.18 Modality Worklist SOP Class**

SOP Class	SOP Class UID
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31

**Table 3.19 Modality Worklist SOP Class – Required Attributes**

Attribute Name	Tag	Matching Key
<b>SOP Common</b>		
SOP Class UID	(0008,0016)	
SOP Instance UID	(0008,0018)	
Specific Character Set	(0008,0005)	
<b>Scheduled Procedure Step</b>		
Scheduled Procedure Step Sequence	(0040,0100)	Required
> Scheduled Station AE Title	(0040,0001)	Required
> Scheduled Procedure Step Start Date	(0040,0002)	Required
> Scheduled Procedure Step Start Time	(0040,0003)	Required

<b>Attribute Name</b>	<b>Tag</b>	<b>Matching Key</b>
> Modality	(0008,0060)	Required
>Requested Contrast Agent	(0032,1070)	
> Scheduled Performing Physician's Name	(0040,0006)	Required
>Scheduled Procedure Step Description	(0040,0007)	
>Scheduled Station Name	(0040,0010)	
>Scheduled Protocol Code Sequence	(0040,0008)	
>>Code Value	(0008,0100)	
>>Coding Scheme Designator	(0008,0102)	
>>Code Meaning	(0008,0104)	
>Scheduled Procedure Step ID	(0040,0009)	
<b>Requested Procedure</b>		
Requested Procedure ID	(0040,1001)	
Requested Procedure Description	(0032,1060)	
Requested Procedure Code Sequence	(0032,0164)	
>Code Value	(0008,0100)	
>Coding Scheme Designator	(0008,0102)	
>Code Meaning	(0008,0104)	
Study Instance UID	(0020,000D)	
Referenced Study Sequence	(0008,1110)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	
Requested Procedure Priority	(0040,1003)	
Requested Procedure Location	(0040,1005)	
<b>Imaging Service Request</b>		
Referring Physicians Name	(0008,0090)	
Accession Number	(0008,0050)	
Requesting Service	(0032,1033)	
<b>Visit Status</b>		

Attribute Name	Tag	Matching Key
Visit Status ID	(0038,0008)	
Patient's Institution Residence	(0038,0400)	
<b>Patient Identification</b>		
Patient's Name	(0010,0010)	
Patient ID	(0010,0020)	
Other Patient Ids*	(0010,1000)	
Other Patient Names	(0010,1001)	
<b>Patient Demographic</b>		
Patient's Birth Date	(0010,0030)	
Patient's Birth Time	(0010,0032)	
Patient's Sex	(0010,0040)	
Patient's Age	(0010,1010)	
Patient's Size	(0010,1020)	
Patient's Weight	(0010,1030)	
Ethnic Group	(0010,2160)	
Occupation	(0010,2180)	
<b>Patient Medical</b>		
Additional Patient's History	(0010,21B0)	

\* Accept only one value (the first value) from the Modality Worklist with a maximum length of 64 characters

### 3.6.2 Procedure Mapping

The procedure mapping feature of the CR products automatically builds the image icons and pre-populates fields such as body/part and projections from information supplied by the key operator. This eliminates the need for the technologists to supply this information for every image created.

For the procedure mapping to function properly, the CR must receive the correct code in one of the following tags:

- Code value (0008,0100) element of the Requested Procedure Code Sequence (0032,1064). This is the factory default.
- Requested Procedure ID (0040,1001)
- Code value (0008,0100) element of the Performed Protocol Code Sequence (0040,0100)

The tag selection is configurable by the key operator.

### 3.7 Modality Performed Procedure Step SOP Class

The Modality Performed Procedure Step (MPPS) commands N-CREATE and N-SET will be sent to the HIS/RIS or PACS by the *DirectView* CR operator to signal the start and end of a study, respectively.

#### 3.7.1 Modality Performed Procedure Step IOD

The DirectView CR provides standard conformance to the Modality Performed Procedure Step SOP Class as an SCU.

**Table 3.20 Modality Performed Procedure Step SOP Class**

SOP Class	SOP Class UID
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3

**Table 3.21 Modality Performed Procedure Step Attributes**

Attribute Name	Tag	DICOM Type	Supported Values
<b>SOP Common</b>			
SOP Class UID	(0008,0016)	1	
SOP Instance UID	(0008,0018)	1	
Specific Character Set	(0008,0005)	1C	
<b>Performed Procedure Step Relationship</b>			
Patient Name	(0010,0010)	2	
Patient ID	(0010,0020)	2	
Patient Birth Date	(0010,0030)	2	
Patient Sex	(0010,0040)	2	
Scheduled Step Attribute Sequence	(0040,0270)	1	
> Study Instance UID	(0010,1000)	1	
> Referenced Study Sequence	(0008,1110)	2	
>> Referenced SOP Class UID	(0008,1150)	1C	
>> Referenced SOP Instance UID	(0008,1155)	1C	
> Accession Number	(0008,0050)	2	

Attribute Name	Tag	DICOM Type	Supported Values
> Requested Procedure ID	(0040,1001)	2	
> Requested Procedure Description	(0032,1060)	2	
> Scheduled Procedure Step ID	(0040,0009)	2	
> Scheduled Procedure Step Description	(0040,0007)	2	
> Scheduled Protocol Code Sequence	(0040,0008)	2	
>> Code Value	(0008,0100)	1C	
>> Coding Scheme Designator	(0008,0102)	1C	
>> Coding Scheme Version	(0008,0103)	3	
>> Code Meaning	(0008,0104)	3	
Referenced Patient Sequence	(0008,1120)	2	Empty Sequence
<b>Performed Procedure Step Information</b>			
Performed Procedure Step ID	(0040,0253)	1	
Performed Station AE Title	(0040,0241)	1	
Performed Station Name	(0040,0242)	2	
Performed Location	(0040,0243)	2	
Performed Procedure Step Start Date	(0040,0244)	1	
Performed Procedure Step Start Time	(0040,0245)	1	
Performed Procedure Step Status	(0040,0252)	1	
Performed Procedure Step Description	(0040,0254)	2	
Performed Procedure Type Description	(0040,0255)	2	
Procedure Code Sequence	(0008,1032)	2	
> Code Value	(0008,0100)	1C	
> Coding Scheme Designator	(0008,0102)	1C	
> Coding Scheme Version	(0008,0103)	3	
> Code Meaning	(0008,0104)	3	
Performed Procedure Step End Date	(0040,0250)	2	

Attribute Name	Tag	DICOM Type	Supported Values
Performed Procedure Step End Time	(0040,0251)	2	
<b>Image Acquisition Results</b>			
Modality	(0008,0060)	1	
Study ID	(0020,0010)	3	
Performed Protocol Code Sequence	(0040,0260)	2	
> Code Value	(0008,0100)	1C	
> Coding Scheme Designator	(0008,0102)	1C	
> Coding Scheme Version	(0008,0103)	3	
> Code Meaning	(0008,0104)	3	
Performed Series Sequence	(0040,0340)	2	
> Performing Physician's Name	(0040,0340)	2C	
> Protocol Name	(0008,1050)	1C	
> Operator's Name	(0008,1070)	2C	
> Series Instance UID	(0020,000E)	1C	
> Series Description	(0008,103E)	2C	
> Retrieve AE Title	(0008,0054)	2C	
> Referenced Image Sequence	(0008,1140)	2C	
>> Referenced SOP Class UID	(0008,1150)	1C	
>> Referenced SOP Instance UID	(0008,1155)	1C	
>Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)	2	<p>If the IHE Dose Reporting Option is enabled on the system, the value for this field will be sent.</p> <p>This field represents the unique identification of Dose Report(s) associated with this procedure step.</p>
<b>Radiation Dose</b>			

Attribute Name	Tag	DICOM Type	Supported Values
Anatomic Structure Sequence	(0008,2229)		Refer to <a href="#">Context Identifier 4031</a> in Addendum <a href="#">A</a> for supported SNOMED Code Values
>Code Value	(0008,0100)		
>Coding Scheme Designator	(0008,0102)		
>Coding Scheme Version	(0008,0103)		
>Code Meaning	(0008,0104)		
>Mapping Resource	(0008,0105)		
>Context Group Version	(0008,0106)		
>Context Identifier	(0008,010f)		
Total Number of Exposures	(0040,0301)		
Distance Source to Detector	(0018,1110)		May be received from CR X-ray interface depending on equipment or from GUI
Distance Source to Entrance	(0040,0306)		
Entrance Dose	(0040,0302)		<p>This value will be calculated if Image Area Dose is available, otherwise value will be zero.</p> <p>It will be measured at reference point “In Detector Plane” when Distance Source to Detector and Distance Source to Patient are NOT available.</p> <p>Note: If the system user manually enters the value for this field it is assumed to be measured at the surface of the patient.</p> <p>Refer to <a href="#">Addendum B</a>.</p>



Attribute Name	Tag	DICOM Type	Supported Values
Entrance Dose in mGy	(0040,8302)		<p>This value will be calculated if Image Area Dose is available, otherwise value will be zero.</p> <p>It will be measured at reference point “In Detector Plane” when Distance Source to Detector and Distance Source to Patient are NOT available.</p> <p>Note: If the system user manually enters the value for this field it is assumed to be measured at the surface of the patient.</p> <p>Refer to <a href="#">Addendum B</a>.</p>
Exposed Area	(0040,0303)		
Image Dose Product	(0018,115E)		May be received from CR X-ray interface depending on equipment
Exposure Dose Sequence	(0040,030E)		
>Radiation Mode	(0018,115A)		
>KVp	(0018,0060)		May be received from CR X-ray interface depending on equipment or from GUI
>X-ray Tube Current in uA	(0018,8151)		May be received from CR X-ray interface depending on equipment or from GUI
>Exposure Time	(0018,1150)		May be received from CR X-ray interface depending on equipment
>Filter Material	(0018,7050)	3	

### 3.8 Storage Commitment Push Model SOP Class

The DirectView CR provides standard conformance to the Storage Commitment Push Model SOP Class as an SCU.

**Table 3.22 Storage Commitment SOP Class**

SOP Class	SOP Class UID
-----------	---------------

Storage Commitment Push Model	1.2.840.10008.1.20.1
-------------------------------	----------------------

The SCPM N-Action command is sent by the *DirectView* CR System at the end of a storage session or at a separate session if configured to do so. The Storage Commitment N-Event-Report is received and processed anytime providing the Port Number is configured correctly between the *DirectView* CR System and the Storage SCP.

### 3.8.1 DIMSE Service N-ACTION

The *DirectView* CR System uses the N-ACTION to instruct the Storage SCP to commit the images of the study.

#### 3.8.1.1 Storage Commitment N-ACTION IOD

**Table 3.23 Storage Commitment N-ACTION Attributes**

Attribute	Tag
Transaction UID	(0008,1195)
Referenced SOP Sequence	(0008,1199)
>Referenced SOP Class UID	(0008,1150)
> Referenced SOP Instance UID	(0008,1155)

### 3.8.2 DIMSE Service N-EVENT-REPORT

The *DirectView* CR System will process the indication of the N-EVENT-REPORT from the Storage Commitment operation. Table [3.24](#) lists the attributes that are processed by the CR.

#### 3.8.2.1 Storage Commitment N-EVENT-REPORT IOD

**Table 3.24 Storage Commitment N-EVENT-REPORT Attributes**

Attribute	Tag
Transaction UID	(0008,1195)
Failed SOP Sequence*	(0008,1198)
> Referenced SOP Class UID	(0008,1150)
> Referenced SOP Instance UID	(0008,1155)
> Failure Reason	(0008, 1197)
Referenced SOP Sequence	(0008,1199)
> Referenced SOP Class UID	(0008,1150)
> Referenced SOP Instance UID	(0008,1155)

\* For Event Type ID 2 only.

### 3.9 Query/Retrieve

The Query/Retrieve (Priors) feature will send separate C-FIND and C-MOVE commands to the PACS to request a list of studies/images for a given patient, and to then request the transfer of those images respectively.

The key pieces of data used to retrieve prior images are Patient ID, Patient's last name, Study Date, Body Part Examined and Modality.

#### 3.9.1 DICOM Query C-FIND

SOP Class	SOP Class UID
Study Root Query Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1

Study Level Key Attributes (C-Find):

First we look for studies that we might be interested in.

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	e.g. ISO_IR 100, GB18030
Study Date	(0008,0020)	Requested date range (yyyyMMdd-yyyyMMdd)
Study Time	(0008,0030)	<Empty>
Accession Number	(0008,0050)	<Empty>
Query/Retrieve Level	(0008,0052)	"STUDY"
Modalities in Study	(0008,0061)	<Empty>
Study Description	(0008,1030)	<Empty>
Patient's Name	(0010,0010)	Last Name of Patient of interest + '*'
Patient ID	(0010,0020)	Patient ID of interest
Patient's Birth Date	(0010,0030)	Patient's Birth Date (optional)
Study Instance UID	(0020,000D)	<Empty>
Study ID	(0020,0010)	<Empty>

Series Level Key Attributes (C-Find):

From the list of matching studies found, we look for matching series.

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	e.g. ISO_IR 100, GB18030

Attribute Name	Tag	Value
Query/Retrieve Level	(0008,0052)	“SERIES”
Modality	(0008,0060)	<Empty>
Series Description	(0008,0103E)	<Empty>
Body Part Examined	(0018,0015)	<Empty>
Patient Position	(0018,5100)	<Empty>
View Position	(0018,5101)	<Empty>
Study Instance UID	(0020,000D)	Study Instance UID returned in the Study Level C-Find response
Series Instance UID	(0020,000E)	<Empty>
Series Number	(0020,0011)	<Empty>

Image Level Key Attributes (C-Find):

From the list of matching series found, we will look for matching images.

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	e.g. ISO_IR 100, GB18030
Query/Retrieve Level	(0008,0052)	“IMAGE”
SOP Instance UID	(0008,0018)	<Empty>
Acquisition Date	(0008,0022)	<Empty>
Acquisition Time	(0008,0032)	<Empty>
SOP Class UID	(0008,0016)	<Empty>
Query/Retrieve Level	(0008,0052)	“IMAGE”
Study Instance UID	(0020,000D)	Study Instance UID returned in the Study Level C-Find response
Series Instance UID	(0020,000E)	Series Instance UID returned in the Series Level C-FIND
Instance number	(0020,0013)	<Empty>

### 3.9.2 DICOM Retrieve C-MOVE

SOP Class	SOP Class UID
Study Root Query Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2

Key Attributes (C-Move):

From the list of matching images, we will send a C-Move command for each image.

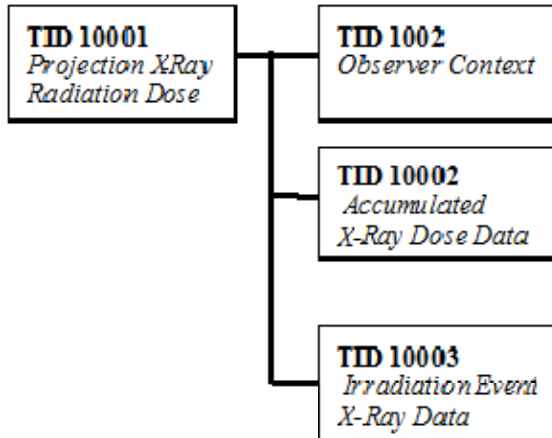
<b>Attribute Name</b>	<b>Tag</b>	<b>Values</b>
SOP Instance UID	(0008,0018)	SOP Instance UID of the image of interest
Query/Retrieve Level	(0008,0052)	“IMAGE”
Study Instance UID	(0020,000D)	Study Instance UID associated with this image
Series Instance UID	(0020,000E)	Series Instance UID associated with this image

### 3.10 Structured Reports

The IHE Dose Reporting feature will enable the creation and delivery (e.g. Store Dose Information, Storage Commitment) of a Radiation Dose Structured Report on completion or discontinuation of a procedure step where irradiation events occurred.

## Radiation Dose Structured Report

### X-Ray Radiation Dose SR IOD Template Structure



Note: Terminology used in the following TID table(s) for the column “Presence of Value”:

#### ALWAYS

If the attribute is a “Mandatory” attribute then it will always be present with a value or included with no value.

If the attribute is a “Mandatory Conditional” attribute and the condition was satisfied, then it will always be present with a value or included with no value.

If the attribute is a “User Option” attribute and the attribute has a value then it will be included.

If the attribute is a “User Option Conditional” attribute and the condition was satisfied and the attribute has a value then it will be included.

#### CONDITIONAL

The attribute is present under specified condition.

TID 10001 Projection X-Ray Radiation Dose					
NL	Relation with Parent	Concept Name	VM	Presence of Value	Value(s)

		(113701, DCM, "X-Ray Radiation Dose Report")	1	ALWAYS	
>	HAS CONCEPT MOD	(121058, DCM, "Procedure reported")	1	ALWAYS	(113704, DCM, "Projection X-Ray")  for Digital and Computed Radiography  (P5-40010, SRT, "Mammography")  for Mammography Computed Radiography
>>	HAS CONCEPT MOD	(G-C0E8, SRT, "Has Intent")	1	ALWAYS	(R-408C3, SRT, "Diagnostic Intent")
>	CONTAINS	(122142, DCM, "Acquisition Device Type")	1	ALWAYS	(113958, DCM, "Integrated Projection Radiography System")  for Digital Radiography  (113959, DCM, "Cassette-based Projection Radiography System")  for Computed Radiography
>		DTID (1002) Observer Context	1-n	ALWAYS	Will have one Device Observer and one Person Observer
>	HAS OBS	(113705, DCM, "Scope of Accumulation")	1	ALWAYS	(113016, DCM, "Performed Procedure Step")

	CONTEXT				
>>	HAS PROPERTIES	DCID (10001) UID Types	1	ALWAYS	(121126, DCM, "Performed Procedure Step SOP Instance UID")
>	CONTAINS	(113945, DCM, "X-Ray Detector Data Available")	1	ALWAYS	(R-0038D, SRT, "Yes")
>	CONTAINS	(113943, DCM, "X-Ray Source Data Available")	1	ALWAYS	(R-0038D, SRT, "Yes")  if X-Ray Source Data is available; otherwise  (R-00339, SRT, "No")
>	CONTAINS	(113944, DCM, "X-Ray Mechanical Data Available")	1	ALWAYS	(R-0038D, SRT, "Yes")  for Digital Radiography Systems   (R-00339, SRT, "No") for Computed Radiography Systems who do not have a Livingston box
>	CONTAINS	DTID (10002) Accumulated X-Ray  Dose	1	ALWAYS	(113622, DCM, "Single Plane"
>	CONTAINS	DTID (10003) Irradiation Event  X-Ray Data	1-n	ALWAYS	
>	CONTAINS	(113854, DCM, "Source of Dose Information")	1-n	ALWAYS	(113857, DCM, "Manual Entry")  for Non-integrated Systems



					(113856, DCM, "Automated Data Collection") for Integrated Systems
TID 10002 Accumulated X-Ray Dose Data					
NL	Relation with Parent	Concept Name	VM	Presence of Value	Value(s)
		(113702, DCM, "Accumulated X-Ray Dose Data")	1	ALWAYS	
>	HAS CONCEPT MOD	(113764, DCM, "Acquisition Plane")	1	ALWAYS	(113622, DCM, "Single Plane")
>	CONTAINS	DTID (10005) Accumulated Mammography X-Ray Dose	1	CONDITIONAL	
>	CONTAINS	DTID (10007) Accumulated Integrated Projection Radiography Dose	1	CONDITIONAL	
>	CONTAINS	DTID (10006) Accumulated Cassette-based Projection Radiography Dose	1	CONDITIONAL	
TID 10003 Irradiation Event X-Ray Data					
NL	Relation with Parent	Concept Name	VM	Presence of Value	Value(s)
		(113706, DCM, "Irradiation Event X-Ray Data")	1	ALWAYS	

>	HAS CONCEPT MOD	(113764, DCM, "Acquisition Plane")	1	ALWAYS	(113622, DCM, "Single Plane")
>	CONTAINS	(113769, DCM, "Irradiation Event UID")	1	ALWAYS	
>	CONTAINS	(111526, DCM, "DateTime Started")	1	ALWAYS	
>	CONTAINS	(113721, DCM, "Irradiation Event Type")	1	ALWAYS	(113611, DCM, "Stationary Acquisition")
>	CONTAINS	(125203, DCM, "Acquisition Protocol")	1	ALWAYS	
>	CONTAINS	(T-D0005, SRT, "Anatomical structure")	1	ALWAYS	DCID (4009) DX Anatomy Imaged  Refer to Addendum <a href="#">A</a>
>	CONTAINS	(111031, DCM, "Image View")	1	ALWAYS	DCID (4010) DX View  DCID (4014) View for Mammography Computed Radiography  Refer to Addendum <a href="#">A</a>
>>	HAS CONCEPT MOD	(111032, DCM, "Image View Modifier")	1	ALWAYS	DCID (4011) DX View Modifier  DCID (4015) View Modifier for Mammography Computed Radiography

					Refer to Addendum <a href="#">A</a>
>	CONTAINS	(123014 , DCM, "Target Region")	1	ALWAYS	DCID (4031) Common Anatomic Regions  Refer to Addendum <a href="#">A</a>
>	CONTAINS	(122130, DCM, "Dose Area Product")	1	CONDITIONAL	For non-integrated systems in order for this value to be populated and sent, the system user needs to enter the value manually.  Value is present for Projection X-Ray.  Refer to Addendum <a href="#">B</a>
>	CONTAINS	(111636, DCM, "Entrance Exposure at RP")	1	CONDITIONAL	Value is present for Mammography Computed Radiography; Value may be present otherwise.  Refer to Addendum <a href="#">B</a>
>	CONTAINS	(113780, DCM, "Reference Point Definition")	1	ALWAYS	(113941, DCM, "In Detector Plane")
>	CONTAINS	DTID (10003a) Irradiation Event X-Ray Detector Data	1	CONDITIONAL	
>	CONTAINS	DTID (10003b) Irradiation Event X-Ray Source Data	1	CONDITIONAL	

>	CONTAINS	DTID (10003c) Irradiation Event X-Ray Mechanical Data	1	CONDITIONAL	
<b>TID 10003a Irradiation Event X-Ray Detector Data</b>					
NL	Relation with Parent	Concept Name	VM	Presence of Value	Value(s)
		(113845, DCM, "Exposure Index")	1	ALWAYS	Units = (1,UCUM, "no units")  This will always be the IEC Exposure Index except for Mammography Computed Radiography.  For Mammography Computed Radiography, we will use the Carestream Health Exposure Index.
		(113846, DCM, "Target Exposure Index")	1	ALWAYS	Units = (1,UCUM, "no units")  This will not be populated for Mammography Computed Radiography.
		(113847, DCM, "Deviation Index")	1	ALWAYS	Units = (1,UCUM, "no units")  This will not be populated for Mammography Computed Radiography.

		(113795, DCM, "Acquired Image")	1-n	ALWAYS	Referenced SOP Class UID and Instance UID of Image Object created for this irradiation event.
TID 10003b Irradiation Event X-Ray Source Data					
NL	Relation with Parent	Concept Name	VM	Presence of Value	Value(s)
		(113738, DCM, "Dose (RP)")	1	CONDITIONAL	<p>Dose at the Reference Point.</p> <p>This value will be calculated if Image Area Dose is available, otherwise value will be zero.</p> <p>Note: If the system user manually enters the value for Entrance Dose it is assumed that the dose information entered is "at the surface of the patient" based on the DICOM Specification for tags Entrance Dose ((0040,0302) and (0040,8302)). Even if this is the case, the Reference Point Definition tag value (113780, DCM, "Reference Point Definition") will still be reported as (113941, DCM, "In Detector</p>

					Plane”).  Value is present for Projection X-Ray.  Refer to Addendum <a href="#">B</a>
		(113780, DCM, “Reference Point Definition”)	1	ALWAYS	(113941, DCM, “In Detector Plane”)
		(111631, DCM, “Average Glandular Dose”)	1	CONDITIONAL	Value is present for Mammography Computed Radiography
		(113733, DCM, “KVP”)	1-n	ALWAYS	For non-integrated systems in order for this value to be populated and sent, the system user needs to enter the value manually.  Refer to Addendum <a href="#">B</a>
		(113734, DCM, “X-Ray Tube Current”)	1-n	ALWAYS	Units = EV (mA, UCUM, “mA”)
		(113824, DCM, “Exposure Time”)	1	ALWAYS	Time in milliseconds
		(113736, DCM, “Exposure”)	1-n	ALWAYS	Units = EV (uAs, UCUM, “uAs”)

**TID 10003c Irradiation Event X-Ray Mechanical Data**

<b>NL</b>	<b>Relation with Parent</b>	<b>Concept Name</b>	<b>VM</b>	<b>Presence of Value</b>	<b>Value(s)</b>
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		DCID (10008) Dose Related Distance Measurements	1-n	CONDITIONAL	(113750, DCM, "Distance Source to Detector")  Value is present if SID value is used in dose calculations.
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**TID 10005 Accumulated Mammography X-Ray Dose**

NL	Relation with Parent	Concept Name	VM	Presence of Value	Value(s)
		(111637, DCM, "Accumulated Average Glandular Dose")	2	ALWAYS	Value is present for Mammography Computed Radiography.  A value multiplicity of 2 will be returned – one for left breast and one for right breast. If no laterality is specified, the dose value will be divided between the left and right breast.
>	HAS CONCEPT MOD	(G-C171, SRT, "Laterality")	1	ALWAYS	DCID (6022) Side  Value is present for Mammography Computed Radiography

**TID 10006 Accumulated Cassette-based Projection Radiography Dose**

NL	Relation with Parent	Concept Name	VM	Presence of Value	Value(s)
		(113947, DCM,	1	CONDITIONAL	(113949, DCM, "Indirect Detector ") for Digital

		“Detector Type”)			Radiography  (113950, DCM, “Storage Detector”) for Computed Radiography and Mammography Computed Radiography
		(113731, DCM, “Total Number of Radiographic Frames”)	1	CONDITIONAL	Value represents the number of images in the procedure step/study that have been exposed.
<b>TID 10007 Accumulated Integrated Projection Radiography Dose</b>					
<b>NL</b>	<b>Relation with Parent</b>	<b>Concept Name</b>	<b>VM</b>	<b>Presence of Value</b>	<b>Value(s)</b>
		(113722, DCM, “Dose Area Product Total”)	1	ALWAYS	The value will be the sum of the Dose Area Product values for the procedure step.  Units = EV (Gy.m2, UCUM, “Gy.m2”)
		(113725, DCM, “Dose (RP) Total”)	1	ALWAYS	The value will be the sum of the Dose (RP) values for the procedure step.  Units = EV (Gy, UCUM, “Gy”)
		(113731, DCM, “Total Number of Radiographic Frames”)	1	ALWAYS	Value represents the number of images in the procedure step/study that have



					been exposed.
		(113780, DCM, "Reference Point Definition")	1	ALWAYS	(113941, DCM, "In Detector Plane")
<b>TID 1002 Observer Context</b>					
<b>NL</b>	<b>Relation with Parent</b>	<b>Concept Name</b>	<b>VM</b>	<b>Presence of Value</b>	<b>Value(s)</b>
	HAS OBS CONTEXT	(121005,DCM, "Observer Type")	1	ALWAYS	(121006, DCM, "Person")  (121007, DCM, "Device")
	HAS OBS CONTEXT	DTID (1003) Person observer identifying attributes	1	ALWAYS	
	HAS OBS CONTEXT	DTID (1004) Device observer identifying attributes	1	ALWAYS	
<b>TID 1004 Device Observer Identifying Attributes</b>					
<b>NL</b>	<b>Relation with Parent</b>	<b>Concept Name</b>	<b>VM</b>	<b>Presence of Value</b>	<b>Value(s)</b>
		(121012,DCM, "Device Observer UID")	1	ALWAYS	This field will be populated.
		(121013,DCM, "Device Observer Name")	1	ALWAYS	Defaults to value of Station Name (0008,1010) in General Equipment Module
		(121014,DCM, "Device	1	ALWAYS	Defaults to value of

		Observer Manufacturer")			Manufacturer (0008,0070) in General Equipment Module
		(121015,DCM, "Device Observer Model Name")	1	ALWAYS	Defaults to value of Manufacturer's Model Name (0008,1090) in General Equipment Module
		(121016,DCM, "Device Observer Serial Number")	1	ALWAYS	Defaults to value of Device Serial Number (0018,1000) in General Equipment Module
		(113876, DCM, "Device Role in Procedure")	1-n	ALWAYS	(113859, DCM, "Irradiating Device")
<b>TID 1003 Person Participant</b>					
<b>NL</b>	<b>Relation with Parent</b>	<b>Concept Name</b>	<b>VM</b>	<b>Presence of Value</b>	<b>Value(s)</b>
		(121008,DCM, "Person Observer Name")	1	ALWAYS	The system user needs to enter the value manually, otherwise a blank value will be sent.  Refer to Addendum <a href="#">B</a>
		(121009,DCM, "Person Observer's Organization Name")	1	ALWAYS	Defaults to Institution Name (0008,0080) of the General Equipment Module
		(121010,DCM, "Person Observer's Role in the Organization")	1	ALWAYS	(121083, DCM, "Technologist")

		(121011,DCM, "Person Observer's Role in this Procedure")	1	ALWAYS	(121094, DCM, "Performing")
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## 4 Communication Profiles

### 4.1 Supported Communications Stacks

The *DirectView* CR System provides TCP/IP Network Communication Support as defined in Part 8 of the DICOM standard.

The *DirectView* CR System normally issues a network echo prior to delivering a job to a qualified DICOM Print or DICOM Store destination to ensure that the device is active.

### 4.2 Physical Media

The *DirectView* CR System supports Ethernet with the following physical connectors:

- Unshielded Twisted pair (10BaseT, 100BaseT and 1000BaseT).

## 5 Extensions/Specializations/Privatizations

Table [5.2](#) lists a number of extensions to the DICOM Store Service Class, which the *DirectView* CR System supports. The extensions are all optional attributes.

### 5.1 Computed Radiography IOD

#### 5.1.1 Specialization of Pixel Spacing

The *DirectView* CR System optionally allows the Pixel Spacing (0028,0030) attribute to be used from the Image Plane Module. This is done to support workstations that incorrectly use this field rather than Imager Pixel Spacing (0018,1164), as defined in the DICOM standard. If this field is used, the actual size of any objects displayed on the workstation (scales, etc.) may be in error.

#### 5.1.2 Alternate Image Display Spaces

In addition to supporting P-Values (DICOM Grayscale Display Function perceptually linear output), the CR systems also support the following display spaces:

##### **Density**

Pixel data is linearly related to optical film density. With a photometric interpretation of MONOCHROME1, a value of 0 represents minimum density and a value of 4095 represents maximum density.

##### **Luminance**

Pixel data is perceptually linear in brightness according to a proprietary model of the human visual system response developed by Kodak. Despite the name used, the pixel data is not linearly related to luminance or log luminance.

This option should only be used in support of legacy Kodak display products.

The CR supports the use of the Density, Luminance or P-Value display spaces with the CR IOD, DX IOD and MG IOD.

### 5.1.3 Extension for P-Value Encoding

If the destination supports VOI LUTs, a VOI LUT converting image pixel values to P-Values will be sent. Otherwise, the VOI LUT will be rendered into the image.

The Photometric Interpretation will be always MONOCHROME2 and an additional tag of Presentation LUT Shape as IDENTITY will be sent.

**Table 5.2 Extension Attributes for P-Value Encoding**

Attribute Name	Tag	DICOM Type	DirectView CR System Type	Supported Values
Photometric Interpretation	(0028,0004)	1	1	MONOCHROME2 Only MONOCHROME2 is sent when P-Value Encoding flag is turned on
Presentation LUT Shape	(2050,0020)	N/A	1C	IDENTITY Sent only when P-Value Encoding flag is turned on

### 5.1.4 Extensions to Body Part Examined and View Position

The user may define additional labels that may be used to populate the Body Part Examined (0018,0015) and View Position (0018,5101) attributes. The software enforces the use of valid characters for the additional labels created by the user.

## 6 Configuration

Table 6.1 lists the network attributes that are configurable by a qualified service provider.

**Table 6.1 Configurable Network Attributes**

Configurable Network Attributes
IP address (Note: The system also supports DHCP)
Subnet Mask
Local Network Host Name ( <i>DirectView CR System AE Title</i> )
SCP DICOM Called Application Entity Title

<b>Configurable Network Attributes</b>
Socket number
Router Address (Gateway)
DICOM Service(s) available
Film Sizes available
Private Tag Support
P-Value Encoding Support
Other destination properties
SCP separate association support
GSPS support
Alternate IOD (Secondary Capture) for the SCP that does not support CR

## 7 Support of Extended Character Sets

The *DirectView CR* will support any valid character set for the Specific Character Set attribute (0008,0005).

The *DirectView CR* System supports the ISO-IR 100 Latin 1 character set as well as the ISO-IR 6 default character set.

The *DirectView CR* System also supports the ISO-IR 87 character set. This is part of the JIS X 0208 code table for 2-byte Japanese character sets that supports Kanji (ideograph), Hiragana (phonetic), and Katakana (phonetic).

The *DirectView CR* System also supports the ISO-IR 13 character set. This is part of the JIS X 0201 code table for single-byte Japanese Katakana (phonetic) characters.

The *DirectView CR* System also supports the ISO-IR 159 character set. This is part of the supplementary JIS X 0212 code table for the multi-byte Japanese Kanji character set.

The *DirectView CR* System also supports the ISO-IR 149 character set. This is part of the KS X 1001 code table for multi-byte Korean character sets that support Hangul (phonetic) and Hanja (ideograph).

The *DirectView CR* System also supports the ISO IR 144 character set. This character set supports Russian characters.

The *DirectView CR* System also supports the ISO IR 148 character set. This character set supports Turkish characters.

The *DirectView CR* System also supports the ISO IR 126 character set. This character set supports Greek characters.

The *DirectView CR* System also supports the ISO IR 101 character set. This character set supports the Czech, Hungarian, Polish and Romanian characters.

The *DirectView CR* System also supports the GB 18030 character set. This character set supports both simplified and traditional Chinese characters.

The value set in the tag Specific Character Set (0008,0005) will be either:

- a) “ISO\_IR 100” (Latin 1),
- b) “ISO\_IR 13” (Katakana),
- c) “ISO 2022 IR 13\ISO 2022 IR 87\ ISO 2022 IR 159” (Katakana, Hiragana, Kanji),
- d) “ISO 2022 IR 149” (Hangul and Hanja),
- e) “GB 18030” (Simplified and Traditional Chinese),
- f) “ISO IR 144” (Russian),
- g) “ISO IR 148” (Turkish),
- h) “ISO IR 126” (Greek),
- i) “ISO IR 101” (Czech, Hungarian, Polish and Romanian),
- j) or blank (ISO-IR 6 is the default character set).

## 8 Error Handling

If communication errors are encountered, retries will be attempted based on configurable retry intervals and maximum number of retries. If the communication cannot be achieved, the job will be considered failed and set for retrial after a configurable time period (default of 5 minutes).

All errors and warnings received from the SCPs will be logged and job status will be reported to the user.



## 9 Addendum A Supported SNOMED Code Values

Table A.1 describes the SNOMED Code Values that are supported by the DirectView CR.

**Table A.1 Supported SNOMED Code Values**

<b>Context Identifier</b>	
19	
<b>Coding Scheme Designator (0008,0102)</b>	<b>Coding Scheme Version (0008,0103)</b>
SRT	20020904
<b>Code Value (0008,0100)</b>	<b>Code Meaning (0008,0104)</b>
F-10440	erect
F-10450	recumbent
F-10460	semi-erect
<b>Context Identifier</b>	
20	
<b>Coding Scheme Designator (0008,0102)</b>	<b>Coding Scheme Version (0008,0103)</b>
SRT	20070524
<b>Code Value (0008,0100)</b>	<b>Code Meaning (0008,0104)</b>
F-10310	prone
F-10316	semi-prone
F-10317	right lateral decubitus
F-10318	lateral decubitus
F-10319	left lateral decubitus
F-10320	standing
F-10326	anatomical
F-10330	kneeling
F-10336	knee-chest
F-10340	supine

F-10346	lithotomy
F-10348	Trendelenburg
F-10349	inverse Trendelenburg
F-10380	frog
F-10390	stooped-over
F-103A0	sitting
F-10410	curled-up
R-40799	lordotic
<b>Context Identifier</b>	
4010	
<b>Coding Scheme Designator (0008,0102)</b>	<b>Coding Scheme Version (0008,0103)</b>
SRT	20090119
<b>Code Value (0008,0100)</b>	<b>Code Meaning (0008,0104)</b>
R-10202	frontal
R-10204	frontal oblique
R-10206	antero-posterior
R-10208	antero-posterior oblique
R-10210	right posterior oblique
R-10212	left posterior oblique
R-10214	postero-anterior
R-10216	postero-anterior oblique
R-10218	right anterior oblique
R-10220	left anterior oblique
R-10222	sagittal
R-10224	medial-lateral
R-40783	lateral oblique
R-10228	lateral-medial
R-10232	right lateral

R-10234	right oblique
R-10236	left lateral
R-10238	left oblique
R-10241	axial
R-10242	cranio-caudal
R-10244	caudo-cranial
R-10246	oblique axial
R-10248	oblique cranio-caudal
R-10250	oblique caudo-cranial
R-10252	frontal-oblique axial
R-10254	sagittal-oblique axial
R-102C1	oblique
R-102CD	lateral
R-102C2	tangential
R-10256	submentovertical
R-10257	verticosubmental
R-102C3	plantodorsal
R-102C4	dorsoplantar
R-102C5	parietoacanthal
R-102C6	acanthoparietal
R-102C7	orbitoparietal
R-102C8	parieto-orbital
R-10230	latero-medial oblique
R-10226	medio-lateral oblique
G-8300	tissue specimen
<b>Context Identifier</b>	
4011	
<b>Coding Scheme Designator (0008,0102)</b>	<b>Coding Scheme Version (0008,0103)</b>

SRT	20070524
<b>Code Value (0008,0100)</b>	<b>Code Meaning (0008,0104)</b>
R-10244	cephalad
R-10242	caudad
R-40885	transthoracic
R-4087B	transforaminal
G-D00B	transoral
R-40554	transorbital
111069	Crosstable
R-421A4	Mouth closed
<b>Context Identifier</b>	
4014	
<b>Coding Scheme Designator (0008,0102)</b>	<b>Coding Scheme Version (0008,0103)</b>
SRT	20090717
<b>Code Value (0008,0100)</b>	<b>Code Meaning (0008,0104)</b>
R-10224	medio-lateral
R-10226	medio-lateral oblique
R-10228	latero-medial
R-10230	latero-medial oblique
R-10242	cranio-caudal
R-10244	caudo-cranial (from below)
R-102D0	superolateral to inferomedial oblique
R-40AAA	inferomedial to superolateral oblique
R-1024A	cranio-caudal exaggerated laterally
R-1024B	cranio-caudal exaggerated medially
G-8310	tissue specimen from breast
<b>Context Identifier</b>	
4015	

<b>Coding Scheme Designator (0008,0102)</b>	<b>Coding Scheme Version (0008,0103)</b>
SRT	20090717
<b>Code Value (0008,0100)</b>	<b>Code Meaning (0008,0104)</b>
R-102D2	Cleavage
R-102D1	Axillary Tail
R-102D3	Rolled Lateral
R-102D4	Rolled Medial
R-102CA	Rolled Inferior
R-102C9	Rolled Superior
R-102D5	Implant Displaced
R-102D6	Magnification
R-102D7	Spot Compression
R-102C2	Tangential
R-40AB3	Nipple in profile
P2-00161	Anterior compression
R-40ABE	Infra-mammary fold
R-40AB2	Axillary tissue
<b>Context Identifier</b>	
4031	
<b>Coding Scheme Designator (0008,0102)</b>	<b>Coding Scheme Version (0008,0103)</b>
SRT	20091021
<b>Code Value (0008,0100)</b>	<b>Code Meaning (0008,0104)</b>
T-D4000	Abdomen
T-15420	Acromioclavicular joint
T-15750	Ankle joint
T-280A0	Apex of Lung
T-D8200	Arm
T-60610	Bile duct

T-74000	Bladder
T-04000	Breast
T-26000	Bronchus
T-12770	Calcaneus
T-11501	Cervical spine
T-D3000	Chest
T-12310	Clavicle
T-11BF0	Coccyx
T-58200	Duodenum
T-D8300	Elbow
T-56000	Esophagus
T-D0300	Extremity
T-D0801	Eye region
T-11196	Facial bones
T-12710	Femur
T-D8800	Finger
T-D9700	Foot
T-12402	Forearm bone
T-63000	Gall bladder
T-D8700	Hand
T-D1100	Head
T-32000	Heart
T-15710	Hip joint
T-12410	Humerus
T-D1213	Jaw region
T-D9200	Knee
T-59000	Large intestine
T-24100	Larynx

T-D9400	Leg
T-11503	Lumbar spine
T-11180	Mandible
T-11133	Mastoid bone
T-11170	Maxilla
T-D3300	Mediastinum
T-11149	Nasal bone
T-D1600	Neck
T-11102	Optic canal
T-22000	Paranasal sinus
T-61100	Parotid gland
T-12730	Patella
T-D6000	Pelvis
T-59600	Rectum
T-11300	Rib
T-15680	Sacroiliac joint
T-11AD0	Sacrum
T-12280	Scapula
T-D1460	Sella turcica
T-12980	Sesamoid bones of foot
T-D2220	Shoulder
T-11100	Skull
T-58000	Small intestine
T-D0146	Spine
T-15610	Sternoclavicular joint
T-11210	Sternum
T-57000	Stomach
T-61300	Submandibular gland

T-15770	Tarsal joint
T-15290	Temporomandibular joint
T-11502	Thoracic spine
T-D8810	Thumb
T-D9800	Toe
T-25000	Trachea
T-70010	Upper urinary tract
T-75000	Urethra
T-88920	Uterus and fallopian tubes
T-15460	Wrist joint
T-11167	Zygomatic arch



## 10 Addendum B Input Field/DICOM Tag Cross Reference

Table B.1 describes the DICOM Image attributes and Patient/Exam information flow through the product. The first column describes the Patient/Exam information fields supported by the products. The second column indicates the MWL IOD Attribute that the system will use to populate the field if a DICOM WorkList SCP is present. The third column identifies the CR Image IOD Attribute containing the data in the system's output and, if applicable, the TID Concept Name contained in the Dose Report.

**Table B.1 Patient/Exam Input and MWL/CR Image Attributes Cross Reference**

User Interface Input field Label	Associated DICOM MWL IOD Element	Associated DICOM IOD Element/ TID Concept Name
<b>Accession Number</b>	Accession Number (0008,0050)	Accession Number (0008,0050)
<b>Angle of Exposue</b>  May be received from CR X-ray interface depending on equipment or input via GUI	NA	Positioner Primary Angle (0018,1510)
<b>Anode Target Material</b>  May be received from CR X-ray interface depending on equipment or input via GUI	NA	Anode Target Material (0018,1191)
<b>Body Part</b>	NA	Body Part Examined (0018,0015)
<b>Cassette ID</b>  input via bar code scanner	NA	Plate ID (0018,1004)
<b>Compression Force</b>  May be received from CR X-ray interface depending on equipment or input via GUI	NA	Compression Force (0018,11A2)
<b>Compression Thickness</b>  May be received from CR X-ray interface depending on equipment or input via GUI	NA	Body Part Thickness (0018,11A0)

User Interface Input field Label	Associated DICOM MWL IOD Element	Associated DICOM IOD Element/ TID Concept Name
<b>Contrast Agent</b>	Requested Contrast Agent (0032,1070)	Contrast/Bolus Agent (0018,0010)
<b>Date Of Birth</b>	Patient's Birth Date (0010,0030)	Patient's Birth Date (0010,0030)
<b>Department Name</b>	Requesting Service (0032,1033)	Institutional Department Name (0008,1040)
<b>Entrance Dose</b>  May be received from CR X-ray interface or input via GUI	NA	Entrance Dose (0040,0302)  Entrance Dose in mGy (0040,8302)  (113738, DCM, "Dose (RP)")
<b>Filter Material</b>  May be received from CR X-ray interface depending on equipment or input via GUI	NA	Filter Material (0018,7050)
<b>Gender</b>	Patient Sex (0010,0040)	Patient Sex (0010,0040)
<b>Image Area Dose</b>  May be received from CR X-ray interface depending on equipment or input via GUI	NA	Image and Fluoroscopy Area Dose Product (0018,115E)  (122130, DCM, "Dose Area Product")
<b>Image Comments</b>	NA	Image Comments (0020,4000)
<b>KVP</b>  May be received from CR X-ray interface or input via GUI	NA	KVP (0018,0060)  (113733, DCM, "KVP")
<b>Laterality</b>	NA	Laterality (0020,0060)
<b>Magnification Ratio</b>  May be received from CR X-ray interface depending on equipment or input via GUI	NA	Estimated Radiographic Magnification Factor (0018,1114)
<b>mAs</b>  May be received from CR X-ray interface depending on equipment or input via GUI	NA	Exposure (0018,1152)
<b>Modality</b>	Modality (0008,0060)	Modality (0008,0060)

User Interface Input field Label	Associated DICOM MWL IOD Element	Associated DICOM IOD Element/ TID Concept Name
<b>Organ Dose</b>  May be received from CR X-ray interface depending on equipment or input via GUI	NA	Organ Dose (0040,0316)  (111636, DCM, "Entrance Exposure at RP")
<b>Orientation</b>	NA	Cassette Orientation (0018,1402)
<b>Patient Age</b>  Read only value	Patient's age (0010,1010)	Patient's age (0010,1010)
<b>Patient Comments</b>	NA	Patient Comments (0010,4000)
<b>Patient First Name</b>	Patient's Name (0010,0010)	Patient's Name (0010,0010)
<b>Patient Last Name</b>		
<b>Patient Middle Name</b>		
<b>Patient Location</b>	Patient's Institution Residence (0038,0400)	Patient's Institution Residence (0038,0400)
<b>Patient Size</b>	Patient's Size (0010,1020)	Patient's Size (0010,1020)
<b>Priority</b>	Requested Procedure Priority (0040,1003)	N/A
<b>Study Date &amp; Time</b>  Read only value	Initial Value: Scheduled Procedure Step Start Date (0040,0002) Scheduled Procedure Step Start Time (0040,0003)  These values will be updated to the time/date that the technologist began the first procedure step for a study.	Study Date (0008,0020) Study Time (0008,0030)  Performed Procedure Step Start Date (0040,0244) Performed Procedure Step Start Time (0040,0245)
<b>Tech ID</b>	NA	Operator's Name (0008,1070)  (121008,DCM, "Person Observer Name")
<b>Patient ID</b>	Patient ID (0010,0020)	Patient ID (0010,0020)

User Interface Input field Label	Associated DICOM MWL IOD Element	Associated DICOM IOD Element/ TID Concept Name
<b>Procedure Code</b>	Requested Procedure ID (0040,1001)  or  Requested Procedure Code Sequence (0032,1064) > code value (0008,0100)  or  Scheduled Protocol Code Sequence (0040,0008) > code Value (0008,0100)	Procedure Code Sequence (0008,1032) > code value (0008,0100)
<b>Procedure ID</b>	Requested Procedure ID (0040,1001)	Requested Procedure ID (0040,1001)