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**Digital Imaging and Communications in Medicine (DICOM)**

8

*Supplement 191: Patient Radiation Dose Reporting (P-RDSR)*

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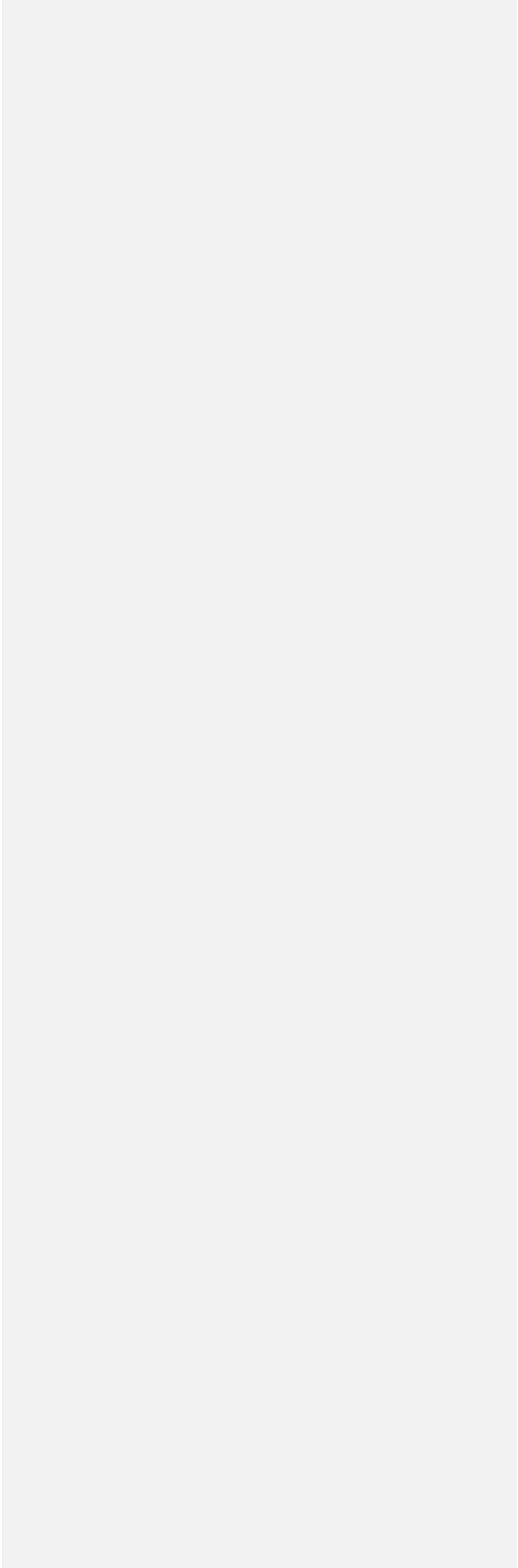
*Prepared by: WG-28 Physics*

26 1300 N. 17th Street, Suite 1847

Rosslyn, Virginia 22209 USA

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72

## Foreword

74 This supplement to the DICOM standard introduces a template for Patient – Radiation Dose Reporting in  
DICOM. The concepts of Structured Reporting will be used in this context.

76 This document is a Supplement to the DICOM Standard. It is an extension to the following parts of the  
published DICOM Standard:

78	PS 3.2	Conformance
	PS 3.3	Information Object Definitions
80	PS 3.4	Service Class Specifications
	PS 3.6	Data Dictionary
82	PS 3.16	Content Mapping Resource
	PS 3.17	Explanatory Information

84

This work was undertaken in liaison with the America Association of Physicists in Medicine (AAPM) and  
86 European Federation of Medical Physicists (EFOMP).

## Scope and Field of Application

88 This Supplement is creating a structured report to contain the information concerning the recording of the  
estimated radiation dose to a patient.

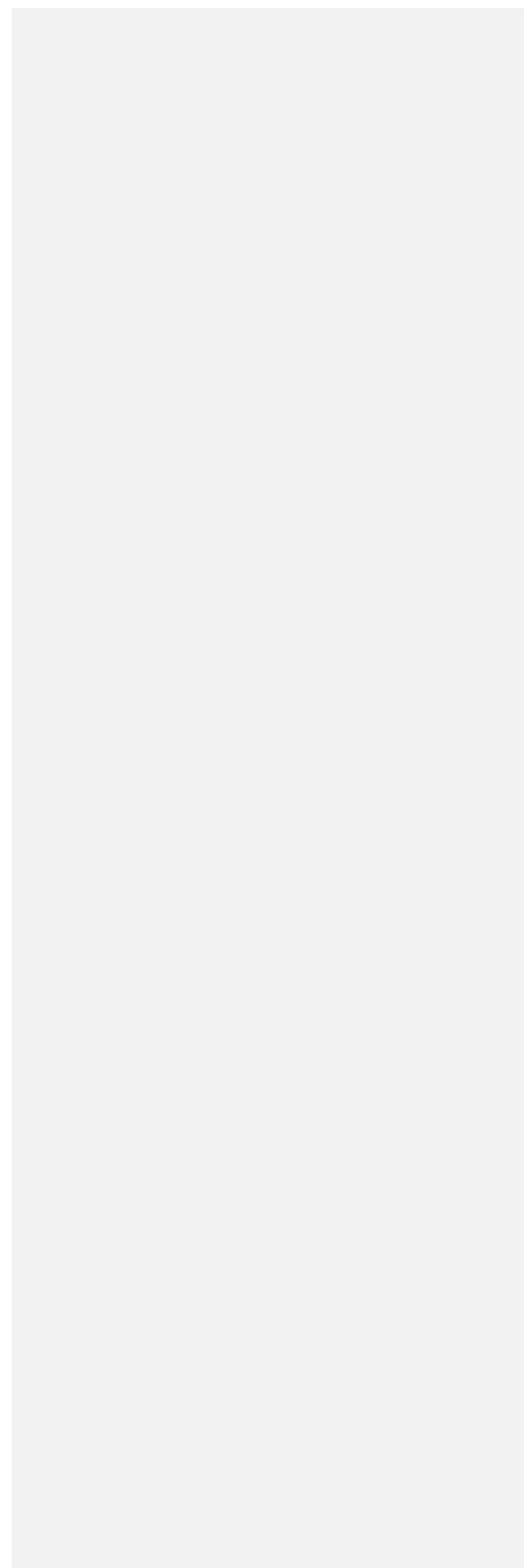
90 This includes radiation dose from CT, projection X-Ray, and radiopharmaceutical administration  
(diagnostic and therapeutic). Dose from external beam, ion beam therapy, or brachytherapy is out of  
92 scope. Also excludes occupational radiation exposures.

There are multiple methodologies and models that can be used to estimate patient dose and these  
94 methods are rapidly changing. Once an estimate of the radiation dose absorbed by a patient is performed,  
storing and transferring the method used, parameters involved with them, and the resulting dose estimate  
96 in standard format is needed.

It is assumed that the best location for information relative to the dosimetric method used and the  
98 estimated patient – radiation dose should be to send this data to a Dose Information Reporter, an actor (in  
the IHE sense) that may or may not be combined with a RIS, a PACS, or may be a standalone system.

100 The approach taken here for the Patient Radiation Dose Structured Report (PRDSR) is to define a new  
Structured Report (SR) object template and SOP Class. This SR object, independent of the images or the  
102 MPPS, could be routed to an appropriate Dose Information Reporter System. A system that claims  
conformance to such an SR object would then be expected, as a concomitant of the conformance claim, to  
104 appropriately deal with such data items.

Such an SR dose object allows the data flow and data management of patient estimated radiation dose  
106 reports to be disentangled from the data flow and data management of images.



OPEN Points

Item	Content
1	References to proprietary model, version, etc. may need be put into separate containers
2	
3	
4	
5	
6	

110

112 CLOSED Points

Item	Response
1	
2	

114 Tasks

Item	
1	Check if "Carbon fiber or Carbon fiber equivalent material" used in Table CID 10006. X-Ray Filter Materials are coded somewhere else
2	In CID prdsrCI10 Estimate Method Types, check UMLS or other sources for these codes
3	Consider a summary of use cases, specific of how an EMR, etc. may use this data
4	Data missing in current RDSR needs to be addressed to support this Patient Radiation Dose SR

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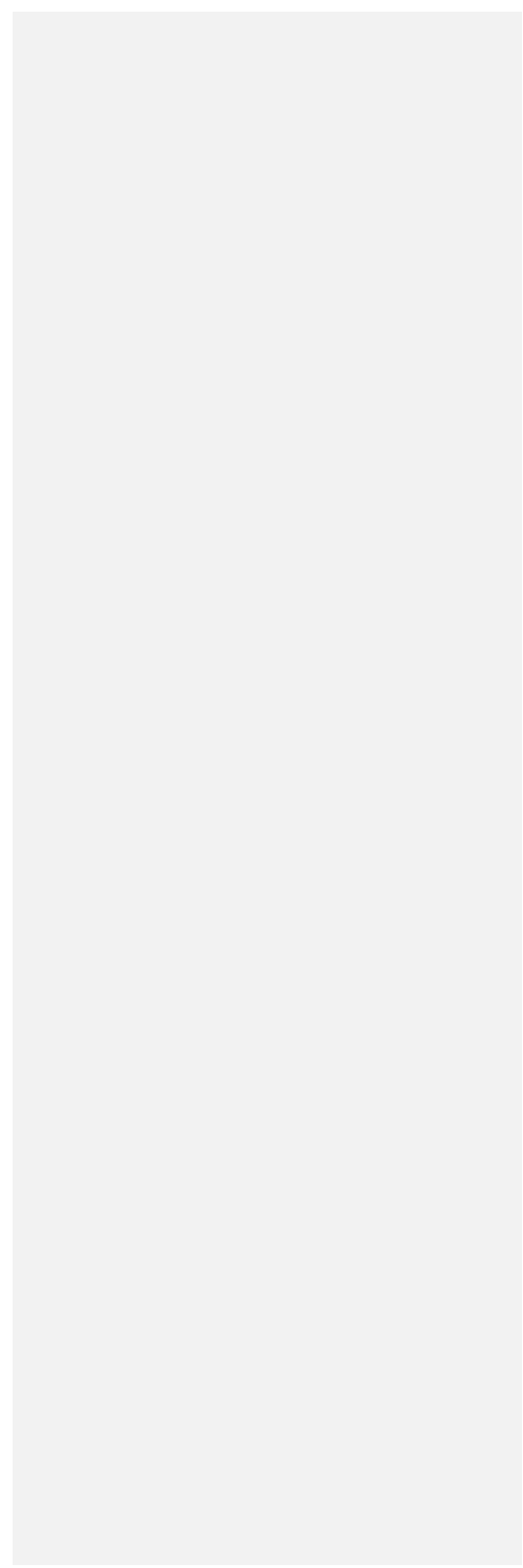
**Changes to NEMA Standards Publication PS 3.2-xxxx**

124

**Digital Imaging and Communications in Medicine (DICOM)**

**Part 2: Conformance**

126



Item #01: Add new SOP Classes in Table A.1-2

128

Table A.1-2  
UID VALUES

UID Value	UID NAME	Category
...		
<u>1.2.840.10008.5.1.4.1.1.88.x</u>	<u>Patient Radiation Dose SR</u>	<u>Transfer</u>
...		

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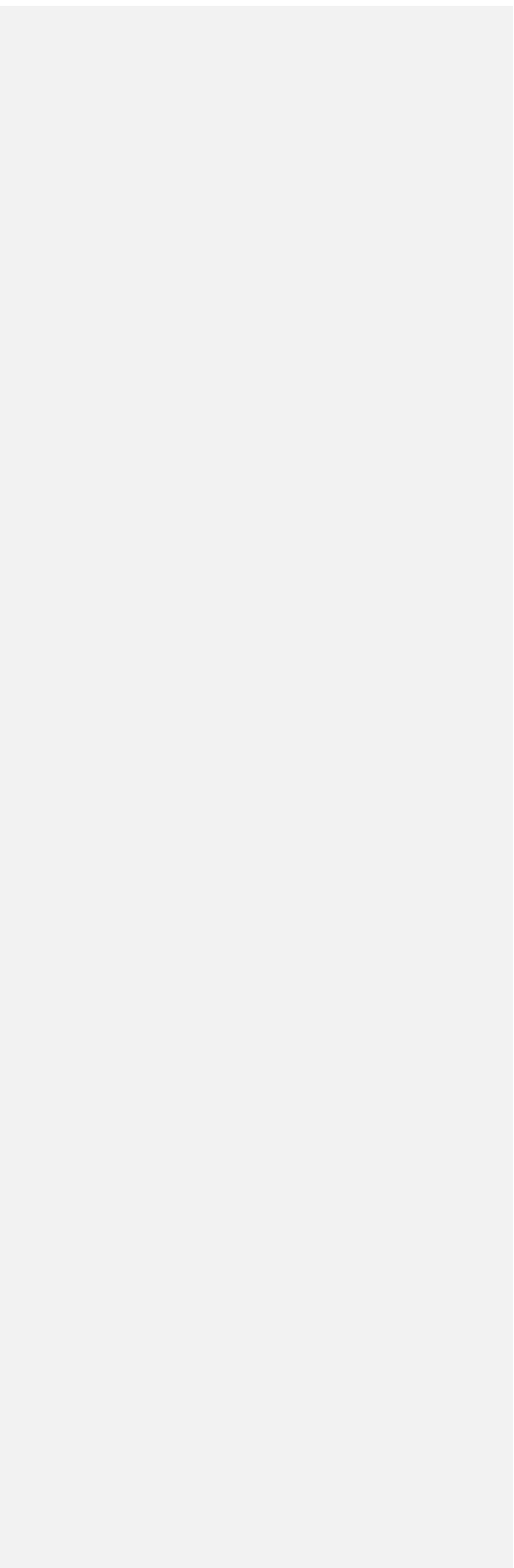
**Changes to NEMA Standards Publication PS 3.3-xxxx**

140

**Digital Imaging and Communications in Medicine (DICOM)**

**Part 3: Information Object Definitions**

142



**Add the following column in PS 3.3 Section A.1.4, Table A.1-3 Composite Information Object Modules Overview - More Non-Images**

144

<b>IODs Modules</b>	<b><u>PRD</u> <u>SR</u></b>
Patient	<b><u>M</u></b>
Clinical Trial Subject	<b><u>U</u></b>
General Study	<b><u>M</u></b>
Patient Study	<b><u>U</u></b>
Clinical Trial Study	<b><u>U</u></b>
SR Document Series	<b><u>M</u></b>
Clinical Trial Series	<b><u>U</u></b>
Synchronization	<b><u>C</u></b>
General Equipment	<b><u>M</u></b>
Enhanced General Equipment	<b><u>M</u></b>
SR Document General	<b><u>M</u></b>
SR Document Content	<b><u>M</u></b>
SOP Common	<b><u>M</u></b>

**Item #02: Add PS3.3 Section A.35.X:**

146

**A.35.X Patient Radiation Dose SR Information Object Definition**

**148 A.35.X.1 Patient Radiation Dose SR Information Object Description**

150 The Patient Radiation Dose SR IOD is used to convey the information used in the calculations for estimating the radiation dose to an individual patient. The complexity of the calculations and the precision of the resulting dose estimate will vary depending on the need.

152 This IOD is not meant for determining patient dose from therapeutic use of radiation in oncology settings. The therapeutic dose in oncology settings is reported by the RT Dose IOD.

154 **A.35.X.2 Patient Radiation Dose SR IOD Entity-Relationship Model**

156 The E-R Model in Section A.1.2 of this Part applies to the Patient Radiation Dose SR IOD. Table A.35.X-1 specifies the Modules of the Patient Radiation Dose SR IOD.

**A.35.X.3 Patient Radiation Dose SR IOD Module Table**

158

**Table A.35.X-1  
PATIENT RADIATION DOSE SR IOD MODULES**

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	Clinical Trial Subject	C.7.1.3	U
Study	General Study	C.7.2.1	M
	Patient Study	C.7.2.2	U
	Clinical Trial Study	C.7.2.3	U
Series	SR Document Series	C.17.1	M
	Clinical Trial Series	C.7.3.2	U
Frame of Reference	Synchronization	C.7.4.2	C - shall be present if system time is synchronized to an external reference. May be present otherwise.
Equipment	General Equipment	C.7.5.1	M
	Enhanced General Equipment	C.7.5.2	M
Document	SR Document General	C.17.2	M
	SR Document Content	C.17.3	M
	SOP Common	C.12.1	M

160

**A.35.X.3.1 Patient Radiation Dose SR IOD Content Constraints**

162 **A.35.X.3.1.1 Template**

164 The document may be constructed from Baseline TID prdsrT01 "Patient Radiation Dose Report" (defined in PS3.16) invoked at the root node.

166 Note: This IOD may be used with other Templates defined for Patient Radiation Dose Reporting. Such other Templates may be specialized for specific modalities or future dose measurement techniques.

168 **A.35.X.3.1.2 Value Type**

170 Value Type (0040,A040) in the Content Sequence (0040,A730) of the SR Document Content Module is constrained to the following Enumerated Values (see Table C.17.3-7 for Value Type definitions):

- 172 TEXT
- 173 CODE
- 174 NUM
- 175 DATETIME
- 176 UIDREF
- 177 PNAME
- 178 COMPOSITE
- IMAGE

CONTAINER

180

**A.35.X.3.1.3 Relationship Constraints**

182 Relationships between content items in the content of this IOD may be conveyed by -value. Table A.35.X-2  
184 specifies the relationship constraints of this IOD. See Table C.17.3-2 for Relationship Type definitions.

184

186 **Table A.35.X-2  
RELATIONSHIP CONTENT CONSTRAINTS FOR PATIENT RADIATION DOSE SR IOD**

Source Value Type	Relationship Type (Enumerated Values)	Target Value Type
CONTAINER	CONTAINS	TEXT, CODE, NUM, DATETIME, UIDREF, PNAME, IMAGE, COMPOSITE, CONTAINER
CONTAINER	HAS OBS CONTEXT	DATETIME, CODE, TEXT, UIDREF, PNAME
TEXT, CODE, NUM	HAS OBS CONTEXT	TEXT, CODE, NUM, DATETIME, UIDREF, PNAME, COMPOSITE
CONTAINER, IMAGE, COMPOSITE	HAS ACQ CONTEXT	TEXT, CODE, NUM, DATETIME, UIDREF, PNAME, CONTAINER.
any type	HAS CONCEPT MOD	TEXT, CODE
TEXT, CODE, NUM	HAS PROPERTIES	TEXT, CODE, NUM, DATETIME, UIDREF, PNAME, IMAGE, COMPOSITE, CONTAINER.
PNAME	HAS PROPERTIES	TEXT, CODE, DATETIME, DATE, TIME, UIDREF, PNAME
TEXT, CODE, NUM	INFERRED FROM	TEXT, CODE, NUM, DATETIME, UIDREF, IMAGE, COMPOSITE, CONTAINER.

188 Note: The SOP Classes to which an IMAGE or COMPOSITE Value Type may refer, is documented in the  
190 Conformance Statement for an application (see PS 3.2 and PS 3.4).

190

192 **Changes to NEMA Standards Publication PS 3.4-xxxx**

**Digital Imaging and Communications in Medicine (DICOM)**

194 **Part 4: Service Class Specifications**

194

196 **Item #05: Add SOP Class to Table B.3-3**

**Table B.3-3  
STANDARD AND RELATED GENERAL SOP CLASSES**

SOP Class Name	Related General SOP Class Name
...	
<u>Patient Radiation Dose SR</u>	<u>Comprehensive SR</u>

200 **Item #06: Add SOP Class to Table B.5-1**

**B.5 STANDARD SOP CLASSES**

**Table B.5-1  
STANDARD SOP CLASSES**

SOP Class Name	SOP Class UID	IOD (See PS 3.3)
...		
<u>Patient Radiation Dose SR</u>	<u>1.2.840.10008.5.1.4.1.1.88.X</u>	<u>Patient Radiation Dose SR IOD</u>

204 **Item #07: Add Structured Reporting SOP Class to Section B.5.1.5**

**B.5.1.5 Structured Reporting Storage SOP Classes**

The requirements of Annex O apply to the following SOP Classes:

- ...
- Patient Radiation Dose SR

210 **Item #08: Add SOP Class to Table I.4-1**

**I.4 MEDIA STORAGE SOP CLASSES**

**Table I.4-1  
Media Storage Standard SOP Classes**

SOP Class Name	SOP Class UID	IOD (See PS 3.3)
...		
<u>Patient Radiation Dose SR</u>	<u>1.2.840.10008.5.1.4.1.1.88.X</u>	<u>Patient Radiation Dose SR IOD</u>

214 **Item #09: Add SOP Class to Section I.4.1.2**

**I.4.1.2 Structured Reporting Storage SOP Classes**

The requirements of Annex O apply to the following SOP Classes:

- ...
- Patient Radiation Dose SR

222

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226

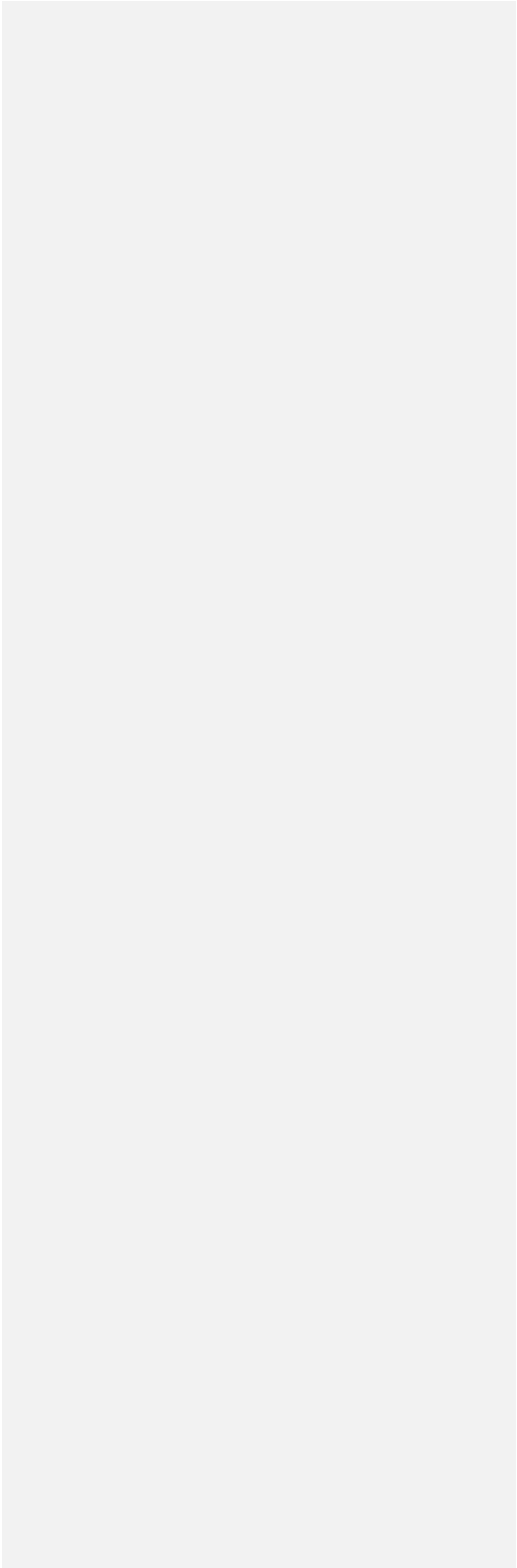
228

**Changes to NEMA Standards Publication PS 3.6-xxxx**

**Digital Imaging and Communications in Medicine (DICOM)**

230

**Part 6: Data Dictionary**



232 **Item #10: Add the following row to Table A-1**

UID Value	UID Name	UID Type	Part
...			
<b><u>1.2.840.10008.5.1.4.1.1.88.X</u></b>	<b><u>Patient Radiation Dose SR</u></b>	<b><u>SOP Class</u></b>	<b><u>PS 3.4</u></b>
...			

234

236

238

240

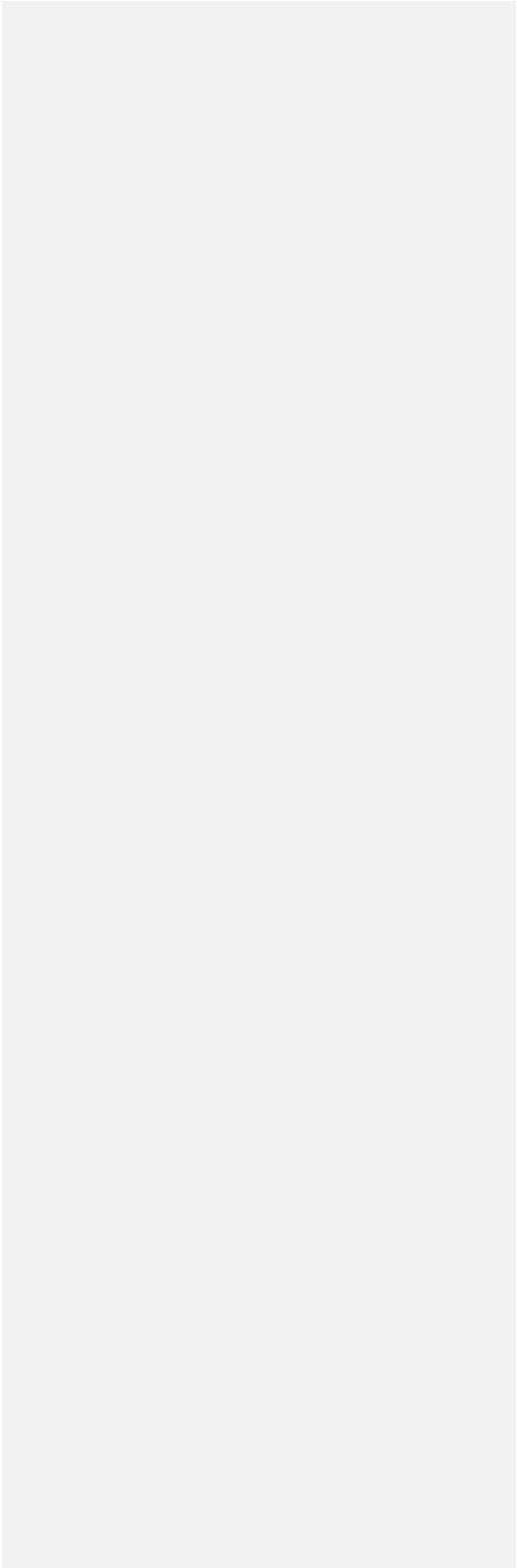
242

**Changes to NEMA Standards Publication PS 3.16-xxxx**

**Digital Imaging and Communications in Medicine (DICOM)**

244

**Part 16: Content Mapping Resource**

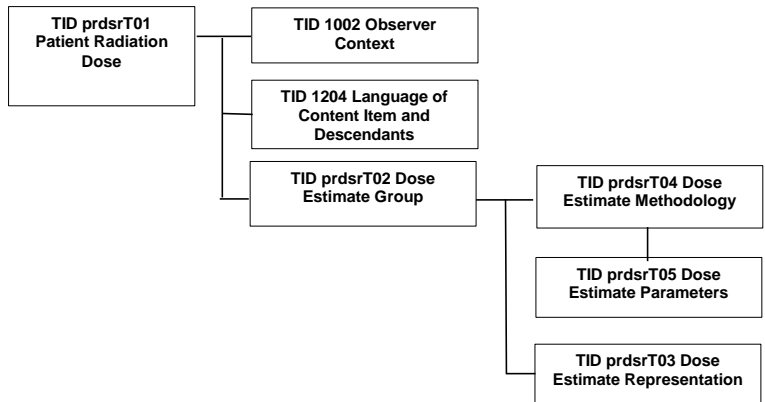




246 **Item #11: Add new Section to Annex A**

**PATIENT RADIATION DOSE SR IOD TEMPLATES**

248 The templates that comprise the Patient Radiation Dose SR are interconnected as in Figure A-x.



250 **Figure A-x: Patient Radiation Dose SR IOD Template Structure**

**TID prdsrT01 Patient Radiation Dose**

252 This template defines a container (the root) with subsidiary content items for determining an estimated radiation dose to a patient.

254

256

258

**TID prdsrT01**  
**Patient Radiation Dose**  
**Type: Extensible**  
**Order: Non Significant**  
**Root: Yes**

NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		CONTAINER	EV (prdsrCD001, DCM, "Patient Radiation Dose Report")	1	M		
2	> HAS CONCEPT MOD	INCLUDE	DTID 1204 "Language of Content Item and Descendants"	1	M		
3	> HAS OBS CONTEXT	INCLUDE	DTID (1002) Observer Context	1-n	M		
4	> CONTAINS	INCLUDE	DTID (prdsrT02, "Dose Estimate Group")	1-n	M		
5	> CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U		

--	--	--	--	--	--	--	--	--	--

260

**Content Item Descriptions**

Row 3	Identify all observers and devices involved with organ estimations included in this PRDSR.
Row 4	For the same exposure of an organ or set of organs there can be multiple dose estimates groups.

262

**TID prdsrT02 Dose Estimate Group**

264 The dose estimate group is used to record the results from one or more analysis methods from a single radiation exposure and/or from multiple exposures. Organ dose estimates are calculated from one or more irradiation events to a patient. The output from one or more sources of radiation can be used separately or combined to estimate the dose to a patient or individual organs.

268

**TID prdsrT02  
Dose Estimate Group  
Type: Extensible  
Order: Non Significant**

270

NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		CONTAINS	CONTAINER	EV (prdsrCD002, DCM, "Dose Estimate Group")	1	M	
2	>	HAS CONCEPT MOD	TEXT	EV (prdsrCD003, DCM, "Dose Estimate Group Name")	1	M	
3	>	HAS PROPERTIES	CODE	EV (prdsrCD093, DCM, "Source Category")	1	M	DCID prdsrCI01 "Source Categories"
4	>	CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U	
5	>	CONTAINS	INCLUDE	DTID (prdsrT04, DCM, "Dose Estimate Methodology")	1	M	
6	>	CONTAINS	INCLUDE	DTID (prdsrT03, DCM, "Dose Estimate Distribution")	1	U	
7	>	CONTAINS	CONTAINER	EV (113517, DCM, "Organ Dose Information")	1-n	M	
8	>>	CONTAINS	CODE	EV (T-D0060, SRT, "Organ")	1	M	DCID prdsrCI12 "Organs for Dose Estimations"
9	>>	CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U	
10	>>	CONTAINS	NUM	EV (prdsrCD113, DCM, "Absorbed Dose")	1	M	UNITS = EV (mGy, UCUM, "mGy")
11	>>>	HAS CONCEPT MOD	CODE	EV (121401, DCM, "Derivation")	1	M	DCID prdsrCI02 "Dose Derivation Types"

12	>>	CONTAINS	NUM	EV (prdsrCD112, DCM, "Equivalent Dose")	1	U		UNITS = EV (mSv, UCUM, "mSv")
13	>>>	HAS CONCEPT MOD	CODE	EV (121401, DCM, "Derivation")	1	M		DCID prdsrCI02 "Dose Derivation Types"

272

**Content Item Descriptions**

274	Row 3	Provide classification of the radiation source(s) used.
	Row 4	Reason these sources, e.g. multiple x-ray tubes (bi-plane XA and dual source CT), radioactive sources, etc. are combined.
	Row 12	This should be included only if quality factor is not equal to one. This is not Effective Dose. Effective Dose cannot be determined for an individual patient.

276 **TID prdsrT03 Dose Estimate Distribution**

Different representations (e.g. images) of the absorbed energy in organs allows a better understanding of how this energy is distributed throughout the entire patient or in an region or phantom.

280 **TID prdsrT03 Dose Estimate Distribution**  
Type: Extensible  
Order: Non Significant

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (prdsrCD012, DCM, "Dose Estimate Distribution")	1	M		
2	>	CONTAINS	CONTAINER	EV (prdsrCD014, DCM, "Dose Distribution Data")	1-n	M		
3	>>	CONTAINS	IMAGE		1	MC	IF not Row 4	
4	>>	CONTAINS	COMPOSITE		1	MC	IF not Row 3	
5	>>	CONTAINS	CODE	EV (T-D0060,SRT, "Organ")	1-n	M		
6	>>	CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U		

284 **Content Item Descriptions**

Row 3 and 4	Reference to an Instance that contains the dose representation, e.g. surface segmentation, mesh, parametric map, RT dose IOD's, Secondary Capture, etc.
Row 5	Listing of organs included in Rows 3 or 4. Shall contain only organs given in Row 7 TID prdsrT02 "Dose Estimate Group. Some organs listed in TID prdsrT02 "Dose Estimate Group" may not be included in the Dose Distribution Data.

286

**TID prdsrT04 Dose Estimate Methodology**

288 This template includes the information specific to the organ dose calculation methodology used when  
estimating dose to individual organs, entire body or a phantom from imaging studies that use ionizing  
290 radiation.

292

**TID prdsrT04  
Dose Estimate Methodology  
Type: Extensible  
Order: Non Significant**

294

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (prdsrCD015, DCM, "Dose Estimate Methodology")	1	M		
2	>	CONTAINS	COMPOSITE	EV (prdsrCD016, DCM, "Source RDSR")	1-n	M		
3	>>	HAS PROPERTIES	UIDREF	EV (113853, DCM, "Irradiation Event UID")	1-n	MC	IFF some Irradiation Events in the RDSR were not used in calculating the dose.	
4	>	CONTAINS	CONTAINER	EV (prdsrCD100, DCM, "Patient Dose Model")	1	M		
5	>>	CONTAINS	CODE	EV (prdsrCD017, DCM, "Patient Model Type")	1	M		DCID prdsrCI03 "Patient Model Type".
6	>>	CONTAINS	CODE	EV (prdsrCD020, DCM, "Radiation Transport Model Type")	1	M		DCID prdsrCI04 "Radiation Transport Model Type".
7	>>	CONTAINS	IMAGE	EV (prdsrCD025, DCM, "Patient Dose Model Data")	1	U	IF not Row 8	
8	>>	CONTAINS	COMPOSITE	EV (prdsrCD025, DCM, "Patient Dose Model Data")	1	U	IF not Row 7	
9	>>	CONTAINS	TEXT	EV (prdsrCD026, DCM, "Patient Dose Model Reference")	1	U		
10	>>	CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U		
11	>>	CONTAINS	CONTAINER	EV (prdsrCD027, DCM, "Patient Model Demographics")	1	M		
12	>>>	CONTAINS	NUM	EV (prdsrCD028, DCM, "Minimum age")	1	MC	IF minimum age is defined for the model	DCID 7456 "Units of Measured Age"
13	>>>	CONTAINS	NUM	EV (prdsrCD030, DCM, "Maximum age")	1	MC	IF maximum age is defined for the model	DCID 7456 "Units of Measured Age"

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14	>>>	CONTAINS	CODE	EV (prdsrCD037, DCM, "Model Patient sex")	1	MC	IF Model requires sex be defined.	DCID 7455 "Sex"
15	>>>	CONTAINS	NUM	EV (prdsrCD038, DCM, "Minimum weight")	1	MC	IF minimum weight is defined for the model	UNITS = EV (kg, UCUM, "kg")
16	>>>	CONTAINS	NUM	EV (prdsrCD041, DCM, "Maximum weight")	1	MC	IF maximum weight is defined for the model	UNITS = EV (kg, UCUM, "kg")
17	>>>	CONTAINS	NUM	EV (prdsrCD039, DCM, "Minimum height")	1	MC	IF minimum height is defined for the model	UNITS = EV (cm, UCUM, "cm")
18	>>>	CONTAINS	NUM	EV (prdsrCD042, DCM, "Maximum height")	1	MC	IF maximum height is defined for the model	UNITS = EV (cm, UCUM, "cm")
19	>>	CONTAINS	CONTAINER	EV (prdsrCD056, DCM, "Registration of Patient Model with RDSR")	1	U		
20	>>>	CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U		
21	>>>	CONTAINS	CODE	EV (prdsrCD046, DCM, "Registration Method")	1	M		DCID 7100 "RCS Registration Method Type"
22	>>>	CONTAINS	COMPOSITE	EV (prdsrCD044, DCM, "Spatial Fiducials")	1	MC	IF row 20 is (125022, DCM, "Fiducial Alignment")	
23	>>>	CONTAINS	COMPOSITE	EV (prdsrCD044, DCM, "Spatial Registration")	1	M		
24	>	CONTAINS	CONTAINER	EV (prdsrCD057, DCM, "X-Ray Beam Attenuator Information")	1-n	MC	IF Attenuators used in estimation	
25	>>	CONTAINS	CODE	EV (prdsrCD058, DCM, "Attenuator Material Category")	1	M		DCID prdsrCI07 "Attenuator Material Category"
26	>>	CONTAINS	CODE	EV (prdsrCD065, DCM, "Equivalent Attenuator Material")	1	M		DCID 10006 X-Ray Filter Materials
27	>>	CONTAINS	NUM	EV (prdsrCD069, DCM, "Equivalent Attenuator Thickness")	1	M		UNITS = EV (mm, UCUM, "mm")
28	>>	CONTAINS	TEXT	EV (prdsrCD068, DCM, "Attenuator Description")	1	U		
29	>>	CONTAINS	CONTAINER	EV (prdsrCD072, DCM, "X-Ray Beam Attenuator Model")	1	U		
30	>>>	CONTAINS	CODE	EV (prdsrCD020, DCM, "Radiation Transport Model Types")	1	U		DCID prdsrCI04 "Radiation Transport Model Types"

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Page 22

31	>>>	CONTAINS	TEXT	EV (prdsrCD074, DCM, "X-Ray Beam Attenuator Model Reference")	1	U		
32	>>	CONTAINS	CONTAINER	EV (prdsrCD075, DCM, "Registration of X-Ray Beam Attenuator Model with RDSR")	1	MC	IF X-Ray Beam Attenuator Model location is different from the equipment output referenced in RDSR (i.e. row 2)	
33	>>>	CONTAINS	CODE	EV (prdsrCD046 DCM "Registration Method")	1	MC		DCID 7100 "RCS Registration Method Type"
34	>>>	CONTAINS	COMPOSITE	EV (prdsrCD044, DCM, "Spatial Fiducials")	1	MC	IF row 32 is equal (125022, DCM, "Fiducial Alignment")	
35	>>>	CONTAINS	COMPOSITE	EV (prdsrCD044, DCM, "Spatial Registration")	1	MC		
36	>	CONTAINS	CONTAINER	EV (prdsrCD076, DCM, "Radiation Dose Estimate Method")	1-n	M		
37	>>	CONTAINS	CODE	EV (prdsrCD077, DCM, "Radiation Dose Estimate Method Type")	1	M		DCID prdsrC110 "Estimate Method Types"
38	>>	CONTAINS	INCLUDE	DTID prdsrT05 "Radiation Dose Estimate Parameters"	1	U		
39	>>	CONTAINS	TEXT	EV (prdsrCD082, DCM, "Radiation Dose Estimate Method Reference")	1	U		

296 Content Item Descriptions

Row 2	List the RDSR's used in the dose estimation. If an RDSR does not exist one must be created from estimated data. These can be from any modality, e.g. CT, projection X-Ray radiopharmaceutical (diagnostic or therapeutic).
Row 3	Reference to Irradiation Event UID's that are being used in the Dose Estimate Methodology only if all irradiation events are not included in the methodology.
Rows 7 and 8	Reference to an instance that contains the model e.g. Surface Segmentation, Mesh, Parametric Map or RT IOD.
Row 9	Reference to Publication describing the model used. May be proprietary, if so reference the manufacturer model and version
Rows 11 through 18	These are the demographics of the patient model used to estimate dose. These are not necessarily the actual patient demographics (e.g. the values input at time of the irradiation event may be incorrect).
Row 19	Registration of the patient model to each RDSR.
Rows 22 and 34	This is a reference to the Spatial Fiducial IOD.
Rows 23 and 35	This is a reference to the Spatial Registration IOD. If RCS Registration Method Type is Visual Alignment it is assumed any translation/rotation information from the visual alignment is added to other alignment translation/rotation information and saved as a single Spatial Registration IOD.
Rows 24	One content per attenuator. This can be information about materials in the radiation beam that is used in the estimation method and that may or may not have been included in the RDSR. If the beam Attenuator (e.g. filter) is included here and is also in the RDSR it is

	assumed additional information relative to the beam Attenuator material, shape, size, location was needed and this information was not in the RDSR or the RDSR information is considered incorrect or incomplete.
Row 26	The estimation method may use an equivalent material rather than the actual material, e.g. a plastic table may be use equivalent aluminum attenuation.
Row 31 and 39	Provide name of method, reference to a publication or the manufacturer model and version

298 **TID prdsrT05 Dose Estimate Parameters**

300 This template includes the parameters that are specific to the Dose Estimate Method used in the  
301 algorithms when estimating dose to individual organs, phantoms or the entire body from imaging studies  
302 that use ionizing radiation.

302 **TID prdsrT05**  
303 **Dose Estimate Parameters**  
304 **Type: Extensible**  
305 **Order: Non Significant**

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (prdsrCD034, DCM, "Dose Estimate Parameters")	1	M		
2	>	CONTAINS	NUM	BCID rdsrCI06A "Radiation Dose Estimation Parameter"	1-n	M		
3	>>	CONTAINS	CODE	EV(prdsrCD064, DCM, "Radiation Dose Estimate Parameter Type")	1	M		DCID prdsrCI06 "Radiation Dose Estimate Parameter Type"

308 **Content Item Descriptions**

Row 2	These are the parameters of the method specified in Row 39 of TID prdsrT04 Dose Estimate Methodology

310 **Item #12: Add the following CID's to Part 16 Annex B:**

**CID prdsrCI01 Source Categories**

**Table CID prdsrCI01**  
**Source Categories**

**Type: Extensible**      **Version: yyyyymmdd**

Coding Scheme Designator	Code Value	Code Meaning
DCM	prdsrCD089	Single source exposure
DCM	prdsrCD090	Multi-source exposure

--	--	--

316 CID prdsrCI12 Organs for Dose Estimates

318 **Table CID prdsrCI12**  
**Organs for Dose Estimates**

**Type: Extensible      Version: yyyyymmdd**

<b>Coding Scheme Designator</b>	<b>Code Value</b>	<b>Code Meaning</b>
<i>Include CID 10044 "Radiosensitive Organs"</i>		
<b>SRT</b>	<b>T-D0010</b>	<b>Entire Body</b>
<b>DCM</b>	<b>113681</b>	<b>Phantom</b>

320 CID prdsrCI02 Dose Derivation Types

322 **Table CID prdsrCI02**  
**Dose Derivation Types**

**Type: Extensible      Version: yyyyymmdd**

<b>Coding Scheme Designator</b>	<b>Code Value</b>	<b>Code Meaning</b>
SRT	G-A437	Maximum
SRT	R-404FB	Minimum
SRT	R-00317	Mean
DCM	prdsrCD095	Single Dose Value

326 CID prdsrCI13 Dose Estimate Distribution Representation

328 **Table CID prdsrCI13**  
**Dose Estimate Distribution Representation**

**Type: Extensible      Version: yyyyymmdd**

<b>Coding Scheme Designator</b>	<b>Code Value</b>	<b>Code Meaning</b>
DCM	prdsrCD084	Isodose
DCM	prdsrCD085	Skin dose map
DCM	prdsrCD086	Screen capture
DCM	prdsrCD087	3D dose map
DCM	prdsrCD088	Dose gradient
DCM	prdsrCD096	Point Cloud
DCM	121342	Dose Image



330

**CID prdsrCI03 Patient Model Types**

332

**Table CID prdsrCI03  
Patient Model Types**

334

**Type: Extensible      Version: yyyyymmdd**

<b>Coding Scheme Designator</b>	<b>Code Value</b>	<b>Code Meaning</b>
DCM	prdsrCD018	Simple Object
DCM	prdsrCD019	Anthropomorphic
DCM	prdsrCD094	Patient Segmented

**CID prdsrCI04 Radiation Transport Model Type**

336

**Table CID prdsrCI04  
Radiation Transport Model Type**

338

**Type: Extensible      Version: yyyyymmdd**

<b>Coding Scheme Designator</b>	<b>Code Value</b>	<b>Code Meaning</b>
DCM	prdsrCD021	Geometric
DCM	prdsrCD022	Voxelized
DCM	prdsrCD023	Mesh
DCM	prdsrCD024	NURBS
DCM	prdsrCD097	Measured radiation dose
DCM	prdsrCD006	BREP

340

Table CID 7456 is included for reference only, no changes required.

**Table CID 7456. Units of Measure for Age**

342

**Table CID 7456  
Units of Measure for Age**

344

**Type: Non-Extensible      Version: 20020904**

<b>Coding Scheme Designator</b>	<b>Code Value</b>	<b>Code Meaning</b>
UCUM	a	year
UCUM	mo	month
UCUM	wk	week
UCUM	d	day
UCUM	h	hour
UCUM	min	minute

346

Table CID 7100 is included for reference only, no changes required.

348

**CID 7100 RCS Registration Method Type**

350

**Table CID 7100**  
**RCS Registration Method Type**  
**Type: Extensible      Version: 20040115**

352

Coding Scheme Designator	Code Value	Code Meaning
DCM	125021	Frame of Reference Identity
DCM	125022	Fiducial Alignment
DCM	125023	Acquisition Equipment Alignment
DCM	125024	Image Content-based Alignment
DCM	125025	Visual Alignment

354 **CID prdsrCI07 Attenuator Material Category**

356

**Table CID prdsrCI07**  
**Attenuator Material Category**  
**Type: Extensible      Version: yyyyymmdd**

Coding Scheme Designator	Code Value	Code Meaning
DCM	prdsrCD059	Table
DCM	prdsrCD060	Table core
DCM	prdsrCD061	Table outer liner
DCM	prdsrCD062	Table pad
DCM	prdsrCD063	Patient protection shield
DCM	prdsrCD031	Beam block
DCM	prdsrCD092	Patient Support
DCM	113771	X-Ray Filters

358

**Table CID 10006. X-Ray Filter Materials**

360

**Table CID 10006**  
**X-Ray Filter Materials**  
**Type: Extensible      Version: yyyyymmdd**

362

Coding Scheme Designator	Code Value	Code Meaning
...	...	...
DCM	prdsrCD066	Carbon fiber or Carbon fiber equivalent material
DCM	prdsrCD067	Composite
SRT	C-139F9	Tin or Tin compound

364 **CID prdsrCI10 Estimate Method Types**

366 **Table CID prdsrCI10  
Estimate Method Types**  
Type: Extensible Version: yyyyymmdd

Coding Scheme Designator	Code Value	Code Meaning
DCM	prdsrCD078	Monte Carlo
DCM	prdsrCD079	Tabular data
DCM	prdsrCD080	Analytical
DCM	prdsrCD081	Empirical

368

**CID prdsrCI06A Radiation Dose Estimation Parameter**

370 **Table CID prdsrCI06A  
Radiation Dose Estimation Parameter**  
372 Type: Extensible Version: yyyyymmdd

Coding Scheme Designator	Code Value	Code Meaning
DCM	prdsrCD005	Breast thickness
DCM	111634	HVL
DCM	111046	Percent fibroglandular tissue
DCM	prdsrCD007	Normalized mean glandular dose (DgN)
DCM	prdsrCD008	Patient AP dimension
DCM	prdsrCD009	Patient lateral dimension
DCM	prdsrCD010	f-s coefficient
DCM	prdsrCD011	Backscatter
DCM	**defined in CP1525**	Water equivalent diameter (Dw)
DCM	prdsrCD033	Tissue air ratio

374 **CID prdsrCI06 Radiation Dose Estimate Parameter Type**

376 **Table CID prdsrCI06  
Radiation Dose Estimate Parameter Type**  
Type: Extensible Version: yyyyymmdd

Coding Scheme Designator	Code Value	Code Meaning
DCM	prdsrCD052	Correction factor
DCM	prdsrCD053	Curve fit parameter
DCM	prdsrCD055	Homogeneity factor
DCM	prdsrCD122	Normalization factor
DCM	prdsrCD123	Offset factor

DCM	112031	Attenuation Coefficient
DCM	prdsrCD126	Tissue Fraction
DCM	prdsrCD127	Distance correction
DCM	prdsrCD128	Conversion factor
DCM	121206	Distance
DCM	111634	HVL

378

380 **Item #: Add the following Coded terms to Part 16 Annex D: Table D-1**

**Table D-1. DICOM Controlled Terminology Definitions**

Code Value	Code Meaning	Definition	Notes
prdsrCD001	Patient Radiation Dose Report	A report of estimated absorbed energy from ionizing radiation to a patient.	
prdsrCD002	Dose Estimate Group	One or more estimates of absorbed energy from ionizing radiation.	
prdsrCD003	Dose Estimate Group Name	Name used to identify a dose estimate group.	
prdsrCD004	Lower uncertainty in Absorbed Dose	The lower estimated uncertainty in the radiation dose to the organ	
prdsrCD005	Breast thickness	Thickness of the breast	
prdsrCD006	BREP	Boundary based representation of the model for the estimation of radiation transport and absorbed dose in materials.	
prdsrCD007	Normalized mean glandular dose (DgN)	Conversion values used to calculate the absorbed dose from radiation to the fibroglandular tissue component of the breast from the exposure in air.	
prdsrCD008	Patient AP dimension	The size of a patient in the anterior-posterior dimension	
prdsrCD009	Patient lateral dimension	The size of a patient in the lateral dimension	
prdsrCD010	f-s coefficient	Conversion factor for Size Specific Dose Estimate (SSDE) calculations from CTDI <sub>vol</sub>	
prdsrCD011	Backscatter	Scattering of radiation or particles in a direction opposite to that of the incident radiation	
prdsrCD012	Dose Estimate Distribution	The distribution of the estimated absorbed energy to an organ, a set of organs or the whole body, e.g., surface segmentation, mesh, parametric map, RT dose IOD's, Secondary Capture, etc.	
prdsrCD013	Dose Distribution Model	The form of the model used to represent the distribution of the radiation dose.	
prdsrCD014	Dose Distribution Data	The absorbed energy data created from the estimation method.	
prdsrCD015	Dose Estimate Methodology	The methodology and parameters used to estimate the radiation dose to an organ, the whole body or a phantom.	
prdsrCD016	Source RDSR	Radiation Dose Structured Report used as the source of the irradiation event output information	

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prdsrCD017	Patient Model Type	The type of model used to define the shape, size, location of objects, etc. for use in radiation transport analysis.		
prdsrCD018	Simple Object	A simple object used to model a patient or organ, e.g. cylinder for estimating radiation dose		
prdsrCD019	Anthropomorphic	A patient model for estimating radiation dose that describes or thought of as having a human form or human attributes		
prdsrCD020	Radiation Transport Model Types	The model used to estimate radiation transport and absorbed dose in materials		
prdsrCD021	Geometric	A geometrical shape used as the model for the estimation of radiation transport and absorbed dose in materials		
prdsrCD022	Voxelized	A volumetric pixel format for the model for the estimation of radiation transport and absorbed dose in materials		
prdsrCD023	Mesh	A mesh structure representation for the model for the estimation of radiation transport and absorbed dose in materials		
prdsrCD024	NURBS	Surfaces of a non-uniform rational B-spline (NURBS) based representation for the model for the estimation of radiation transport and absorbed dose in materials		
prdsrCD025	Patient Dose Model Data	The stored data from the model used to estimate radiation dose to a patient or organ		
prdsrCD026	Patient Model Reference	A reference to the methodology or rationale for the model used in the estimation of radiation dose		
prdsrCD027	Patient Model Demographics	Parameters used by the radiation dose estimation method that are indicative of the patient type or population		
prdsrCD028	Minimum Age	The minimum age of the patient model used in the radiation dose estimation method		
prdsrCD029				
prdsrCD030	Model Maximum Age	The maximum patient age supported by the model		
prdsrCD031	Beam Block	A material placed in the radiation beam that is used to completely attenuate the beam in a specific region of the field of view		

prdsrCD032	RDSR origin coordinate name	The name of the origin within the RDSR equipment FOR that is being designated as location 0,0,0 in Cartesian coordinates	
prdsrCD033	Tissue air ratio	Ratio of the absorbed dose at a given depth in tissue to the absorbed dose at the same point in air.	
prdsrCD034	Dose Estimate Parameters	The parameters used in the algorithms for determining the radiation dose to a patient, organs, or any material	
prdsrCD035	Radiation Dose Estimate Parameter Description	A description of what the meaning of Radiation Dose Estimate parameter. This is often a correction or other factor that is used in the simulation or empirical model.	
prdsrCD036			
prdsrCD037	Model Patient Sex	The patient sex supported by the model	
prdsrCD038	Minimum Weight	The minimum weight of the patient model used in the radiation dose estimation method	
prdsrCD039	Minimum Height	The minimum height of the patient model used in the radiation dose estimation method	
prdsrCD041	Maximum Weight	The maximum weight of the patient model used in the radiation dose estimation method	
prdsrCD042	Maximum Height	The maximum height of the patient model used in the radiation dose estimation method	
prdsrCD043	Position Reference Indicator	Specifies the part of the imaging target that was used as a reference point associated with a Frame of Reference.	
prdsrCD044	Spatial Registration	Reference to the Spatial Registration IOD, Deformable Spatial Registration IOD or Spatial Fiducials IOD used	
prdsrCD045			
prdsrCD046	Registration Method	Name of the method to register the frame of reference for two or more data sets	
prdsrCD047	fiducial mark x-coordinate	In Cartesian space, the x-coordinate of the location in image space, which may or may not correspond to an anatomical reference, which is often used for registering data sets.	

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prdsrCD048	fiducial mark y-coordinate	In Cartesian space, the y-coordinate of the location in image space, which may or may not correspond to an anatomical reference, which is often used for registering data sets		
prdsrCD049	fiducial mark z-coordinate	In Cartesian space, the z-coordinate of the location in image space, which may or may not correspond to an anatomical reference, which is often used for registering data sets		
prdsrCD050	Fiducial mark name	Name of the location of the fiducial marker placed on the patient or object used for registration. For patient registration this is often an anatomical reference point such as the iliac crest, orbital-medial, sternal notch, symphysis pubis, xiphoid, lower costal margin, or external auditory meatus.		
prdsrCD051	Confidence Interval	A range of values so defined that there is a specified probability that the value of a parameter lies within it		
prdsrCD052	Correction factor	A factor that is used to make an adjustment to a calculation to account for deviations in the method		
prdsrCD053	Curve fit parameter	A value used in a mathematical statement from the empirical determination of a curve or function that approximates a set of data		
prdsrCD054				
prdsrCD055	Homogeneity factor	A value that is used to describe the uniformity or composition of a data set or a material that relates to the same degree of variability		
prdsrCD056	Registration of Patient Model to RDSR	The registration of patient model to the RDSR		
prdsrCD057	X-Ray Beam Attenuator Information	Additional attenuators that are in the radiation beam that may alter the estimated radiation dose to the patient or organ		
prdsrCD058	Attenuator Material Category	The type of attenuator that is in the radiation beam that may alter the estimated radiation dose to the patient or organ		
prdsrCD059	Table	The table a patient is sitting, standing or lying on and that is in the radiation beam such that it may alter the estimated radiation dose to the patient or organ		
prdsrCD060	Table core	The core material of a table a patient is sitting, standing or lying on and that is in the radiation beam such that it may alter the estimated radiation dose to the patient or organ		



prdsrCD061	Table outer liner	The outer shell of a table a patient is sitting, standing or lying on and that is in the radiation beam such that it may alter the estimated radiation dose to the patient or organ		
prdsrCD062	Table pad	The padding on a table a patient is sitting, standing or lying on and that is in the radiation beam such that it may alter the estimated radiation dose to the patient or organ		
prdsrCD063	Patient protection shield	A material placed within the radiation beam to protect the patient from radiation that may alter the estimated radiation dose to the patient or organ		
prdsrCD064	Estimation Parameter	Parameters used in mathematical, simulation or empirical calculations		
prdsrCD065	Equivalent Attenuator Material	The equivalent material that was used in the methodology to estimate the radiation dose to the patient or organ		
prdsrCD066	Carbon fiber or Carbon fiber compound	A material consisting of thin, strong crystalline filaments of carbon		
prdsrCD067	Composite	A material made from two or more constituent materials with significantly different physical or chemical properties that, when combined, produce a material with characteristics different from the individual components		
prdsrCD068	Attenuator Description	An explanation of the actual attenuator material and how it was used in the estimation of radiation dose		
prdsrCD069	Equivalent Attenuator Thickness	The thickness of the equivalent attenuator used to estimate radiation dose to a patient or organ		
prdsrCD070				
prdsrCD071	Dose Estimate Parameter Value	The quantity of a parameter used in a radiation dose estimation method that is often a correction or other factor used in simulation or empirical models		
prdsrCD072	X-Ray Beam Attenuator Model	A model of an object of attenuator placed in the radiation beam that modifies the beam and is used in the estimation of radiation dose		
prdsrCD073	Tin or Tin compound	A material made from Tin or alloys and mixtures that contain Tin		
prdsrCD074	X-Ray Beam Attenuator Model Reference	A reference to the methodology or rationale for the model of the beam Attenuator used in the estimation of radiation dose		

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prdsrCD075	Registration of X-Ray Beam Attenuator Model with RDSR	The registration of beam Attenuator model to the RDSR output information	
prdsrCD076	Radiation Dose Estimate Method	Name of the grouping of radiation dose estimation methods and parameters for a set of organs, tissues or phantoms	
prdsrCD077	Radiation Dose Estimate Method Type	Type of method used to estimate the radiation dose to a patient or organ	
prdsrCD078	Monte Carlo	Algorithms that rely on repeated random sampling to obtain numerical results.	
prdsrCD079	Tabular data	Table of values indexed by a key.	
prdsrCD080	Analytical	Algorithms that use mathematical models that have a deterministic result.	
prdsrCD081	Empirical	Algorithms that use mathematical models that use parameters derived from observation.	
prdsrCD082	Radiation Dose Estimate Method Reference	A reference to the methodology or rationale for the estimation methodology used for the estimation of radiation dose.	
prdsrCD083	Uncertainty Type	The value type of the uncertainty in the radiation dose estimation	
prdsrCD084	Isodose	Representation of radiation dose of equal intensity as a curve or line	
prdsrCD085	Skin dose map	Representation of radiation dose of equal intensity as a surface on the skin	
prdsrCD086	Screen capture	Representation of radiation dose from a secondary capture image	
prdsrCD087	3D dose map	Representation of radiation dose as a 3D shape or object	
prdsrCD088	Dose gradient	Representation of the change in radiation dose with respect to the change in another variable. Often represented as a change with respect to time or distance.	
prdsrCD089	Single source exposure	Radiation exposure that originates from a single source (e.g. a single x-ray tube, a radioactive tracer within the body).	
prdsrCD090	Multi-source exposure	More than one source of radiation exposure that are being combined for the estimation of radiation dose (e.g. dual source CT, radioactive tracer and CT sources).	

prdsrCD091			
prdsrCD092	Patient Support		
prdsrCD093	Source Specification	The sources of radiation that were used in the estimated radiation dose to organs	
prdsrCD094	Patient Segmented	A patient model for estimating radiation dose defined from the actual patient anatomy or characteristics	
prdsrCD095	Single Dose Value	Radiation dose specified at a single location. This can be at the reference point.	
prdsrCD096	Point Cloud	Radiation dose represented as a distribution of points	
prdsrCD097	Measured radiation dose	The measured amount of energy that is deposited in a material by ionizing radiation	
prdsrCD098			
prdsrCD099			
prdsrCD100	Patient Dose Model	A computational representation of a human body or other object used to simulate the attenuation of radiation in human tissue	
prdsrCD101			
prdsrCD102			
prdsrCD103			
prdsrCD104			
prdsrCD105			
prdsrCD106			
prdsrCD107			
prdsrCD108			
prdsrCD109			
prdsrCD110			
prdsrCD111			
prdsrCD112	Equivalent Dose	Absorbed dose to a tissue or organ multiplied by a "quality" factor to normalize the dose to the type of radiation that is depositing the dose	

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prdsrCD113	Absorbed Dose	energy from ionizing radiation absorbed per unit mass by a material	
prdsrCD114			
prdsrCD115	Monte Carlo Simulations Method	A problem solving technique used to approximate the probability of certain outcomes by running multiple trial runs with known and assumed parameters that simulate the result	
prdsrCD116	Monte Carlo software name	The name of a software package that does Monte Carlo simulations	
prdsrCD117	Monte Carlo software version	The version of the software package used for Monte Carlo simulations	
prdsrCD118			
prdsrCD119			
prdsrCD120	Radiation Source Model	The model of the source of radiation used in Monte Carlo Simulations	
prdsrCD121	Radiation Source Model Name	The name of the model of the source of radiation used in Monte Carlo Simulations	
prdsrCD122	Normalization factor	A factor that is used to make an adjustment to a calculation to normalize the data set	
prdsrCD123	Offset factor	A factor that is used to make an adjustment to a calculation to translate or move the data set in a defined manner	
prdsrCD124			
prdsrCD125			
prdsrCD126	Tissue Fraction	The amount of a specific tissue content in a material	
prdsrCD127	Distance correction	A correction factor for a measurement or a location	
prdsrCD128	Conversion factor	A numerical ratio to express a measurement from one unit to another unit	

384

386

388

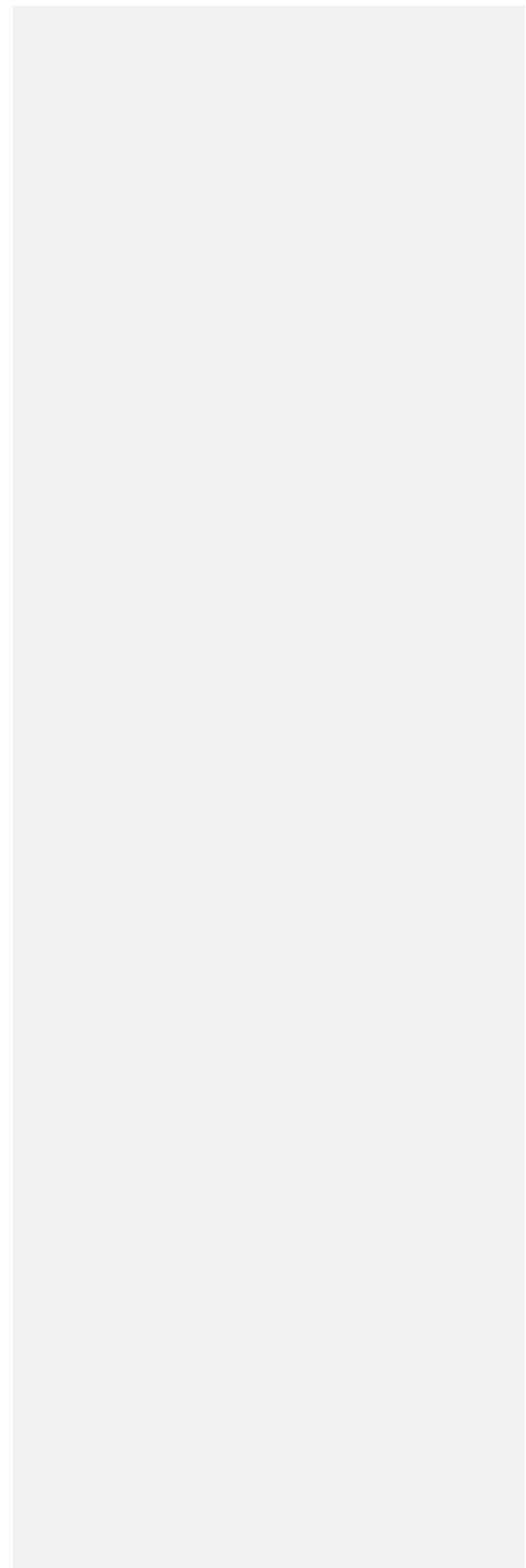
390

**Changes to NEMA Standards Publication PS 3.17-xxxx**

392

**Digital Imaging and Communications in Medicine (DICOM)  
Part 17: Explanatory Information**

394



Item #15: Add Patient Radiation Dose Reporting Use Cases Annex

396 **XXX Patient Radiation Dose SR**  
**Document (Informative)**

398 This Annex contains examples of the use of Patient Radiation Dose templates within Patient Radiation Dose SR Documents

400 **XXX.1 Skin Dose Map Example**

The following example shows the report of the skin dose map calculated from the dose delivered during an X-Ray interventional cardiology procedure.

404 The calculation uses an RDSR provided by a Single Plane X-Ray Angiography equipment of the manufacturer "A". The RDSR is created during one procedure step, corresponding to the coronary stenting of an adult male of 83 Kg and 179 cm height.

406 The skin dose calculations are performed by an application on a separated workstation of the manufacturer "B", operated by the medical physicist, who is logged into the workstation at the time of the creation of the Patient Radiation Dose SR document.

410 The dose calculation application generates a Patient Radiation Dose SR document and a Secondary Capture containing an image of the dose distribution over the deployed skin of the patient model.

The dose calculation application uses the following settings and assumptions:

412 RDSR Source Data:

- All the Irradiation Event UIDs are used in the calculation of the skin dose map.

414

Patient Model:

- The Patient model is a combination of two elliptic cylinders to represent the chest and neck of the patient.
- The actual dimensions of the model are determined by the age, gender, height and weight of the patient.
- In this example the exact height and weight of the patient are used to the creation of the model. The resulting elliptic cylinder for the chest of the model is 31 cm in the AP dimension and 74 cm in the lateral dimension.
- The application creates internally a 3D voxelized model that is stored in a DICOM Instance.

422 Patient Model Registration:

- The distance from the top of the patient's head to the head of the table (measured during the procedure) is known. The location of the patient head and table head are stored in a Spatial Fiducial instance.
- The application uses fiducials to register the patient model with the data of the source RDSR.
- A-priori knowledge of the distance from the table head to the system Isocenter at table zero position is calibrated offline.
- The table tilt, cradle and rotation angles are ignored because the description of the acquisition geometry is incomplete in the RDSR. Only table translations relative to the Isocenter are considered in the calculations.

430

Beam Attenuators:

- A-priori knowledge of the model of the table and mattress (i.e. shape, dimensions, and absorption material) is calibrated offline, and it's referenced internally by the application. The model contains the same coordinate system as the one used in the equipment referenced in the RDSR, so there is no need of another registration instance.

434

436 - The X-Ray filter information from the source RDSR is used by the application. There is no other a-priori  
438 knowledge of the X-Ray filtration.

440 **Table XXX.1-1. Skin Dose Map Example**

Node	Code Meaning of Concept Name	Code or Example Value	TID
1	Patient Radiation Dose Report	<CONTAINER>	TID prdsrT01
1.1	Language of Content Item and Descendants	(En, IETF4646, "English")	TID 1204
1.2	Observer Type	(121007, DCM, "Device")	TID 1002
1.3	Device Observer UID	<UID of Physicist Workstation>	TID 1004
1.4	Device Observer Name	MedPhys-01	TID 1004
1.5	Device Observer Manufacturer	Manufacturer B	TID 1004
1.6	Device Observer Model Name	DW	TID 1004
1.7	Observer Type	(121006, DCM, "Person")	TID 1002
1.8	Person Observer Name	Doe^John^Dr^PhD	TID 1003
1.9	Person Observer's Role in the Organization	(C1708969, UMLS, "Medical Physicist")	TID 1003
1.10	Dose Estimate Group	<CONTAINER>	TID prdsrT02
1.10.1	Dose Estimate Group Name	Skin Dose Map	TID prdsrT02
1.10.2	Source Category	(prdsrCD089, DCM, "Single source exposure")	TID prdsrT02
1.10.3	Comment	Single Plane XA	TID prdsrT02
1.10.4	Dose Estimate Methodology	<CONTAINER>	TID prdsrT04
1.10.4.1	Source RDSR	<UID of RDSR #1>	TID prdsrT04
1.10.4.2	Patient Dose Model	<CONTAINER>	TID prdsrT04
1.10.4.2.1	Patient Model Type	(prdsrCD018, DCM, "Simple Object")	TID prdsrT04
1.10.4.2.2	Radiation Transport Model Type	(prdsrCD022, DCM, "Voxelized")	TID prdsrT04
1.10.4.2.3	Patient Dose Model Data	<UID of 3D Voxelized Patient Model>	TID prdsrT04
1.10.4.2.4	Patient Dose Model Reference	DOI:1.2.3.4	TID prdsrT04
1.10.4.2.5	Comment	Combined Elliptic Cylinders	TID prdsrT04

**Commented [DP1]:** May need to add employee number, better than name  
<Francisco>  
- In TID 1003 there is no employee number  
- Nesting levels are OK. In TID 1002, 1003 and 1004 all the content items are at the same level

Node	Code Meaning of Concept Name	Code or Example Value	TID
1.10.4.2.6	Patient Model Demographics	<CONTAINER>	TID prdsrT04
1.10.4.2.6.1	Minimum age	18 (a, UCUM, "year")	TID prdsrT04
1.10.4.2.6.2	Maximum age	90 (a, UCUM, "year")	TID prdsrT04
1.10.4.2.6.3	Model Patient sex	(M, DCM, "Male")	TID prdsrT04
1.10.4.2.6.4	Minimum weight	83 (kg, UCUM, "kg")	TID prdsrT04
1.10.4.2.6.5	Maximum weight	83 (kg, UCUM, "kg")	TID prdsrT04
1.10.4.2.6.6	Minimum height	179 (cm, UCUM, "cm")	TID prdsrT04
1.10.4.2.6.7	Maximum height	179 (cm, UCUM, "cm")	TID prdsrT04
1.10.4.2.7	Registration of Patient Model with RDSR	<CONTAINER>	TID prdsrT04
1.10.4.2.7.1	Comments	Distance from the top of patient's head to the head of the table = 10 cm	TID prdsrT04
1.10.4.2.7.2	Registration Method	(125023, DCM, "Fiducial Alignment")	TID prdsrT04
1.10.4.2.7.3	Spatial Fiducials	<UID of "Spatial Fiducials">	TID prdsrT04
1.10.4.2.7.4	Spatial Registration	<UID of "Spatial Registration">	TID prdsrT04
1.10.4.3	X-Ray Beam Attenuator Information	<CONTAINER>	TID prdsrT04
1.10.4.3.1	Attenuator Material Category	(prdsrCD059, DCM, "Table")	TID prdsrT04
1.10.4.3.2	Equivalent Attenuator Material	(C-139F9, DCM, "Tin or Tin compound")	TID prdsrT04
1.10.4.3.3	Equivalent Attenuator Thickness	100 (mm, UCUM, "mm")	TID prdsrT04
1.10.4.3.4	Attenuator Description	X-Ray Table with mattress	TID prdsrT04
1.10.4.3.5	X-Ray Beam Attenuator Model	<CONTAINER>	TID prdsrT04
1.10.4.3.5.1	Radiation Transport Model Types	(prdsrCD021, DCM, "Geometric")	TID prdsrT04
1.10.4.3.5.2	X-Ray Beam Attenuator Model Reference	DOI:1.4.2.3	TID prdsrT04
1.10.4.4	Radiation Dose Estimate Method	<CONTAINER>	TID prdsrT04
1.10.4.4.1	Radiation Dose Estimate Method Type	(prdsrCD080, DCM, "Analytical")	TID prdsrT04
1.10.4.4.2	Dose Estimate Parameters	<CONTAINER>	TID prdsrT05



Node	Code Meaning of Concept Name	Code or Example Value	TID
1.10.4.4.2.1	(prdsrCD033, DCM, " <b>Tissue air ratio</b> ")	<b>1.06</b> ({ratio}, UCUM, " <b>ratio</b> ")	TID prdsrT05
1.10.4.4.2.1.1	Radiation Dose Estimate Parameter Type	(prdsrCD128, DCM, " <b>Conversion factor</b> ")	TID prdsrT05
1.10.4.4.2.2	(prdsrCD008, DCM, " <b>Patient AP dimension</b> ")	<b>31</b> (cm, UCUM, " <b>cm</b> ")	TID prdsrT05
1.10.4.4.2.2.1	Radiation Dose Estimate Parameter Type	(121206, DCM, " <b>Distance</b> ")	TID prdsrT05
1.10.4.4.2.3	(prdsrCD009, DCM, " <b>Patient lateral dimension</b> ")	<b>74</b> (cm, UCUM, " <b>cm</b> ")	TID prdsrT05
1.10.4.4.2.3.1	Radiation Dose Estimate Parameter Type	(121206, DCM, " <b>Distance</b> ")	TID prdsrT05
1.10.4.4.3	Radiation Dose Estimate Method Reference	<b>DOI:4.2.13.4</b>	TID prdsrT04
1.10.5	Dose Estimate Distribution	<CONTAINER>	TID prdsrT03
1.10.5.1	Distribution Model	(prdsrCD085, DCM, " <b>Skin dose map</b> ")	TID prdsrT03
1.10.5.1.1	Dose Distribution Data	<UID of Secondary Capture>	TID prdsrT03
1.10.5.1.2	Organ	(T-00009, SRT, " <b>Skin</b> ")	TID prdsrT03
1.10.5.1.3	Comment	<b>2D map of the dose on the deployed skin</b>	TID prdsrT03
1.10.6	Organ Dose Information	<CONTAINER>	TID prdsrT02
1.10.6.1	Organ	(T-00009, SRT, " <b>Skin</b> ")	TID prdsrT02
1.10.6.2	Comment	<b>Skin in the area of the chest and neck</b>	TID prdsrT02
1.10.6.3	Absorbed Dose	<b>3000</b> (mGy, UCUM, " <b>mGy</b> ")	TID prdsrT02
1.10.6.3.1	Derivation	(G-A437, SRT, " <b>Maximum</b> ")	TID prdsrT02
1.11	Comment	<b>Skin dose map report</b>	TID prdsrT01