DICOM Conformance Statement

AI-Rad Companion

SIEMENS Healthineers

1 Conformance Statement Overview

AI-Rad Companion is a cloud-based/on-premise application that consists of cloud/edge resources that store DICOM and other data, and individual services that operate on them. It communicates indirectly with other DICOM nodes because it makes use of the network services provided by ***teamplay DICOM Hub*** and ***teamplay Receiver***.

AI-Rad Companion services:

- Receive input DICOM data from ***teamplay DICOM Hub*** after a storage request to ***teamplay Receiver*** using the configurable AET "AIRC" or "AIRC-RT" (for Organs RT extension).
- Store result DICOM data via ***teamplay DICOM Hub*** and ***teamplay Receiver*** to a target DICOM node configured in ***teamplay DICOM Hub.***
- Calculate derived DICOM images, SR documents and RT Structure Sets to provide additional clinical information to support diagnosis.
- Display images to a user (browser-based viewer application).

AI-Rad Companion conforms to the DICOM Standard [2] and supports the network services through ***teamplay DICOM Hub*** and ***teamplay Receiver*** as described in Table 1 - Network Services, and the media services as described in Table 2 – Media Services. Please refer to the DICOM Conformance Statements of ***teamplay DICOM Hub*** and ***teamplay Receiver*** [1] for further information on the provided network services.

This DCS is applicable for the following products and versions:

Product Name	Version
AI-Rad Companion Engine	VA32
AI-Rad Companion Brain MR	VA40
AI-Rad Companion Prostate MR	VA40
AI-Rad Companion Chest X-ray	VA60
AI-Rad Companion Chest CT Musculoskeletal	VA21
AI-Rad Companion Chest CT Cardiovascular	VA21
AI-Rad Companion Chest CT Pulmonary	VA30
AI-Rad Companion Organs RT	VA40

Table 1 - Network Services

SOP Classes	SOP Class UID	User of Service (SCU)		Provider of Service (SCP)	
SOP Classes managed by *AI-Rad Companion.*					
		Create	**Send**	**Store**	**Display**
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Yes	Yes	No
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	No	Yes	Yes	No
Digital X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	No	Yes	Yes	No
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	No	Yes	Yes	No
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	No	Yes	Yes	No
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes	Yes	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	No	Yes	Yes	No
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	No	Yes	Yes	No
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes	Yes	Yes
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	No	Yes	Yes	No
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	No	Yes	Yes	No
Enhanced MR Color Image Storage	1.2.840.10008.5.1.4.1.1.4.3	No	Yes	Yes	No
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	No	Yes	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes	Yes	Yes
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	No	Yes	Yes	No
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	No	Yes	Yes	No
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	No	Yes	Yes	No
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	No	Yes	Yes	No
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	No	Yes	Yes	No
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	No	Yes	Yes	No
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	No	Yes	Yes	No
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	No	Yes	Yes	No
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	No	Yes	Yes	No
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes	Yes	No
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	No	Yes	Yes	No
Pseudo-Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.3	No	Yes	Yes	No
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	No	Yes	Yes	No
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	No	Yes	Yes	No
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	No	Yes	Yes	No
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	No	Yes	Yes	No
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	No	Yes	Yes	No

SOP Classes	SOP Class UID	User of Service (SCU)		Provider of Service (SCP)	
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	No	Yes	Yes	No
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3	No	Yes	Yes	No
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	No	Yes	Yes	No
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	No	Yes	Yes	No
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	No	Yes	Yes	No
Deformable Spatial Registration SOP Class	1.2.840.10008.5.1.4.1.1.66.3	No	Yes	Yes	No
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	No	Yes	Yes	No
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	No	Yes	Yes	No
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	No	Yes	Yes	No
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	No	Yes	Yes	No
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes	Yes	No
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes	Yes	No
Procedure Log Storage Storage	1.2.840.10008.5.1.4.1.1.88.40	No	Yes	Yes	No
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	No	Yes	Yes	No
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59	No	Yes	Yes	No
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	No	Yes	Yes	No
Encapsulated PDF Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.1	No	Yes	Yes	No
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	No	Yes	Yes	No
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	No	Yes	Yes	No
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	No	Yes	Yes	No
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes	Yes	No
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	No	Yes	Yes	No
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	No	Yes	Yes	No
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	No	Yes	Yes	No
Transfer (Private SOP Class)					
syngo Non-Image Storage	1.3.12.2.1107.5.9.1	Yes		Yes	
Storage Commitment					
N/A	N/A	N/A		N/A	
Worklist Management					
N/A	N/A	N/A		N/A	
Query/Retrieve					
N/A	N/A	N/A		N/A	
Print Management					
N/A	N/A	N/A		N/A	

Table 2 – Media Services

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disk - Recordable		
N/A	N/A	N/A
DVD		
N/A	N/A	N/A
USB		
N/A	N/A	N/A

Table 3 - Implementation Identifying Information

Name	Value
Implementation Class UID	1.3.12.2.1107.5.8.21

2 Table of Contents

3 Introduction

3.1 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.

3.2 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between ***AI-Rad Companion*** and other DICOM conformant products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [2]. 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 between ***AI-Rad Companion*** and other DICOM conformant equipment.
- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipement, as established by the healthcare facility.

Siemens Heathineers 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.

3.3 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:

AE	DICOM Application Entity
AET	Application Entity Title
ASCII	American Standard Code for Information Interchange
DCS	DICOM Conformance Statement
DICOM	Digital Imaging and Communications in Medicine
FSC	File Set Creator
FSR	File Set Reader
FSU	File Set Updater
GSDF	Grayscale Standard Display Function
IOD	DICOM Information Object Definition
ISO	International Standard Organization
N/A	Not Applicable
NEMA	National Electrical Manufacturers Association
O	Optional Key Attribute
PDU	DICOM Protocol Data Unit
R	Required Key Attribute
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM Server)
SOP	DICOM Service-Object Pair

SR	DICOM Structured Report
TID	Template ID
U	Unique Key Attribute
UID	Unique Identifier
UTF-8	Unicode Transformation Format-8
VR	Value Representation

3.4 References

[1] DICOM Conformance Statements of teamplay: - https://www.siemens-healthineers.com/en-in/services/it-standards/dicom-conformance-statements-digital-and-automation/teamplay

[2] NEMA PS3 / ISO 12052, Digital Imaging and Communications in Medicine (DICOM) Standard, National Electrical Manufacturers Association, Rosslyn, VA, USA (available free at http://medical.nema.org/)

[3] AI-Rad Companion Data Privacy and Security White Paper: - https://intranet.for.healthineers.siemens.com/cms/sv-ds/en/business/products/Pages/AI-Rad-Companion.aspx. [Based on on-demand request from the end users]

[4] Teamplay Data Privacy and Security White Paper: - https://intranet.for.healthineers.siemens.com/cms/sv-ds/en/business/products/Pages/teamplay.aspx. [Based on on-demand request from the end users]

4 Networking

Please refer to the latest version of DICOM Conformance Statements of ***teamplay DICOM Hub*** and ***teamplay Receiver*** [1] for further information on the provided networking capabilites for ***AI-Rad Companion.***

5 Media Interchange

AI-Rad Companion is not providing any means for media interchange.

6 Support of Extended Character Sets

6.1 Character sets for AI-Rad Companion

AI-Rad Companion DICOM application supports the following character sets as defined in the four tables below when data minimization is switched off in teamplay privacy settings.

Table 4- Single-Byte Character Sets without Code Extension

Character Set Description	Defined Term	ISO registration number	Character Set
Default repertoire	None	ISO_IR 6	ISO 646
Latin alphabet No. 1	ISO_IR 100	ISO_IR 100	Supplementary set
		ISO_IR 6	ISO 646
Latin alphabet No. 2	ISO_IR 101	ISO_IR 101	Supplementary set
		ISO_IR 6	ISO 646
Latin alphabet No. 3	ISO_IR 109	ISO_IR 109	Supplementary set
		ISO_IR 6	ISO 646
Latin alphabet No. 4	ISO_IR 110	ISO_IR 110	Supplementary set
		ISO_IR 6	ISO 646
Latin alphabet No. 5	ISO_IR 148	ISO_IR 148	Supplementary set
		ISO_IR 6	ISO 646
Cyrillic	ISO_IR 144	ISO_IR 6	Supplementary set
		ISO_IR 6	ISO 646
Arabic	ISO_IR 127	ISO_IR 127	Supplementary set
		ISO_IR 6	ISO 646
Greek	ISO_IR 126	ISO_IR 126	Supplementary set
		ISO_IR 6	ISO 646
Hebrew	ISO_IR 138	ISO_IR 138	Supplementary set
		ISO_IR 6	ISO 646
Japanese	ISO_IR 13	ISO_IR 13	JIS X 0201: Katakana
		ISO_IR 14	JIS X 0201: Romaji
Thai	ISO_IR 166	ISO_IR 166	TIS 620-253 (1990)
		ISO_IR 6	ISO 646

Table 5 - Single-Byte Characters Sets with Code Extension

Character Set Description	Defined Term	Standard for Code Extension	ESC sequence	ISO registration number	Character Set
Default repertoire	ISO 2022 IR 6	ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Latin alphabet No.1	ISO 2022 IR 100	ISO 2022	ESC 02/13 04/01	ISO-IR 100	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Latin alphabet No.2	ISO 2022 IR 101	ISO 2022	ESC 02/13 04/02	ISO-IR 101	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Latin alphabet No.3	ISO 2022 IR 109	ISO 2022	ESC 02/13 04/03	ISO-IR 109	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Latin alphabet No. 4	ISO 2022 IR 110	ISO 2022	ESC 02/13 04/04	ISO-IR 110	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646
Latin alphabet No. 5	ISO 2022 IR 148	ISO 2022	ESC 02/13 04/13	ISO-IR 148	Supplementary set
		ISO 2022	ESC 02/08 04/02	ISO-IR 6	ISO 646

Table 6 - Multi-Byte Character Sets without Code Extension

Character Set Description	Defined Term	ISO registration number	Character Set
Unicode	ISO_IR 192	ISO 10646	Unicode in UTF-8
Chinese	GB18030	GB18030	GB 18030-2000 (China Association for Standardization)

Table 7 - Multi-Byte Character Sets with Code Extension

Character Set Description	Defined Term	Standard for Code Extension	ESC sequence	ISO registration number	Character Set
Japanese	ISO 2022 IR 159	ISO 2022	ESC 02/04 02/08 04/04	ISO-IR 159	JIS X 0212: Supplementary Kanji set
Korean	ISO 2022 IR 149	ISO 2022	ESC 02/04 02/09 04/03	ISO-IR 149	KS X 1001: Hangul and Hanja

All SCS (Special Character Sets) listed above are supported for incoming Data.

There are now three categories of character sets which have to be differentiated because of their different encoding formats:

- Conventional ISO character sets: ISO_IR 6, ISO 2022 IR 6, ISO_IR 100, etc.→ Encoded in ISO 2022
- ISO_IR 192 → Encoded in UTF-8
- GB18030 → Encoded in GB18030

It is not possible to recognize the following mismatches automatically on receiving or importing:

- An attribute value is encoded in ISO_IR 192 ← → (0008,0005) contains a conventional ISO character set as primary character set
- An attribute value is encoded in GB18030 ← → (0008,0005) contains a conventional ISO character set as primary character set
- An attribute value is encoded in ISO 2022 ← → (0008,0005) contains ISO_IR 192
- An attribute value is encoded in ISO 2022 ← → (0008,0005) contains GB18030

An IOD that contains one of the above-mentioned inconsistencies does not conform to DICOM. As these kinds of inconsistencies cannot be recognized by the system, the IOD will not be rejected but the character data might be corrupted.

AI-Rad Companion supports Kanji characters in the byte zone after 74 (79, 7A, 7B and 7C).

Please refer to the DICOM Conformance Statements of ***teamplay DICOM Hub*** and ***teamplay Receiver*** [1] for further information on the support of Extended Character Sets for ***AI-Rad Companion.***

7 Attribute confidentiality profiles

7.1 De-identification

Please refer to the ***AI-Rad Companion Data Privacy and Security White Paper*** [3] for further information on the support of de-identification of attributes natively for ***AI-Rad Companion*** Cloud deployment. In case of edge (on-premise) deployment, no de-identification happens from teamplay.

For more information on individual privacy levels, please refer to ***teamplay Data Privacy and Security White Paper*** [4].

8 Security

8.1 Security Profiles

As stated in the DICOM Conformance Statements of ***teamplay Receiver*** and ***teamplay DICOM Hub*** [1], the ***AI-Rad Companion*** is not supporting any specific security profiles.

8.2 Association Level Security

It is possible to configure in teamplay configuration whether the SCP will only answer to known AETs or to any AET.

8.3 Application Level Security

- A User must login with own password
- For configuration and maintenance, a Service Technician must login with a separate password.

9 Annexes

9.1 IOD Contents

9.1.1 Created SOP Instance(s)

AI-Rad Companion creates objects of the following SOP Classes during processing.

Table 8 - List of created SOP Classes (Chest CT)

SOP Class Name	SOP Class UID
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33

Note:

1) Value 4 in DICOM tag Image Type (0008,0008) is used in the secondary capture result series to indicate the projection type of the reconstructed objects, namely
   - MPR_THICK
   - CVRT

Table 9 - List of created SOP Classes (Prostate MR)

SOP Class Name	SOP Class UID
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33

Table 10- List of created SOP Classes (Brain MR)

SOP Class Name	SOP Class UID
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22

Note:

1) Colors superimposed algorithm results are encoded using MR Image Storage (1.2.840.10008.5.1.4.1.1.4) in the following result series
   - <OriginalInputSeriesDescription>_Morpho_Deviation
   - <OriginalInputSeriesDescription>_Morpho_Fused_Deviation
   - <OriginalInputSeriesDescription>_Morpho_Label
   - <OriginalInputSeriesDescription>_Morpho_Fused_Label
   - <OriginalInputSeriesDescription>_WMH_Label
   - <OriginalInputSeriesDescription>_WMH_Fused_Label

   The objects violating the MR Image Storage IOD using the following attribute values are
   - (0028,0002) Samples per pixel as 3
   - (0028,0004) Photometric Interpretation as "RGB"
   - (0028,0100) Bits Allocated as 8

2) In Enhanced SR IOD, Device UID (0018, 1002) added as part of Contributing equipment sequence (0018,A001) is a violation of DICOM standard.This can be considered as standard extended SOP class UID. There is a request [Change request ID (DICOM CP2062) to add Device UID to the Contributing equipment sequence.

Table 11 - List of created SOP Classes (Organs RT)

SOP Class Name	SOP Class UID
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3

Table 12 – List of created SOP Classes (Chest X-ray)

SOP Class Name	SOP Class UID
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1

9.2 Data Dictionary of Private Attributes

The following Table 13 - Private Data Element Dictionary – Prostate MR lists all private attributes created by ***AI-Rad Companion Prostate MR*** which may be included in the generated instances.

Table 13 - Private Data Element Dictionary – Prostate MR

Tag	Private Owner Code	Name	VR	VM	Description
(0021, xx01)	SIEMENS MR SDR 01	CreatorIdentifier	LO	1	Character string
(0021, xx02)	SIEMENS MR SDR 01	ApplicationIdentifier	LO	1	Character string
(0021, xx01)	SIEMENS MR AIRC	glandVolume	FD	1	Floating point double value (ml)
(0021, xx02)	SIEMENS MR AIRC	psa	FD	1	Floating point double value (ng/ml)
(0021, xx03)	SIEMENS MR AIRC	psaDensity	FD	1	Floating point double value (ng/ml2)

The following Table 14- Private Data Element Dictionary – Brain MR lists all private attributes created by ***AI-Rad Companion Brain MR*** which may be included in the generated instances.

Table 14- Private Data Element Dictionary – Brain MR

Tag	Private Owner Code	Name	VR	VM	Description
(0021, xxD0)	SIEMENS MR NEURO	AlgoVersion	LO	1	Character string
(0021, xxD1)	SIEMENS MR NEURO	NormativeRangePercentile	DS	1	A decimal string shall contain the characters range between 0-1
(0021, xxD3)	SIEMENS MR NEURO	LMBlendFactor	DS	1	A decimal string shall contain the characters range between 0-1
(0021, xxD4)	SIEMENS MR NEURO	DMBlendFactor	DS	1	A decimal string shall contain the characters range between 0-1
(0021, xx01)	SIEMENS MR SDR 01	CreatorIdentifier	LO	1	Character string
(0021, xx02)	SIEMENS MR SDR 01	ApplicationIdentifier	LO	1	Character string

The following Table 15- Private Data Element Dictionary – Chest X-ray lists all private attributes created by ***AI-Rad Companion Chest X-ray*** which may be included in the generated instances.

Table 15- Private Data Element Dictionary – Chest X-ray

Tag	Private Owner Code	Name	VR	VM	Description
(0015, xx10)	AI-Rad Companion Chest X-ray	Pneumothorax AI score	IS	1	Integer string between 1 to 10
(0015, xx11)	AI-Rad Companion Chest X-ray	Pleural Effusion AI score	IS	1	Integer string between 1 to 10
(0015, xx12)	AI-Rad Companion Chest X-ray	Lesions AI score	IS	1	Integer string between 1 to 10
(0015, xx13)	AI-Rad Companion Chest X-ray	Consolidation AI score	IS	1	Integer string between 1 to 10
(0015, xx14)	AI-Rad Companion Chest X-ray	Atelectasis AI score	IS	1	Integer string between 1 to 10
(0015, xx15)	AI-Rad Companion Chest X-ray	Abnormality indicator	IS	1	Integer string – 0 or 1: '1' if there is at least one finding abnormal, '0' otherwise.

The following Table 16- Private Data element Dictionary- Chest CT lists all private attributes created by ***AI-Rad Companion Chest CT*** which may be included in the generated instances.

Table 16- Private Data Element Dictionary- Chest CT

Tag	Private Owner Code	Name	VR	VM	Description
(0029,xx7e)	SIEMENS SYNGO ADVANCED PRESENTATION	Fused Presentation LUT	CS	1	Coded String

Note: If any of the finding(s) are disabled due to feature toggle, in such cases the private attribute for that finding shall not be created.

9.2.1 Usage of Attributes from received IODs

N/A

9.2.2 Attribute mapping

N/A.

9.2.3 Coerced / Modified fields

N/A

9.3 Coded Terminology and Templates

N/A

9.3.1 Context Groups

N/A

9.3.2 Template Specifications

AI-Rad Companion Chest X-ray will generate the results in the form of Comprehensive DICOM SR represented in TID 1500 Measurement Report format. Please see the following table for an overview of DICOM attributes and their values corresponding to this Measurement Report template.

Table 17– TID 1500 Measurement Report for Comprehensive DICOM SR – Chest X-ray

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
		Code	EV(111017,DCM,CAD Processing and Findings Summary)	(111242, DCM, All algorithms succeeded; with findings) OR (111241, DCM, All algorithms succeeded; without findings)	4001
		Code	EV (111064, DCM, "Summary of Detections")	(111222, DCM, Succeeded)	4000
>	INFERRED FROM	CONTAINER	EV (111063, DCM, "Successful Detections")		4015
>>	CONTAINS	Code	EV (111022, DCM, "Detection Performed")	(CHESTXRAY001, 99SHSAIRC, AI-Rad Companion Chest X-ray)	4017
>>>	HAS PROPERTIES	TEXT	EV (111001, DCM, "Algorithm Name")	Assessment of AP view for 2 findings (Pneumothorax, Consolidation) OR Assessment of PA view for 5 findings	4019

				(Pneumothorax, Pleural Effusion, Pulmonary Lesions, Consolidation, Atelectasis)	
>>>	HAS PROPERTIES	TEXT	EV (111003, DCM, "Algorithm Version")	Version of the algorithm where the findings were found For example: 9.0	4019
>>>	HAS PROPERTIES	IMAGE		Contains the reference to the original input image	401
		CONTAINER	EV (126000, DCM, "Imaging Measurement Report")		1500
>	CONTAINS	CONTAINER	EV (126010, DCM, "Imaging Measurements")		1500
>>	CONTAINS	CONTAINER	EV (125007, DCM, "Measurement Group")		1410
>>>	HAS OBS CONTEXT	TEXT	DT (112039, DCM, "Tracking Identifier")	Lesion / PleuralEffusion / Pneumothorax / Consolidation / Atlectasis.	1410
>>>	HAS OBS CONTEXT	UIDREF	EV (112040, DCM, "Tracking Unique Identifier")	Uniquely generated	1410
>>>	CONTAINS	CODE	EV (121071, DCM, "Finding")	A coded representation of the finding, using Radlex codes, that can take one of the following values:- 1) (RID28493, RADLEX, Atelectasis) 2) (RID34539 ,RADLEX, Pleural effusion) 3) (RID43255, RADLEX, Consolidation) 4) (RID38780, RADLEX, Lesion) 5) (RID5352, RADLEX, Pneumothorax) 6) (111241, DCM, All algorithms succeeded: without findings)	1410
>>>	CONTAINS	SCOORD	EV (111030, DCM, "Image Region")		1410
>>>>	SELECTED FROM	IMAGE		Original image	1410
>>>	CONTAINS	NUM	(RID29, RADLEX, "Confidence")	UNITS = EV (1, UCUM, "no units")	1410
>>>>	HAS CONCEPT MOD	TEXT	EV (111012, DCM, "Certainty of Finding")	VALUE = Confidence range (1 - low to 10 - high)	1410
>>>	CONTAINS	TEXT	EV (121106, DCM, “Comment”)	AI Confidence score should be always interpreted as the non-diagnostic likelihood of the findings.	1410
>	HAS CONCEPT MOD	CODE	EV (121049, DCM, "Language of Content Item and Descendants")	(eng, ISO639_2,"English")	1204
>>	HAS CONCEPT MOD	CODE	EV (121046, DCM, "Country of Language")	(US, ISO3166_1,"United States")	1204
>	HAS OBS CONTEXT	CODE	EV (121005, DCM, "Observer Type")	(121007, DCM, "Device")	1002
>	HAS OBS CONTEXT	UIDREF	EV (121012, DCM, "Device Observer UID")	Same as Device UID (0018,1002)	1004
>	HAS OBS CONTEXT	TEXT	EV (121014, DCM, "Device Observer Manufacturer")	Same as Manufacturer (0008,0070)	1004
>	HAS OBS CONTEXT	TEXT	EV (121015, DCM, "Device Observer Model Name")	Same as Manufacturer’s Model Name (0008,1090)	1004
>	HAS CONCEPT MOD	CODE	EV (121058, DCM, "Procedure reported")	(RPID2502, RADLEX, XR Chest 1 View)	1500
>	CONTAINS	CONTAINER	EV (111028, DCM, "Image Library")		1600
>>	CONTAINS	CONTAINER	EV (126200, DCM, "Image Library Group")		1600
>>>	CONTAINS	IMAGE		Contains 2 images - One for Original image/Secondary Capture image	1601
>>>	HAS ACQ CONTEXT	CODE	EV (121139, DCM, "Modality")	Digital Radiography (DX)/Computed Radiography (CR)/Other Modality (OT)	1602
>>>	HAS ACQ CONTEXT	CODE	EV (111060, DCM, "Study Date")	Copied from Original image	1602

>>>	HAS ACQ CONTEXT	CODE	EV (111061, DCM, "Study Time")	Copied from Original image	1602

AI-Rad Companion Chest CT will generate the results in the form of Comprehensive DICOM SR represented in TID 1500 Measurement Report format. Please see the below tables for an overview of DICOM attributes and their values corresponding to this Measurement Report template.

Table 18 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
		CONTAINER	EV (126000, DCM, "Imaging Measurement Report")	Imaging Measurement Report	1500
>	HAS CONCEPT MOD	CODE	EV (113011, DCM, "Document Title Modifier")	("CHESTCT0999", "99SHSAIRC", "AI-Rad CT Lung Lesion"/"AI-Rad CT Lung Parenchyma"/"AI-Rad CT Cardio"/"AI-Rad CT Vascular Aorta"/"AI-RAD CT Spine"/"AI-Rad CT Pulmonary Density")	2010
>	HAS CONCEPT MOD	CODE	EV ("121049", "DCM", "Language of Content Item and Descendants")	("eng", "RFC5646", "English")	1204
>>	HAS CONCEPT MOD	CODE	EV ("121046", "DCM", "Country of Language")	("US", "ISO3166_1", "United States")	1204
>	HAS CONCEPT MOD	CODE	EV ("121058", "DCM", "Procedure Reported")	("24627-2", "LN", "CT Chest")	1500
>	CONTAINS	CONTAINER	EV ("111028", "DCM", "Image Library")		1600
>>	CONTAINS	CONTAINER	EV ("126200", "DCM", "Image Library Group")		1600
>>>	HAS ACQ CONTEXT	CODE	EV ("121139", "DCM", "Modality")	("CT", "DCM", "Computed Tomography")	1602
>>>	HAS ACQ CONTEXT	DATE	EV ("111060", "DCM", "Study Date")	Copied from input image	1602
>>>	HAS ACQ CONTEXT	TIME	EV ("111061", "DCM", "Study Time")	Copied from input image	1602
>	CONTAINS	CONTAINER	EV ("126010", "DCM", "Image Measurements")		1500
>>	CONTAINS	CONTAINER	EV ("125007", "DCM", "Image Measurement Group")		1411

Table 19 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT Lesion

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
Refer Table 18 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT					
>>>	HAS OBS CONTEXT	TEXT	DT ("112039", "DCM", "Tracking Identifier")	1. Lesion, If more than one lesions are found then identifier is named as L1, L2 etc. 2. "No findings" if there are no lesions detected	1411
>>>	HAS OBS CONTEXT	UIDREF	EV ("112040", "DCM", "Tracking Unique Identifier")	Unique Identifiers	1411
>>>	CONTAINS	CODE	EV ("121071", "DCM", "Finding")	Different Codes and Meaning of findings: 1. ("RID50149", RADLEX, "Pulmonary nodule"). 2. ("AIRAD007", 99CT, "No lesion found in input data or all results rejected") 3. ("AIRAD007", 99CT, "algorithm failed: no lesion results available")	1411

>>>	HAS CONCEPT MOD	CODE	EV ("363698007", "SCT", "Finding site")	Different Codes and Meaning of finding sites: 1. ("RID1302", RADLEX, "Right lung") 2. ("RID1326", RADLEX, "Left lung") 3. ("RID1327", RADLEX, "Upper lobe of left lung") 4. ("RID1338", RADLEX, "Lower lobe of left lung") 5. ("RID1303", RADLEX, "Upper lobe of right lung") 6. ("RID1310", RADLEX, "Middle lobe of lung") 7. ("RID1315", RADLEX, "Lower lobe of right lung") 8. ("RID1301", RADLEX, "Lung") 9. ("39607008",SCT, "Both lungs")	1419
>>>	HAS OBS CONTEXT	TEXT	EV (CHESTCT0102,99SHSAIRC,"Lesion Review Status")	Autoconfirmed/Confirmed/TobeConfirmed/ TobeReviewed.	
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual representation")	Refers to result image SOP Instance UID	1411
>>>	CONTAINS	NUM	EV (103339001, SCT, "Maximum 2D diameter")	UNITS = EV (mm,UCUM,milimeter)	
>>>>	INFERRED FROM	SCOORD		Graphic data (0070, 0022) and Graphic type (0070,0023) atrributes are added.	320
>>>	CONTAINS	NUM	EV (AIRAD101, 99CT, "Maximum 3D diameter")	UNITS = EV (mm,UCUM,milimeter)	
>>>	CONTAINS	NUM	EV (103340004, SCT, "Maximum perpendicular 2D diameter")	UNITS = EV (mm,UCUM,milimeter)	
>>>	CONTAINS	NUM	EV (RID50155, RADLEX, "Mean 2D diameter")	UNITS = EV (mm,UCUM,milimeter)	
>>>	CONTAINS	NUM	EV (RID28668, RADLEX, "Volume")	UNITS = EV (mm3,UCUM,cubic milimeter)	
>>>	CONTAINS	Text	EV (121106, DCM, "Comment")	A warning indicating that slice thickness is outside optimum range would be added in case slice thickness of input data is >2.5 mm for US Institutes.	1410
>	CONTAINS	CONTAINER	EV (126011, DCM, Derived Imaging Measurements)		1420
>>	CONTAINS	NUM	EV (CHESTCT0103, 99SHSAIRC, Maximum 2D Diameter Change)	UNITS = EV (%, UCUM, Percent)	
>>	CONTAINS	NUM	EV (CHESTCT0104, 99SHSAIRC, Maximum 3D diameter Change)	UNITS = EV (%, UCUM, Percent)	
>>	CONTAINS	NUM	EV (CHESTCT0105, 99SHSAIRC, Maximum perpendicular 2D diameter Change)	UNITS = EV (%, UCUM, Percent)	
>>	CONTAINS	NUM	EV (CHESTCT0106, 99SHSAIRC, Mean 2D diameter Change)	UNITS = EV (%, UCUM, Percent)	
>>	HAS OBS CONTEXT	NUM	EV (CHESTCT0108, 99SHSAIRC, Volume Change)	UNITS = EV (d, UCUM, Day); If volume change exceeds 999 days, then UNITS = EV(%, UCUM, Percent)	

Table 20 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT Parenchyma

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
Refer Table 18 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT					

>>>	HAS OBS CONTEXT	TEXT	DT ("112039", "DCM", "Tracking Identifier")	1. LeftUpperLobe / LeftLowerLobe / RightUpperLobe / RightMiddleLobe / RightLowerLobe / LeftLung / RightLung / BothLungs / Undefined / Lung Applied Range 2. “No findings“ if there is no parenchyma results detected	1411
>>>	HAS OBS CONTEXT	UIDREF	EV ("112040", "DCM", "Tracking Unique Identifier")	Unique identifier	1411
>>>	CONTAINS	CODE	EV ("121071", "DCM", "Finding")	Different Codes and Meaning of findings: 1. ("RID6039", RADLEX, "Low attenuation in lung") when parenchyma results were found 2. (“AIRAD007”, 99CT, “No parenchyma results available or all results rejected”) 3. (“C98451”, NCIt, “Chronic Lung Disorder”)	1411
>>>	HAS CONCEPT MOD	CODE	EV ("363698007", "SCT", "Finding site")	Different Codes and Meaning of finding sites: 1. ("RID1302", RADLEX, "Right lung") 2. ("RID1326", RADLEX, "Left lung") 3. (“RID1327”, RADLEX, “Upper lobe of left lung”) 4. (“RID1338”, RADLEX, “Lower lobe of left lung”) 5. (“RID1303”, RADLEX, “Upper lobe of right lung”) 6. (“RID1310”, RADLEX, “Middle lobe of lung”) 7. (“RID1315”, RADLEX, “Lower lobe of right lung”) 8. (“RID1301”, RADLEX, “Lung”) 9. (“39607008”,SCT, “Both lungs”)	1419
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual representation")	Refers result image SOP Instance UID	1411
>>>	CONTAINS	CODE	EV (130400, DCM, “Geometric purpose of region”)	(111041, DCM, “Contour”)	1411
>>>	CONTAINS	NUM	EV (AIRAD202, 99CT, “LAV950”)	UNITS = EV (% ,UCUM,Percent)	
>>>	CONTAINS	CODE	EV (AIRAD006, 99CT, “Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	
>>>	CONTAINS	CODE	EV (AIRAD201, 99CT, “Lung Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	
>>>	CONTAINS	IMAGE	EV (121232, DCM, “Source series for segmentation”)	Original image series	1411

Table 21 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT Cardio

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
Refer Table 18 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT					
>>>	HAS OBS CONTEXT	TEXT	DT ("112039", "DCM", "Tracking Identifier")	1. Heart/Calcium Score/Calcium Applied Range 2. “No findings“ if there are no cardiac results detected	1411

>>>	HAS OBS CONTEXT	UIDREF	EV ("112040", "DCM", "Tracking Unique Identifier")	Unique identifier	1411
>>>	CONTAINS	CODE	EV ("121071", "DCM", "Finding")	Different Codes and Meaning of findings: 1. ("C35552", NCIt, "Cardio Vascular System Finding") 2. ("AIRAD007", 99CT, "No cardiac results available or all results rejected")	1411
>>>	HAS CONCEPT MOD	CODE	EV ("363698007", "SCT", "Finding site")	Different Codes and Meaning of finding sites: 1. ("RID1385", "RADLEX", "Heart") 2. ("C12843", "NCIt", "Coronary Artery")	1419
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual representation")	Refers result image SOP Instance UID	1411
>>>	CONTAINS	NUM	EV (AIRAD303, 99CT, "Heart Volume")	UNITS = EV (mL,UCUM,milimeter)	
>>>	CONTAINS	NUM	EV (AIRAD304, 99CT, "Coronary Calcium")	UNITS = EV (mm3, UCUM,cubic milimeter)	
>>>	CONTAINS	CODE	EV (AIRAD006, 99CT, "Range")	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. ("AIRAD005", 99CT, "Red") 4. ("AIRAD004", 99CT, "Orange")	
>>>	CONTAINS	CODE	EV (AIRAD302, 99CT, "Coronary Calcium Range")	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. ("AIRAD005", 99CT, "Red") 4. ("AIRAD004", 99CT, "Orange")	

Table 22 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT Vascular

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
Refer Table 18 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT					
>>>	HAS OBS CONTEXT	TEXT	DT ("112039", "DCM", "Tracking Identifier")	1. AorticSinus / Sinoturbularjunction / MidAscending / ProximalArch / MidArch / ProximalDescending / MidDescending / Diaphragm / Abdomina / Aorta Applied Range 2. "No Findings", If vascular results are not found	1411
>>>	HAS OBS CONTEXT	UIDREF	EV ("112040", "DCM", "Tracking Unique Identifier")	Unique Identifiers	1411
>>>	CONTAINS	CODE	EV ("121071", "DCM", "Finding")	Different Codes and Meaning of findings: 1. ("C35552", NCIt, "Cardio Vascular System Finding") 2. ("AIRAD007", 99CT, "No aorta results available or all results rejected")	
>>>	HAS CONCEPT MOD	CODE	EV ("363698007", "SCT", "Finding site")	Different Codes and Meaning of finding sites: 1. ("C33557", NCIt, "Sinus of Valsalva") 2. ("RID579", RADLEX, "Sinotubular Junction") 3. ("AIRAD403", 99CT, "Mid Ascending Aorta") 4. ("AIRAD404", 99CT, "Proximal Aortic Arch") 5. ("AIRAD405", 99CT, "Mid Aortic Arch") 6. ("AIRAD406", 99CT, "Proximal Descending Aorta") 7. ("AIRAD407", 99CT, "Mid Descending Aorta") 8. ("AIRAD408", 99CT, "Aorta at Diaphragm") 9. ("RID905", RADLEX, "Abdominal Aorta")	1419

				10. (“RID480”, RADLEX,”Aorta”)	
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual representation")	Refers to result image SOP Instance UID	1411
>>>	CONTAINS	NUM	EV (RID13432, RADLEX, “Diameter”)	UNITS = EV (mm,UCUM,milimeter)	
>>>	CONTAINS	CODE	EV (AIRAD006, 99CT, “Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	
>>>	CONTAINS	CODE	EV (AIRAD410, 99CT, “Aorta Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	

Table 23 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT Spine

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
Refer Table 18 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT					
>>>	HAS OBS CONTEXT	TEXT	DT ("112039", "DCM", "Tracking Identifier")	1. Thoracic vertebrae labels / Spine Applied Range 2. “No Findings“, if algorithm failed to determine spine labels	1411
>>>	HAS OBS CONTEXT	UIDREF	EV ("112040", "DCM", "Tracking Unique Identifier")	Unique identifiers	1411
>>>	CONTAINS	CODE	EV ("121071", "DCM", "Finding")	Different Codes and Meaning of findings: 1. (“C110937”, NCIt, “Musculoskeletal Finding”) 2. (“AIRAD007”, 99CT, “No spine results available or all results rejected”)	1411
>>>	HAS CONCEPT MOD	CODE	EV ("363698007", "SCT", "Finding site")	Different Codes and Meaning of finding sites: 1. ("RID29198", "RADLEX", "First thoracic vertebra") 2. ("RID29199", "RADLEX", "Second thoracic vertebra") 3. ("RID29200", "RADLEX", "Third thoracic vertebra") 4. ("RID29201", "RADLEX", "Fourth thoracic vertebra") 5. ("RID29202", "RADLEX", "Fifth thoracic vertebra") 6. ("RID29203", "RADLEX", "Sixth thoracic vertebra") 7. ("RID29204", "RADLEX", "Seventh thoracic vertebra") 8. ("RID31704", "RADLEX", "Eighth thoracic vertebra") 9. ("RID29206", "RADLEX", "Ninth thoracic vertebra") 10. ("RID29207", "RADLEX", "Tenth thoracic vertebra") 11. ("RID29208", "RADLEX", "Eleventh thoracic vertebra") 12. ("RID29209", "RADLEX", "Twelfth thoracic vertebra") 13. ("RID29154”, “RADLEX”, "Vertebra")	1419
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual representation")	Refers result image SOP Instance UID	1411

>>>	CONTAINS	NUM	EV (121207, DCM, “Height”)	UNITS = EV (mm,UCUM,milimeter)	
>>>>	HAS CONCEPT MOD	CODE	DT (106233006, SCT, “Topographical Modifier”)	Different codes and meanings of modifiers in RADLEX: 1. ("RID5818", RADLEX, "Anterior") 2. ("RID5820", RADLEX, "Medial") 3. (“RID5819”, RADLEX, “Posterior”)	
>>>>	HAS CONCEPT MOD	CODE	EV (AIRAD006, 99CT, “Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	
>>>	CONTAINS	NUM	EV (112031, DCM, “Attenuation coefficient”)	UNITS = EV (hnsf’U,UCUM,Hounsfield unit)	
>>>>	HAS CONCEPT MOD	CODE	EV (121401, DCM, “Derivation”)	(C53319,NCIt,”Mean”)	
>>>	CONTAINS	CODE	EV (AIRAD501, 99CT, “Spine Range”)	Different Codes and Meaning of ranges: 1. ("RID39089", RADLEX, "Green") 2. ("RID39037", RADLEX, "Yellow") 3. (“AIRAD005”, 99CT, “Red”) 4. (“AIRAD004”, 99CT, “Orange”)	

Table 24 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT Pulmonary density

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
Refer Table 18 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Chest CT					
>>>	HAS OBS CONTEXT	TEXT	DT ("112039", "DCM", "Tracking Identifier")	1. LeftUpperLobe, LeftLowerLobe, RightUpperLobe, RightMiddleLobe, RightLowerLobe, LeftLung, RightLung, BothLungs, Lung 2. “Not found or Not confirmed“, if lung opacities are not found 3. “No Findings“, if algorithm failes to detect opacities in lung	1411
>>>	HAS OBS CONTEXT	UIDREF	EV ("112040", "DCM", "Tracking Unique Identifier")	Unique identifiers	1411
>>>	CONTAINS	CODE	EV ("121071", "DCM", "Finding")	Different Codes and Meaning of findings: 1. (“RAD28530“, DCM, “Opacities“) 2. (“AIRAD007”, 99CT, “Algorithm failed: no pulmonary density results available”) 3. (“AIRAD007”, 99CT, “Lung opacities not found or not confirmed”)	1411
>>>	HAS CONCEPT MOD	CODE	EV (31094006, SCT, “Lung lobes”)	Different Codes and Meaning of lung lobes: 1. ("RID1302", RADLEX, "Right lung") 2. ("RID1326", RADLEX, "Left lung") 3. (“RID1327”, RADLEX, “Upper lobe of left lung”) 4. (“RID1338”, RADLEX, “Lower lobe of left lung”) 5. (“RID1303”, RADLEX, “Upper lobe of right lung”) 6. (“RID1310”, RADLEX, “Middle lobe of lung”) 7. (“RID1315”, RADLEX, “Lower lobe of right lung”) 8. (“RID1301”, RADLEX, “Lung”) 9. (“39607008”,SCT, “Both lungs”)	
>>>	CONTAINS	CODE	EV (130400, DCM, “Geometric purpose of region”)	(111041, DCM, “Outline”)	1411
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual representation")	Refers to result image SOP Instance UID	1411

>>>	CONTAINS	IMAGE	EV (121232, DCM, “Source series for segmentation”)	Original image series	1411
>>>	CONTAINS	NUM	EV (AIRAD601, 99CT, “Opacity score”)	UNITS = EV ({Number},UCUM,Number)	
>>>	CONTAINS	NUM	EV (AIRAD602, 99CT, “Total Volume”)	UNITS = EV (mL,UCUM,mililiter)	
>>>	CONTAINS	NUM	EV (AIRAD603, 99CT, “Opacity volume”)	UNITS = EV (mL,UCUM,mililiter)	
>>>	CONTAINS	NUM	EV (AIRAD604, 99CT, “Opacity percentage”)	UNITS = EV (%{vol},UCUM,VolumePercent)	
>>>	CONTAINS	NUM	EV (AIRAD605, 99CT, “High opacity volume”)	UNITS = EV (mL,UCUM,mililiter)	
>>>	CONTAINS	NUM	EV (AIRAD606, 99CT, “High opacity percentage”)	UNITS = EV (%{vol},UCUM,VolumePercent)	
>>>	CONTAINS	NUM	EV (AIRAD607, 99CT, “Mean HU total”)	UNITS = EV (hnsf’U,UCUM,Hounsfield unit)	

Table 25 -- TID 1500 Measurement Report for Comprehensive DICOM SR – Brain MR

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
		CONTAINER	EV (126000, DCM, “Imaging Measurement Report”)	AIRC Research MR Brain - NOT FOR CLINICAL USE	1500
>	CONTAINS	CODE	EV (111017, DCM, “CAD Processing and Findings Summary”)	All algorithms succeeded; with findings, Not all algorithms succeeded; with findings, No algorithms succeeded; without findings	4001
>	CONTAINS	CODE	EV (111064, DCM, “Summary of Detections”)	Succeeded, Partially Succeeded, Failed	4000
>>	INFERREDFROM	CONTAINER	EV (111063, DCM, “Successful Detections”)		4015
>>	INFERREDFROM	CONTAINER	EV (111025, DCM, “Failed Detections”)		4015
>>>	CONTAINS	CODE	EV (111022, DCM, “Detection Performed”)	AI-Rad Companion Brain Morphometry, AI-Rad Companion White Matter Hyperintensities	4017
>	CONTAINS	CONTAINER	EV (126010, DCM, “Imaging Measurements”)		1500
>	CONTAINS	CONTAINER	EV (C0034375, UMLS, “Qualitative Evaluations”)		1500
>>	CONTAINS	CONTAINER	EV (125007, DCM, “Measurement Group”)		1411
>>>	HAS OBS CONTEXT	TEXT	DT (112039, DCM, “Tracking Identifier”)		1411
>>>	HAS OBS CONTEXT	UIDREF	EV (112040, DCM, “Tracking Unique Identifier”)		1411
>>>	CONTAINS	UIDREF	EV (121232, DCM, “Source series for segmentation”)		1411
>>>	HAS CONCEPT MOD	TEXT	EV (111001, DCM, “Algorithm Name”)	Morphometry, WMH	4019
>>>	HAS CONCEPT MOD	TEXT	EV (111003, DCM, “Algorithm Version”)	36, 4.0.0	4019
>>>	CONTAINS	Text	EV (121106, DCM, “Comment”)		1410
>	HAS CONCEPT MOD	CODE	EV (121049, DCM, “Language of Content Item and Descendants”)	English	1204
>>	HAS CONCEPT MOD	CODE	EV (121046, DCM “Country of Language”)	United States	1204

>	HAS OBS CONTEXT	CODE	EV (121005, DCM, “Observer Type”)	Device	1002
>	HAS OBS CONTEXT	UIDREF	EV (121012, DCM, “Device Observer UID”)		1004
>	HAS OBS CONTEXT	TEXT	EV (121014, DCM, “Device Observer Manufacturer”)	Siemens Healthineers	1004
>	HAS OBS CONTEXT	TEXT	EV (121015, DCM, “Device Observer Model Name”)	AI Rad Companion Research	1004
>	HAS CONCEPT MOD	CODE	EV (121058, DCM, “Procedure reported”)		1500
>	CONTAINS	CONTAINER	EV (111028, DCM, “Image Library”)		1600
>>	CONTAINS	CONTAINER	EV (126200, DCM, “Image Library Group”)		1600
>>>>	HAS ACQ CONTEXT	CODE	EV (121139, DCM, “Modality”)	Magnetic Resonance	1602
>>>>	HAS ACQ CONTEXT	DATE	EV (111060, DCM, “Study Date”)		1602
>>>>	HAS ACQ CONTEXT	TIME	EV (111061, DCM, “Study Time”)		1602

Table 26- TID 1500 Measurement Report for Comprehensive DICOM SR – Prostate MR

Nesting Level	Relationship Type	Value Type	Concept Name	Values	TID
		CONTAINER	EV (126000, DCM, "Imaging Measurement Report")	Imaging Measurement Report	1500
>	CONTAINS	CODE	EV (111017, DCM, “CAD Processing and Findings Summary”)	All algorithms succeeded; with findings	4001
>	CONTAINS	CODE	EV (111064, DCM, “Summary of Detections”)	Succeeded, Partially Succeeded, Failed	4000
>>	INFERREDFROM	CONTAINER	EV (111063, DCM, “Successful Detections”)		4015
>>>	CONTAINS	CODE	EV (111022, DCM, “Detection Performed”)	(PROSTATEMR001, 99SHSAIRC, "AI-Rad Companion Prostate MR")	4017
>>>	HAS PROPERTIES	TEXT	EV (111001, DCM, "Algorithm Name")	Prostate AI	4019
>>>	HAS PROPERTIES	TEXT	EV (111003, DCM, "Algorithm Version")	Version of the algorithm with which the findings were found For example: VB60	4019
>>>	HAS PROPERTIES	IMAGE		Contains the reference to the original input image	400
>	CONTAINS	CONTAINER	EV (126010, DCM, “Imaging Measurements”)		1500
>>	CONTAINS	CONTAINER	EV (125007, DCM, “Measurement Group”)		1411
>>>	HAS OBS CONTEXT	TEXT	DT (112039, DCM, “Tracking Identifier”)	Prostate	1411
>>>	HAS OBS CONTEXT	UIDREF	EV (112040, DCM, “Tracking Unique Identifier”)		1411
>>>	CONTAINS	CODE	EV ("363698007", "SCT", "Finding Site")	(41216001, SCT, "Prostate")	
>>>	CONTAINS	IMAGE	EV ("130401", "DCM", "Visual explanation")	Reference image	
>>>	CONTAINS	NUM	EV ("C25335", "NCIt", "Volume")	Prostate gland volume; Units: ml	1402
>>>	CONTAINS	NUM	EV (“63476009”, “SCT”, “PSA”)	PSA value entered by user; Units:ng/ml	
>>>	CONTAINS	NUM	EV (LN, 15325-4, "PSA Density")	Computed PSA density; Units:ng/ml2	

>>>	CONTAINS	CODE	(“RID50294”, “RADLEX”, “PI-RADS Overall Assessment Category”)	Overall PI-RADS value ("RID50289", "RADLEX", "PI-RADS 1 - Very low"), ("RID50290", "RADLEX", "PI-RADS 2 - Low"), ("RID50291", "RADLEX", "PI-RADS 3 - Intermediate"), ("RID50292", "RADLEX", "PI-RADS 4 - High"), ("RID50293", "RADLEX", "PI-RADS 5 - Very high"), ("RID50322", "RADLEX", "PI-RADS X - Inadequate or absent")	
>>	CONTAINS	CONTAINER	EV (125007, DCM, “Measurement Group”)		1411
>>>	HAS OBS CONTEXT	TEXT	DT (112039, DCM, “Tracking Identifier”)	Lesion N (1,2,.....n), repeated in case n lesions are detected.	1411
>>>	HAS OBS CONTEXT	UIDREF	EV (112040, DCM, “Tracking Unique Identifier”)		1411
>>>	CONTAINS	CODE	(121071, DCM, Finding)	(Finding, RID38780, "Lesion")	
>>>	CONTAINS	CODE	EV ("363698007", "SCT", "Finding Site")	Localization of the lesion, one of the following code: (716901006, SCT, "Central zone of Left half prostate"); (716900007, SCT, "Central zone of Right half prostate"); (716937001, SCT, "Left anterior apical peripheral zone of prostate"); (716931000, SCT, "Left anterior apical transition zone of prostate"); (716905002, SCT, "Left anterior basal peripheral zone of prostate"); (716897000, SCT, "Left anterior basal transition zone of prostate"); (716920008, SCT, "Left anterior middle peripheral zone of prostate"); (716914007, SCT, "Left anterior middle transition zone of prostate"); (716927006, SCT, "Left apical anterior fibromuscular stroma of prostate"); (716893001, SCT, "Left basal anterior fibromuscular stroma of prostate"); (716910003, SCT, "Left middle anterior fibromuscular stroma of prostate"); (716933002, SCT, "Left posterior apical transition zone of prostate"); (716899002, SCT, "Left posterior basal transition zone of prostate"); (716916009, SCT, "Left posterior middle transition zone of prostate"); (716939003, SCT, "Left posterolateral apical peripheral zone of prostate"); (716907005, SCT, "Left posterolateral basal peripheral zone of prostate"); (716922000, SCT, "Left posterolateral middle peripheral zone of prostate"); (716941002, SCT, "Left posteromedial apical peripheral zone of prostate"); (716924004, SCT, "Left posteromedial middle peripheral zone of prostate"); (716936005, SCT, "Right anterior apical peripheral zone of prostate"); (716930004, SCT, "Right anterior apical transition zone of prostate"); (716904003, SCT, "Right anterior basal peripheral zone of prostate"); (716896009, SCT, "Right anterior basal transition zone of prostate"); (716919002, SCT, "Right anterior middle peripheral zone of prostate"); (716913001, SCT, "Right anterior middle transition zone of prostate");	

				(716926002, SCT, "Right apical anterior fibromuscular stroma of prostate"); (716892006, SCT, "Right basal anterior fibromuscular stroma of prostate"); (716909008, SCT, "Right middle anterior fibromuscular stroma of prostate"); (716932007, SCT, "Right posterior apical transition zone of prostate"); (716898005, SCT, "Right posterior basal transition zone of prostate"); (716915008, SCT, "Right posterior middle transition zone of prostate"); (716938006, SCT, "Right posterolateral apical peripheral zone of prostate"); (716906001, SCT, "Right posterolateral basal peripheral zone of prostate"); (716921007, SCT, "Right posterolateral middle peripheral zone of prostate"); (716940001, SCT, "Right posteromedial apical peripheral zone of prostate"); (716923005, SCT, "Right posteromedial middle peripheral zone of prostate")	
>>>	CONTAINS	IMAGE	("130401", "DCM", "Visual explanation")	Reference to explanatory image (slice showing the lesion)	
>>>	CONTAINS	NUM	EV (“81827009”, SCT, Diameter)	Diameter value detected by AI or user defined value. Unit: cm	
>>>	CONTAINS	CODE	EV (“RID50295”, RADLEX, PI-RADS Lesion Assessment Category)	PI-RADS assessment of the individual lesion, one of the following: (RID50296, RADLEX, "PI-RADS 1 - Very low (Lesion)"), ("RID50297", RADLEX, "PI-RADS 2 - Low (Lesion)"), ("RID50298", RADLEX, "PI-RADS 3 - Intermediate (Lesion)"), ("RID50299", RADLEX, "PI-RADS 4 - High (Lesion)"), ("RID50300", RADLEX, "PI-RADS 5 - Very high (Lesion)"), ("RID50323", RADLEX, "PI-RADS X - Inadequate or absent (Lesion)")	4306
>>>	CONTAINS	UIDREF	EV (121232, DCM, “Source series for segmentation”)		1411
>>>	CONTAINS	Text	EV (121106, DCM, “Comment”)		1410
>	HAS CONCEPT MOD	CODE	EV (121049, DCM, “Language of Content Item and Descendants”)	English	1204
>>	HAS CONCEPT MOD	CODE	EV (121046, DCM “Country of Language”)	United States	1204
>	HAS OBS CONTEXT	CODE	EV (121005, DCM, “Observer Type”)	Device	1002
>	HAS OBS CONTEXT	UIDREF	EV (121012, DCM, “Device Observer UID”)		1004
>	HAS OBS CONTEXT	TEXT	EV (121014, DCM, “Device Observer Manufacturer”)	Siemens Healthineers	1004
>	HAS OBS CONTEXT	TEXT	EV (121015, DCM, “Device Observer Model Name”)	AI Rad Companion Prostate MR	1004
>	HAS CONCEPT MOD	CODE	EV (121058, DCM, “Procedure reported”)	(126021, DCM, "Multiparametric MRI of Prostate")	1500
>	CONTAINS	CONTAINER	EV (111028, DCM, “Image Library”)		1600
>>	CONTAINS	CONTAINER	EV (126200, DCM, “Image Library Group”)		1600
>>>>	HAS ACQ CONTEXT	CODE	EV (121139, DCM, “Modality”)	(MR, DCM, "Magnetic Resonance")	1602
>>>>	HAS ACQ CONTEXT	DATE	EV (111060, DCM, “Study Date”)		1602
>>>>	HAS ACQ CONTEXT	TIME	EV (111061, DCM, “Study Time”)		1602

9.3.3 Private Code definitions

N/A

9.4 Grayscale Image Consistency

N/A

9.5 Standard Extended / Specialized / Private SOP Classes

N/A

9.6 Private Transfer Syntaxes

No private Transfer Syntaxes are defined for or requested by ***AI-Rad Companion***.

Annex A: Index of Tables

Annex B: Table of Figures

N/A

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Legal Manufacturer
Siemens Healthcare GmbH
Henkestr. 127
91052 Erlangen
Germany
Phone +49 9131 84-0
siemens.com/Healthineers

Siemens Healthineers Headquarters
Siemens Healthcare GmbH
Henkestr. 127
91052 Erlangen
Germany