# DICOM

## Conformance Statement

## PCR Eleva Release 1.2



Document Number: XPS031-080444.04

PHILIPS

**Issued by:**
Philips Healthcare

P.O. Box 10.000
5680 DA Best
The Netherlands

Document Number: XPS031-080444.04
Date: 3-August-2009

# 1. DICOM CONFORMANCE STATEMENT OVERVIEW

This document is the DICOM Conformance Statement for the Philips Medical Systems PCR ELEVA.
The PCR Eleva system is a workstation for cassette-based digital radiography. It contains an export function based on the DICOM image storage to transfer image data from the PCR Eleva system to a remote system. This DICOM export function and other functions of PCR Eleva are described in this document.

**PCR ELEVA in a DICOM network.**
The figure below shows the position of PCR Eleva in a radiology environment.

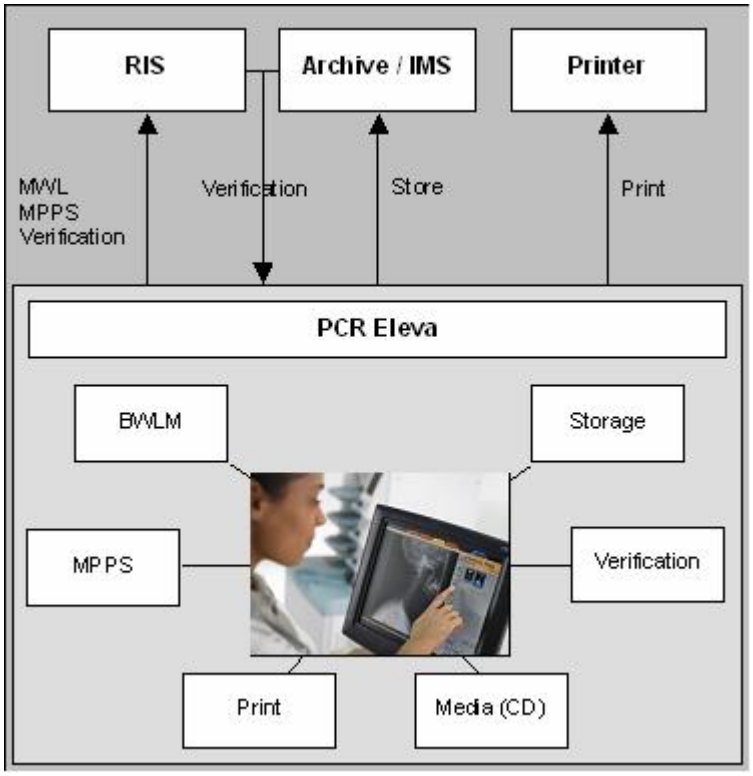


**Figure 1: PCR Eleva in a DICOM network**

PCR Eleva is an embedded modality system for DICOM images. It provides, among other things, the following features:

- Verification of application level communication.
- Basic Worklist Management (BWLM).
- Storage of images on a remote DICOM system.
- Study Management per Modality Performed Procedure Step (MPPS).
- Printing of hardcopies on a remote DICOM printer.
- Storage of images per DICOM media only on Compact Disc (CD).

**Table 1: Network Services**

| SOP Class | | User of Service (SCU) | Provider of Service (SCP) |
|---|---|---|---|
| **Name** | **UID** | | |
| **Other** | | | |
| Verification SOP Class | 1.2.840.10008.1.1 | No | Yes |
| **Print Management** | | | |
| Basic Grayscale Print Management Meta SOP Class | 1.2.840.10008.5.1.1.9 | Yes | No |
| >Basic Film Box SOP Class | 1.2.840.10008.5.1.1.2 | Yes | No |
| >Basic Film Session SOP Class | 1.2.840.10008.5.1.1.1 | Yes | No |
| >Basic Grayscale Image Box SOP Class | 1.2.840.10008.5.1.1.4 | Yes | No |
| >Printer SOP Class | 1.2.840.10008.5.1.1.16 | Yes | No |
| **Transfer** | | | |
| Computed Radiography Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.1 | Yes | No |
| Digital Mammography X-Ray Image Storage - Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.2 | Yes | No |
| Digital Mammography X-Ray Image Storage - Proc. SOP | 1.2.840.10008.5.1.4.1.1.1.2.1 | Yes | No |
| Digital X-Ray Image Storage - For Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.1 | Yes | No |
| Digital X-Ray Image Storage - For Proc. SOP | 1.2.840.10008.5.1.4.1.1.1.1.1 | Yes | No |
| Secondary Capture Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.7 | Yes | No |
| **Workflow Management** | | | |
| Modality Performed Procedure Step SOP Class | 1.2.840.10008.3.1.2.3.3 | Yes | No |
| Modality Worklist Information Model - FIND SOP Class | 1.2.840.10008.5.1.4.31 | Yes | No |
| Storage Commitment Push Model SOP Class | 1.2.840.10008.1.20.1 | Yes | No |

*Note: Verification SCU (C-ECHO) is supported, but is only available for the service engineer during configuration. An auto configuration of a DICOM node using an A-ASSOCIATE-RQ can be initiated as well.*

A table of Supported Media Storage Application Profiles (with roles) is provided.

**Table 2: Media Services**

| Media Storage Application Profile | File-set Creater (FSC) | File-set Updater (FSU) | File-set Reader (FSR) | Display Directory (FSR) |
|---|---|---|---|---|
| **Compact Disk-Recordable** | | | | |
| General Prupose CD-R Interchange | Yes | Yes | No | Yes |

# 2. TABLE OF CONTENTS

**1. DICOM CONFORMANCE STATEMENT OVERVIEW ..... 3**
**2. TABLE OF CONTENTS ..... 5**
**3. INTRODUCTION ..... 7**
**3.1. REVISION HISTORY ..... 7**
**3.2. AUDIENCE ..... 7**
**3.3. REMARKS ..... 7**
**3.4. DEFINITIONS, TERMS AND ABBREVIATIONS ..... 8**
**3.5. REFERENCES ..... 9**
**4. NETWORKING ..... 10**
**4.1. IMPLEMENTATION MODEL ..... 10**
4.1.1. Application Data Flow ..... 10
4.1.2. Functional Definition of AE's ..... 11
4.1.2.1. Functional Definition of Eleva ..... 11
4.1.3. Sequencing of Real World Activities ..... 13
**4.2. AE SPECIFICATIONS ..... 14**
4.2.1. Eleva ..... 14
4.2.1.1. SOP Classes ..... 14
4.2.1.2. Association Policies ..... 14
4.2.1.2.1. General ..... 14
4.2.1.2.2. Number of Associations ..... 15
4.2.1.2.3. Asynchronous Nature ..... 15
4.2.1.2.4. Implementation Identifying Information ..... 15
4.2.1.2.5. Communication Failure Handling ..... 15
4.2.1.3. Association Initiation Policy ..... 16
4.2.1.3.1. (Real-World) Activity – Modality worklist as SCU ..... 18
4.2.1.3.2. (Real-World) Activity – Modality Performed Procedure Step As SCU ..... 26
4.2.1.3.3. (Real-World) Activity – Storage Commitment Push Model AS SCU ..... 32
4.2.1.3.4. (Real-World) Activity – Image Export ..... 34
4.2.1.3.5. (Real-World) Activity – Print Management as SCU ..... 38
4.2.1.4. Association Acceptance Policy ..... 43
4.2.1.4.1. (Real-World) Activity – Verification as SCP ..... 45
**4.3. NETWORK INTERFACES ..... 46**
4.3.1. Physical Network Interfaces ..... 46
4.3.2. Additional Protocols ..... 46
**4.4. CONFIGURATION ..... 46**
4.4.1. AE Title/Presentation Address Mapping ..... 46
4.4.1.1. Local AE Titles ..... 46
4.4.1.2. Remote AE Title/Presentation Address Mapping ..... 46
4.4.2. Parameters ..... 47
**5. MEDIA INTERCHANGE ..... 48**
**5.1. IMPLEMENTATION MODEL ..... 48**
5.1.1. Application Data Flow Diagram ..... 48
5.1.2. Functional Definitions of AE's ..... 48
5.1.2.1. Functional Definition of Eleva. ..... 48
5.1.3. Sequencing of Real World Activities ..... 48
**5.2. AE SPECIFICATIONS ..... 49**
5.2.1. Eleva Media – Specification ..... 49
5.2.1.1. File Meta Information for the Eleva Media ..... 49
5.2.1.2. Real-World Activities ..... 49
5.2.1.2.1. RWA - Create File-set ..... 50
5.2.1.2.2. RWA - Update File-set ..... 50
5.2.1.2.3. RWA - Display Directory ..... 50
**5.3. AUGMENTED AND PRIVATE APPLICATION PROFILES ..... 50**
5.3.1. Sequencing of Real World Activities ..... 51
5.3.2. Private Application Profiles ..... 51
**5.4. MEDIA CONFIGURATION ..... 51**
**6. SUPPORT OF CHARACTER SETS ..... 52**

**7. SECURITY ..... 53**
**7.1. SECURITY TRANSPORT CONNECTION PROFILES ..... 53**
**7.2. ATTRIBUTE CONFIDENTIALITY PROFILES ..... 53**
**8. ANNEXES OF APPLICATION "ELEVA" ..... 55**
**8.1. IOD CONTENTS ..... 55**
8.1.1. Created SOP Instance ..... 55
8.1.1.1. List of created SOP Classes ..... 55
8.1.1.2. Computed Radiography Image Storage SOP Class ..... 56
8.1.1.3. Secondary Capture Image Storage SOP Class ..... 60
8.1.1.4. Digital X-Ray Image Storage - For Pres. SOP ..... 65
8.1.1.5. Digital X-Ray Image Storage - For Proc. SOP ..... 72
8.1.1.6. Digital Mammography X-Ray Image Storage - Proc. SOP ..... 78
8.1.1.7. Digital Mammography X-Ray Image Storage - Pres. SOP ..... 84
8.1.2. Usage of Attributes from Received IOD ..... 89
8.1.3. Attribute Mapping ..... 90
8.1.4. Coerced/Modified fields ..... 90
**8.2. DATA DICTIONARY OF PRIVATE ATTRIBUTES ..... 91**
**8.3. CODED TERMINOLOGY AND TEMPLATES ..... 91**
8.3.1. Context Groups ..... 91
8.3.2. Template Specifications ..... 91
8.3.3. Private code definitions ..... 91
**8.4. GRAYSCALE IMAGE CONSISTENCY ..... 91**
**8.5. STANDARD EXTENDED/SPECIALIZED/PRIVATE SOPS ..... 91**
**8.6. PRIVATE TRANSFER SYNTAXES ..... 91**

# 3. INTRODUCTION

The introduction specifies product and relevant disclaimers as well as any general information that the vendor feels is appropriate.

## 3.1. Revision History

The revision history provides dates and differences of the different releases.

**Table 3: Revision History**

| Document Version | Date of Issue | Status | Description |
|---|---|---|---|
| 00 | 26-August-2008 | Proposal | Initial version |
| 01 | 17 September 2008 | Approved | Updated version after review. |
| 02 | 24 September 2008 | Approved | Changed Session 7 |
| 03 | 10 July 2009 | Approved | Final version after update change GXRCQ00018648 |
| 04 | 3 August 2009 | Approved | Review update on Final version. |

## 3.2. Audience

This Conformance Statement is intended for:

- (Potential customers
- System integrators of medical equipment
- Marketing staf interested in system functionality
- Software designers implementing DICOM interfaces

It is assumed that the reader is familiar with the DICOM standard.

## 3.3. Remarks

The DICOM Conformance Statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of DICOM PS 3.2.
This DICOM Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

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

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

- **New versions of the DICOM Standard**
  The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery.
  The user should ensure that any non-Philips provider linking to Philips equipment also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

## 3.4. Definitions, Terms and Abbreviations

| | |
|---|---|
| AE | Application Entity |
| CD | Compact Disc |
| CD-R | CD-Recordable |
| CR | Computed Radiography |
| DICOM | Digital Imaging and Communications in Medicine |
| DX | Digital X-Ray |
| EBE | DICOM Explicit VR Big Endian |
| ELE | DICOM Explicit VR Little Endian |
| FSC | File-set Creator |
| FSR | File-set Reader |
| FSU | File-set Updater |
| GUI | Graphic User Interface |
| ILE | DICOM Implicit VR Little Endian |
| IOD | Information Object Definition |
| MG | Mammography |
| MPPS | Modality Performed Procedure Step |
| NEMA | National Electrical Manufacturers Association |
| NM | Nuclear Medicine |
| PDU | Protocol Data Unit |
| RF | X-Ray Radiofluorscopic |
| RIS | Radiology Information System |
| RWA | Real-World Activity |
| SC | Secondary Capture |
| SCP | Service Class Provider |
| SCU | Service Class User |
| SOP | Service Object Pair |
| TCP/IP | Transmission Control Protocol/ Internet Protocol |
| UID | Unique Identifier |

| | |
|---|---|
| US | Ultrasound |
| WLM | Worklist Management |
| XA | X-Ray Angiographic |

## 3.5. References

[DICOM] Digital Imaging and Communications in Medicine, Part 1 - 18 (NEMA PS 3.1- PS 3.18),
National Electrical Manufacturers Association (NEMA)
Publication Sales 1300 N. 17th Street, Suite 1847
Rosslyn, Virginia. 22209, United States of America
Internet: http://medical.nema.org/
Note that at any point in time the official standard consists of the most recent yearly edition of the base standard (currently 2008) plus all the supplements and correction items that have been approved as Final Text.

# 4. NETWORKING

This section contains the networking related services (vs. the media related ones).

## 4.1. Implementation model

The implementation model consists of three sections:

- The application data flow diagram, specifying the relationship between the Application Entities and the "external world" or Real-World Activities,
- A functional description of each Application Entity, and
- The sequencing constraints among them.

### 4.1.1. Application Data Flow

The PCR Eleva system consists of one single application entity only the Eleva Application Entity (Eleva AE)

It incorporates the following functionality.

- The Eleva AE can verify application level communication by using the verification service as SCP.
- The Eleva AE can request a worklist by using the Basic Worklist Management service as SCU.
- The Eleva AE can store images by using the Storage service as SCU and use the Storage-Commit SOP-Class perform storage-commit as SCU.
- The Eleva AE can compose the modality performed procedure step by using the Study Management service as SCU.
- The Eleva AE can print images by using the Print Management service as SCU Eleva AE.

The figure bellows shows the networking application data flow as a functional overview of the Eleva AE.

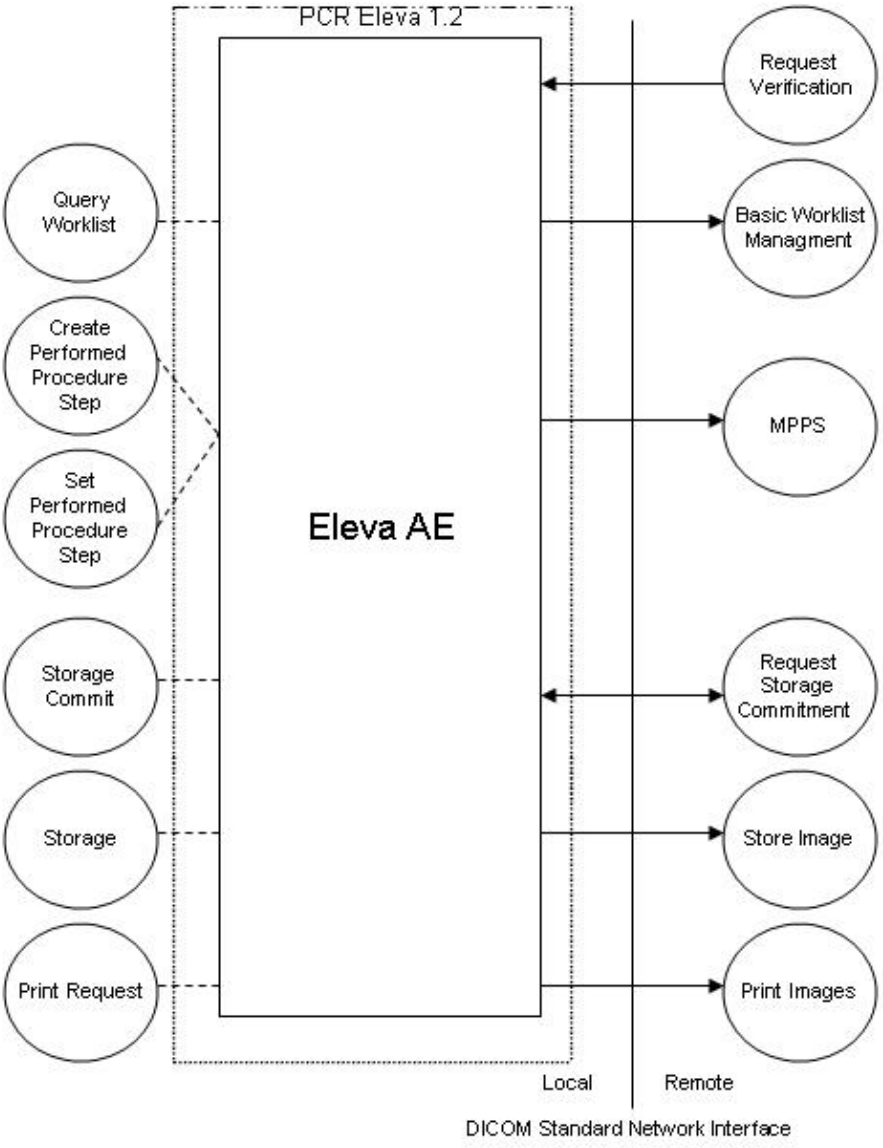


**Figure 2: Application Data Flow Diagram**

## 4.1.2. Functional Definition of AE's

This section contains a functional definition for each individual local Application Entity.

### 4.1.2.1. Functional Definition of Eleva

The Eleva AE is the one and only application entity within the PCR Eleva. It includes the following service classes.

Verification Service Class
The Eleva AE provides the Verification service as SCP.

A remote SCU shall request an association with the Eleva AE for Verification SOP class. After accepting the association the Eleva AE shall receive and respond to the Verification request and release the association when requested.

Basic Worklist Management Service Class

The Eleva AE may use the Basic Worklist Management service as SCU.

After initiating the worklist query the Eleva AE shall request an association with the configured remote Basic Worklist Management SCP. After accepting the association the Eleva AE shall send the find request, wait for response, and then release the association.

The user interface shall be updated with the query results.

Storage Service Class
The Eleva AE may use the Storage service as SCU.

After a performed procedure step the Eleva AE shall store the related images at the configured Storage SCP. It shall request an association with the remote Storage SCP for the applicable Storage SOP classes. After accepting the association the Eleva AE shall send the store request, wait for response, and then release the association.

After successful storage the user interface shall be updated accordingly.

After successful storage, if selected, the ELEVA AE shall request storage commitment per Storage Commitment service (ref. Storage Commitment Service Class)

Storage Commitment Service Class
The ELEVA AE can perform the Storage Commitment service as SCU.

The ELEVA AE shall request an association with the selected remote SCP for the Storage Commitment Push Model SOP class. When the association is accepted, the ELEVA AE shall send the Storage Commitment requests, receive the Storage Commitment responses and act accordingly, and release the association.
When the remote commitment actions have been finished, the remote SCP should request an association with the ELEVA AE (still SCU). After accepting the association, the ELEVA AE shall receive the Storage Commitment reports, and release the association when requested.

The Storage Commitment Service can be done synchronously and asynchronously.

Study Management Service Class
The Eleva AE may use the Study Management service as SCU.

Before performing a procedure step the Eleva AE shall request an association with the configured remote Study Management SCP. After accepting the association the Eleva AE shall send a create request, wait for response, and then release the association.

After performing a procedure step the Eleva AE shall request a new association to send a set request, and after response, release the association.
Depending on the status of creates and set and the configuration the Eleva AE may perform a retry.
The user interface shall be updated with the performed procedure step status.

Basic Grayscale Print Management Meta Class
The Eleva AE may use the Basic Grayscale Print Management service as SCU.

After a performed procedure step the Eleva AE shall print the related images on the configured Printer. It shall request an association with the remote Basic Grayscale Print Management SCP for the applicable Basic Grayscale Print Management SOP class. After accepting the association the Eleva AE shall send the print request, wait for response, and then release the association.

After successful printing the user interface shall be updated accordingly.

### 4.1.3. Sequencing of Real World Activities

The figure below shows a typical sequence of an examination using a worklist. The user updates the worklist (query Worklist) and then selects and opens an examination. When the user starts the examination (acquiring the first image), the RIS is notified (Create Performed Procedure Step). After the user confirmed each acquisition (image 1-N) per default the image is sent to archive (Store Image) and printer (Print Image) simultaneously. Finally, when closing the examination, the RIS is notified to update the data of the examination (Set Performed Procedure Step).

Note that Print Image will send images to the printer only when enough images were received to fulfill the configured printer format or when the print job is flushed manually.
When the last image of an examination is received the print job will be flushed automatically.

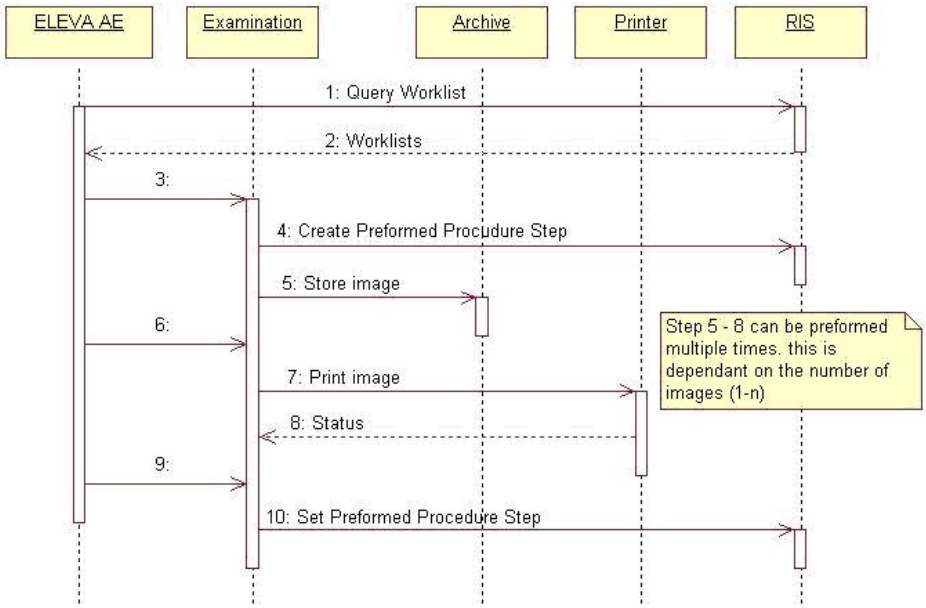


**Figure 3: Sequence of an examination**

## 4.2. AE Specifications

This section in the DICOM Conformance Statement is a set of application entity specifications. There are as many of these subsections as there are different AE's in the implementation.

### 4.2.1. Eleva

Detail of this specific Application Entity is specified in this section.

#### 4.2.1.1. SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

**Table 4: SOP Classes for Eleva**

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|---|---|---|
| Computed Radiography Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.1 | Yes | No |
| Digital Mammography X-Ray Image Storage - Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.2 | Yes | No |
| Digital Mammography X-Ray Image Storage - Proc. SOP | 1.2.840.10008.5.1.4.1.1.1.2.1 | Yes | No |
| Digital X-Ray Image Storage - For Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.1 | Yes | No |
| Digital X-Ray Image Storage - For Proc. SOP | 1.2.840.10008.5.1.4.1.1.1.1.1 | Yes | No |
| Modality Performed Procedure Step SOP Class | 1.2.840.10008.3.1.2.3.3 | Yes | No |
| Modality Worklist Information Model - FIND SOP Class | 1.2.840.10008.5.1.4.31 | Yes | No |
| Secondary Capture Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.7 | Yes | No |
| Storage Commitment Push Model SOP Class | 1.2.840.10008.1.20.1 | Yes | No |
| Verification SOP Class | 1.2.840.10008.1.1 | No | Yes |
| Basic Grayscale Print Management Meta SOP Class | 1.2.840.10008.5.1.1.9 | Yes | No |
| >Basic Film Box SOP Class | 1.2.840.10008.5.1.1.2 | Yes | No |
| >Basic Film Session SOP Class | 1.2.840.10008.5.1.1.1 | Yes | No |
| >Basic Grayscale Image Box SOP Class | 1.2.840.10008.5.1.1.4 | Yes | No |
| >Printer SOP Class | 1.2.840.10008.5.1.1.16 | Yes | No |

Note: Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

#### 4.2.1.2. Association Policies

Each AE specification contains a description of the general association establishment and acceptance policies of the AE.

##### 4.2.1.2.1. General

The DICOM standard application context has specified.

**Table 5: DICOM Application Context**

| Description | Value |
|---|---|
| Application Context Name | 1.2.840.10008.3.1.1.1 |

#### 4.2.1.2.2. Number of Associations

The number of simultaneous associations that an Application Entity may support as a Initiator or Acceptor is specified.

**Table 6: Number of associations as an Association Initiator for this AE**

| Description | Value |
|---|---|
| Maximum number of simultaneous associations | 2 |

**Table 7: Number of associations as an Association Acceptor for this AE**

| Description | Value |
|---|---|
| Maximum number of simultaneous associations | 1 |

#### 4.2.1.2.3. Asynchronous Nature

**Table 8: Asynchronous nature as an Association Initiator for this AE**

| Description | Value |
|---|---|
| Maximum number of outstanding asynchronous transactions | 0 |

Asynchronous nature as an association Initiator is not supported by the Eleva AE.

#### 4.2.1.2.4. Implementation Identifying Information

The value supplied for Implementation Class UID and version name are documented here.

**Table 9: DICOM Implementation Class and Version for Eleva**

| | |
|---|---|
| Implementation Class UID | 1.3.46.670589.30.1.3 |
| Implementation Version Name | PMS_ELEVA_PA_2.1 |

#### 4.2.1.2.5. Communication Failure Handling

The behavior of the AE during communication failure is summarized in next table.

**Table 10: Communication Failure Behavior**

| Exception | Behavior |
|---|---|
| Timeout | The Association is aborted using A-ABORT and command marked as failed. The reason is logged and reported to the user. |
| Association aborted | The command is marked as failed. The reason is logged and reported to the user. |
| RIS query timeout(default 240 seconds) | The association is aborted using A-ABORT and command marked as failed. The reason is logged and reported to the user. |

#### 4.2.1.3. Association Initiation Policy

The Application Entity will response on a received reject Association attempts as shown in next table.

**Table 11: Association Rejection response**

| Result | Source | Reason/Diagnosis | Explanation |
|---|---|---|---|
| 1 - rejected-permanent | 1 - DICOM UL service-user | 1 - no-reason-given | Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent,1: REJECT_SOURCE_dul_user,1: REJECT_REASON_no_reason_given) |
| | | 2 - applicaton-context-name-not supported | Association is not established. The following error is logged. Association rejected by peer ( 1: REJECT_RESULT_permanent, 1: REJECT_SOURCE_dul_user, 2: REJECT_RESON _application_context_not_support) |
| | | 3 - calling-AE-title-not-recognized | Association is not established. The following error is logged. Association rejected by peer ( 1: REJECT_RESULT_permanent, 1: REJECT_SOURCE_dul_user, 3: REJECT_REASON _calling_aetitle_not_recognized) |
| | | 7 - called-AE-title-not-recognized | Association is not established. The following error is logged. Association rejected by peer ( 1: REJECT_RESULT_permanent, 1: REJECT_SOURCE_dul_user, 7: REJECT_REASON _called_aetitle_not_recognized) |
| | 2 - DICOM UL service-provider (ACSE related function) | 1 - no-reason-given | Association is not established. The following error is logged. Error: UserRecoverable: impl.dicom.access.PEER: Association rejected by peer 1: REJECT_RESULT_permanent, 2: REJECT_SOURCE_dul_provider (acse), 1: REJECT_REASON_no_reason_given) |
| | | 2 - protocol-version-not-supported | Association is not established. The following error is logged. Association rejected by peer ( 1: REJECT_RESULT_permanent, 2: REJECT_SOURCE_dul_provider (acse), 2: REJECT_REASON _application_context_not_support) |
| | 3 - DICOM UL service-provider(Presentation related function) | 1 - tempory-congestion | Association is not established. The following error is logged. Association rejected by peer 1: REJECT_RESULT_permanent, 3: REJECT_SOURCE_dul_provider (presentation), 1: REJECT_REASON_no_reason_given) |
| | | 2 - Local-limit-exceeded | Association is not established. The following error is logged. Association rejected by peer ( 1: REJECT_RESULT_permanent, 3: REJECT_SOURCE_dul_provider (presentation), 2: REJECT_REASON _application_context_not_support) |
| 2 - rejected-transient | 1 - DICOM UL service-user | 1 - no-reason-given | Association is not established. The following error is logged. Association rejected by peer ( 2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 1: REJECT_REASON_no_reason_given) |

| Result | Source | Reason/Diagnosis | Explanation |
|---|---|---|---|
| | | 2 - application-context-name-not-supported | Association is not established.<br>The following error is logged.<br>Association rejected by peer (<br>2: REJECT_RESULT_transient,<br>1: REJECT_SOURCE_dul_user,<br>2: REJECT_REASON<br>_application_context_not_support) |
| | | 3 - calling-AE-title-not-recognized | Association is not established.<br>The following error is logged.<br>Association rejected by peer (<br>2: REJECT_RESULT_transient,<br>1: REJECT_SOURCE_dul_user,<br>3: REJECT_REASON<br>_calling_aetitle_not_recognized) |
| | | 7 - called-AE-title-not-recognized | Association is not established.<br>The following error is logged.<br>Association rejected by peer (<br>2: REJECT_RESULT_transient,<br>1: REJECT_SOURCE_dul_user,<br>7: REJECT_REASON<br>_called_aetitle_not_recognized) |
| | 2 - DICOM UL service-provider (ACSE related function) | 1 - no-reason-given | Association is not established.<br>The following error is logged.<br>Association rejected by peer (<br>2: REJECT_RESULT_transient,<br>2: REJECT_SOURCE_dul_provider (acse),<br>1: REJECT_REASON_no_reason_given) |
| | | 2 - protocol-version-not-supported | Association is not established.<br>The following error is logged.<br>Association rejected by peer (<br>2: REJECT_RESULT_transient,<br>2: REJECT_SOURCE_dul_provider (acse),<br>2: REJECT_REASON<br>_application_context_not_support) |
| | 3 - DICOM UL service-provider (Presentation related function) | 1 - tempory congestion | Association is not established.<br>The following error is logged.<br>Association rejected by peer (<br>2: REJECT_RESULT_transient,<br>3: REJECT_SOURCE_dul_provider<br>(presentation),<br>1: REJECT_REASON_no_reason_given) |
| | | 2 - local-limit-exceeded | Association is not established.<br>The following error is logged.<br>Association rejected by peer (<br>2: REJECT_RESULT_transient,<br>3: REJECT_SOURCE_dul_provider<br>(presentation),<br>2: REJECT_REASON<br>_application_context_not_support) |

The behavior of the AE on receiving an association abort is summarized in next table.

**Table 12: Association Abort Handling**

| Source | Reason/Diagnosis | behavior |
|---|---|---|
| 0 - DICOM UL service-user (initiated abort) | 0 - reason-not-specified | When received, the PCR Eleva terminates the connection with the following log: Association ABORTED by peer (0: ABORT_SOURCE_dul_user,0: ABORT_REASON_not_specified). |
| 2 - DICOM UL service-provider (initiated abort) | 0 - reason-not-specified | When received, the PCR Eleva terminates the connection with the following log:<br>Association ABORTED by peer (<br>2: ABORT_SOURCE_dul_provider,<br>0: ABORT_REASON_not_specified). |

| Source | Reason/Diagnosis | behavior |
|---|---|---|
| | 1- unrecognized-PDU | When received, the PCR Eleva terminates the connection with the following log:<br>Association ABORTED by peer (<br>2: ABORT_SOURCE_dul_provider,<br>1: ABORT_REASON_unrecognized_pdu). |
| | 2 - unexpected-PDU | When received, the PCR Eleva terminates the connection with the following log:<br>Association ABORTED by peer<br>2: ABORT_SOURCE_dul_provider,<br>2: ABORT_REASON_unexpected_pdu). |
| | 4 - unrecognized-PDU parameter | When received, the PCR Eleva terminates the connection with the following log:<br>Association ABORTED by peer (<br>2: ABORT_SOURCE_dul_provider,<br>4: ABORT_REASON_unrecognized_pdu_parameter). |
| | 5 - unexpecte-PDU parameter | When received, the PCR Eleva terminates the connection with the following log:<br>Association ABORTED by peer (<br>2: ABORT_SOURCE_dul_provider,<br>5: ABORT_REASON_unexpected_pdu_parameter). |
| | 6 - invalid-PDU-parameter value | When received, the PCR Eleva terminates the connection with the following log:<br>Association ABORTED by peer (<br>2: ABORT_SOURCE_dul_provider,<br>6: ABORT_REASON_invalid_pdu_parameter). |

#### 4.2.1.3.1. (Real-World) Activity – Modality worklist as SCU

##### 4.2.1.3.1.1. Description and Sequencing of Activities

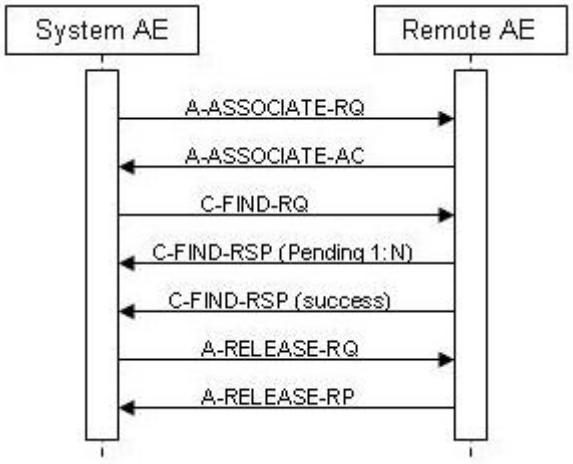


**Figure 4: (Real World) Activity - Modality worklist as SCU**

For each Broad or specific Worklist request, an association towards the Basic Worklist Management SCP is established and a C-FIND request is transmitted. The Broad query can be configured with a combination of the Matching Keys:

- Scheduled Station AE Title
- Scheduled Procedure Step Start Date
- Modality

Each of the matching keys is optional. The association will be closed on reception of the last C-FIND response. The Worklist Query result is displayed in the Patient List. The query is interruptible if it was triggered by the user.

After clicking the Query Worklist button the ELEVA AE shall request an association

with the configured remote Basic Worklist Management SCP.
When the association is accepted the ELEVA AE shall send the broad query find request, wait for response, and then release the association.

This RWA may be initiated in two ways.

After clicking the Query Worklist button the ELEVA AE shall request an association with the configured remote Basic Worklist Management SCP. When the association is accepted the ELEVA AE shall send the Broad Query find request, wait for response, and then release the association.

After clicking the Patient Query button - entering and confirming the matching key values - the ELEVA AE shall request an association with the configured remote Basic Worklist Management SCP. When the association is accepted the ELEVA AE shall send the patient query find request, wait for response, and then release the association.

Optionally the Broad Query may also be performed automatically in the system background. The time interval between subsequent background queries is configurable. Manual and automatic background queries are serialized and do not interfere with another.

#### 4.2.1.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

**Table 13: Proposed Presentation Contexts for (Real-World) Activity – Modality worklist As SCU**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| **Abstract Syntax** | | **Transfer Syntax** | | **Role** | **Extended Negotiation** |
| **Name** | **UID** | **Name List** | **UID List** | | |
| Modality Worklist Information Model - FIND SOP Class | 1.2.840.10008.5.1.4.31 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |

#### 4.2.1.3.1.3. SOP Specific Conformance for Modality Worklist Information Model - FIND SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

##### 4.2.1.3.1.3.1. Dataset Specific Conformance for Modality Worklist (Patient query) C-FIND SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
The table below should be read as follows:
Attribute Name: Attributes supported to build a Modality Worklist Request Identifier.
Tag: DICOM tag for this attribute.
VR: DICOM VR for this attribute.
M: Matching Keys for (automatic) Worklist Update.
R: Return Keys. An “X” will indicate that this attribute as Return Key with
zero length for Universal Matching.

Q: Interactive Query Key. An “X” will indicate that this attribute as matching key can be used.
D: Displayed Keys. An “X” indicates that this Worklist attribute is displayed to the user during a patient registration dialog.
IOD: An “X” indicates that this Worklist attribute is included into all object Instances created during performance of the related Procedure Step.
Type of matching: The following types of matching exists:
Single Value Matching
List of UID Matching
Wild Card Matching
Range Matching
Sequence Matching
Universal Matching

**Table 14: Worklist Request Identifier**

| Attribute Name | Tag | VR | M | R | Q | D | IOD | Type of Matching | Comment |
|---|---|---|---|---|---|---|---|---|---|
| **SOP Common Module** | | | | | | | | | |
| Specific Character Set | 0008,0005 | CS | | | | | | | |
| **Patient Identification Module** | | | | | | | | | |
| Issuer of Patient ID | 0010,0021 | LO | | X | | | | | |
| Other Patient IDs | 0010,1000 | LO | | X | | | | | |
| Patient ID | 0010,0020 | LO | X | X | X | X | | Single Value, Universal | |
| Patient's Name | 0010,0010 | PN | X | X | X | X | | Single Value, Universal, WildCard | |
| **Patient Demographic Module** | | | | | | | | | |
| Confidentiality Constraint on Patient Data Description | 0040,3001 | LO | | | | | | | |
| Ethnic Group | 0010,2160 | SH | | X | | X | | | |
| Patient Comments | 0010,4000 | LT | | X | | X | | | |
| Patient's Age | 0010,1010 | AS | | | | | | | |
| Patient's Birth Date | 0010,0030 | DA | | X | | X | | | |
| Patient's Sex | 0010,0040 | CS | | X | | X | | | |
| Patient's Size | 0010,1020 | DS | | X | | X | | | |
| Patient's Weight | 0010,1030 | DS | | X | | X | | | |
| **Patient Medical Module** | | | | | | | | | |
| Additional Patient History | 0010,21B0 | LT | | X | | X | | | |
| Contrast Allergies | 0010,2110 | LO | | X | | X | | | |
| Medical Alerts | 0010,2000 | LO | | X | | X | | | |
| Pregnancy Status | 0010,21C0 | US | | X | | X | | | |
| Special Needs | 0038,0050 | LO | | X | | | | | |
| **Visit Status Module** | | | | | | | | | |
| Current Patient Location | 0038,0300 | LO | | X | | | | | |
| **Scheduled Procedure Step Module** | | | | | | | | | |
| Scheduled Procedure Step Sequence | 0040,0100 | SQ | | X | | | | | |
| >Comments on the Scheduled Procedure Step | 0040,0400 | LT | | X | | | | | |
| >Modality | 0008,0060 | CS | X | X | X | | | Single Value, Universal | SOP Classes: CR, DX, OT, US, MG, RF, XA, PX, NM |
| >Pre-Medication | 0040,0012 | LO | | X | | | | | |
| >Requested Contrast Agent | 0032,1070 | LO | | X | | | | | |
| >Scheduled Performing Physician's Name | 0040,0006 | PN | | X | | | | | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | X | | X | | | |

| Attribute Name | Tag | VR | M | R | Q | D | IOD | Type of Matching | Comment |
|---|---|---|---|---|---|---|---|---|---|
| >Scheduled Procedure Step End Date | 0040,0004 | DA | | X | | | | | |
| >Scheduled Procedure Step End Time | 0040,0005 | TM | | X | | | | | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | X | | | | | |
| >Scheduled Procedure Step Location | 0040,0011 | SH | | X | | | | | |
| >Scheduled Procedure Step Start Date | 0040,0002 | DA | X | X | X | X | | Single Value, Universal | Value: All, Today, Tomorrow, Yesterday |
| >Scheduled Procedure Step Start Time | 0040,0003 | TM | | X | | X | | | |
| >Scheduled Procedure Step Status | 0040,0020 | CS | | X | | | | | |
| >Scheduled Station AE Title | 0040,0001 | AE | X | X | X | | | Single Value, Universal | |
| >Scheduled Station Name | 0040,0010 | SH | | X | | | | | |
| >Scheduled Protocol Code Sequence | 0040,0008 | SQ | | X | | | | | |
| >>Code Meaning | 0008,0104 | LO | | X | | | | | |
| >>Code Value | 0008,0100 | SH | | X | | | | | |
| >>Coding Scheme Designator | 0008,0102 | SH | | X | | | | | |
| >>Coding Scheme Version | 0008,0103 | SH | | X | | | | | |
| **Requested Procedure Module** | | | | | | | | | |
| Names of Intended Recipients of Results | 0040,1010 | PN | | | | | | | |
| Patient Transport Arrangements | 0040,1004 | LO | | | | | | | |
| Reason for the Requested Procedure | 0040,1002 | LO | | | | | | | |
| Requested Procedure Comments | 0040,1400 | LT | | | | | | | |
| Requested Procedure Description | 0032,1060 | LO | | X | | X | | | |
| Requested Procedure ID | 0040,1001 | SH | X | | | | | Single Value, Universal | |
| Requested Procedure Priority | 0040,1003 | SH | | | | | | | |
| Study Instance UID | 0020,000D | UI | | X | | | | | |
| Referenced Study Sequence | 0008,1110 | SQ | | X | | | | | |
| >Referenced SOP Class UID | 0008,1150 | UI | | X | | | | | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | X | | | | | |
| Requested Procedure Code Sequence | 0032,1064 | SQ | | X | | | | | |
| >Code Meaning | 0008,0104 | LO | | X | | | | | |
| >Code Value | 0008,0100 | SH | | X | | | | | |
| >Coding Scheme Designator | 0008,0102 | SH | | X | | | | | |
| >Coding Scheme Version | 0008,0103 | SH | | X | | | | | |
| **Imaging Service Request Module** | | | | | | | | | |
| Accession Number | 0008,0050 | SH | X | X | X | X | | Single Value, Universal | |
| Imaging Service Request Comments | 0040,2400 | LT | | | | | | | |
| Issue Date of Imaging Service Request | 0040,2004 | DA | | | | | | | |
| Reason for the Imaging Service Request (RETIRED) | 0040,2001 | LO | | X | | | | | |
| Referring Physician's Name | 0008,0090 | PN | | X | | | | | |
| Requesting Physician | 0032,1032 | PN | | X | | | | | |
| Requesting Service | 0032,1033 | LO | | | | | | | |

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

**Table 15: Status Response**

| Service Status | Code | Further Meaning | Behavior |
|---|---|---|---|
| Success | 0000 | Matching is complete | The worklist is updated. |
| Failure | A700 | Refused<br>– Out of resources | The association is released. The reason is logged. |
| | A900 | Failed<br>– Identifier does not match SOP class | The association is released. The reason is logged. |
| | Cxxx | Failed<br>– Unable to process | The association is released. The reason is logged. |
| Cancel | FE00 | Matching terminated due to Cancel request | The association is released. The reason is logged. |
| Pending | FF00 | Matches are continuing<br>– Current match is supplied and any optional keys were supported in the same manner as required keys | The Query Worklist job continues. |
| | FF01 | Matches are continuing<br>– Warning that one or more optional keys were not supported for existence and/or matching for this identifier | The Query Worklist job continues. |

#### 4.2.1.3.1.3.2. Patient and Study Merge

The ELEVA AE looks in its internal database for a Study with the same Study Instance UID (0020,000D) as given in the Scheduled Procedure Step.

If a Study Instance UID match was not found, it looks for a Patient with the same Patient ID (0010,0020) as given in the Scheduled Procedure Step. If no Patient match is found, a new Patient is created, using attributes from Scheduled Procedure Step. If Patient with a matching Patient ID was found, attributes are updated for the internal Patient, based on the attributes as given in the Scheduled Procedure Step.
A new Study with a Study Instance UID as given in the Scheduled Procedure Step is created.

If a Study Instance UID match was found, all Patient attributes as given in the Scheduled Procedure Step are updated in the internal database for the parent patient of this study. Study attributes are updated for the internal study based on the attributes as given in the Scheduled Procedure Step.

#### 4.2.1.3.1.3.3. Scheduled Procedure Step (= Examination) Merge

If the ELEVA AE's internal database contains no SPS with Scheduled Procedure Step ID (0040,0009) identifying an incoming Scheduled Procedure Step, it creates a new one and creates an corresponding Examination referencing this Scheduled Procedure Step ID.

If the ELEVA AE's internal database contains already an SPS with the Scheduled Procedure Step ID (0040,0009) identifying an incoming Scheduled Procedure Step, the behavior depends on the corresponding Examination state.

If the Examination is still "scheduled", the SPS attributes are compared to the attributes sent with the most recent WLM query. If at least one attribute differs, the scheduled Examination is deleted and re-scheduled. Manual changes the user might have performed on this Examination are lost.

If the Examination has already started, no changes are performed, and the potential changes of the incoming Scheduled Procedure Step are disregarded.

#### 4.2.1.3.1.3.4. Dataset Specific Conformance for Modality Worklist (Broadcast Query) C-FIND SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
The table below should be read as follows:
Attribute Name: Attributes supported to build a Modality Worklist Request Identifier.
Tag: DICOM tag for this attribute.
VR: DICOM VR for this attribute.
M: Matching Keys for (automatic) Worklist Update.
R: Return Keys. An “X” will indicate that this attribute as Return Key with zero length for Universal Matching.
Q: Interactive Query Key. An “X” will indicate that this attribute as matching key can be used.
D: Displayed Keys. An “X” indicates that this Worklist attribute is displayed to the user during a patient registration dialog.
IOD: An “X” indicates that this Worklist attribute is included into all object Instances created during performance of the related Procedure Step.
Type of matching: The following types of matching exists:
Single Value Matching
List of UID Matching
Wild Card Matching
Range Matching
Sequence Matching
Universal Matching

**Table 16: Worklist Request Identifier**

| Attribute Name | Tag | VR | M | R | Q | D | IOD | Type of Matching | Comment |
|---|---|---|---|---|---|---|---|---|---|
| **SOP Common Module** | | | | | | | | | |
| Specific Character Set | 0008,0005 | CS | | | | | | | |
| **Patient Identification Module** | | | | | | | | | |
| Issuer of Patient ID | 0010,0021 | LO | | | | | | | |
| Other Patient IDs | 0010,1000 | LO | | | | | | | |
| Patient ID | 0010,0020 | LO | | | | X | | | |
| Patient's Name | 0010,0010 | PN | | | | X | | | Last name, First name, Prefix, Middle name, Suffix |
| **Patient Demographic Module** | | | | | | | | | |
| Confidentiality Constraint on Patient Data Description | 0040,3001 | LO | | | | | | | |
| Ethnic Group | 0010,2160 | SH | | | | | | | |
| Patient Comments | 0010,4000 | LT | | | | | | | |
| Patient's Age | 0010,1010 | AS | | | | | | | |
| Patient's Birth Date | 0010,0030 | DA | | | | X | | | |
| Patient's Sex | 0010,0040 | CS | | | | X | | | |
| Patient's Size | 0010,1020 | DS | | | | | | | |
| Patient's Weight | 0010,1030 | DS | | | | X | | | |
| **Patient Medical Module** | | | | | | | | | |
| Additional Patient History | 0010,21B0 | LT | | | | | | | |
| Contrast Allergies | 0010,2110 | LO | | | | | | | |
| Medical Alerts | 0010,2000 | LO | | | | X | | | |

| Attribute Name | Tag | VR | M | R | Q | D | IOD | Type of Matching | Comment |
|---|---|---|---|---|---|---|---|---|---|
| Pregnancy Status | 0010,21C0 | US | | | | X | | | |
| Special Needs | 0038,0050 | LO | | | | | | | |
| **Visit Status Module** | | | | | | | | | |
| Current Patient Location | 0038,0300 | LO | | | | | | | |
| **Scheduled Procedure Step Module** | | | | | | | | | |
| Scheduled Procedure Step Sequence | 0040,0100 | SQ | | | | | | | |
| >Comments on the Scheduled Procedure Step | 0040,0400 | LT | | | | | | | |
| >Modality | 0008,0060 | CS | | | | | | | |
| >Pre-Medication | 0040,0012 | LO | | | | | | | |
| >Requested Contrast Agent | 0032,1070 | LO | | | | | | | |
| >Scheduled Performing Physician's Name | 0040,0006 | PN | | | | X | | | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | | | | | | |
| >Scheduled Procedure Step End Date | 0040,0004 | DA | | | | | | | |
| >Scheduled Procedure Step End Time | 0040,0005 | TM | | | | | | | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | | | | | | |
| >Scheduled Procedure Step Location | 0040,0011 | SH | | | | | | | |
| >Scheduled Procedure Step Start Date | 0040,0002 | DA | | | | | | | |
| >Scheduled Procedure Step Start Time | 0040,0003 | TM | | | | | | | |
| >Scheduled Procedure Step Status | 0040,0020 | CS | | | | | | | |
| >Scheduled Station AE Title | 0040,0001 | AE | | | | | | | |
| >Scheduled Station Name | 0040,0010 | SH | | | | | | | |
| >Scheduled Protocol Code Sequence | 0040,0008 | SQ | | | | | | | |
| >>Code Meaning | 0008,0104 | LO | | | | | | | |
| >>Code Value | 0008,0100 | SH | | | | | | | |
| >>Coding Scheme Designator | 0008,0102 | SH | | | | | | | |
| >>Coding Scheme Version | 0008,0103 | SH | | | | | | | |
| **Requested Procedure Module** | | | | | | | | | |
| Names of Intended Recipients of Results | 0040,1010 | PN | | | | | | | |
| Patient Transport Arrangements | 0040,1004 | LO | | | | | | | |
| Reason for the Requested Procedure | 0040,1002 | LO | | | | | | | |
| Requested Procedure Comments | 0040,1400 | LT | | | | | | | |
| Requested Procedure Description | 0032,1060 | LO | | | | | | | |
| Requested Procedure ID | 0040,1001 | SH | | | | | | | |
| Requested Procedure Priority | 0040,1003 | SH | | | | | | | |
| Study Instance UID | 0020,000D | UI | | | | | | | |
| Referenced Study Sequence | 0008,1110 | SQ | | | | | | | |
| >Referenced SOP Class UID | 0008,1150 | UI | | | | | | | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | | | | | | |
| Requested Procedure Code Sequence | 0032,1064 | SQ | | | | | | | |
| >Code Meaning | 0008,0104 | LO | | | | | | | |
| >Code Value | 0008,0100 | SH | | | | | | | |
| >Coding Scheme Designator | 0008,0102 | SH | | | | | | | |
| >Coding Scheme Version | 0008,0103 | SH | | | | | | | |

| Attribute Name | Tag | VR | M | R | Q | D | IOD | Type of Matching | Comment |
|---|---|---|---|---|---|---|---|---|---|
| **Imaging Service Request Module** | | | | | | | | | |
| Accession Number | 0008,0050 | SH | | | | X | | | |
| Imaging Service Request Comments | 0040,2400 | LT | | | | | | | |
| Issue Date of Imaging Service Request | 0040,2004 | DA | | | | | | | |
| Reason for the Imaging Service Request (RETIRED) | 0040,2001 | LO | | | | | | | |
| Referring Physician's Name | 0008,0090 | PN | | | | X | | | |
| Requesting Physician | 0032,1032 | PN | | | | X | | | |
| Requesting Service | 0032,1033 | LO | | | | | | | |

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

**Table 17: Status Response**

| Service Status | Code | Further Meaning | Behavior |
|---|---|---|---|
| Success | 0000 | Matching is complete | The worklist is updated. |
| Failure | A700 | Refused<br>– Out of resources | The association is released. The reason is logged. |
| | A900 | Failed<br>– Identifier does not match SOP class | The association is released. The reason is logged. |
| | Cxxx | Failed<br>– Unable to process | The association is released. The reason is logged. |
| Cancel | FE00 | Matching terminated due to Cancel request | The association is released. The reason is logged. |
| Pending | FF00 | Matches are continuing<br>– Current match is supplied and any optional keys were supported in the same manner as required keys | The Query Worklist job continues. |
| | FF01 | Matches are continuing<br>– Warning that one or more optional keys were not supported for existence and/or matching for this identifier | The Query Worklist job continues. |

#### 4.2.1.3.1.3.5. Dataset Specific Conformance for Modality Worklist Information Model - FIND C-CANCEL SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

There is no specific DICOM information available for the C-CANCEL dataset.

#### 4.2.1.3.2. (Real-World) Activity – Modality Performed Procedure Step As SCU

##### 4.2.1.3.2.1. Description and Sequencing of Activities

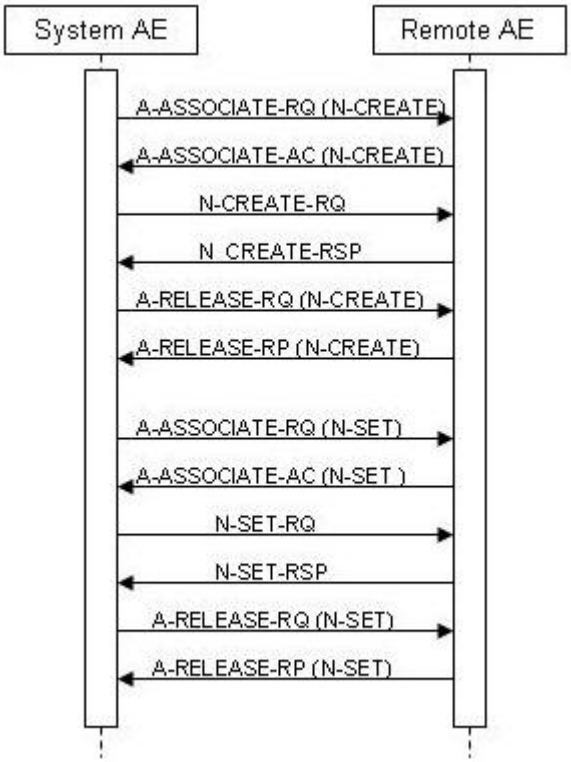


**Figure 5: (Real World) Activity - Modality Performed Procedure Step as SCU**

**Description of Activities**

An PCR Eleva "Examination" is regarded equivalent to a DICOM Procedure Step. It is scheduled or manually entered before an acquisition is taken, and performed by taking acquisitions. If scheduled by the RIS, one Examination is the result of one Scheduled Procedure Step. Since an examination may not be re-opened after having been closed, and each examination workflow context is enclosed in one MPPS, one examination may result in 0:1 MPPS instances. However, image archiving after the examination's closure leads to 1:n MPPS instances per examination (append case).

After the image for a Scheduled Procedure Step has been acquired, the system sets the MPPS status of the related examination to "IN PROGRESS" and generates an initial MPPS IN PROGRESS message. The system does not generate intermediate MPPS IN PROGRESS messages for subsequent acquisitions of this Scheduled Procedure Step instance.

After finishing the appropriate acquisition(s), the system will change the MPPS status of the related examination to "COMPLETED" and generate an MPPS N-SET-FINAL message.
PCR Eleva also generates MPPS messages for unscheduled examinations.

The MPPS COMPLETED message will list the UID's of all related DICOM archived images and the format of (optionally) generated direct prints.

After abandoning or discontinuing a procedure step, the operator may set the MPPS status of the related examination to "DISCONTINUED" and the system generates a MPPS DICONTINUED message. The reason for abandoning or discontinuing a

procedure step is unspecified.

The operator may interchange the performed sequence order of scheduled procedure steps.

MPPS messages may interleave. Depending on the application workflow optimization by the user, an MPPS sequence like this may come up:

MPPS / SOP Instance UID 1: N-CREATE (IN PROGRESS)
MPPS / SOP Instance UID 2: N-CREATE (IN PROGRESS)
MPPS / SOP Instance UID 3: N-CREATE (IN PROGRESS)
...
MPPS / SOP Instance UID 2: N-SET (COMPLETED)
MPPS / SOP Instance UID 1: N-SET (COMPLETED)
MPPS / SOP Instance UID 3: N-SET (COMPLETED)
(i.e.: running multiple procedure steps 'in parallel').

**Sequencing of Activities**
After storing a performed procedure step the ELEVA AE shall request an association with the configured remote Study Management SCP. After accepting the association the ELEVA AE shall send a Create request, wait for response, and then release the association.

#### 4.2.1.3.2.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

**Table 18: Proposed Presentation Contexts for (Real-World) Activity – Modality Performed Procedure Step As SCU**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| Modality Performed Procedure Step SOP Class | 1.2.840.10008.3.1.2.3.3 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |

#### 4.2.1.3.2.3. SOP Specific Conformance for Modality Performed Procedure Step SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.
When acquiring the first image of a Scheduled or Unscheduled Procedure Step, PCR Eleva generates a MPPS IN PROGRESS message.
PCR Eleva does not generate intermediate IN PROGRESS (N-SET) messages and does not support the Performed Procedure Step Exception Management Option. PCR Eleva has no Billing Code Tables and does not support the Performed Procedure Step Billing and Material Management Option, except default values for Medium Type (2000,0030) and Film Size ID (2010,0050), if optional Local Print is configured.

**Assisted Acquisition Protocol Setting Option**
ELEVA AE by default derives the specific acquisition protocol from the Scheduled Protocol Code Sequence Items. Any single Item results in an Examination.
ELEVA AE supports 3 more (configurable) mapping relations, as shown below:

- Examination is selected from Scheduled Protocol Code Items->Code Value (0040,0008) (default)

- Examination is selected from Scheduled Procedure Step Description (0040,0007)
- Examination is selected from Requested Procedure Code Items->Code Value (0032,1064)
- Examination is selected from Requested Procedure Description (0032,1060)

ELEVA AE does not evaluate the attributes Coding Scheme Version (0008,0103), Coding Scheme Designator (0008,0102), Code Meaning (0008,0104), but only the Code Value (0008,0100), for mapping the examination settings. I.e. ELEVA AE expects that any used Code Value is unique (unambiguous) within a given RIS domain.

**Restrictions Depending on Number of Scheduled Protocol Code Items**
It is highly recommended that the Scheduled Procedure Step contains only 1 Item in the Scheduled Protocol Code Sequence.

If the Scheduled Procedure Step contains <n> items in the Scheduled Protocol Code Sequence, the Scheduled Procedure Step is split into <n> examinations, where any single examination shows only 1 of the Scheduled Protocol Code Items, but all the other attributes are the same.
When such an examination is returned back via MPPS, also the Performed Protocol Code Sequence will show only 1 item. If all <n> Scheduled Procedure Step Code Items are performed, <n> MPPS instances will be sent back to the RIS, and the sum of all Performed Protocol Code Items will be <n>.

#### 4.2.1.3.2.3.1. Dataset Specific Conformance for Modality Performed Procedure Step N-CREATE SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

**Table 19: MPPS Request Identifiers for N-CREATE-RQ**

| Attribute Name | Tag | VR | Value | Comment |
|---|---|---|---|---|
| **Performed Procedure Step Information Module** | | | | |
| Performed Location | 0040,0243 | SH | | EMPTY |
| Performed Procedure Step Description | 0040,0254 | LO | | |
| Performed Procedure Step End Date | 0040,0250 | DA | | Finish of the examination |
| Performed Procedure Step End Time | 0040,0251 | TM | | Finish of the examination |
| Performed Procedure Step ID | 0040,0253 | SH | | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | Start of the examination |
| Performed Procedure Step Start Time | 0040,0245 | TM | | Start of the examination |
| Performed Procedure Step Status | 0040,0252 | CS | | |
| Performed Procedure Type Description | 0040,0255 | LO | | |
| Performed Station AE Title | 0040,0241 | AE | Eleva | |
| Performed Station Name | 0040,0242 | SH | | EMPTY |
| Procedure Code Sequence | 0008,1032 | SQ | | |
| >Code Meaning | 0008,0104 | LO | | |
| >Code Value | 0008,0100 | SH | | |
| >Coding Scheme Designator | 0008,0102 | SH | | |
| >Coding Scheme Version | 0008,0103 | SH | | |

| Attribute Name | Tag | VR | Value | Comment |
|---|---|---|---|---|
| **Radiation Dose Module** | | | | |
| Entrance Dose | 0040,0302 | US | | |
| Image and Fluoroscopy Area Dose Product | 0018,115E | DS | | Hot sent in case of appended MPPS Instances |
| Total Number of Exposures | 0040,0301 | US | | |
| Total Time of Fluoroscopy | 0040,0300 | US | | |
| Exposure Dose Sequence | 0040,030E | SQ | | |
| **SOP Common Module** | | | | |
| Specific Character Set | 0008,0005 | CS | | Optional |
| **Performed Procedure Step Relationship Module** | | | | |
| Patient ID | 0010,0020 | LO | | |
| Patient's Birth Date | 0010,0030 | DA | | |
| Patient's Name | 0010,0010 | PN | | |
| Patient's Sex | 0010,0040 | CS | | |
| Referenced Patient Sequence | 0008,1120 | SQ | | |
| Scheduled Step Attributes Sequence | 0040,0270 | SQ | | |
| >Accession Number | 0008,0050 | SH | | |
| >Requested Procedure Description | 0032,1060 | LO | | |
| >Requested Procedure ID | 0040,1001 | SH | | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | |
| >Study Instance UID | 0020,000D | UI | | |
| >Referenced Study Sequence | 0008,1110 | SQ | | |
| >>Referenced SOP Class UID | 0008,1150 | UI | | |
| >>Referenced SOP Instance UID | 0008,1155 | UI | | |
| >Scheduled Protocol Code Sequence | 0040,0008 | SQ | | |
| >>Code Meaning | 0008,0104 | LO | | |
| >>Code Value | 0008,0100 | SH | | |
| >>Coding Scheme Designator | 0008,0102 | SH | | |
| **Image Acquisition Results Module** | | | | |
| Modality | 0008,0060 | CS | | |
| Study ID | 0020,0010 | SH | | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | |
| >Code Meaning | 0008,0104 | LO | | |
| >Code Value | 0008,0100 | SH | | |
| >Coding Scheme Designator | 0008,0102 | SH | | |
| >Coding Scheme Version | 0008,0103 | SH | | |
| Performed Series Sequence | 0040,0340 | SQ | | |
| **Billing And Material Management Code Module** | | | | |
| Film Consumption Sequence | 0040,0321 | SQ | | |
| **Additional Module** | | | | |
| Issuer of Patient ID | 0010,0021 | LO | | |

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

**Table 20: Status Response**

| Service Status | Code | Further Meaning | Behavior |
|---|---|---|---|
| Success | 0000 | Successful operation | The SCP has successfully received the modality performed procedure step create request. Log entry. |
| Failure | 0213 | Resource limitation | The command is reported to the user as failed. The reason is logged.<br>After a configured period of time the storage will be retried up to a configured number of times. |
| | xxxx | Any failure accept | The command is reported to the user as failed. The reason is logged. No retry. |

#### 4.2.1.3.2.3.2. Dataset Specific Conformance for Modality Performed Procedure Step N-SET SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

**Table 21: MPPS Request Identifiers for N-SET-RQ**

| Attribute Name | Tag | VR | Value | Comment |
|---|---|---|---|---|
| **Performed Procedure Step Information Module** | | | | |
| Performed Procedure Step Description | 0040,0254 | LO | | |
| Performed Procedure Step End Date | 0040,0250 | DA | | |
| Performed Procedure Step End Time | 0040,0251 | TM | | |
| Performed Procedure Step Status | 0040,0252 | CS | | |
| Procedure Code Sequence | 0008,1032 | SQ | | |
| >Code Meaning | 0008,0104 | LO | | |
| >Code Value | 0008,0100 | SH | | |
| >Coding Scheme Designator | 0008,0102 | SH | | |
| **Radiation Dose Module** | | | | |
| Entrance Dose | 0040,0302 | US | | |
| Image and Fluoroscopy Area Dose Product | 0018,115E | DS | | Not accumulating: re-processed images, non-digital images. Not sent in case of appended MPPS instances. |
| Total Number of Exposures | 0040,0301 | US | | Not accumulating: re-processed images, non-digital images. Not sent in case of appended MPPS instances. |
| Total Time of Fluoroscopy | 0040,0300 | US | | |
| Exposure Dose Sequence | 0040,030E | SQ | | |
| **Image Acquisition Results Module** | | | | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | |
| >Code Meaning | 0008,0104 | LO | | |
| >Code Value | 0008,0100 | SH | | |
| >Coding Scheme Designator | 0008,0102 | SH | | |
| Performed Series Sequence | 0040,0340 | SQ | | |
| >Operators' Name | 0008,1070 | PN | | N-Values |
| >Performing Physician's Name | 0008,1050 | PN | | |
| >Protocol Name | 0018,1030 | LO | | Copied from Perf. Act. Item code Value. |

| Attribute Name | Tag | VR | Value | Comment |
|---|---|---|---|---|
| >Retrieve AE Title | 0008,0054 | AE | | |
| >Series Description | 0008,103E | LO | | |
| >Series Instance UID | 0020,000E | UI | | |
| >Referenced Image Sequence | 0008,1140 | SQ | | In No-Tome Examinations 1 item only. In Tome-Examinations N items. Missing after conventional acquisition. |
| >Referenced Non-Image Composite SOP Instance Sequence | 0040,0220 | SQ | | |
| **Billing And Material Management Code Module** | | | | |
| Film Consumption Sequence | 0040,0321 | SQ | | |
| >Film Size ID | 2010,0050 | CS | | |
| >Medium Type | 2000,0030 | CS | | |
| >Number of Films | 2100,0170 | IS | | |

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

**Table 22: Status Response**

| Service Status | Code | Further Meaning | Behavior |
|---|---|---|---|
| Success | 0000 | Confirmation | The association is released. |
| Failure | 0110 | Processing failure – performed procedure step object may no longer be updated | The reason is logged. |
| | xxxx | (any other failure) | The reason is logged. |

#### 4.2.1.3.3. (Real-World) Activity – Storage Commitment Push Model AS SCU

##### 4.2.1.3.3.1. Description and Sequencing of Activities

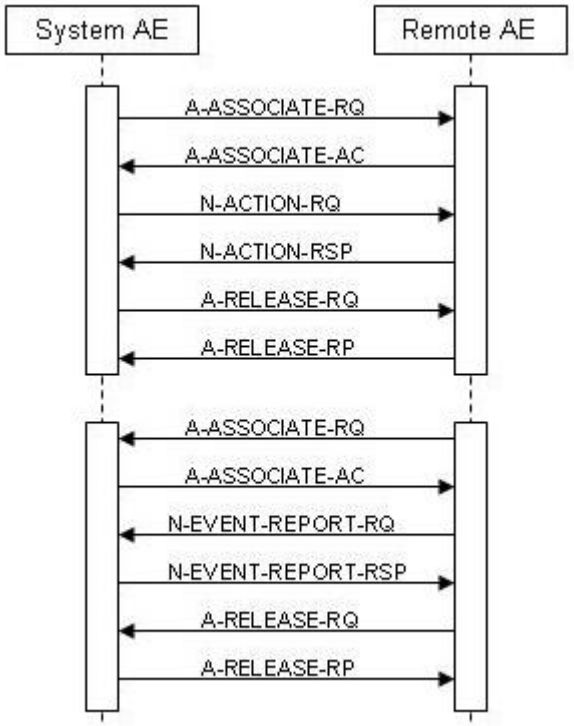


**Figure 6: (Real World) Activity - Asynchronious Storage Commitment Push model as SCU**

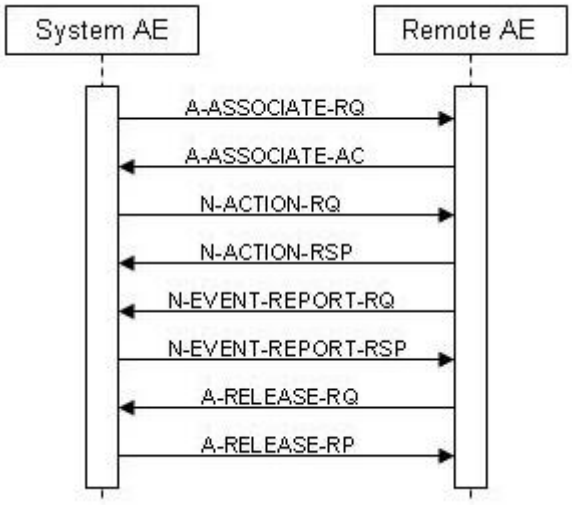


**Figure 7: (Real World) Activity - Synchronious Storage Commitment Push model as SCU**

Archive means that PCR Eleva stores images with Storage Commitment.
This RWA may be initiated in two ways.

- Manually in the viewer, after clicking the Store button the ELEVA AE will store the selected images at the selected Storage SCP.

- Automatically during an examination, after clicking the Confirm button the ELEVA AE will automatically store the related images of the performed procedure step at the configured Storage SCP.

The ELEVA AE will request an association with the remote Storage SCP for the applicable Storage SOP classes. After accepting the association the ELEVA AE will send the store request, wait for response, and then release the association. The store response status may be inspected on the UI. The transferred image shall not be deleted from the system until the Storage Commit N-Event is received.

Depending on the status of the store the ELEVA AE may queue store requests for retries. The queued store requests can be cancelled from the UI.

When an archive supports DICOM Storage Commitment, this node can be configured for it. For each image that is sent to this node, also a Storage Commitment Request is sent. The image is delete-protected until the Storage Commit Response has been received. The current status is shown in the Image Info Panel.
In case of a wrong configuration (an archive is configured to support Storage Commitment, but does not really do so), the MIP component recognizes this, and our application sees a successful Storage Commitment.

#### 4.2.1.3.3.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

**Table 23: Proposed Presentation Contexts for (Real-World) Activity – Storage Commitment Push Model AS SCU**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| **Abstract Syntax** | | **Transfer Syntax** | | **Role** | **Extended Negotiation** |
| **Name** | **UID** | **Name List** | **UID List** | | |
| Storage Commitment Push Model SOP Class | 1.2.840.10008.1.20.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |

#### 4.2.1.3.3.3. SOP Specific Conformance for Storage Commitment Push Model SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

##### 4.2.1.3.3.3.1. Dataset Specific Conformance for Storage Commitment Push Model N-ACTION SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

**Table 24: Storage Commitment Attribute for N-ACTION-RQ**

| Attribute Name | Tag | Comment |
|---|---|---|
| **Storage Commitment Module** | | |
| Transaction UID | 0008,1195 | |
| Referenced SOP Sequence | 0008,1199 | |
| >Referenced SOP Class UID | 0008,1150 | |
| >Referenced SOP Instance UID | 0008,1155 | |

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

**Table 25: Status Response**

| Service Status | Code | Further Meaning | Behavior |
|---|---|---|---|
| Success | 0000 | Storage is complete | UI status is updated |
| Refused | A7xx | Out of resources | The association is released. The reason is logged. The user is informed. |
| Error | A9xx | Data set does not match SOP class | The association is released. The reason is logged. The user is informed. |
| | Cxxx | Cannot understand | The association is released. The reason is logged. The user is informed. |
| Warning | B000 | Coercion of data elements | The association is released. The reason is logged. The user is informed. |
| | B006 | Elements discarded | The association is released. The reason is logged. The user is informed. |
| | B007 | Data set does not match SOP class | The association is released. The reason is logged. The user is informed. |

#### 4.2.1.3.3.2. Dataset Specific Conformance for Storage Commitment Push Model N-EVENT-REPORT SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.

No specific information available

### 4.2.1.3.4. (Real-World) Activity – Image Export

#### 4.2.1.3.4.1. Description and Sequencing of Activities

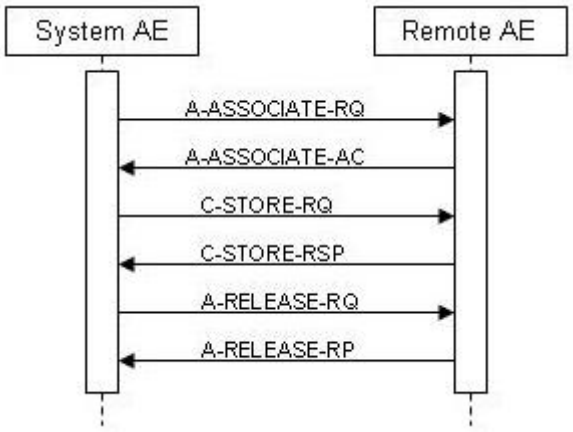


**Figure 8: (Real World) Activity - Image Export**

Export means that PCR Eleva stores images without Storage Commitment.
This RWA may be initiated in two ways.

- Manually in the viewer, after clicking the Store button the ELEVA AE will store the selected images at the selected Storage SCP.

- Automatically during an examination, after clicking the Confirm button the ELEVA AE will automatically store the related images of the performed procedure step at the configured Storage SCP.

The ELEVA AE will request an association with the remote Storage SCP for the applicable Storage SOP classes. After accepting the association the ELEVA AE will send the store request, wait for response, and then release the association. The store response status may be inspected on the UI.

Depending on the status of the store the ELEVA AE may queue store requests for retries. The queued store requests can be cancelled from the UI.

#### 4.2.1.3.4.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

**Table 26: Proposed Presentation Contexts for (Real-World) Activity – Image Export**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| **Abstract Syntax** | | **Transfer Syntax** | | **Role** | **Extended Negotiation** |
| **Name** | **UID** | **Name List** | **UID List** | | |
| Computed Radiography Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| Digital Mammography X-Ray Image Storage - Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.2 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| Digital Mammography X-Ray Image Storage - Proc. SOP | 1.2.840.10008.5.1.4.1.1.1.2.1 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| Digital X-Ray Image Storage - For Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.1 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| Digital X-Ray Image Storage - For Proc. SOP | 1.2.840.10008.5.1.4.1.1.1.1.1 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| Secondary Capture Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.7 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |

By default, all images are DICOM Stored according to the SOP Class Digital XRay. CR Image attributes that are undefined for DX Images are stored in private attributes.

As a configurable choice, Images can be stored as Computed Radiology SOP Class. This capability is required to be compatible with installed radiology equipment. DX Image attributes that are undefined for CR Images are then stored in private attributes.

For DICOM CR images there is a constraint that a change in position, detector, body part or laterality implies a new series. This has been relaxed for DX images through the use of the 'DX Anatomy Imaged' and 'DX Positioning' Modules, which define attributes at image level.

The DX Image IOD is used in two SOP Classes as defined in the DICOM Standard, a SOP Class for storage of images intended for Presentation, and a SOP Class for storage of images intended for further Processing before presentation.
These are distinguished by their SOP Class UID and by the Enumerated Value of the

mandatory Attribute in the DX Series Module, Presentation Intent Type (0008,0068).

Another choice can be DICOM Stored according to Secondary Capture SOP Class. This capability is required to be compatible with installed radiology equipment. Optionally only the attributes defined for Secondary Capture Images or all attributes are stored.

The PCR Eleva Release 1.2 can also create Mammography Images by the Digital Mammography X-Ray Image IOD. Same as the DX Image IOD is this used in two SOP classes. For storage of images intended for Presentation and a SOP Class for storage of images intended for further Processing before presentation.
These are distinguished by their SOP Class UID and by the Enumerated Value of the mandatory Attribute in the DX Series Module, Presentation Intent Type (0008,0068).

It is possible to export / store one single image first as a DICOM CR and secondly as a DICOM DX object, therefore the SOP Instance UIDs of both DICOM image instances have to be different.

The Numbering Scheme shall support 'Hanging Protocols' of PACS systems & Viewing Stations, in case of the CR as well as the DX model:
1. The Series Number shall start with 1 for the first Series of every Study Instance, identified by StudyInstanceUID.
2. The Series Number shall increase by 1 for every new Series Instance within the same Study Instance, by the timely order, the Series Instances are created.
3. The Image Number shall start with 1 for every new Series Instance.
4. The Image Number shall increase by 1 for every new Image Instance within the same Series Instance, by the timely order, the Images are created.

For DX SOP Class is in the DICOM Standard defined:
The Digital X-Ray (DX) Image Information Object Definition specifies an image that has been created by a digital projection radiography imaging device.
Notes:

- This includes but is not limited to: chest radiography, linear and multi-directional tomography, orthopantomography and skeletal radiography. Acquisition of image data may include but is not limited to: CCD-based sensors, stimulable phosphor imaging plates, amorphous selenium, scintillation based amorphous silicon and secondary capture of film-based images.
- Specific IODs are defined for intra-oral radiography and mammography that further specialization of the DX IOD.

A DX image shall consist of the result of a single X-Ray exposure, in order to ensure that the anatomical and orientation attributes are meaningful for the image, permitting safe annotation, appropriate image processing and appropriate dissemination.
Notes:

- The requirement for the PCR Eleva specifically deprecates the common film/screen and Computed Radiography practice of making multiple exposures on different areas of a cassette or plate by using lead occlusion between exposures. Such acquisitions could be separated and transformed into multiple DX images during an appropriate quality assurance step by an operator.
- The requirement for the PCR Eleva does not deprecate the acquisition of multiple paired structures during a single exposure, provided that they can be described by the relevant orientation attributes. For example, an AP or PA projection of both hands side by side is typically obtained in a single exposure,

and can be described by a Patient Orientation (0020,0020) of R\H or L\H since both hands are in the same traditional Anatomical Position.

#### 4.2.1.3.4.3. SOP Specific Conformance for Storage SOP Classes

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

##### 4.2.1.3.4.3.1. Dataset Specific Conformance for C-STORE-RQ

Detail regarding the Dataset Specific response behavior will be reported in this section.
This includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

**Table 27: Status Response**

| Service Status | Error code | Further Meaning | Behavior |
|---|---|---|---|
| Success | 0000 | Storage is complete | UI status is updated. |
| Failure | A7xx | Refused: Out of Resources | The association is released. The reason is logged. The user is informed. |
| | A9xx | Error: Data Set does not match SOP Class | The association is released. The reason is logged. The user is informed. |
| | Cxxx | Error: cannot understand | The association is released. The reason is logged. The user is informed. |
| Warning | B000 | Coercion of Data Elements | The association is released. The reason is logged. The user is informed. |
| | B007 | Data Set does not match SOP Class | The association is released. The reason is logged. The user is informed. |
| | B006 | Elements Discarded | The association is released. The reason is logged. The user is informed. |

The status can be inspected via the user interface.

#### 4.2.1.3.5. (Real-World) Activity – Print Management as SCU

##### 4.2.1.3.5.1. Description and Sequencing of Activities

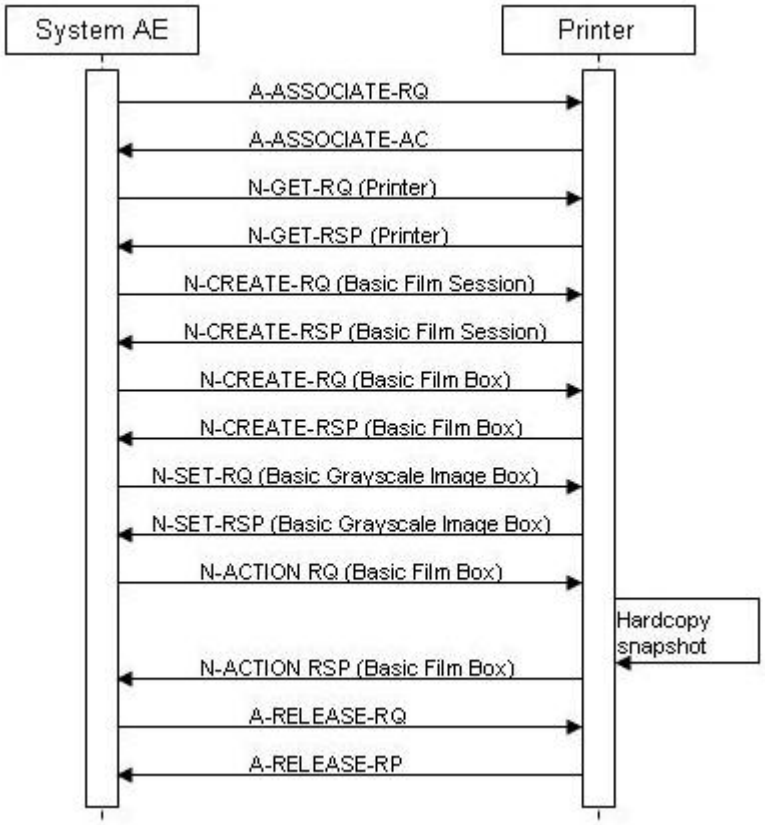


**Figure 9: (Real World) Activity - Print Management as SCU**

The Eleva AE cannot handle any N-EVENT-REPORT messages.
A print job (film session) comprises one single film box with one single image (that is composed of 1..N modality images).

The print component in PCR Eleva supports a highly automated print from acquisition operation mode, which does not interrupt the clinical acquisition workflow.
Supplementary to that is the manual print operation mode that is to be used as advanced interactive print preview and as reprint facility.
There shall be two modes of configuration for automatic printing: auto and easy print.
In auto print mode conflicting and incomplete print jobs are either printed "as is" or must be manually corrected and confirmed.
In easy print mode all automatically started print jobs have to be confirmed manually.
The behavior of the print GUI on entry is dependent on the configuration not on the workflow context.
The three different print modes are:

- No auto print jobs active: Screen is empty.
- Auto print configured: All incomplete pages and conflict jobs are seen for that patient.
- Easy print configured: All current print jobs are seen for that patient.

By Manual Printing the basic composition of films is possible with click and point functions.
To allow for more automation, auto-arranging (AA) is required.
AA takes the configured defaults (2x1P 14x17) and loads the images automatically.
User can make multiple selections of images or all images select/deselect and

pressed "arrange". Images are taken for AA in the order they have been selected, if this is relevant for the
Templates if ALL images are selected, then they are taken in order from top left to lower right in rows.
After AA the result can be modified manually.

By Auto Print the operation mode the handling of conflicts between configuration and operation is configurable. This means:
If the collimation and thus the image are larger as originally configured it can be configured if the image shall be cut, scaled or the print job with the conflict shall be manually corrected and confirmed.
If the operator omits one of the routine views configured and a page is thus left half-filled it can be configured if the page is going to be printed half-filled, if a layout suitable for the number of available images is chosen instead or if the page must be manually changed and confirmed.
In case of a manual check configured conflict jobs are sent to the print GUI and handled like the Easy Print. Outstanding jobs are shown to the user by:

- An icon in the patient list at every affected patient / study
- User guidance giving patient name of unprinted film at the time the film ready to be printed

By Easy Print all print jobs are sent to the Print UI for checking first.
The user is not forced to go there, but outstanding jobs are shown to the user by:

- An icon in the patient list at every affected patient / study
- User guidance giving patient name of unprinted film at the time the film ready to be printed

Depending on the response status of set and the configuration the Eleva AE may perform a retry.

#### 4.2.1.3.5.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

**Table 28: Proposed Presentation Contexts for (Real-World) Activity – Print Management As SCU**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| **Abstract Syntax** | | **Transfer Syntax** | | **Role** | **Extended Negotiation** |
| **Name** | **UID** | **Name List** | **UID List** | | |
| Basic Grayscale Print Management Meta SOP Class | 1.2.840.10008.5.1.1.9 | | | SCU | None |
| >Basic Film Box SOP Class | 1.2.840.10008.5.1.1.2 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| >Basic Film Session SOP Class | 1.2.840.10008.5.1.1.1 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| >Basic Grayscale Image Box SOP Class | 1.2.840.10008.5.1.1.4 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |
| >Printer SOP Class | 1.2.840.10008.5.1.1.16 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | | |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |

**Table 29: DICOM Command Response Status Handling behavior for Grayscale Print Manangement Meta SOP Class**

| Service Status | Error Code | Further Meaning | Behavior |
|---|---|---|---|
| Success | 0000 | Successful operation | The print job continues. |
| Failure | xxxx | Any failure | In the AutoPrint mode a GUI is invoked. The status panel of this GUI displays a message based on the 'Further Meaning' The warning or failure response of a print request that is invoked by the Manual Print Composer GUI will be displayed by a pop-up window (if the user has not closed the GUI before the printer status was delivered). |
| Warning | xxxx | Any warning | In the AutoPrint mode a GUI is invoked. The status panel of this GUI displays a message based on the 'Further Meaning'. The warning or failure response of a print request that is invoked by the Manual Print Composer GUI will be displayed by a pop-up window (if the user has not closed the GUI before the printer status was delivered. |

The behavior of the Application Entity during communication failure for printing is summarized in next table.

**Table 30: DICOM Command Communication Failure Behavior for Printing SCU**

| Exception | Behavior |
|---|---|
| Timeout | The Association is aborted using A-ABORT and the command is marked as failed. The reason is logged. After a maximum number of retries the user is notified via pop-up (in preview mode only). |
| Association aborted | The command is marked as failed. The reason is logged. After a maximum number of retries the user is notified via pop-up (in preview mode only) |
| Failed to connect | Log entry. After a maximum number of retries the user is notified via pop-up (in preview mode only). |

This section specifies each IOD created (including private IOD's).

Abbreviations used in the Module table for the column "Presence of Value" are:

| | |
|---|---|
| ALWAYS | The attribute is always present with a value |
| EMPTY | The attribute is always present without any value (attribute sent zero length) |
| VNAP | The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present) |
| ANAP | The attribute is present under specified condition – if present then it will always have a value |
| VNAPCV | The attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present) |
| ANAPEV | The attribute is present under specified condition – if present then it will not have any value |

The abbreviations used in the Module table for the column "Source" are:

| | |
|---|---|
| AUTO | The attribute value is generated automatically |
| CONFIG | The attribute value source is a configurable parameter |
| COPY | The attribute value source is another SOP instance |
| FIXED | The attribute value is hard-coded in the application |
| IMPLICIT | The attribute value source is a user-implicit setting |
| MPPS | The attribute value is the same as that use for Modality Performed Procedure Step |
| MWL | The attribute value source is a Modality Worklist |
| USER | The attribute value source is explicit user input |

#### 4.2.1.3.5.3. SOP Specific Conformance for Basic Film Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

##### 4.2.1.3.5.3.1. Dataset Specific Conformance for Basic Film Box N-CREATE SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

**Table 31: Basic Film Box Presentation Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Configuration Information | 2010,0150 | ST | | ALWAYS | CONFIG | |
| Film Orientation | 2010,0040 | CS | | ALWAYS | CONFIG | |
| Film Size ID | 2010,0050 | CS | | ALWAYS | CONFIG | |
| Image Display Format | 2010,0010 | ST | | ALWAYS | CONFIG | |
| Magnification Type | 2010,0060 | CS | | ALWAYS | CONFIG | |
| Max Density | 2010,0130 | US | | ALWAYS | CONFIG | |
| Trim | 2010,0140 | CS | | ALWAYS | CONFIG | |

**Table 32: Basic Film Box Relationship Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Referenced Film Session Sequence | 2010,0500 | SQ | | ALWAYS | AUTO | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ALWAYS | AUTO | |
| >Referenced SOP Instance UID | 0008,1155 | UI | 1.2.840.10008.5.1.1 | ALWAYS | AUTO | |

##### 4.2.1.3.5.3.2. Dataset Specific Conformance for Basic Film Box N-ACTION SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

No DICOM information available.

#### 4.2.1.3.5.4. SOP Specific Conformance for Basic Film Session SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

##### 4.2.1.3.5.4.1. Dataset Specific Conformance for Basic Film Session N-CREATE SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

**Table 33: Basic Film Session Presentation Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Film Destination | 2000,0040 | CS | | ALWAYS | CONFIG | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Film Session Label | 2000,0050 | LO | | ALWAYS | AUTO | |
| Medium Type | 2000,0030 | CS | | ALWAYS | USER | |
| Number of Copies | 2000,0010 | IS | | ALWAYS | AUTO | |
| Print Priority | 2000,0020 | CS | | ALWAYS | AUTO | |

#### 4.2.1.3.5.5. SOP Specific Conformance for Basic Grayscale Image Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

##### 4.2.1.3.5.5.1. Dataset Specific Conformance for Basic Grayscale Image Box N-SET SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

**Table 34: Image Box Pixel Presentation Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Image Position | 2020,0010 | US | | ALWAYS | AUTO | |
| Polarity | 2020,0020 | CS | | ALWAYS | AUTO | |
| Basic Grayscale Image Sequence | 2020,0110 | SQ | | ALWAYS | AUTO | |
| >Bits Allocated | 0028,0100 | US | 16, 8 | ALWAYS | AUTO | |
| >Bits Stored | 0028,0101 | US | 12, 8 | ALWAYS | IMPLICIT | |
| >Columns | 0028,0011 | US | | ALWAYS | IMPLICIT | Depending on the selected printer type and film size. |
| >High Bit | 0028,0102 | US | 11, 7 | ALWAYS | AUTO | |
| >Photometric Interpretation | 0028,0004 | CS | MONOCHROME1, MONOCHROME2 | ALWAYS | CONFIG | |
| >Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| >Pixel Representation | 0028,0103 | US | 0x0000 | ALWAYS | AUTO | |
| >Rows | 0028,0010 | US | | ALWAYS | IMPLICIT | Depending on the selected printer type and film size. |
| >Samples per Pixel | 0028,0002 | US | 1 | ALWAYS | AUTO | |

#### 4.2.1.3.5.6. SOP Specific Conformance for Printer SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

##### 4.2.1.3.5.6.1. Dataset Specific Conformance for Printer N-EVENT-REPORT SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.

No specific DICOM information available

#### 4.2.1.4. Association Acceptance Policy

ELEVA AE accepts associations to allow remote applications to verify application level communication.

The ELEVA AE rejects association requests from unknown applications, i.e. applications that offer an unknown "calling AE title". An application is known if and only if it is defined per configuration.

The ELEVA AE rejects association requests from applications that do not address the ELEVA AE, i.e. that offer a wrong "called AE title".

The Application Entity may reject Association attempts as shown in the table below.

**Table 35: Association Reject Reasons**

| Result | Source | Reason/Diag | Explanation |
|---|---|---|---|
| 1 - rejected permanent | 1 - DICOM UL service-user | 1 - no-Reason-given | Association is not established due to any problem other than that specified in the rows below. (Example: Problem while decodig the DICOM stream). |
| | | 2 - application-context-name-not-supported | An application context name other than 1.2.840.3.1.1.1 is requested by the SCU during association. |
| | | 3 - calling-AE-title-not-recognized | The configuration does not contain a repository having the calling AE Title as per the association request.There is a problem in the configuration (related to composing the configuration from the SCU and the SCP configuration). |
| | | 7 - called-AE-title-not-recognized | The called AE Title in the association request does not match the AE Title as per the configuration. |
| | 2 - DICOM UL service provider (ACSE related function) | 1 - no-reason-given | Not used. |
| | | 2 - protocol-version-not-supported | Not used. |
| | 3 - DICOM UL service provider (Presentation related function) | 1 - tempory-congestion | Not used. |
| | | 2 - local-limit-exceeded | Not used. |
| 2 - Rejected-transient | 1 - DICOM UL service-user | 1 - no-Reason-given | Not used. |
| | | 2 - application-context-name-not-supported | Not used. |
| | | 3 - calling-AE-title-not-recognized | Not used. |
| | | 7 - called-AE-title-not-recognized | Not used. |
| | 2 - DICOM UL service provider (ACSE related function) | 1 - no-reason-given | Maximum number of associations is exceeded and an association request is received. |
| | | 2 - protocol-version-not-supported | Not used. |
| | 3 - DICOM UL service provider (Presentation related function) | 1 - tempory-congestion | Not used. |
| | | 2 - local-limit-exceeded | Not used. |

The behavior of the AE for sending an association abort is summarized in next table

**Table 36: Association Abort Policies**

| Source | Reason/Diagnosis | Behavior |
|---|---|---|
| 0 - DICOM UL service-user (initiated abort) | 0 - reason-not-specified | When received, the PCR Eleva terminates the connection with the following log: Association ABORTED by peer ( 0: ABORT_SOURCE_dul_user, 0: ABORT_REASON_not_specified). Sent when: Association times out due to inactivity. Any other problem than ones specified in the rows below. (examples: Problem while decording the DICOM stream, Invalid request, Echo SCP was unable to send the Response to SCU, Error writing to SCU stream). |
| 2 - DICOM UL service-provider (initiated abort) | 0 - reason-not-specified | When received, the PCR Eleva terminates the connection with the following log: Association ABORTED by peer ( 2: ABORT_SOURCE_dul_provider, 0: ABORT_REASON_not_specified). |
| | 1 - unrecognized-PDU | When received, the PCR Eleva terminates the connection with the following log: Association ABORTED by peer ( 2: ABORT_SOURCE_dul_provider, 1: ABORT_REASON_unrecognized_pdu). Sent when: An unrecognized PDU is received. |
| | 2 - unexpected-PDU | When received, the PCR Eleva terminates the connection with the following log: Association ABORTED by peer ( 2: ABORT_SOURCE_dul_provider, 2: ABORT_REASON_unexpected_pdu). Sent when: The received PDU type is not expected in the current state of connection. |
| | 4 - unrecognized-PDU parameter | When received, the PCR Eleva terminates the connection with the following log: Association ABORTED by peer ( 2: ABORT_SOURCE_dul_provider, 4: ABORT_REASON_unrecognized_pdu_parameter). Sent when: An unrecognized Associate PDU item is received. |
| | 5 - unexpected-PDU parameter | When received, the PCR Eleva terminates the connection with the following log: Association ABORTED by peer ( 2: ABORT_SOURCE_dul_provider, 5: ABORT_REASON_unexpected_pdu_parameter). Sent when: One of the Associate PDU items is received more than once.One of the Associate PDU items is received unexpectedly. |
| | 6 - invalid-PDU-parameter value | When received, the PCR Eleva terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 6: ABORT_REASON_invalid_pdu_parameter). Sent when: One of the Associate PDU items is received more than once. One of the Associate PDU items is not received Empty Called AE Title String (space-only) is received. Empty Calling AE Title String (space-only) is received. Unknown abstract syntax is received.The length or the format of the received PDU item is invalid. |

#### 4.2.1.4.1. (Real-World) Activity – Verification as SCP

##### 4.2.1.4.1.1. Description and Sequencing of Activities

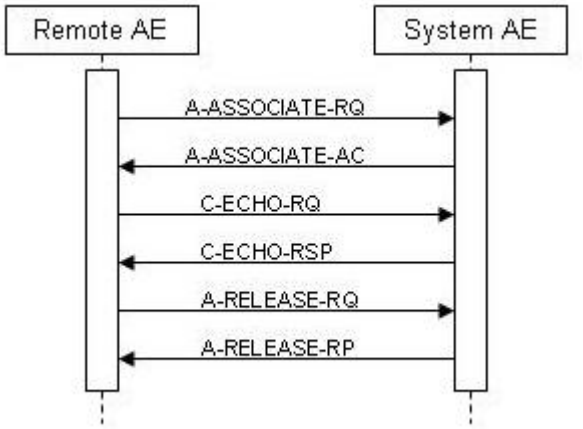


**Figure 10: (Real World) Activity - Verification as SCP**

The Eleva AE accepts associations from systems that which to verify application level communication using the C-ECHO command.

##### 4.2.1.4.1.2. Accepted Presentation Contexts

The presentation contexts are defined in next table.

**Table 37: Acceptable Presentation Contexts for (Real-World) Activity – Verification as SCP**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| **Abstract Syntax** | | **Transfer Syntax** | | **Role** | **Extended Negotiation** |
| **Name** | **UID** | **Name List** | **UID List** | | |
| Verification SOP Class | 1.2.840.10008.1.1 | Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCP | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | Implicit VR Little Endian | 1.2.840.10008.1.2 | | |

##### 4.2.1.4.1.3. SOP Specific Conformance for Verification SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

###### 4.2.1.4.1.3.1. Dataset Specific Conformance for Verification C-ECHO SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

**Table 38: Status Response**

| Service Status | Code | Further Meaning | Behavior |
|---|---|---|---|
| Success | 0000 | Verification is complete | The PCR Eleva has successfully received the verification request. |

## 4.3. Network Interfaces

### 4.3.1. Physical Network Interfaces

The System provides only DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8 of the standard.

Supported physical medium include:
IEEE 802.3-1995 10BASE-T
IEEE 802.3-1995 100BASE-TX (Fast Ethernet)

The TCP/IP Stack as supported by the underlying Operating System.
The API is the WinSock 2 interface as supported by the underlying Operating System.

### 4.3.2. Additional Protocols

No additional protocols are used.

## 4.4. Configuration

Any implementation's DICOM conformance may be dependent upon configuration, which takes place at the time of installation. Issues concerning configuration is addressed in this section.

### 4.4.1. AE Title/Presentation Address Mapping

An important installation issue is the translation from AE title to presentation address. How this is to be performed is describe here.

#### 4.4.1.1. Local AE Titles

The local AE title mapping and configuration are specified as:

**Table 39: AE Title configuration table**

| Application Entity | Default AE Title | Default TCP/IP Port |
|---|---|---|
| ELEVA AE | ELEVA | 3010 |

#### 4.4.1.2. Remote AE Title/Presentation Address Mapping

Specified is here the configuration of the remote application.

No specified DICOM information available.

### 4.4.2. Parameters

The specification of important operational parameters, their default value and range (if configurable) is specified here.

**Table 40: Configuration Parameters Table**

| Parameter | Configurable | Default Value |
|---|---|---|
| **General Parameter** | | |
| Artim Timeout Specifies the time in seconds of the ARTIM (Association Request/Reject/Release Timer).Allowed values:0: unlimited waiting time0 < n: real time in seconds | Yes | 60 seconds |
| Maximum number of simultaneous associations | Yes | 2 |
| Maximum PDU size the AE can receive | No | - |
| Maximum PDU size the AE can send | Yes | 16384 |
| Automatic Association Timeout Specifies the association inactivity timeout in seconds after which the association is closed automatically. Allowed values:-1: immediate timeout0: unlimited waiting time0 < n: real time in seconds | Yes | 0 [unlimited] |
| Transfer Syntax support: ILE, ELE, EBE | Yes | ILE, ELE, EBE |
| **Storage Specific Parameters** | | |
| Automatic export to a configurable destination | Yes | - |
| **Storage Commitment Specific Parameters** | | |
| Storage Commit Max Reply Waiting Time. Specifies the time in seconds that is waited for a storage commitment event report message. After this time the association will be terminated. Allow values-1: immediate timeout0: unlimited waiting time0 < n: real time in seconds | Yes | -1 [asynchonous] |
| **Basic Worklist Management Specific Parameters** | | |
| RIS query timeout Specifies the time after which the query is automatically aborted Allowed values: 1 - 300 minutes | Yes | 240 [minutes] |
| Background broad query time interval Specifies the time until the background query will be repeated. Allowed values:0: no broad query0 < n: real time in minutes | Yes | 0 [no broad query] |
| **Print Management Specific Parameters** | | |
| Automatic print to a configurable destination | Yes | - |

# 5. MEDIA INTERCHANGE

## 5.1. Implementation model

The implementation model identifies the DICOM Application Entities for Media in specific implementation and relates the Application Entities to Real-World Activities.

### 5.1.1. Application Data Flow Diagram

The PCR Eleva system consists of one single application entity only: the Eleva AE.

Next figure shows the Media Interchange application data flow as a functional overview of the Eleva AE.

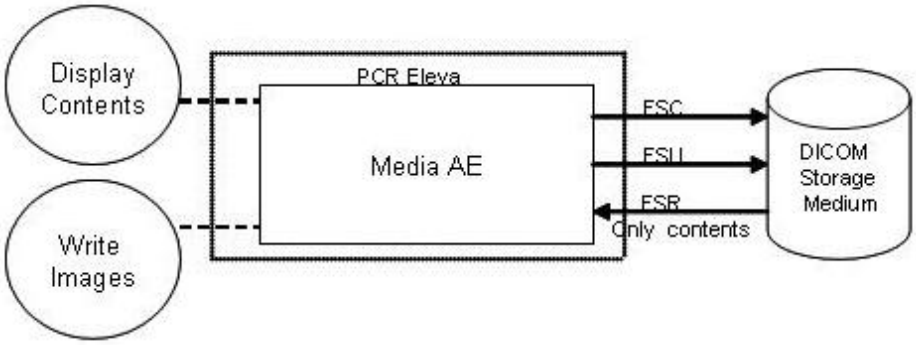


**Figure 11: Media Intechange Application Data Flow Diagram**

The ELEVA AE will act as a FSR when reading the directory of the medium.
The ELEVA AE will act as FSC/FSU when writing the selected images in a patient folder onto the CD-R medium only for the SOP Classes:

- Computer Radiography Image Storage
- Digital X-Ray Image Storage – For Presentation
- Digital X-Ray Image Storage – For Processing
- Secondary Capture Image Storage.

### 5.1.2. Functional Definitions of AE's

This section contains the functional definition of each individual local Media Application Entity.

#### 5.1.2.1. Functional definition of Eleva.

The Eleva AE is the one and only application entity within the PCR Eleva. It includes the following service class.

Media Storage Service Class.
The Eleva AE can perform the Media Storage Service as SCU, with capabilities for RWA Display Directory (as FSR) and RWA Write Images (as FSC/FSU).

### 5.1.3. Sequencing of Real World Activities

This section contains a description of sequencing of Real-World Activities that the Media Application Entities require.

Write images can be initiated by selecting a proper destination, selecting requested images and clicking the export button.

Whenever a CD-R has be written the ELEVA AE first tries to read the DICOMDIR. The Eleva AE will compile the updated DICOMDIR and any DICOM images into a CD session image; this CD session image will be written to CD-R.

## 5.2. AE Specifications

This section in the DICOM Conformance Statement specifies a set of Media Application Entities.

### 5.2.1. Eleva Media – Specification

This section contains general policies that apply to all of the Application Entities described in subsequent section.

The ELEVA AE provides Standard Conformance to the DICOM Media Storage Service and File Format ([DICOM] PS 3.10) and the Media Storage Application Profiles STD-GEN-CD ([DICOM] PS 3.11) for reading.
ELEVA AE supports multi-patient and multi-session CD-R disks.

Only adding on of instances is supported for the FSU, deleting is not supported.

The following table shows that for one or more Application Profiles there Real-World Activities and the roles of each of these Real-World Activities.

**Table 41: AE Eleva Media related Application Profiles, RWA activities and roles**

| Supported Application Profile | Identifier | Real-World Activities | Roles |
|---|---|---|---|
| General Purpose CD-R Interchange | STD-GEN-CD | Update File-set | FSU |
| | | Create File-set | FSC |
| | | Display Directory | FSR |

#### 5.2.1.1. File Meta Information for the Eleva Media

The section describes the real-world activities for the roles and Media Storage Service Class options supported by the ELEVA AE.

**Table 42: File Meta Information for the Eleva Media**

| | |
|---|---|
| File Meta Information Version | 00,01 |
| Implementation Class UID | 1.3.46.670589.30.1.3 |
| Implementation Version Name | PMS_ELEVA_PA_2.1 |

#### 5.2.1.2. Real-World Activities

The AE specification contains a description of the Real-World Activities, which invoke the paticular AE.

#### 5.2.1.2.1. RWA - Create File-set

When an image transfer to CD-R is initiated then the ELEVA AE acts as an FSC or FSU using the interchange option to export SOP Instances from the local database to a CD-R medium.

##### 5.2.1.2.1.1. Media Storage Application Profile

The ELEVA AE supports the RWA Write Images for the STD-GEN-CD Application profile.

###### 5.2.1.2.1.1.1. Options

The DICOMDIR file will be extended when new images are written. In case some attributes are not present in an image but are specified as mandatory in the DICOMDIR definition in DICOM Media, a generated value will be filled in.

#### 5.2.1.2.2. RWA - Update File-set

When an image transfer to CD-R is initiated then the ELEVA AE acts as an FSC or FSU using the interchange option to export SOP Instances from the local database to a CD-R medium.

##### 5.2.1.2.2.1. Media Storage Application Profile

The ELEVA AE supports the RWA Write Images for the STD-GEN-CD Application Profile.

###### 5.2.1.2.2.1.1. Options

The DICOMDIR file will be extended when new images are written. In case some attributes are not present in an image but are specified as mandatory in the DICOMDIR definition in DICOM Media, a generated value will be filled in.

#### 5.2.1.2.3. RWA - Display Directory

The ELEVA AE will act as a FSR when reading the directory of the medium. This will result in an overview of the images on the PCR Eleva screen.

##### 5.2.1.2.3.1. Media Storage Application Profile

The ELEVA AE supports the RWA Display Directory for the STD-GEN-CD Application Profile.

###### 5.2.1.2.3.1.1. Options

Not applicable.

## 5.3. Augmented and Private Application Profiles

This section is used for the description of augmented and Private Application Profiles.

### 5.3.1. Sequencing of Real World Activities

Any Augmented Application Profiles used by the Application Entity is described in this section. The rules governing the structure of an Augmented Application Profile are described.

### 5.3.2. Private Application Profiles

Not applicable

## 5.4. Media Configuration

By anonymous patient on CD the following DICOM attributes will be changed.

**Table 43: Anonymous patient by Media**

| Attribute Name | Tag | Change to |
|---|---|---|
| Media Storage SOP Instance UID | 0002,0003 | New UID |
| Referenced SOP Instance UID in File | 0004,1511 | New UID |
| SOP Instance UID | 0008,0016 | New UID |
| Accession Number | 0008,0050 | [empty] |
| Institution Name | 0008,0080 | [empty] |
| Institution Address | 0008,0081 | [empty] |
| Referring Physician's Name | 0008,0090 | [empty] |
| Station Name | 0008,1010 | [empty] |
| Study Description | 0008,1030 | [empty] |
| Series Description | 0008,103E | [empty] |
| Institutional Department Name | 0008,1040 | [empty] |
| Performing Physician's Name | 0008,1050 | [empty] |
| Operators' Name | 0008,1070 | [empty] |
| Patient Name | 0010,0010 | [empty] |
| Patient ID | 0010,0020 | New ID |
| Patient's Birth Date | 0010,0030 | [empty] |
| Patient's Sex | 0010,0040 | [empty] |
| Other Patient IDs | 0010,1000 | [empty] |
| Patient's Size | 0010,1020 | [empty] |
| Patient Weight | 0010,1030 | [empty] |
| Device Serial Number | 0018,1000 | New ID |
| Study Instance UID | 0020,000D | New UID |
| Series Instance UID | 0020,000E | New UID |
| Study ID | 0020,0010 | New ID |
| Requesting Physician | 0032,1032 | [empty] |
| Request Attributes Sequence | 0040,0270 | [empty sequence] |
| Requested Procedure ID | 0040,1001 | New ID |

# 6. SUPPORT OF CHARACTER SETS

Any support for character sets beyond the default character repertoire in Network and Media services is described here.

**Table 44: Supported DICOM Character Sets of PCR Eleva**

| Character Set Description | Defined Term | ESC Sequence | ISO Registration Number | Code Element | Character Set |
|---|---|---|---|---|---|
| Latin alphabet No. 1 | ISO_IR 100 | - | ISO-IR 6 | G0 | ISO 646 |
| | | - | ISO-IR 100 | G1 | Supplementary set of ISO 8859 |

# 7. SECURITY

## 7.1. Security Transport Connection Profiles

**The Basic TLS Secure Transport Connection Profile**
PCR Eleva conforms to the Basic TLS Secure Transport Connection Profile.

Since PCR Eleva acts only as SCU (except Verify) no IP port is specified to accept TLS connections.

PCR Eleva provides a service accessible tool to configure private keys and certificates of the local and remote DICOM nodes.

## 7.2. Attribute Confidentiality Profiles

**The Basic Application Level Confidentiality Profile**
PCR Eleva conforms to the Basic Application Level Confidentiality Profile as de-identifier.

De-identified SOP Instances will be created on DICOM Media if specified by the user.

No instances of the Encrypted Attributes Data Set are created. No Transfer Syntaxes are supported for encoding/decoding of Encrypted Attributes Data Sets.

Table below lists the protected attributes. The terms used to describe the replacement value can be read as follows:

| | |
|---|---|
| empty | The attribute will have a value of zero length. |
| n. a. | Not applicable, the attribute is not contained in the standard IOD of XD-S. |
| anon string | The original value is mapped onto a string with a length of max 12 characters UID using the procedure described below. |
| anon UID | The original value is mapped onto a syntactically valid DICOM UID using the procedure described below. |

The above mentioned mapping procedure works as follows:

- The original value is taken as a string of arbitrary length.
- This string is mapped onto a 16-byte value using MD5 hash.
- From this value only the first 8 bytes are used further.
- To create an anon string these first 8 bytes are mapped onto a 12 characters long string using base 64.
- To create an anon UID the 8 bytes are read as two integers which are used to create a valid DICOM UID:
  (ImplClassUID).(DevSerialNu).2.Integer(byte[0-3]).Integer(byte[4-7])

MD5 hash makes practically sure that different strings are mapped to different 16-byte values. So the whole procedure ensures that the relationship between SOP Instances by the means of their UIDs remains consistent.

**Table 45: Basic Application Level Confidentiality Profile Attributes**

| Attribute Name | Tag | Replacement Value |
|---|---|---|
| Instance Creator UID | 0008,0014 | anon UID |
| SOP Instance UID | 0008,0018 | anon UID |
| Accession Number | 0008,0050 | empty |
| Institution Name | 0008,0080 | empty |

| Attribute Name | Tag | Replacement Value |
|---|---|---|
| Institution Address | 0008,0081 | empty |
| Referring Physician's Name | 0008,0090 | empty |
| Referring Physician's Telephone Number | 0008,0092 | n.a. |
| Station Name | 0008,0094 | n.a. |
| Study Description | 0008,1010 | empty |
| Series Description | 0008,1030 | empty |
| Institutional Department Name | 0008,103E | empty |
| Physician(s) of Recored | 0008,1040 | empty |
| Performed Physicians' Name | 0008,1048 | empty |
| Name of Physician(s) Reading Study | 0008,1050 | empty |
| Operators' Name | 0008,1060 | empty |
| Admitting Diagnoses Description | 0008,1070 | empty |
| Referenced SOP Instance UID | 0008,1155 | anon UID |
| Derivation Description | 0008,2111 | empty |
| Patient's Name | 0010,0010 | empty |
| Patient ID | 0010,0020 | anon string |
| Patient's Birth Date | 0010,0030 | empty |
| Patient's Birth Time | 0010,0032 | empty |
| Patient's Sex | 0010,0040 | empty |
| Other Patient IDs | 0010,1000 | empty |
| Other Patient Names | 0010,1001 | empty |
| Patient's Age | 0010,1010 | empty |
| Patient's Size | 0010,1020 | empty |
| Patient's Weight | 0010,1030 | empty |
| Medical Record Locator | 0010,1090 | n.a. |
| Ethnic Group | 0010,2160 | empty |
| Occupation | 0010,2180 | empty |
| Additional Patient's History | 0010,21B0 | empty |
| Patient Comments | 0010,4000 | empty |
| Device Serial Number | 0018,1000 | anon string |
| Protocol Name | 0018,1030 | empty |
| Study Instance UID | 0020,000D | anon UID |
| Series Instance UID | 0020,000E | anon UID |
| Study ID | 0020,0010 | anon string |
| Frame of Reference UID | 0020,0052 | anon UID |
| Synchronization Frame of Reference UID | 0020,0200 | n.a. |
| Image Comments | 0020,4000 | empty |
| Requested Attributes Sequence | 0040,0275 | empty |
| UID | 0040,A124 | anon UID |
| Content Sequence | 0040,A730 | empty |
| Storage Media File-set UID | 0088,0140 | anon UID |
| Referenced Frame of Reference UID | 3006,0024 | n.a. |
| Releated Frame of Reference UID | 3006,00C2 | n.a. |

No attributes or attribute values are inserted.

# 8. ANNEXES OF APPLICATION "ELEVA"

## 8.1. IOD Contents

### 8.1.1. Created SOP Instance

This section specifies each created IOD by this application.

This section specifies each IOD created (including private IOD's). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

| | |
|---|---|
| ALWAYS | The module is always present |
| CONDITIONAL | The module is used under specified condition |

Abbreviations used in the Module table for the column "Presence of Value" are:

| | |
|---|---|
| ALWAYS | The attribute is always present with a value |
| EMPTY | The attribute is always present without any value (attribute sent zero length) |
| VNAP | The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present) |
| ANAP | The attribute is present under specified condition – if present then it will always have a value |
| ANAPCV | The attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present) |
| ANAPEV | The attribute is present under specified condition – if present then it will not have any value |

The abbreviations used in the Module table for the column "Source" are:

| | |
|---|---|
| AUTO | The attribute value is generated automatically |
| CONFIG | The attribute value source is a configurable parameter |
| COPY | The attribute value source is another SOP instance |
| FIXED | The attribute value is hard-coded in the application |
| IMPLICIT | The attribute value source is a user-implicit setting |
| MPPS | The attribute value is the same as that use for Modality Performed Procedure Step |
| MWL | The attribute value source is a Modality Worklist |
| USER | The attribute value source is explicit user input |

#### 8.1.1.1. List of created SOP Classes

**Table 46: List of created SOP Classes**

| SOP Class Name | SOP Class UID |
|---|---|
| Computed Radiography Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.1 |
| Secondary Capture Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.7 |
| Digital X-Ray Image Storage - For Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.1 |
| Digital X-Ray Image Storage - For Proc. SOP | 1.2.840.10008.5.1.4.1.1.1.1.1 |
| Digital Mammography X-Ray Image Storage - Proc. SOP | 1.2.840.10008.5.1.4.1.1.1.2.1 |
| Digital Mammography X-Ray Image Storage - Pres. SOP | 1.2.840.10008.5.1.4.1.1.1.2 |

### 8.1.1.2. Computed Radiography Image Storage SOP Class

**Table 47: IOD of Created Computed Radiography Image Storage SOP Class Instances**

| Information Entity | Module | Presence Of Module |
|---|---|---|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Study | Patient Study Module | CONDITIONAL |
| Series | General Series Module | ALWAYS |
| Series | CR Series Module | ALWAYS |
| Equipment | General Equipment Module | ALWAYS |
| Image | General Image Module | ALWAYS |
| Image | Contrast/Bolus Module | CONDITIONAL |
| Image | CR Image Module | ALWAYS |
| Image | Image Pixel Module | ALWAYS |
| Image | SOP Common Module | ALWAYS |
| Image | Overlay Plane Module | CONDITIONAL |
| Image | Modality LUT Module | CONDITIONAL |
| Image | VOI LUT Module | ALWAYS |
| | Additional Module | ALWAYS |

**Table 48: Patient Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Ethnic Group | 0010,2160 | SH | | ANAP | AUTO | |
| Issuer of Patient ID | 0010,0021 | LO | | ANAP | USER, MWL | |
| Other Patient IDs | 0010,1000 | LO | | ANAP | USER, MWL | |
| Patient Comments | 0010,4000 | LT | | ANAP | USER, MWL | |
| Patient ID | 0010,0020 | LO | | ALWAYS | AUTO, MWL | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | USER, MWL | |
| Patient's Name | 0010,0010 | PN | | VNAP | USER, MWL | |
| Patient's Sex | 0010,0040 | CS | F, M, O | VNAP | USER, MWL | |

**Table 49: General Study Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Accession Number | 0008,0050 | SH | | VNAP | USER, MWL | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | USER, MWL | |
| Study Date | 0008,0020 | DA | | VNAP | AUTO | |
| Study Description | 0008,1030 | LO | | ANAP | USER, MWL | |
| Study ID | 0020,0010 | SH | | VNAP | AUTO, MWL | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO, MWL | |
| Study Time | 0008,0030 | TM | | VNAP | AUTO | |
| Procedure Code Sequence | 0008,1032 | SQ | | ANAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |
| Referenced Study Sequence | 0008,1110 | SQ | | ANAP | MWL | |

| | | | | | | |
|---|---|---|---|---|---|---|
| >Referenced SOP Class UID | 0008,1150 | UI | | ANAPEV | MWL | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ANAPEV | MWL | |

**Table 50: Patient Study Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Additional Patient History | 0010,21B0 | LT | | ANAP | USER, MWL | |
| Patient's Size | 0010,1020 | DS | | ANAP | USER, MWL | |
| Patient's Weight | 0010,1030 | DS | | ANAP | USER, MWL | |

**Table 51: General Series Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Laterality | 0020,0060 | CS | | VNAP | CONFIG | |
| Modality | 0008,0060 | CS | CR | ALWAYS | CONFIG | |
| Operators' Name | 0008,1070 | PN | | ALWAYS | USER, MPPS | |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAP | AUTO, MPPS | |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO, | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | AUTO, MPPS | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | AUTO, MPPS | |
| Performing Physician's Name | 0008,1050 | PN | | ANAP | USER, MPPS | |
| Protocol Name | 0018,1030 | LO | | ALWAYS | USER, MWL | |
| Series Date | 0008,0021 | DA | | ANAP | AUTO | |
| Series Description | 0008,103E | LO | | ANAP | USER, MPPS | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO, MPPS | |
| Series Number | 0020,0011 | IS | | ALWAYS | AUTO, MPPS | |
| Series Time | 0008,0031 | TM | | ANAP | AUTO | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | ANAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |
| Referenced Performed Procedure Step Sequence | 0008,1111 | SQ | | ALWAYS | AUTO | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ALWAYS | AUTO | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO | |
| Request Attributes Sequence | 0040,0275 | SQ | | ANAP | MWL | |
| >Requested Procedure ID | 0040,1001 | SH | | ANAPEV | MWL | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | ANAP | MWL | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | ANAPEV | MWL | |
| >Scheduled Protocol Code Sequence | 0040,0008 | SQ | | ANAP | MWL | |
| >>Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >>Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |

### Table 52: CR Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Body Part Examined | 0018,0015 | CS | | VNAP | USER, MPPS | |
| View Position | 0018,5101 | CS | | VNAP | AUTO | |

### Table 53: General Equipment Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Device Serial Number | 0018,1000 | LO | | ALWAYS | CONFIG | |
| Institution Address | 0008,0081 | ST | | ALWAYS | CONFIG | |
| Institution Name | 0008,0080 | LO | | ALWAYS | CONFIG | |
| Institutional Department Name | 0008,1040 | LO | | ALWAYS | CONFIG | |
| Manufacturer | 0008,0070 | LO | Philips Medical Systems | ALWAYS | AUTO | |
| Manufacturer's Model Name | 0008,1090 | LO | PCR Eleva | ALWAYS | AUTO | |
| Software Version(s) | 0018,1020 | LO | | ALWAYS | AUTO | |
| Spatial Resolution | 0018,1050 | DS | | ALWAYS | AUTO | |
| Station Name | 0008,1010 | SH | | ALWAYS | CONFIG | |

### Table 54: General Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Date | 0008,0022 | DA | | ALWAYS | AUTO | |
| Acquisition Time | 0008,0032 | TM | | ALWAYS | AUTO | |
| Burned In Annotation | 0028,0301 | CS | | ALWAYS | AUTO | |
| Content Date | 0008,0023 | DA | | ALWAYS | AUTO | |
| Content Time | 0008,0033 | TM | | ALWAYS | AUTO | |
| Image Type | 0008,0008 | CS | ORIGINAL, PRIMARY | ALWAYS | AUTO | |
| Instance Number | 0020,0013 | IS | | ALWAYS | AUTO | |
| Lossy Image Compression | 0028,2110 | CS | 00 | ANAP | AUTO | |
| Patient Orientation | 0020,0020 | CS | | VNAP | AUTO | |
| Presentation LUT Shape | 2050,0020 | CS | IDENTITY | ALWAYS | AUTO | |

### Table 55: Contrast/Bolus Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Contrast/Bolus Agent | 0018,0010 | LO | | VNAP | AUTO | |

### Table 56: CR Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Device Processing Description | 0018,1400 | LO | | ANAP | AUTO | |
| Distance Source to Detector | 0018,1110 | DS | | ANAP | AUTO | |
| Exposure | 0018,1152 | IS | | ANAP | AUTO | |
| Exposure Time | 0018,1150 | IS | | ANAP | AUTO | |
| Imager Pixel Spacing | 0018,1164 | DS | | ALWAYS | AUTO | |
| KVP | 0018,0060 | DS | | ANAP | AUTO | |
| Photometric Interpretation | 0028,0004 | CS | MONOCHROME2 | ALWAYS | AUTO | |
| Relative X-ray Exposure | 0018,1405 | IS | | ANAP | AUTO | |
| X-ray Tube Current | 0018,1151 | IS | | ANAP | AUTO | |

### Table 57: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Bits Allocated | 0028,0100 | US | 16 | ALWAYS | AUTO | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Bits Stored | 0028,0101 | US | 10, 15, 12 | ALWAYS | AUTO | |
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| High Bit | 0028,0102 | US | 9, 11, 14 | ALWAYS | AUTO | |
| Pixel Aspect Ratio | 0028,0034 | IS | 1, 1 | ALWAYS | AUTO | |
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| Pixel Representation | 0028,0103 | US | 0000 | ALWAYS | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |
| Samples per Pixel | 0028,0002 | US | 1 | ALWAYS | AUTO | |

**Table 58: SOP Common Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| SOP Class UID | 0008,0016 | UI | | ALWAYS | AUTO | |
| SOP Instance UID | 0008,0018 | UI | 1.2.840.10008.5.1.4.1.1.1 | ALWAYS | AUTO | |
| Specific Character Set | 0008,0005 | CS | | ANAPCV | AUTO | |

**Table 59: Overlay Plane Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Overlay Bit Position | 6000,0102 | US | | ANAP | AUTO | |
| Overlay Bits Allocated | 6000,0100 | US | | ANAP | AUTO | |
| Overlay Columns | 6000,0011 | US | | ANAP | AUTO | |
| Overlay Data | 6000,3000 | O W/ OB | | ANAP | AUTO | |
| Overlay Origin | 6000,0050 | SS | | ANAP | AUTO | |
| Overlay Rows | 6000,0010 | US | | ANAP | AUTO | |
| Overlay Type | 6000,0040 | CS | | ANAP | AUTO | |

**Table 60: Modality LUT Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Rescale Intercept | 0028,1052 | DS | | ALWAYS | AUTO | |
| Rescale Slope | 0028,1053 | DS | | ALWAYS | AUTO | |
| Rescale Type | 0028,1054 | LO | US | ALWAYS | AUTO | |

**Table 61: VOI LUT Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Window Center | 0028,1050 | DS | 2047.0 | ALWAYS | AUTO | |
| Window Width | 0028,1051 | DS | 4095.0 | ALWAYS | AUTO | |

**Table 62: Additional Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Medical Alerts | 0010,2000 | LO | | VNAP | USER, MWL | |
| Contrast Allergies | 0010,2110 | LO | | VNAP | USER, MWL | |
| Pregnancy Status | 0010,21C0 | US | | VNAP | USER, MWL | |
| Image and Fluoroscopy Area Dose Product | 0018,115E | DS | | VNAP | AUTO | |
| Requesting Physician | 0032,1032 | PN | | VNAP | USER, MWL | |
| Requesting Service | 0032,1033 | LO | | VNAP | USER, MWL | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Requested Procedure Description | 0032,1060 | LO | | VNAP | USER, MWL | |
| Special Needs | 0038,0050 | LO | | VNAP | USER, MWL | |
| Patient State | 0038,0500 | LO | | VNAP | USER, MWL | |
| Performed Station AE Title | 0040,0241 | AE | | VNAP | AUTO, MPPS | |
| Performed Procedure Step End Date | 0040,0250 | DA | | VNAP | AUTO, MPPS | |
| Performed Procedure Step End Time | 0040,0251 | TM | | VNAP | AUTO, MPPS | |
| Performed Procedure Step Status | 0040,0252 | CS | | VNAP | AUTO, MPPS | |
| Total Time of Fluoroscopy | 0040,0300 | US | | VNAP | AUTO | |
| Total Number of Exposures | 0040,0301 | US | | VNAP | AUTO | |
| Entrance Dose | 0040,0302 | US | | VNAP | AUTO | |
| Requested Procedure ID | 0040,1001 | SH | | VNAP | USER, MWL | |
| Reason for the Requested Procedure | 0040,1002 | LO | | VNAP | USER, MWL | |
| Requested Procedure Priority | 0040,1003 | SH | | VNAP | USER, MWL | |
| Patient Transport Arrangements | 0040,1004 | LO | | VNAP | USER, MWL | |
| Names of Intended Recipients of Results | 0040,1010 | PN | | VNAP | USER, MWL | |
| Requested Procedure Comments | 0040,1400 | LT | | VNAP | USER, MWL | |
| Reason for the Imaging Service Request (RETIRED) | 0040,2001 | LO | | VNAP | MWL | |
| Issue Date of Imaging Service Request | 0040,2004 | DA | | VNAP | USER, MWL | |
| Imaging Service Request Comments | 0040,2400 | LT | | VNAP | USER, MWL | |
| Requested Procedure Code Sequence | 0032,1064 | SQ | | VNAP | MWL | |
| >Code Value | 0008,0100 | SH | | VNAP | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | VNAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | VNAP | MWL | |
| Exposure Dose Sequence | 0040,030E | SQ | | VNAP | AUTO | |
| >KVP | 0018,0060 | DS | | VNAP | AUTO | |
| >Exposure Time | 0018,1150 | IS | | VNAP | AUTO | |
| >Radiation Mode | 0018,115A | CS | | VNAP | AUTO | |
| >Filter Type | 0018,1160 | SH | | VNAP | AUTO | |
| >Filter Material | 0018,7050 | CS | | VNAP | AUTO | |
| >X-Ray Tube Current in uA | 0018,8151 | DS | | VNAP | AUTO | |
| Film Consumption Sequence | 0040,0321 | SQ | | VNAP | AUTO | |
| >Medium Type | 2000,0030 | CS | | VNAP | AUTO | |
| >Film Size ID | 2010,0050 | CS | | VNAP | AUTO | |
| >Number of Films | 2100,0170 | IS | | VNAP | AUTO | |

#### 8.1.1.3. Secondary Capture Image Storage SOP Class

**Table 63: IOD of Created Secondary Capture Image Storage SOP Class Instances**

| Information Entity | Module | Presence Of Module |
|---|---|---|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Study | Patient Study Module | CONDITIONAL |
| Series | General Series Module | ALWAYS |

| | | |
|---|---|---|
| Equipment | General Equipment Module | ALWAYS |
| Equipment | SC Equipment Module | ALWAYS |
| Image | General Image Module | ALWAYS |
| Image | Image Pixel Module | ALWAYS |
| Image | SC Image Module | ALWAYS |
| Image | SOP Common Module | ALWAYS |
| Image | Modality LUT Module | CONDITIONAL |
| Image | VOI LUT Module | CONDITIONAL |
| | Additional Module | ALWAYS |

**Table 64: Patient Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Ethnic Group | 0010,2160 | SH | | ANAP | USER, MWL | |
| Issuer of Patient ID | 0010,0021 | LO | | ANAP | | |
| Other Patient IDs | 0010,1000 | LO | | ANAP | USER, MWL | |
| Patient Comments | 0010,4000 | LT | | ANAP | USER, MWL | |
| Patient ID | 0010,0020 | LO | | ALWAYS | USER, MWL | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | USER, MWL | |
| Patient's Name | 0010,0010 | PN | | VNAP | USER, MWL | |
| Patient's Sex | 0010,0040 | CS | | VNAP | USER, MWL | |

**Table 65: General Study Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Accession Number | 0008,0050 | SH | | VNAP | USER, MWL | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | USER, MWL | |
| Study Date | 0008,0020 | DA | | VNAP | AUTO | |
| Study Description | 0008,1030 | LO | | ANAP | USER, MWL | |
| Study ID | 0020,0010 | SH | | VNAP | AUTO, MWL | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO, MWL | |
| Study Time | 0008,0030 | TM | | VNAP | AUTO | |
| Procedure Code Sequence | 0008,1032 | SQ | | ANAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |
| Referenced Study Sequence | 0008,1110 | SQ | | ANAP | MWL | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ANAPEV | MWL | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ANAPEV | MWL | |

**Table 66: Patient Study Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Additional Patient History | 0010,21B0 | LT | | VNAP | AUTO, MWL | |
| Patient's Size | 0010,1020 | DS | | ANAP | AUTO, MWL | |
| Patient's Weight | 0010,1030 | DS | | VNAP | AUTO, MWL | |

### Table 67: General Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Body Part Examined | 0018,0015 | CS | | VNAP | USER, MPPS | |
| Laterality | 0020,0060 | CS | | VNAP | CONFIG | |
| Operators' Name | 0008,1070 | PN | | ALWAYS | USER, MPPS | |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAP | AUTO, MPPS | |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO, MPPS | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | AUTO, MPPS | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | AUTO, MPPS | |
| Performing Physician's Name | 0008,1050 | PN | | ANAP | USER, MPPS | |
| Protocol Name | 0018,1030 | LO | | ALWAYS | USER, MWL | |
| Series Date | 0008,0021 | DA | | ANAP | AUTO | |
| Series Description | 0008,103E | LO | | ANAP | USER, MPPS | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO, MPPS | |
| Series Number | 0020,0011 | IS | | ALWAYS | AUTO, MPPS | |
| Series Time | 0008,0031 | TM | | ANAP | AUTO | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | ANAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |
| Referenced Performed Procedure Step Sequence | 0008,1111 | SQ | | ALWAYS | AUTO | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ALWAYS | AUTO | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO | |
| Request Attributes Sequence | 0040,0275 | SQ | | ANAP | MWL | |
| >Requested Procedure ID | 0040,1001 | SH | | ANAPEV | MWL | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | ANAP | MWL | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | ANAPEV | MWL | |
| >Scheduled Protocol Code Sequence | 0040,0008 | SQ | | ANAP | MWL | |
| >>Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >>Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |

### Table 68: General Equipment Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Device Serial Number | 0018,1000 | LO | | ANAP | CONFIG | |
| Institution Address | 0008,0081 | ST | | ALWAYS | CONFIG | |
| Institution Name | 0008,0080 | LO | | ALWAYS | CONFIG | |
| Institutional Department Name | 0008,1040 | LO | | ALWAYS | CONFIG | |
| Manufacturer | 0008,0070 | LO | | ALWAYS | AUTO | |
| Manufacturer's Model Name | 0008,1090 | LO | | ALWAYS | AUTO | |
| Software Version(s) | 0018,1020 | LO | | ALWAYS | AUTO | |
| Spatial Resolution | 0018,1050 | DS | | ALWAYS | AUTO | |
| Station Name | 0008,1010 | SH | | ALWAYS | CONFIG | |

**Table 69: SC Equipment Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Conversion Type | 0008,0064 | CS | WSD | ALWAYS | AUTO | |
| Modality | 0008,0060 | CS | CR | ALWAYS | AUTO | |

**Table 70: General Image Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Date | 0008,0022 | DA | | ALWAYS | AUTO | |
| Acquisition Time | 0008,0032 | TM | | ALWAYS | AUTO | |
| Burned In Annotation | 0028,0301 | CS | | ALWAYS | AUTO | |
| Content Date | 0008,0023 | DA | | ALWAYS | AUTO | |
| Content Time | 0008,0033 | TM | | ALWAYS | AUTO | |
| Image Type | 0008,0008 | CS | | ALWAYS | AUTO | |
| Instance Number | 0020,0013 | IS | | ALWAYS | AUTO | |
| Lossy Image Compression | 0028,2110 | CS | | ANAP | AUTO | |
| Patient Orientation | 0020,0020 | CS | | VNAP | USER | |

**Table 71: Image Pixel Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Bits Allocated | 0028,0100 | US | 16 | ALWAYS | AUTO | |
| Bits Stored | 0028,0101 | US | 10, 12, 15 | ALWAYS | AUTO | |
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| High Bit | 0028,0102 | US | 9, 11, 14 | ALWAYS | AUTO | |
| Photometric Interpretation | 0028,0004 | CS | MONOCHROME2 | ALWAYS | AUTO | |
| Pixel Aspect Ratio | 0028,0034 | IS | 1/1 | ALWAYS | AUTO | |
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| Pixel Representation | 0028,0103 | US | 0000 | ALWAYS | AUTO | |
| Planar Configuration | 0028,0006 | US | | ALWAYS | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |
| Samples per Pixel | 0028,0002 | US | 1 | ALWAYS | AUTO | |

**Table 72: SC Image Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Date of Secondary Capture | 0018,1012 | DA | | ALWAYS | AUTO | |
| Time of Secondary Capture | 0018,1014 | TM | | ALWAYS | AUTO | |

**Table 73: SOP Common Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| SOP Class UID | 0008,0016 | UI | | ALWAYS | AUTO | |
| SOP Instance UID | 0008,0018 | UI | | ALWAYS | AUTO | |
| Specific Character Set | 0008,0005 | CS | | ANAPCV | AUTO | |

**Table 74: Modality LUT Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Rescale Intercept | 0028,1052 | DS | | ALWAYS | AUTO | |
| Rescale Slope | 0028,1053 | DS | | ALWAYS | AUTO | |
| Rescale Type | 0028,1054 | LO | | ALWAYS | AUTO | |

### Table 75: VOI LUT Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Window Center | 0028,1050 | DS | | ALWAYS | AUTO | |
| Window Width | 0028,1051 | DS | | ALWAYS | AUTO | |

### Table 76: Additional Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Presentation Intent Type | 0008,0068 | CS | | VNAP | AUTO | |
| Medical Alerts | 0010,2000 | LO | | VNAP | USER, MWL | |
| Contrast Allergies | 0010,2110 | LO | | VNAP | USER, MWL | |
| Pregnancy Status | 0010,21C0 | US | | VNAP | USER, MWL | |
| Contrast/Bolus Agent | 0018,0010 | LO | | VNAP | AUTO | |
| KVP | 0018,0060 | DS | | VNAP | AUTO | |
| Distance Source to Detector | 0018,1110 | DS | | VNAP | AUTO | |
| Exposure Time | 0018,1150 | IS | | VNAP | AUTO | |
| X-ray Tube Current | 0018,1151 | IS | | VNAP | AUTO | |
| Exposure | 0018,1152 | IS | | VNAP | AUTO | |
| Radiation Setting | 0018,1155 | CS | | VNAP | AUTO | |
| Image and Fluoroscopy Area Dose Product | 0018,115E | DS | | VNAP | AUTO | |
| Imager Pixel Spacing | 0018,1164 | DS | | VNAP | AUTO | |
| Acquisition Device Processing Description | 0018,1400 | LO | | VNAP | AUTO | |
| Relative X-ray Exposure | 0018,1405 | IS | | VNAP | AUTO | |
| Tomo Layer Height | 0018,1460 | DS | | VNAP | AUTO | |
| Positioner Motion | 0018,1500 | CS | | VNAP | AUTO | |
| Positioner Type | 0018,1508 | CS | | VNAP | AUTO | |
| Positioner Primary Angle | 0018,1510 | DS | | VNAP | AUTO | |
| Positioner Secondary Angle | 0018,1511 | DS | | VNAP | AUTO | |
| Positioner Primary Angle Increment | 0018,1520 | DS | | VNAP | AUTO | |
| Positioner Secondary Angle Increment | 0018,1521 | DS | | VNAP | AUTO | |
| Collimator Shape | 0018,1700 | CS | | VNAP | AUTO | |
| Collimator Left Vertical Edge | 0018,1702 | IS | | VNAP | AUTO | |
| Collimator Right Vertical Edge | 0018,1704 | IS | | VNAP | AUTO | |
| Collimator Upper Horizontal Edge | 0018,1706 | IS | | VNAP | AUTO | |
| Collimator Lower Horizontal Edge | 0018,1708 | IS | | VNAP | AUTO | |
| Center of Circular Collimator | 0018,1710 | IS | | VNAP | AUTO | |
| Radius of Circular Collimator | 0018,1712 | IS | | VNAP | AUTO | |
| Vertices of the Polygonal Collimator | 0018,1720 | IS | | VNAP | AUTO | |
| View Position | 0018,5101 | CS | | VNAP | AUTO | |
| Detector Type | 0018,7004 | CS | | VNAP | AUTO | |
| Date of Last Detector Calibration | 0018,700C | DA | | VNAP | AUTO | |
| Time of Last Detector Calibration | 0018,700E | TM | | VNAP | AUTO | |
| Field of View Origin | 0018,7030 | DS | | VNAP | AUTO | |
| Field of View Rotation | 0018,7032 | DS | | VNAP | AUTO | |
| Field of View Horizontal Flip | 0018,7034 | CS | | VNAP | AUTO | |
| Image Laterality | 0020,0062 | CS | | VNAP | AUTO | |
| Pixel Intensity Relationship | 0028,1040 | CS | | VNAP | AUTO | |
| Pixel Intensity Relationship Sign | 0028,1041 | SS | | VNAP | AUTO | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Requesting Physician | 0032,1032 | PN | | VNAP | USER, MWL | |
| Requesting Service | 0032,1033 | LO | | VNAP | USER, MWL | |
| Requested Procedure Description | 0032,1060 | LO | | VNAP | USER, MWL | |
| Special Needs | 0038,0050 | LO | | VNAP | USER, MWL | |
| Patient State | 0038,0500 | LO | | VNAP | USER, MWL | |
| Performed Station AE Title | 0040,0241 | AE | | VNAP | AUTO, MPPS | |
| Performed Procedure Step End Date | 0040,0250 | DA | | VNAP | AUTO, MPPS | |
| Performed Procedure Step End Time | 0040,0251 | TM | | VNAP | AUTO, MPPS | |
| Performed Procedure Step Status | 0040,0252 | CS | | VNAP | AUTO, MPPS | |
| Total Time of Fluoroscopy | 0040,0300 | US | | VNAP | AUTO | |
| Total Number of Exposures | 0040,0301 | US | | VNAP | AUTO | |
| Entrance Dose | 0040,0302 | US | | VNAP | AUTO | |
| Requested Procedure ID | 0040,1001 | SH | | VNAP | USER, MWL | |
| Reason for the Requested Procedure | 0040,1002 | LO | | VNAP | USER, MWL | |
| Requested Procedure Priority | 0040,1003 | SH | | VNAP | USER, MWL | |
| Patient Transport Arrangements | 0040,1004 | LO | | VNAP | USER, MWL | |
| Names of Intended Recipients of Results | 0040,1010 | PN | | VNAP | AUTO | |
| Requested Procedure Comments | 0040,1400 | LT | | VNAP | MWL | |
| Reason for the Imaging Service Request (RETIRED) | 0040,2001 | LO | | VNAP | MWL | |
| Issue Date of Imaging Service Request | 0040,2004 | DA | | VNAP | USER, MWL | |
| Imaging Service Request Comments | 0040,2400 | LT | | VNAP | USER, MWL | |
| Requested Procedure Code Sequence | 0032,1064 | SQ | | VNAP | MWL | |
| >Code Value | 0008,0100 | SH | | VNAP | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | VNAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | VNAP | MWL | |
| Exposure Dose Sequence | 0040,030E | SQ | | VNAP | AUTO | |
| Film Consumption Sequence | 0040,0321 | SQ | | VNAP | AUTO | |
| >Medium Type | 2000,0030 | CS | | VNAP | AUTO | |
| >Film Size ID | 2010,0050 | CS | | VNAP | AUTO | |
| >Number of Films | 2100,0170 | IS | | VNAP | AUTO | |
| Acquisition Context Sequence | 0040,0555 | SQ | | VNAP | AUTO | |

#### 8.1.1.4. Digital X-Ray Image Storage - For Pres. SOP

**Table 77: IOD of Created Digital X-Ray Image Storage - For Pres. SOP Instances**

| Information Entity | Module | Presence Of Module |
|---|---|---|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Study | Patient Study Module | CONDITIONAL |
| Series | General Series Module | ALWAYS |
| Series | DX Series Module | ALWAYS |
| Equipment | General Equipment Module | ALWAYS |
| Image | Contrast/Bolus Module | CONDITIONAL |

| | | |
|---|---|---|
| Image | Display Shutter Module | CONDITIONAL |
| Image | Acquisition Context Module | ALWAYS |
| Image | General Image Module | ALWAYS |
| Image | Image Pixel Module | ALWAYS |
| Image | X-Ray Tomography Acquisition Module | CONDITIONAL |
| Image | X-Ray Collimator Module | CONDITIONAL |
| Image | SOP Common Module | ALWAYS |
| Image | Overlay Plane Module | CONDITIONAL |
| Image | DX Anatomy Imaged Module | ALWAYS |
| Image | DX Detector Module | ALWAYS |
| Image | DX Image Module | ALWAYS |
| Image | DX Positioning Module | CONDITIONAL |
| Image | X-Ray Acquisition Dose Module | CONDITIONAL |
| | Additional Module | ALWAYS |

**Table 78: DX Anatomy Imaged Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Image Laterality | 0020,0062 | CS | | ALWAYS | AUTO | |
| Anatomic Region Sequence | 0008,2218 | SQ | | VNAP | AUTO | |

**Table 79: DX Detector Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Date of Last Detector Calibration | 0018,700C | DA | | ANAP | AUTO | |
| Detector Type | 0018,7004 | CS | | VNAP | AUTO | |
| Field of View Horizontal Flip | 0018,7034 | CS | | ANAPEV | AUTO | |
| Field of View Origin | 0018,7030 | DS | | ANAPEV | AUTO | |
| Field of View Rotation | 0018,7032 | DS | | ANAPEV | AUTO | |
| Imager Pixel Spacing | 0018,1164 | DS | | ALWAYS | AUTO | |
| Time of Last Detector Calibration | 0018,700E | TM | | ANAP | AUTO | |

**Table 80: DX Image Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Device Processing Description | 0018,1400 | LO | | ANAP | AUTO | |
| Bits Allocated | 0028,0100 | US | 16 | ALWAYS | AUTO | |
| Bits Stored | 0028,0101 | US | 10, 12, 15 | ALWAYS | CONFIG | |
| Burned In Annotation | 0028,0301 | CS | | ALWAYS | CONFIG | |
| High Bit | 0028,0102 | US | 11, 14, 9 | ALWAYS | AUTO | |
| Image Type | 0008,0008 | CS | ORIGINAL, PRIMARY | ALWAYS | AUTO | |
| Lossy Image Compression | 0028,2110 | CS | 00 | ALWAYS | AUTO | |
| Patient Orientation | 0020,0020 | CS | | ALWAYS | AUTO | |
| Photometric Interpretation | 0028,0004 | CS | MONOCHROME2 | ALWAYS | AUTO | |
| Pixel Intensity Relationship | 0028,1040 | CS | LOG | ALWAYS | AUTO | |
| Pixel Intensity Relationship Sign | 0028,1041 | SS | 1 | ALWAYS | AUTO | |
| Pixel Representation | 0028,0103 | US | 0 | ALWAYS | AUTO | |
| Presentation LUT Shape | 2050,0020 | CS | IDENTITY | ALWAYS | AUTO | |
| Rescale Intercept | 0028,1052 | DS | | ALWAYS | AUTO | |
| Rescale Slope | 0028,1053 | DS | | ALWAYS | AUTO | |
| Rescale Type | 0028,1054 | LO | | ALWAYS | AUTO | |
| Samples per Pixel | 0028,0002 | US | 1 | ALWAYS | AUTO | |
| Window Center | 0028,1050 | DS | 2047.0 | ANAPEV | AUTO | |
| Window Width | 0028,1051 | DS | 4095.0 | ANAPEV | AUTO | |

### Table 81: DX Positioning Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Distance Source to Detector | 0018,1110 | DS | | ANAP | AUTO | |
| Positioner Primary Angle | 0018,1510 | DS | | ANAP | AUTO | |
| Positioner Primary Angle Increment | 0018,1520 | DS | | ANAP | AUTO | |
| Positioner Secondary Angle | 0018,1511 | DS | | ANAP | AUTO | |
| Positioner Secondary Angle Increment | 0018,1521 | DS | | ANAP | AUTO | |
| Positioner Type | 0018,1508 | CS | | VNAP | AUTO | |
| View Position | 0018,5101 | CS | | ANAP | AUTO | |

### Table 82: DX Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Modality | 0008,0060 | CS | DX | ALWAYS | CONFIG | |
| Presentation Intent Type | 0008,0068 | CS | FOR PRESENTATION | ALWAYS | AUTO | |

### Table 83: X-Ray Acquisition Dose Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Entrance Dose | 0040,0302 | US | | ANAP | AUTO | |
| Exposure | 0018,1152 | IS | | ANAP | AUTO | |
| Exposure Time | 0018,1150 | IS | | ANAP | AUTO | |
| Image and Fluoroscopy Area Dose Product | 0018,115E | DS | | ANAP | AUTO | |
| KVP | 0018,0060 | DS | | ANAP | AUTO | |
| Relative X-ray Exposure | 0018,1405 | IS | | ANAP | AUTO | |
| X-ray Tube Current | 0018,1151 | IS | | ANAP | AUTO | |

### Table 84: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Ethnic Group | 0010,2160 | SH | | ANAP | USER, MWL | |
| Issuer of Patient ID | 0010,0021 | LO | | ANAP | USER, MWL | |
| Other Patient IDs | 0010,1000 | LO | | ANAP | USER, MWL | |
| Patient Comments | 0010,4000 | LT | | ANAP | USER, MWL | |
| Patient ID | 0010,0020 | LO | | VNAP | USER, MWL | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | USER, MWL | |
| Patient's Name | 0010,0010 | PN | | VNAP | USER, MWL | |
| Patient's Sex | 0010,0040 | CS | | VNAP | USER, MWL | |

### Table 85: General Study Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Accession Number | 0008,0050 | SH | | VNAP | USER, MWL | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | USER, MWL | |
| Study Date | 0008,0020 | DA | | VNAP | MPPS | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Study Description | 0008,1030 | LO | | ANAP | USER, MWL | |
| Study ID | 0020,0010 | SH | | VNAP | AUTO, MPPS | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO, MPPS | |
| Study Time | 0008,0030 | TM | | VNAP | MPPS | |
| Procedure Code Sequence | 0008,1032 | SQ | | ANAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |
| Referenced Study Sequence | 0008,1110 | SQ | | ANAP | MWL | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ALWAYS | MWL | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | MWL | |

**Table 86: Patient Study Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Additional Patient History | 0010,21B0 | LT | | ANAP | USER, MWL | |
| Patient's Size | 0010,1020 | DS | | ANAP | USER, MWL | |
| Patient's Weight | 0010,1030 | DS | | ANAP | USER, MWL | |

**Table 87: General Series Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Body Part Examined | 0018,0015 | CS | | ANAP | USER, MPPS | |
| Laterality | 0020,0060 | CS | | ANAPCV | CONFIG | |
| Operators' Name | 0008,1070 | PN | | ANAP | USER, MPPS | |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAP | AUTO, MPPS | |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO, MPPS | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | AUTO, MPPS | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | AUTO, MPPS | |
| Performing Physician's Name | 0008,1050 | PN | | ANAP | USER, MPPS | |
| Protocol Name | 0018,1030 | LO | | ANAP | USER, MWL | |
| Series Date | 0008,0021 | DA | | ANAP | MPPS | |
| Series Description | 0008,103E | LO | | ANAP | USER, MPPS | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO, MPPS | |
| Series Number | 0020,0011 | IS | | VNAP | AUTO, MPPS | |
| Series Time | 0008,0031 | TM | | ANAP | MPPS | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | ANAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |
| Request Attributes Sequence | 0040,0275 | SQ | | ANAP | MWL | |
| >Requested Procedure ID | 0040,1001 | SH | | ANAPEV | MWL | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | ANAP | MWL | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | ANAPEV | MWL | |

| | | | | | | |
|---|---|---|---|---|---|---|
| >Scheduled Protocol Code Sequence | 0040,0008 | SQ | | ANAP | MWL | |
| >>Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >>Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |

**Table 88: General Equipment Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Device Serial Number | 0018,1000 | LO | | ANAP | CONFIG | |
| Institution Address | 0008,0081 | ST | | ANAP | CONFIG | |
| Institution Name | 0008,0080 | LO | | ANAP | CONFIG | |
| Institutional Department Name | 0008,1040 | LO | | ANAP | CONFIG | |
| Manufacturer | 0008,0070 | LO | Philips Medical Systems | VNAP | AUTO | |
| Manufacturer's Model Name | 0008,1090 | LO | PCR Eleva | ANAP | AUTO | |
| Software Version(s) | 0018,1020 | LO | | ANAP | AUTO | |
| Spatial Resolution | 0018,1050 | DS | | ANAP | AUTO | |
| Station Name | 0008,1010 | SH | | ANAP | CONFIG | |

**Table 89: Contrast/Bolus Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Contrast/Bolus Agent | 0018,0010 | LO | | VNAP | AUTO | |

**Table 90: Display Shutter Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Center of Circular Shutter | 0018,1610 | IS | | ANAPEV | AUTO | |
| Radius of Circular Shutter | 0018,1612 | IS | | ANAPEV | AUTO | |
| Shutter Left Vertical Edge | 0018,1602 | IS | | ANAPEV | AUTO | |
| Shutter Lower Horizontal Edge | 0018,1608 | IS | | ANAPEV | AUTO | |
| Shutter Right Vertical Edge | 0018,1604 | IS | | ANAPEV | AUTO | |
| Shutter Shape | 0018,1600 | CS | | ALWAYS | AUTO | |
| Shutter Upper Horizontal Edge | 0018,1606 | IS | | ANAPEV | AUTO | |
| Vertices of the Polygonal Shutter | 0018,1620 | IS | | ANAPEV | AUTO | |

**Table 91: Acquisition Context Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Context Sequence | 0040,0555 | SQ | | VNAP | AUTO | |

**Table 92: General Image Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Date | 0008,0022 | DA | | ANAP | AUTO | |
| Acquisition Time | 0008,0032 | TM | | ANAP | AUTO | |
| Content Date | 0008,0023 | DA | | ANAPCV | AUTO | |
| Content Time | 0008,0033 | TM | | ANAPCV | AUTO | |
| Instance Number | 0020,0013 | IS | | VNAP | AUTO | |

**Table 93: Image Pixel Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Pixel Aspect Ratio | 0028,0034 | IS | 1, 1 | ANAPEV | AUTO | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |

**Table 94: X-Ray Tomography Acquisition Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Tomo Layer Height | 0018,1460 | DS | | ALWAYS | AUTO | |

**Table 95: X-Ray Collimator Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Center of Circular Collimator | 0018,1710 | IS | | ANAPEV | AUTO | |
| Collimator Left Vertical Edge | 0018,1702 | IS | | ANAPEV | AUTO | |
| Collimator Lower Horizontal Edge | 0018,1708 | IS | | ANAPEV | AUTO | |
| Collimator Right Vertical Edge | 0018,1704 | IS | | ANAPEV | AUTO | |
| Collimator Shape | 0018,1700 | CS | | ALWAYS | AUTO | |
| Collimator Upper Horizontal Edge | 0018,1706 | IS | | ANAPEV | AUTO | |
| Radius of Circular Collimator | 0018,1712 | IS | | ANAPEV | AUTO | |
| Vertices of the Polygonal Collimator | 0018,1720 | IS | | ANAPEV | AUTO | |

**Table 96: SOP Common Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| SOP Class UID | 0008,0016 | UI | | ANAPEV | AUTO | |
| SOP Instance UID | 0008,0018 | UI | 1.2.840.10008.5.1.4.1.1.1.1 | ANAPEV | AUTO | |
| Specific Character Set | 0008,0005 | CS | | ANAPEV | AUTO | |

**Table 97: Overlay Plane Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Overlay Bit Position | 6000,0102 | US | | ALWAYS | AUTO | |
| Overlay Bits Allocated | 6000,0100 | US | | ALWAYS | AUTO | |
| Overlay Columns | 6000,0011 | US | | ALWAYS | AUTO | |
| Overlay Data | 6000,3000 | O W/ OB | | ANAPEV | AUTO | |
| Overlay Origin | 6000,0050 | SS | | ALWAYS | AUTO | |
| Overlay Rows | 6000,0010 | US | | ALWAYS | AUTO | |
| Overlay Type | 6000,0040 | CS | | ALWAYS | AUTO | |

**Table 98: Additional Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Medical Alerts | 0010,2000 | LO | | VNAP | USER, MWL | |
| Contrast Allergies | 0010,2110 | LO | | VNAP | USER, MWL | |
| Pregnancy Status | 0010,21C0 | US | | VNAP | USER, MWL | |
| Radiation Setting | 0018,1155 | CS | | VNAP | AUTO | |
| Positioner Motion | 0018,1500 | CS | | VNAP | AUTO | |
| Pixel Spacing | 0028,0030 | DS | | VNAP | AUTO | |
| Requesting Physician | 0032,1032 | PN | | VNAP | USER, MWL | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Requesting Service | 0032,1033 | LO | | VNAP | USER, MWL | |
| Requested Procedure Description | 0032,1060 | LO | | VNAP | USER, MWL | |
| Special Needs | 0038,0050 | LO | | VNAP | USER, MWL | |
| Patient State | 0038,0500 | LO | | VNAP | USER, MWL | |
| Performed Station AE Title | 0040,0241 | AE | | VNAP | AUTO, MPPS | |
| Performed Procedure Step End Date | 0040,0250 | DA | | VNAP | AUTO, MPPS | |
| Performed Procedure Step End Time | 0040,0251 | TM | | VNAP | AUTO, MPPS | |
| Performed Procedure Step Status | 0040,0252 | CS | | VNAP | AUTO, MPPS | |
| Total Time of Fluoroscopy | 0040,0300 | US | | VNAP | AUTO | |
| Total Number of Exposures | 0040,0301 | US | | VNAP | AUTO | |
| Requested Procedure ID | 0040,1001 | SH | | VNAP | AUTO, MWL | |
| Requested Procedure Priority | 0040,1003 | SH | | VNAP | MWL | |
| Patient Transport Arrangements | 0040,1004 | LO | | VNAP | USER, MWL | |
| Names of Intended Recipients of Results | 0040,1010 | PN | | VNAP | AUTO | |
| Requested Procedure Comments | 0040,1400 | LT | | VNAP | MWL | |
| Reason for the Imaging Service Request (RETIRED) | 0040,2001 | LO | | VNAP | MWL | |
| Issue Date of Imaging Service Request | 0040,2004 | DA | | VNAP | AUTO | |
| Imaging Service Request Comments | 0040,2400 | LT | | VNAP | USER, MWL | |
| Film Consumption Sequence | 0040,0321 | SQ | | VNAP | AUTO | |
| >Medium Type | 2000,0030 | CS | | ALWAYS | AUTO | |
| >Film Size ID | 2010,0050 | CS | | ALWAYS | AUTO | |
| >Number of Films | 2100,0170 | IS | | ALWAYS | AUTO | |

### 8.1.1.5. Digital X-Ray Image Storage - For Proc. SOP

**Table 99: IOD of Created Digital X-Ray Image Storage - For Proc. SOP Instances**

| Information Entity | Module | Presence Of Module |
|---|---|---|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Study | Patient Study Module | CONDITIONAL |
| Series | DX Series Module | ALWAYS |
| Series | General Series Module | ALWAYS |
| Equipment | General Equipment Module | ALWAYS |
| Image | Contrast/Bolus Module | CONDITIONAL |
| Image | Display Shutter Module | CONDITIONAL |
| Image | Acquisition Context Module | ALWAYS |
| Image | General Image Module | ALWAYS |
| Image | Image Pixel Module | ALWAYS |
| Image | X-Ray Tomography Acquisition Module | CONDITIONAL |
| Image | X-Ray Collimator Module | CONDITIONAL |
| Image | SOP Common Module | ALWAYS |
| Image | Overlay Plane Module | CONDITIONAL |
| Image | DX Anatomy Imaged Module | ALWAYS |
| Image | DX Detector Module | ALWAYS |
| Image | DX Image Module | ALWAYS |
| Image | DX Positioning Module | CONDITIONAL |
| Image | X-Ray Acquisition Dose Module | CONDITIONAL |
| | Additional Module | ALWAYS |

**Table 100: DX Anatomy Imaged Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Image Laterality | 0020,0062 | CS | | ALWAYS | AUTO | |
| Anatomic Region Sequence | 0008,2218 | SQ | | VNAP | AUTO | |

**Table 101: DX Detector Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Date of Last Detector Calibration | 0018,700C | DA | | ANAP | AUTO | |
| Detector Type | 0018,7004 | CS | | VNAP | AUTO | |
| Field of View Horizontal Flip | 0018,7034 | CS | | ANAPEV | AUTO | |
| Field of View Origin | 0018,7030 | DS | | ANAPEV | AUTO | |
| Field of View Rotation | 0018,7032 | DS | | ANAPEV | AUTO | |
| Imager Pixel Spacing | 0018,1164 | DS | | ALWAYS | AUTO | |
| Time of Last Detector Calibration | 0018,700E | TM | | ANAP | AUTO | |

**Table 102: DX Image Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Device Processing Description | 0018,1400 | LO | | ANAP | AUTO | |
| Bits Allocated | 0028,0100 | US | 16 | ALWAYS | AUTO | |
| Bits Stored | 0028,0101 | US | 10, 12, 15 | ALWAYS | CONFIG | |
| Burned In Annotation | 0028,0301 | CS | | ALWAYS | CONFIG | |
| High Bit | 0028,0102 | US | 11, 14, 9 | ALWAYS | AUTO | |
| Image Type | 0008,0008 | CS | ORIGINAL, PRIMARY | ALWAYS | AUTO | |
| Lossy Image Compression | 0028,2110 | CS | 00 | ALWAYS | AUTO | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Patient Orientation | 0020,0020 | CS | | ALWAYS | AUTO | |
| Photometric Interpretation | 0028,0004 | CS | MONOCHROME1 | ALWAYS | AUTO | |
| Pixel Intensity Relationship | 0028,1040 | CS | LOG | ALWAYS | AUTO | |
| Pixel Intensity Relationship Sign | 0028,1041 | SS | 1 | ALWAYS | AUTO | |
| Pixel Representation | 0028,0103 | US | | ALWAYS | AUTO | |
| Presentation LUT Shape | 2050,0020 | CS | INVERSE | ALWAYS | AUTO | |
| Rescale Intercept | 0028,1052 | DS | | ALWAYS | AUTO | |
| Rescale Slope | 0028,1053 | DS | | ALWAYS | AUTO | |
| Rescale Type | 0028,1054 | LO | | ALWAYS | AUTO | |
| Samples per Pixel | 0028,0002 | US | | ALWAYS | AUTO | |

**Table 103: DX Positioning Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Distance Source to Detector | 0018,1110 | DS | | ANAP | AUTO | |
| Positioner Primary Angle | 0018,1510 | DS | | ANAP | AUTO | |
| Positioner Primary Angle Increment | 0018,1520 | DS | | ANAP | AUTO | |
| Positioner Secondary Angle | 0018,1511 | DS | | ANAP | AUTO | |
| Positioner Secondary Angle Increment | 0018,1521 | DS | | ANAP | AUTO | |
| Positioner Type | 0018,1508 | CS | | VNAP | AUTO | |
| View Position | 0018,5101 | CS | | ANAP | AUTO | |

**Table 104: DX Series Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Modality | 0008,0060 | CS | DX | ALWAYS | CONFIG | |
| Presentation Intent Type | 0008,0068 | CS | FOR PROCESSING | ALWAYS | AUTO | |
| Referenced Performed Procedure Step Sequence | 0008,1111 | SQ | | ANAPEV | AUTO | |

**Table 105: X-Ray Acquisition Dose Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Entrance Dose | 0040,0302 | US | | ANAP | AUTO | |
| Exposure | 0018,1152 | IS | | ANAP | AUTO | |
| Exposure Time | 0018,1150 | IS | | ANAP | AUTO | |
| Image and Fluoroscopy Area Dose Product | 0018,115E | DS | | ANAP | AUTO | |
| KVP | 0018,0060 | DS | | ANAP | AUTO | |
| Relative X-ray Exposure | 0018,1405 | IS | | ANAP | AUTO | |
| X-ray Tube Current | 0018,1151 | IS | | ANAP | AUTO | |

**Table 106: Patient Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Ethnic Group | 0010,2160 | SH | | ANAP | USER, MWL | |
| Issuer of Patient ID | 0010,0021 | LO | | ANAP | USER, MWL | |
| Other Patient IDs | 0010,1000 | LO | | ANAP | USER, MWL | |
| Patient Comments | 0010,4000 | LT | | ANAP | USER, MWL | |
| Patient ID | 0010,0020 | LO | | ALWAYS | USER, MWL | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | USER, MWL | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Patient's Name | 0010,0010 | PN | | VNAP | USER, MWL | |
| Patient's Sex | 0010,0040 | CS | F, M, O | VNAP | USER, MWL | |

**Table 107: General Study Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Accession Number | 0008,0050 | SH | | VNAP | USER, MWL | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | USER, MWL | |
| Study Date | 0008,0020 | DA | | ALWAYS | MPPS | |
| Study Description | 0008,1030 | LO | | ANAP | USER, MWL | |
| Study ID | 0020,0010 | SH | | ALWAYS | AUTO, MPPS | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO, MPPS | |
| Study Time | 0008,0030 | TM | | ALWAYS | MPPS | |
| Procedure Code Sequence | 0008,1032 | SQ | | ANAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |
| Referenced Study Sequence | 0008,1110 | SQ | | ANAP | MWL | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ANAPEV | MWL | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ANAPEV | MWL | |

**Table 108: Patient Study Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Additional Patient History | 0010,21B0 | LT | | ANAP | USER, MWL | |
| Patient's Size | 0010,1020 | DS | | ANAP | USER, MWL | |
| Patient's Weight | 0010,1030 | DS | | ANAP | USER, MWL | |

**Table 109: General Series Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Body Part Examined | 0018,0015 | CS | | ANAP | USER, MPPS | |
| Laterality | 0020,0060 | CS | | ANAPCV | CONFIG | |
| Operators' Name | 0008,1070 | PN | | ANAP | USER, MPPS | |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAP | AUTO, MPPS | |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO, MPPS | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | AUTO, MPPS | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | AUTO, MPPS | |
| Performing Physician's Name | 0008,1050 | PN | | ANAP | USER, MPPS | |
| Protocol Name | 0018,1030 | LO | | ANAP | USER, MWL | |
| Series Date | 0008,0021 | DA | | ANAP | MPPS | |
| Series Description | 0008,103E | LO | | ANAP | USER, MPPS | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO, MPPS | |
| Series Number | 0020,0011 | IS | | VNAP | AUTO, MPPS | |
| Series Time | 0008,0031 | TM | | ANAP | MPPS | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | ANAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |
| Request Attributes Sequence | 0040,0275 | SQ | | ANAP | MWL | |
| >Requested Procedure ID | 0040,1001 | SH | | ANAPEV | MWL | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | ANAP | MWL | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | ANAPEV | MWL | |
| >Scheduled Protocol Code Sequence | 0040,0008 | SQ | | ANAP | MWL | |
| >>Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >>Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >>Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |

**Table 110: General Equipment Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Device Serial Number | 0018,1000 | LO | | ALWAYS | CONFIG | |
| Institution Address | 0008,0081 | ST | | ALWAYS | CONFIG | |
| Institution Name | 0008,0080 | LO | | ALWAYS | CONFIG | |
| Institutional Department Name | 0008,1040 | LO | | ALWAYS | CONFIG | |
| Manufacturer | 0008,0070 | LO | Philips Medical Systems | ALWAYS | AUTO | |
| Manufacturer's Model Name | 0008,1090 | LO | PCR Eleva | ALWAYS | AUTO | |
| Software Version(s) | 0018,1020 | LO | | ALWAYS | AUTO | |
| Spatial Resolution | 0018,1050 | DS | | ALWAYS | AUTO | |
| Station Name | 0008,1010 | SH | | ALWAYS | CONFIG | |

**Table 111: Contrast/Bolus Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Contrast/Bolus Agent | 0018,0010 | LO | | VNAP | AUTO | |

**Table 112: Display Shutter Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Center of Circular Shutter | 0018,1610 | IS | | ANAPEV | AUTO | |
| Radius of Circular Shutter | 0018,1612 | IS | | ANAPEV | AUTO | |
| Shutter Left Vertical Edge | 0018,1602 | IS | | ANAPEV | AUTO | |
| Shutter Lower Horizontal Edge | 0018,1608 | IS | | ANAPEV | AUTO | |
| Shutter Right Vertical Edge | 0018,1604 | IS | | ANAPEV | AUTO | |
| Shutter Shape | 0018,1600 | CS | | ALWAYS | AUTO | |
| Shutter Upper Horizontal Edge | 0018,1606 | IS | | ANAPEV | AUTO | |
| Vertices of the Polygonal Shutter | 0018,1620 | IS | | ANAPEV | AUTO | |

**Table 113: Acquisition Context Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Context Sequence | 0040,0555 | SQ | | VNAP | AUTO | |

### Table 114: General Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Date | 0008,0022 | DA | | ALWAYS | AUTO | |
| Acquisition Time | 0008,0032 | TM | | ALWAYS | AUTO | |
| Content Date | 0008,0023 | DA | | ALWAYS | AUTO | |
| Content Time | 0008,0033 | TM | | ALWAYS | AUTO | |
| Instance Number | 0020,0013 | IS | | VNAP | AUTO | |

### Table 115: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Pixel Aspect Ratio | 0028,0034 | IS | 1, 1 | ANAPEV | AUTO | |
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |

### Table 116: X-Ray Tomography Acquisition Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Tomo Layer Height | 0018,1460 | DS | | ALWAYS | AUTO | |

### Table 117: X-Ray Collimator Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Center of Circular Collimator | 0018,1710 | IS | | ANAPEV | AUTO | |
| Collimator Left Vertical Edge | 0018,1702 | IS | | ANAPEV | AUTO | |
| Collimator Lower Horizontal Edge | 0018,1708 | IS | | ANAPEV | AUTO | |
| Collimator Right Vertical Edge | 0018,1704 | IS | | ANAPEV | AUTO | |
| Collimator Shape | 0018,1700 | CS | | ALWAYS | AUTO | |
| Collimator Upper Horizontal Edge | 0018,1706 | IS | | ANAPEV | AUTO | |
| Radius of Circular Collimator | 0018,1712 | IS | | ANAPEV | AUTO | |
| Vertices of the Polygonal Collimator | 0018,1720 | IS | | ANAPEV | AUTO | |

### Table 118: SOP Common Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| SOP Class UID | 0008,0016 | UI | | ANAPEV | AUTO | |
| SOP Instance UID | 0008,0018 | UI | | ANAPEV | AUTO | |
| Specific Character Set | 0008,0005 | CS | | ANAPEV | AUTO | |

### Table 119: Overlay Plane Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Overlay Bit Position | 6000,0102 | US | 0 | ALWAYS | AUTO | |
| Overlay Bits Allocated | 6000,0100 | US | 1 | ALWAYS | AUTO | |
| Overlay Columns | 6000,0011 | US | | ALWAYS | AUTO | |
| Overlay Data | 6000,3000 | O W/ OB | | ANAPEV | AUTO | |
| Overlay Origin | 6000,0050 | SS | 1 | ALWAYS | AUTO | |
| Overlay Rows | 6000,0010 | US | | ALWAYS | AUTO | |
| Overlay Type | 6000,0040 | CS | G | ALWAYS | AUTO | |

**Table 120: Additional Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Medical Alerts | 0010,2000 | LO | | VNAP | USER, MWL | |
| Contrast Allergies | 0010,2110 | LO | | VNAP | USER, MWL | |
| Pregnancy Status | 0010,21C0 | US | | VNAP | USER, MWL | |
| Radiation Setting | 0018,1155 | CS | | VNAP | AUTO | |
| Positioner Motion | 0018,1500 | CS | | VNAP | AUTO | |
| Pixel Spacing | 0028,0030 | DS | | VNAP | AUTO | |
| Requesting Physician | 0032,1032 | PN | | VNAP | USER, MWL | |
| Requesting Service | 0032,1033 | LO | | VNAP | USER, MWL | |
| Requested Procedure Description | 0032,1060 | LO | | VNAP | USER, MWL | |
| Special Needs | 0038,0050 | LO | | VNAP | USER, MWL | |
| Patient State | 0038,0500 | LO | | VNAP | USER, MWL | |
| Performed Station AE Title | 0040,0241 | AE | | VNAP | AUTO, MPPS | |
| Performed Procedure Step End Date | 0040,0250 | DA | | VNAP | AUTO, MPPS | |
| Performed Procedure Step End Time | 0040,0251 | TM | | VNAP | AUTO, MPPS | |
| Performed Procedure Step Status | 0040,0252 | CS | | VNAP | AUTO, MPPS | |
| Total Time of Fluoroscopy | 0040,0300 | US | | VNAP | AUTO | |
| Total Number of Exposures | 0040,0301 | US | | VNAP | AUTO | |
| Requested Procedure ID | 0040,1001 | SH | | VNAP | AUTO, MWL | |
| Reason for the Requested Procedure | 0040,1002 | LO | | VNAP | MWL | |
| Requested Procedure Priority | 0040,1003 | SH | | VNAP | MWL | |
| Patient Transport Arrangements | 0040,1004 | LO | | VNAP | USER, MWL | |
| Names of Intended Recipients of Results | 0040,1010 | PN | | VNAP | AUTO | |
| Requested Procedure Comments | 0040,1400 | LT | | VNAP | MWL | |
| Reason for the Imaging Service Request (RETIRED) | 0040,2001 | LO | | VNAP | MWL | |
| Issue Date of Imaging Service Request | 0040,2004 | DA | | VNAP | AUTO | |
| Imaging Service Request Comments | 0040,2400 | LT | | VNAP | USER, MWL | |
| Film Consumption Sequence | 0040,0321 | SQ | | VNAP | AUTO | |

### 8.1.1.6. Digital Mammography X-Ray Image Storage - Proc. SOP

**Table 121: IOD of Created Digital Mammography X-Ray Image Storage - Proc. SOP Instances**

| Information Entity | Module | Presence Of Module |
|---|---|---|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Study | Patient Study Module | CONDITIONAL |
| Series | General Series Module | ALWAYS |
| Series | Mammography Series Module | ALWAYS |
| Series | DX Series Module | ALWAYS |
| Equipment | General Equipment Module | ALWAYS |
| Image | Contrast/Bolus Module | CONDITIONAL |
| Image | Display Shutter Module | CONDITIONAL |
| Image | Acquisition Context Module | ALWAYS |
| Image | General Image Module | ALWAYS |
| Image | Image Pixel Module | ALWAYS |
| Image | X-Ray Tomography Acquisition Module | 0 |
| Image | X-Ray Collimator Module | CONDITIONAL |
| Image | SOP Common Module | ALWAYS |
| Image | Overlay Plane Module | CONDITIONAL |
| Image | DX Anatomy Imaged Module | ALWAYS |
| Image | DX Detector Module | ALWAYS |
| Image | DX Image Module | ALWAYS |
| Image | Mammography Image Module | ALWAYS |
| Image | X-Ray Acquisition Dose Module | CONDITIONAL |
| Image | DX Positioning Module | CONDITIONAL |
| | Additional Module | ALWAYS |

**Table 122: DX Anatomy Imaged Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Anatomic Region Sequence | 0008,2218 | SQ | | ALWAYS | AUTO | |

**Table 123: DX Detector Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Detector Type | 0018,7004 | CS | | VNAP | AUTO | |
| Imager Pixel Spacing | 0018,1164 | DS | | ALWAYS | AUTO | |
| Sensitivity | 0018,6000 | DS | | VNAP | AUTO | |

**Table 124: DX Image Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Device Processing Description | 0018,1400 | LO | | ANAPCV | AUTO | |
| Bits Allocated | 0028,0100 | US | 16 | ALWAYS | AUTO | |
| Bits Stored | 0028,0101 | US | 10, 12, 15 | ALWAYS | CONFIG | |
| Burned In Annotation | 0028,0301 | CS | | ALWAYS | CONFIG | |
| Calibration Image | 0050,0004 | CS | | ALWAYS | AUTO | |
| High Bit | 0028,0102 | US | 11, 14, 9 | ALWAYS | AUTO | |
| Image Type | 0008,0008 | CS | ORIGINAL, PRIMARY | ALWAYS | AUTO | |
| Lossy Image Compression | 0028,2110 | CS | 00 | ALWAYS | AUTO | |
| Patient Orientation | 0020,0020 | CS | | ALWAYS | AUTO | |
| Photometric Interpretation | 0028,0004 | CS | MONOCHROME1 | ALWAYS | AUTO | |
| Pixel Intensity Relationship | 0028,1040 | CS | LOG | ALWAYS | AUTO | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pixel Intensity Relationship Sign | 0028,1041 | SS | 1 | ALWAYS | AUTO | |
| Pixel Representation | 0028,0103 | US | | ALWAYS | AUTO | |
| Presentation LUT Shape | 2050,0020 | CS | INVERSE | ALWAYS | AUTO | |
| Rescale Intercept | 0028,1052 | DS | | ALWAYS | AUTO | |
| Rescale Slope | 0028,1053 | DS | | ALWAYS | AUTO | |
| Rescale Type | 0028,1054 | LO | | ALWAYS | AUTO | |
| Samples per Pixel | 0028,0002 | US | | ALWAYS | AUTO | |

**Table 125: Mammography Image Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Image Laterality | 0020,0062 | CS | | ALWAYS | AUTO | |
| Organ Exposed | 0040,0318 | CS | BREAST | ALWAYS | AUTO | |
| Positioner Primary Angle | 0018,1510 | DS | | ANAPCV | AUTO | |
| Positioner Secondary Angle | 0018,1511 | DS | | ANAPCV | AUTO | |
| Positioner Type | 0018,1508 | CS | NONE | ALWAYS | AUTO | |
| Anatomic Region Sequence | 0008,2218 | SQ | | ALWAYS | AUTO | |
| View Code Sequence | 0054,0220 | SQ | | ALWAYS | AUTO | Filled with mapping of Viewposition according to DICOM-table Context ID 4014 |
| >View Modifier Code Sequence | 0054,0222 | SQ | | EMPTY | AUTO | Always empty |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |

**Table 126: Mammography Series Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Modality | 0008,0060 | CS | MG | ALWAYS | AUTO | |

**Table 127: X-Ray Acquisition Dose Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Comments on Radiation Dose | 0040,0310 | ST | | ANAP | AUTO | |
| Image and Fluoroscopy Area Dose Product | 0018,115E | DS | | ANAP | AUTO | |
| Relative X-ray Exposure | 0018,1405 | IS | | ANAP | AUTO | |

**Table 128: DX Series Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Presentation Intent Type | 0008,0068 | CS | FOR PROCESSING | ALWAYS | AUTO | |
| Referenced Performed Procedure Step Sequence | 0008,1111 | SQ | | ANAPEV | AUTO | |
| >Referenced SOP Class UID | 0008,1150 | UI | | ANAPEV | AUTO | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ANAPEV | AUTO | |

**Table 129: DX Positioning Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Positioner Type | 0018,1508 | CS | | VNAP | AUTO | |
| View Position | 0018,5101 | CS | | ANAP | AUTO | |

**Table 130: Patient Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Ethnic Group | 0010,2160 | SH | | ANAP | MWL, USER | |
| Issuer of Patient ID | 0010,0021 | LO | | ANAP | MWL, USER | |
| Other Patient IDs | 0010,1000 | LO | | ANAP | MWL, USER | |
| Patient Comments | 0010,4000 | LT | | ANAP | MWL, USER | |
| Patient ID | 0010,0020 | LO | | ALWAYS | MWL, USER | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | MWL, USER | |
| Patient's Name | 0010,0010 | PN | | VNAP | MWL, USER | |
| Patient's Sex | 0010,0040 | CS | | VNAP | MWL, USER | |

**Table 131: General Study Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Accession Number | 0008,0050 | SH | | VNAP | MWL, USER | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | MWL, USER | |
| Study Date | 0008,0020 | DA | | ALWAYS | MPPS | |
| Study Description | 0008,1030 | LO | | ANAP | MWL, USER | |
| Study ID | 0020,0010 | SH | | VNAP | AUTO, MPPS | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO, MPPS | |
| Study Time | 0008,0030 | TM | | ALWAYS | MPPS | |
| Procedure Code Sequence | 0008,1032 | SQ | | ANAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | MWL | |

**Table 132: Patient Study Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Additional Patient History | 0010,21B0 | LT | | ANAP | MWL, USER | |
| Patient's Size | 0010,1020 | DS | | ANAP | MWL, USER | |
| Patient's Weight | 0010,1030 | DS | | ANAP | MWL, USER | |

**Table 133: General Series Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Body Part Examined | 0018,0015 | CS | | ANAP | MPPS, USER | |
| Comments on the Performed Procedure Step | 0040,0280 | ST | | ANAP | AUTO | |
| Operators' Name | 0008,1070 | PN | | ANAP | MPPS, USER | |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAP | AUTO, MPPS | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO, MPPS | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | AUTO, MPPS | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | AUTO, MPPS | |
| Performing Physician's Name | 0008,1050 | PN | | ANAP | MPPS, USER | |
| Protocol Name | 0018,1030 | LO | | ANAP | MWL, USER | |
| Series Date | 0008,0021 | DA | | ANAP | MPPS | |
| Series Description | 0008,103E | LO | | ANAP | MPPS, USER | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO, MPPS | |
| Series Number | 0020,0011 | IS | | VNAP | AUTO, MPPS | |
| Series Time | 0008,0031 | TM | | ANAP | MPPS | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | ANAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | MWL | |

**Table 134: General Equipment Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Device Serial Number | 0018,1000 | LO | | ALWAYS | CONFIG | |
| Institution Address | 0008,0081 | ST | | ALWAYS | CONFIG | |
| Institution Name | 0008,0080 | LO | | ALWAYS | CONFIG | |
| Institutional Department Name | 0008,1040 | LO | | ALWAYS | CONFIG | |
| Manufacturer | 0008,0070 | LO | Philips Medical Systems | ALWAYS | AUTO | |
| Manufacturer's Model Name | 0008,1090 | LO | PCR Eleva | ALWAYS | AUTO | |
| Software Version(s) | 0018,1020 | LO | | ALWAYS | AUTO | |
| Spatial Resolution | 0018,1050 | DS | | ALWAYS | AUTO | |
| Station Name | 0008,1010 | SH | | ALWAYS | CONFIG | |

**Table 135: Contrast/Bolus Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Contrast/Bolus Agent | 0018,0010 | LO | | VNAP | AUTO | |

**Table 136: Display Shutter Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Center of Circular Shutter | 0018,1610 | IS | | ANAPEV | AUTO | |
| Radius of Circular Shutter | 0018,1612 | IS | | ANAPEV | AUTO | |
| Shutter Left Vertical Edge | 0018,1602 | IS | | ANAPEV | AUTO | |
| Shutter Lower Horizontal Edge | 0018,1608 | IS | | ANAPEV | AUTO | |
| Shutter Right Vertical Edge | 0018,1604 | IS | | ANAPEV | AUTO | |
| Shutter Shape | 0018,1600 | CS | | ALWAYS | AUTO | |
| Shutter Upper Horizontal Edge | 0018,1606 | IS | | ANAPEV | AUTO | |
| Vertices of the Polygonal Shutter | 0018,1620 | IS | | ANAPEV | AUTO | |

**Table 137: Acquisition Context Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Context Sequence | 0040,0555 | SQ | | VNAP | AUTO | |

### Table 138: General Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Date | 0008,0022 | DA | | ALWAYS | AUTO | |
| Acquisition Time | 0008,0032 | TM | | ALWAYS | AUTO | |
| Content Date | 0008,0023 | DA | | ALWAYS | AUTO | |
| Content Time | 0008,0033 | TM | | ALWAYS | AUTO | |
| Instance Number | 0020,0013 | IS | | VNAP | AUTO | |

### Table 139: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Pixel Aspect Ratio | 0028,0034 | IS | 1, 1 | ANAP | AUTO | |
| Pixel Data | 7FE0,0010 | OW /OB | | ALWAYS | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |

### Table 140: X-Ray Tomography Acquisition Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Tomo Layer Height | 0018,1460 | DS | | ALWAYS | AUTO | |

### Table 141: X-Ray Collimator Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Collimator Left Vertical Edge | 0018,1702 | IS | | ANAPEV | AUTO | |
| Collimator Lower Horizontal Edge | 0018,1708 | IS | | ANAPEV | AUTO | |
| Collimator Right Vertical Edge | 0018,1704 | IS | | ANAPEV | AUTO | |
| Collimator Shape | 0018,1700 | CS | | ALWAYS | AUTO | |
| Collimator Upper Horizontal Edge | 0018,1706 | IS | | ANAPEV | AUTO | |

### Table 142: SOP Common Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| SOP Class UID | 0008,0016 | UI | | ANAPEV | AUTO | |
| SOP Instance UID | 0008,0018 | UI | | ANAPEV | AUTO | |
| Specific Character Set | 0008,0005 | CS | | ANAPEV | AUTO | |

### Table 143: Overlay Plane Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Overlay Bit Position | 6000,0102 | US | | ALWAYS | AUTO | |
| Overlay Bits Allocated | 6000,0100 | US | | ALWAYS | AUTO | |
| Overlay Columns | 6000,0011 | US | | ALWAYS | AUTO | |
| Overlay Data | 6000,3000 | O W/ OB | | ANAPEV | AUTO | |
| Overlay Origin | 6000,0050 | SS | | ALWAYS | AUTO | |
| Overlay Rows | 6000,0010 | US | | ALWAYS | AUTO | |
| Overlay Type | 6000,0040 | CS | | ALWAYS | AUTO | |

**Table 144: Additional Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Medical Alerts | 0010,2000 | LO | | VNAP | MWL, USER | |
| Contrast Allergies | 0010,2110 | LO | | VNAP | MWL, USER | |
| Pregnancy Status | 0010,21C0 | US | | VNAP | MWL, USER | |
| Pixel Spacing | 0028,0030 | DS | | VNAP | AUTO | |
| Requesting Physician | 0032,1032 | PN | | VNAP | MWL, USER | |
| Requesting Service | 0032,1033 | LO | | VNAP | MWL, USER | |
| Requested Procedure Description | 0032,1060 | LO | | VNAP | MWL, USER | |
| Special Needs | 0038,0050 | LO | | VNAP | MWL, USER | |
| Patient State | 0038,0500 | LO | | VNAP | MWL, USER | |
| Performed Station AE Title | 0040,0241 | AE | | VNAP | AUTO, MPPS | |
| Performed Procedure Step End Date | 0040,0250 | DA | | VNAP | AUTO, MPPS | |
| Performed Procedure Step End Time | 0040,0251 | TM | | VNAP | AUTO, MPPS | |
| Performed Procedure Step Status | 0040,0252 | CS | | VNAP | AUTO, MPPS | |
| Total Time of Fluoroscopy | 0040,0300 | US | | VNAP | AUTO | |
| Total Number of Exposures | 0040,0301 | US | | VNAP | AUTO | |
| Requested Procedure ID | 0040,1001 | SH | | VNAP | AUTO, MWL | |
| Reason for the Requested Procedure | 0040,1002 | LO | | VNAP | MWL | |
| Requested Procedure Priority | 0040,1003 | SH | | VNAP | MWL | |
| Patient Transport Arrangements | 0040,1004 | LO | | VNAP | MWL, USER | |
| Names of Intended Recipients of Results | 0040,1010 | PN | | VNAP | AUTO | |
| Requested Procedure Comments | 0040,1400 | LT | | VNAP | MWL | |
| Reason for the Imaging Service Request (RETIRED) | 0040,2001 | LO | | ALWAYS | MWL | |
| Issue Date of Imaging Service Request | 0040,2004 | DA | | ANAP | AUTO | |
| Imaging Service Request Comments | 0040,2400 | LT | | ALWAYS | MWL, USER | |
| Film Consumption Sequence | 0040,0321 | SQ | | VNAP | AUTO | |

### 8.1.1.7. Digital Mammography X-Ray Image Storage - Pres. SOP

**Table 145: IOD of Created Digital Mammography X-Ray Image Storage - Pres. SOP Instances**

| Information Entity | Module | Presence Of Module |
|---|---|---|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Study | Patient Study Module | CONDITIONAL |
| Series | General Series Module | ALWAYS |
| Series | DX Series Module | ALWAYS |
| Series | Mammography Series Module | ALWAYS |
| Equipment | General Equipment Module | ALWAYS |
| Image | General Image Module | ALWAYS |
| Image | Image Pixel Module | ALWAYS |
| Image | Contrast/Bolus Module | CONDITIONAL |
| Image | Display Shutter Module | CONDITIONAL |
| Image | Acquisition Context Module | ALWAYS |
| Image | X-Ray Tomography Acquisition Module | CONDITIONAL |
| Image | X-Ray Collimator Module | CONDITIONAL |
| Image | Overlay Plane Module | CONDITIONAL |
| Image | SOP Common Module | ALWAYS |
| Image | DX Detector Module | ALWAYS |
| Image | DX Image Module | ALWAYS |
| Image | DX Positioning Module | CONDITIONAL |
| Image | Mammography Image Module | ALWAYS |
| Image | X-Ray Acquisition Dose Module | CONDITIONAL |
| | Additional Module | ALWAYS |

**Table 146: DX Detector Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Detector Type | 0018,7004 | CS | | VNAP | AUTO | |
| Imager Pixel Spacing | 0018,1164 | DS | | ALWAYS | AUTO | |
| Sensitivity | 0018,6000 | DS | | VNAP | AUTO | |

**Table 147: DX Image Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Device Processing Description | 0018,1400 | LO | | ANAP | AUTO | |
| Bits Allocated | 0028,0100 | US | 16 | ALWAYS | AUTO | |
| Bits Stored | 0028,0101 | US | 10, 12, 15 | ALWAYS | CONFIG | |
| Burned In Annotation | 0028,0301 | CS | | ALWAYS | CONFIG | |
| Calibration Image | 0050,0004 | CS | | VNAP | AUTO | |
| High Bit | 0028,0102 | US | 11, 14, 9 | ALWAYS | AUTO | |
| Image Type | 0008,0008 | CS | ORIGINAL, PRIMARY | ALWAYS | AUTO | |
| Lossy Image Compression | 0028,2110 | CS | 00 | ALWAYS | AUTO | |
| Patient Orientation | 0020,0020 | CS | | ALWAYS | AUTO | |
| Photometric Interpretation | 0028,0004 | CS | MONOCHROME2 | ALWAYS | AUTO | |
| Pixel Intensity Relationship | 0028,1040 | CS | LOG | ALWAYS | AUTO | |
| Pixel Intensity Relationship Sign | 0028,1041 | SS | 1 | ALWAYS | AUTO | |
| Pixel Representation | 0028,0103 | US | | ALWAYS | AUTO | |
| Presentation LUT Shape | 2050,0020 | CS | IDENTITY | ALWAYS | AUTO | |
| Rescale Intercept | 0028,1052 | DS | | ALWAYS | AUTO | |
| Rescale Slope | 0028,1053 | DS | | ALWAYS | AUTO | |
| Rescale Type | 0028,1054 | LO | | ALWAYS | AUTO | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Samples per Pixel | 0028,0002 | US | | ALWAYS | AUTO | |
| Window Center | 0028,1050 | DS | 2047.0 | ANAP | AUTO | |
| Window Width | 0028,1051 | DS | 4095.0 | ANAP | AUTO | |

**Table 148: DX Series Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Presentation Intent Type | 0008,0068 | CS | FOR PRESENTATION | ALWAYS | AUTO | |
| Referenced Performed Procedure Step Sequence | 0008,1111 | SQ | | ANAP | AUTO | |
| >Referenced SOP Class UID | 0008,1150 | UI | 1.2.840.10008.3.1.2.3.3 | ANAP | AUTO | |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ANAP | AUTO | |

**Table 149: DX Positioning Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| View Position | 0018,5101 | CS | | ANAP | AUTO | |

**Table 150: Mammography Image Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Image Laterality | 0020,0062 | CS | | ALWAYS | AUTO | |
| Organ Exposed | 0040,0318 | CS | BREAST | ALWAYS | AUTO | |
| Positioner Type | 0018,1508 | CS | NONE | ALWAYS | AUTO | |
| Anatomic Region Sequence | 0008,2218 | SQ | | ALWAYS | AUTO | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |
| View Code Sequence | 0054,0220 | SQ | | ALWAYS | AUTO | Filled with mapping of View position according to DICOM-table Context ID 4014 |
| >View Modifier Code Sequence | 0054,0222 | SQ | | EMPTY | AUTO | Always empty |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | AUTO | |
| >Code Value | 0008,0100 | SH | | ALWAYS | AUTO | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | AUTO | |

**Table 151: Mammography Series Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Modality | 0008,0060 | CS | MG | ALWAYS | AUTO | |

**Table 152: X-Ray Acquisition Dose Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Comments on Radiation Dose | 0040,0310 | ST | | ANAP | AUTO | |
| Image and Fluoroscopy Area Dose Product | 0018,115E | DS | | ANAP | AUTO | |
| Relative X-ray Exposure | 0018,1405 | IS | | ANAP | AUTO | |

**Table 153: Patient Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Ethnic Group | 0010,2160 | SH | | ANAP | MWL, USER | |
| Issuer of Patient ID | 0010,0021 | LO | | ANAP | MWL, USER | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Other Patient IDs | 0010,1000 | LO | | ANAP | MWL, USER | |
| Patient Comments | 0010,4000 | LT | | ANAP | MWL, USER | |
| Patient ID | 0010,0020 | LO | | ALWAYS | MWL, USER | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | MWL, USER | |
| Patient's Name | 0010,0010 | PN | | VNAP | MWL, USER | |
| Patient's Sex | 0010,0040 | CS | F, M, O | VNAP | MWL, USER | |

**Table 154: General Study Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Accession Number | 0008,0050 | SH | | VNAP | MWL, USER | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | MWL, USER | |
| Study Date | 0008,0020 | DA | | VNAP | MPPS | |
| Study Description | 0008,1030 | LO | | ANAPCV | MWL, USER | |
| Study ID | 0020,0010 | SH | | VNAP | AUTO, MPPS | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO, MPPS | |
| Study Time | 0008,0030 | TM | | VNAP | MPPS | |
| Procedure Code Sequence | 0008,1032 | SQ | | ANAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | | |

**Table 155: Patient Study Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Additional Patient History | 0010,21B0 | LT | | ANAP | MWL, USER | |
| Patient's Size | 0010,1020 | DS | | ANAP | MWL, USER | |
| Patient's Weight | 0010,1030 | DS | | ANAP | MWL, USER | |

**Table 156: General Series Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Body Part Examined | 0018,0015 | CS | | ANAP | MPPS, USER | |
| Comments on the Performed Procedure Step | 0040,0280 | ST | | ANAP | AUTO | |
| Operators' Name | 0008,1070 | PN | | ANAP | MPPS, USER | |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAP | AUTO, MPPS | |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO, MPPS | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | AUTO, MPPS | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | AUTO, MPPS | |
| Performing Physician's Name | 0008,1050 | PN | | ANAP | MPPS, USER | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Protocol Name | 0018,1030 | LO | | ANAP | MWL, USER | |
| Series Date | 0008,0021 | DA | | ANAP | MPPS | |
| Series Description | 0008,103E | LO | | ANAP | MPPS, USER | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO, MPPS | |
| Series Number | 0020,0011 | IS | | VNAP | AUTO, MPPS | |
| Series Time | 0008,0031 | TM | | ANAP | MPPS | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | | ANAP | MWL | |
| >Code Meaning | 0008,0104 | LO | | ALWAYS | MWL | |
| >Code Value | 0008,0100 | SH | | ALWAYS | MWL | |
| >Coding Scheme Designator | 0008,0102 | SH | | ALWAYS | MWL | |
| >Coding Scheme Version | 0008,0103 | SH | | ANAP | MWL | |

**Table 157: General Equipment Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Device Serial Number | 0018,1000 | LO | | ALWAYS | CONFIG | |
| Institution Address | 0008,0081 | ST | | ALWAYS | CONFIG | |
| Institution Name | 0008,0080 | LO | | ALWAYS | CONFIG | |
| Institutional Department Name | 0008,1040 | LO | | ALWAYS | CONFIG | |
| Manufacturer | 0008,0070 | LO | Philips Medical Systems | ALWAYS | AUTO | |
| Manufacturer's Model Name | 0008,1090 | LO | PCR Eleva | ALWAYS | AUTO | |
| Software Version(s) | 0018,1020 | LO | | ALWAYS | AUTO | |
| Spatial Resolution | 0018,1050 | DS | | ALWAYS | AUTO | |
| Station Name | 0008,1010 | SH | | ALWAYS | CONFIG | |

**Table 158: General Image Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Date | 0008,0022 | DA | | ALWAYS | AUTO | |
| Acquisition Time | 0008,0032 | TM | | ALWAYS | AUTO | |
| Content Date | 0008,0023 | DA | | ALWAYS | AUTO | |
| Content Time | 0008,0033 | TM | | ALWAYS | AUTO | |
| Instance Number | 0020,0013 | IS | | VNAP | AUTO | |

**Table 159: Image Pixel Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Pixel Aspect Ratio | 0028,0034 | IS | | ANAPEV | AUTO | |
| Pixel Data | 7FE0,0010 | O W/ OB | | ALWAYS | AUTO | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |

**Table 160: Contrast/Bolus Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Contrast/Bolus Agent | 0018,0010 | LO | | VNAP | AUTO | |

**Table 161: Display Shutter Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Center of Circular Shutter | 0018,1610 | IS | | ANAPEV | AUTO | |
| Radius of Circular Shutter | 0018,1612 | IS | | ANAPEV | AUTO | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Shutter Left Vertical Edge | 0018,1602 | IS | | ANAPEV | AUTO | |
| Shutter Lower Horizontal Edge | 0018,1608 | IS | | ANAPEV | AUTO | |
| Shutter Right Vertical Edge | 0018,1604 | IS | | ANAPEV | AUTO | |
| Shutter Shape | 0018,1600 | CS | | ALWAYS | AUTO | |
| Shutter Upper Horizontal Edge | 0018,1606 | IS | | ANAPEV | AUTO | |
| Vertices of the Polygonal Shutter | 0018,1620 | IS | | ANAPEV | AUTO | |

**Table 162: Acquisition Context Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Acquisition Context Sequence | 0040,0555 | SQ | | VNAP | AUTO | |

**Table 163: X-Ray Tomography Acquisition Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Tomo Layer Height | 0018,1460 | DS | | ALWAYS | AUTO | |

**Table 164: X-Ray Collimator Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Collimator Left Vertical Edge | 0018,1702 | IS | | ANAPEV | AUTO | |
| Collimator Lower Horizontal Edge | 0018,1708 | IS | | ANAPEV | AUTO | |
| Collimator Right Vertical Edge | 0018,1704 | IS | | ANAPEV | AUTO | |
| Collimator Shape | 0018,1700 | CS | | ALWAYS | AUTO | |
| Collimator Upper Horizontal Edge | 0018,1706 | IS | | ANAPEV | AUTO | |

**Table 165: Overlay Plane Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Overlay Bit Position | 6000,0102 | US | | ALWAYS | AUTO | |
| Overlay Bits Allocated | 6000,0100 | US | | ALWAYS | AUTO | |
| Overlay Columns | 6000,0011 | US | | ALWAYS | AUTO | |
| Overlay Data | 6000,3000 | O W/ OB | | ANAPEV | AUTO | |
| Overlay Origin | 6000,0050 | SS | | ALWAYS | AUTO | |
| Overlay Rows | 6000,0010 | US | | ALWAYS | AUTO | |
| Overlay Type | 6000,0040 | CS | | ALWAYS | AUTO | |

**Table 166: SOP Common Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| SOP Class UID | 0008,0016 | UI | | ALWAYS | AUTO | |
| SOP Instance UID | 0008,0018 | UI | | ALWAYS | AUTO | |
| Specific Character Set | 0008,0005 | CS | | ANAPEV | AUTO | |

**Table 167: Additional Module**

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---|---|---|---|---|---|---|
| Medical Alerts | 0010,2000 | LO | | VNAP | MWL, USER | |
| Contrast Allergies | 0010,2110 | LO | | VNAP | MWL, USER | |
| Pregnancy Status | 0010,21C0 | US | | VNAP | MWL, USER | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pixel Spacing | 0028,0030 | DS | | VNAP | AUTO | |
| Requesting Physician | 0032,1032 | PN | | VNAP | MWL, USER | |
| Requesting Service | 0032,1033 | LO | | VNAP | MWL, USER | |
| Requested Procedure Description | 0032,1060 | LO | | VNAP | MWL, USER | |
| Special Needs | 0038,0050 | LO | | VNAP | MWL, USER | |
| Patient State | 0038,0500 | LO | | VNAP | MWL, USER | |
| Performed Station AE Title | 0040,0241 | AE | | VNAP | AUTO, MPPS | |
| Performed Procedure Step End Date | 0040,0250 | DA | | VNAP | AUTO, MPPS | |
| Performed Procedure Step End Time | 0040,0251 | TM | | VNAP | AUTO, MPPS | |
| Performed Procedure Step Status | 0040,0252 | CS | | VNAP | AUTO, MPPS | |
| Total Number of Exposures | 0040,0301 | US | | VNAP | AUTO | |
| Requested Procedure ID | 0040,1001 | SH | | VNAP | AUTO, MWL | |
| Reason for the Requested Procedure | 0040,1002 | LO | | VNAP | MWL | |
| Requested Procedure Priority | 0040,1003 | SH | | VNAP | MWL | |
| Patient Transport Arrangements | 0040,1004 | LO | | VNAP | MWL, USER | |
| Names of Intended Recipients of Results | 0040,1010 | PN | | VNAP | AUTO | |
| Requested Procedure Comments | 0040,1400 | LT | | VNAP | MWL | |
| Reason for the Imaging Service Request (RETIRED) | 0040,2001 | LO | | VNAP | MWL | |
| Issue Date of Imaging Service Request | 0040,2004 | DA | | VNAP | AUTO | |
| Imaging Service Request Comments | 0040,2400 | LT | | VNAP | MWL, USER | |
| Film Consumption Sequence | 0040,0321 | SQ | | VNAP | AUTO | |

### 8.1.2. Usage of Attributes from Received IOD

The PCR Eleva has only an export side. The modality cannot read/view images from a CD or by import.

### 8.1.3. Attribute Mapping

In this section is specified the mapping between the Modality Worklist, Storage and Modality Performed Procedure Step.

**Table 168: Attribute mapping during Modality Workflow**

| Name | WLM tag | MPPS Create tag | MPPS Set tag | Image IOD tag |
|---|---|---|---|---|
| Accession Number | 0008,0050 | 0008,0050 | - | 0008,0050 |
| Modality | - | 0008,0060 | - | 0008,0060 |
| Referring Physician's Name | 0008,0090 | - | - | 0008,0090 |
| Operator's Name | - | - | 0008,1070 | 0008,1070 |
| Referenced Study Sequence | 0008,1110 | 0008,1110 | - | 0008,1110 |
| Referenced Image Sequence (0008,1140)>Referenced SOP Class UID | - | - | 0008,1150 | 0008,0016 |
| SOP Class UID | | | | |
| Referenced Image Sequence (0008,1140)>Referenced SOP Instance UID | - | - | 0008,1155 | 0008,0018 |
| SOP Instance UID | | | | |
| Patient's Name | 0010,0010 | 0010,0010 | - | 0010,0010 |
| Patient ID | 0010,0020 | 0010,0020 | - | 0010,0020 |
| Issuer of Patient ID | 0010,0021 | 0010,0021 | - | 0010,0021 |
| Patient's Birth Date | 0010,0030 | 0010,0030 | - | 0010,0030 |
| Patient's Sex | 0010,0040 | 0010,0040 | - | 0010,0040 |
| Other Patient IDs | 0010,1000 | 0010,1000 | - | 0010,1000 |
| Medical Alerts | 0010,2000 | - | - | 0010,2000 |
| Contrast Allergies | 0010,2110 | - | - | 0010,2110 |
| Ethnic group | 0010,2160 | - | - | 0010,2160 |
| Additional Patient History | 0010,21B0 | - | - | 0010,21B0 |
| Pregnancey Status | 0010,21C0 | - | - | 0010,21C0 |
| Patient Comments | 0010,4000 | - | - | 0010,4000 |
| Protocol Name | - | - | 0018,1030 | 0018,1030 |
| Study Instance UID | 0020,000D | 0020,000E | - | 0020,000D |
| Series Instance UID | - | - | 0020,000E | 0020,000E |
| Study ID | - | 0020,0010 | - | 0020,0010 |
| Requesting Service | 0032,1033 | - | - | 0032,1033 |
| Requested Procedure Description | 0032,1060 | 0032,1060 | - | - |
| Requested Procedure Code Sequence [3] | 0032,1064 | 0008,1032 | 0008,1032 | 0008,1032 |
| Performed Procedure Code Sequence | | | | |
| Special Needs | 0038,0050 | - | - | 0038,0050 |
| Patient State | 0038,0500 | - | - | 0038,0500 |
| Scheduled Procedure Step Description [4] | 0040,0007 | 0040,007 | - | 0040,0007 |
| Performed Procedure Step Description | | 0040,0254 | | 0040,0254 |
| Scheduled Protocol Code Sequence [4] | 0040,0008 | 0040,0260 | 0040,0260 | 0040,0008 |
| Performed Protocol Code Sequence | | | | 0040,0260 |
| Scheduled Procedure Step ID | 0040,0009 | 0040,0009 | - | 0040,0009 |
| Performed Procedure Step Start Date | - | 0040,0244 | - | 0040,0244 |
| Performed Procedure Step Start Time | - | 0040,0245 | - | 0040,0245 |
| Perfomred Procedure Step ID | - | 0040,0253 | - | 0040,0253 |
| Request Procedure ID | 0040,1001 | 0040,1001 | - | 0040,1001 |

Note 1: Value accumulated from all performed acquisitions including dropped (repeated) acquisitions.
Note 2: Images related specific value.
Note 3: If procedure is performed as requested.
Note 4: If protocol is performed as scheduled.

### 8.1.4. Coerced/Modified fields

Not applicable

## 8.2. Data Dictionary of Private Attributes

Not applicable

## 8.3. Coded Terminology and Templates

This application support the following Coded Terminology and templates as described in the sub-sections.

### 8.3.1. Context Groups

Not applicable

### 8.3.2. Template Specifications

Not applicable

### 8.3.3. Private code definitions

Not applicable

## 8.4. Grayscale Image consistency

The monitor of PCR Eleva system can be calibrated according Grayscale Display Function standard.

The pixel values exported and printed should be interpreted as P-Value. If the export destination or the printer does not support GSDF, PCR Eleva provides calibration tools to adapt to this device to afford grayscale images consistency. The calibration takes into account ambient luminance and lightbox luminance.

## 8.5. Standard Extended/Specialized/Private SOPs

Not applicable

## 8.6. Private Transfer Syntaxes

Not applicable