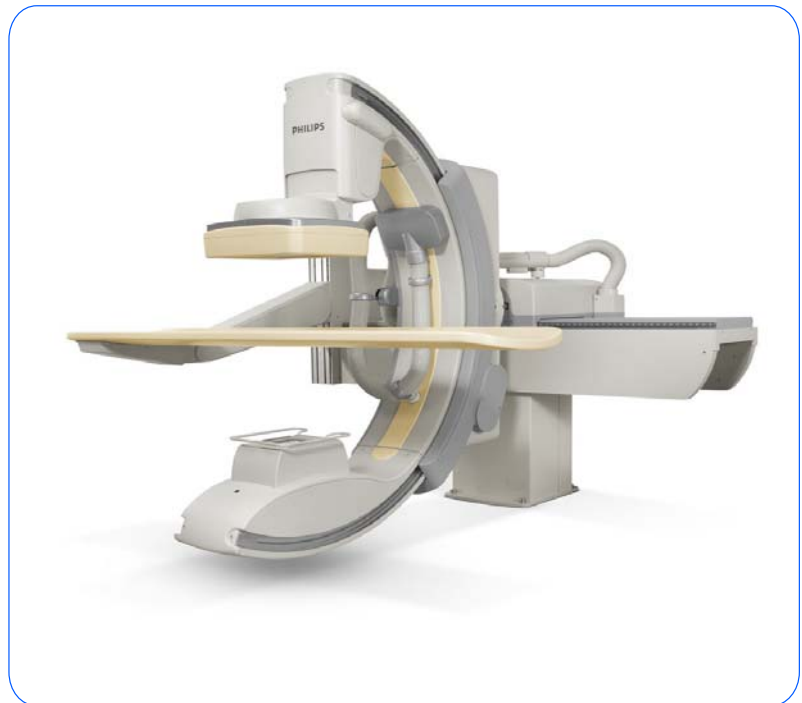

DICOM

Conformance Statement

MultiDiagnost ELEVA with
Flat Detector R3.1.1.



Issued by:

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Document Number: XPS 080-050290
Date: 9 December 2005

1 DICOM CONFORMANCE STATEMENT OVERVIEW

The MultiDiagnost Eleva with Flat Detector is a multifunctional X-ray system, designed to provide faster, more confident diagnoses. It combines a wide applicational range with revolutionary Eleva technology that adapts the system to your way of working. Equipped with Philips' latest dynamic Flat Detector that provides excellent image quality at the lowest possible dose.

The MultiDiagnost Eleva with Flat Detector system is an Digital Fluorography modality. Depending on the purchased options and chosen configuration, the MultiDiagnost Eleva with Flat Detector system provides the following DICOM data exchange features:

- Request Worklist
- Issue Procedure information to RIS / HIS system
- Image acquisition and display
- Image review and processing
- Image handling, storage and networking,
- Administration of patient, physician and examination data.
- Read and Write DICOM CD-RW disks.
- Read and write DICOM DVD-RW disks.
- It allows the operator to print images stored in the database on a DICOM printer.
- Copy images from the local database to remote databases and vice versa.
- Import images for viewing.
- Storage Commitment function
- It allows a remote system to Query the MD ELEVA System database and to Retrieve images from it.
- Can send out images either as raw data or as processed data.

The main application areas are:

- R/F examinations
- Vascular examinations
- Interventional procedures

This DICOM Conformance Statement describes the DICOM conformance of the MultiDiagnost Eleva with Flat Detector system.

Disclaimer:

Imported Images are not intended to be exported

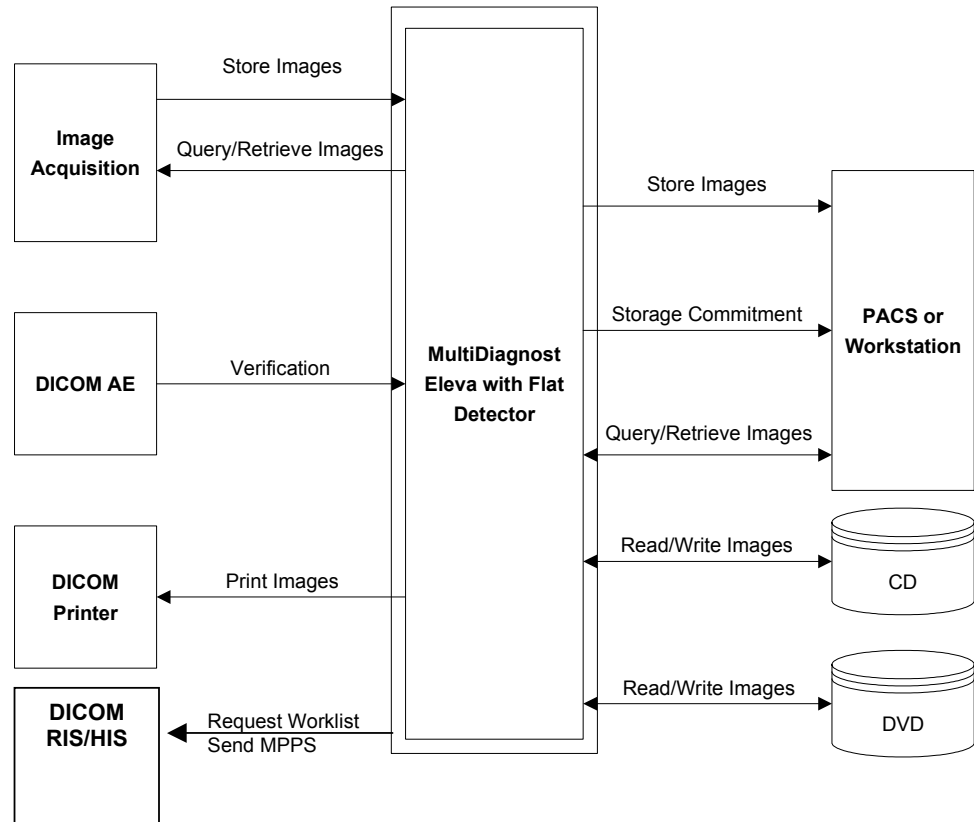


Figure 1: MultiDiagnost Eleva with Flat Detector System in a DICOM Network environment

MultiDiagnost Eleva with Flat Detector allows the operator also to view, analyze and process the images stored in the database. Some advanced analysis and processing applications are primarily designed for images generated by Philips equipment when sent to the MultiDiagnost Eleva with Flat Detector.

This DICOM Conformance Statement describes the DICOM conformance of the MultiDiagnost Eleva with Flat Detector platform.

Table 1 presents an overview of all network services and the applicable SOP classes as provided by MultiDiagnost Eleva with Flat Detector system.

Table 1: Network Services

| SOP Class | | User of Service (SCU) | Provider of Service (SCP) |
|--|------------------------------|-----------------------|---------------------------|
| Name | UID | | |
| Storage | | | |
| Computed Radiography Image Storage | 1.2.840.10008.5.1.4.1.1.1 | Yes | Yes |
| Digital X-Ray Image Storage – for Presentation | 1.2.840.10008.5.1.4.1.1.1.1 | Yes | Yes |
| CT Image Storage | 1.2.840.10008.5.1.4.1.1.2 | Yes | Yes |
| Ultrasound Multi-frame Image Storage | 1.2.840.10008.5.1.4.1.1.3.1 | Yes | Yes |
| MR Image Storage | 1.2.840.10008.5.1.4.1.1.4 | Yes | Yes |
| Ultrasound Image Storage | 1.2.840.10008.5.1.4.1.1.6.1 | Yes | Yes |
| Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7 | Yes | Yes |
| Grayscale Softcopy Presentation State Storage | 1.2.840.10008.5.1.4.1.1.11.1 | Yes | Yes |
| X-Ray Angiographic Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | Yes | Yes |
| X-Ray Radiofluoroscopic Image Storage | 1.2.840.10008.5.1.4.1.1.12.2 | Yes | Yes |
| Private Storage | | | |
| Specialized X-Ray | 1.3.46.670589.2.3.1.1 | Yes | Yes |
| CX Image | 1.3.46.670589.2.4.1.1 | Yes | Yes |
| 3D Volume Storage | 1.3.46.670589.5.0.1.1 | Yes | Yes |
| 3D Volume Object Storage | 1.3.46.670589.5.0.2.1 | Yes | Yes |
| Surface Storage | 1.3.46.670589.5.0.3.1 | Yes | Yes |
| MR Cardio Storage | 1.3.46.670589.5.0.8.1 | Yes | Yes |
| CT Synthetic Image | 1.3.46.670589.5.0.9 | Yes | Yes |
| MR Synthetic Image | 1.3.46.670589.5.0.10 | Yes | Yes |
| MR Cardio Analysis Storage | 1.3.46.670589.5.0.11.1 | Yes | Yes |
| CX Synthetic Image | 1.3.46.670589.5.0.12 | Yes | Yes |
| Perfusion | 1.3.46.670589.5.0.13 | Yes | Yes |
| Perfusion Analysis | 1.3.46.670589.5.0.14 | Yes | Yes |
| Query/Retrieve | | | |
| Patient Root Query/Retrieve Information Model – FIND | 1.2.840.10008.5.1.4.1.2.1.1 | Yes | Yes |
| Patient Root Query/Retrieve Information Model – MOVE | 1.2.840.10008.5.1.4.1.2.1.2 | Yes | Yes |
| Study Root Query/Retrieve Information Model – FIND | 1.2.840.10008.5.1.4.1.2.2.1 | Yes | Yes |
| Study Root Query/Retrieve Information Model – MOVE | 1.2.840.10008.5.1.4.1.2.2.2 | Yes | Yes |
| Patient/Study Only Query/Retrieve Information Model – FIND | 1.2.840.10008.5.1.4.1.2.3.1 | Yes | Yes |
| Patient/Study Only Query/Retrieve Information Model – MOVE | 1.2.840.10008.5.1.4.1.2.3.2 | Yes | Yes |
| Workflow Management | | | |
| Storage Commitment Push Model | 1.2.840.10008.1.20.1 | Yes | No |
| Verification | 1.2.840.10008.1.1 | No | Yes |
| Modality Worklist Information Model - FIND | 1.2.840.10008.5.1.4.3.1 | Yes | No |
| Modality Performed Procedure Step | 1.2.840.10008.3.1.2.3.3 | Yes | No |
| Print Management | | | |
| Basic Grayscale Print Management (Meta) | 1.2.840.10008.5.1.1.9 | Yes | No |
| > Basic Film Session | 1.2.840.10008.5.1.1.1 | Yes | No |
| > Basic Film Box | 1.2.840.10008.5.1.1.2 | Yes | No |
| > Basic Grayscale Image Box | 1.2.840.10008.5.1.1.4 | Yes | No |
| > Printer | 1.2.840.10008.5.1.1.16 | Yes | No |
| Basic Color Print Management (Meta) | 1.2.840.10008.5.1.1.18 | Yes | No |

| SOP Class | | User of Service (SCU) | Provider of Service (SCP) |
|-------------------------|-------------------------|-----------------------|---------------------------|
| Name | UID | | |
| > Basic Film Session | 1.2.840.10008.5.1.1.1 | Yes | No |
| > Basic Film Box | 1.2.840.10008.5.1.1.2 | Yes | No |
| > Basic Color Image Box | 1.2.840.10008.5.1.1.4.1 | Yes | No |
| > Printer | 1.2.840.10008.5.1.1.16 | Yes | No |
| Presentation LUT | 1.2.840.10008.5.1.1.23 | Yes | No |

The following table lists the Supported media Storage Application Profiles (with roles).

Table 2: Media Services

| Media Storage Application Profile | Write Files (FSC / FSU) | Read Files (FSR) | Supported media |
|-----------------------------------|-------------------------|------------------|-----------------|
| CD – R Disk | | | |
| General Purpose CD-R | YES / YES | YES | CD |
| DVD Disk | | | |
| General Purpose DVD-JPEG | YES / NO | YES | DVD+R / DVD+RW |

Note: Not supported are the media DVD -R / -RW.

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3 INTRODUCTION

3.1 Revision History

Table 3: Revision History

| Document Version | Date of Issue | Author | Description |
|------------------|---------------|------------|--|
| 04 | 09-12-2005 | PMS MIT-IO | Final version of the DICOM Conformance Statement for MultiDiagnost Eleva with Flat Detector R3.1.1 |

3.2 Audience

This DICOM Conformance Statement is intended for:

- (potential) customers
- system integrators of medical equipment
- 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 1 through 8 and follows the contents and structuring requirements of the DICOM Standard PS 3.2 –2004.

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 DICOM Conformance Statement.
Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant DICOM Conformance Statements. If the DICOM 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

DICOM definitions, terms and abbreviations are used throughout this Conformance Statement. For a description of these, see NEMA PS 3.3-2004 and PS 3.4-2004.

The word Philips in this document refers to Philips Medical Systems.

The following acronyms and abbreviations may be used in this document:

| | |
|--------|---|
| AE | Application Entity |
| ACP | Archiving / Connectivity and Print |
| ACR | American College of Radiology |
| CD | Compact Disc |
| CD-R | CD-Recordable |
| CSE | Customer Support Engineer |
| DICOM | Digital Imaging and Communications in Medicine |
| DIMSE | DICOM Message Service Element |
| DVD | Digital Video Disc |
| EBE | DICOM Explicit VR Big Endian |
| ELE | DICOM Explicit VR Little Endian |
| FD | Flat Detector |
| FSC | File-set Creator |
| FSR | File-set Reader |
| FSU | File-set Updater |
| GUI | Graphical User Interface |
| HIPAA | Health Insurance Portability and Accountability Act |
| HIS | Hospital Information System |
| ILE | DICOM Implicit VR Little Endian |
| IHE | Integrating the Healthcare Enterprise |
| IOD | Information Object Definition |
| JPEG | Joint Photographic Experts Group |
| MD | MultiDiagnost |
| MPPS | Modality Performed Procedure Step |
| MR | Magnetic Resonance |
| MWL | Modality Worklist |
| N/A | Not Applicable |
| NEMA | National Electrical Manufacturers Association |
| PACS | Picture Archiving and Communication System |
| PDU | Protocol Data Unit |
| PMS(N) | Philips Medical Systems (Nederland B.V.) |
| Q/R | Query/Retrieve (Service Class) |

| | |
|--------|---|
| 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 |
| VR | Value Representation |
| WLM | Worklist Management |

The following terms are used in this document:

MultiDiagnost Eleva with Flat Detector System.

The MultiDiagnost Eleva with Flat Detector is a multifunctional X-ray system, designed to provide faster, more confident diagnoses. It combines a wide applicational range with revolutionary Eleva technology that adapts the system to your way of working. Equipped with Philips' latest dynamic Flat Detector that provides excellent image quality at the lowest possible dose.

Image Archive (PACS)

A PACS is a system that provides long term storage of images, Presentation States, Key Image Notes and Evidence Documents [IHE].

Image Display Viewer

The Image Display Viewer is a system that offers browsing of Patients' Studies. In addition, it may support the retrieval and display of selected sets of images, Presentation States, Key Image Notes, and Evidence Documents [IHE].

Department System Scheduler

A department-based information system that provides functions related to the management of orders received from external systems or through the department system's user interface. Upon a defined workflow action, makes procedures available for charge posting. The actor defines the action/event that actually causes charges to post [IHE].

Performed Procedure Step Manager

A system that re-distributes the Modality Performed Procedure Step Information from the Acquisition Modality or image Creator to the Department System Scheduler/Order Filler and Image Manager [IHE].

Printer

A system that accepts and processes DICOM print requests as a DICOM Print SCP and performs image rendering on hardcopy media. The system must support pixel rendering according to the DICOM Grayscale Standard Display Function [IHE].

3.5 References

- [DICOM] Digital Imaging and Communications in Medicine (DICOM), Part 1 – 16 (NEMA PS 3.1-2004 – PS 3.16-2004), National Electrical Manufacturers Association (NEMA)

Publication Sales 1300 N. 17th Street, Suite 1847
Rosslyn, Virginia. 22209, United States of America

[IHE] Integrating the Healthcare Enterprise
(IHE) Technical Framework Revision 5.4:
Radiological Society of North America (RSNA), Inc.
820 Jorie Boulevard, Oak Brook, IL, United States of America

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 MultiDiagnost Eleva with Flat Detector Application Entity and the “external world” or Real-World Activities,
- A functional description of the MultiDiagnost Eleva with Flat Detector Application Entity, and
- the sequencing constraints among them.

4.1.1 Application Data Flow

The **MultiDiagnost ELEVA with Flat Detector (MD ELEVA)** has two Application Entities in its implementation, namely

- MultiDiagnost ELEVA with Flat Detector RIS Application Entity (**MD ELEVA RIS AE**) and
- MultiDiagnost ELEVA with Flat Detector ACP AE Application Entity (**MD ELEVA ACP AE**).

Figure 2 shows the Networking application data flow as a functional overview of these application entities. On the left-hand side, the local Real-World Activities (RWA) are presented, whereas on the right-hand side, the remote Real-World Activities are presented.

As depicted in Figure 2, the MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS AE and MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE incorporate the following functionality:

- After RWA Request Verification, the MD ELEVA with FLAT DETECTOR as SCP provides standard Verification Service Class functionality to the requesting SCU.
- After RWA Import Images, the MD ELEVA with FLAT DETECTOR as SCP provides standard Storage Service Class functionality to the requesting SCU.
- After RWA Query Local Images/Retrieve Local Images, the MD ELEVA with FLAT DETECTOR as SCP provides standard Query/Retrieve Service Class functionality to the requesting SCU.
- After RWA Export Images (triggered by either the operator or RWA Retrieve Local Images), the MD ELEVA with FLAT DETECTOR as SCU uses the remote SCP Storage Service Class functionality to store local images, either as raw data or as processed data, on a remote database.
- After operator RWA Find Remote Images, the MD ELEVA with FLAT DETECTOR as SCU uses the remote SCP Query/Retrieve Service Class functionality to query remote images.
- After operator RWA Move Remote Images, the MD ELEVA with FLAT DETECTOR as SCU uses the remote SCP Query/Retrieve Service Class functionality to retrieve remote images.
- After operator RWA Request Storage Commitment, the MD ELEVA with FLAT DETECTOR as SCU uses the remote SCP Storage Commitment Service Class functionality to commit remote images.
- After operator RWA Print Images, the MD ELEVA with FLAT DETECTOR as SCU uses the remote Print Management Service Class to print local images.

-
- After operator RWA Request Printer Status, the MD ELEVA with FLAT DETECTOR as SCU uses the remote Print Management Service Class to request the printer status.
 - The MD ELEVA with FLAT DETECTOR can request a Worklist from a remote system such as a RIS / HIS system. The MD ELEVA with FLAT DETECTOR can issue the request information using the Modality Performed Procedure Step service to update the RIS.
 - The MD ELEVA with FLAT DETECTOR can request to query a selected remote system, request to copy images from MD ELEVA with FLAT DETECTOR to a selected remote system, request storage commitment on exported images, request to retrieve selected images from remote systems and can request to print images. This results in Associations initiated by MD ELEVA with FLAT DETECTOR.
 - The MD ELEVA with FLAT DETECTOR is able to reply on verification requests, to execute a requested query, to store received images into MD ELEVA with FLAT DETECTOR and retrieve requested images from MD ELEVA with FLAT DETECTOR. These requests from remote systems are done via Associations initiated by the remote systems.
 - The MD ELEVA with FLAT DETECTOR is also able to display the contents (i.e. directory listing) of DICOM CD-Recordable disk to Write, Read and Update images, either as raw data or as processed data (RF / XA), on / from a DICOM CD-Recordable disk.
 - The MD ELEVA with FLAT DETECTOR is also able to display the contents (i.e. directory listing) of DICOM DVD disk to Write and Read images, either as raw data or as processed data (RF / XA), on / from a DICOM DVD disk.

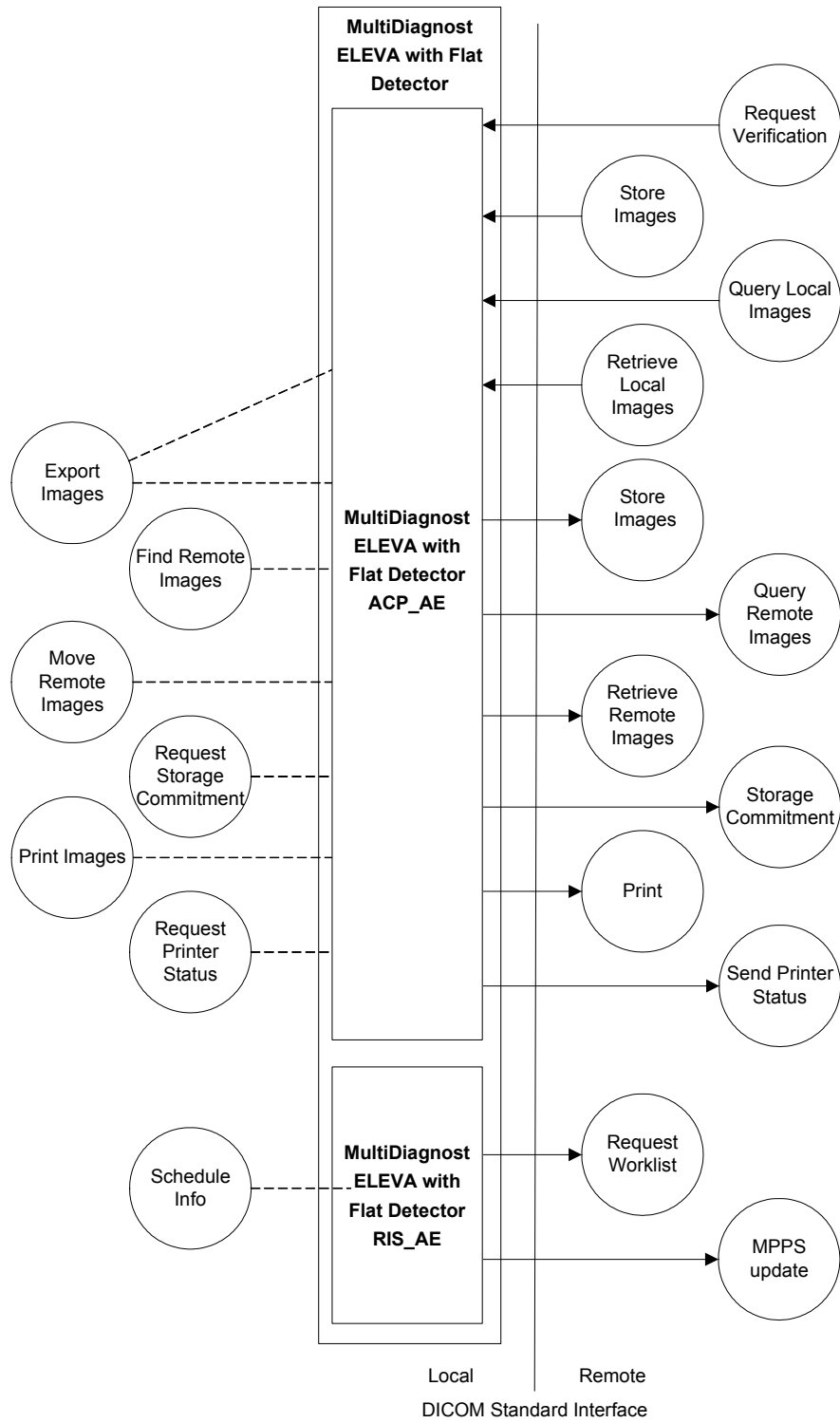


Figure 2: Networking Application Data Flow Diagram of the MultiDiagnost ELEVA with Flat Detector

4.1.2 Functional Definition of AE's

This section shall describe in general terms the functions to be performed by the AE, and the DICOM services used to accomplish these functions.

4.1.2.1 Functional Definition of MD ELEVA with FLAT DETECTOR

The MD ELEVA with FLAT DETECTOR includes the following service classes.

Verification Service Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Verification service as SCP (RWA Request Verification).

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

Storage Service Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Storage service as SCP (RWA Import Images).

A remote SCU shall request an association with the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE for Storage SOP classes. After accepting the association, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall receive the Storage requests, store the data in the local database, send the applicable Storage responses, and release the association when requested.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Storage service as SCU (RWA Export Images, triggered by operator or retrieve request).

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request an association with the selected remote SCP for all applicable Storage SOP classes. When the association is accepted, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall send the Storage requests (including data from local database), receive the Storage responses and act accordingly, and release the association. Finally, if configured, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request storage commitment per Storage Commitment service (ref. Storage Commitment service class).

Query/Retrieve Service Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Query/Retrieve service as SCP (RWA Query Local Images and RWA Retrieve Local Images).

A remote SCU shall request an association with the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE for Query/Retrieve SOP classes. After accepting the association, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall receive the Query/Retrieve requests. In case of a Retrieve request, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request storage per Storage service as SCU (ref. Storage Service Class). Next, the

MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall send the applicable Query/Retrieve responses, and release the association when requested.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Query/Retrieve service as SCU (RWA Find Remote Images and RWA Move Remote Images).

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request an association with the selected remote SCP for the applicable (configured) Query/Retrieve SOP class. When the association is accepted, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall send the Query/Retrieve requests, receive the Query/Retrieve responses and act accordingly, and finally release the association.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE fully supports the Cancel functionality, both as SCU and as SCP.

Storage Commitment Service Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Storage Commitment service as SCU (RWA Request Storage Commitment).

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request an association with the selected remote SCP for the Storage Commitment Push Model SOP class. When the association is accepted, the MULTIDIAGNOST ELEVA with FLAT DETECTOR 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 MULTIDIAGNOST ELEVA with FLAT DETECTOR AE (still SCU). After accepting the association, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall receive the Storage Commitment reports, and release the association when requested.

The Storage Commitment Service can be done Synchronous and Asynchronous.

A detailed specification of the Storage Commitment is described in section 4.2.1.3.4 (RWA Request Storage Commitment).

Print Management Service Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE Print service acts as a Service Class User SCU (RWA Print Images).

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request an association with the selected remote SCP (printer) for all applicable SOP classes of the applicable Print Management Meta SOP class. When the association is accepted, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall send the Print requests (including data from local database), receive the Print responses and act accordingly, and finally release the association.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE can perform the Printer service as SCU (RWA Request Printer Status)

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall request an association with the selected remote SCP (printer) for the Printer SOP class.

When the association is accepted, the MULTIDIAGNOST ELEVA with FLAT DETECTOR AE shall send the Get / Event Report request, receive the Printer responses and act accordingly, and finally release the association.

Worklist Service Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS Application Entity (MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS AE) acts as a Service Class User (SCU) for Worklist and MPPS.

Media Service Class.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR AE acts also as a File Set Creator (FSC), File Set Reader (FSR) and File Set Updater (FSU) for supported CD + R medium and File Set Creator (FSC) and File Set Reader (FSR) for supported DVD + RW medium.

4.1.3 Sequencing of Real World Activities

This section shall contain a description of specific sequencing as well as potential constraints of Real-World Activities, including any applicable user interactions, as performed by the MD ELEVA with FLAT DETECTOR.

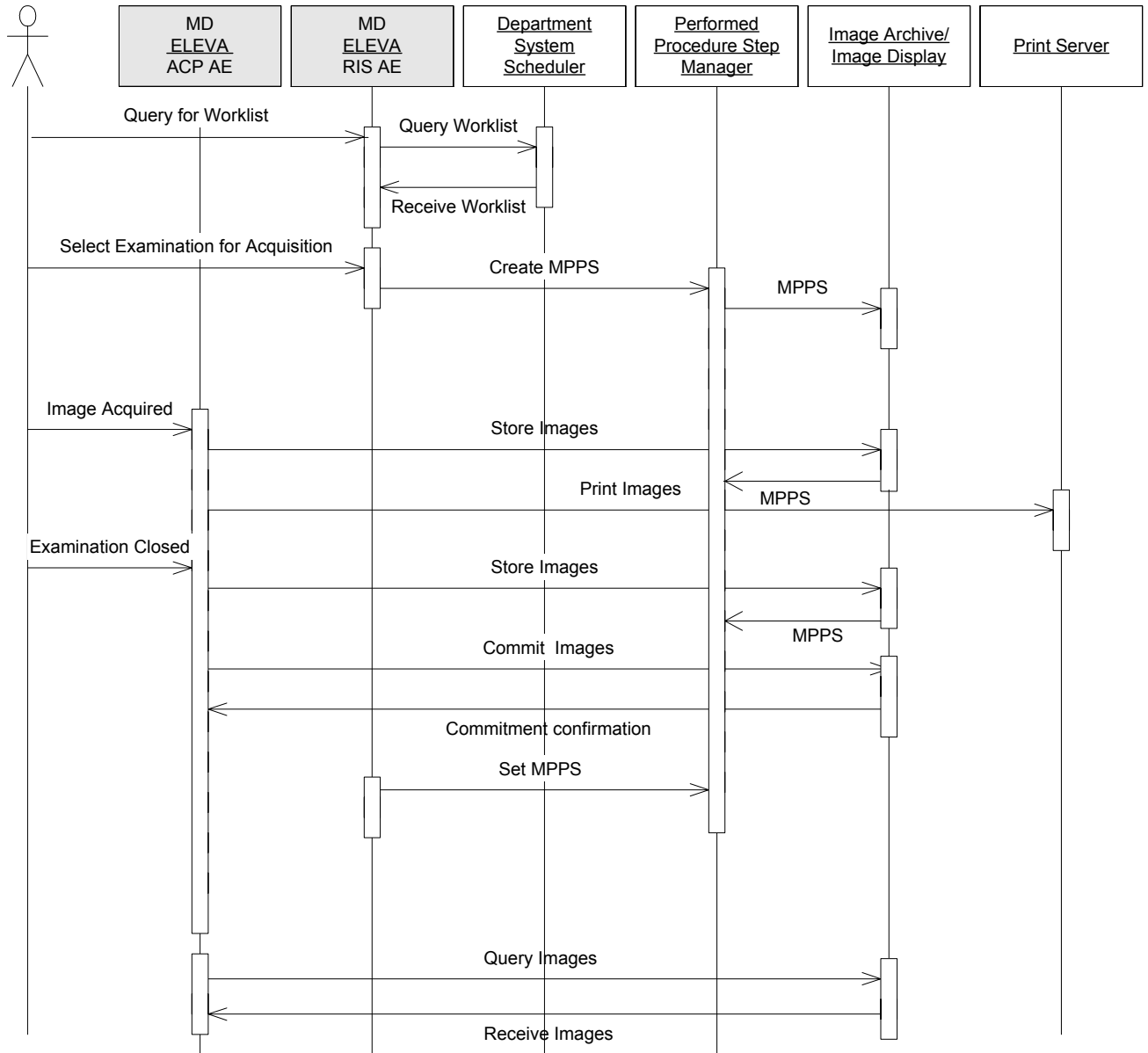


Figure 3: Sequencing of the Real World Activities of MD ELEVA with FLAT DETECTOR

Examinations, identified with a new UID, are created inside the MultiDiagnost Eleva with Flat Detector RIS as result of Worklist Management or on manual scheduling by

the clinical user. Once an examination (an equivalent to the DICOM Procedure Step) is created, the clinical user can select this examination for acquisition.

The administration Patient information, put in by the clinical user, and the worklist patient information will be sent together to the MultiDiagnost Eleva with Flat Detector ACP.

A Examination, selection for acquisition is synchronized between the MultiDiagnost Eleva with Flat Detector RIS and the MultiDiagnost Eleva with Flat Detector ACP. Once an acquisition has started, the MPPS CREATED messages are sent from the MultiDiagnost Eleva with Flat Detector RIS to the RIS.

Acquired images from the MultiDiagnost Eleva with Flat Detector ACP and related data from the clinical user are added to the examination.

The composite images acquired are automatic forwarded to the MultiDiagnost ELEVA ACP AE, and can now be used for Viewing, Printing or Exporting.

When the clinical user has indicated on the MultiDiagnost Eleva with Flat Detector ACP that the examination is finished the Examination will be deleted here, as soon as the automatic export of the images has taken place.

A MPPS "**COMPLETED**" or "**DISCONTINUED**" message is sent from the MultiDiagnost ELEVA RIS AE to the RIS.

4.2 AE SPECIFICATIONS

The next section in the DICOM Conformance Statement contains the specifications of the Network capabilities of the **MD ELEVA with FLAT DETECTOR** consists of the next DICOM Application Entities:

- **MultiDiagnost Eleva with Flat Detector ACP AE** (MD ELEVA ACP AE)
- **MultiDiagnost Eleva with Flat Detector RIS AE** (MD ELEVA RIS AE)

The functions supported by these AE's are specified in the sections 4.2.1 and 4.2.2.

The media functionality is described in section 5.

4.2.1 MultiDiagnost Eleva with Flat Detector ACP AE

The MultiDiagnost Eleva with Flat Detector ACP Application Entity provides Standard Extended Conformance to the DICOM V3.0 SOP classes as SCU/SCP as specified in Table 4.

The following remarks are important:

- In case the remote system does not support the import of a specific Image Storage SOP Class, the MultiDiagnost Eleva with Flat Detector ACP AE will convert (if configured to do so) these images and sends them via the SC Image SOP Class.
- The Imported Images should only be used for viewing purposes.
- The MultiDiagnost Eleva with Flat Detector ACP AE requests for a Storage Commitment.

4.2.1.1 Supported SOP Classes MultiDiagnost Eleva with Flat Detector ACP AE as SCP/SCU.

This Application Entity provides extended Standard Conformance to the following SOP classes.

Table 4: SOP Classes for MultiDiagnost Eleva with Flat Detector ACP AE

| SOP Class Name | SOP Class UID | SCU | SCP |
|--|------------------------------|-----|-----|
| Verification | 1.2.840.10008.1.1 | No | Yes |
| Storage Commitment Push Model | 1.2.840.10008.1.20.1 | Yes | No |
| PRINTER | | | |
| Basic Grayscale Print Management (Meta) | 1.2.840.10008.5.1.1.9 | Yes | No |
| > Basic Film Session | 1.2.840.10008.5.1.1.1 | Yes | No |
| > Basic Film Box | 1.2.840.10008.5.1.1.2 | Yes | No |
| > Basic Grayscale Image Box | 1.2.840.10008.5.1.1.4 | Yes | No |
| > Printer | 1.2.840.10008.5.1.1.16 | Yes | No |
| Basic Color Print Management (Meta) | 1.2.840.10008.5.1.1.18 | Yes | No |
| > Basic Film Session | 1.2.840.10008.5.1.1.1 | Yes | No |
| > Basic Film Box | 1.2.840.10008.5.1.1.2 | Yes | No |
| > Basic Color Image Box | 1.2.840.10008.5.1.1.4.1 | Yes | No |
| > Printer | 1.2.840.10008.5.1.1.16 | Yes | No |
| Presentation LUT | 1.2.840.10008.5.1.1.23 | Yes | No |
| MODALITY SOP CLASSES | | | |
| Computed Radiography Image Storage | 1.2.840.10008.5.1.4.1.1.1 | Yes | Yes |
| Digital X-Ray Image Storage – for Presentation | 1.2.840.10008.5.1.4.1.1.1.1 | Yes | Yes |
| CT Image Storage | 1.2.840.10008.5.1.4.1.1.2 | Yes | Yes |
| Ultrasound Multi-frame Image Storage | 1.2.840.10008.5.1.4.1.1.3.1 | Yes | Yes |
| MR Image Storage | 1.2.840.10008.5.1.4.1.1.4 | Yes | Yes |
| Ultrasound Image Storage | 1.2.840.10008.5.1.4.1.1.6.1 | Yes | Yes |
| Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7 | Yes | Yes |
| Grayscale Softcopy Presentation State Storage | 1.2.840.10008.5.1.4.1.1.11.1 | Yes | Yes |
| X-Ray Angiographic Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | Yes | Yes |
| X-Ray Radiofluoroscopic Image Storage | 1.2.840.10008.5.1.4.1.1.12.2 | Yes | Yes |
| QUERY / RETRIEVE | | | |
| Patient Root Query/Retrieve Information Model – FIND | 1.2.840.10008.5.1.4.1.2.1.1 | Yes | Yes |
| Patient Root Query/Retrieve Information Model – MOVE | 1.2.840.10008.5.1.4.1.2.1.2 | Yes | Yes |
| Study Root Query/Retrieve Information Model – FIND | 1.2.840.10008.5.1.4.1.2.2.1 | Yes | Yes |
| Study Root Query/Retrieve Information Model – MOVE | 1.2.840.10008.5.1.4.1.2.2.2 | Yes | Yes |
| Patient/Study Only Query/Retrieve Information Model – FIND | 1.2.840.10008.5.1.4.1.2.3.1 | Yes | Yes |
| Patient/Study Only Query/Retrieve Information Model – MOVE | 1.2.840.10008.5.1.4.1.2.3.2 | Yes | Yes |
| SPECIALIZED SOP CLASSES | | | |
| Specialized X-Ray | 1.3.46.670589.2.3.1.1 | Yes | Yes |
| CX Image | 1.3.46.670589.2.4.1.1 | Yes | Yes |
| 3D Volume Storage | 1.3.46.670589.5.0.1.1 | Yes | Yes |
| 3D Volume Object Storage | 1.3.46.670589.5.0.2.1 | Yes | Yes |
| Surface Storage | 1.3.46.670589.5.0.3.1 | Yes | Yes |
| MR Cardio Storage | 1.3.46.670589.5.0.8.1 | Yes | Yes |
| CT Synthetic Image | 1.3.46.670589.5.0.9 | Yes | Yes |
| MR Synthetic Image | 1.3.46.670589.5.0.10 | Yes | Yes |
| MR Cardio Analysis Storage | 1.3.46.670589.5.0.11.1 | Yes | Yes |
| CX Synthetic Image | 1.3.46.670589.5.0.12 | Yes | Yes |
| Perfusion | 1.3.46.670589.5.0.13 | Yes | Yes |
| Perfusion Analysis | 1.3.46.670589.5.0.14 | Yes | Yes |

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

Remarks:

- During installation the list of available SOP classes can be configured per MultiDiagnost Eleva with Flat Detector ACP. The SOP classes to be supported can be configured per remote station.
- The Private SOP classes may be stored in image archives, but are to be used by MultiDiagnost Eleva with Flat Detector ACP only!
- In case the remote SCP system does not support the import of a specific image storage SOP class, the MultiDiagnost Eleva with Flat Detector ACP will convert and send such images as Secondary Capture images (if configured to do so).
- After storing images as SCU the MultiDiagnost Eleva with Flat Detector ACP shall request Storage Commitment (only if configured to do so).

4.2.1.2 Association Policies

This section shall contain a description of the General Association Establishment and Acceptance policies of the AE.

4.2.1.2.1 General

The MultiDiagnost Eleva with Flat Detector ACP as SCU will offer unrestricted maximum PDU size on Associations initiated. This is also configurable per remote station. When the MultiDiagnost Eleva with Flat Detector ACT acts as SCP the maximum number of simultaneous associations is unlimited by default, but the maximum can be limited via the configuration.

The DICOM standard application context shall be specified.

Table 5: DICOM Application Context

| | |
|--------------------------|-----------------------|
| Application Context Name | 1.2.840.10008.3.1.1.1 |
|--------------------------|-----------------------|

4.2.1.2.2 Number of Associations

The number of simultaneous Associations supported by MultiDiagnost Eleva with Flat Detector ACP as a Service Class Provider (SCP) is in principle not limited.

Table 6: Number of Associations as an Association Initiator for MultiDiagnost Eleva with Flat Detector ACP

| | |
|---|-----|
| Maximum number of simultaneous associations | 3 * |
|---|-----|

* As a result of local activities, MultiDiagnost Eleva with Flat Detector ACP will initiate at most 3 simultaneous associations. One association may be used to issue **query** requests, the other association may be used to issue **store or retrieve** requests, and another association may be used for **print** requests. Furthermore, MultiDiagnost Eleva with Flat Detector ACP may initiate an association for each remote retrieve request, executed by MultiDiagnost Eleva with Flat Detector ACP as a C-MOVE operation. These associations are used to

issue the C-STORE sub-operations implied by the retrieve requests. The number of simultaneous store associations for this retrieve purpose is principally not limited.

The number of simultaneous associations for Storage Commitment is configurable.

Table 7: Number of Associations as an Association Acceptor for MultiDiagnost Eleva with Flat Detector ACP

| | |
|---|--------------|
| Maximum number of simultaneous associations | Configurable |
|---|--------------|

Nevertheless, the number of simultaneous supported associations shall be determined by the available resources (CPU, memory, disk space).

4.2.1.2.3 Asynchronous Nature

MD ELEVA with FLAT DETECTOR does not support asynchronous operations, and will not perform asynchronous window negotiation.

Table 8: Asynchronous Nature as an Association Initiator for MultiDiagnost Eleva with Flat Detector ACP

| | |
|---|-----|
| Maximum number of outstanding asynchronous transactions | N/A |
|---|-----|

4.2.1.2.4 Implementation Identifying Information

Following Implementation Class UID and Version Name are defined.

Table 9: DICOM Implementation Class and Version for MultiDiagnost Eleva with Flat Detector ACP

| | |
|-------------------------------|----------------------|
| THE IMPLEMENTATION CLASS UID: | 1.3.46.670589.5.2.23 |
| Implementation Version Name | ViewForum R4.2 |

4.2.1.3 Association Initiation Policy

MultiDiagnost Eleva with Flat Detector ACP shall initiate associations as a result of the following events.

- The MultiDiagnost Eleva with Flat Detector ACP operator or a remote (Query/Retrieve) application copies selected images from the MultiDiagnost Eleva with Flat Detector ACP database to another database; ref. section 4.2.1.3.1 Export Images.
- The MultiDiagnost Eleva with Flat Detector ACP operator queries a remote database; ref. section 4.2.1.3.2 Find Remote Images.
- The MultiDiagnost Eleva with Flat Detector ACP operator copies selected images from a remote database to another database; ref. section 4.2.1.3.3 Move Remote Images.
- The operator requests storage commitment of images on a remote database; ref. section 4.2.1.3.4 Request Storage Commitment.

- The MultiDiagnost Eleva with Flat Detector ACP operator requests to print selected images of the MultiDiagnost Eleva with Flat Detector ACP database; ref. section 4.2.1.3.5 Print Images.
- The MultiDiagnost Eleva with Flat Detector ACP operator requests the status of the selected printer; ref. section 4.2.1.3.6
- Request Printer Status.

4.2.1.3.1 Export Images

4.2.1.3.1.1 Description and Sequencing of Activities

The RWA Export Images involves the storage of images from the local MultiDiagnost Eleva with Flat Detector ACP database to a remote system. This export of images can be done as raw data either as processed data, XA or RF. There are two ways for the MultiDiagnost Eleva with Flat Detector ACP to initiate Export Images.

1. The operator is able to copy the images selected in a patient folder from the local MultiDiagnost Eleva with Flat Detector ACP database to another database by means of the copy tool in the MultiDiagnost Eleva with Flat Detector ACP data-handling tool. For each selected patient MultiDiagnost Eleva with Flat Detector ACP initiates an association to the selected peer entity, and uses it to send C-STORE requests and receive the associated C-STORE responses. The association is released when all selected images in the selected folder have been transmitted. MultiDiagnost Eleva with Flat Detector ACP handles operator copy requests one after another.
2. A remote application copies images from the local MultiDiagnost Eleva with Flat Detector ACP database to another database by sending a C-MOVE request to MultiDiagnost Eleva with Flat Detector ACP. For each received retrieve request MultiDiagnost Eleva with Flat Detector ACP initiates an association to the requested retrieve/move destination, and uses it to send C-STORE requests and receive associated C-STORE responses. The association is released when all instances, i.e. images and presentation states as selected by the retrieve request identifier, have been stored. MultiDiagnost ELEVA with Flat Detector ACP is able to simultaneously handle C-MOVE requests.

Along with the image data the MultiDiagnost ELEVA with Flat Detector ACP shall also export presentation state data. If the SCP supports the Grayscale Softcopy Presentation State storage SOP class then the applicable presentation state data will be transferred as such, otherwise the presentation state data will be merged with the image data before export.

Please refer to section 8.1.4 Coerced / Modified fields, for more information on Presentation State storage.

If configured, the MultiDiagnost ELEVA with Flat Detector ACP shall also try and initiate a storage commitment of the stored image (after releasing the storage association). See section 4.2.1.3.4 (RWA Request Storage Commitment) for a detailed specification of the storage commitment.

Figure 4 shows the sequence of events after the operator or remote application initiates the RWA Export Images.

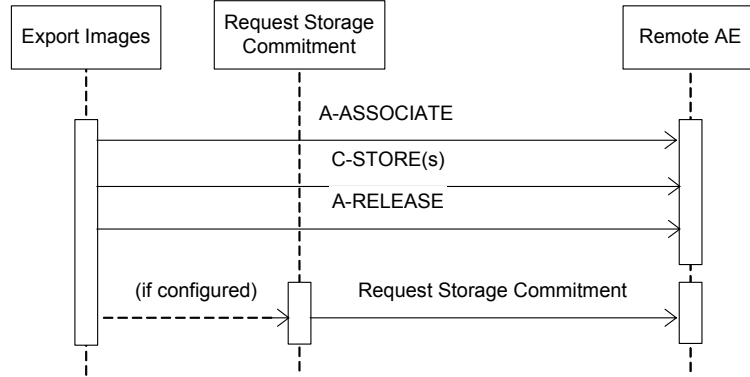


Figure 4: Sequencing of RWA Export Images

4.2.1.3.1.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. The Presentation Contexts proposed by the MultiDiagnost ELEVA with Flat Detector ACP AE for Export Images are defined in Table 10.

Table 10: Proposed Presentation Contexts for Export Images

| Presentation Context Table | | | | | |
|--|------------------------------|-------------------|---|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List (note) | UID List | | |
| Computed Radiography Image Storage | 1.2.840.10008.5.1.4.1.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Digital X-Ray Image Storage – for Presentation | 1.2.840.10008.5.1.4.1.1.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| CT Image Storage | 1.2.840.10008.5.1.4.1.1.2 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| MR Image Storage | 1.2.840.10008.5.1.4.1.1.4 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Grayscale Softcopy Presentation State Storage | 1.2.840.10008.5.1.4.1.1.11.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| X-Ray Angiographic Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |

| Presentation Context Table | | | | | |
|---------------------------------------|------------------------------|---|---|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List (note) | UID List | | |
| X-Ray Radiofluoroscopic Image Storage | 1.2.840.10008.5.1.4.1.1.12.2 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Specialized X-Ray | 1.3.46.670589.2.3.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| CX Image | 1.3.46.670589.2.4.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| 3D Volume Storage | 1.3.46.670589.5.0.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| 3D Volume Object Storage | 1.3.46.670589.5.0.2.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Surface Storage | 1.3.46.670589.5.0.3.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| MR cardio Storage | 1.3.46.670589.5.0.8.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| CT Synthetic Image | 1.3.46.670589.5.0.9 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| MR Synthetic Image | 1.3.46.670589.5.0.10 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| MR Cardio Analysis Storage | 1.3.46.670589.5.0.11.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| CX Synthetic Image | 1.3.46.670589.5.0.12 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Perfusion | 1.3.46.670589.5.0.13 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Perfusion Analysis | 1.3.46.670589.5.0.14 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Ultra sound Multi-frame Image Storage | 1.2.840.10008.5.1.4.1.1.3.1 | ILE ELE EBE JPEG Baseline (Note 1) | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 | SCU | None |
| Ultra sound Image Storage | 1.2.840.10008.5.1.4.1.1.6.1 | ILE ELE EBE JPEG Baseline (Note 1) | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 | SCU | None |

Note : For performance reasons the ELE transfer syntax is preferred. Extended negotiation is not supported.

Note1: Only for Photometric Interpretation of RGB and YBR_FULL_422. Therefore JPEG Baseline transfer syntax may NOT be configured for SCU systems that are capable of handling storage of monochrome images too.

4.2.1.3.1.3 SOP Specific Conformance for SOP Classes

Important remarks about the exported images:

- In case the remote system does not support modality specific image storage SOP class, the MD ELEVA ACP AE will convert the images (if configured to do so) and send them via the Secondary Capture image storage SOP class. These Secondary Capture images and additional information (like graphics, text and important attribute information) are burnt-in (if configured). The original bit depth of the Secondary Capture image is kept.
Note: only standard DICOM images can be converted, private SOP classes cannot be converted.
- In case of color images, all color-coding schemes are sent as they were received.
- Attributes e.g. Study Date and Study Time will be added to images to be exported (if not yet present). This is done because there are imaging systems relying on the existence of these attributes.
- The MD ELEVA ACP AE allows the operator to modify attributes of the stored images. MD ELEVA ACP AE does not modify the pixel values of the stored images.
Modified images retain their original Study, Series and Image UID.
- On the export of an imported image the MD ELEVA ACP AE adds private attributes to the image.
- The exported MD ELEVA ACP AE images do not contain Instance Number if the original images received from modalities do not contain this attribute or provide information in other attributes for MD ELEVA ACP AE to generate it.
- Exported CT/MR images relate Scanogram and Slice images in the following way: Attribute 'Referenced Image Sequence' is present in the slice images and points to the related Scanogram image.
Note that Attribute 'Frame of Reference UID' in the Scanogram (Localiser image) and related image slices are not guaranteed to be equal; this depends on the source of the images.
- For Secondary Capture images only one Window Width and Window Centre value is exported.
- Please refer to section 8.1.4 Coerced / Modified fields, for more information on stored images.
- When the location of a graphic or text annotation is specified relatively with regards to the displayed area. (i.e. DICOM attribute: Bounding Box Annotation Units, Anchor Point Annotation Units or Graphic Annotation Units equals "DISPLAY"), the annotation is not displayed.
- Areas occluded by Shutter are always black in MD ELEVA ACP AE, whereas it is possible to want it to be white in DICOM.
- On the export of such an image the MultiDiagnost ELEVA with Flat Detector ACP first sets up an association to determine if the SCP supports the Grayscale Softcopy Presentation State SOP Class.
If the SCP doesn't supports the Grayscale Softcopy Presentation State service the Graphical information is added to the image object additional a new instance UID is generated for this image.
- All kind of Images sending out, are included with Performed Procedure Step Tags like: (Start Date, Start Time, ID).

Use of optional, private and retired attributes

The transmitted Storage SOP instances may include all optional elements specified in the DICOM standard, depending on the source of the images. The transmitted Storage SOP instances may contain Retired and Private data elements, depending on the source of the images and of the MD ELEVA ACP AE configuration.

The MD ELEVA ACP AE can convert the transfer syntax when exporting images. The MD ELEVA ACP AE can perform a transfer syntax according to the following table.

Table 11: Transfer Syntax Conversion

| Syntax | Source | ILE | ELE | EBE | JPEG Baseline |
|---------------|--------|-----|-----|-----|---------------|
| Destination | | | | | |
| ILE | | + | + | + | - |
| ELE | | + | + | + | - |
| EBE | | + | + | + | - |
| JPEG Baseline | * | + | + | + | - |

- *JPEG Baseline is only supported for images with Photometric Interpretation of YBR_FULL_422.*
- *As MD ELEVA ACP AE internally stores the images in uncompressed format, the image data shall be compressed to JPEG (RGB to YBR_FULL_422) before export.*
- *Note that JPEG Baseline transfer syntax may NOT be configured for SCU systems that are capable of handling storage of monochrome images too.*

The Store Response Status is saved in the log file; a user error will be displayed in the GUI.

The MD ELEVA ACP AE will stop the transfer of the images and release the association as soon as it receives an unsuccessful Store Response Status. In case that a remote application requested the transfer (by means of a C-MOVE request), a move response with status unsuccessful is sent to the retrieve requestor.

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 12: DICOM Command Response Status Handling Behavior

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|-----------------------------------|------------|--|
| Success | Storage is complete | 0000 | Continues with next store until completed thereafter the store job is marked as completed and the association is released. |
| Refused | Out of Resources | A7xx | The store job fails and the association is released. The reason is logged and reported to the user. |
| Error | Data set does not match SOP Class | A9xx | The store job fails and the association is released. The reason is logged and reported to the user. |
| | Cannot understand | Cxxx | The store job fails and the association is released. The reason is logged and reported to the user. |
| Warning | Coercion of Data Elements | B000 | Continues with next store until completed thereafter the store job is marked as completed and the association is released. |
| | Elements discarded | B006 | Continues with next store until completed thereafter the store job is marked as completed and the association is released. |
| | Data set does not match SOP class | B007 | Continues with next store until completed thereafter the store job is marked as completed and the association is released. |

Table 13: DICOM Command Communication Failure Behavior

| Exception | Behavior |
|--------------------------|---|
| ARTIM Time-out | The store job fails in case of association setup. The reason is logged and reported to the user. |
| Reply Time-out | The store job fails and the association is aborted. The reason is logged and reported to the user. |
| Association Time-out SCU | The association is released. |
| Association aborted | The store job fails. The reason is logged and reported to the user. |

4.2.1.3.2 Find Remote Images

4.2.1.3.2.1 Description and Sequencing of Activities

The RWA Find Remote Images involves the query of a remote system to find matching images in the remote database.

The operator queries a remote database by means of the query tool in the MD ELEVA ACP AE data handling facility. The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE initiates an association to the selected peer entity and uses it to send Query (C-FIND) requests (and receive the associated responses). The association is released when the execution of the query completes (the Query/Retrieve dialog on the GUI is closed).

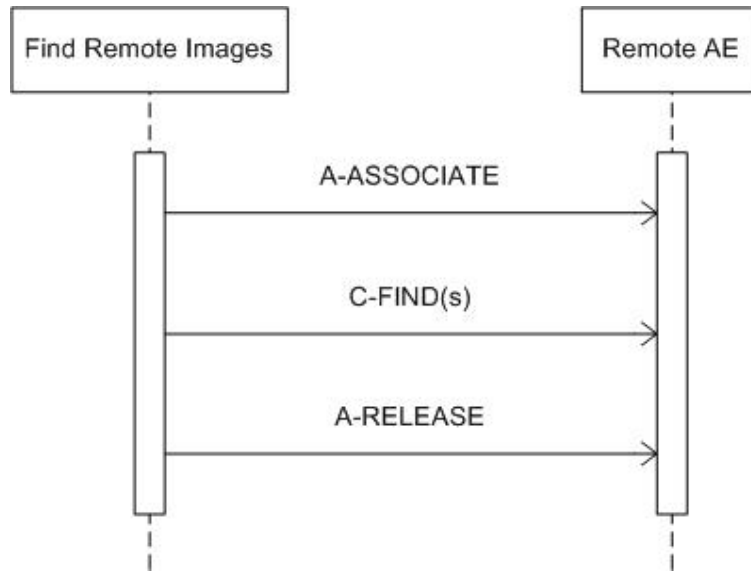


Figure 5: Sequencing of RWA Find Remote Images

4.2.1.3.2.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE for Find Remote Images are defined in Table 14.

Table 14: Proposed Presentation Contexts for Find Remote Images

| Presentation Context Table | | | | | |
|--|-----------------------------|-------------------|---|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List (note) | UID List | | |
| Patient Root Query /Retrieve Information Model - FIND | 1.2.840.10008.5.1.4.1.2.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Study Root Query /Retrieve Information Model - FIND | 1.2.840.10008.5.1.4.1.2.2.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Patient/Study Only Query/Retrieve Information Model - FIND | 1.2.840.10008.5.1.4.1.2.3.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |

Note: For performance reasons the ELE transfer syntax is preferred.

4.2.1.3.2.3 SOP Specific Conformance for SOP Classes

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE will not generate queries containing optional keys. The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE will not generate relational queries.

In the following table the supported Query Keys for each query level are described. Universal matching shall be supported as default.

Table 15: Supported Query Keys of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE

| Query Level | Query Key | | | |
|-------------|--------------------------------------|-----------|-----------|--------------|
| | Name | Tag | Query Key | Matching Key |
| Patient | Patient's Name | 0010,0010 | X | X |
| | Patient ID | 0010,0020 | X | X |
| | Patient's Birth Date | 0010,0030 | X | |
| | Patient's Sex | 0010,0040 | X | |
| Study | Study Date | 0008,0020 | X | X |
| | Study Time | 0008,0030 | X | |
| | Accession Number | 0008,0050 | X | X |
| | Modalities in Study | 0008,0061 | | |
| | Referring Physician's Name | 0008,0090 | X | |
| | Study Description | 0008,1030 | X | |
| | Study Instance UID | 0020,000D | | |
| | Study ID | 0020,0010 | X | X |
| | Requesting Physician | 0032,1032 | | |
| Series | Modality | 0008,0060 | X | |
| | Station Name | 0008,1010 | X | |
| | Performing Physician's Name | 0008,1050 | X | |
| | Body Part Examined | 0018,0015 | X | |
| | Protocol Name | 0018,1030 | X | |
| | Series Instance UID | 0020,000E | | |
| | Series Number | 0020,0011 | | |
| | Performed Station Name | 0040,0242 | X | |
| | Performed Procedure Step Start Date | 0040,0244 | X | |
| | Performed Procedure Step ID | 0040,0253 | X | |
| | Performed Procedure Type Description | 0040,0255 | X | |
| Image | SOP Class UID | 0008,0016 | X | |
| | SOP Instance UID | 0008,0018 | X | |
| | Content Date | 0008,0023 | X | |
| | Content Time | 0008,0033 | X | |
| | Instance Number | 0020,0013 | X | |

Do note that the query results screen will display all patients that have an empty Patient ID as one patient entry.

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 16: DICOM Command Response Status Handling Behavior

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|--|------------|---|
| Success | Matching is complete | 0000 | The find results are displayed. |
| Refused | Out of Resources | A700 | No find results are displayed. The reason is logged. |
| Failed | Identifier does not match SOP class | A900 | No find results are displayed. The reason is logged. |
| | Unable to process | Cxxx | No find results are displayed. The reason is logged. |
| Cancel | Matching terminated due to Cancel Request | FE00 | No find results are displayed. The reason is logged. |
| Pending | Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys | FF00 | The find command continues. |
| | Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier | FF01 | The find command continues. |

Table 17: DICOM Command Communication Failure Behavior

| Exception | Behavior |
|--------------------------|---|
| ARTIM Time-out | N/A |
| Reply Time-out | The query fails and the association is aborted. The reason is logged and reported to the user. |
| Association Time-out SCU | The association is released. |
| Association aborted | The query fails. The reason is logged and reported to the user. |

4.2.1.3.3 Move Remote Images

4.2.1.3.3.1 Description and Sequencing of Activities

The RWA Move Remote Images involves the retrieve of images on a remote system by moving matching images from the remote database to another database.

The operator is able to copy the selected images in a patient folder from a remote database to another, local or remote, database by means of the copy tool in the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE data handling facility. The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE initiates for each copy request an association to the selected peer entity (Remote AE) and uses it to send the Retrieve (C-MOVE) request (and receive the associated responses). An examination may contain both images and presentation states. The association is released after the final Retrieve (C-MOVE) response for the related request has been received (no more pending).

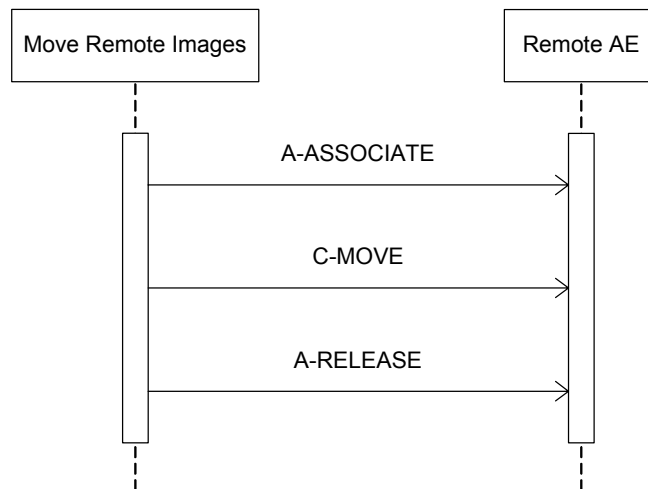


Figure 6: Sequencing of RWA Move Remote Images

4.2.1.3.3.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE for Move Remote Images are defined in Table 18.

Table 18: Proposed Presentation Contexts for Move Remote Images

| Presentation Context Table | | | | | |
|--|-----------------------------|-------------------|---|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List (note) | UID List | | |
| Patient Root Query /Retrieve Information Model - MOVE | 1.2.840.10008.5.1.4.1.2.1.2 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Study Root Query /Retrieve Information Model - MOVE | 1.2.840.10008.5.1.4.1.2.2.2 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Patient/Study Only Query/Retrieve Information Model - MOVE | 1.2.840.10008.5.1.4.1.2.3.2 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |

Note: For performance reasons the ELE transfer syntax is preferred.

4.2.1.3.3.3 SOP Specific Conformance for SOP Classes

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE provides standard conformance.

Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 19: DICOM Command Response Status Handling Behavior

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|--|------------|---|
| Success | Sub-operations complete – No Failures | 0000 | The move job is marked as completed. The association is released. |
| Refused | Out of Resources – Unable to calculate number of matches | A701 | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| | Out of Resources – Unable to perform Sub-operations | A702 | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| | Move Destination unknown | A801 | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| Failed | Identifier does not match SOP class | A900 | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| | Unable to process | Cxxx | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| Cancel | Sub-operations terminated due to Cancel Indication | FE00 | The move job is marked as failed. The association is released. The reason is logged and reported to the user. |
| Warning | Sub-operations complete – One or more Failures | B000 | The move job is marked as completed. The association is released. |
| Pending | Sub-operations are continuing | FF00 | The move job continues. |

Table 20: DICOM Command Communication Failure Behavior

| Exception | Behavior |
|--------------------------|--|
| ARTIM Time-out | The move job fails in case of association setup. The reason is logged and reported to the user. |
| Reply Time-out | The move job fails and the association is aborted. The reason is logged and reported to the user. |
| Association Time-out SCU | N/A |
| Association aborted | The move job fails. The reason is logged and reported to the user. |

4.2.1.3.4 Request Storage Commitment

4.2.1.3.4.1 Description and Sequencing of Activities

The RWA Request Storage Commitment involves the storage commitment of images on a remote system.

If configured, Storage Commitment will be initiated in a new association after closing the association of the related image storage (C-STORE). This new association will be open until the remote archive sends a storage commitment report (**synchronous**) or when the configured maximum time is passed. When this maximum configured period is passed, it is the responsibility of the remote archive to setup a new association with MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE and send the storage commitment report (**asynchronous**).

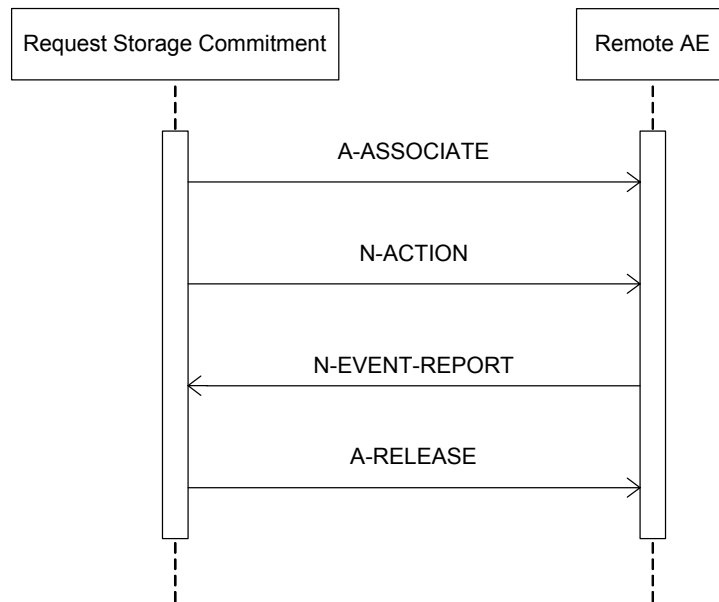


Figure 7: Sequencing of Synchronous RWA Request Storage Commitment

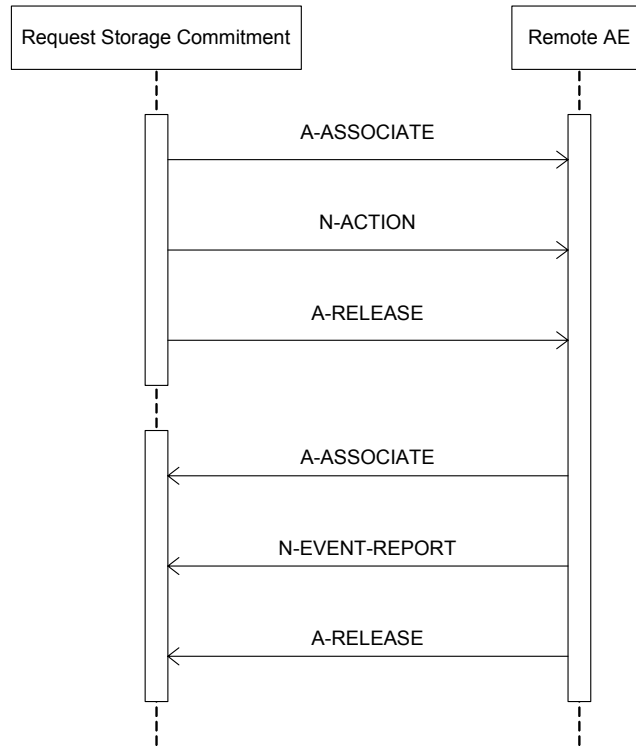


Figure 8: Sequencing of Asynchronous RWA Request Storage Commitment

4.2.1.3.4.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE for Request Storage Commitment are defined in Table 21.

Table 21: Proposed Presentation Contexts for Request Storage Commitment

| Presentation Context Table | | | | | |
|-------------------------------|----------------------|------------------|---------------------|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List (note) | UID List | | |
| Storage Commitment Push Model | 1.2.840.10008.1.20.1 | ILE | 1.2.840.10008.1.2 | SCU | None |
| | | ELE | 1.2.840.10008.1.2.1 | SCU | None |
| | | EBE | 1.2.840.10008.1.2.2 | SCU | None |

Note: For performance reasons the ELE transfer syntax is preferred.

4.2.1.3.4.3 SOP Specific Conformance for SOP Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE provides standard conformance. In MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE many remote nodes can be configured for storage Images. Per remote node one node can be configured to deliver the Storage Commitment service. Following are the details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors.

Table 22: DICOM Command Response Status Handling Behavior

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|--------------------|------------|--|
| Success | Operation complete | 0000 | Continues with waiting for storage commitment. |
| Failure | (any failure) | xxxx | The reason is logged. |

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE does not take any more actions on receiving the N-EVENT-REPORT, even when failures exist (Event Type ID 2).

Table 23: DICOM Command Communication Failure Behavior

| Exception | Behavior |
|--------------------------|---|
| ARTIM Time-out | The reason is logged. |
| Reply Time-out | The association is released. Continues with waiting for storage commitment. |
| Association Time-out SCU | The association is released. Continues with waiting for storage commitment. |
| Association aborted | Continues with waiting for storage commitment. |

4.2.1.3.5 Print Images

4.2.1.3.5.1 Description and Sequencing of Activities

The RWA Print Images involves the printing of images by sending the selected images to a Print Management SCP (i.e. printer). After selecting the print destination (out of choice list of configured printers) and some print parameters (depending on the configuration and the selected printer; these values can be configured too), the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall initiate an association to the selected printer and use it to send the print job. MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE also has an option for print preview.

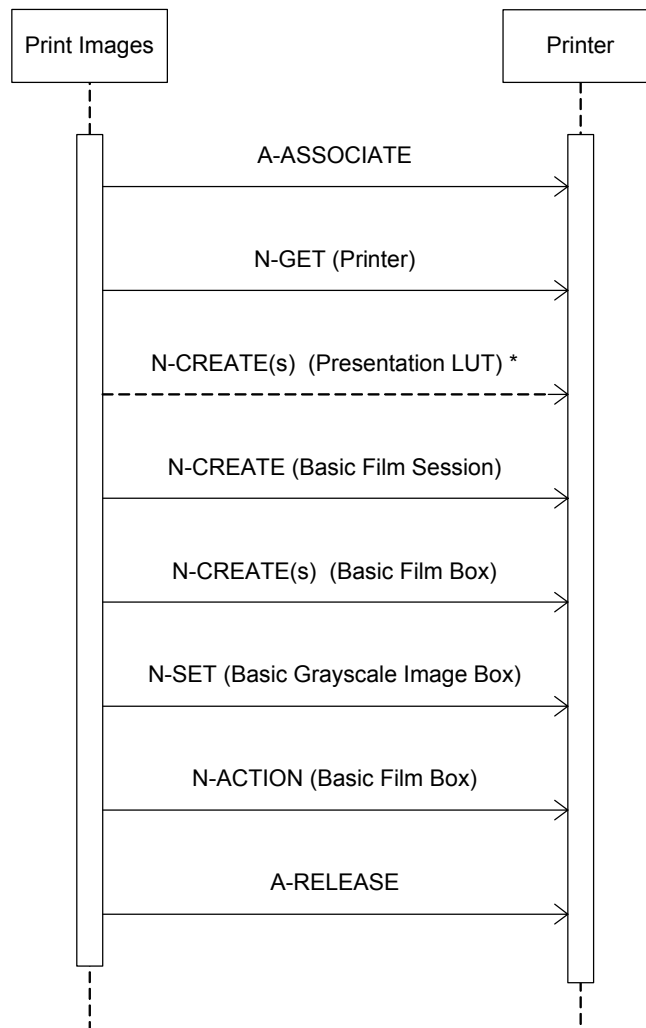


Figure 9: Sequencing of RWA Print Images

- Note that the Presentation LUT SOP class is only supported for Grayscale image printing.

4.2.1.3.5.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE for Print Images are defined in Table 24.

Table 24: Proposed Presentation Contexts for Print Images

| Presentation Context Table | | | | | |
|---|------------------------|-------------------|---|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List (note) | UID List | | |
| Basic Grayscale Print Management (Meta) | 1.2.840.10008.5.1.1.9 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Basic Color Print Management (Meta) | 1.2.840.10008.5.1.1.14 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Presentation LUT | 1.2.840.10008.5.1.1.23 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |

Note: For performance reasons the ELE transfer syntax is preferred.

Overlay, Annotation (showing the values of some major identifying attributes) and **Shutter information** is processed in the images sent to the printer (i.e. burnt-in in the image).

The next abbreviations are used in the following tables:

Used Presentation Values:

ALWAYS the module or attribute shall always be present with value
 ANAP Attribute Not Always Present
 VNAP Value Not Always Present (attribute sent zero length if no value is present)
 EMPTY Attribute is sent without a value
 MAYBE the module may be present under specified condition
 OPTIONAL the module may be available, depending on source object

Used Source Items:

AUTO the attribute value is generated automatically
 CONF the attribute value source is a configurable parameter
 IMPL the attribute value source is a user-implicit configuration setting
 MPPS the attribute value source is a modality performed procedure step
 MWL the attribute value source is a modality Worklist
 SPEC the attribute value source is a specific DICOM object
 USER the attribute value source is explicit user input

4.2.1.3.5.3 SOP Specific Conformance Printer SOP Class

The Printer process conforms to the Printer Sop Class.
The following DIMSE service element is supported:

N-GET

N-GET DIMSE does not create any Data Set Attributes.
The behavior on successful and unsuccessful transfer is given in the table below.

Table 25: DICOM Command Response Status Handling Behavior for Printer N-GET

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|----------------------|------------|---|
| Success | Successful operation | 0000 | The print job continues. |
| Warning | (any warning) | xxxx | The print job continues and the warning is logged. |
| Failure | (any failure) | xxxx | The print job is marked as failed, the reason is logged and reported to the user. |

4.2.1.3.5.4 SOP Specific Conformance Basic Film Session SOP Class

The Printer process conforms to the Basic Film Session Sop Class.
The following DIMSE service element is supported:

N-CREATE

The following table lists the supported attributes for the N-CREATE DIMSE.

Table 26: Basic Film Session Presentation Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--------------------|-----------|----|------------------------------|-------------------|-----------|
| Number of Copies | 2000,0010 | IS | 1 to 99 | ALWAYS | USER/IMPL |
| Print Priority | 2000,0020 | CS | HIGH | ALWAYS | USER/IMPL |
| Medium Type | 2000,0030 | CS | BLUE FILM, CLEAR FILM, PAPER | ALWAYS | IMPL |
| Film Destination | 2000,0040 | CS | MAGAZINE, PROCESSOR | ALWAYS | IMPL |
| Film Session Label | 2000,0050 | LO | Philips Medical Systems | ALWAYS | AUTO |

The behavior on successful and unsuccessful transfer is given in the table below.

Table 27: DICOM Command Response Status Handling Behavior for Basic Film Session N-CREATE

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|-----------------------------------|------------|--|
| Success | Film Session successfully created | 0000 | The print job continues. |
| Warning | Memory Allocation not supported | B600 | The print job continues and the warning is logged. |

4.2.1.3.5.5 SOP Specific Conformance Basic Film Box SOP Class

The Printer process conforms to the Basic Film Box Sop Class.
The following DIMSE service elements are supported:

N-CREATE N-ACTION

The following table lists the supported attributes for the N-CREATE DIMSE

Table 28: Basic Film Box Presentation Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---------------------------|-----------|----|---|-------------------|--------|
| Image Display Format | 2010,0010 | ST | STANDARD\1,1 CUSTOM\1 | ALWAYS | CONF |
| Film Orientation | 2010,0040 | CS | PORTRAIT; LANDSCAPE | ALWAYS | CONF |
| Film Size ID | 2010,0050 | CS | 8INX10IN, 8_5INX11IN, A, 10INX12IN, 10INX14IN, A3, 11INX14IN, 11INX17IN, A4, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM | ALWAYS | CONF |
| Magnification Type | 2010,0060 | CS | | ALWAYS | USER |
| Max Density | 2010,0130 | US | | VNAP | CONF |
| Trim | 2010,0140 | CS | NO, YES | VNAP | CONF |
| Configuration Information | 2010,0150 | ST | L=1, L=V | ALWAYS | CONF |

Table 29: Basic Film Box Relationship Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--------------------------------------|-----------|----|--------------------------------|-------------------|--------|
| Referenced Film Session Sequence | 2010,0500 | SQ | | ALWAYS | AUTO |
| >Referenced SOP Class UID | 0008,1150 | UI | UID of Parent Film Session | ALWAYS | AUTO |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO |
| Referenced Presentation LUT Sequence | 2050,0500 | SQ | | ANAP | AUTO |
| > Referenced SOP Class UID | 0008,1150 | UI | UID of Parent LUT Presentation | ALWAYS | AUTO |
| > Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO |

The behavior on successful and unsuccessful transfer is given in the table below.

Table 30: DICOM Command Response Status Handling Behavior for Basic Film Box N-CREATE

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|---|------------|---|
| Success | Film Box successfully created | 0000 | The print job continues. |
| Warning | Requested Min Density or Max Density outside of Printer's operating Range | B605 | The print job continues and the warning is logged. |
| Failure | There is an existing Film Box that has not been printed | C616 | The print job is marked as failed and the reason is logged. |

N-ACTION DIMSE does not create any Data Set Attributes.
The behavior on successful and unsuccessful transfer is given in the table below.

Table 31: DICOM Command Response Status Handling Behavior for Basic Film Box N-ACTION

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|---|------------|--|
| Success | Film accepted for printing | 0000 | The print job continues. |
| Warning | Film Box SOP Instance Hierarchy does not contain Image Box SOP Instances | B603 | The print job continues and the warning is logged and reported to the user. |
| | Image Size is larger than Image Box Size – The Image has been de-magnified | B604 | The print job continues and the warning is logged and reported to the user. |
| | Image Size is larger than Image Box Size – The Image has been cropped to fit | B609 | The print job continues and the warning is logged and reported to the user. |
| | Image Size or combined Print Image Size is larger than Image Box Size – The Image or combined Print Image has been decimated to fit | B60A | The print job continues and the warning is logged and reported to the user. |
| Failure | Unable to create Print Job SOP Instance – Print Queue is full | C602 | The print job is marked as failed and the reason is logged and reported to the user. |
| | Image Size is larger than Image Box Size | C603 | The print job is marked as failed and the reason is logged and reported to the user. |
| | Combined Print Image Size is larger than Image Box Size | C613 | The print job is marked as failed and the reason is logged and reported to the user. |

4.2.1.3.5.6 SOP Specific Conformance Basic Grayscale Image Box SOP Class

The Printer process conforms to the Basic Grayscale Image Box Sop Class.
The following DIMSE service element is supported:

N-SET

The following table lists the supported attributes for the N-SET DIMSE

Table 32: Basic Grayscale Image Box SOP Class - N-SET-RQ - Pixel Presentation Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--------------------------------|-----------|----|-------------|-------------------|--------|
| Image Position | 2020,0010 | US | 1 | ALWAYS | AUTO |
| Polarity | 2020,0020 | CS | NORMAL | ALWAYS | AUTO |
| Basic Grayscale Image Sequence | 2020,0110 | SQ | | ALWAYS | AUTO |
| > Samples per Pixel | 0028,0002 | US | 1 | ALWAYS | AUTO |
| > Photometric Interpretation | 0028,0004 | CS | MONOCHROME2 | ALWAYS | AUTO |
| > Rows | 0028,0010 | US | | ALWAYS | IMPL |
| > Columns | 0028,0011 | US | | ALWAYS | IMPL |
| > Bits Allocated | 0028,0100 | US | 8, 16, 16 | ALWAYS | AUTO |
| > Bits Stored | 0028,0101 | US | 8, 14, 12 | ALWAYS | IMPL |
| > High Bit | 0028,0102 | US | 7, 13, 11 | ALWAYS | AUTO |

| | | | | | |
|------------------------|-----------|-------|---|--------|------|
| > Pixel Representation | 0028,0103 | US | 0 | ALWAYS | AUTO |
| > Pixel Data | 7FE0,0010 | OB/OW | | ALWAYS | AUTO |

The behavior on successful and unsuccessful transfer is given in the table below.

Table 33: DICOM Command Response Status Handling Behavior for Basic Grayscale Image Box N-SET

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|---|------------|---|
| Success | Image successfully stored in Image Box | 0000 | The print job continues. |
| Warning | Image Size is larger than Image Box Size – The Image has been de-magnified | B604 | The print job continues and the warning is logged and reported to the user. |
| | Requested Min Density or Max Density outside of Printer's operating Range | B605 | The print job continues and the warning is logged and reported to the user. |
| | Image Size is larger than Image Box Size – The Image has been cropped to fit | B609 | The print job continues and the warning is logged and reported to the user. |
| | Image Size or combined Print Image Size is larger than Image Box Size – The Image or combined Print Image has been decimated to fit | B60A | The print job continues and the warning is logged and reported to the user. |
| Error | Image Size is larger than Image Box Size | C603 | The print job is marked as failed and the reason is logged and reported to the user |
| | Insufficient Memory in Printer to store the Image | C605 | The print job is marked as failed and the reason is logged and reported to the user |
| | Combined Print Image Size is larger than Image Box Size | C613 | The print job is marked as failed and the reason is logged and reported to the user |

4.2.1.3.5.7 SOP Specific Conformance Basic Color Image Box SOP Class

The Printer process conforms to the Basic Color Image Box Sop Class.
The following DIMSE service element is supported:

N-SET

The following table lists the supported attributes for the N-SET DIMSE

Table 34: Basic Color Image Box SOP Class - N-SET-RQ - Pixel Presentation Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------------|-----------|----|--------|-------------------|--------|
| Image Position | 2020,0010 | US | 1 | ALWAYS | AUTO |
| Polarity | 2020,0020 | CS | NORMAL | ALWAYS | AUTO |
| Basic Color Image Sequence | 2020,0111 | SQ | | ALWAYS | AUTO |
| > Samples per Pixel | 0028,0002 | US | 3 | ALWAYS | AUTO |
| > Photometric Interpretation | 0028,0004 | CS | RGB | ALWAYS | AUTO |
| > Planar Configuration | 0028,0006 | US | 0,1 | ALWAYS | IMPL |
| > Rows | 0028,0010 | US | | ALWAYS | IMPL |
| > Columns | 0028,0011 | US | | ALWAYS | IMPL |

| | | | | | |
|------------------------|-----------|----|---|--------|------|
| > Bits Allocated | 0028,0100 | US | 8 | ALWAYS | AUTO |
| > Bits Stored | 0028,0101 | US | 8 | ALWAYS | IMPL |
| > High Bit | 0028,0102 | US | 7 | ALWAYS | AUTO |
| > Pixel Representation | 0028,0103 | US | 0 | ALWAYS | AUTO |
| > Pixel Data | 7FE0,0010 | OW | | ALWAYS | AUTO |

The behavior on successful and unsuccessful transfer is given in the table below.

Table 35: DICOM Command Response Status Handling Behavior for Basic Color Image Box N-SET

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|---|------------|--|
| Success | Image successfully stored in Image Box | 0000 | The print job continues. |
| Warning | Image Size is larger than Image Box Size – The Image has been de-magnified | B604 | The print job continues and the warning is logged and reported to the user. |
| | Requested Min Density or Max Density outside of Printer's operating Range | B605 | The print job continues and the warning is logged and reported to the user. |
| | Image Size is larger than Image Box Size – The Image has been cropped to fit | B609 | The print job continues and the warning is logged and reported to the user. |
| | Image Size or combined Print Image Size is larger than Image Box Size – The Image or combined Print Image has been decimated to fit | B60A | The print job continues and the warning is logged and reported to the user. |
| Error | Image Size is larger than Image Box Size | C603 | The print job is marked as failed and the reason is logged and reported to the user. |
| | Insufficient Memory in Printer to store the Image | C605 | The print job is marked as failed and the reason is logged and reported to the user. |
| | Combined Print Image Size is larger than Image Box Size | C613 | The print job is marked as failed and the reason is logged and reported to the user. |

4.2.1.3.5.8 SOP Specific Conformance Presentation LUT SOP Class

The Printer process conforms to the Presentation LUT SOP Class.
The following DIMSE service element is supported:

N-CREATE

The following table lists the supported attributes for the N-CREATE DIMSE

Table 36: Presentation LUT Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------|-----------|----|----------|-------------------|--------|
| Presentation LUT Shape | 2050,0020 | CS | IDENTITY | ALWAYS | AUTO |

The behavior on successful and unsuccessful transfer is given in the table below.

Table 37: DICOM Command Response Status Handling Behavior for Presentation LUT N-CREATE

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|--|------------|--|
| Success | Presentation LUT successfully created | 0000 | The print job continues. |
| Warning | Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead. | B605 | The print job continues and the warning is logged. |

The N-EVENT-REPORT of the Printer SOP Class is summarized in Table below.

Table 38: DICOM Command Response Status Handling Behavior for Printer N-EVENT-REPORT

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|----------------------|------------|--|
| Normal | Successful operation | 0000 | The print job is marked as completed. |
| Warning | (any warning) | xxxx | The print job is marked as completed and the warning is logged and reported to the user. |
| Failure | (any failure) | xxxx | The print job is marked as failed and the reason is logged and reported to the user |

Note: ELEVA will ignore the contents of these events. However, the printer status is polled via a separate association.

The behavior of the AE during communication failure is summarized in Table 39.

Table 39: DICOM Command Communication Failure Behavior

| Exception | Behavior |
|--------------------------|---|
| ARTIM Time-out | Print job fails. |
| Reply Time-out | The association is released. |
| Association Time-Out SCU | The association is released. |
| Association aborted | The Print job is marked as failed. The reason is logged and reported to the user. |

4.2.1.3.6 Request Printer Status

4.2.1.3.6.1 Description and Sequencing of Activities

The RWA Request Printer Status involves the request for the printer status of the configured Print Management SCP's (i.e. printers).

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE will periodically request the printer status. If an association already exists for a print job (RWA Print Images) then the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall use this association, otherwise a new association shall be initiated.

The status codes as returned by the printer shall be logged for service purposes and shall not be shown on the GUI.

The Printer Status Tool may be used to reveal the received printer status.

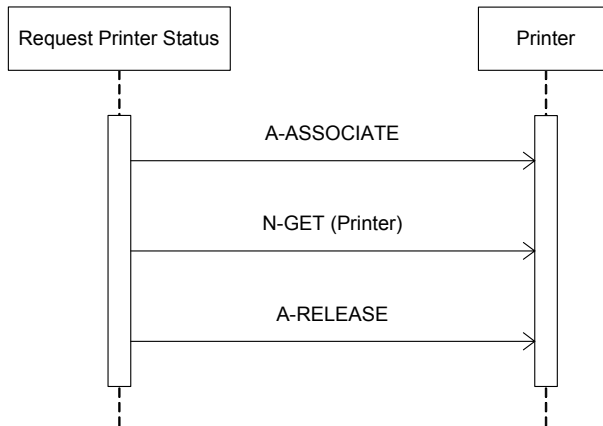


Figure 10: Sequencing of RWA Request Printer Status

4.2.1.3.6.2 Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of Presentation Contexts to be used on that association. In this subsection, the Presentation Contexts proposed by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE for Request Printer Status are defined in Table 40.

Table 40: Proposed Presentation Contexts for Request Printer Status

| Presentation Context Table | | | | | |
|----------------------------|------------------------|-------------------|---|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List (note) | UID List | | |
| Printer | 1.2.840.10008.5.1.1.16 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |

Note: For performance reasons the ELE transfer syntax is preferred and shall be chosen in case multiple Transfer Syntaxes are accepted in the Association Acceptance

4.2.1.3.6.3 SOP Specific Conformance for the Printer SOP Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE provides standard conformance to the Printer SOP class.

All details regarding the specific conformance, including response behavior to all status codes, both from an application level and communication errors are provided in Table 41.

Table 41: DICOM Command Response Status Handling Behavior

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|----------------------|------------|---|
| Success | Matching is complete | 0000 | The print job continues. |
| Warning | (any warning) | xxxx | The print job continues and the warning is logged and reported to the user. |
| Error | (any failure) | xxxx | The print job is marked as failed. The reason is logged and reported to the user. |

The behavior of the AE during communication failure is summarized in Table 42.

Table 42: DICOM Command Communication Failure Behavior

| Exception | Behavior |
|--------------------------|---|
| ARTIM Timeout | Print job fails. |
| Reply Time-out | The association is released. |
| Association Time-out SCU | The association is released. |
| Association aborted | The print job is marked as failed. The reason is logged and reported to the user. |

4.2.1.4 Association Acceptance Policy

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept Associations for the following purposes:

- To allow remote applications to verify application level communication with MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE; ref. section 4.2.1.4.1 Request Verification.
- To allow remote applications to store images in the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE database (i.e. image import); ref. section 4.2.1.4.2 Import Images.
- To allow remote applications to query the MultiDiagnost Eleva with Flat Detector database; ref. section 4.2.1.4.3 Query Local Images.
- To allow remote applications to retrieve images from the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE MultiDiagnost Eleva with Flat Detector database; ref. section 4.2.1.4.4 Retrieve Local Images.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall reject 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 during configuration of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE system.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall reject association requests from applications that do not address the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE, i.e. applications that offer a wrong **“called AE title”**.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE title is defined during configuration of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE system.

4.2.1.4.1 Request Verification

4.2.1.4.1.1 Description and Sequencing of Activities

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept associations from systems that wish to verify application level communication using the C-ECHO command.

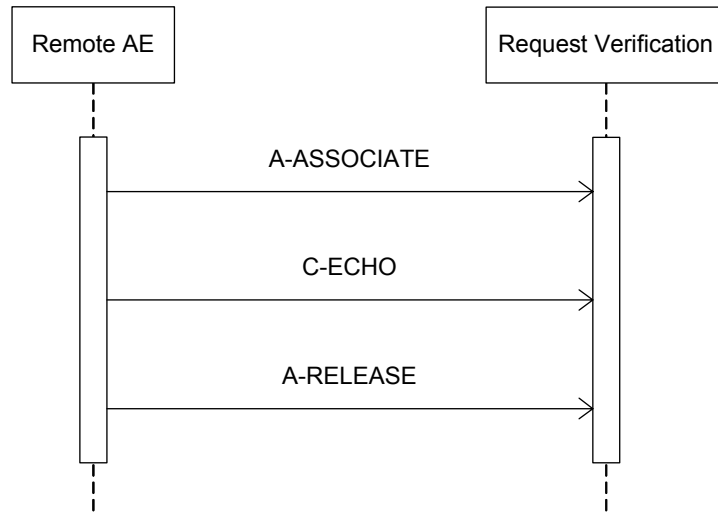


Figure 11: Sequencing of RWA Request Verification

4.2.1.4.1.2 Accepted Presentation Contexts

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall be able to accept the presentation contexts as specified in the next table.

Table 43: Acceptable Presentation Contexts for Request Verification

| Presentation Context Table | | | | | |
|----------------------------|-------------------|-------------------|---|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| Verification | 1.2.840.10008.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |

For performance reasons the ELE transfer syntax is preferred and shall be chosen in case multiple Transfer Syntaxes are proposed in the Association Negotiation.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that the MULTIDIAGNOST ELEVA with FLAT

DETECTOR ACP AE accepts multiple proposed Presentation Contexts with the same SOP class but different Transfer Syntaxes.
 There is no check for duplicate contexts, and these will therefore be accepted.

4.2.1.4.1.3 SOP Specific Conformance for C-ECHO SOP Class

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE provides standard conformance to the Verification service class.

The behavior of an Application Entity shall be summarized as shown in Table 44.

The standard as well as the manufacturer specific status codes and their corresponding behavior shall be specified.

Table 44: Verification C-ECHO Response Status Handling Behavior

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|-----------------|------------|----------|
| N/A | | | |

4.2.1.4.2 Import Images

4.2.1.4.2.1 Description and Sequencing of Activities

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept associations from systems that wish to store images in the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE database using the C-STORE command.

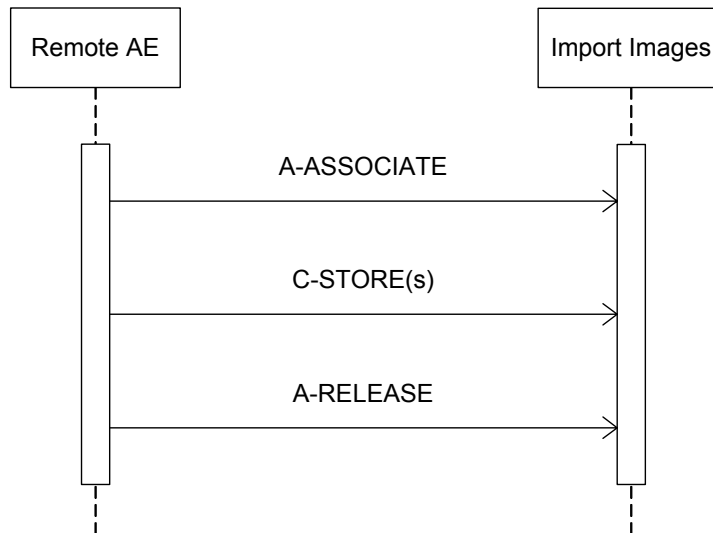


Figure 12: Sequencing of RWA Import Images

4.2.1.4.2.2 Accepted Presentation Contexts

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall be able to accept the presentation contexts as specified in the next table.

Table 45: Acceptable Presentation Contexts for Import Images

| Presentation Context Table | | | | | |
|--|------------------------------|-------------------|---|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List (note) | UID List | | |
| Computed Radiography Image Storage | 1.2.840.10008.5.1.4.1.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| Digital X-Ray Image Storage – for Presentation | 1.2.840.10008.5.1.4.1.1.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| CT Image Storage | 1.2.840.10008.5.1.4.1.1.2 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| MR Image Storage | 1.2.840.10008.5.1.4.1.1.4 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| Grayscale Softcopy Presentation State Storage | 1.2.840.10008.5.1.4.1.1.11.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| X-Ray Angiographic Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| X-Ray Radiofluoroscopic Image Storage | 1.2.840.10008.5.1.4.1.1.12.2 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| Specialized X-Ray | 1.3.46.670589.2.3.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| CX Image | 1.3.46.670589.2.4.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| 3D Volume Storage | 1.3.46.670589.5.0.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| 3D Volume Object Storage | 1.3.46.670589.5.0.2.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| Surface Storage | 1.3.46.670589.5.0.3.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| MR cardio Storage | 1.3.46.670589.5.0.8.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| CT Synthetic Image | 1.3.46.670589.5.0.9 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| MR Synthetic Image | 1.3.46.670589.5.0.10 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| MR Cardio Analysis Storage | 1.3.46.670589.5.0.11.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |

| Presentation Context Table | | | | | |
|---------------------------------------|-----------------------------|---|---|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List (note) | UID List | | |
| CX Synthetic Image | 1.3.46.670589.5.0.12 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| Perfusion | 1.3.46.670589.5.0.13 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| Perfusion Analysis | 1.3.46.670589.5.0.14 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| Ultra sound Multi-frame Image Storage | 1.2.840.10008.5.1.4.1.1.3.1 | ILE ELE EBE JPEG Baseline (Note 1) | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4 .50 | SCP | None |
| Ultra sound Image Storage | 1.2.840.10008.5.1.4.1.1.6.1 | ILE ELE EBE JPEG Baseline (Note 1) | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4 .50 | SCP | None |

For performance reasons the ELE transfer syntax is preferred and shall be chosen in case multiple Transfer Syntaxes are proposed in the Association Negotiation

Note 1 : Only for Photometric Interpretation of RGB and YBR_FULL_422. Therefore JPEG Baseline transfer syntax may NOT be configured for SCU systems that are capable of handling storage of monochrome images too.

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE accepts multiple proposed Presentation Contexts with the same SOP class but different Transfer Syntaxes. There is no check for duplicate contexts, and these will therefore be accepted.

4.2.1.4.2.3 SOP Specific Conformance for SOP Classes

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE provides standard level 1 (Base) conformance to the Storage service class.

If the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE imports an image and during the association negotiation the Presentation State SOP class was not negotiated, then the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE creates a Presentation State instance for the imported image. The following table gives an overview of the image formats that can be viewed or stored.

Table 46: Support for Photometric Interpretation

| Photometric Interpretation | Storage | Viewing |
|----------------------------|---------|---------|
| MONOCHROME1 | Yes | Yes |
| MONOCHROME2 | Yes | Yes |
| RGB | Yes | Yes |
| YBR_FULL | Yes | No |
| YBR_FULL_422 | Yes * | Yes * |
| YBR_PARTIAL_422 | Yes | No |
| PALETTE COLOR | Yes | No |
| Other | Yes | No |

Note: * is an Compressed YBR_FULL_422 images received per JPEG Baseline transfer shall be stored (and consequently viewed) as RGB images.

If the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE **receives** improper DICOM, the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE tries as much as possible to make it proper DICOM (if configured to do so). The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE also tries to remain as transparent as possible on images; on export the images must be changed only to such extend as really necessary. Therefore it is not guaranteed that all DICOM violations of incoming images are repaired (e.g. enumerated values are not changed).

Thus improper DICOM import may result in improper DICOM export from the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE (no checks are available for incorrect UID's, Date/Time formats, etc.).

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE **stores** all additional standard, private and retired attributes in received images. Retrieval of these attributes VR's is only possible (by means of a C-STORE) if the following conditions are satisfied:

- The image was encoded (when MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE was C-STORE SCP) using one of the explicit value representations; or
- The image was encoded (when MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE was C-STORE SCP) using implicit value representation and the destination (i.e. a remote C-STORE SCP) has accepted implicit value representation as the only transfer syntax applicable to the storage SOP class of the image (with MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE as C-STORE SCU).

Otherwise the VR shall be set to Unknown (UN).

Important implementation remarks and restrictions:

- The DICOM standard does not guarantee that the advanced MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE applications can process the received images. This depends on the presence and consistency of a set of attributes in these images. The conditions for running the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE applications shall be specified in separate Annexes.
- See 8.1.4 Coerced / Modified fields, for details on Coerced and Modified Attributes.

- When the location of a Graphic or Text Annotation is specified relatively with regards to the displayed area.
(i.e. DICOM attribute: Bounding Box Annotation Units (0070,0003), Anchor Point Annotation Units (0070,0004) or Graphic Annotation Units (0070,0005) equals "DISPLAY"), the annotation is not displayed.
- Areas occluded by shutter are always black in MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE, whereas it is possible to want it to be white in DICOM.
- On the export of imported images the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE adds private attributes to the image.
- MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE does NOT support IVUS (IntraVascular UltraSound) Ultrasound images.
- If during the image transfer the Presentation States instances are transferred before the images, the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE changes the content of the Images.

For the following attributes, present in the original images, **MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE** will takes the following action:

Table 47: Actions taken by MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE:

| Attribute Name | Tag | Actions | |
|--|-----------|------------------------------|---|
| | | Removed from original images | Set to a zero length value in the exported images |
| Referenced Patient Sequence | 0008,1120 | X | |
| Procedure Code Sequence | 0008,1032 | X | |
| Performed Protocol Code Sequence | 0040,0260 | X | |
| Requested Attributes Sequence | 0040,0275 | X | |
| Comments on the Performed Procedure Step | 0040,0280 | X | |
| Patient's Birth Date | 0010,0032 | | X |
| Other Patient's ID's | 0010,1000 | | X |
| Other Patient's Names | 0010,1001 | | X |
| Ethnic Group | 0010,2160 | | X |
| Patient Comments | 0010,4000 | | X |
| Patient's Age | 0010,1010 | | X |
| Patient's Size | 0010,1020 | | X |
| Patient's Weight | 0010,1030 | | X |
| Occupation | 0010,2180 | | X |
| Additional Patient's History | 0010,21B0 | | X |

Support for Additional Standard, Private and Retired attributes:
MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE stores all Additional Standard, Private and Retired attributes in received images.
Retrieval of these attributes is only possible (by means of a C-MOVE request) if the following conditions are satisfied:

- The image was encoded (when MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE was C-STORE SCP) using one of the explicit value representations or

- The image was encoded (when MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE was C-STORE SCP) using implicit value representation and the move destination (i.e. a C-STORE Service Class Provider) has accepted implicit value representation as the only transfer syntax applicable to the storage SOP class of the image (when MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE is C-STORE SCU).

The Response Status Behavior of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE is as described in Table 48. The standard as well as the manufacturer specific status codes and their corresponding behavior shall be specified.

Table 48: Storage C-STORE Response Status Handling Behavior

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|-----------------------------------|------------|--|
| Success | Storage is complete | 0000 | The image(s) shall be stored in the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE database. |
| Refused | Out of Resources | A700 | The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE database is full – recovery from this condition is left to the SCU. MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall send a notification, log the condition, and abort the association. |
| Error | Data set does not match SOP class | A900 | The SOP class of the image(s) does not match the negotiated abstract syntax. MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall send a notification, log the condition, and abort the association. |
| | Cannot understand | C000 | The image(s) cannot be parsed. MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall send a notification, log the condition, and abort the association. |
| Warning | Coercion of Data Elements | B000 | N/A |
| | Elements discarded | B006 | N/A |
| | Data set does not match SOP class | B007 | N/A |

4.2.1.4.3 Query Local Images

4.2.1.4.3.1 Description and Sequencing of Activities

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept associations from systems that wish to query the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE database using the C-FIND command.

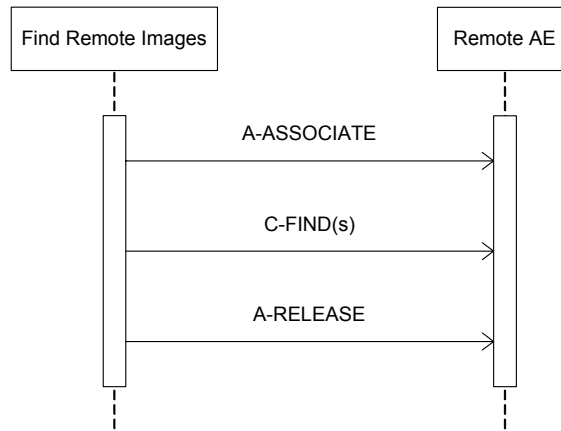


Figure 13: Sequencing of RWA Query Local Images

4.2.1.4.3.2 Accepted Presentation Contexts

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall be able to accept the presentation contexts as SCP, as specified in the next table.

Table 49: Acceptable Presentation Contexts for Query Local Images

| Presentation Context Table | | | | | |
|--|-----------------------------|-------------------|---|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List (note) | UID List | | |
| Patient Root Query /Retrieve Information Model - FIND | 1.2.840.10008.5.1.4.1.2.1.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| Study Root Query /Retrieve Information Model - FIND | 1.2.840.10008.5.1.4.1.2.2.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |
| Patient/Study Only Query/Retrieve Information Model - FIND | 1.2.840.10008.5.1.4.1.2.3.1 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCP | None |

Note : For performance reasons the ELE transfer syntax is preferred and shall be chosen in case multiple Transfer Syntaxes are proposed in the Association Negotiation

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE accepts multiple proposed Presentation Contexts with the same SOP class but different Transfer Syntaxes.

There is no check for duplicate contexts, and these will therefore be accepted.

4.2.1.4.3.3 SOP Specific Conformance for SOP Classes

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE provides standard conformance to the Query/Retrieve service class. Relational queries are not supported. The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall handle simultaneous C-FIND requests simultaneously.

The MultiDiagnost Eleva with Flat Detector database distinguishes two patients with the same Patient ID but different Patient's Name or Patient's Birth Date. However, the DICOM Query/Retrieve service class has Patient ID as a unique key at Patient level, and thus two patients with the same Patient ID cannot be distinguished via a standard DICOM Query.

The following Query Keys shall be supported:

Table 50: Supported Query Keys

| Query Level | Query Key | | Standard Matching |
|-------------|---------------------|-------------|-------------------|
| | Name | Tag | |
| Patient | Patient's Name | (0010,0010) | Yes |
| | Patient ID | (0010,0020) | Yes |
| Study | Study Date | (0008,0020) | Yes |
| | Study Time | (0008,0030) | Yes |
| | Accession Number | (0008,0050) | Yes |
| | Study Instance UID | (0020,000D) | Yes |
| | Study ID | (0020,0010) | Yes |
| Series | Modality | (0008,0060) | Yes |
| | Series Instance UID | (0020,000E) | Yes |
| | Series Number | (0020,0011) | Yes |
| Image | SOP Instance UID | (0008,0018) | Yes |
| | Instance Number | (0020,0013) | Yes |

When querying optional keys the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE will respond successfully for available keys if queried per **universal matching**; otherwise it will respond with warning.

Note that when querying optional keys with **non-universal matching** the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE will return information using universal matching for those keys.

Note that when a query is performed per Patient/Study Only Query/Retrieve Information Model SOP class on Patient Level, the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE always sends back the attribute "Patient's Name" (0010,0010), also when it was not requested.

The response status behavior of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE is as described in Table 51. The standard as well as the manufacturer specific status codes and their corresponding behavior shall be specified.

Table 51: Query/Retrieve C-FIND Response Status Handling Behavior

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|--|------------|--|
| Success | Matching is complete | 0000 | The C-FIND request handling is completed, no more C-FIND responses are sent. |
| Refused | Out of Resources | A700 | N/A |
| Failed | Identifier does not match SOP class | A900 | N/A |
| | Unable to process | C000 | The C-FIND request cannot be parsed. MultiDiagnost Eleva with Flat Detector logs the reason. |
| Cancel | Matching terminated due to Cancel Request | FE00 | The C-FIND request is cancel, no more C-FIND responses are sent. |
| Pending | Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys | FF00 | The C-FIND responses are continuing. |
| | Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier | FF01 | The C-FIND responses are continuing. |

4.2.1.4.4 Retrieve Local Images

4.2.1.4.4.1 Description and Sequencing of Activities

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept associations from systems that wish to retrieve images from the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE database using the C-MOVE command.

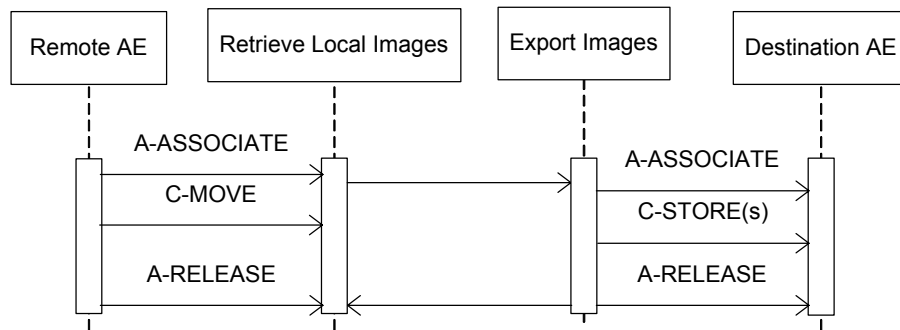


Figure 14: Sequencing of RWA Retrieve Local Images

After RWA Retrieve Local Images the RWA Export Images is started; the RWA Export Images is described in section 4.2.1.3.1.

4.2.1.4.4.2 Accepted Presentation Contexts

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall be able to accept the presentation contexts as specified in the next table.

Table 52: Acceptable Presentation Contexts for Retrieve Local Images

| Presentation Context Table | | | | | |
|--|-----------------------------|-------------------|---|------|----------------------|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List (note) | UID List | | |
| Patient Root Query /Retrieve Information Model - MOVE | 1.2.840.10008.5.1.4.1.2.1.2 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Study Root Query /Retrieve Information Model - MOVE | 1.2.840.10008.5.1.4.1.2.2.2 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |
| Patient/Study Only Query/Retrieve Information Model - MOVE | 1.2.840.10008.5.1.4.1.2.3.2 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |

Note : For performance reasons the ELE transfer syntax is preferred and shall be chosen in case multiple Transfer Syntaxes are proposed in the Association Negotiation

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall accept all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE accepts multiple proposed Presentation Contexts with the same SOP class but different Transfer Syntaxes.

There is no check for duplicate contexts, and these will therefore be accepted.

4.2.1.4.4.3 SOP Specific Conformance for SOP Classes

The response status behavior of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE is as described in Table 53. The standard as well as the manufacturer specific status codes and their corresponding behavior shall be specified.

Table 53: Query/Retrieve C-MOVE Response Status Handling Behavior

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|--|------------|---|
| Success | Sub-operations complete – No Failures | 0000 | The C-MOVE command has been completed. |
| Refused | Out of Resources – Unable to calculate number of matches | A701 | N/A |
| | Out of Resources – Unable to perform Sub-operations | A702 | N/A |
| | Move Destination unknown | A801 | No C-STORE command will be sent. MultiDiagnost Eleva with Flat Detector logs the reason. |
| Failed | Identifier does not match SOP class | A900 | N/A |
| | Unable to process | C000 | The C-MOVE request cannot be parsed. No Store Command will be sent. MultiDiagnost Eleva with Flat Detector logs the reason. |

| Service Status | Further Meaning | Error Code | Behavior |
|----------------|--|------------|---|
| Cancel | Sub-operations terminated due to Cancel Indication | FE00 | The C-MOVE request is cancelled, no more C-MOVE responses are sent. |
| Warning | Sub-operations complete – One or more Failures | B000 | N/A |
| Pending | Sub-operations are continuing | FF00 | Approximately every 30 seconds to indicate progress. |

4.2.2 MultiDiagnost Eleva with Flat Detector ACP AE

The 4.2.2 MultiDiagnost Eleva with Flat Detector ACP Application Entity (MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE) provides Standard Conformance to the following DICOM 3.0 SOP classes as an SCU specified in the Table below.

4.2.2.1 Supported SOP Classes by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE as SCU.

This Application Entity provides extended Standard Conformance to the SOP classes Specified in the next Table.

Table 54: Query Supported SCU SOP Classes by the MultiDiagnost Eleva with Flat Detector ACP AE

| SOP Class Name | UID |
|--|-------------------------|
| Modality Worklist Information Model - FIND | 1.2.840.10008.5.1.4.31 |
| Modality Performed Procedure Step | 1.2.840.10008.3.1.2.3.3 |

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP Application Entity does not support DICOM 3.0 SOP classes as a SCP.

4.2.2.2 Association Policies

This section shall contain a description of the General Association Establishment and Acceptance policies of the AE.

4.2.2.2.1 General

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP offers unrestricted max. PDU size on associations initiated by MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP. The PDU size is also configurable per remote station.

The DICOM standard application context shall be specified.

Table 55: DICOM Application Context

| | |
|--------------------------|-----------------------|
| Application Context Name | 1.2.840.10008.3.1.1.1 |
|--------------------------|-----------------------|

4.2.2.2.2 Number of Associations

The maximum number of simultaneous associations is by default unlimited, but the maximum can be limited via the configuration repository.

4.2.2.2.3 Asynchronous Nature

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP does not support asynchronous operations and will not perform asynchronous window negotiation.

4.2.2.2.4 Implementation Identifying Information

Following Implementation Class UID and Version Name are defined for the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP.

| | |
|----------------------------------|----------------------|
| THE IMPLEMENTATION CLASS UID: | 1.3.46.670589.5.2.23 |
| THE IMPLEMENTATION VERSION NAME: | VIEWFORUM R4.2 |

4.2.2.2.5 Association Acceptance Policy

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP Application Entity does not handle incoming associations.

4.2.2.2.6 Association Initiation Policy

For each request an association to the peer entity is established.

4.2.2.3 Real – World Activity – Management Worklist (MWL) – FIND**4.2.2.3.1 Association Real – World Activity**

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.

4.2.2.3.2 Description and Sequencing of Activities

This RWA may be initiated in two ways.

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

When the association is accepted the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE shall send the patient query find request, wait for response, and then release the association.

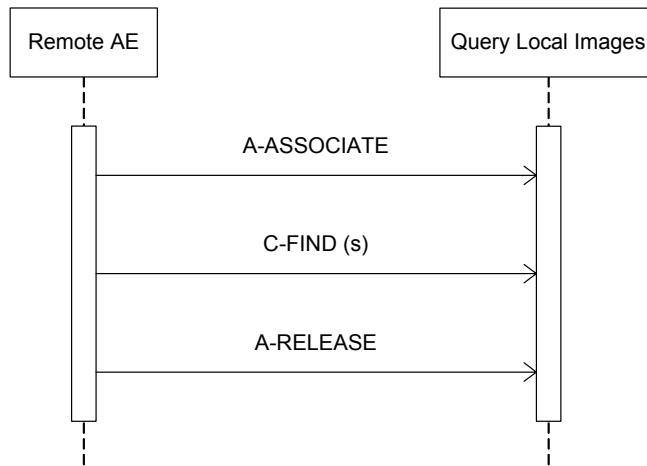


Figure 15: Sequencing of RWA Query Worklist

4.2.2.3.3 SOP Specific Conformance – MWL-FIND

By default, the patient/examination list update is performed by a “Broad” Query with pre-configured matching keys. This MWL query may be performed in the system background and may be disabled. The time interval between subsequent background queries is configurable.

The Broad Query may also be issued by the operator and will be performed from the Patient List User interface.

The table below gives an overview of the Matching Keys for a Broad Query.

Table 56: Matching Keys for Broad Query

| Attribute Name | Tag | Note |
|-------------------------------------|-----------|---|
| Scheduled Station AE Title | 0040,0001 | Configurable of: “ALL” or comma separated list of Application Entity names |
| Scheduled Procedure Step Start Date | 0040,0002 | Configurable of: “ALL”, “<Today”, “<Today + Tomorrow”, “<Today + Yesterday” |
| Modality (type) | 0008,0060 | “CR”, “OT”, “XA”, “RF”, “DX”, “US” |

When Date matching is configured, the Date value is continuously generated from local system time, including nightshift tolerance in the morning hours taking the steps from “<Yesterday”.

The modality type query may be used for environments that do not schedule per individual modality’s AE Title, but for a modality pool.

The optional Patient Based Worklist Query is typically triggered by operator action when a patient arrives at the system for examination. MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP expects the operator to enter the value(s) of the search key(s).

The Table below gives an overview of the Matching Keys for a Patient Query

Table 57: Matching Keys for Patient Query

| Matching Keys for Patient Query | | | |
|-------------------------------------|-----------|---|------------------------------------|
| Attribute Name | Tag | Note | Wildcard Search (using " * " only |
| Patient's Name | 0010,0010 | Identified from admission form. | Yes |
| Patient ID | 0010,0020 | Identified from admission form. | Yes |
| Accession Number | 0008,0040 | Identified from admission form. | Yes |
| Requested Procedure ID | 0040,1001 | Identified from admission form. | Yes |
| Scheduled Station AE Title | 0040,0001 | | Yes |
| Scheduled Procedure Step Start Date | 0040,0002 | This key may be optionally (default: no) added by the system. Its value is (Configurable) one of: date of <today>, date of <today> and subsequent dates, date of prior to and incl. <today> | No |

Wildcard search (using " * " only) is supported for:

- "Patient's Name",
- "Patient ID",
- "Accession Number",
- "Requested Procedure ID", and
- "Scheduled Station AE Title".

The Patient Query can be cancelled after the user has pressed a "Cancel" Button on the User Interface. In this case the DICOM association will be aborted immediately. As the query is performed asynchronously, intermate results are displayed in the meantime.

4.2.2.3.3.1 Patient and Study Merge

The ELEVA looks in its internal database, of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP, for a Study with the same Study Instance UID (0020,000D) as given in the Scheduled Procedure Step (SPS).

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.

4.2.2.3.3.2 Scheduled Procedure Step (= Examination) Merge

If the internal database of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP 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 internal database of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP contains already an SPS with the Scheduled Procedure Step ID (0040,0009) identifying an incoming Scheduled Procedure Step, the behaviour 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.

4.2.2.4 Modality Worklist Information Model – FIND SOP Class

Table 58: Modules of the Modality Worklist Information Model – FIND SOP Class

| Information Entity | Module Name | Usage |
|--------------------|---------------------------------|--------|
| General | SOP Common Module | ALWAYS |
| Study | Scheduled Procedure Step Module | ALWAYS |
| | Requested Procedure Module | ALWAYS |
| | Imaging Service Request Module | ALWAYS |
| Visit | Visit Status Module | ALWAYS |
| Patient | Patient Identification Module | ALWAYS |
| | Patient Demographic Module | ALWAYS |
| | Patient Medical Module | ALWAYS |

Table 59: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – SOP Common Module

| Attribute Name | Tag | VR | Note |
|------------------------|------------|----|---|
| Specific Character Set | 0008, 0005 | CS | Configurable: Not queried, or queried as "ISO-IR 100" |

Table 60: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Patient Identifier Module

| Attribute Name | Tag | VR | Note |
|--------------------|-----------|----|---|
| Patient's Name | 0010,0010 | PN | Displayed. Optional matching key in Patient Query |
| Patient ID | 0010,0020 | LO | Displayed. Optional matching key in Patient Query |
| Patient Other ID's | 0010,1000 | LO | Displayed. |

Table 61: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Patient Demographic Module

| Attribute Name | Tag | VR | Note |
|----------------------|-----------|----|--|
| Patient's Birth Date | 0010,0030 | DA | Displayed. Used for calculation of Patient Type. |
| Patient's Sex | 0010,0040 | CS | Applied Value(s): F, M, O |
| Patient's Size | 0010,1020 | DS | Stored. Used for calculation of Patient Type. |
| Patient's Weight | 0010,1030 | DS | Stored. Used for calculation of Patient Type. |
| Ethnic Group | 0010,2160 | SH | Displayed. |
| Patient Comments | 0010,4000 | LT | Displayed. |

Table 62: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Patient Medical Module

| Attribute Name | Tag | VR | Note |
|----------------------------|-----------|----|---|
| Medical Alerts | 0010,2000 | LO | Displayed. |
| Contrast Allergies | 0010,2110 | LO | Displayed. |
| Additional Patient History | 0010,21B0 | LT | Displayed. |
| Pregnancy Status | 0010,21C0 | US | Displayed. Applied Value(s): 0001, 0002, 0003, 0004 |

Table 63: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Visit Status Module

| Attribute Name | Tag | VR | Note |
|--------------------------|-----------|----|---------|
| Current Patient Location | 0038,0300 | LO | Stored. |

Table 64: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Schedule Procedure Step Module

| Attribute Name | Tag | VR | Note |
|---|-----------|----|--|
| Scheduled Procedure Step Sequence | 0040,0100 | SQ | |
| > Modality | 0008,0060 | CS | Stored. Optional matching key for Broad and Patient Query |
| > Requested Contrast Agent | 0032,1070 | LO | Stored. |
| > Scheduled AE Title | 0040,0001 | AE | Stored. Optional matching key for Broad and Patient Query |
| > Scheduled Procedure Step Start Date | 0040,0002 | DT | Stored. Displayed until Examination becomes in progress. Optional matching key for Broad and Patient Query |
| > Scheduled Procedure Step Start Time | 0040,0003 | TM | Stored. Displayed until Examination becomes in progress. |
| > Scheduled Procedure Step End Date | 0040,0004 | DT | |
| > Scheduled Procedure Step End Time | 0040,0005 | TM | |
| > Scheduled Performing Physician's Name | 0040,0006 | PN | Stored. |
| > Scheduled Procedure Step Description | 0040,0007 | LO | Stored. Displayed if configured as source item for code mapping. |
| > Scheduled Action Item Code Sequence | 0040,0008 | SQ | Stored. Displayed if configured as source item for code mapping. |

| Attribute Name | Tag | VR | Note |
|--|-----------|----|------------|
| >> Code Value | 0008,0100 | SH | Displayed. |
| >> Coding Scheme Designator | 0008,0102 | SH | Stored. |
| >> Coding Scheme Version | 0008,0103 | SH | Stored. |
| >> Code Meaning | 0008,0104 | LO | Stored. |
| > Scheduled Procedure Step ID | 0040,0009 | SH | Stored. |
| > Scheduled Station Name | 0040,0010 | SH | Stored. |
| > Scheduled Procedure Step Location | 0040,0011 | SH | Stored. |
| > Pre-Medication | 0040,0012 | LO | Stored. |
| > Scheduled Procedure Step Status | 0040,0020 | CS | Stored. |
| > Comments on the Scheduled Procedure Step | 0040,0400 | LT | Stored. |

Table 65: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Requested Procedure Module

| Attribute Name | Tag | VR | Note |
|---|-----------|----|---|
| Referenced Study Sequence | 0008,1110 | SQ | Stored. |
| > Referenced SOP Class UID | 0008,1150 | UI | Stored. |
| > Referenced SOP Instance UID | 0008,1155 | UI | Stored. |
| Study Instance UID | 0020,000D | UI | Stored. |
| Requested Procedure Description | 0032,1060 | LO | Stored. |
| Requested Procedure Code Sequence | 0032,1064 | SQ | Stored. |
| > Code Value | 0008,0100 | SH | Stored. Displayed if configured as source item for code mapping. |
| > Coding Scheme Designator | 0008,0102 | SH | Stored. |
| > Coding Scheme Version | 0008,0103 | SH | Stored. |
| > Code Meaning | 0008,0104 | LO | Stored. |
| Requested Procedure ID | 0040,1001 | SH | Stored. Displayed if configured as source item for code mapping. Optional matching key for Patient Query |
| Patient Transport Arrangements | 0040,1004 | LO | Stored. |
| Names of Intended Recipients of Results | 0040,1010 | PN | Displayed. |
| Requested Procedure Comments | 0040,1400 | LT | Stored. |

Table 66: MWL Inform. Model - FIND SOP Class - C-FIND-RQ – Imaging Service Request Module

| Attribute Name | Tag | VR | Note |
|----------------------------------|-----------|----|--|
| Accession Number | 0008,0050 | SH | Displayed. Optional matching key for Patient Query |
| Referring Physician's Name | 0008,0090 | PN | Displayed. |
| Requesting Physician | 0032,1032 | PN | Displayed. |
| Requesting Service | 0032,1033 | LO | Displayed. |
| Imaging Service Request Comments | 0040,2400 | LT | Stored. |

4.2.2.4.1.1 Proposed Presentation Contexts

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP Application Entity will propose the presentation contexts as given in the next table.

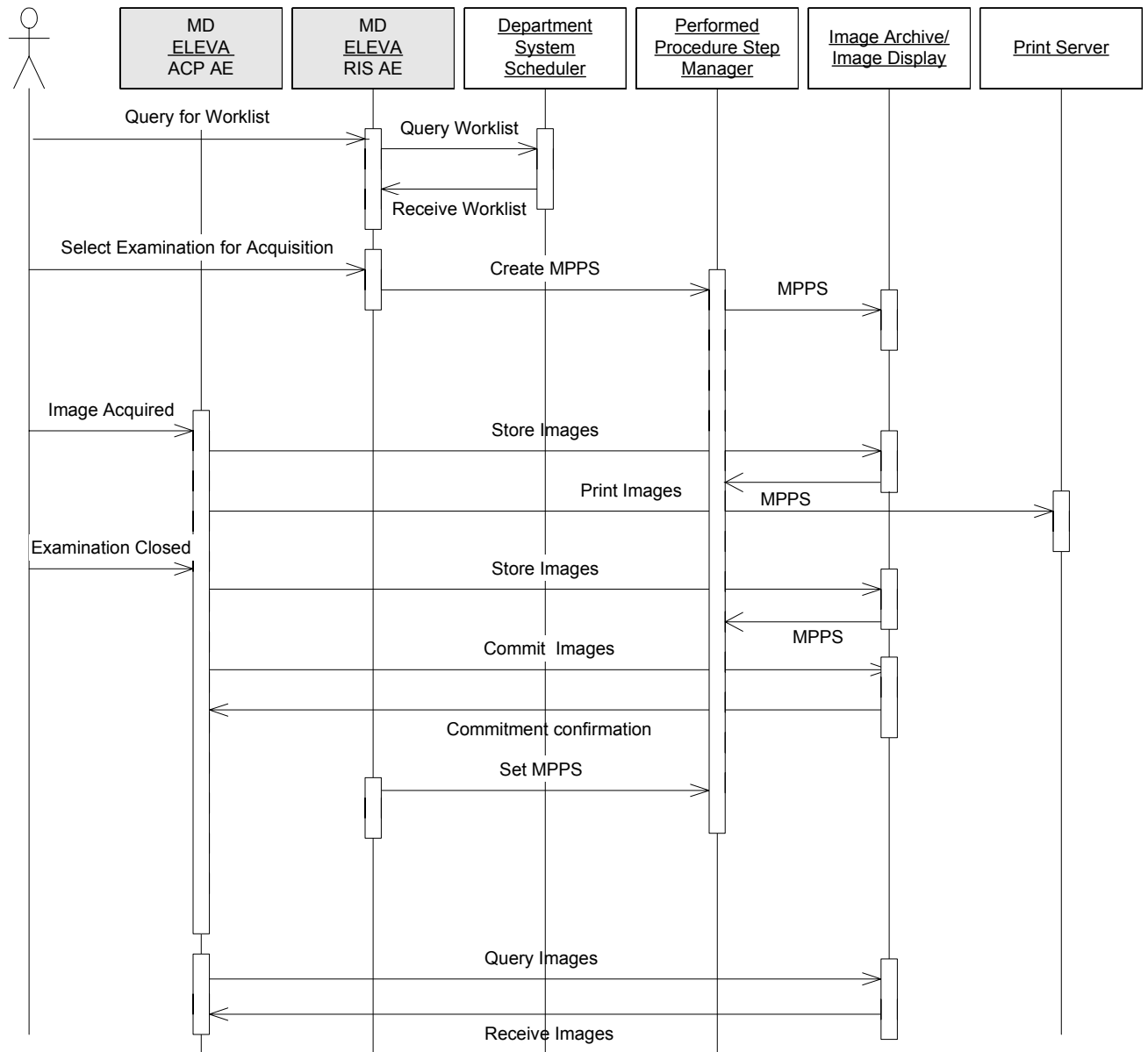
Table 67: Proposed Presentation Contexts MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP MWL SCU

| Abstract Syntax | UID | Transfer Syntax | UID List | Role | Ext. Neg. |
|-----------------|------------------------|-------------------|---|------|-----------|
| MWL-FIND | 1.2.840.10008.5.1.4.31 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |

Note: ELE is preferred Transfer Syntax

4.2.2.5 Real-World Activity –Modality Performed Procedure Step (MPPS)

4.2.2.5.1 Association Real – World Activity



An MULTIDIAGNOST ELEVA with FLAT DETECTOR “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).

An initial MPPS **IN PROGRESS** message with **N-CREATE** is sent once the first X-Ray Radiation has been released. The system does not generate intermediate MPPS **IN PROGRESS** messages for subsequent acquisitions of this Scheduled Procedure Step / Examination instance.

After the Examination has been closed by the clinical user, the system will change the MPPS status of the related examination to “COMPLETED” and generate a MPPS **COMPLETED** message by **N-SET**. The examination cannot be reopened.

The MultiDiagnost ELEVA with Flat Detector also generates MPPS messages for unscheduled examinations.

The clinical user might cancel an unclosed examination at any time. Depending on the state of the examination and MPPS related system configuration, an MPPS **IN PROGRESS** message might be already sent (discontinued case) or not (abandoned case).

If not, (abandoned case) the system generates an MPPS **IN PROGRESS** message.

In both cases the system sends a MPPS **DICONTINUED** message.

The reason for abandoning or discontinuing a procedure step is unspecified.

4.2.2.5.1.1 Sequencing of Performed Procedure Steps

The performed sequence order of scheduled procedure steps may be interchanged by the user.

4.2.2.5.1.2 Interleave of Performed Procedure Steps

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

```
MPPS / Inst UID 1: N_CREATE / IN PROGRESS
MPPS / Inst UID 2: N_CREATE / IN PROGRESS
MPPS / Inst UID 3: N_CREATE / IN PROGRESS
...
MPPS / Inst UID 2: N_SET / COMPLETED
MPPS / Inst UID 1: N_SET / COMPLETED
MPPS / Inst UID 3: N_SET / COMPLETED
```

(i.e.: running multiple procedure steps ‘in parallel’).

4.2.2.5.2 Presentation Context Table

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP will propose the presentation contexts as given in the next table.

Table 68: Proposed Presentation Context for the Verification by the RIS AE

| Abstract Syntax | UID | Transfer Syntax | UID List | Role | Ext. Neg. |
|-----------------|-------------------------|-------------------|---|------|-----------|
| MPPS | 1.2.840.10008.3.1.2.3.3 | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |

Note: For Modality Performed Procedure Step, ELE is preferred.

4.2.2.5.3 SOP Specific Conformance

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP by default derives the specific acquisition protocol from the Scheduled Protocol Code Sequence Items. If this Sequence contains more than one Protocol Code, these codes will be displayed as separate examinations on the UI, but will be handled by one common MPPS instance.

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP supports 3 more (configurable) mapping relations, as shown below:

Table 69: The Configurable Mapping Relations are:

| Examination is selected from: | | | |
|--------------------------------------|-----------|------------|---------|
| Attribute Name | Tag | → | Note |
| Scheduled Procedure Step | | | |
| Scheduled Procedure Step Description | 0040,0007 | | |
| Scheduled Protocol Code Sequence | 0040,0008 | Code Value | default |
| Requested Procedure | | | |
| Requested Procedure Description | 0032,1060 | | |
| Requested Procedure Code Sequence | 0032,1064 | Code Value | |

Table 70: The Evaluated Attributes of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP are:

| Evaluated Attributes of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP | | | |
|--|-----------|-----------|--------------------------------------|
| Attribute Name | Tag | Evaluated | Note |
| Coding Scheme Version | 0008,0103 | No | |
| Coding Scheme Designator | 0008,0102 | No | |
| Code Meaning | 0008,0104 | No | |
| Code Value | 0008,0100 | Yes | for mapping the examination settings |

That is, MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP expects, that any used Code Value is unique (unambiguous) within a given RIS domain.

The number of items in the Scheduled Protocol Code Sequence accepted by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP is not limited.

4.2.2.5.3.1 All Supported N-CREATE-RQ Models:

Table 71: MPPS SOP Class - N-CREATE-RQ - SOP Common Module

| Attribute Name | Tag | VR | Note |
|------------------------|-----------|----|-------------------------|
| Specific Character Set | 0008,0005 | CS | ISO_IR 100 |
| SOP Class UID | 0008,0016 | UI | 1.2.840.10008.3.1.2.3.3 |
| SOP Instance UID | 0008,0018 | UI | |

Table 72: MPPS SOP Class - N-CREATE-RQ - Image Acquisition Results Module

| Attribute Name | Tag | VR | Note |
|---|-----------|----|---|
| Modality | 0008,0060 | CS | Applied Value: RF |
| Study ID | 0020,0010 | SH | If scheduled: Req. Procedure ID, else: equipment generated Study identifier |
| Performed Action Item Code Sequence | 0040,0260 | SQ | 0 length |
| >Code Value | 0008,0100 | SH | |
| >Coding Scheme Designator | 0008,0102 | SH | |
| >Coding Scheme Version | 0008,0103 | SH | |
| >Code Meaning | 0008,0104 | LO | |
| Performed Series Sequence | 0040,0340 | SQ | |
| >Retrieve AE Title | 0008,0054 | AE | |
| >Series Description | 0008,103E | LO | |
| >Performing Physician's Name | 0008,1050 | PN | |
| >Operators' Name | 0008,1070 | PN | |
| >Referenced Image Sequence | 0008,1140 | SQ | |
| >>Referenced SOP Class UID | 0008,1150 | UI | Uniquely identifies the referenced SOP Class. This attribute is only used only if Images may be retrieved as Single Image SOP Classes. |
| >>Referenced SOP Instance UID | 0008,1155 | UI | Uniquely identifies the referenced SOP Instance. This attribute is only used only if Images may be retrieved as Single Image SOP Classes. |
| >Protocol Name | 0018,1030 | LO | |
| >Series Instance UID | 0020,000E | UI | |
| >Referenced Non-Image Composite SOP Instance Sequence | 0040,0220 | SQ | |
| >>Referenced SOP Class UID | 0008,1150 | UI | |
| >>Referenced SOP Instance UID | 0008,1155 | UI | |

Table 73: MPPS SOP Class - N-CREATE-RQ – Performed Procedure Step Information Module

| Attribute Name | Tag | VR | Note |
|--------------------------------------|-----------|----|------------------------|
| Procedure Code Sequence | 0008,1032 | SQ | |
| >Code Value | 0008,0100 | SH | |
| >Coding Scheme Designator | 0008,0102 | SH | |
| >Coding Scheme Version | 0008,0103 | SH | |
| >Code Meaning | 0008,0104 | LO | |
| >Mapping Resource | 0008,0105 | CS | |
| >Context Group Version | 0008,0106 | DT | |
| >Context Group Local Version | 0008,0107 | DT | |
| >Code Set Extension Flag | 0008,010B | CS | Applied Value(s): N, Y |
| >Context Group Extension Creator UID | 0008,010D | UI | |
| >Context Identifier | 0008,010F | CS | |
| Performed Station AE Title | 0040,0241 | AE | Eleva |
| Performed Station Name | 0040,0242 | SH | 0 length |
| Performed Location | 0040,0243 | SH | 0 length |
| Performed Procedure Step Start Date | 0040,0244 | DA | |
| Performed Procedure Step Start Time | 0040,0245 | TM | |
| Performed Procedure Step End Date | 0040,0250 | DA | 0 length |
| Performed Procedure Step End Time | 0040,0251 | TM | 0 length |

| Attribute Name | Tag | VR | Note |
|--------------------------------------|-----------|----|--|
| Performed Procedure Step Status | 0040,0252 | CS | Applied Value(s): COMPLETED, DISCONTINUED, IN PROGRESS |
| Performed Procedure Step ID | 0040,0253 | SH | |
| Performed Procedure Step Description | 0040,0254 | LO | 0 length |
| Performed Procedure Type Description | 0040,0255 | LO | 0 length |

Table 74: Proposed MPPS SOP Class - N-CREATE-RQ – Performed Procedure Step Relationship Module

| Attribute Name | Tag | VR | Note |
|---------------------------------------|-----------|----|--|
| Referenced Patient Sequence | 0008,1120 | SQ | |
| >Referenced SOP Class UID | 0008,1150 | UI | Uniquely identifies the referenced SOP Class. Required if Referenced Patient Sequence (0008:1200) is sent. Applied Value(s): 1.2.840.10008.3.1.2.1.1 |
| >Referenced SOP Instance UID | 0008,1155 | UI | Uniquely identifies the referenced SOP Instance. Required if Referenced Patient Sequence (0008:1120) is sent. |
| Patient's Name | 0010,0010 | PN | |
| Patient ID | 0010,0020 | LO | |
| Patient's Birth Date | 0010,0030 | DA | |
| Patient's Sex | 0010,0040 | CS | |
| Scheduled Step Attribute Sequence | 0040,0270 | SQ | |
| >Accession Number | 0008,0050 | SH | |
| >Referenced Study Sequence | 0008,1110 | SQ | 0 length if unscheduled |
| >>Referenced SOP Class UID | 0008,1150 | UI | |
| >>Referenced SOP Instance UID | 0008,1155 | UI | |
| >Study Instance UID | 0020,000D | UI | |
| >Requested Procedure Description | 0032,1060 | LO | |
| >Scheduled Procedure Step Description | 0040,0007 | LO | |
| >Scheduled Protocol Code Sequence | 0040,0008 | SQ | |
| >>Code Value | 0008,0100 | SH | |
| >>Coding Scheme Designator | 0008,0102 | SH | |
| >>Coding Scheme Version | 0008,0103 | SH | |
| >>Code Meaning | 0008,0104 | LO | |
| >>Mapping Resource | 0008,0105 | CS | |
| >>Context Group Version | 0008,0106 | DT | |
| >>Context Group Local Version | 0008,0107 | DT | |
| >>Code Set Extension Flag | 0008,010B | CS | Applied Value(s): N, Y |
| >>Context Group Extension Creator UID | 0008,010D | UI | |
| >>Context Identifier | 0008,010F | CS | |
| >Scheduled Procedure Step ID | 0040,0009 | SH | |
| >Requested Procedure ID | 0040,1001 | SH | |

Table 75: MPPS SOP Class - N-CREATE-RQ - Radiation Dose Module

| Attribute Name | Tag | VR | Note |
|---------------------------|-----------|----|----------|
| Image Area Dose Product | 0018,115E | DS | See Note |
| Total Time Of Fluoroscopy | 0040,0300 | US | See Note |
| Total Number of Exposures | 0040,0301 | US | See Note |
| Entrance Dose | 0040,0302 | US | See Note |

Note: Not sent in case of appended MPPS instances

4.2.2.5.3.2 All Supported N-SET-RQ Models:

Table 76: MPPS SOP Class - N-SET-RQ - SOP Common Module

| Attribute Name | Tag | VR | Note |
|------------------|-----------|----|-------------------------|
| SOP Class UID | 0008,0016 | UI | 1.2.840.10008.3.1.2.3.3 |
| SOP Instance UID | 0008,0018 | UI | |

Table 77: MPPS SOP Class - N-SET-RQ - Image Acquisition Results Module

| Attribute Name | Tag | VR | Note |
|---|-----------|----|--|
| Performed Protocol Code Sequence | 0040,0260 | SQ | 1 item only |
| > Code Value | 0008,0100 | SH | |
| > Coding Scheme Designator | 0008,0102 | SH | |
| > Coding Scheme Version | 0008,0103 | SH | |
| > Code Meaning | 0008,0104 | SH | |
| Performed Series Sequence | 0040,0340 | SQ | One or more items |
| > Retrieve AE Title | 0008,0054 | AE | Zero length |
| > Series Description | 0008,103E | LO | Zero length |
| > Performing Physician's Name | 0008,1050 | PN | Zero length |
| > Operator's Name | 0008,1070 | PN | Name(s) of the operator(s) |
| > Referenced Image Sequence | 0008,1140 | SQ | |
| >> Referenced SOP Class UID | 0008,1150 | UI | Presently only RF class |
| >> Referenced SOP Instance UID | 0008,1155 | UI | |
| > Protocol Name | 0018,1030 | LO | Copy of Performed Protocol Code Sequence → Code Value |
| > Series Instance UID | 0020,000E | UI | |
| > Referenced Standalone SOP Instance Sequence | 0040,0220 | SQ | Zero length |

Table 78: MPPS SOP Class - N-SET-RQ - Performed Procedure Step Information Module

| Attribute Name | Tag | VR | Note |
|-----------------------------------|-----------|----|-------------------|
| Procedure Code Sequence | 0008,1032 | SQ | |
| > Code Value | 0008,0100 | SH | |
| > Coding Scheme Designator | 0008,0102 | SH | |
| > Coding Scheme Version | 0008,0103 | SH | |
| > Code Meaning | 0008,0104 | LO | |
| Performed Procedure Step End Date | 0040,0250 | DA | |
| Performed Procedure Step End Time | 0040,0251 | TM | |
| Performed Procedure Step Status | 0040,0252 | CS | Applied Value(s): |

| Attribute Name | Tag | VR | Note |
|--------------------------------------|-----------|----|-------------------------|
| | | | COMPLETED, DISCONTINUED |
| Performed Procedure Step Description | 0040,0254 | LO | Zero length |
| Performed Procedure Type Description | 0040,0255 | LO | |

Table 79: MPPS SOP Class - N-SET-RQ - Radiation Dose Module

| Attribute Name | Tag | VR | Note |
|---------------------------|-----------|----|---|
| Image Area Dose Product | 0018,115E | DS | Not accumulating: re-processed images, non-digital images. See Note |
| Total Time Of Fluoroscopy | 0040,0300 | US | See Note |
| Total Number of Exposures | 0040,0301 | US | Not counting: re-processed images. See Note |
| Entrance Dose | 0040,0302 | US | See Note |

Note: Not sent in case of appended MPPS instances

4.3 NETWORK INTERFACES

4.3.1 Physical Network Interface

The MD ELEVA with FLAT DETECTOR (MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE and the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE) application provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of [DICOM].

MD ELEVA with FLAT DETECTOR inherits its TCP/IP stack from Windows XP (i.e. the operating system platform).

MD ELEVA with FLAT DETECTOR supports a single network interface: Ethernet ISO.8802-3.

With standard supported physical medium include:

- IEEE 802.3 10BASE-TX
- IEEE 802.3 100BASE-TX (Fast Ethernet)
- IEEE 802.3 1000BASE-X (Fiber Optic Gigabit Ethernet).

4.4 CONFIGURATION

The MultiDiagnost Eleva with Flat Detector system is configured by means of a configuration program.

This program is accessible at start-up of the MultiDiagnost Eleva with Flat Detector system. It is password protected and intended to be used by Philips Customer Support Engineers only.

The configuration program shall prompt the Customer Support Engineer to enter configuration information as required by the MultiDiagnost Eleva with Flat Detector application.

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 shall be described in this section.

4.4.1.1 Local AE Titles

The MD ELEVA with FLAT DETECTOR exits of two Application Entity titles and two IP addresses. One for the MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS AE and one for the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE.

At installation the Customer Support Engineer can change the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE host name. The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE can be changed independently.

The MultiDiagnost Eleva with Flat Detector ACP AE listens on **port 3010** (default).

Table 80: AE Title Configuration Table

| Application Entity | Default AE Title | Default TCP/IP Port |
|---|--|---------------------|
| MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE | <IP host name MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP> | 3010 * |
| MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS AE | <IP host name MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS > | Configurable |

Note: * Not configurable.

4.4.1.2 Remote AE Title/Presentation Address Mapping

4.4.1.2.1 Remote Association Initiators

All relevant remote applications able to setup a DICOM association towards MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE and MULTIDIAGNOST ELEVA with FLAT DETECTOR RIS AE must be configured at MultiDiagnost Eleva with Flat Detector configuration time.

The Customer Support Engineer (CSE) must provide the following information for each remote application:

- The **Application Entity Title**.
- The **SOP Classes** and **Transfer Syntaxes** for which MultiDiagnost Eleva with Flat Detector ACP AE accepts associations.

4.4.1.2.2 Remote Association Acceptors

The following information must be provided for all relevant remote applications that are able to accept DICOM associations from MultiDiagnost Eleva with Flat Detector RIS AE :

- The **Application Entity Title**.
- The **Host name / IP address** on which the remote application resides.
- The **Port number** at which the remote application accepts association requests.

4.4.2 Specified Operational Parameters

The specification of important operational parameters, and if configurable, their default value and range, shall be specified here.

The configuration parameters like SOP Classes and Transfer Syntaxes to be used are given in Table 4.

The configuration parameters for the MultiDiagnost Eleva with Flat Detector ACP are given in Table 81, and categorized in the following sections for the MultiDiagnost Eleva with Flat Detector ACP:

- General Parameters.
- Local Configurable Parameters.
- Remote Configurable Parameters.
- General Print Parameters.
- Printer Specific Print Parameters.

Table 81: Configuration Parameters table

| Parameter | Configurable | Default Value |
|---|--------------|----------------------|
| General Parameters | | |
| Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout) | No | - |
| General DIMSE level time-out values | No | - |
| Time-out waiting for response to TCP/IP connect request. (Low-level timeout) | No | - |
| Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout) | No | - |
| Time-out for waiting for data between TCP/IP packets. (Low-level timeout) | No | - |
| Any changes to default TCP/IP settings, such as configurable stack parameters. | No | - |
| Local Configurable Parameters | | |
| Size constraint in maximum object size | No | - |
| Maximum PDU size the AE can receive | Yes | 0 (unlimited) |
| Maximum PDU size the AE can send | No | - |
| AE specific DIMSE level time-out values | No | - |
| Number of simultaneous associations by Service and/or SOP class | No | - |
| SOP class support | Yes | none |
| Transfer Syntax support ¹ | Yes | ELE |
| Remote Configurable Parameters | | |
| Size constraint in maximum object size (see note) | No | - |
| Maximum PDU size the AE can receive | Yes | 0 (unlimited) |
| Maximum PDU size the AE can send | No | - |
| AE specific DIMSE level time-out values | No | - |
| Number of simultaneous associations by Service and/or SOP class | No | - |
| SOP class support | Yes | none |
| Transfer Syntax support | Yes | ELE |
| Storage Commitment request must be sent after Storage request | Yes | not |
| Storage Commitment time-out (synchronous to asynchronous) | Yes | none |
| Automatic conversion of images of SOP classes not supported by remote systems into Secondary Capture Image Storage SOP instances | Yes | convert to SC |
| Export of pure DICOM images (i.e. only the standard DICOM attributes as defined in the related IOD) or extended DICOM images (with additional Standard DICOM, Private and Retired attributes) | Yes | allow all attributes |
| Support of overlays for DICOM node not supporting Presentation State objects ² | Yes | enabled |
| Support of overlays for DICOM node supporting Presentation State objects ² | Yes | disabled |
| Support of overlays for CD ² | Yes | disabled |
| General Print Parameters | | |
| The DICOM printers that may be selected by the operator | Yes | none |
| Printer Specific Print Parameters ³ | | |
| Medium type | Yes | all available |
| Film size ID (i.e. media size) | Yes | all available |
| Resolution (300 / 600 dpi) | Yes | 300 |
| Color model (8 / 16 bits color) | Yes | 8 |
| Min Density | Yes | 0 |
| Max Density | Yes | 0 |

Note 1: The JPEG Baseline transfer syntax is only supported for RGB and YBR_FULL_422 images; therefore JPEG Baseline may NOT be configured for systems that are capable of handling storage of monochrome images too.

Note 2: The MultiDiagnost Eleva with Flat Detector Copy-tool can override the configured setting of overlay support.

Note 3: These print parameters can be selected from choice lists. These choice lists are defined via so-called prototypes for each type of printer and print medium. These prototypes are also configurable.

5 MEDIA INTERCHANGE

5.1 Implementation Model

The Implementation Model identifies the DICOM Application Entities in a specific implementation, and relates the Application Entities to Real-World Activities.

5.1.1 Application Data Flow

The MD ELEVA with FLAT DETECTOR consists of one single application entity only: the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP Application Entity.

Figure 16 shows the Media Interchange Application Data Flow as a functional overview of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE for CD-R and DVD.

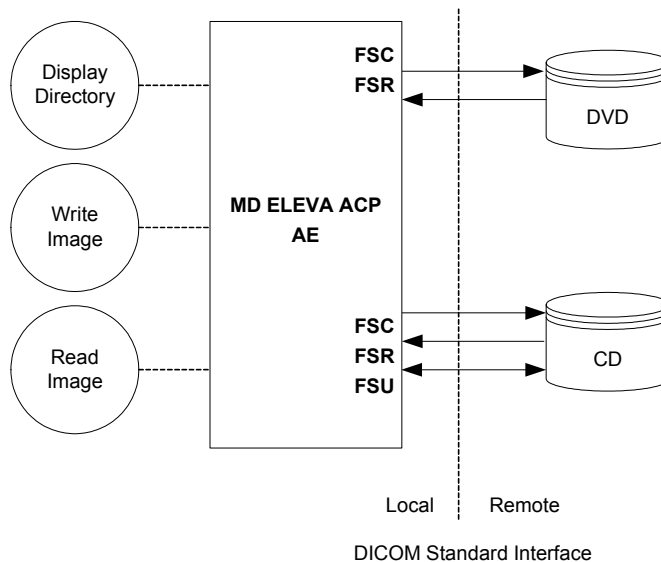


Figure 16: Media Interchange Application Data Flow Diagram

Table 88 shows the Media Interchange overview of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP and the supporting roles for CD-R and DVD.

Table 82: media Services table

| Ma Storage Application | Write Files (FSC / FSU) | Read Files (FSR) |
|--------------------------|-------------------------|------------------|
| General Purpose CD-R | YES / YES | YES |
| General Purpose DVD-JPEG | YES / NO | YES |

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP will act as a FSR, for CD-R and DVD, when reading the directory of the medium.
 The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP will act as a FSC / FSU for a CD-R and as FSC for DVD, when writing the selected images in a patient folder onto the medium.
 MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE supports the media profiles as shows in the Table below:

Table 83: media Profiles supported by MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP

| Application Profile | CD | DVD+RW / DVD+R |
|---------------------|------------|----------------|
| General Purpose | STD-GEN-CD | STD-GEN-DVD |

Note; DVD-R and DVD-RW can be read but are not supported for writing.

Supported Photometric Interpretations

The MD ELEVA with FLAT DETECTOR supports images with the following DICOM Photometric Interpretations as shows in the Table below:

Table 84: Photometric interpretations supported by MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP

| Photometric Interpretation | Import | Export | Viewing |
|----------------------------|--------|--------|---------|
| MONOCHROME1 | YES | YES | YES |
| MONOCHROME2 | YES | YES | YES |
| PALETTE COLOR | YES | YES | NO |
| RGB | YES | YES | YES |
| YBR_FULL | YES | YES | NO |
| YBR_FULL_422 (see note) | YES | YES | NO |
| YBR_PARTIAL_422 | YES | YES | NO |
| YBR_RCT | YES | YES | NO |
| YBR_ICT | YES | YES | NO |

Note: if the photometric interpretation YBR_FULL_422 is used in combination with transfer syntax JPEG-lossy then the pixel data is converted to RGB on import.

The system proposes the transfer syntaxes mentioned in Table below.

Table 85: Transfer Syntaxes of DVD / CD supported by MD ELEVA with FLAT DETECTOR

| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
|-----------------|----------|-------------------|---|------|----------------------|
| Name | UID | Name List (note) | UID List | | |
| See Note | See Note | ILE ELE EBE | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 | SCU | None |

Note: any of the standard image storage and private SOP classes mentioned before. The preferred transfer syntax is ELE.

MD ELEVA with FLAT DETECTOR supports images with Lossy image compression via JPEG as described as shows in the Table below.

Table 86: JPEG coding supported by MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP

| DICOM Transfer Syntax UID | JPEG coding process | JPEG description |
|---------------------------|---------------------|---|
| 1.2.840.10008.1.2.4.50 | 1 | Lossy, Baseline (JPEG 8 Bit Image Compression) |

Note: Lossy Compression is only supported for images with photometric interpretation RGB and YBR_FULL_422 and therefore MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE supports this only for Ultrasound Images.

5.1.2 Functional Definitions of AE's

This section shall describe in general terms the functions to be performed by the AE, and the DICOM services used to accomplish these functions.

5.1.2.1 Functional Definition of MultiDiagnost ELEVA with Flat Detector ACP

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP is the one and only application entity within MD ELEVA with Flat Detector. It includes the following service class.

Media Storage Service Class for CD and DVD

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP can perform the CD-R media Storage service as SCU, with capabilities for:

RWA Display Directory (as FSR),
RWA Write Images (as FSC / FSU), and
RWA Read Images (as FSR).

For DVD the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP can perform the media Storage service as SCU, with capabilities for:

RWA Display Directory (as FSR),
RWA Write Images (as FSC), and
RWA Read Images (as FSR).

5.1.3 Sequencing of Real World Activities

Whenever a CD or DVD has to be written the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP first tries to read the DICOMDIR. The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP will compile the updated DICOMDIR and any required DICOM images into a CD or DVD session image; this CD or DVD session image will be written to CD or DVD disk.

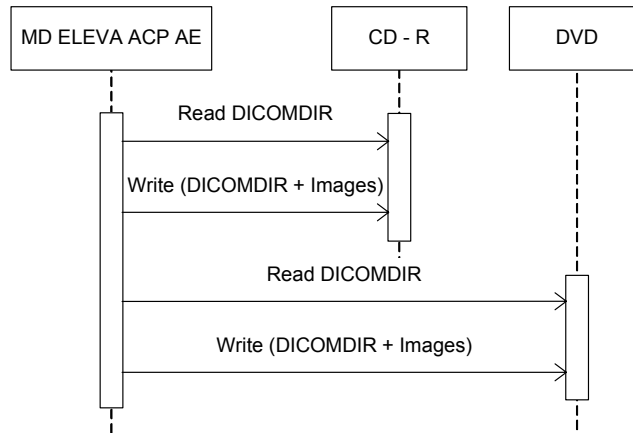


Figure 17: Sequencing of RWA Write Images

5.1.4 File Meta Information for Implementation Class and Version

This section shall be used to list the values assigned to the File Meta Information attributes (ref. [DICOM] PS 3.10) that pertain to the Implementation Class and Version.

The Implementation Class UID and the Implementation Version Name in the File Meta Header are as specified for Networking (ref. Table 9 in section 4.2.1.2.4).

Table 87: DICOM Implementation Class and Version for MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP

| Implementation Class and Version | |
|----------------------------------|----------------------|
| File Meta Information Version | 00, 01 |
| Implementation Class UID | 1.3.46.670589.5.2.23 |
| Implementation Version Name | ViewForum R4.2 |

5.2 AE Specifications

The next section in the DICOM Conformance Statement contains the specification of the one and only MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP Application Entity.

5.2.1 MultiDiagnost Eleva with Flat Detector ACP

The MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP provides Standard Conformance to the DICOM media Storage Service and File Format ([DICOM] PS 3.10), the media Storage Application Profiles STD-GEN-CD ([DICOM] PS 3.11) and the media Storage Application Profiles STD-GEN-DVD-JPEG ([DICOM] PS 3.12) for Reading and Writing.

MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE supports multi-patient and multi-session CD-R / DVD disks, both for Reading and Writing.

Supported media by MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE are:

- **CD:** CD R / CD RW with the profile: STD-GEN-CD and
- **DVD:** DVD+R and DVD+RW with the profile: STD-GEN-DVD-JPEG and the Transfer Syntax ELE uncompressed.

The DVD - R and DVD - RW media can be Read but are NOT supported for Writing.

The supported Application Profiles, their Roles and the Service Class (SC) options, all defined in DICOM terminology, are listed in Table 88.

Table 88: AE Related Application Profiles, Real-World Activities, and Roles for CD-R and DVD

| Supported Application Profile | Real-World Activity | Roles | SC Option |
|-------------------------------|---------------------|----------|-------------|
| STD-GEN-CD | Display Directory | FSR | Interchange |
| | Write Images | FSC, FSU | Interchange |
| | Read Images | FSR | Interchange |
| STD-GEN-DVD-JPEG | Display Directory | FSR | Interchange |
| | Write Images | FSC | Interchange |
| | Read Images | FSR | Interchange |

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

5.2.1.1 File Meta Information for the

The Source Application Entity Title is configurable (see ref. section 5.4 Media Configuration).

5.2.1.2 Real-World Activities

5.2.1.2.1 Display Directory

When a database open action is initiated on the CD-R or DVD then MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP acts as an FSR using the interchange option to read the DICOMDIR of the CD-R or DVD medium.

This will result in an overview of the patients, studies, series and images on the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP screen.

5.2.1.2.1.1 Media Storage Application Profile

As depicted in Table 88, the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP supports the RWA Display Directory for the STD-GEN-CD and the STD-GEN-DVD-JPEG Application Profile.

5.2.1.2.1.1.1 Options

The mandatory DICOMDIR keys are required for the correct displaying of directory information. The displaying is structured according the DICOM Composite Information Model: Patient, Study, Series and Image.

5.2.1.2.2 Write Images

When an image transfer to CD-R or DVD is initiated then the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP acts as an FSC or FSU (CD-R only) using the interchange option to export SOP Instances from the local database to a CD-R or DVD medium.

5.2.1.2.2.1 Media Storage Application Profile

As depicted in Table 88, the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP supports the RWA Write Images for the STD-GEN-CD and the STD-GEN-DVD-JPEG Application Profile.

5.2.1.2.2.1.1 Options

The same remarks as in section 4.2.1.3.1.3 about the existence of Optional, Retired and Private Attributes are applicable.

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.

Implementation remarks and restrictions

When writing the DICOMDIR records, key values are generated when no value of the corresponding attribute is supplied, according to the following table.

Table 89: Generated Keys

| Key | Tag | Generated Value |
|-----------------|-------------|--|
| Patient Keys | | |
| Patient ID | (0010,0020) | At import MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP each time creates a new value based on the Study Instance UID for each new study written to the CD-R / DVD (even if this study belongs to a patient recorded earlier). Otherwise the default-generated value shall be a succession of "UNKNOWN", the Patient's Name, the Patient's Birth Date, and the Patient's Sex, concatenated by using underscore characters. |
| Study Keys | | |
| Study Date | (0008,0020) | Date on which this Study was created. |
| Study Time | (0008,0030) | Time on which this Study was created. |
| Study ID | (0020,0010) | "UNKNOWN" |
| Series Keys | | |
| Series Number | (0020,0011) | 1 |
| Image Keys | | |
| Instance Number | (0020,0013) | 1 |

The default value for the Pixel Intensity Relationship (0028,1040) is set to DISP. MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP can write Volumes of the media to that media.
MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP asks for a new media if media is spanning over more CD-R / DVD disks.

5.2.1.2.3 Read Images

When an image transfer from CD-R or DVD is initiated then the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP acts as an FSR using the interchange option to import SOP Instances from the CD-R / DVD mdum.

5.2.1.2.3.1 Media Storage Application Profile

As depicted in Table 88, the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP supports the RWA Read Images for the STD-GEN-CD and STD-GEN-DVD-JPEG Application Profile.

5.2.1.2.3.1.1 Options

The mandatory attributes of the DICOM images are required for the correct storage of the images in the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP internal image database.

Optional attributes and Retired / Private attributes are stored too – if present; this is equivalent with the level 2 (Full) conformance for the Storage service class in the Network support; ref. section 4.2.1.4.2.

The same remarks as in section 4.2.1.4.2.3 about the storage of images and about requirements to process read images via the dcated MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP application functions are applicable.

5.3 Augmented and Private Application Profiles

This section shall be used for the description of Augmented and Private Application Profiles.

5.3.1 Augmented Application Profiles

None.

5.3.2 Private Application Profiles

None.

5.4 Media Configuration

Any configuration issues may be found in the Networking section 4.4 CONFIGURATION.

6 SUPPORT OF CHARACTER SETS

When the MD ELEVA with FLAT DETECTOR receives images with undefined character set then the import will be terminated with error status code.

The MD ELEVA with FLAT DETECTOR supports the extended character set ISO IR 100, which is the Latin alphabet No 1, supplementary set.

The default Factory Settings for the WLM query request attribute "Specific Character set (0008,0005)" is "NO" and should be configured to support the "27H Character.

7 SECURITY

7.1 Security Profiles

None supported.

7.2 Association level security

Any calling AE title and/or IP address may open an association.

7.3 Application level security

The MD ELEVA with FLAT DETECTOR does not supports the HIPAA Audit trail profile.

8 ANNEXES

8.1 IOD Contents

This section specifies each IOD created by the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE to be exported as UnProcessed / Processed Images.

- All supported IOD's can be converted (if configured) to a Secondary Capture Image Storage SOP Class, section 8.1.1.1
- X-Ray Radiofluoroscopic Image Storage SOP Class, section 8.1.1.2 (Processed Mode)
- Grayscale Softcopy Presentation State (AS LAST SEEN / NEW AT IMPORT), section 8.1.1.3
- Grayscale Softcopy Presentation State Object of the MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE, (AS ACQUIRED) section 8.1.1.4
- SOP Instances in Captured Image(s). section 8.1.2
- Captured Image as Photo(s). section 8.1.2.1
- Captured Image(s) as Original section 8.1.2.2

8.1.1 SOP Instances MultiDiagnost ELEVA with flat Detector

This section specifies each IOD to be exported by the **MULTIDIAGNOST ELEVA with FLAT DETECTOR ACP AE**.

This can take place as UNPROCESSED RAW data and PROCESSED data as RF.

If the remote system does not support the import of a specific Image Storage SOP Class, the MultiDiagnost Eleva with Flat Detector ACP AE will convert (if configured to do so) these images and sends them via the SC Image SOP Class.

The Imported Images should only be used for viewing purposes.

Used abbreviations are:

Used Presentation Values:

| | |
|----------|--|
| ALWAYS | the module or attribute shall always be present with value |
| ANAP | Attribute Not Always Present |
| ANAPC | Attribute Not Always Present but under Condition |
| VNAP | Value Not Always Present (attribute sent zero length if no value is present) |
| EMPTY | Attribute is sent without a value |
| MAYBE | the module may be present under specified condition |
| OPTIONAL | the module may be available, depending on source object |

Used Source Items:

| | |
|------|---|
| AUTO | the attribute value is generated automatically |
| CONF | the attribute value source is a configurable parameter |
| IMPL | the attribute value source is a user-implicit configuration setting |
| MPPS | the attribute value source is a Modality Performed Procedure Step |
| MWL | the attribute value source is a Modality Worklist |
| SPEC | the attribute value source is a specific DICOM object |
| USER | the attribute value source is explicit user input |

8.1.1.1 Secondary Capture Image Storage SOP Class for the MD ELEVA Processed Mode

Table 90: Modules of the Secondary Capture Image Storage SOP Class

| Information Entity | Module Name | Reference | Presence of Module |
|--------------------|--------------------------|-----------|--------------------|
| Patient | Patient Module | Table 91 | ALWAYS |
| Study | General Study Module | Table 92 | ALWAYS |
| Series | General Series Module | Table 94 | ALWAYS |
| Equipment | General Equipment Module | Table 95 | ALWAYS |
| | SC Equipment Module | Table 93 | ALWAYS |
| Image | General Image Module | Table 96 | ALWAYS |
| | Image Pixel Module | Table 97 | ALWAYS |
| | SC Image Module | Table 98 | ALWAYS |
| | SOP Common Module | Table 99 | ALWAYS |

Table 91: Secondary Capture Image Storage SOP Class - Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------|-----------|----|---------------------------|-------------------|--------|
| Patient's Name | 0010,0010 | PN | | ALWAYS | AUTO |
| Patient's ID | 0010,0020 | LO | | VNAP | AUTO |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | AUTO |
| Patient's Sex | 0010,0040 | CS | Applied Value(s): F, M, O | VNAP | AUTO |

Table 92: Secondary Capture Image Storage SOP Class - General Study Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------------|-----------|----|---------------------------------------|-------------------|--------|
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO |
| Study Date | 0008,0020 | DA | Date on which this Study was created. | ALWAYS | AUTO |
| Study Time | 0008,0030 | TM | Time on which this Study was created. | ALWAYS | AUTO |
| Accession Number | 0008,0050 | SH | | VNAP | AUTO |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | AUTO |
| Study Description | 0008,1030 | LO | | VNAP | AUTO |
| Study ID | 0020,0010 | SH | | ALWAYS | AUTO |

Table 93: Secondary Capture Image Storage SOP Class - SC Equipment Module

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

Table 94: Secondary Capture Image Storage SOP Class - General Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--|-----------|----|--|-------------------|--------|
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO |
| Series Number | 0020,0011 | IS | | ALWAYS | AUTO |
| Laterality | 0020,0060 | CS | Applied Value(s): L, R | VNAP | AUTO |
| Series Date | 0008,0021 | DA | Date the Series started | ALWAYS | AUTO |
| Series Time | 0008,0031 | TM | Time the Series started | ALWAYS | AUTO |
| Performing Physicians' Name | 0008,1050 | PN | | VNAP | AUTO |
| Protocol Name | 0018,1030 | LO | | ANAP | AUTO |
| Referenced Performed Procedure Step_Sequence | 0008,1111 | SQ | | ANAP | AUTO |
| >Referenced SOP Class UID | 0008,1150 | UI | Required if Referenced Study Component Sequence (0008:1111) is sent. | ALWAYS | AUTO |
| >Referenced SOP Instance UID | 0008,1155 | UI | Required if referenced Study Component Sequence (0008:1111) is sent. | ALWAYS | AUTO |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ALWAYS | AUTO |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ALWAYS | AUTO |
| Performed Procedure Step ID | 0040,0253 | SH | | ALWAYS | AUTO |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAP | AUTO |
| Request Attributes Sequence | 0040,0275 | SQ | | ANAP | AUTO |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | ANAP | AUTO |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | MAYBE | AUTO |
| >Requested Procedure ID | 0040,1001 | SH | | MAYBE | AUTO |

Table 95: Secondary Capture Image Storage SOP Class - General Equipment Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------------|-----------|----|--|-------------------|--------|
| Manufacturer | 0008,0070 | LO | Philips Medical Systems | ALWAYS | AUTO |
| Institution Name | 0008,0080 | LO | | ALWAYS | AUTO |
| Station Name | 0008,1010 | SH | Eleva | ALWAYS | AUTO |
| Manufacturer's Module Name | 0008,1090 | LO | Extended Digital Imaging | ALWAYS | AUTO |
| Device Serial Number | 0018,1000 | LO | DSI R6.1.1 | ALWAYS | AUTO |
| Software Versions | 0018,1020 | LO | CRISP R1.0.1 PMS1.1 MIMIT EVIIMDictionary PMS1.1 MIMIT PIIMDICTIONARY PMS1.1 MIMIT EVIIMDictionary | ALWAYS | AUTO |

Table 96: Secondary Capture Image Storage SOP Class - General Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------|-----------|----|---------------------------------|-------------------|--------|
| Image Type | 0008,0008 | CS | ORIGINAL, PRIMARY, SINGLE PLANE | ALWAYS | AUTO |
| Instance Number | 0008,0013 | IS | | ALWAYS | AUTO |

| | | | | | |
|---------------------|-----------|----|--------------------------|--------|------|
| Acquisition Date | 0008,0022 | DA | | ANAP | AUTO |
| Content Date | 0008,0023 | DA | | ALWAYS | AUTO |
| Acquisition Time | 0008,0032 | TM | | ALWAYS | AUTO |
| Content Time | 0008,0033 | TM | | ALWAYS | AUTO |
| Acquisition Number | 0020,0012 | IS | | ALWAYS | AUTO |
| Instance Number | 0020,0013 | IS | | ALWAYS | AUTO |
| Patient Orientation | 0020,0020 | CS | Always zero length value | ALWAYS | AUTO |

Table 97: Secondary Capture Image Storage SOP Class - Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------------|-----------|----|-------------|-------------------|--------|
| Samples per Pixel | 0028,0002 | US | 1 | ALWAYS | AUTO |
| Photometric Interpretation | 0028,0004 | CS | Monochrome2 | ALWAYS | AUTO |
| Row | 0028,0010 | US | 1024 | ALWAYS | AUTO |
| Columns | 0028,0011 | US | 1024 | ALWAYS | AUTO |
| Bits Allocated | 0028,0100 | US | 16 | ALWAYS | AUTO |
| Bits Stored | 0028,0101 | US | 14 | ALWAYS | AUTO |
| High Bit | 0028,0102 | US | 13 | ALWAYS | AUTO |
| Pixel Representation | 0028,0103 | US | 0 | ALWAYS | AUTO |
| Pixel Data | 7FE0,0010 | OW | | ALWAYS | AUTO |

Table 98: Secondary Capture Image Storage SOP Class - SC Image Module

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

Table 99: Secondary Capture Image Storage SOP Class - SOP Common Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------|-----------|----|-----------------------|-------------------|--------|
| Specific Character Set | 0008,0005 | CS | ISO_IR 100 | ANAP | CONF |
| SOP Class UID | 0008,0016 | UI | 1.2.840.10008.5.1.1.7 | ALWAYS | AUTO |
| SOP Instance UID | 0008,0018 | UI | | ALWAYS | AUTO |

8.1.1.2 X-Ray RadioFluoroscopic SOP Class for the MD ELEVA Processed Mode

The following tables give a detailed overview of all supported attributes of the XRF Storage SOP Class for the Processed Mode with or without Overlays. The list of possible values are given. The situation that an attribute is present conditionally / optionally or that an attribute may contain a zero length value, is indicated too. Conditions and Defined / Enumerated Values of DICOM 3.0 are applicable but are not shown in the tables.

Table 100: Modules of the X-Ray RadioFluoroscopic Image Storage SOP Class

| Information Entity | Module Name | Reference | Presence of Module |
|--------------------|--------------------------|-----------|--------------------|
| Patient | Patient Module | Table 101 | ALWAYS |
| Study | General Study Module | Table 102 | ALWAYS |
| Series | General Series Module | Table 103 | ALWAYS |
| Equipment | General Equipment Module | Table 104 | ALWAYS |
| Image | Image Pixel Module | Table 109 | ALWAYS |
| | General Image Module | Table 108 | ALWAYS |
| | Cine Module | Table 105 | ALWAYS |
| | Multi-Frame | Table 106 | ALWAYS |
| | Display Shutter Module | Table 107 | ALWAYS |
| | Overlay Plane | Table 112 | CONDITIONAL |
| | XRF Positioner | Table 111 | ALWAYS |
| | X-ray Image Module | Table 110 | ALWAYS |
| | X-Ray Acquisition Module | Table 113 | ALWAYS |
| | SOP Common Module | Table 114 | ALWAYS |
| | VOI LUT Module | Table 115 | OPTIONAL |

Table 101: XRF Image Storage SOP Class - Patient Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------|-----------|----|---|-------------------|--------|
| Patient's Name | 0010,0010 | PN | Received from RIS or Entered by Operator | ALWAYS | AUTO |
| Patient ID | 0010,0020 | LO | Received from RIS or Entered by Operator | VNAP | AUTO |
| Patient's Birth Date | 0010,0030 | DA | Received from RIS or Entered by Operator | VNAP | AUTO |
| Patient's Sex | 0010,0040 | CS | Received From RIS or Entered by Operator. F,M,O | VNAP | AUTO |

Table 102: XRF Image Storage SOP Class - General Study Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------------|-----------|----|--|-------------------|--------|
| Study Instance UID | 0020,000D | UI | Generated at the creation of the study or received from RIS. | ALWAYS | AUTO |
| Study Date | 0008,0020 | DA | Date on which this Study was created. | ALWAYS | AUTO |
| Study Time | 0008,0030 | TM | Time on which this Study was created. | ALWAYS | AUTO |
| Accession Number | 0008,0050 | SH | Zero length if not received from RIS | VNAP | AUTO |
| Referring Physician's Name | 0008,0090 | PN | Zero length if not received from RIS | VNAP | AUTO |
| Study Description | 0008,1030 | LO | | VNAP | AUTO |
| Study ID | 0020,0010 | SH | Undefined | ALWAYS | AUTO |

Table 103: XRF Image Storage SOP Class - General Series Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--|-----------|----|--|-------------------|--------|
| Series Date | 0008,0021 | DA | Date the Series started. | ALWAYS | AUTO |
| Series Time | 0008,0031 | TM | Time the Series started. | ALWAYS | AUTO |
| Modality | 0008,0060 | CS | RF | ALWAYS | AUTO |
| Performing Physicians' Name | 0008,1050 | PN | Received from RIS, entered by user or is empty if not known. | VNAP | 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 | ALWAYS | AUTO |
| > Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO |
| Protocol Name | 0018,1030 | LO | | VNAP | AUTO |
| Series Instance UID | 0020,000E | UI | | ALWAYS | CONF |
| Series Number | 0020,0011 | IS | | VNAP | AUTO |
| Laterality | 0020,0060 | CS | Always zero length value. | MAYBE | AUTO |
| Performed Procedure Step Start Date | 0040,0244 | DA | | VNAP | AUTO |
| Performed Procedure Step Start Time | 0040,0245 | TM | | VNAP | AUTO |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO |
| Performed Procedure Step Description | 0040,0254 | LO | | VNAP | AUTO |
| Request Procedure Sequence | 0040,0275 | SQ | | ANAP | AUTO |
| > Scheduled Procedure Step Description | 0040,0007 | LO | | ANAP | AUTO |
| > Scheduled Procedure Step ID | 0040,0009 | SH | | VNAP | AUTO |
| > Requested Procedure ID | 0040,1001 | SH | | VNAP | AUTO |

Table 104: XRF Image Storage SOP Class – General Equipment Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---------------------------|-----------|----|---|-------------------|--------|
| Manufacturer | 0008,0070 | LO | Philips Medical Systems | ALWAYS | AUTO |
| Institution Name | 0008,0080 | LO | | ALWAYS | AUTO |
| Station Name | 0008,1010 | SH | Eleva | ALWAYS | AUTO |
| Manufacturer's Model Name | 0008,1090 | LO | Extended Digital Imaging | ALWAYS | AUTO |
| Device Serial Number | 0018,1000 | LO | DSI R6.1.1 | ALWAYS | AUTO |
| Software Versions | 0018,1020 | LO | CRISP R1.0.1 PMS1.1MIMIT EVIIMDictionary PMS1.1 MIMIT PIIMDICTIONARY PMS1.1 MIMIT EVIIMDictionary | ALWAYS | AUTO |

Table 105: XRF Image Storage SOP Class - Cine Module Attributes (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------|-----------|----|-------|-------------------|--------|
| Frame Time | 0018.1063 | DS | | VNAP | AUTO |
| Cine Rate | 0018,0040 | IS | | ANAP | AUTO |

Table 106: XRF Image Storage SOP Class – Multi-Frame Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-------------------------|-----------|----|----------|-------------------|--------|
| Number of Frame | 0028,0008 | IS | | ALWAYS | AUTO |
| Frame Increment Pointer | 0028,0009 | AT | 00181063 | ALWAYS | AUTO |

Table 107: XRF Image Storage SOP Class - Display Shutter Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-------------------------------|-----------|----|-------------|-------------------|--------|
| Shutter Shape | 0018,1600 | CS | RECTANGULAR | ALWAYS | AUTO |
| Shutter Left Vertical Edge | 0018,1602 | IS | | ANAP | AUTO |
| Shutter Right Vertical Edge | 0018,1604 | IS | | ANAP | AUTO |
| Shutter Upper Horizontal Edge | 0018,1606 | IS | | ANAP | AUTO |
| Shutter Lower Horizontal Edge | 0018,1608 | IS | | ANAP | AUTO |

Table 108: XRF Image Storage SOP Class - General Image Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------|-----------|----|----------|-------------------|--------|
| Acquisition Date | 0008,0022 | DA | | VNAP | AUTO |
| Content Date | 0008,0023 | DA | | MAYBE | AUTO |
| Acquisition Time | 0008,0032 | TM | | ANAP | AUTO |
| Content Time | 0008,0033 | TM | | MAYBE | AUTO |
| Acquisition Number | 0020,0012 | IS | | VNAP | AUTO |
| Instance Number | 0020,0013 | IS | | VNAP | AUTO |
| Patient Orientation | 0020,0020 | CS | | MAYBE | AUTO |
| Presentation LUT Shape | 2050,0020 | CS | IDENTITY | VNAP | AUTO |

Table 109: XRF Image Storage SOP Class - Image Pixel Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------|-----------|----|-----------|-------------------|--------|
| Row | 0028,0010 | US | 1024, 512 | ALWAYS | AUTO |
| Columns | 0028,0011 | US | 1024, 512 | ALWAYS | AUTO |
| Pixel Data | 7FE0,0010 | OW | | ALWAYS | AUTO |

Table 110: XRF Image Storage SOP Class – X-Ray Image Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------------|-----------|----|---------------------------------|-------------------|--------|
| Image Type | 0008,0008 | CS | ORIGINAL, PRIMARY, SINGLE PLANE | ALWAYS | AUTO |
| Samples per Pixel | 0028,0002 | US | 1 | ALWAYS | AUTO |
| Photometric Interpretation | 0028,0004 | CS | MONOCHROME2 | ALWAYS | AUTO |
| Bits Allocated | 0028,0100 | US | 16 | ALWAYS | AUTO |
| Bits Stored | 0028,0101 | US | 14 | ALWAYS | AUTO |
| High Bit | 0028,0102 | US | 13 | ALWAYS | AUTO |
| Pixel Representation | 0028,0103 | US | 0 | ALWAYS | AUTO |
| Pixel Intensity Relationship | 0028,1040 | CS | DISP | ALWAYS | AUTO |

Table 111: XRF Image Storage SOP Class – XRF Positioner Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-----------------------------|-----------|----|-------|-------------------|--------|
| Distance Source to Detector | 0018,1110 | DS | | ALWAYS | AUTO |

Table 112: XRF Image Storage SOP Class - Overlay Plane Module (O)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------|-----------|----|-----------|-------------------|--------|
| Overlay Rows | 6000,0010 | US | 512, 1024 | ANAP | AUTO |
| Overlay Columns | 6000,0011 | US | 512, 1024 | ANAP | AUTO |
| Overlay Time | 6000,0040 | CS | G | ANAP | AUTO |
| Overlay Origin | 6000,0050 | SS | 1, 1 | ANAP | AUTO |
| Overlay Bits Allocated | 6000,0100 | US | 1 | ANAP | AUTO |
| Overlay Bits Position | 6000,0102 | US | 0 | ANAP | AUTO |
| Overlay Data | 6000,3000 | OW | | ANAP | AUTO |

Note: This Overlay Plane Module is only present if Overlays is configured to be supported

Table 113: XRF Image Storage SOP Class – X-Ray Acquisition Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--------------------|-----------|----|---|-------------------|--------|
| KVP | 0018,0060 | DS | Always zero length value. | VNAP | AUTO |
| Exposure | 0018,1152 | IS | | MAYBE | AUTO |
| Radiation Setting | 0018,1155 | CS | GR, SC | ALWAYS | AUTO |
| Exposure Time | 0018,1150 | IS | Required if Exposure (0018,1152) is not present. | ANAP | AUTO |
| X-Ray Tube Current | 0018,1151 | IS | Required if Exposure (0018,1152) is not present. | ANAP | AUTO |
| Exposure | 0018,1152 | IS | Required if either Exposure Time (0018,1150) or X-Ray Tube Current (0018,1151) are not present. | MAYBE | AUTO |

Note: In this system up to 3 attributes are sent out together, namely the attributes (0018,1150) "Exposure Time", attributes (0018,1151) "X-Ray Tube Current" and "Exposure " (0018,1152).

Table 114: XRF Image Storage SOP Class – SOP Common Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------|-----------|----|------------------------------|-------------------|--------|
| Specific Character Set | 0008,0005 | CS | ISO_IR 100 | ANAP | CONF |
| SOP Class UID | 0008,0016 | UI | 1.2.840.10008.5.1.4.1.1.12.2 | ALWAYS | AUTO |
| SOP Instance UID | 0008,0018 | UI | | ALWAYS | AUTO |

Table 115: XRF Image Storage SOP Class – VOI LUT Module (O)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------|-----------|----|--|-------------------|--------|
| Window Center | 0028,1050 | DS | is related to the Contrast / Brightness. | ANAP | AUTO |
| Window Width | 0028,1051 | DS | is related to the Contrast / Brightness. | ALWAYS | AUTO |

8.1.1.3 Grayscale Softcopy Presentation State (AS LAST SEEN) for the Processed Mode

When the MD ELEVA with FLAT DETECTOR imports a storage object without Presentation State object then it will create a presentation object for this storage object, which it then can use for export with the Presentation Label **"NEW AT IMPORT"** (if negotiated).

If private Presentation State information exists, then this will be used to create the Presentation State object. Depending on the setup, the MD ELEVA with FLAT DETECTOR may or may not add this Private Presentation State information on export with the Presentation Label **"AS LAST SEEN"**.

Table 116: Modules of the Grayscale Softcopy Presentation State Storage SOP Class

| Information Entity | Module Name | Reference | Presence of Module |
|--------------------|----------------------------------|-------------------------|--------------------|
| Patient | Patient Module | Table 117 | ALWAYS |
| Study | General Study Module | Table 118 | ALWAYS |
| Series | General Series Module | Table 119 | ALWAYS |
| | Presentation Series Module | Table 122 | ALWAYS |
| Equipment | General Equipment Module | Table 120 | ALWAYS |
| Image | Display shutter module | Table 121 | ALWAYS |
| | Displayed Area Module | Table 125 | ALWAYS |
| | | Graphic Layer Module | Table 128 |
| | Graphic Annotation | Table 129 | MAYBE |
| | Softcopy Presentation LUT Module | Table 124 | ALWAYS |
| | | Softcopy VOI LUT Module | Table 123 |
| | Presentation State Module | Table 126 | ALWAYS |
| | SOP Common Module | Table 122 | ALWAYS |

Table 117: Grayscale Softcopy Presentation State Storage SOP Class - Patient Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------|-----------|----|---------------------------|-------------------|--------|
| Patient's Name | 0010,0010 | PN | | ALWAYS | SPEC |
| Patient ID | 0010,0020 | LO | | VNAP | SPEC |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | SPEC |
| Patient's Sex | 0010,0040 | CS | Applied Value(s): F, M, O | VNAP | SPEC |

Table 118: Grayscale Softcopy Presentation State Storage SOP Class - General Study Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------------|-----------|----|---------------------------------------|-------------------|--------|
| Study Date | 0008,0020 | DA | Date on which this Study was created. | ALWAYS | SPEC |
| Study Time | 0008,0030 | TM | Time on which this Study was created. | ALWAYS | SPEC |
| Accession Number | 0008,0050 | SH | | VNAP | SPEC |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | SPEC |
| Study Description | 0008,1030 | LO | | VNAP | SPEC |
| Study Instance UID | 0020,000D | UI | | ALWAYS | SPEC |
| Study ID | 0020,0010 | SH | | VNAP | SPEC |

Table 119: Grayscale Softcopy Presentation State Storage SOP Class - General Series Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--|-----------|----|-------------------------|-------------------|--------|
| Series Date | 0008,0021 | DA | Date the Series started | ALWAYS | AUTO |
| Series Time | 0008,0031 | TM | Time the Series started | ALWAYS | AUTO |
| Performing Physician's Name | 0008,1050 | PN | | VNAP | USER |
| 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 | ALWAYS | AUTO |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO |
| Protocol Name | 0018,1030 | LO | | ANAP | SPEC |
| Series Number | 0020,0011 | IS | | VNAP | SPEC |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO |
| Laterally | 0020,0060 | CS | Applied Value(s): L, R | MAYBE | SPEC |
| Performed Procedure Step Start Date | 0040,0244 | DT | | ALWAYS | SPEC |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ALWAYS | SPEC |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO |
| Performed Procedure Step Description | 0040,0254 | LO | | VNAP | SPEC |
| Request Attributes Sequence | 0040,0275 | SQ | | ANAP | AUTO |
| > Requested Procedure ID | 0040,1001 | SH | | ANAP | AUTO |
| > Scheduled Procedure Step Description | 0040,0007 | LO | | ANAP | AUTO |
| > Scheduled Procedure Step ID | 0040,0009 | SH | | MAYBE | AUTO |

Table 120: Grayscale Softcopy Presentation State Storage SOP Class - General Equipment Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---------------------------|-----------|----|--|-------------------|--------|
| Manufacturer | 0008,0070 | LO | Philips Medical Systems | ALWAYS | AUTO |
| Institution Name | 0008,0080 | LO | Hospital | ALWAYS | USER |
| Station Name | 0008,1010 | SH | | ALWAYS | AUTO |
| Manufacturer's Model Name | 0008,1090 | LO | ViewForum | ALWAYS | AUTO |
| Device Serial Number | 0018,1000 | LO | | ALWAYS | AUTO |
| Software Versions | 0018,1020 | LO | ViewForum 4.2 PMS1.1 MIMIT EVIIMDictionary | ALWAYS | AUTO |

Table 121: Grayscale Softcopy Presentation State Storage SOP Class - DISPLAY Shutter Module (C)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-------------------------------|-----------|----|-------------|-------------------|--------|
| Shutter Shape | 0018,1600 | CS | RECTANGULAR | ALWAYS | SPEC |
| Shutter Left Vertical Edge | 0018,1602 | IS | | ANAP | USER |
| Shutter Right Vertical Edge | 0018,1604 | IS | | ANAP | USER |
| Shutter Upper Horizontal Edge | 0018,1606 | IS | | ANAP | USER |
| Shutter Lower Horizontal Edge | 0018,1608 | IS | | ANAP | USER |

Table 122: Grayscale Softcopy Presentation State Storage SOP Class - SOP Common Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------|-----------|----|------------------------------|-------------------|--------|
| Specific Character Set | 0008,0005 | CS | ISO_IR 100 | ANAP | AUTO |
| SOP Class UID | 0008,0016 | UI | 1.2.840.10008.5.1.4.1.1.11.1 | ALWAYS | AUTO |
| SOP Instance UID | 0008,0018 | UI | | ALWAYS | AUTO |

Table 123: Grayscale Softcopy Presentation State Storage SOP Class - Softcopy VOI LUT Module (C)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---------------------------|-----------|----|-------|-------------------|--------|
| Softcopy VOI LUT Sequence | 0028,3110 | SQ | | ALWAYS | SPEC |
| > Window Center | 0028,1050 | DS | | ANAP | SPEC |
| > Window Width | 0028,1051 | DS | | ANAP | SPEC |

Table 124: Softcopy PS Storage SOP Class – Softcopy Presentation LUT Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------|-----------|----|---------|-------------------|--------|
| Presentation LUT Shape | 2050,0020 | CS | INVERSE | ANAP | AUTO |

Table 125: Grayscale Softcopy Presentation State Storage SOP Class - Displayed Area Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|-----------|----|---|-------------------|--------|
| Displayed Area Selection Sequence | 0070,005A | SQ | | ALWAYS | AUTO |
| > Displayed Area Top Left Hand Corner | 0070,0052 | SL | 1, 1 | ALWAYS | AUTO |
| > Displayed Area Bottom Right Hand Corner | 0070,0053 | SL | 1024, 1024 | ALWAYS | AUTO |
| > Presentation Size Mode | 0070,0100 | CS | SCALE TO FIT | ALWAYS | AUTO |
| > Presentation Pixel Spacing | 0070,0101 | DS | Required if Presentation Size Mode (0070,0100) is TRUE SIZE. May be present if Presentation Size Mode (0070,0100) is SCALE TO FIT or MAGNIFY. | ANAP | AUTO |
| Presentation Pixel Aspect Ratio | 0070,0102 | IS | | ANAP | AUTO |

Table 126: Grayscale Softcopy Presentation State Storage SOP Class - Presentation State Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--------------------------------|-----------|----|------------------------------------|-------------------|--------|
| Referenced Series Sequence | 0008,1115 | SQ | | ALWAYS | AUTO |
| > Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO |
| > Referenced Image Sequence | 0008,1140 | SQ | | ALWAYS | AUTO |
| >> Referenced SOP Class UID | 0008,1150 | UI | 1.2.840.10008.5.1.4.1.1.12.2 | ALWAYS | AUTO |
| >> Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO |
| Instance Number | 0020,0013 | IS | | ALWAYS | AUTO |
| Presentation Label | 0070,0080 | CS | "AS LAST SEEN", "NEW AT IMPORT" | ALWAYS | AUTO |
| Presentation Description | 0070,0081 | LO | | VNAP | AUTO |
| Presentation Creation Date | 0070,0082 | DA | Current Date | ALWAYS | AUTO |
| Presentation Creation Time | 0070,0083 | TM | Current Time | ALWAYS | AUTO |
| Presentation Creator's Name | 0070,0084 | PN | | VNAP | AUTO |

Table 127: Grayscale Softcopy Presentation State Storage SOP Class - Presentation Series Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------|-----------|----|-------------------------|-------------------|--------|
| Modality | 0008,0060 | CS | PR = Presentation State | ALWAYS | AUTO |

Table 128: Grayscale Softcopy Presentation State Storage SOP Class - Graphic Layer Module (C)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|-----------|----|--------------------|-------------------|--------|
| Graphic Layer Sequence | 0070,0060 | SQ | | ANAP | AUTO |
| > Graphic Layer | 0070,0002 | CS | VFGFX | ANAP | AUTO |
| > Graphic Layer Order | 0070,0062 | IS | | ANAP | AUTO |
| > Graphic Layer Recommended Display RGB Value | 0070,0067 | US | FFFF, FFFF, FFFF | ANAP | AUTO |
| > Graphic Layer Description | 0070,0068 | LO | ViewForum Graphics | ANAP | AUTO |

Table 129: Grayscale Softcopy Presentation State Storage SOP Class - Graphic Annotation Module (C)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|-----------|----|----------------------------------|-------------------|--------|
| Graphic Annotation Sequence | 0070,0001 | SQ | | ANAP | AUTO |
| > Graphic Layer | 0070,0002 | CS | Layer created on import VFGFX | ANAP | USER |
| >Text Object Sequence | 0070,0008 | SQ | | ANAP | USER |
| >> Bounding Box Annotation Units | 0070,0003 | CS | PIXEL | ALWAYS | USER |
| >> Anchor Point Annotation Units | 0070,0004 | CS | PIXEL | ALWAYS | USER |
| >> Unformatted Text Value | 0070,0006 | ST | | ANAP | USER |
| >> Bounding Box Top Left Hand Corner | 0070,0010 | FL | | ALWAYS | USER |
| >> Bounding Box Bottom Right Hand Corner | 0070,0011 | FL | | ALWAYS | USER |
| >> Bounding Box Text Horizontal Justification | 0070,0012 | CS | CENTER, LEFT, RIGHT | ALWAYS | USER |

| | | | | | |
|------------------------------|-----------|----|--|--------|------|
| >> Anchor Point | 0070,0014 | FL | | ALWAYS | USER |
| >> Anchor Point Visibility | 0070,0015 | CS | N, Y | ALWAYS | USER |
| > Graphic Object Sequence | 0070,0009 | SQ | | ANAP | USER |
| >> Graphic Annotation Units | 0070,0005 | CS | PIXEL | ALWAYS | USER |
| >> Graphic Dimensions | 0070,0020 | US | | ALWAYS | USER |
| >> Number of Graphics Points | 0070,0021 | US | | ALWAYS | USER |
| >> Graphic Data | 0070,0022 | FL | | ALWAYS | USER |
| >> Graphic Type | 0070,0023 | CS | CIRCLE, ELLIPSE, INTERPOLATED, POINT, POLYLINE | ALWAYS | USER |
| >> Graphic Filled | 0070,0024 | CS | N, Y | ANAP | USER |

8.1.1.4 Grayscale Softcopy Presentation State (AS ACQUIRED) for Processed Mode

This section specifies each IOD created by the **MD ELEVA** for the **Processed Mode**.

If private Presentation State information exists, in RAW mode, then the ELEVA DICOM AE will be send the Presentation State object with the Presentation Label " **AS ACQUIRED**".

Table 130: Modules of the Grayscale Softcopy Presentation State Storage SOP Class

| Information Entity | Module Name | Reference | Presence of Module |
|--------------------|----------------------------------|-----------|--------------------|
| Patient | Patient Module | Table 131 | ALWAYS |
| Study | General Study Module | Table 132 | ALWAYS |
| Series | General Series Module | Table 133 | ALWAYS |
| | Presentation Series Module | Table 140 | ALWAYS |
| Equipment | General Equipment Module | Table 134 | ALWAYS |
| | | | |
| Presentation State | Display shutter module | Table 135 | ALWAYS |
| | Displayed Area Module | Table 139 | ALWAYS |
| | Softcopy Presentation LUT Module | Table 138 | ALWAYS |
| | Softcopy VOI LUT Module | Table 137 | ALWAYS |
| | Presentation State Module | Table 141 | ALWAYS |
| | SOP Common Module | Table 136 | ALWAYS |

Table 131: Softcopy PS Storage SOP Class – C-STORE-RQ - Patient Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------|-----------|----|---------------------------|-------------------|--------|
| Patient's Name | 0010,0010 | PN | | ALWAYS | SPEC |
| Patient ID | 0010,0020 | LO | | VNAP | SPEC |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | SPEC |
| Patient's Sex | 0010,0040 | CS | Applied Value(s): F, M, O | VNAP | SPEC |

Table 132: Softcopy PS Storage SOP Class – C-STORE-RQ - General Study Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|----------------------------|-----------|----|--|-------------------|--------|
| Study Date | 0008,0020 | DA | Date on which this presentation was created. | ALWAYS | SPEC |
| Study Time | 0008,0030 | TM | Time on which this presentation was created. | ALWAYS | SPEC |
| Accession Number | 0008,0050 | SH | | VNAP | SPEC |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | SPEC |
| Study Description | 0008,1030 | LO | | ANAP | SPEC |

| | | | | | |
|--------------------|-----------|----|--|--------|------|
| Study ID | 0020,0010 | SH | | VNAP | SPEC |
| Study Instance UID | 0020,000D | UI | | ALWAYS | SPEC |

Table 133: Softcopy PS Storage SOP Class – C-STORE-RQ - General Series Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--|-----------|----|-------------------------|-------------------|--------|
| Series Date | 0008,0021 | DA | Date the Series started | VNAP | SPEC |
| Series Time | 0008,0031 | TM | Time the Series started | VNAP | SPEC |
| Protocol Name | 0008,1030 | LO | | ANAP | AUTO |
| Performing Physician's Name | 0008,1050 | PN | | VNAP | USER |
| Referenced Performed Procedure Step_Sequence | 0008,1111 | SQ | | ANAP | AUTO |
| >Referenced SOP Class UID | 0008,1150 | UI | | ALWAYS | AUTO |
| >Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO |
| Series Number | 0020,0011 | IS | | VNAP | SPEC |
| Performed Procedure Step Start Date | 0040,0244 | DT | | ANAP | AUTO |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | AUTO |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | AUTO |
| Performed Procedure Step Description | 0040,0254 | LO | | ANAP | SPEC |
| Request Attributes Sequence | 0040,0275 | SQ | | ANAP | AUTO |
| >Requested Procedure ID | 0040,1001 | SH | | MAYBE | AUTO |
| >Scheduled Procedure Step ID | 0040,0009 | SH | | MAYBE | AUTO |
| >Scheduled Procedure Step Description | 0040,0007 | LO | | ANAP | AUTO |

Table 134: Softcopy PS Storage SOP Class – C-STORE-RQ - General Equipment Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---------------------------|-----------|----|--|-------------------|--------|
| Manufacturer | 0008,0070 | LO | Philips Medical Systems | ALWAYS | AUTO |
| Institution Name | 0008,0080 | LO | | ALWAYS | USER |
| Station Name | 0008,1010 | SH | Eleva | ALWAYS | AUTO |
| Manufacturer's Model Name | 0008,1090 | LO | ViewForum | ALWAYS | AUTO |
| Device Serial Number | 0018,1000 | LO | DSI R6.1.1 | ALWAYS | AUTO |
| Software Versions | 0018,1020 | LO | ViewForum 3.2 PMS1.1 MIMIT EVIIMDictionary PMS1.1MIMITPIIMDICTIONARY PMS1.1 MIMIT EVIIMDictionary | ALWAYS | AUTO |

Table 135: Grayscale Softcopy Presentation State Storage SOP Class - Shutter Module(M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|-------------------------------|-----------|----|-------------|-------------------|--------|
| Shutter Shape | 0018,1600 | CS | RECTANGULAR | ALWAYS | AUTO |
| Shutter Left Vertical Edge | 0018,1602 | IS | | ALWAYS | AUTO |
| Shutter Right Vertical Edge | 0018,1604 | IS | | ALWAYS | AUTO |
| Shutter Upper Horizontal Edge | 0018,1606 | IS | | ALWAYS | AUTO |
| Shutter Lower Horizontal Edge | 0018,1608 | IS | | ALWAYS | AUTO |

Table 136: Softcopy PS Storage SOP Class – C-STORE-RQ - SOP Common Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------|-----------|----|------------------------------|-------------------|--------|
| Specific Character Set | 0008,0005 | CS | ISO_IR 100 | ANAP | CONF |
| SOP Class UID | 0008,0016 | UI | 1.2.840.10008.5.1.4.1.1.11.1 | ALWAYS | AUTO |
| SOP Instance UID | 0008,0018 | UI | | ALWAYS | AUTO |

Table 137: Softcopy PS Storage SOP Class – C-STORE-RQ - VOI LUT Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--------------------------------|-----------|----|-----------------------|-------------------|--------|
| Softcopy VOI LUT Sequence | 0028,3110 | SQ | | ALWAYS | AUTO |
| > Referenced Image Sequence | 0008,1140 | SQ | | ALWAYS | AUTO |
| >> References SOP Class UID | 0008,1150 | UI | 1.3.46.670589.2.3.1.1 | ALWAYS | AUTO |
| >> References SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO |
| > Window Center | 0028,1050 | DS | | ALWAYS | AUTO |
| > Window Width | 0028,1051 | DS | | ALWAYS | AUTO |

Table 138: Softcopy PS Storage SOP Class – C-STORE-RQ - Softcopy Presentation LUT Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|------------------------|-----------|----|--------------------|-------------------|--------|
| Presentation LUT Shape | 2050,0020 | CS | IDENTITY , INVERSE | ANAP | AUTO |

Table 139: Softcopy PS Storage SOP Class – C-STORE-RQ - Displayed Area Module (M)

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|-----------|----|--|-------------------|--------|
| Displayed Area Selection Sequence | 0070,005A | SQ | | ALWAYS | AUTO |
| > Displayed Area Top Left Hand Corner | 0070,0052 | SL | 1, 1 | ALWAYS | AUTO |
| > Displayed Area Bottom Right Hand Corner | 0070,0053 | SL | 1024, 1024 | ALWAYS | AUTO |
| > Presentation Size Mode | 0070,0100 | CS | Applied Value(s): MAGNIFY, SCALE TO FIT, TRUE SIZE | ALWAYS | AUTO |
| > Presentation Pixel Spacing | 0070,0101 | DS | | ANAPC | AUTO |
| > Presentation Pixel Aspect Ratio | 0070,0102 | IS | 1, 1 | ANAPC | AUTO |

Table 140: Softcopy PS Storage SOP Class – C-STORE-RQ - Presentation Series Module (M)

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

**Table 141: Softcopy PS Storage SOP Class – C-STORE-RQ -
Presentation State Module (M)**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|--------------------------------|-----------|----|--|-------------------|--------|
| Referenced Series Sequence | 0008,1115 | SQ | | ALWAYS | AUTO |
| > Referenced Image Sequence | 0008,1140 | SQ | | ALWAYS | AUTO |
| >> Referenced SOP Class UID | 0008,1150 | UI | 1.3.46.670589.2.3.1.1, 1.2.840.10008.5.1.4.1.1.12.2 | ALWAYS | AUTO |
| >> Referenced SOP Instance UID | 0008,1155 | UI | | ALWAYS | AUTO |
| > Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO |
| Instance Number | 0020,0013 | IS | | ALWAYS | AUTO |
| Content Label | 0070,0080 | CS | "AS ACQUIRED" | ALWAYS | USER |
| Content Description | 0070,0081 | LO | | VNAP | AUTO |
| Presentation Creation Date | 0070,0082 | DT | Date on which this presentation was created. | ALWAYS | AUTO |
| Presentation Creation Time | 0070,0083 | TM | Time on which this presentation was created. | ALWAYS | AUTO |
| Content Creator's Name | 0070,0084 | PN | | VNAP | AUTO |

8.1.2 SOP Instances in Captured Image(s).

On the MultiDiagnost Eleva with Flat Detector it is possible to make Snap Shots from image(s) and exports these Captured Image(s) as Photo or as Original image data.

8.1.2.1 Captured Image as Photo(s).

| Information Entity | Module Name | Usage |
|--------------------|---------------------------|--------|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Series | General Series Module | ALWAYS |
| Equipment | General Equipment Module | ALWAYS |
| | SC Image Equipment Module | ALWAYS |
| Image | General Image Module | ALWAYS |
| | Image Pixel Module | ALWAYS |
| | SOP Common Module | ALWAYS |

| Name | Tag | VR | Presence of Value | Source | Comment |
|-------------------------------------|-----------|----|-------------------|--------|--|
| Patient Module (M) | | | | | |
| Patient's Name | 0010,0010 | PN | ALWAYS | COPY | - |
| Patient ID | 0010,0020 | LO | VNAP | COPY | - |
| Patient's Birth Date | 0010,0030 | DA | VNAP | COPY | - |
| Patient's Sex | 0010,0040 | CS | VNAP | COPY | - |
| General Study Module (M) | | | | | |
| Study Date | 0008,0020 | DA | VNAP | COPY | Date on which this Study was created. |
| Study Time | 0008,0030 | TM | VNAP | COPY | Time on which this Study was created. |
| Accession Number | 0008,0050 | SH | VNAP | COPY | - |
| Referring Physician's Name | 0008,0090 | PN | VNAP | COPY | - |
| Study Description | 0008,1030 | LO | ALWAYS | USER | - |
| Study Instance UID | 0020,000D | UI | ALWAYS | COPY | - |
| Study ID | 0020,0010 | SH | ALWAYS | AUTO | ReviewFolder |
| General Series Module (M) | | | | | |
| Series Date | 0008,0021 | DA | ALWAYS | AUTO | - |
| Series Time | 0008,0031 | TM | ALWAYS | AUTO | - |
| Protocol Name | 0018,1030 | LO | ALWAYS | USER | - |
| Series Instance UID | 0020,000E | UI | ALWAYS | AUTO | - |
| Series Number | 0020,0011 | IS | ALWAYS | AUTO | - |
| Performed Procedure Step Start Date | 0040,0244 | DA | ALWAYS | COPY | - |
| Performed Procedure Step Start Time | 0040,0245 | TM | ALWAYS | COPY | - |
| General Equipment Module (M) | | | | | |
| Manufacturer | 0008,0070 | LO | ALWAYS | COPY | Philips Medical Systems |
| Institution Name | 0008,0080 | LO | ANAP | COPY | - |
| Manufacturer's Model Name | 0008,1090 | LO | ALWAYS | AUTO | ViewForum |
| Software Version(s) | 0018,1020 | LO | ALWAYS | AUTO | ViewForum 4.2 PMS1.1 MIMIT EVIIMDictionary |

| Name | Tag | VR | Presence of Value | Source | Comment |
|-------------------------------|-----------|----|-------------------|--------|--------------------------------------|
| SC Image Equipment Module (M) | | | | | |
| Modality | 0008,0060 | CS | ALWAYS | AUTO | OT |
| Conversion Type | 0008,0064 | CS | ALWAYS | AUTO | WSD |
| General Image Module (M) | | | | | |
| Image Type | 0008,0008 | CS | ALWAYS | AUTO | DERIVED, SECONDARY |
| Acquisition Date | 0008,0022 | DA | ALWAYS | AUTO | - |
| Content Date | 0008,0023 | DA | ALWAYS | AUTO | - |
| Acquisition Time | 0008,0032 | TM | ALWAYS | AUTO | - |
| Content Time | 0008,0033 | TM | ALWAYS | AUTO | - |
| Image Pixel Module (M) | | | | | |
| Samples per Pixel | 0028,0002 | US | ALWAYS | AUTO | 3 |
| Photometric Interpretation | 0028,0004 | CS | ALWAYS | AUTO | RGB |
| Planar Configuration | 0028,0006 | US | ALWAYS | AUTO | 0 |
| Rows | 0028,0010 | US | ALWAYS | AUTO | 1024 |
| Columns | 0028,0011 | US | ALWAYS | AUTO | 1024 |
| Bits Allocated | 0028,0100 | US | ALWAYS | AUTO | 8 |
| Bits Stored | 0028,0101 | US | ALWAYS | AUTO | 8 |
| High Bit | 0028,0102 | US | ALWAYS | AUTO | 7 |
| Pixel Representation | 0028,0103 | US | ALWAYS | AUTO | 0 |
| Pixel Data | 7FE0,0010 | OW | ALWAYS | AUTO | - |
| SOP Common Module (M) | | | | | |
| Specific Character Set | 0008,0005 | CS | ALWAYS | COPY | - |
| SOP Class UID | 0008,0016 | UI | ALWAYS | AUTO | 1.2.840.10008.5.1.4.1.1.7 (SC Image) |
| SOP Instance UID | 0008,0018 | UI | ALWAYS | AUTO | - |

8.1.2.2 Captured Image(s) as Original.

The Captured Images contains the following Modules:

| Information Entity | Module Name | Usage |
|--------------------|--------------------------|--------|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Series | General Series Module | ALWAYS |
| Equipment | General Equipment Module | ALWAYS |
| | Multi-Frame Module | ALWAYS |
| Image | General Image Module | ALWAYS |
| | Image Pixel Module | ALWAYS |
| | X-ray Image Module | ALWAYS |
| | X-ray Acquisition Module | ALWAYS |
| | SOP Common Module | ALWAYS |

| Name | Tag | VR | Presence of Value | Source | Comment |
|---------------------------------------|-----------|----|-------------------|--------|--|
| Patient Module (M) | | | | | |
| Patient's Name | 0010,0010 | PN | ALWAYS | COPY | - |
| Patient ID | 0010,0020 | LO | VNAP | COPY | - |
| Patient's Birth Date | 0010,0030 | DA | VNAP | COPY | - |
| Patient's Sex | 0010,0040 | CS | VNAP | COPY | - |
| General Study Module (M) | | | | | |
| Study Date | 0008,0020 | DA | VNAP | COPY | Date on which this Study was created. |
| Study Time | 0008,0030 | TM | VNAP | COPY | Time on which this Study was created. |
| Accession Number | 0008,0050 | SH | VNAP | COPY | - |
| Referring Physician's Name | 0008,0090 | PN | VNAP | COPY | - |
| Study Description | 0008,1030 | LO | ALWAYS | USER | - |
| Study Instance UID | 0020,000D | UI | ALWAYS | COPY | - |
| Study ID | 0020,0010 | SH | VNAP | COPY | ReviewFolder |
| General Series Module (M) | | | | | |
| Series Date | 0008,0021 | DA | ANAP | AUTO | - |
| Series Time | 0008,0031 | TM | ANAP | AUTO | - |
| Protocol Name | 0018,1030 | LO | ALWAYS | USER | - |
| Series Instance UID | 0020,000E | UI | ALWAYS | AUTO | - |
| Series Number | 0020,0011 | IS | VNAP | AUTO | - |
| Performed Procedure Step Start Date | 0040,0244 | DA | ANAP | COPY | - |
| Performed Procedure Step Start Time | 0040,0245 | TM | ANAP | COPY | - |
| General Equipment Module (M) | | | | | |
| Manufacturer | 0008,0070 | LO | ALWAYS | COPY | Philips Medical Systems |
| Institution Name | 0008,0080 | LO | VNAP | COPY | - |
| Manufacturer's Model Name | 0008,1090 | LO | ALWAYS | AUTO | ViewForum |
| Software Version(s) | 0018,1020 | LO | ALWAYS | AUTO | ViewForum 4.2 PMS1.1 MIMIT EVIIMDictionary |
| Multi-Frame Module (M) | | | | | |
| Number of Frames | 0028,0008 | IS | ALWAYS | AUTO | - |
| Frame Increment Pointer | 0028,0009 | AT | ALWAYS | AUTO | - |

| Name | Tag | VR | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------------------|--------|--|
| General Image Module (M) | | | | | |
| Acquisition Date | 0008,0022 | DA | ALWAYS | AUTO | - |
| Content Date | 0008,0023 | DA | ALWAYS | AUTO | - |
| Acquisition Time | 0008,0032 | TM | ALWAYS | AUTO | - |
| Content Time | 0008,0033 | TM | ALWAYS | AUTO | - |
| Instance Number | 0020,0013 | IS | ALWAYS | AUTO | - |
| Image Pixel Module (M) | | | | | |
| Rows | 0028,0010 | US | ALWAYS | AUTO | 1024 |
| Columns | 0028,0011 | US | ALWAYS | AUTO | 1024 |
| Pixel Data | 7FE0,0010 | OW | ALWAYS | AUTO | - |
| X-ray Image Module (M) | | | | | |
| Image Type | 0008,0008 | CS | ALWAYS | AUTO | ORIGINAL PRIMARY SINGLE PLANE |
| Samples per Pixel | 0028,0002 | US | ALWAYS | AUTO | 1 |
| Photometric Interpretation | 0028,0004 | CS | ALWAYS | AUTO | MONOCHROME2 |
| Bits Allocated | 0028,0100 | US | ALWAYS | AUTO | 16 |
| Bits Stored | 0028,0101 | US | ALWAYS | AUTO | 12 |
| High Bit | 0028,0102 | US | ALWAYS | AUTO | 11 |
| Pixel Representation | 0028,0103 | US | ALWAYS | AUTO | 0 |
| Pixel Intensity Relationship | 0028,1040 | CS | ALWAYS | AUTO | DISP |
| X-ray Acquisition Module (M) | | | | | |
| Radiation Setting | 0018,1155 | CS | ALWAYS | AUTO | GR |
| SOP Common Module (M) | | | | | |
| Specific Character Set | 0008,0005 | CS | ALWAYS | COPY | - |
| SOP Class UID | 0008,0016 | UI | ALWAYS | AUTO | 1.2.840.10008.5.1 4.1.1.12.1 (XRF Image) |
| SOP Instance UID | 0008,0018 | UI | ALWAYS | AUTO | - |

8.1.3 Attribute Mapping

The following table shows the relation between BWLM and MPPS and image Storage attributes.

Table 142: Attribute Mapping during Modality Workflow

| Name | BWLM Tag | MPPS | | Image IOD Tag |
|--------------------------------------|-----------|------------|-----------|---------------|
| | | Create Tag | Set Tag | |
| Specific Character Set | 0008,0005 | - | - | 0008,0005 |
| Accession Number | 0008,0050 | 0008,0050 | - | 0008,0050 |
| Modality | 0008,0060 | 0008,0060 | - | 0008,0060 |
| Referring Physician's Name | 0008,0090 | - | - | 0008,0090 |
| Operators' Name | - | - | 0008,1070 | 0008,1070 |
| Referenced Study Sequence | 0008,1110 | 0008,1110 | - | 0008,1110 |
| Referenced Image Sequence | 0008,1150 | 0008,1140 | 0008,1140 | 0008,1140 |
| > Referenced SOP Class UID | - | 0008,1150 | 0008,1150 | 0008,1150 |
| SOP Class UID | - | - | - | - |
| > Referenced SOP Instance UID | - | 0008,1155 | 0008,1155 | 0008,1155 |
| SOP Instance UID | - | - | - | - |
| Patient's Name | 0010,0010 | 0010,0010 | - | 0010,0010 |
| Patient ID | 0010,0020 | 0010,0020 | - | 0010,0020 |
| 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 |
| Patient's Size | 0010,1020 | - | - | 0010,1020 |
| Patient's Weight | 0010,1030 | - | - | 0010,1030 |
| Patient's Telephone Numbers | 0010,2154 | - | - | 0010,2154 |
| 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 |
| Patient Comments | 0010,4000 | - | - | 0010,4000 |
| KVP | - | - | 0018,0060 | 0018,0060 |
| Protocol Name | - | - | 0018,1030 | 0018,1030 |
| Image Area Dose Product | - | - | 0018,115E | 0018,115E |
| Study Instance UID | 0020,000D | 0020,000D | - | 0020,000D |
| Series Instance UID | - | - | 0020,000E | 0020,000E |
| Study ID | - | 0020,0010 | - | 0020,0010 |
| Requested Procedure Description | 0032,1060 | 0032,1060 | - | - |
| Scheduled Procedure Step Description | 0040,0007 | 0040,0007 | - | 0040,0007 |
| Performed Procedure Step Description | - | 0040,0254 | 0040,0254 | 0040,0254 |
| Scheduled Protocol Code Sequence | 0040,0008 | 0040,0008 | - | 0040,0008 |
| Performed Protocol Code Sequence | - | 0040,0260 | 0040,0260 | 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 |
| Performed Procedure Step ID | - | 0040,0253 | - | 0040,0253 |
| Requested Procedure ID | 0040,1001 | 0040,1001 | - | 0040,1001 |

8.1.4 Coerced / Modified fields

In general, MultiDiagnost Eleva with Flat Detector will try and optimize the imported image data. This may involve the removal of redundant data, either or not due to the creation of a Grayscale Softcopy Presentation State object for the image data. This may also involve the creation of extra attributes. As it is not the intention of MultiDiagnost Eleva with Flat Detector to export this data as such, the SOP Instance UID shall not be changed.

If not available at import then MultiDiagnost Eleva with Flat Detector will create the additional attributes as listed in the Table below.

Table 143: Additional Attributes for Import Images

| Name | Tag | Generated Value |
|--------------------------------------|-----------|--|
| Performed Procedure Step Start Date | 0040,0244 | Copied from (0008,0020) Study Date. |
| Performed Procedure Step Start Time | 0040,0245 | Copied from (0008,0030) Study Time. |
| Performed Procedure Step ID | 0040,0253 | Copied from (0020,0010) Study ID. |
| Performed Procedure Step Description | 0040,0254 | Copied from (0008,1030) Study Description. |

If the SCU does not propose a Presentation Context for the Grayscale Softcopy Presentation State storage SOP class, then MultiDiagnost Eleva with Flat Detector will derive Grayscale Softcopy Presentation State data from the imported image data and store this data in a new series within the examination of the imported image.

However, if during import the image is accompanied by Grayscale Softcopy Presentation State data, the MultiDiagnost Eleva with Flat Detector database shall avoid data overlap by only storing the relevant data from the first object received; either the first image or its Presentation State!

Thus it will omit data received by succeng objects concerning the optional attributes (VT=3) listed in Table 144, and clear all mandatory attributes (VT=2) listed in Table 145.

Table 144: Omitted Attributes for Import Images

| Attribute Name | Tag | VR | Comment |
|--|-----------|----|---------|
| Patient Module | | | |
| Referenced Patient Sequence | 0008,1120 | SQ | |
| Patient's Birth Time | 0010,0032 | TM | |
| Other Patient's Id's | 0010,1000 | LO | |
| Other Patient's Names | 0010,1001 | PN | |
| Ethnic Group | 0010,2160 | SH | |
| Patient Comments | 0010,4000 | LT | |
| General Study Module | | | |
| Referring Physician Identification Sequence | 0008,0096 | SQ | |
| Study Description | 0008,1030 | LO | |
| Procedure Code Sequence | 0008,1032 | SQ | |
| Physician(s) of Record | 0008,1048 | PN | |
| Physician(s) of Record Identification Sequence | 0008,1049 | SQ | |

| Attribute Name | Tag | VR | Comment |
|--|-----------|-------|---------|
| Name of Physician(s) Reading Study | 0008,1060 | PN | |
| Physician(s) Reading Study Identification Sequence | 0008,1062 | SQ | |
| Referenced Study Sequence | 0008,1110 | SQ | |
| Patient Study Module | | | |
| Admitting Diagnoses Description | 0008,1080 | LO | |
| Admitting Diagnoses Code Sequence | 0008,1084 | SQ | |
| Patient's Age | 0010,1010 | AS | |
| Patient's Size | 0010,1020 | DS | |
| Patient's Weight | 0010,1030 | DS | |
| Occupation | 0010,2180 | SH | |
| Additional Patient's History | 0010,21B0 | LT | |
| Clinical Trial Study Module | | | |
| Clinical Trial Time Point Description | 0012,0051 | ST | |
| General Series Module | | | |
| Series Date | 0008,0021 | DA | |
| Series Time | 0008,0031 | TM | |
| Series Description | 0008,103E | LO | |
| Performing Physicians' Name | 0008,1050 | PN | |
| Performing Physician Identification Sequence | 0008,1052 | SQ | |
| Operators' Name | 0008,1070 | PN | |
| Operators Identification Sequence | 0008,1072 | SQ | |
| Referenced Performed Procedure Step Sequence | 0008,1111 | SQ | |
| Body Part Examined | 0018,0015 | CS | |
| Protocol Name | 0018,1030 | LO | |
| Smallest Pixel Value in Series | 0028.0108 | US/SS | |
| Largest Pixel Value in Series | 0028.0109 | US/SS | |
| Performed Procedure Step Start Date | 0040,0244 | DA | |
| Performed Procedure Step Start Time | 0040,0245 | TM | |
| Performed Procedure Step ID | 0040,0253 | SH | |
| Performed Procedure Step Description | 0040,0254 | LO | |
| Performed Protocol Code Sequence | 0040,0260 | SQ | |
| Request Attributes Sequence | 0040,0275 | SQ | |
| Comments on the Performed Procedure Step | 0040,0280 | ST | |
| General Equipment Module | | | |
| Institution Name | 0008,0080 | LO | |
| Institution Address | 0008,0081 | SH | |
| Station Name | 0008,1010 | SH | |
| Institutional Department Name | 0008,1040 | LO | |
| Manufacturer's Model Name | 0008,1090 | LO | |
| Device Serial Number | 0018,1000 | LO | |
| Software Versions | 0018,1020 | LO | |
| Spatial Resolution | 0018,1050 | DS | |
| Date of Last Calibration | 0018,1200 | DA | |
| Time of Last Calibration | 0018,1201 | TM | |
| Pixel Padding Value | 0028,0120 | US/SS | |
| Display Shutter Module | | | |
| Shutter Presentation Value | 0018,1622 | US | |
| Overlay Plane Module | | | |
| Overlay Description | 60xx,0022 | LO | |
| Overlay Subtype | 60xx,0045 | LO | |
| ROI Area | 60xx,1301 | IS | |
| ROI Mean | 60xx,1302 | DS | |
| ROI Standard Deviation | 60xx,1303 | DS | |

| Attribute Name | Tag | VR | Comment |
|--|-----------|----|---------|
| Overlay Label | 60xx,1500 | LO | |
| SOP Common Module | | | |
| Instance Creation Date | 0008,0012 | DA | |
| Instance Creation Time | 0008,0013 | TM | |
| Instance Creator UID | 0008,0014 | UI | |
| Coding Scheme Identification Sequence | 0008,0110 | SQ | |
| Timezone Offset From UTC | 0008,0201 | SH | |
| Contributing Equipment Sequence | 0018,A001 | SQ | |
| Instance Number | 0020,0013 | IS | |
| SOP Instance Status | 0100,0410 | CS | |
| SOP Authorization Date and Time | 0100,0420 | DT | |
| SOP Authorization Comment | 0100,0424 | LT | |
| Authorization Equipment Certification Number | 0100,0426 | LO | |
| MAC Parameters Sequence | 4FFE,0001 | SQ | |
| Digital Signatures Sequence | FFFA,FFFA | SQ | |

Table 145: Cleared Attributes for Import Images

| Attribute Name | Tag | VR | Comment |
|---|-----------|----|---------|
| Patient Module | | | |
| Patient's Name | 0010,0010 | PN | |
| Patient ID | 0010,0020 | LO | |
| Patient's Birth Date | 0010,0030 | DA | |
| Patient's Sex | 0010,0040 | CS | |
| Clinical Trial Subject Module | | | |
| Clinical Trial Protocol Name | 0012,0021 | LO | |
| Clinical Trial Site ID | 0012,0030 | LO | |
| Clinical Trial Site Name | 0012,0031 | LO | |
| General Study Module | | | |
| Study Date | 0008,0020 | DA | |
| Study Time | 0008,0030 | TM | |
| Accession Number | 0008,0050 | SH | |
| Referring Physician's Name | 0008,0090 | PN | |
| Study ID | 0020,0010 | SH | |
| Clinical Trial Study Module | | | |
| Clinical Trial Time Point ID | 0012,0050 | LO | |
| General Series Module | | | |
| Series Number | 0020,0011 | IS | |
| Laterality | 0020,0060 | CS | |
| Clinical Trial Series Module | | | |
| Clinical Trial Coordinating Center Name | 0012,0060 | LO | |
| General Equipment Module | | | |
| Manufacturer | 0008,0070 | LO | |
| Mask Module | | | |
| Recommended Viewing Mode | 0028,1090 | CS | |
| Overlay/Curve Activation Module | | | |
| Curve Activation Layer | 50xx,1001 | CS | |
| Overlay Activation Layer | 60xx,1001 | CS | |

MultiDiagnost Eleva with Flat Detector allows the operator to modify attributes of the stored images; see Table 146.

MultiDiagnost Eleva with Flat Detector does not modify the pixel values of the stored images.

Modified images retain their original Study, Series and Image UID.

Table 146: Modifiable Attributes

| Attribute Name | Tag | VR | Comment |
|--|-----------|----|---------|
| Patient | | | |
| Patient's Name | 0010,0010 | PN | |
| Patient ID | 0010,0020 | LO | |
| Patient's Birth Date | 0010,0030 | DA | |
| Patient's Sex | 0010,0040 | CS | |
| Medical Alerts | 0010,2000 | LO | |
| Contrast Allergies | 0010,2110 | LO | |
| Patient Comments | 0010,4000 | LT | |
| Study | | | |
| Accession Number | 0008,0050 | SH | |
| Referring Physician's Name | 0008,0090 | PN | |
| Study Description | 0008,1030 | LO | |
| Physician(s) of Record | 0008,1048 | PN | |
| Name of Physician(s) Reading Study | 0008,1060 | PN | |
| Admitting Diagnoses Description | 0008,1080 | LO | |
| Patient's Age | 0010,1010 | AS | |
| Occupation | 0010,2180 | SH | |
| Additional Patient History | 0010,21B0 | LT | |
| Examination | | | |
| Performed Station Name | 0040,0242 | SH | |
| Performed Location | 0040,0243 | SH | |
| Performed Procedure Step Description | 0040,0254 | LO | |
| Performed Procedure Type Description | 0040,0255 | LO | |
| Comments on the Performed Procedure Step | 0040,0280 | ST | |
| Series | | | |
| - | - | | |

8.2 Data Dictionary of Private Attributes

Not applicable.

8.3 Coded Terminology and Templates

Not applicable.

8.4 Grayscale Image consistency

The high-resolution display monitor attached to the product can be calibrated by using the service tool together with a light probe. See the [VFRB] for details on the calibration procedure.

8.5 Standard Extended/Specialized/Private SOPs

The Standard DICOM SOP Classes may be Extended with additional attributes:

Standard attributes of other SOP Classes; the presence of these attributes in exported images can be configured, see section 4.2.1.3.1.3

Retired (from ACR NEMA 1.0 or 2.0) attributes; the presence of these attributes in exported images can be configured, see section 4.2.1.3.1.3

Private attributes; the presence of these attributes in exported images can be configured, see section 4.2.1.3.1.3

The Table 147 list the supported Private SOP Classes. The usage of these SOP Classes are in the MD ELEVA with FLAT DETECTORs domain only.

However instances of these Private SOP Classes may be exported towards a PACS environment and stored in a (central) DICOM archive and should be configured in order to make this possible.

Table 147: Private SOP classes of MULTIDIAGNOST ELEVA with FLAT DETECTOR System

| SOP Class | Description |
|--|------------------------|
| 3D Volume Storage (Private class) | 1.3.46.670589.5.0.1.1 |
| 3D Volume Object Storage (Private class) | 1.3.46.670589.5.0.2.1 |
| Surface Storage (Private class) | 1.3.46.670589.5.0.3.1 |
| CT Synthetic Image (Private class) | 1.3.46.670589.5.0.9 |
| MR Synthetic Image (Private class) | 1.3.46.670589.5.0.10 |
| MR Cardio Storage (Private class) | 1.3.46.670589.5.0.8.1 |
| MR Cardio Analysis Storage (Private class) | 1.3.46.670589.5.0.11.1 |
| Specialized X-ray (Private class) | 1.3.46.670589.2.3.1.1 |
| CX Image (Private class) | 1.3.46.670589.2.4.1.1 |
| CX Synthetic Image (Private class) | 1.3.46.670589.5.0.12 |
| Perfusion (Private class) | 1.3.46.670589.5.0.13 |
| Perfusion Analysis (Private class) | 1.3.46.670589.5.0.14 |

8.6 Private Transfer Syntaxes

None.