

DICOM Conformance Statement

Application Annex:

EmboGuide R1.0

On Interventional Workspot R1.4



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1. Introduction

This DICOM Conformance Statement annex is applicable to the EmboGuide 1.0 Application, later referred to as EmboGuide application. In general the EmboGuide application is the user environment for viewing and analyzing XA images in order to guide the physician during tumor embolization procedures.

1.1. Revision History

The revision history below provides dates and differences among individual document versions.

Table 1: Revision History

| Document Version | Date of Issue | Status | Description |
|------------------|---------------|------------|---|
| 00 | 01-Mar-2016 | Authorized | Initial Version for EmboGuide R1.0 on Interventional Workspot R1.4.x where x is 0 or higher |
| 01 | 17-Nov-2016 | Authorized | Editorial changes |
| 02 | 10-Jan-2017 | Authorized | Updated value for Manufacturer (0008, 0070) from "Philips Medical Systems" to "Philips". |

1.2. Terminology

| | |
|-------|--|
| DICOM | Digital Imaging and Communications in Medicine |
| IOD | Information Object Definition |
| UID | Unique Identifier |
| VR | Value Representation |

2. Data Specifications

2.1. Supported IODs

This section specifies each IOD accepted and / or created by EmboGuide Application.

ACCEPTED The applicable IOD is accepted for storage in the repository of the hosting platform and supported for import EmboGuide Application for viewing and analysis.

CREATED The EmboGuide Application supports generation of derived data by using the applicable IOD and is able to store this data in the repository of the hosting platform.

Table 2: Supported IOD's

| Name | IOD UID | Support | |
|---|------------------------------|----------|---------|
| | | ACCEPTED | CREATED |
| Raw Data Storage SOP Class | 1.2.840.10008.5.1.4.1.1.66 | No | Yes |
| X-Ray Angiographic Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.12.1 | Yes | Yes |
| Multiframe True Color Secondary Capture Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.7.4 | No | Yes |
| Secondary Capture Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.7 | No | Yes |

2.1.1. Acceptance Criteria

This section specifies the acceptance criteria applied by EmboGuide Application to which a dataset should adhere before it can be imported into the application. This can be criteria on the highest level (e.g. data from a certain manufacturer or system model) or certain DICOM attributes mandatory to be present into the dataset holding a specific value. In case one or more Philips private attributes are required, then a list of supported Philips system models will be mentioned.

Table 3: Accepted system models

| Manufacturer | Modality | System Model Name(s) |
|----------------|----------------|----------------------|
| Not applicable | Not applicable | Not applicable |

Table 4: Accepted transfer syntaxes per IOD

| Name | IOD UID | Transfer Syntax | |
|--|------------------------------|---|------------------------|
| | | Name | UID |
| X-Ray Angiographic Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.12.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 |
| | | Explicit VR Big Endian | 1.2.840.10008.1.2.2 |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 |
| | | JPEG 2000 Image Compression | 1.2.840.10008.1.2.4.91 |
| | | JPEG 2000 Image Compression (Lossless Only) | 1.2.840.10008.1.2.4.90 |
| | | JPEG Baseline (Process 1) | 1.2.840.10008.1.2.4.50 |
| | | JPEG Extended (Process 2 & 4) | 1.2.840.10008.1.2.4.51 |
| | | JPEG Lossless, Non-Hierarchical, FOP (Process 14) | 1.2.840.10008.1.2.4.70 |
| | | RLE Lossless | 1.2.840.10008.1.2.5 |

Table 5: Accepted attribute values

| Attribute Name | Attribute Number | Values / Comments |
|----------------|------------------|-------------------|
| Not applicable | Not applicable | Not applicable |

2.1.2. Contents of Created IOD's

This section specifies in detail the attribute contents of created data objects. Attributes are grouped together by its corresponding module as specified by DICOM standard. Philips private attributes are excluded for specification.

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

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

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

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

2.1.2.1. List of created SOP Classes

Table 6: List of created SOP Classes

| SOP Class Name | SOP Class UID |
|---|------------------------------|
| X-Ray Angiographic Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.12.1 |
| Raw Data Storage SOP Class | 1.2.840.10008.5.1.4.1.1.66 |
| Secondary Capture Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.7 |
| Multiframe True Color Secondary Capture Image Storage SOP Class | 1.2.840.10008.5.1.4.1.1.7.4 |

2.1.2.2. X-Ray Angiographic Image Storage SOP Class

Table 7: IOD of Created X-Ray Angiographic Image Storage Instances

| Information Entity | Module | Presence Of Module |
|--------------------|---------------------------------------|--------------------|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Series | General Series Module | ALWAYS |
| Equipment | General Equipment Module | ALWAYS |
| Image | General Image Module | ALWAYS |
| | Image Pixel Module | ALWAYS |
| | Cine Module | ALWAYS |
| | Multi-Frame Module | ALWAYS |
| | Display Shutter Module | ALWAYS |
| | X-Ray Image Module | ALWAYS |
| | X-Ray Acquisition Module | ALWAYS |
| | X-Ray Table Module | ALWAYS |
| | XA Positioner Module | ALWAYS |
| | DX Detector Module | ALWAYS |
| | VOI LUT Module | ALWAYS |
| | SOP Common Module | ALWAYS |
| | Extended DICOM and private attributes | OPTIONAL |

Table 8: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------|-----------|----|-------|-------------------|--------|---------|
| Patient's Name | 0010,0010 | PN | | VNAP | | |

| | | | | | | |
|----------------------|-----------|----|--|------|--|--|
| Patient ID | 0010,0020 | LO | | VNAP | | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | | |
| Patient's Sex | 0010,0040 | CS | | VNAP | | |

Table 9: General Study Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------------|-----------|----|-------|-------------------|--------|---------|
| Study Date | 0008,0020 | DA | | VNAP | | |
| Study Time | 0008,0030 | TM | | VNAP | | |
| Accession Number | 0008,0050 | SH | | VNAP | | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | | |
| Study ID | 0020,0010 | SH | | VNAP | | |

Table 10: General Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-------------------------------------|-----------|----|-------|-------------------|--------|---------|
| Series Date | 0008,0021 | DA | | ANAP | | |
| Series Time | 0008,0031 | TM | | ANAP | | |
| Modality | 0008,0060 | CS | | ALWAYS | | |
| Series Description | 0008,103E | LO | | ANAP | | |
| Performing Physician's Name | 0008,1050 | PN | | ANAP | | |
| Related Series Sequence | 0008,1250 | SQ | | ANAP | | |
| >Study Instance UID | 0020,000D | UI | | ALWAYS | | |
| >Series Instance UID | 0020,000E | UI | | ALWAYS | | |
| >Purpose of Reference Code Sequence | 0040,A170 | SQ | | VNAP | | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | | |
| Series Number | 0020,0011 | IS | | VNAP | | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | | |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | | |

Table 11: General Equipment Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------|-----------|----|-------------------------|-------------------|--------|---|
| Manufacturer | 0008,0070 | LO | Philips | VNAP | | |
| Institution Name | 0008,0080 | LO | | ANAP | | |
| Manufacturer's Model Name | 0008,1090 | LO | Interventional Workspot | ANAP | | |
| Software Versions | 0018,1020 | LO | 1.4.x | ANAP | | where "x" is the detailed application SW version. |

Table 12: General Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-----------------------------|-----------|-------|-------|-------------------|--------|---------|
| Image Type | 0008,0008 | CS | | ANAP | | |
| Acquisition Date | 0008,0022 | DA | | ANAP | | |
| Content Date | 0008,0023 | DA | | VNAP | | |
| Acquisition Time | 0008,0032 | TM | | ANAP | | |
| Content Time | 0008,0033 | TM | | VNAP | | |
| Instance Number | 0020,0013 | IS | | VNAP | | |
| Patient Orientation | 0020,0020 | CS | | ANAP | | |
| Lossy Image Compression | 0028,2110 | CS | | ANAP | | |
| Icon Image Sequence | 0088,0200 | SQ | | ANAP | | |
| >Samples per Pixel | 0028,0002 | US | | ALWAYS | | |
| >Photometric Interpretation | 0028,0004 | CS | | ALWAYS | | |
| >Rows | 0028,0010 | US | | ALWAYS | | |
| >Columns | 0028,0011 | US | | ALWAYS | | |
| >Bits Allocated | 0028,0100 | US | | ALWAYS | | |
| >Bits Stored | 0028,0101 | US | | ALWAYS | | |
| >High Bit | 0028,0102 | US | | ALWAYS | | |
| >Pixel Representation | 0028,0103 | US | | ALWAYS | | |
| >Pixel Data | 7FE0,0010 | OW/OB | | ANAP | | |
| >Image Type | 0008,0008 | CS | | ANAP | | |
| >SOP Class UID | 0008,0016 | UI | | ANAP | | |
| >SOP Instance UID | 0008,0018 | UI | | ANAP | | |
| >Instance Number | 0020,0013 | IS | | ANAP | | |
| >Patient Orientation | 0020,0020 | CS | | ANAP | | |

Table 13: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------------|-----------|-------|-------|-------------------|--------|---------|
| Samples per Pixel | 0028,0002 | US | | ALWAYS | | |
| Photometric Interpretation | 0028,0004 | CS | | ALWAYS | | |
| Rows | 0028,0010 | US | | ALWAYS | | |
| Columns | 0028,0011 | US | | ALWAYS | | |
| Bits Allocated | 0028,0100 | US | | ALWAYS | | |
| Bits Stored | 0028,0101 | US | | ALWAYS | | |
| High Bit | 0028,0102 | US | | ALWAYS | | |
| Pixel Representation | 0028,0103 | US | | ALWAYS | | |
| Pixel Data | 7FE0,0010 | OB/OW | | VNAP | | |

Table 14: Cine Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------|-----------|----|-------|-------------------|--------|---------|
| Cine Rate | 0018,0040 | IS | | ANAP | | |
| Frame Time | 0018,1063 | DS | | ALWAYS | | |

Table 15: Multi-Frame Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------|-----------|----|-------|-------------------|--------|---------|
| Number of Frames | 0028,0008 | IS | | ALWAYS | | |

| | | | | | | |
|-------------------------|-----------|----|--|--------|--|--|
| Frame Increment Pointer | 0028,0009 | AT | | ALWAYS | | |
|-------------------------|-----------|----|--|--------|--|--|

Table 16: Display Shutter Module

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

Table 17: X-Ray Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|--------|---------|
| Image Type | 0008,0008 | CS | | ALWAYS | | |
| Samples per Pixel | 0028,0002 | US | | ALWAYS | | |
| Photometric Interpretation | 0028,0004 | CS | | ALWAYS | | |
| Frame Increment Pointer | 0028,0009 | AT | | ALWAYS | | |
| Bits Allocated | 0028,0100 | US | | ALWAYS | | |
| Bits Stored | 0028,0101 | US | | ALWAYS | | |
| High Bit | 0028,0102 | US | | ALWAYS | | |
| Pixel Representation | 0028,0103 | US | | ALWAYS | | |
| Pixel Intensity Relationship | 0028,1040 | CS | | ALWAYS | | |
| Lossy Image Compression | 0028,2110 | CS | | ALWAYS | | |

Table 18: X-Ray Acquisition Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------|-----------|----|-------|-------------------|--------|---------|
| KVP | 0018,0060 | DS | | VNAP | | |
| Exposure Time | 0018,1150 | IS | | VNAP | | |
| Radiation Setting | 0018,1155 | CS | | ALWAYS | | |
| Imager Pixel Spacing | 0018,1164 | DS | | ANAP | | |
| Pixel Spacing | 0028,0030 | DS | | ALWAYS | | |

Table 19: X-Ray Table Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------|-----------|----|-------|-------------------|--------|---------|
| Table Motion | 0018,1134 | DS | | VNAP | | |
| Table Angle | 0018,1138 | DS | | ANAP | | |

Table 20: XA Positioner Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------------|-----------|----|-------|-------------------|--------|---------|
| Distance Source to Patient | 0018,1111 | DS | | ANAP | | |
| Distance Source to Patient | 0018,1111 | DS | | ANAP | | |
| Positioner Motion | 0018,1500 | CS | | VNAP | | |
| Positioner Primary Angle | 0018,1510 | DS | | VNAP | | |
| Positioner Secondary Angle | 0018,1511 | DS | | VNAP | | |

| | | | | | | |
|--------------------------------------|-----------|----|--|------|--|--|
| Positioner Primary Angle Increment | 0018,1520 | DS | | VNAP | | |
| Positioner Secondary Angle Increment | 0018,1521 | DS | | VNAP | | |

Table 21: DX Detector Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------|-----------|----|-------|-------------------|--------|---------|
| Imager Pixel Spacing | 0018,1164 | DS | | ALWAYS | | |
| Pixel Spacing | 0028,0030 | DS | | ALWAYS | | |

Table 22: VOI LUT Module

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

Table 23: SOP Common Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------|-----------|----|------------------------------|-------------------|--------|---------|
| Instance Creation Date | 0008,0012 | DA | | ANAP | | |
| Instance Creation Time | 0008,0013 | TM | | ANAP | | |
| SOP Class UID | 0008,0016 | UI | 1.2.840.10008.5.1.4.1.1.12.1 | ALWAYS | | |
| SOP Instance UID | 0008,0018 | UI | | ALWAYS | | |
| Instance Number | 0020,0013 | IS | | ANAP | | |

Table 24: Extended DICOM and private attributes for X-Ray Angiographic Image Storage SOP Class

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------------|-----------|----|-------|-------------------|--------|---------|
| Conversion Type | 0008,0064 | CS | WSD | ANAP | AUTO | |
| Table Horizontal Rotation Angle | 0018,9469 | FL | | ANAP | | |
| Table Cradle Tilt Angle | 0018,9471 | FL | | ANAP | | |
| Application Version | 0018,9525 | LO | | ANAP | | |
| Frame Of Reference UID | 0020,0013 | UI | | ANAP | | |
| Position Reference Indicator | 0020,1040 | LO | | ANAP | | |
| Requested Procedure ID | 0040,1001 | SH | | ANAP | | |

2.1.2.3. Raw data Storage SOP class

Table 25: IOD of Created Raw Data Storage SOP Class Instances

| Information Entity | Module | Presence Of Module |
|--------------------|---------------------------|--------------------|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Series | General Series Module | ALWAYS |
| Frame of Reference | Frame of Reference Module | OPTIONAL |
| Equipment | General Equipment Module | ALWAYS |

| | | |
|-------|---------------------------------------|----------|
| Image | Acquisition Context Module | ALWAYS |
| | Raw Data Module | ALWAYS |
| | SOP Common Module | ALWAYS |
| | Extended DICOM and Private Attributes | OPTIONAL |

Table 26 : Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------|-----------|----|-------|-------------------|--------|---------|
| Patient's Name | 0010,0010 | PN | | ALWAYS | AUTO | |
| Patient ID | 0010,0020 | LO | | ALWAYS | AUTO | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | AUTO | |
| Patient's Sex | 0010,0040 | CS | | ALWAYS | AUTO | |

Table 27 : General Study Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------------|-----------|----|-------|-------------------|------------|---------|
| Study Date | 0008,0020 | DA | | ALWAYS | AUTO | |
| Study Time | 0008,0030 | TM | | ALWAYS | AUTO | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | AUTO | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO | |
| Study ID | 0020,0010 | SH | | ALWAYS | AUTO | |
| Accession Number | 0008,0050 | SH | | EMPTY | AUTO, USER | |

Table 28 : General Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-------------------------------------|-----------|----|-------|-------------------|--------|---------|
| Series Date | 0008,0021 | DA | | ANAP | AUTO | |
| Series Time | 0008,0031 | TM | | ANAP | AUTO | |
| Modality | 0008,0060 | CS | | ALWAYS | AUTO | |
| Series Description | 0008,103E | LO | | ANAP | | |
| Performing Physicians' name | 0008,1050 | PN | | ANAP | | |
| Related Series Sequence | 0008,1250 | SQ | | ANAP | | |
| >Study Instance UID | 0020,000D | UI | | ALWAYS | | |
| >Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO | |
| >Purpose of Reference Code Sequence | 0040,A170 | SQ | | VNAP | | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | | |
| Series Number | 0020,0011 | IS | | VNAP | AUTO | |
| Laterality | 0020,0060 | CS | | ANAP | | |
| Performed Procedure Step Start Date | 0040,0244 | DA | | ANAP | | |
| Performed Procedure Step Start Time | 0040,0245 | TM | | ANAP | | |
| Performed Procedure Step ID | 0040,0253 | SH | | ANAP | | |

Table 29: Frame of Reference Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|--------|---------|
| Frame of Reference UID | 0020,0052 | UI | | ALWAYS | AUTO | |
| Position Reference Indicator | 0020,1040 | LO | | VNAP | AUTO | |

Table 30: General Equipment Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------|-----------|----|-------------------------|-------------------|--------|---|
| Manufacturer | 0008,0070 | LO | Philips | VNAP | FIXED | |
| Institution Name | 0008,0080 | LO | | ANAP | USER | |
| Manufacturer's Model Name | 0008,1090 | LO | Interventional Workspot | ANAP | FIXED | |
| Software Versions | 0018,1020 | LO | 1.4.x | ANAP | AUTO | where "x" is the detailed application SW version. |

Table 31: Acquisition Context Module

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

Table 32: Raw Data Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------|-----------|----|-------|-------------------|--------|---------|
| Content Date | 0008,0023 | DA | | ALWAYS | AUTO | |
| Content Time | 0008,0033 | TM | | ALWAYS | AUTO | |
| Creator Version UID | 0008,9123 | UI | | ALWAYS | AUTO | |
| Instance Number | 0020,0013 | IS | | ANAP | AUTO | |

Table 33: SOP Common Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------------|-----------|----|----------------------------|-------------------|--------|---------|
| SOP Class UID | 0008,0016 | UI | 1.2.840.10008.5.1.4.1.1.66 | ALWAYS | AUTO | |
| SOP Instance UID | 0008,0018 | UI | | ALWAYS | AUTO | |
| Original Specialized SOP Class UID | 0008,001B | UI | | VNAP | AUTO | |
| Instance Creation Date | 0008,0012 | DA | | VNAP | AUTO | |
| Instance Creation Time | 0008,0013 | TM | | VNAP | AUTO | |
| Instance Number | 0020,0013 | IS | | VNAP | | |

Table 34: Extended DICOM and private attributes for Raw Data Image Storage SOP class

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------|-----------|----|-------|-------------------|--------|---------|
| Date | 0040,A121 | DA | | VNAP | AUTO | |
| Time | 0040,A122 | TM | | VNAP | AUTO | |

2.1.2.4. Secondary Capture Image Storage SOP class**Table 35: IOD of Created Secondary Capture Image Storage SOP Class Instances**

| Information Entity | Module | Presence Of Module |
|--------------------|---------------------------------------|--------------------|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Series | General Series Module | ALWAYS |
| Equipment | General Equipment Module | CONDITIONAL |
| | SC Equipment Module | ALWAYS |
| Image | General Image Module | ALWAYS |
| | Image Pixel Module | ALWAYS |
| | SOP Common Module | ALWAYS |
| | Extended DICOM and private attributes | CONDITIONAL |

Table 36: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------|-----------|----|-------|-------------------|--------|---------|
| Patient's Name | 0010,0010 | PN | | ALWAYS | AUTO | |
| Patient ID | 0010,0020 | LO | | ALWAYS | AUTO | |
| Patient's Birth Date | 0010,0030 | DA | | ALWAYS | AUTO | |
| Patient's Sex | 0010,0040 | CS | | ALWAYS | AUTO | |

Table 37: General Study Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------------|-----------|----|-------|-------------------|--------|---------|
| Study Date | 0008,0020 | DA | | ALWAYS | AUTO | |
| Study Time | 0008,0030 | TM | | ALWAYS | AUTO | |
| Accession Number | 0008,0050 | SH | | VNAP | | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | AUTO | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO | |
| Study ID | 0020,0010 | SH | | ALWAYS | AUTO | |

Table 38: General Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-------------------------------------|-----------|----|-------|-------------------|--------|---------|
| Series Date | 0008,0021 | DA | | ALWAYS | AUTO | |
| Series Time | 0008,0031 | TM | | ALWAYS | AUTO | |
| Modality | 0008,0060 | CS | | ALWAYS | AUTO | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO | |
| Series Number | 0020,0011 | IS | | VNAP | AUTO | |
| Related Series Sequence | 0008,1250 | SQ | | VNAP | | |
| >Study Instance UID | 0020,000D | UI | | ALWAYS | | |
| >Series Instance UID | 0020,000E | UI | | ALWAYS | | |
| >Purpose of Reference Code Sequence | 0040,A170 | SQ | | EMPTY | | |

Table 39: General Equipment Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------|-----------|----|-------------------------|-------------------|--------|---|
| Manufacturer | 0008,0070 | | Philips | VNAP | | |
| Station Name | 0008,1010 | SH | | ANAP | | |
| Manufacturer's Model Name | 0008,1090 | LO | Interventional Workspot | ALWAYS | FIXED | |
| Software Versions | 0018,1020 | LO | 1.4.x | ALWAYS | FIXED | where "x" is the detailed application SW version. |

Table 40 : SC Equipment Module

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

Table 41: General Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-----------------|-----------|----|-------|-------------------|--------|---------|
| Instance Number | 0020,0013 | IS | | ALWAYS | | |

| | | | | | | |
|---------------------|-----------|----|--|------|--|--|
| Patient Orientation | 0020,0020 | CS | | VNAP | | |
|---------------------|-----------|----|--|------|--|--|

Table 42: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------------|-----------|-------|-------|-------------------|--------|---------|
| Samples per Pixel | 0028,0002 | US | | ALWAYS | | |
| Photometric Interpretation | 0028,0004 | CS | | ALWAYS | | |
| Planar Configuration | 0028,0006 | US | | ALWAYS | | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Bits Allocated | 0028,0100 | US | 8 | ALWAYS | | |
| Bits Stored | 0028,0101 | US | 8 | ALWAYS | | |
| High Bit | 0028,0102 | US | 7 | ALWAYS | | |
| Pixel Representation | 0028,0103 | US | 0000 | ALWAYS | AUTO | |
| Pixel Data | 7FE0,0010 | OW/OB | | ALWAYS | AUTO | |

Table 43: SOP Common Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------|-----------|----|---------------------------|-------------------|--------|---------|
| SOP Class UID | 0008,0016 | UI | 1.2.840.10008.5.1.4.1.1.7 | ALWAYS | FIXED | |
| SOP Instance UID | 0008,0018 | UI | | ALWAYS | AUTO | |
| Instance Creation Date | 0008,0012 | DA | | ANAP | AUTO | |
| Instance Creation Time | 0008,0013 | TM | | ANAP | AUTO | |
| Instance Number | 0020,0013 | IS | | ANAP | AUTO | |

Table 44 : Extended DICOM and private attributes for Secondary Capture Image Storage SOP Class Instances

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------|-----------|----|-------|-------------------|--------|---------|
| Requested Procedure ID | 0040,1001 | SH | | ANAP | | |

2.1.2.5. Multiframe True Color Secondary Capture Image Storage SOP class

Table 45: IOD of Created Multiframe True Color Secondary Capture Image Storage SOP Class Instances

| Information Entity | Module | Presence Of Module |
|--------------------|---------------------------------------|--------------------|
| Patient | Patient Module | ALWAYS |
| Study | General Study Module | ALWAYS |
| Series | General Series Module | ALWAYS |
| Equipment | General Equipment Module | CONDITIONAL |
| | SC Equipment Module | ALWAYS |
| Image | General Image Module | ALWAYS |
| | Image Pixel Module | ALWAYS |
| | Cine Module | CONDITIONAL |
| | Multi-Frame Module | ALWAYS |
| | Multi-Frame Functional Groups Module | OPTIONAL |
| | SC Multi-frame Image Module | ALWAYS |
| | SOP Common Module | ALWAYS |
| | Extended DICOM and private attributes | CONDITIONAL |

Table 46: Patient Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------|-----------|----|-------|-------------------|--------|---------|
| Patient's Name | 0010,0010 | PN | | VNAP | AUTO | |
| Patient ID | 0010,0020 | LO | | VNAP | AUTO | |
| Patient's Birth Date | 0010,0030 | DA | | VNAP | AUTO | |
| Patient's Sex | 0010,0040 | CS | | VNAP | AUTO | |

Table 47: General Study Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------------|-----------|----|-------|-------------------|--------|---------|
| Study Date | 0008,0020 | DA | | VNAP | AUTO | |
| Study Time | 0008,0030 | TM | | VNAP | AUTO | |
| Accession Number | 0008,0050 | SH | | VNAP | | |
| Referring Physician's Name | 0008,0090 | PN | | VNAP | AUTO | |
| Study Instance UID | 0020,000D | UI | | ALWAYS | AUTO | |
| Study ID | 0020,0010 | SH | | VNAP | AUTO | |

Table 48: General Series Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-------------------------------------|-----------|----|-------|-------------------|--------|---------|
| Series Date | 0008,0021 | DA | | ANAP | AUTO | |
| Series Time | 0008,0031 | TM | | ANAP | AUTO | |
| Modality | 0008,0060 | CS | | ALWAYS | AUTO | |
| Series Instance UID | 0020,000E | UI | | ALWAYS | AUTO | |
| Series Number | 0020,0011 | IS | | ANAP | AUTO | |
| Related Series Sequence | 0008,1250 | SQ | | ANAP | | |
| >Study Instance UID | 0020,000D | UI | | ALWAYS | | |
| >Series Instance UID | 0020,000E | UI | | ALWAYS | | |
| >Purpose of Reference Code Sequence | 0040,A170 | SQ | | VNAP | | |

Table 49: General Equipment Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|---------------------------|-----------|----|-------------------------|-------------------|--------|---|
| Manufacturer | 0008,0070 | LO | Philips | VNAP | AUTO | |
| Station Name | 0008,1010 | SH | | ANAP | | |
| Manufacturer's Model Name | 0008,1090 | LO | Interventional Workspot | ANAP | FIXED | |
| Software Versions | 0018,1020 | LO | 1.4.x | ANAP | FIXED | where "x" is the detailed application SW version. |

Table 50 : SC Equipment Module

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

Table 51: General Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-----------------|-----------|----|-------|-------------------|--------|---------|
| Instance Number | 0020,0013 | IS | | VNAP | | |

| | | | | | | |
|----------------------|-----------|----|--|------|--|--|
| Patient Orientation | 0020,0020 | CS | | VNAP | | |
| Burned in Annotation | 0028,0301 | CS | | ANAP | | |

Table 52: Image Pixel Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------------------|-----------|-------|-------|-------------------|--------|---------|
| Samples per Pixel | 0028,0002 | US | | ALWAYS | | |
| Photometric Interpretation | 0028,0004 | CS | | ALWAYS | | |
| Planar Configuration | 0028,0006 | US | | ALWAYS | | |
| Rows | 0028,0010 | US | | ALWAYS | AUTO | |
| Columns | 0028,0011 | US | | ALWAYS | AUTO | |
| Bits Allocated | 0028,0100 | US | 8 | ALWAYS | | |
| Bits Stored | 0028,0101 | US | 8 | ALWAYS | | |
| High Bit | 0028,0102 | US | 7 | ALWAYS | | |
| Pixel Representation | 0028,0103 | US | 0000 | ALWAYS | AUTO | |
| Pixel Data | 7FE0,0010 | OW/OB | | ALWAYS | AUTO | |

Table 53: Cine Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|----------------|-----------|----|-------|-------------------|--------|---------|
| Frame Time | 0018,1063 | DS | | ALWAYS | AUTO | |

Table 54: Multi-Frame Module

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

Table 55: Multi-Frame Functional Groups Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------|-----------|----|-------|-------------------|--------|---------|
| Instance Number | 0020,0013 | IS | | ALWAYS | AUTO | |
| Number of Frames | 0028,0008 | IS | | ALWAYS | AUTO | |

Table 56: SC Multi-Frame Image Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|-------------------------|-----------|----|-------|-------------------|--------|---------|
| Frame Increment Pointer | 0028,0009 | AT | | ALWAYS | AUTO | |
| Burned In Annotation | 0028,0301 | CS | | ALWAYS | AUTO | |

Table 57: SOP Common Module

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------|-----------|----|-----------------------------|-------------------|--------|---------|
| SOP Class UID | 0008,0016 | UI | 1.2.840.10008.5.1.4.1.1.7.4 | ALWAYS | FIXED | |
| SOP Instance UID | 0008,0018 | UI | | ALWAYS | AUTO | |
| Instance Creation Date | 0008,0012 | DA | | ANAP | AUTO | |
| Instance Creation Time | 0008,0013 | TM | | ANAP | AUTO | |
| Instance Number | 0020,0013 | IS | | ANAP | AUTO | |

Table 58 : Extended DICOM and private attributes for Multiframe True Color Secondary Capture Image Storage SOP Class Instances

| Attribute Name | Tag | VR | Value | Presence of Value | Source | Comment |
|------------------------------|-----------|----|-------|-------------------|--------|---------|
| Acquisition Context Sequence | 0040,0555 | LO | | ANAP | | |
| Requested Procedure ID | 0040,1001 | LO | | ANAP | | |