

DICOM Conformance Statement

RT Image Suite VB80C



DICOM Conformance Overview

RT Image Suite is an image processing application, and can process the incoming data (DICOM images, reports). **RT Image Suite** creates and displays the below mentioned IODs but depends on syngo.via as a DICOM Communication platform to start **RT Image Suite**.

RT Image Suite

- obtains images and creates objects (images, reports)
- displays images to user

Table 1: Network Services

SOP Classes	SOP Class UID	User of Service (SCU)		Provider of Service (SCP)	
		Create	Send	Store	Display
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	No	No	Yes
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Yes	No	No	Yes
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	No	No	Yes
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	No	No	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	No	No	Yes
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Yes	No	No	Yes
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	Yes	No	No	Yes
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Yes	No	No	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	No	No	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	No	No	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	No	No	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No	No	Yes

Please note, any Network Transfer occurs through syngo.via [2]

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1 Introduction

1.1 Revision History

Version	Date	Change
VB80A	2023-06-22	Initial Version of syngo.via RT Image Suite DICOM Conformance Statement
VB80A	2023-07-12	Updated Review comments. Released version R1.0
VB80C	2024-02-05	Updated document R 1.1
VB80C	2024-02-13	Updated Review comments. Released version R2.0

1.2 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

1.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between **RT Image Suite** and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [1]. DICOM by itself does not guarantee interoperability.

The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.

This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

- The comparison of conformance statements is the first step towards Assessing interconnectivity and interoperability of **RT Image Suite** DICOM conformant equipment.
- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.

Siemens Healthineers reserves the right to modify the design and specifications contained herein without prior notice. Please contact your local Siemens Healthineers representative for the most recent product information.

1.4 Definitions, Terms and Abbreviations

Definitions, terms, and abbreviations used in this document are defined within the different parts of the DICOM standard.

Additional Abbreviations and terms are as follows:

DCS	DICOM Conformance Statement
DICOM	Digital Imaging and Communications in Medicine
IOD	DICOM Information Object Definition
ISO	International Standard Organization
N/A	not applicable
NEMA	National Electrical Manufacturers Association
RTiS	RT Image Suite
IHE	Integrating the Healthcare Enterprise

SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM Server)
SOP	DICOM Service-Object Pair
SR	Structured Report
TID	Template ID
UID	Unique Identifier
VR	Value Representation

1.5 References

- [1] NEMA PS3 / ISO 12052, Digital Imaging and Communications in Medicine (DICOM) Standard, National Electrical Manufacturers Association, Rosslyn, VA, USA (available free at <https://www.dicomstandard.org/>)
- [2] syngo.via VB80A DCS statement – [syngo.via \(siemens-healthineers.com\)](https://syngo.via/siemens-healthineers.com)

2 Networking

Refer [2]

3 Media Interchange

Refer [2]

4 Transformations of DICOM to CDA

Refer [2]

5 Support of Extended Character Sets

Refer [2]

6 Attribute confidentiality profiles

Refer [2]

7 Security

Refer [2]

8 Annexes

8.1 IOD Contents

The following Tables use several abbreviations. The abbreviations used in the “Presence” column are

- VNAP: Value is Not Always Present. Attribute is sent zero length if no value is present.
- ANAP: Attribute Not Always Present.
- ALWAYS: Attribute and Value are always present.
- EMPTY: Attribute is sent zero length.

The abbreviations used in the “Source” Column are

- MWL: The attribute value is copied from Modality Worklist.
- USER: The attribute value is entered by the user.
- AUTO: The attribute value is generated by the system.
- CONFIG: The attribute value is obtained by configuration
- COPIED: The attribute value is obtained from the input image

The abbreviations used in the “Presence of Module” Column are

- ALWAYS: The module is always present.
- CONDITIONAL: The module is used under specified condition.
- OPTIONAL: The module is not always present.

8.1.1 Created SOP Instances

8.1.1.1 Common Modules

8.1.1.1.1 Patient Module Attributes

Table 2: Patient Module

Attribute	Tag	Source	Value	Presence	Comments
Patient's Name	(0010, 0010)	COPIED		VNAP	
Patient ID	(0010,0020)	COPIED		VNAP	
Patient's Birth Date	(0010,0030)	COPIED		VNAP	
Patient's Birth Time	(0010,0032)	COPIED		ANAP	
Patient's Sex	(0010,0040)	COPIED		VNAP	
Other Patient IDs	(0010,1000)	COPIED		ANAP	
Other Patient Names	(0010,1001)	COPIED		ANAP	
Ethnic Group	(0010,2160)	COPIED		ANAP	

8.1.1.1.2 General Study Module Attributes

Table 3: General Study Module

Attribute	Tag	Source	Value	Presence	Comments
Study Instance UID	(0020,000D)	COPIED		ALWAYS	
Study Date	(0008,0020)	COPIED		VNAP	
Study Time	(0008,0030)	COPIED		VNAP	
Study ID	(0020,0010)	COPIED		VNAP	
Referring Physician's Name	(0008,0090)	COPIED		VNAP	
Accession Number	(0008,0050)	COPIED		VNAP	
Study Description	(0008,1030)	COPIED		ANAP	
Procedure Code Sequence	(0008,1032)	COPIED		ANAP	
>Code Value	(0008,0100)	COPIED		VNAP	
>Coding Scheme Designator	(0008,0102)	COPIED		VNAP	
>Coding Scheme Version	(0008,0103)	COPIED		VNAP	
>Code Meaning	(0008,0104)	COPIED		ALWAYS	
Referenced Study Sequence	(0008,1110)	COPIED		ANAP	
>Referenced SOP Class UID	(0008,1150)	COPIED		ALWAYS	
>Referenced SOP Instance UID	(0008,1155)	COPIED		ALWAYS	

8.1.1.1.3 Patient Study Module Attributes

Table 4: Patient Study Module

Attribute	Tag	Source	Value	Presence	Comments
Patient's Age	(0010,1010)	COPIED		ANAP	
Smoking Status	(0010,21A0)	COPIED		ANAP	

8.1.1.1.4 General Series module Attributes

Table 5: General Series Module

Attribute	Tag	Source	Value	Presence	Comments
Series Date	(0008,0021)	AUTO		ANAP	
Series Time	(0008,0031)	AUTO		ANAP	
Modality	(0008,0060)	FIXED	MR, CT, PT	ALWAYS	Depending on the SOP class generated
Series Description	(0008,103E)	AUTO/USER	- "RT Image Suite_RTIS Mappings" for RWVM IOD - USER in case of Registration IODs	ANAP	
Operators' Name	(0008,1070)	COPIED		ANAP	
Performed Procedure Step Start Date	(0040,0244)	AUTO		ANAP	
Performed Procedure Step Start Time	(0040,0245)	AUTO		ANAP	
Performed Procedure Step End Date	(0040,0250)	AUTO		ANAP	
Performed Procedure Step ID	(0040,0253)	USER/AUTO		ANAP	
Performed Procedure Step Description	(0040,0254)	COPIED		ANAP	
Related Series Sequence	(0008,1250)	AUTO		ANAP	
>Study Instance UID	(0020,000D)	AUTO		ALWAYS	
>Series Instance UID	(0020,000E)	AUTO		ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
>Purpose of Reference Code Sequence	(0040,A170)	AUTO		VNAP	
>>Code Value	(0008,0100)	AUTO		ALWAYS	
>>Coding Scheme Designator	(0008,0102)	AUTO		ALWAYS	
>>Code Meaning	(0008,0104)	AUTO		ALWAYS	
>>Mapping Resource	(0008,0105)	AUTO		ANAP	
>>Context Group Version	(0008,0106)	AUTO		ANAP	
>>Context Identifier	(0008,010F)	AUTO		ANAP	

8.1.1.1.5 General Equipment Module Attributes

Table 6: General Equipment Module

Attribute	Tag	Source	Value	Presence	Comments
Manufacturer	(0008,0070)	FIXED	SIEMENS Healthineers	ALWAYS	
Station Name	(0008,1010)	USER		ANAP	
Device Serial Number	(0018,1000)	FIXED		ALWAYS	
Software Versions	(0018,1020)	FIXED	VB80C	ALWAYS	
Spatial Resolution	(0018,1050)	AUTO		ANAP	
Institutional Department Name	(0008,1040)	AUTO		ANAP	
Manufacturer's Model Name	(0008,1090)	FIXED	syngo.via.VB80C	ALWAYS	Appended with ".RTEngine" for all Registration IODs For SR objects, it is "syngo.via"

8.1.1.1.6 Frame of Reference Module Attributes

Table 7: Frame of Reference Module

Attribute	Tag	Source	Value	Presence	Comments
Frame of Reference UID	(0020,0052)	AUTO		ALWAYS	
Position Reference Indicator	(0020,1040)	AUTO		VNAP	Empty in case of RT Image IOD

8.1.1.1.7 General Image Module Attributes

Table 8: General Image Module

Attribute	Tag	Source	Value	Presence	Comments
Image Type	(0008,0008)	FIXED	DERIVED\SECONDARY*	ALWAYS	*Remaining values are copied from input image apart from "DERIVED\SECONDARY"
Acquisition Date	(0008,0022)	COPIED		ANAP	
Content Date	(0008,0023)	COPIED		VNAP	
Acquisition Time	(0008,0032)	COPIED		ANAP	
Content Time	(0008,0033)	COPIED		VNAP	
Instance Number	(0020,0013)	COPIED		VNAP	
Patient Orientation	(0020,0020)	COPIED		VNAP	
Burned In Annotation	(0028,0301)	COPIED		ANAP	
Image Comments	(0020,4000)	COPIED		ANAP	

8.1.1.1.8 General Reference Module Attributes

Table 9: General Reference Module

Attribute	Tag	Source	Value	Presence	Comments
Referenced Image Sequence	(0008,1140)	AUTO		ANAP	
>Referenced SOP Class UID	(0008,1150)	AUTO		ALWAYS	
>Referenced SOP Instance UID	(0008,1155)	AUTO		ALWAYS	
Derivation Description	(0008,2111)	AUTO/FIXED	FIXED as "Secondary Capture" in case of SC Image SOP Class, otherwise AUTO	ALWAYS	
Derivation Code Sequence	(0008,9215)	AUTO		ANAP	
>Code Value	(0008,0100)	AUTO		VNAP	
>Coding Scheme Designator	(0008,0102)	AUTO		VNAP	
>Coding Scheme Version	(0008,0103)	AUTO		ANAP	
>Code Meaning	(0008,0104)	AUTO		ALWAYS	

8.1.1.1.9 Image Pixel Module Attribute

Table 10: Image Pixel Module

Attribute	Tag	Source	Value	Presence	Comments
Samples Per Pixel	(0028,0002)	FIXED		ALWAYS	
Photometric Interpretation	(0028,0004)	AUTO/FIXED		ALWAYS	FIXED for Secondary Capture IOD as "RGB"
Rows	(0028,0010)	AUTO		ALWAYS	
Columns	(0028,0011)	AUTO		ALWAYS	
Bits Allocated	(0028,0100)	AUTO		ALWAYS	
Bits Stored	(0028,0101)	AUTO		ALWAYS	
High Bit	(0028,0102)	AUTO		ALWAYS	
Pixel Representation	(0028,0103)	AUTO		ALWAYS	
Pixel Data	(7FE0,0010)	AUTO		ALWAYS	

8.1.1.1.10 VOI LUT Module Attributes

Table 11: VOI LUT Module

Attribute	Tag	Source	Value	Presence	Comments
Window Center	(0028,1050)	COPIED/FIXED		ANAP	FIXED in case of Synthetic CT IOD In case of HEAD scan, value is 40 In case of PELVIS scan, value is 35
Window Width	(0028,1051)	COPIED/FIXED		ANAP	FIXED in case of Synthetic CT IOD In case of HEAD scan, value is 120 In case of PELVIS scan, value is 350

8.1.1.1.11 SOP Common Module Attributes

Table 12: SOP Common Module

Attribute	Tag	Source	Value	Presence	Comments
Specific Character Set	(0008,0005)	COPIED		ANAP	
Instance Creation Date	(0008,0012)	AUTO		ANAP	
Instance Creation Time	(0008,0013)	AUTO		ANAP	
SOP Class UID	(0008,0016)	COPIED		ALWAYS	
SOP Instance UID	(0008,0018)	COPIED		ALWAYS	
Instance Number	(0020,0013)	COPIED		ANAP	
Contributing Equipment Sequence	(0018,A001)	COPIED		ANAP	
>Manufacturer	(0008,0070)	COPIED		ALWAYS	
>Institution Name	(0008,0080)	COPIED		ANAP	
>Institution Address	(0008,0081)	COPIED		ANAP	
>Station Name	(0008,1010)	COPIED		ANAP	
>Manufacturer's Model Name	(0008,1090)	COPIED		ANAP	
>Device Serial Number	(0018,1000)	COPIED		ANAP	
>Software Versions	(0018,1020)	COPIED		ANAP	
>Date of Last Calibration	(0018,1200)	COPIED		ANAP	
>Time of Last Calibration	(0018,1201)	COPIED		ANAP	
>Purpose of Reference Code Sequence	(0040,A170)	COPIED		ALWAYS	
>>Code Value	(0008,0100)	COPIED		ALWAYS	
>>Coding Scheme Designator	(0008,0102)	COPIED		ALWAYS	
>>Code Meaning	(0008,0104)	COPIED		ALWAYS	
Original Attributes Sequence	(0400,0561)	AUTO		ANAP	
>Modified Attributes Sequence	(0400,0550)	AUTO		ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
>Attribute Modification DateTime	(0400,0562)	AUTO		ALWAYS	
>Modifying System	(0400,0563)	FIXED	Siemens Healthcare syngo Transfer Framework	ALWAYS	
>Source of Previous Values	(0400,0564)	FIXED	Transfer Framework	VNAP	
>Reason for the Attribute Modification	(0400,0565)	FIXED	COERCE	ALWAYS	

8.1.1.1.12 Common Instance Reference Module Attributes

Table 13: Common Instance Reference Module

Attribute	Tag	Source	Value	Presence	Comments
Referenced Series Sequence	(0008,1115)	AUTO		ANAP	
>Referenced Instance Sequence	(0008,114A)	AUTO		ALWAYS	
>>Referenced SOP Class UID	(0008,1150)	AUTO		ALWAYS	
>>Referenced SOP Instance UID	(0008,1155)	AUTO		ALWAYS	
>Series Instance UID	(0020,000E)	AUTO		ALWAYS	
Studies Containing Other Referenced Instances Sequence	(0008,1200)	AUTO		ANAP	
>Referenced Series Sequence	(0008,1115)	AUTO		ALWAYS	
>>Referenced Instance Sequence	(0008,114A)	AUTO		ALWAYS	
>>>Referenced SOP Class UID	(0008,1150)	AUTO		ALWAYS	
>>>Referenced SOP Instance UID	(0008,1155)	AUTO		ALWAYS	
>>Series Instance UID	(0020,000E)	AUTO		ALWAYS	
>Study Instance UID	(0020,000D)	AUTO		ALWAYS	

8.1.1.2 RT Structure Set Storage SOP Class

Table 14: IOD of created RT Structure Set Storage SOP Class Instances defines the structure of RT Structure Set Storage.

Table 14: IOD of created RT Structure Set Storage SOP Class Instances

IE	Module	Reference	Presence of Module
Patient	Patient Module	Table 2: Patient Module	ALWAYS
Study	General Study Module	Table 3: General Study Module	ALWAYS
Series	RT Series	Table 15: RT Series Module	ALWAYS
Equipment	General Equipment	Table 6: General Equipment Module	ALWAYS
Frame of Reference	Frame of Reference Module	Table 7: Frame of Reference Module	OPTIONAL
Structure Set	Structure Set Module	Table 16: Structure Set Module	ALWAYS
	ROI Contour	Table 17: ROI Contour Module	ALWAYS
	ROI Observations	Table 18: RT ROI Observations Module	ALWAYS
	Approval	Table 19: Approval Module	OPTIONAL
	SOP Common	Table 12: SOP Common Module	ALWAYS
	Common Instance Reference	Table 13: Common Instance Reference Module	OPTIONAL

8.1.1.2.1 RT Series Module Attributes

Table 15: RT Series Module

Attribute	Tag	Source	Value	Presence	Comments
Series Date	(0008,0021)	AUTO	Date the series started	ANAP	
Series Time	(0008,0031)	AUTO	Time the Series started	ANAP	
Modality	(0008,0060)	FIXED	RTSTRUCT,RTIMAGE,RTDOSE,RTPLAN	ALWAYS	Either one of the enumerated values based on the type of IOD created
Series Description	(0008,103E)	USER/AUTO		ANAP	For StructureSet IOD <User defined 16 characters>_yyMMdd_HHm mss> Ex: StructureSet_1_M_20221116_105307 For RT Image IOD "<RT Plan Name (300A,0003)>_RTImageSeries" with character length not exceeding For RT Plan IOD "RT Plan Label (300A,0002)" - USER for DOSE IOD
Operators' Name	(0008,1070)	COPIED		VNAP	
Series Instance UID	(0020,000E)	AUTO		ALWAYS	
Series Number	(0020,0011)	AUTO		VNAP	

8.1.1.2.2 Structure Set Module Attributes

Table 16: Structure Set Module

Attribute	Tag	Source	Value	Presence	Comments
Structure Set Label	(3006,0002)	AUTO		ALWAYS	
Structure Set Name	(3006,0004)	USER		ANAP	
Structure Set Date	(3006,0008)	AUTO		VNAP	
Structure Set Time	(3006,0009)	AUTO		VNAP	
Referenced Frame of Reference Sequence	(3006,0010)	AUTO		ANAP	
>Frame of Reference UID	(0020,0052)	AUTO		ALWAYS	
>RT Referenced Study Sequence	(3006,0012)	AUTO		ANAP	
>>Referenced SOP Class UID	(0008,1150)	AUTO		ALWAYS	
>>Referenced SOP Instance UID	(0008,1155)	AUTO		ALWAYS	
>>RT Referenced Series Sequence	(3006,0014)	AUTO		ALWAYS	
>>>Series Instance UID	(0020,000E)	AUTO		ALWAYS	
>>>Contour Image Sequence	(3006,0016)	AUTO		ALWAYS	
>>>>Referenced SOP Class UID	(0008,1150)	AUTO		ALWAYS	
>>>>Referenced SOP Instance UID	(0008,1155)	AUTO		ALWAYS	
Structure Set ROI Sequence	(3006,0020)	AUTO		ALWAYS	
>Private Creator	(0029,0010)	AUTO	SIEMENS CT RT Structure Set	ANAP	If Contour Geometric Type (3006,0042) is POINT
>Rt ROI Locked Status	(0029,SIEMENS CT RT Structure Set,01)	USER	With values of None, UserLock, ApprovedLock, SendToLaserLock, LaserReachedLock	ALWAYS	
>ROI Number	(3006,0022)	AUTO	Running number starting from 1	ALWAYS	
>Referenced Frame of Reference UID	(3006,0024)	AUTO		ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
>ROI Name	(3006,0026)	USER		VNAP	
>ROI Generation Algorithm	(3006,0036)	USER	With an enumerated value of AUTOMATIC, SEMIAUTOMATIC or MANUAL	VNAP	Based on user choice, either manually drawn or automatically calculated by Algorithm

8.1.1.2.3 ROI Contour Module Attributes

Table 17: ROI Contour Module

Attribute	Tag	Source	Value	Presence	Comments
ROI Contour Sequence	(3006,0039)	AUTO		ALWAYS	
>Private Creator	(0029,0010)	FIXED	SIEMENS CT RT Structure Set	ANAP	Present only if Contour Geometric Type (3006,0042) is POINT
>Rt Reference Point Token	(0029,SIEMENS CT RT Structure Set,02)	AUTO	RT reference point token	ANAP	System generated token value
>ROI Display color	(3006,002A)	AUTO		ANAP	
>Contour Sequence	(3006,0040)	AUTO		ANAP	
>>Contour Image Sequence	(3006,0016)	AUTO		ANAP	
>>>Referenced SOP Class UID	(0008,1150)	AUTO		ALWAYS	
>>>Referenced SOP Instance UID	(0008,1155)	AUTO		ALWAYS	
>>Contour Geometric Type	(3006,0042)	AUTO	POINT or CLOSED_PLANAR	ALWAYS	POINT in case of Reference Point created by USER. CLOSED_PLANAR in case of organ or tumour segmentation
>>Number of Contour Points	(3006,0046)	AUTO		ALWAYS	
>>Contour Number	(3006,0048)	AUTO		ANAP	

Attribute	Tag	Source	Value	Presence	Comments
>>Contour Data	(3006,0050)	AUTO		ALWAYS	
>Referenced ROI Number	(3006,0084)	AUTO	Value equal to ROI Number (3006,0022)	ALWAYS	

8.1.1.2.4 RT ROI Observations Module Attributes

Table 18: RT ROI Observations Module

Attribute	Tag	Source	Value	Presence	Comments
RT ROI Observations Sequence	(3006,0080)	AUTO		ALWAYS	
>Observation Number	(3006,0082)	AUTO	Value equal to ROI Number (3006,0022)	ALWAYS	
>Referenced ROI Number	(3006,0084)	AUTO	Value equal to ROI Number (3006,0022)	ALWAYS	
>RT ROI Interpreted Type	(3006,00A4)	USER	ISOCENTER or MARKER in case of Contour Geometric Type (3006,0042) is POINT. AVOIDANCE, BOLUS, CAVITY, CONTRAST_AGENT, CONTROL, CTV, DOSE_REGION, EXTERNAL, FIXATION, GTV, IRRAD_VOLUME, MARKER, ORGAN, PTV, SUPPORT, TREATED_VOLUME in case of Contour Geometric Type (3006,0042) is CLOSED_PLANAR.	VNAP	
>ROI Interpreter	(3006,00A6)	AUTO		VNAP	

8.1.1.2.5 Approval Module Attributes

Table 19: Approval Module

Attribute	Tag	Source	Value	Presence	Comments
Approval Status	(300E,0002)	USER	With a value of either APPROVED, UNAPPROVED	ALWAYS	

8.1.1.3 RT Image Storage SOP Class

Table 20: IOD of created RT Image Storage SOP Class Instances

IE	Module	Reference	Presence of Module
Patient	Patient Module	Table 2: Patient Module	ALWAYS
Study	General Study Module	Table 3: General Study Module	ALWAYS
Series	RT Series	Table 15: RT Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	Table 7: Frame of Reference Module	OPTIONAL
Equipment	General Equipment	Table 6: General Equipment Module	ALWAYS
Image	General Image Module	Table 8: General Image Module	ALWAYS
	Image Pixel Module	Table 10: Image Pixel Module	ALWAYS
	RT Image Module	Table 21: RT Image Module	ALWAYS
	Modality LUT Module	Table 22: Modality LUT Module	OPTIONAL
	VOI LUT Module	Table 11: VOI LUT Module	OPTIONAL
	SOP Common Module	Table 12: SOP Common Module	ALWAYS

8.1.1.3.1 RT Image Module Attributes

Table 21: RT Image Module

Attribute	Tag	Source	Value	Presence	Comments
Image Type	(0008,0008)	FIXED	DERIVED\SECONDARY\IDRR	ALWAYS	
Conversion Type	(0008,006)	FIXED	WSD	ALWAYS	
Samples per Pixel	(0028,0002)	FIXED	1	ALWAYS	
Photometric Interpretation	(0028,0004)	AUTO	MONOCHROME2	ALWAYS	
Bits Allocated	(0028,0100)	COPIED		ALWAYS	
Bits Stored	(0028,0101)	COPIED		ALWAYS	
High Bit	(0028,0102)	COPIED		ALWAYS	
Pixel Representation	(0028,0103)	COPIED		ALWAYS	
RT Image Label	(3002,0002)	USER		ALWAYS	
RT Image Name	(3002,0003)	USER		ANAP	
RT Image Plane	(3002,000C)	FIXED	NORMAL	ALWAYS	
X-Ray Image Receptor Angle	(3002,000E)	FIXED	Empty	ALWAYS	
Image Plane Pixel Spacing	(3002,0011)	COPIED		VNAP	
RT Image Position	(3002,0012)	FIXED	Empty	ALWAYS	
Radiation Machine Name	(3002,0020)	USER		VNAP	
Radiation Machine SAD	(3002,0022)	USER		VNAP	
RT Image SID	(3002,0026)	USER	Same as Radiation Machine SAD (3002,0020)	VNAP	
Primary Dosimeter Unit	(300A,00B3)	FIXED	Empty	ALWAYS	
Gantry Angle	(300A,011E)	USER		ANAP	
Beam Limiting Device Angle	(300A,0120)	USER		ANAP	
Referenced RT Plan Sequence	(300C,0002)	AUTO		ANAP	
>Referenced SOP Class UID	(0008,1150)	COPIED		ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
>Referenced SOP Instance UID	(0008,1155)	COPIED		ALWAYS	
Referenced Beam Number	(300C,0006)	AUTO	Refers to Beam Number (300A,00C0)	ANAP	

8.1.1.3.2 Modality LUT Module Attributes

Table 22: Modality LUT Module

Attribute	Tag	Source	Value	Presence	Comments
Rescale Intercept	(0028,1052)	AUTO		ANAP	
Rescale Slope	(0028,1053)	AUTO		ANAP	
Rescale Type	(0028,1054)	AUTO		ANAP	

8.1.1.4 RT Dose SOP Class

Table 23: IOD of created RT Dose Storage SOP Class Instances

IE	Module	Reference	Presence of Module
Patient	Patient Module	Table 2: Patient Module	ALWAYS
Study	General Study Module	Table 3: General Study Module	ALWAYS
Series	RT Series	Table 15: RT Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	Table 7: Frame of Reference Module	ALWAYS
Equipment	General Equipment	Table 6: General Equipment Module	ALWAYS
Dose	Image Plane Module	Table 24: Image Plane Module	CONDITIONAL Required if Dose data contains grid-based doses
	Image Pixel Module	Table 10: Image Pixel Module	CONDITIONAL Required if dose data contains grid-based doses.
	Multi-frame Module	Table 25: Multi-frame Module	CONDITIONAL Required if dose data contains grid-based doses.
	Modality LUT Module	Table 22: Modality LUT Module	OPTIONAL
	RT Dose Module	Table 26: RT Dose Module	ALWAYS
	Structure Set Module	Table 16: Structure Set Module	CONDITIONAL Required if dose data contains dose points or isodose curves
	SOP Common Module	Table 12: SOP Common Module	ALWAYS

8.1.1.4.1 Image Plane Module Attributes

Table 24: Image Plane Module

Attribute	Tag	Source	Value	Presence	Comments
Slice Thickness	(0018,0050)	AUTO		VNAP	
Image Position (Patient)	(0020,0032)	AUTO		ALWAYS	
Image Orientation (Patient)	(0020,0037)	AUTO		ALWAYS	
Pixel Spacing	(0028,0030)	AUTO		ALWAYS	

8.1.1.4.2 Multi-frame Module Attributes

Table 25: Multi-frame Module

Attribute	Tag	Source	Value	Presence	Comments
Number of Frames	(0028,0008)	AUTO		ALWAYS	
Frame Increment Pointer	(0028,0009)	FIXED	Points to Grid Frame Offset Vector (3004,000C)	ALWAYS	

8.1.1.4.3 RT Dose Module Attributes

Table 26: RT Dose Module

Attribute	Tag	Source	Value	Presence	Comments
Instance Number	(0020,0013)	COPIED		ANAP	
Samples per Pixel	(0028,0002)	COPIED		ANAP	
Photometric Interpretation	(0028,0004)	FIXED	MONOCHROME2	ALWAYS	
Bits Allocated	(0028,0100)	COPIED		ANAP	
Bits Stored	(0028,0101)	COPIED		ANAP	
High Bit	(0028,0102)	COPIED		ANAP	
Dose Units	(3004,0002)	COPIED		ALWAYS	
Dose Type	(3004,0004)	COPIED		ALWAYS	
Dose Comment	(3004,0006)	USER		ANAP	
Dose Summation Type	(3004,000A)	FIXED	PLAN or BEAM	ALWAYS	
Grid Frame Offset Vector	(3004,000C)	AUTO		ANAP	
Dose Grid Scaling	(3004,000E)	AUTO		ANAP	

Please do note: Referenced RT Plan Sequence Attribute (300C,0002) is not present, even though Dose Summation Type (3004,000A) value is PLAN or BEAM.

8.1.1.5 RT Plan Storage SOP Class

Table 27: IOD of created RT Plan Storage SOP Class Instances

IE	Module	Reference	Presence of Module
Patient	Patient Module	Table 2: Patient Module	ALWAYS
Study	General Study Module	Table 3: General Study Module	ALWAYS
Series	RT Series	Table 15: RT Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	Table 7: Frame of Reference Module	OPTIONAL
Equipment	General Equipment	Table 6: General Equipment Module	ALWAYS
Plan	RT General Plan	Table 28: RT General Plan	ALWAYS
	RT Patient Setup Module	Table 30: RT Patient Setup Module	OPTIONAL
	RT Beams	Table 29: RT Beams	CONDITIONAL Required if RT Fraction Scheme Module exists and Number of Beams (300A,0080) is greater than zero for one or more fraction groups. Shall not be present, if RT Brachy Application Setups Module is present. May be present otherwise.
	Approval	Table 19: Approval Module	OPTIONAL
	SOP Common	Table 12: SOP Common Module	ALWAYS

8.1.1.5.1 RT General Plan Module Attributes

Table 28: RT General Plan

Attribute	Tag	Source	Value	Presence	Comments
Instance Number	(0020,0013)	FIXED	1	ALWAYS	
RT Plan Label	(300A,0002)	USER		ALWAYS	Allowed length of character is 16
RT Plan Name	(300A,0003)	FIXED	Value of RT Plan Label (300A,0002)	ALWAYS	
RT Plan Date	(300A,0006)	AUTO		VNAP	
RT Plan Time	(300A,0007)	AUTO		VNAP	
Referenced Structure Set Sequence	(300C,0060)	AUTO		ANAP	
>Referenced SOP Class UID	(0008,1150)	AUTO		ALWAYS	
>Referenced SOP Instance UID	(0008,1155)	AUTO		ALWAYS	

8.1.1.5.2 RT Beams Module Attributes

Table 29: RT Beams

Attribute	Tag	Source	Value	Presence	Comments
Beam Sequence	(300A,00B0)	AUTO		ALWAYS	
>Manufacturer	(0008,0070)	USER		ANAP	
>Manufacturer's Model Name	(0008,1090)	FIXED	"RT Engine"	ALWAYS	
>Treatment Machine Name	(300A,00B2)	USER		VNAP	
>Source-Axis Distance	(300A,00B4)	USER		ANAP	
>Beam Limiting Device Sequence	(300A,00B6)	AUTO		ALWAYS	
>> RT Beam Limiting Device Type	(300A,00B8)	USER	One of the values: X,Y,ASYMX,ASYMY,MILCX,MILCY	ALWAYS	
>>Number of Leaf/Jaw Pairs	(300A,00BC)	USER		ALWAYS	
>>Leaf Position Boundaries	(300A,00BE)	USER		ANAP	
>Beam Number	(300A,00C0)	AUTO	Running number starting from 1	ALWAYS	
>Beam Name	(300A,00C2)	USER		ANAP	
>Beam Description	(300A,00C3)	AUTO	Value from Beam Name (300A,00C2)	ANAP	
>Beam Type	(300A,00C4)	FIXED	STATIC	ALWAYS	
>Radiation Type	(300A,00C6)	FIXED	PHOTON	ALWAYS	
>Number of Wedges	(300A,00D0)	FIXED	0	ALWAYS	
>Number of Compensators	(300A,00E0)	FIXED	0	ALWAYS	
>Number of Boli	(300A,00ED)	FIXED	0	ALWAYS	
>Number of Blocks	(300A,00F0)	FIXED	0	ALWAYS	
>Number of Control Points	(300A,0110)	FIXED	2	ALWAYS	
>Control Point Sequence	(300A,0111)	AUTO		ALWAYS	
>>Control Point Index	(300A,0112)	FIXED	0	ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
>>Nominal Beam Energy	(300A,0114)	USER		ANAP	
>>Beam Limiting Device Position Sequence	(300A,011A)	AUTO		ANAP	
>>>RT Beam Limiting Device Type	(300A,00B8)	USER	One of the values: X,Y,ASYMX,ASYMY,MILCX,MILCY	ALWAYS	
>>>Leaf/Jaw Positions	(300A,011C)	USER		ALWAYS	
>>Gantry Angle	(300A,011E)	USER		ANAP	
>>Gantry Rotation Direction	(300A,011F)	USER		ANAP	
>>Beam Limiting Device Angle	(300A,0120)	USER		ANAP	
>>Beam Limiting Device Rotation Direction	(300A,0121)	FIXED	NONE	ALWAYS	
>>Patient Support Angle	(300A,0122)	USER		ANAP	
>>Patient Support Rotation Direction	(300A,0123)	FIXED	NONE	ALWAYS	
>>Table Top Eccentric Angle	(300A,0125)	FIXED	0	ALWAYS	
>>Table Top Eccentric Rotation Direction	(300A,0126)	FIXED	NONE	ALWAYS	
>>Isocenter Position	(300A,012C)	USER		ANAP	
>>Cumulative Meterset Weight	(300A,0134)	FIXED	0 or 1	VNAP	
>Referenced Reference Image Sequence	(300C,0042)	AUTO		ANAP	
>>Referenced SOP Class UID	(0008,1150)	AUTO		ALWAYS	
>>Referenced SOP Instance UID	(0008,1155)	AUTO		ALWAYS	
>>Reference Image Number	(300A,00C8)	AUTO		ALWAYS	
>Referenced Patient Setup Number	(300C,006A)	FIXED	1	ALWAYS	

8.1.1.5.3 RT Patient Setup Module Attributes

Table 30: RT Patient Setup Module

Attribute	Tag	Source	Value	Presence	Comments
Patient Setup Sequence	(300A,0180)	AUTO		ALWAYS	
>Patient Position	(0018,5100)	COPIED		ANAP	
>Patient Setup Number	(300A,0182)	FIXED	1	ALWAYS	
>Setup Technique	(300A,01B0)	FIXED	ISOCENTRIC	ALWAYS	

8.1.1.6 Spatial Registration Storage SOP Class

Table 31: IOD of created Spatial Registration Storage SOP Class Instances

IE	Module	Reference	Presence of Module
Patient	Patient Module	Table 2: Patient Module	ALWAYS
Study	General Study Module	Table 3: General Study Module	ALWAYS
	Patient Study Module	Table 4: Patient Study Module	OPTIONAL
Series	General Series Module	Table 5: General Series Module	ALWAYS
	Spatial Registration Series	Table 32: Spatial Registration Series	ALWAYS
Frame of Reference	Frame of Reference Module	Table 7: Frame of Reference Module	ALWAYS
Equipment	General Equipment	Table 6: General Equipment Module	ALWAYS
Spatial Registration	Spatial Registration Module	Table 33: Spatial Registration Module	ALWAYS
	Common Instance Reference Module	Table 13: Common Instance Reference Module	ALWAYS
	General Reference Module	Table 9: General Reference Module	OPTIONAL
	SOP Common Module	Table 12: SOP Common Module	ALWAYS

8.1.1.6.1 Spatial Registration Series Attributes

Table 32: Spatial Registration Series

Attribute	Tag	Source	Value	Presence	Comments
Modality	(0008,0060)	FIXED	REG	ALWAYS	

8.1.1.6.2 Spatial Registration Module Attributes

Table 33: Spatial Registration Module

Attribute	Tag	Source	Value	Presence	Comments
Content Date	(0008,0023)	AUTO		ALWAYS	
Content Time	(0008,0033)	AUTO		ALWAYS	
Instance Number	(0020,0013)	AUTO		ALWAYS	
Private Creator	(0029,0010)	AUTO	SIEMENS SYNGO ADVANCED PRESENTATION	ANAP	
Registration Creation Algorithm Name	(0029,SIEMENS SYNGO ADVANCED PRESENTATION, 73)	FIXED	IVTRigidRegistration	ALWAYS	
Private Creator	(0031,0010)	AUTO	SIEMENS SYNGO WORKFLOW	ANAP	
WF Internal Patient UID	(0031,SIEMENS SYNGO WORKFLOW,10)	COPIED		ANAP	
Presentation Label	(0070,0080)	FIXED	RTISREGISTRATION	ALWAYS	
Presentation Description	(0070,0081)	USER	With values of Deform_Reg, Rigid_Reg	VNAP	Based on registration type specified by User
Presentation Creator's Name	(0070,0084)	AUTO		VNAP	
Registration Sequence	(0070,0308)	AUTO		ALWAYS	
>Referenced Image Sequence	(0008,1140)	AUTO		ANAP	
>>Referenced SOP Class UID	(0008,1150)	AUTO		ALWAYS	
>>Referenced SOP Instance UID	(0008,1155)	AUTO		ALWAYS	
>Frame of Reference UID	(0020,0052)	AUTO		ANAP	
>Matrix Registration Sequence	(0070,0309)	AUTO		ALWAYS	
>>Matrix Sequence	(0070,030A)	AUTO		ALWAYS	
>>>Frame of Reference	(0070,030C)	FIXED	Type of Frame of Reference Transformation Matrix	ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
Transformation Matrix Type			(3006,00C6). Possible values: RIGID, RIGID_SCALE, AFFINE		
>>>Frame of Reference Transformation Matrix	(3006,00C6)	AUTO		ALWAYS	
>>Registration Type Code Sequence	(0070,030D)	AUTO		VNAP	
>Private Creator	(0071,0010)	FIXED	SIEMENS SYNGO REGISTRATION	ALWAYS	
>Registration Is Validated Flag	(0071,SIEMENS SYNGO REGISTRATION, 21)	FIXED	YES or NO	ALWAYS	

8.1.1.7 Spatial Fiducials Storage SOP Class

Table 34: IOD of created Spatial Fiducials Storage SOP Class Instances

IE	Module	Reference	Presence of Module
Patient	Patient Module	Table 2: Patient Module	ALWAYS
Study	General Study Module	Table 3: General Study Module	ALWAYS
Series	General Series	Table 5: General Series Module	ALWAYS
	Spatial Fiducials Series Module	Table 35: Spatial Fiducials Series Module	ALWAYS
Equipment	General Equipment Module	Table 6: General Equipment Module	ALWAYS
Spatial Fiducials	Spatial Fiducials Module	Table 36: Spatial Fiducials Module	ALWAYS
	Common Instance Reference Module	Table 13: Common Instance Reference Module	ALWAYS
	General Reference Module	Table 9: General Reference Module	OPTIONAL
	SOP Common Module	Table 12: SOP Common Module	ALWAYS

8.1.1.7.1 Spatial Fiducials Series Module Attributes

Table 35: Spatial Fiducials Series Module

Attribute	Tag	Source	Value	Presence	Comments
Modality	(0008,0060)	FIXED	FID	ALWAYS	

8.1.1.7.2 Spatial Fiducials Module Attributes

Table 36: Spatial Fiducials Module

Attribute	Tag	Source	Value	Presence	Comments
Content Date	(0008,0023)	AUTO		ALWAYS	
Content Time	(0008,0033)	AUTO		ALWAYS	
Instance Number	(0020,0013)	AUTO		ALWAYS	
Presentation Label	(0070,0080)	FIXED	SPATIALFIDUCIAL	ALWAYS	
Presentation Description	(0070,0081)	AUTO		VNAP	
Presentation Creator's Name	(0070,0084)	AUTO		VNAP	
Fiducial Set Sequence	(0070,031C)	AUTO		ALWAYS	
>Referenced Image Sequence	(0008,1140)	AUTO		ANAP	
>>Referenced SOP Class UID	(0008,1150)	AUTO		ALWAYS	
>>Referenced SOP Instance UID	(0008,1155)	AUTO		ALWAYS	
>Frame of Reference UID	(0020,0052)	AUTO		ANAP	
>Fiducial Sequence	(0070,031E)	AUTO		ALWAYS	
>>Shape Type	(0070,0306)	FIXED	POINT	ALWAYS	
>>Fiducial Identifier	(0070,0310)	AUTO	Integer running number corresponding to number of landmark points, within the session, starting from 1 as string	ALWAYS	
>>Fiducial UID	(0070,031A)	AUTO	Is same as Fiducial Identifier (0070,0310)	ANAP	
>>Number of Contour Points	(3006,0046)	AUTO		ANAP	
>>Contour Data	(3006,0050)	AUTO		ANAP	

8.1.1.8 Deformable Spatial Registration Storage SOP Class

Table 37: IOD of created Deformable Spatial Registration Storage SOP Class Instances

IE	Module	Reference	Presence of Module
Patient	Patient Module	Table 2: Patient Module	ALWAYS
Study	General Study Module	Table 3: General Study Module	ALWAYS
Series	General Series	Table 5: General Series Module	ALWAYS
	Spatial Registration Series Module	Table 32: Spatial Registration Series	ALWAYS
Frame of Reference	Frame of Reference Module	Table 7: Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	Table 6: General Equipment Module	ALWAYS
	Enhanced General Equipment Module	Table 40: Enhanced General Equipment Module	ALWAYS
Spatial Registration	Deformable Spatial Registration Module	Table 39: Deformable Spatial Registration Module	ALWAYS
	Common Instance Reference Module	Table 13: Common Instance Reference Module	ALWAYS
	General Reference Module	Table 9: General Reference Module	OPTIONAL
	SOP Common Module	Table 12: SOP Common Module	ALWAYS

8.1.1.8.1 Spatial Registration Series Module Attributes

Table 38: Spatial Registration Series Module

Attribute	Tag	Source	Value	Presence	Comments
Modality	(0008,0060)	FIXED	REG	ALWAYS	

8.1.1.8.2 Deformable Spatial Registration Module Attributes

Table 39: Deformable Spatial Registration Module

Attribute	Tag	Source	Value	Presence	Comments
Content Date	(0008,0023)	AUTO		ALWAYS	
Content Time	(0008,0033)	AUTO		ALWAYS	
Instance Number	(0020,0013)	AUTO		ALWAYS	
Private Creator	(0029,0010)	FIXED	SIEMENS SYNGO ADVANCED PRESENTATION	ALWAYS	
Registration Creation Algorithm Name	(0029,SIEMENS SYNGO ADVANCED PRESENTATION,73)	FIXED	DeformableRegEngineRegistration	ALWAYS	
Private Creator	(0031,0010)	FIXED	SIEMENS SYNGO WORKFLOW	ALWAYS	
WF Internal Patient UID	(0031,SIEMENS SYNGO WORKFLOW,10)	COPIED		ANAP	
Deformable Registration Sequence	(0064,0002)	AUTO		ALWAYS	
>Referenced Image Sequence	(0008,1140)	AUTO		ANAP	
>>Referenced SOP Class UID	(0008,1150)	AUTO		ALWAYS	
>>Referenced SOP Instance UID	(0008,1155)	AUTO		ALWAYS	
>Source Frame of Reference UID	(0064,0003)	AUTO	Refers to input image Frame of Reference UID	ALWAYS	
>Deformable Registration Grid Sequence	(0064,0005)	AUTO		ANAP	
>>Image Position (Patient)	(0020,0032)	AUTO		ALWAYS	
>>Image Orientation (Patient)	(0020,0037)	AUTO		ALWAYS	
>>Grid Dimensions	(0064,0007)	AUTO		ALWAYS	
>>Grid Resolution	(0064,0008)	AUTO		ALWAYS	
>>Vector Grid Data	(0064,0009)	AUTO		ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
>Pre Deformation Matrix Registration Sequence	(0064,000F)	AUTO		ALWAYS	
>>Frame of Reference Transformation Matrix Type	(0070,030C)	FIXED	RIGID	ALWAYS	
>>Frame of Reference Transformation Matrix	(3006,00C6)	AUTO		ALWAYS	
>Post Deformation Matrix Registration Sequence	(0064,0010)	AUTO		ANAP	
>>Frame of Reference Transformation Matrix Type	(0070,030C)	FIXED	RIGID	ALWAYS	
>>Frame of Reference Transformation Matrix	(3006,00C6)	AUTO		ALWAYS	
>Registration Type Code Sequence	(0070,030D)	AUTO		VNAP	
>Private Creator	(0071,0010)	FIXED	SIEMENS SYNGO REGISTRATION	ALWAYS	
>Registration Is Validated Flag	(0071,SIEMENS SYNGO REGISTRATION, 21)	FIXED	NO	ALWAYS	
>Deformable Registration Inverse Grid Sequence	(0071,SIEMENS SYNGO REGISTRATION, 22)	FIXED		ALWAYS	
>>Image Position (Patient)	(0020,0032)	AUTO		ALWAYS	
>>Image Orientation (Patient)	(0020,0037)	AUTO		ALWAYS	
>>Grid Dimensions	(0064,0007)	AUTO		ALWAYS	
>>Grid Resolution	(0064,0008)	AUTO		ALWAYS	
>>Vector Grid Data	(0064,0009)	AUTO		ALWAYS	
Presentation Label	(0070,0080)	FIXED	RTISREGISTRATION	ALWAYS	
Presentation Description	((0070,0081)	FIXED	Deform_Reg	ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
Presentation Creator's Name	(0070,0084)	AUTO		VNAP	

8.1.1.8.3 Enhanced General Equipment Module Attributes

Table 40: Enhanced General Equipment Module

Attribute	Tag	Source	Value	Presence	Comments
Manufacturer	(0008,0070)	FIXED	SIEMENS Healthineers	ALWAYS	
Manufacturer's Model Name	(0008,1090)	FIXED	syngo.via.VB80C.RTEngine	ALWAYS	
Device Serial Number	(0018,1000)	FIXED		ALWAYS	
Software Versions	(0018,1020)	AUTO	VB80C	ALWAYS	

8.1.1.9 Real World Value Mapping Storage SOP Class

Table 41: IOD of created Real World Value Mapping Storage SOP Class Instances

IE	Module	Reference	Presence of Module
Patient	Patient Module	Table 2: Patient Module	ALWAYS
Study	General Study Module	Table 3: General Study Module	ALWAYS
Series	General Series	Table 5: General Series Module	ALWAYS
	Real World Value Mapping Series Module	Table 42: Real World Value Mapping Series Module	ALWAYS
Equipment	General Equipment Module	Table 6: General Equipment Module	ALWAYS
Real World Value Mapping	Real World Value Mapping Module	Table 43: Real World Value Mapping Module	ALWAYS
	Common Instance Reference Module	Table 13: Common Instance Reference Module	ALWAYS
	SOP Common Module	Table 12: SOP Common Module	ALWAYS

8.1.1.9.1 Real World Value Mapping Series Module Attributes

Table 42: Real World Value Mapping Series Module

Attribute	Tag	Source	Value	Presence	Comments
Modality	(0008,0060)	FIXED	RWV	ALWAYS	

8.1.1.9.2 Real World Value Mapping Module Attributes

Table 43: Real World Value Mapping Module

Attribute	Tag	Source	Value	Presence	Comments
Content Date	(0008,0023)	AUTO		ALWAYS	
Content Time	(0008,0033)	AUTO		ALWAYS	
Instance Number	(0020,0013)	AUTO		ALWAYS	
Private Creator	(0029,0010)	FIXED	SIEMENS SYNGO RWVM	ALWAYS	
RWVM Version	(0029,SIEMENS SYNGO RWVM,50)	AUTO	1.0	ANAP	
Private Creator	(0031,0010)	AUTO	SIEMENS SYNGO WORKFLOW	ANAP	
WF Internal Patient UID	(0031,SIEMENS SYNGO WORKFLOW,10)	COPIED		ANAP	
Referenced Image Real World Value Mapping Sequence	(0040,9094)	AUTO		ALWAYS	
>Referenced Image Sequence	(0008,1140)	AUTO		ALWAYS	
>>Referenced SOP Class UID	(0008,1150)	AUTO		ALWAYS	
>>Referenced SOP Instance UID	(0008,1155)	AUTO		ALWAYS	
>Real World Value Mapping Sequence	(0040,9096)	AUTO		ALWAYS	
>>LUT Explanation	(0028,3003)	AUTO	Same as Code Value (0008,0100) from Measurement Units Code Sequence (0040,08EA)	ALWAYS	
>>Measurement Units Code Sequence	(0040,08EA)	AUTO		ALWAYS	
>>>Code Value	(0008,0100)	USER/FIXED	Either of "SUV-bw" or "Bq/ml" or "Gy"	ALWAYS	FIXED in case of Dose as "Gy"
>>>Coding Scheme Designator	(0008,0102)	AUTO	UCUM	VNAP	
>>>Code Meaning	(0008,0104)	AUTO		ALWAYS	

Attribute	Tag	Source	Value	Presence	Comments
>>LUT Label	(0040,9210)	AUTO	Same as Code Value (0008,0100) from Measurement Units Code Sequence (0040,08EA)	ALWAYS	
>>Real World Value Last Value Mapped	(0040,9211)	FIXED	FIXED in case of Dose as "65535", for others "32767"	ALWAYS	
>>Real World Value First Value Mapped	(0040,9216)	FIXED	FIXED in case of Dose as "0" for others "-32768"	ALWAYS	
>>Real World Value Intercept	(0040,9224)	FIXED	0.0	ALWAYS	
>>Real World Value Slope	(0040,9225)	FIXED	1	ALWAYS	
Presentation Label	(0070,0080)	FIXED	L1 in case of RT Dose SOP class, otherwise Mappings	ALWAYS	
Presentation Description	(0070,0081)	FIXED	Empty	ALWAYS	
Presentation Creator's Name	(0070,0084)	AUTO		VNAP	

8.1.1.10 CT Image Storage SOP Class

Table 44: IOD of created CT Image Storage SOP Class Instances

IE	Module	Reference	Presence of Module
Patient	Patient Module	Table 2: Patient Module	ALWAYS
Study	General Study Module	Table 3: General Study Module	ALWAYS
	Patient Study Module	Table 4: Patient Study Module	OPTIONAL
Series	General Series	Table 5: General Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	Table 7: Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	Table 6: General Equipment Module	ALWAYS
Image	General Image Module	Table 8: General Image Module	ALWAYS
	General Reference Module	Table 9: General Reference Module	OPTIONAL
	Image Plane Module	Table 24: Image Plane Module	ALWAYS

IE	Module	Reference	Presence of Module
	Image Pixel Module	Table 10: Image Pixel Module	ALWAYS
	CT Image Module	Table 45: Modified attributes for CT	ALWAYS
	VOI LUT Module	Table 11: VOI LUT Module	OPTIONAL
	SOP Common Module	Table 12: SOP Common Module	ALWAYS

8.1.1.10.1 Modified Attributes

The below entries are added/edited by the **RT Image Suite** application and the remaining attributes are copied from the original input image.

CT Image IOD is supported only when the input data is from SIEMENS imaging system based on Manufacturer (0008,0070).

Table 45: Modified attributes for CT

Attribute	Tag	Source	Value	Presence	Comments
Image Type	(0008,0008)	FIXED/AUTO	DERIVED\SECONDARY\AXIAL*	ALWAYS	*SYNCT_HEAD or SYNCT_PELVIS based on the Body Part Examined (0018,0015) is BRAIN or PELVIS in case the input data is MR dataset
Series Date	(0008,0021)	AUTO		ANAP	
Series Time	(0008,0031)	AUTO		ANAP	
Content Date	(0008,0023)	AUTO		VNAP	
Content Time	(0008,0033)	AUTO		VNAP	
Instance Creation Date	(0008,0012)	AUTO		ANAP	
Instance Creation Time	(0008,0013)	AUTO		ANAP	
Image Comments	(0020,4000)	FIXED	- For HU based "SyntheticCT HU, Derived from MR images" - For RED based "SyntheticCT RED, Derived from MR images" - For RMD based "SyntheticCT RMD, Derived from MR images"	ALWAYS	
Modality	(0008,0060)	FIXED	CT	ALWAYS	
KVP	(0018,0060)	FIXED	120	ALWAYS	
Acquisition Number	(0020,0012)	FIXED	Empty	ALWAYS	
Private Creator	(0021,0010)	COPIED		ANAP	
Creator Identifier	(0021, SIEMENS MR SDR 01,01)	COPIED		ANAP	

Attribute	Tag	Source	Value	Presence	Comments
Application Identifier	(0021, SIEMENS MR SDR 01,02)	COPIED		ANAP	
Samples per Pixel	(0028,0002)	AUTO		ALWAYS	
Photometric Interpretation	(0028,0004)	FIXED	MONOCHROME2	ALWAYS	
Bits Allocated	(0028,0100)	AUTO		ALWAYS	Calculated based on input image by the Algorithm
Bits Stored	(0028,0101)	AUTO		ALWAYS	Calculated based on input image by the Algorithm
High Bit	(0028,0102)	AUTO		ALWAYS	Calculated based on input image by the Algorithm
Rescale Intercept	(0028,1052)	FIXED	-1024.0	ALWAYS	
Rescale Slope	(0028,1053)	FIXED	1.0	ALWAYS	
Rescale Type	(0028,1054)	FIXED	HU	ALWAYS	
Manufacturer	(0008,0070)	FIXED	SIEMENS Healthineers	ALWAYS	
Software Versions	(0018,1020)	FIXED	VB80C	ALWAYS	
Manufacturer's Model Name	(0008,1090)	FIXED	syngo.via.VB80C	ALWAYS	
Series Description	(0008,103E)	USER/FIXED	- USER for Synthetic CT IOD with prefixed value "SyntheticCT" and "HU" for HU based generation, "RED" for RED based generation, "RMD" for RMD based generation While generating multiphase split series below conditions apply with description length not exceeding 64 characters - FIXED for 4D CT input images with format of "<Original series description> <Space><Phase Info><Space><TPS_SORT><Space><Phase number><%> If Original series description contains percentage signs, task shall remove percentage signs from Original series	ANAP	

Attribute	Tag	Source	Value	Presence	Comments
			description as part of resultant series name. In 4D amplitude reconstruction images, Phase Info shall be <Phase value><Space> <Ex/In> - FIXED for 3D input images with format of "<original series description><Space><x>" where x is running number		

8.1.1.11 MR Image Storage SOP Class

Table 46: IOD of created MR Image Storage SOP Class Instances

IE	Module	Reference	Presence of Module
Patient	Patient Module	Table 2: Patient Module	ALWAYS
Study	General Study Module	Table 3: General Study Module	ALWAYS
	Patient Study Module	Table 4: Patient Study Module	OPTIONAL
Series	General Series	Table 5: General Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	Table 7: Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	Table 6: General Equipment Module	ALWAYS
Image	General Image Module	Table 8: General Image Module	ALWAYS
	General Reference Module	Table 9: General Reference Module	OPTIONAL
	Image Plane Module	Table 24: Image Plane Module	ALWAYS
	Image Pixel Module	Table 10: Image Pixel Module	ALWAYS
	MR Image Module	Table 47: Modified attributes for MR	ALWAYS
	VOI LUT Module	Table 11: VOI LUT Module	OPTIONAL
	SOP Common Module	Table 12: SOP Common Module	ALWAYS

8.1.1.11.1 Modified Attributes

The below entries are added/edited by the **RT Image Suite** application and remaining attributes are copied from the original input image.

Table 47: Modified attributes for MR

Attribute	Tag	Source	Value	Presence	Comments
Image Type	(0008,0008)	AUTO	DERIVED\SECONDARY*	ALWAYS	*Remaining values are copied from input image apart from "DERIVED\SECONDARY"
Series Date	(0008,0021)	AUTO		ANAP	
Series Time	(0008,0031)	AUTO		ANAP	
Content Date	(0008,0023)	AUTO		VNAP	
Content Time	(0008,0033)	AUTO		VNAP	
Instance Creation Date	(0008,0012)	AUTO	Date the SOP Instance was created	ANAP	
Instance Creation Time	(0008,0013)	AUTO	Time the SOP Instance was created	ANAP	
Modality	(0008,0060)	FIXED	MR	ALWAYS	
Series Description	(0008,103E)	FIXED	- For 4D MR diffusion series input images with format of " "<original series description><space><BValue> " - For MR Dynamic input Images with format of " "<original series description>_TPS_SORT<<Phase number>>% "	ALWAYS	
Manufacturer	(0008,0070)	FIXED	SIEMENS Healthineers	ALWAYS	
Software Versions	(0018,1020)	FIXED	VB80C	ALWAYS	
Manufacturer's Model Name	(0008,1090)	FIXED	syngo.via.VB80C	ALWAYS	

8.1.1.12 Positron Emission Tomography Image Storage SOP Class

Table 48: IOD of created Positron Emission Tomography Image Storage SOP Class Instances

IE	Module	Reference	Presence of Module
Patient	Patient Module	Table 2: Patient Module	ALWAYS
Study	General Study Module	Table 3: General Study Module	ALWAYS
	Patient Study Module	Table 4: Patient Study Module	OPTIONAL
Series	General Series	Table 5: General Series Module	ALWAYS
	PET Series Module	No changes made, COPIED from input images	ALWAYS
	PET Isotope Module	No changes made, COPIED from input images	ALWAYS
	PET Multi-Gated Acquisition Module	No changes made, COPIED from input image	CONDITIONAL Required if Series Type (0054,1000) Value 1 is GATED
	NM/PET Patient Orientation Module	No changes made, COPIED from input images	ALWAYS
Frame of Reference	Frame of Reference Module	Table 7: Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	Table 6: General Equipment Module	ALWAYS
Image	General Image Module	Table 8: General Image Module	ALWAYS
	General Reference Module	Table 9: General Reference Module	OPTIONAL
	Image Plane Module	Table 24: Image Plane Module	ALWAYS
	Image Pixel Module	Table 10: Image Pixel Module	ALWAYS
	PET Image Module	Table 49:	ALWAYS
	VOI LUT Module	Table 11: VOI LUT Module	OPTIONAL
	SOP Common Module	Table 12: SOP Common Module	ALWAYS

8.1.1.12.1 Modified Attributes

The below entries are added/edited by the **RT Image Suite** application and remaining attributes are copied from the original input image

Table 49: Modified Attributes

Attribute	Tag	Source	Value	Presence	Comments
Image Type	(0008,0008)	FIXED	DERIVED\SECONDARY*	ALWAYS	*Remaining values are copied from input image and appended further.
Series Date	(0008,0021)	AUTO		ANAP	
Series Time	(0008,0031)	AUTO		ANAP	
Content Date	(0008,0023)	AUTO		VNAP	
Content Time	(0008,0033)	AUTO		VNAP	
Instance Creation Date	(0008,0012)	AUTO	Date the SOP Instance was created	ANAP	
Instance Creation Time	(0008,0013)	AUTO	Time the SOP Instance was created	ANAP	
Modality	(0008,0060)	FIXED	PT	ALWAYS	
Series Description	(0008,103E)	AUTO		ANAP	With the format of "<Original series description><Space><Phase number>"
Manufacturer	(0008,0070)	FIXED	SIEMENS Healthineers	ALWAYS	
Software Versions	(0018,1020)	FIXED	VB80C	ALWAYS	
Manufacturer's Model Name	(0008,1090)	FIXED	syngo.via.VB80C	ALWAYS	

8.1.1.13 Secondary Capture Image SOP Class

Table 50: IOD of created Secondary Capture Image Storage SOP Class Instances

IE	Module	Reference	Presence of Module
Patient	Patient Module	Table 2: Patient Module	ALWAYS
Study	General Study Module	Table 3: General Study Module	ALWAYS
	Patient Study Module	Table 4: Patient Study Module	OPTIONAL
Series	General Series	Table 5: General Series Module	ALWAYS
Equipment	General Equipment Module	Table 6: General Equipment Module	OPTIONAL
	SC Equipment Module	Table 51: SC Equipment Module	ALWAYS
Image	General Image Module	Table 8: General Image Module	ALWAYS
	General Reference Module	Table 9: General Reference Module	OPTIONAL
	Image Pixel Module	Table 10: Image Pixel Module	ALWAYS
	SC Image Module	Table 52: SC Image Module	ALWAYS
	SOP Common Module	Table 12: SOP Common Module	ALWAYS

8.1.1.13.1 SC Equipment Module Attributes

Table 51: SC Equipment Module

Attribute	Tag	Source	Value	Presence	Comments
Modality	(0008,0060)	COPIED		ANAP	
Conversion Type	(0008,0064)	FIXED	WSD	ALWAYS	
Secondary Capture Device ID	(0018,1010)	USER	syngo.via	ANAP	
Secondary Capture Device Manufacturer	(0018,1016)	FIXED	SIEMENS Healthineers	ALWAYS	
Secondary Capture Device Software Versions	(0018,1019)	FIXED	VB80C	ALWAYS	

8.1.1.13.2 SC Image Module Attributes

Table 52: SC Image Module

Attribute	Tag	Source	Value	Presence	Comments
Date of Secondary Capture	(0018,1012)	AUTO		ANAP	
Time of Secondary Capture	(0018,1014)	AUTO		ANAP	
Pixel Spacing	(0028,0030)	AUTO		VNAP	

8.1.2 Usage of Attributes from Received IODs

N/A

8.1.3 Attribute Mapping

N/A

8.1.4 Coerced/Modified Fields

N/A

8.2 Data Dictionary of Private Attributes

Table 53: Private Data Element Dictionary

DICOM Tag	Name	VR	VM	Safe from Identity Leakage
(0029,SIEMENS CT RT Structure Set,01)	Rt ROI Locked Status	LO	1	YES
(0029, SIEMENS CT RT Structure Set,02)	Rt Reference Point Token	UL	1	YES
(0071,SIEMENS SYNGO REGISTRATION,20)	Registered Image Sequence	SQ	1	YES
(0071,SIEMENS SYNGO REGISTRATION,21)	Registration Is Validated Flag	CS	1	YES
(0071,SIEMENS SYNGO REGISTRATION,22)	Deformable Registration Inverse Grid Sequence	SQ	1	YES
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,73)	Registration Creation Algorithm Name	LO	1	YES
(0031,SIEMENS SYNGO WORKFLOW,10)	WF Internal Patient UID	UI	1	YES
(0029,SIEMENS SYNGO RWVM,50)	RWVM Version	LO	1	YES
(0029, SIEMENS CSA REPORT, 08)	PLAIN_VIEWING	CS	1	YES
(0029,SIEMENS CSA REPORT,09)	syngo Report Version	LO	1	YES
(0077, SIEMENS SYNGO EVIDENCE DOCUMENT DATA,10)	PlainViewingReport	LO	1	YES
(0077, SIEMENS SYNGO EVIDENCE DOCUMENT DATA,11)	Evidence Document Template Version	DS	1	YES
(0077, SIEMENS SYNGO EVIDENCE DOCUMENT DATA,20)	Evidence Document Clinical Finding Data	OB	1	YES
(0077, SIEMENS SYNGO EVIDENCE DOCUMENT DATA,21)	Evidence Document Metadata	OB	1	YES
(0077, SIEMENS SYNGO EVIDENCE DOCUMENT DATA,30)	Evidence Document Implementation Version	DS	1	YES
(0077, SIEMENS SYNGO EVIDENCE DOCUMENT DATA,40)	Evidence Document Predecessor	OB	1	YES
(0077, SIEMENS SYNGO EVIDENCE DOCUMENT DATA,50)	Evidence Document Logical ID	LO	1	YES
(0077, SIEMENS SYNGO EVIDENCE DOCUMENT DATA,60)	Evidence Document Application Data	OB	1	YES
(0077, SIEMENS SYNGO EVIDENCE DOCUMENT DATA,70)	RT Image Suite	LO	1	YES

DICOM Tag	Name	VR	VM	Safe from Identity Leakage
(0077, SIEMENS SYNGO EVIDENCE DOCUMENT DATA,71)	RTIS	LO	1	YES
(0077, SIEMENS SYNGO EVIDENCE DOCUMENT DATA,72)	Evidence Document Owner Supported Templates	OB	1	YES
(0077, SIEMENS SYNGO EVIDENCE DOCUMENT DATA,80)	Evidence Document Volume Catalog	OB	1	YES
(0087,SIEMENS SYNGO ENCAPSULATED DOCUMENT DATA,20)	Study Model	UT	1	YES
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B1)	ImageText View Name	ST	1	YES
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B2)	ImageText View Content Sequence	SQ	1	YES
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B2)	ImageText View Content Sequence	SQ	1	YES
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B3)	ImageText Line Names	LO	1-n	YES
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,B4)	ImageText Line Values	LO	1-n	YES
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,BC)	ImageText ViewID	ST	1	YES
(0029,SIEMENS SYNGO ADVANCED PRESENTATION,BD)	Unlinked Image Text View Name	ST	1	YES
(0029,SIEMENS MEDCOM HEADER,20)	Platform History	OB	1	YES
(0029,SIEMENS MEDCOM HEADER,40)	Application Header Sequence	SQ	1	YES
(0029,SIEMENS MEDCOM HEADER,41)	Application Header Type	CS	1	YES
(0029,SIEMENS MEDCOM HEADER,42)	Application Header ID	LO	1	YES
(0029,SIEMENS MEDCOM HEADER,43)	Application Header Version	LO	1	YES
(0029,SIEMENS CSA HEADER,18)	Modality Series Header Type	CS	1	YES
(0029,SIEMENS CSA HEADER,19)	Modality Series Header Version	LO	1	YES
(0029,SIEMENS CSA HEADER,20)	Modality Series Header Info	OB	1	YES
(0071,SIEMENS MED PT,22)	Decay Correction DateTime	DT	1	YES
(0071,SIEMENS MED PT,24)	Table Motion	CS	1	YES
(0021, SIEMENS MR SDR 01,01)	Creator Identifier	LO	1	YES
(0021, SIEMENS MR SDR 01,02)	Application Identifier	LO	1	YES

8.3 Coded Terminology and Templates

8.3.1 Context Groups

N/A

8.3.2 Template Specifications

N/A

8.3.3 Private Code definitions

N/A

8.4 Grayscale Image Consistency

N/A

8.5 Standard Extended / Specialized / Private SOP Classes

This section describes the Standard Extended SOP Class, Specialized SOP Class, or Private SOP Class that are used.

SOP Class Name	SOP Class UID	Reference
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	8.1.1.2
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	8.1.1.3
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	8.1.1.4
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	8.1.1.5
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	8.1.1.6
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	8.1.1.8
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	8.1.1.9
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	8.1.1.10
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	8.1.1.11
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	8.1.1.12

8.6 Private Transfer Syntaxes

N/A

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