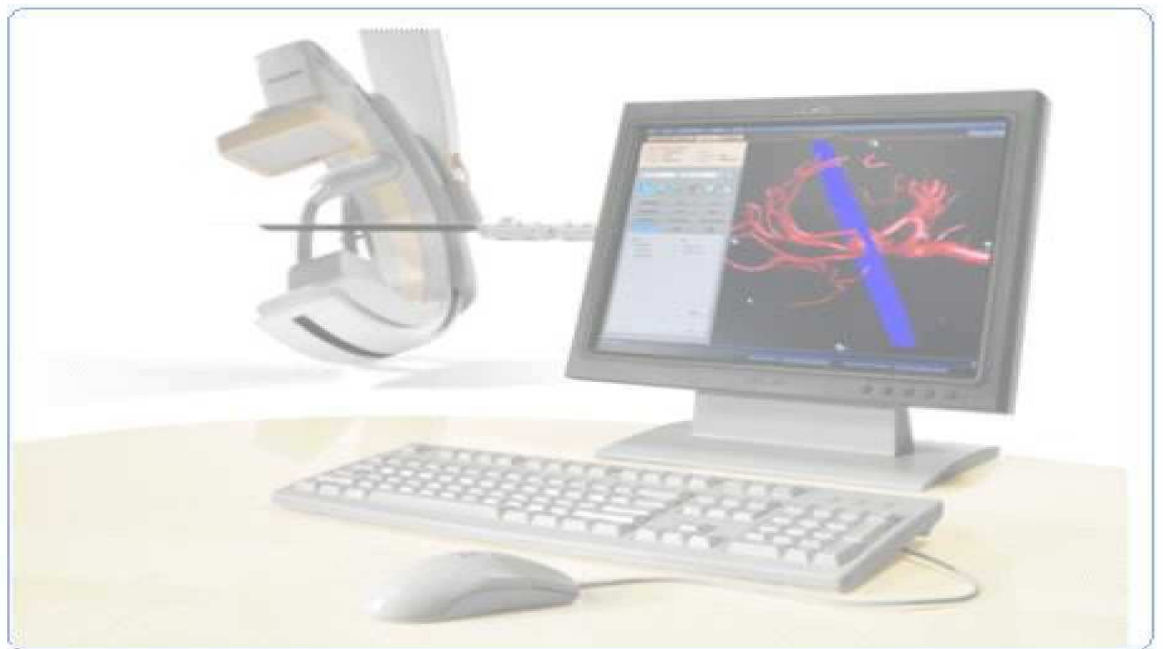


DICOM Conformance Statement

Application Annex:
HeartNavigator R2.0.5



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1. Introduction

This DICOM Conformance Statement annex is applicable to HeartNavigator 2.0.5, later referred to as HeartNavigator Application. In general the HeartNavigator Application is the user environment for viewing and analyzing XA and SC images. HeartNavigator provides automated planning to help simplify complex structural heart disease procedures. It creates an excellent volume rendered 3D image of the heart from previously acquired 2D CT datasets. Virtual device templates can then be used to assess and select the appropriate device size and the best projection for the patient's individual anatomy. HeartNavigator provides fast and fully automated measurements for typical anatomical distances and diameters and therefore improving the workflow of planning a TAVR/TAVI procedure. Use HeartNavigator instead of taking several low-contrast aortograms to find the optimal projection for your structural heart disease procedure. The HeartNavigator automatically segments anatomical structures, landmarks and planes out of the DICOM cardiac CT-datasets. In addition, the software automatically determines the most commonly used projection angles to be used during the procedure.

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	02-March-2015	Final	

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 IOD's

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

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

CREATED The Heart Navigator 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
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	No
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	Yes

2.1.1. Acceptance Criteria

This section specifies the acceptance criteria applied by Heart Navigator 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

IOD		Transfer Syntax	
Name	UID	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
		Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
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. Secondary Capture Image Storage SOP class

Table 6: 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 7: 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 8: 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				
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 9: 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			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		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 10: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Institution Name	0008,0080	LO		VNAP	AUTO	
Station Name	0008,1010	SH		ANAP		
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ALWAYS	FIXED	
Software Version(s)	0018,1020	LO	1.3.0	ALWAYS	FIXED	

Table 11 : 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 12: General Image Module

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

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		
Planar Configuration	0028,0006	US		ANAP		
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 14: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	See chapter 6 of IW DCS	CONDITIONAL	FIXED	
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 15 : Extended DICOM and private attributes for Secondary Capture Image Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Private	2001,0010	LO		ANAP		
Private	2001,0011	LO		ANAP		
Private	2001,10c1	LO		ANAP		
Medical Alerts	0010,2000	LO		ANAP		
Allergies	0010,2110	LO		ANAP		
Pregnancy Status	0010,21C0	US		ANAP		
Requested Procedure Description	0032,1060	LO		ANAP		
Requested Contrast Agent	0032,1070	LO		ANAP		
Special Needs	0038,0050	LO		ANAP		
Patient State	0038,0500	LO		ANAP		
Private	2001,0010	LO		ANAP		
Private	2001,1063	CS		ANAP		
Private	2003,0020	LO		ANAP		
Private	2003,20C3	DT		ANAP		