DICOM Correction Proposal

STATUS	Final Text
Date of Last Update	2022/01/15
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Correction Number CP-2129
Log Summary: Extend RT Segment Characteristics With Metal Alloy Concepts used for Implants
Name of Standard PS3.6, PS3.16 2021e
Rationale for Correction: Although the RT Segment Annotation provides several ways to annotate Segment Characteristics that are important during treatment planning, the codes currently provided will not address the use case where the physician first annotates such Segments. The information in an initial step may be based on an “implant ID” the patient may bring along that only lists the material identifier. It is therefore proposed to extend the corresponding TID 15301 “RT Segment Characteristics” with the capability to add a coded entry from the new CID RT Segment Materials that currently only includes the existing CID 7300 “Implant Materials”. It is foreseen that other CIDs with different materials may be added later on. In addition, CID 7300 is proposed to be extended with more material definitions.
Correction Wording:

Add to Part 6 Annex A, Table A-1

Table A-1 UID VALUES

UID Value	UID Name	UID Keyword	UID Type	Part
1.2.840.10008.2.16.17	**Unified numbering system (UNS) for metals and alloys**	**UNS**	**Coding Scheme**	**PS3.16**

Add to Part 6 Annex A, Table A-3

Table A-3 CONTEXT GROUP UID VALUES

Context UID	Context Identifier	Context Group Name
1.2.840.10008.6.1.1432	**9579**	**RT Segment Materials**

Add to Part 16, 2.1

2 NORMATIVE REFERENCES

The following standards contain provisions that, through reference in this text, constitute provisions of this Standard. At the time of publication, the editions indicated were valid. All standards are subject to

revision, and parties to agreements based on this Standard are encouraged to investigate the possibilities of applying the most recent editions of the standards indicated below.

2.1 General

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[ASTM E 1762-04] ASTM. . Standard Guide for Electronic Authentication of Health Care Information, ASTM International.

[ASTM E 2084-00] ASTM. . Standard Specification for Authentication of Healthcare Information Using Digital Signatures, ASTM International.

[ASTM F 67] ASTM, Standard Specification for Unalloyed Titanium, for Surgical Implant Applications, ASTM International

[ASTM F 75] ASTM, Standard Specification for Cobalt-28 Chromium-6 Molybdenum Alloy Castings and Casting Alloy for Surgical Implants, ASTM International

[ASTM F 90] ASTM, Standard Specification for Wrought Cobalt-20Chromium-15Tungsten-10Nickel Alloy for Surgical Implant Applications, ASTM International

[ASTM F 136] ASTM, Standard Specification for Wrought Titanium-6Aluminum-4Vanadium ELI (Extra Low Interstitial) Alloy for Surgical Implant Applications, ASTM International

[ASTM F 138] ASTM, Standard Specification for Wrought 18Chromium-14Nickel-2.5Molybdenum Stainless Steel Bar and Wire for Surgical Implants, ASTM International

[ASTM F 688] ASTM, Standard Specification for Wrought Cobalt-35Nickel-20Chromium-10Molybdenum Alloy Plate, Sheet, and Foil for Surgical Implants, ASTM International

[ASTM F 1058] ASTM, Standard Specification for Wrought 40Cobalt-20Chromium-16Iron-15Nickel-7Molybdenum Alloy Wire, Strip, and Strip Bar for Surgical Implant Applications, ASTM International

[ASTM F 1295] ASTM, Standard Specification for Wrought Titanium-6Aluminum-7Niobium Alloy for Surgical Implant Applications, ASTM International

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[ISO 3166-1] ISO. . Codes for the representation of names of countries — Part 1: Country codes.

[ISO 5832-1] ISO. Implants for surgery – Metallic materials – Part 1: Wrought stainless steel.

[ISO 5832-2] ISO. Implants for surgery – Metallic materials – Part 2: Unalloyed titanium.

[ISO 5832-3] ISO. Implants for surgery – Metallic materials – Part 3: Wrought titanium 6-aluminium 4-vanadium alloy.

[ISO-5832-4] ISO. Implants for surgery – Metallic materials – Part 4: Cobalt-chromium-molybdenum casting alloy

[ISO 5832-5] ISO. Implants for surgery – Metallic materials – Part 5: Wrought cobalt-chromium-tungsten-nickel alloy.

[ISO 5832-6] ISO. Implants for surgery – Metallic materials – Part 6: Wrought cobalt-nickel-chromium-molybdenum alloy.

[ISO 5832-7] ISO. Implants for surgery – Metallic materials – Part 7: Forgeable and cold-formed cobalt-chromium-nickel-molybdenum-iron alloy.

[ISO 5832-11] ISO. Implants for surgery – Metallic materials – Part 11: Wrought titanium 6-aluminium 7-niobium alloy.

[ISO 5832-14] ISO. Implants for surgery – Metallic materials – Part 14: Wrought titanium 15-molybdenum 5-zirconium 3-aluminium alloy.

[ISO 8824-1] ISO. 2015. Information Technology – Abstract Syntax 1 (ASN.1): Specification of Basic Notation.

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[SAE J1086_201210] SAE International, J1086_201210, Numbering Metals and Alloys (STABILIZED Oct 2012)

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Add to Part 16, chapter 8

Table 8-1. Coding Schemes

Coding Scheme Designator (0008,0012)	Coding Scheme UID (0008,010C)	Coding Scheme Name (0008,0115)	Coding Scheme Responsible Organization (0008,0116)	Coding Scheme Resources Sequence (0008,0109) Type: URL	Description
…					
ASTM-sigpurpose	1.2.840.10065.1.12	ASTM E 2084	ASTM		[ASTM E 2084-00] Signature Purpose codes (see Annex A1 of ASTM E 2084), ASTM Subcommittee E 31.20 Data and System Security for Health Information
UNS	**1.2.840.10008.2.16.17**	**UNS**	**SAE International**		**Unified numbering system (UNS) for metals and alloys [SAE J1086_201210]**
…					

Add to Part 16, Annex B

CID 9579 RT SEGMENT MATERIALS

9579 RT Segment Materials
Resources: HTML | FHIR JSON | FHIR XML | IHE SVS XML
Type: Extensible
Version: 20220115
UID: 1.2.840.10008.6.1.1432

Coding Scheme Designator	Code Value	Code Meaning
Include CID 7300 "Implant Materials"		

Update in Part 16, Annex B

CID 7300 IMPLANT MATERIALS

Context ID 7300
Implant Materials
Resources: HTML | FHIR JSON | FHIR XML | IHE SVS XML
Type: Extensible
Version: ~~20101102~~20220115
UID: 1.2.840.10008.6.1.1031

Coding Scheme Designator	Code Value	Code Meaning	SNOMED-RT ID	UMLS Concept Unique ID	ASTM Reference	ISO Reference
SCT	261250004	Nickel Titanium	F-61166	C0076736		
SCT	256496006	Gold Alloy	F-611FC	C0018027		
SCT	256506002	Stainless Steel Material	F-61207	C0038126		
SCT	412155002	Polymer	F-61DF9	C0032521		
SCT	256501007	Carbon Fiber	F-61202	C0108411		
UNS	S31673	Stainless steel (SS316L)			[ASTM F 138]	[ISO 5832-1]
UNS	R50250	Titanium			[ASTM F 67]	[ISO 5832-2]
UNS	R56400	Titanium alloy (Titanium Aluminium-6 Vanadium-4)			[ASTM F 136]	[ISO 5832-3]
UNS	R30075	Cobalt chromium alloy (Cobalt Chromium-28 Molybdenum 6)			[ASTM F 75]	[ISO 5832-4]
DCM	130736	Titanium alloy (Titanium Molybdenum-15 Zirconium-5 Aluminium-3)				[ISO 5832-14]
UNS	R30605	Cobalt-chromium alloy (Cobalt Chromium-20 Tungsten-15 Nickel-10)			[ASTM F 90]	[ISO 5832-5]
UNS	R30035	Cobalt-chromium alloy (Cobalt Nickel-35 Chromium-20 Molybdenum-10)			[ASTM F 688]	[ISO 5832-6]
UNS	R30003	Cobalt-chromium alloy (Cobalt Chromium-20 Nickel-15 Iron-15 Molybdenum-7 Manganese-2)			[ASTM F 1058]	[ISO 5832-7]
UNS	R56700	Titanium alloy (Titanium Aluminium-6 Niobium-7)			[ASTM F 1295]	[ISO 5832-11]

Update in Part 16 Annex C, TID 15301 RT Segment Characteristics

TID 15301 RT Segment Characteristics

Type: **Extensible**
Order: **Non-Significant**
Root: **No**

Table TID 15301. RT Segment Characteristics

	NL	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1		NUMERIC	EV (130082, DCM, "Relative Mass Density")	1	U		Units = EV ({ratio}, UCUM, "ratio")
2		NUMERIC	EV (130083, DCM, "Relative Electron Density")	1	U		Units = EV ({ratio}, UCUM, "ratio")
3		NUMERIC	EV (130084, DCM, "Effective Z")	1	U		Units = EV (1, UCUM, "no units")
4		NUMERIC	EV (130085, DCM, "Effective Z per A")	1	U		Units = EV (/u, UCUM, "/u")
5		NUMERIC	EV (130086, DCM, "Relative Linear Stopping Power")	1	U		Units = EV ({ratio}, UCUM, "ratio")
6	>	NUMERIC	EV (130087, DCM, "Reference Energy")	1	M		Units = EV (MeV, UCUM, "Megaelectronvolt")
7		NUMERIC	EV (130088, DCM, "Linear Cell Kill Factor")	1	U		Units = EV ({ratio}, UCUM, "ratio")
8		NUMERIC	EV (130089, DCM, "Quadratic Cell Kill Factor")	1	U		Units = EV ({ratio}, UCUM, "ratio")
9		NUMERIC	EV (130090, DCM, "High Dose Fraction Linear Cell Kill Factor")	1	U		Units = EV ({ratio}, UCUM, "ratio")
10		NUMERIC	EV (130091, DCM, "Half-time for Tissue Repair ")	1	U		Units = EV (s, UCUM, "second")
11		NUMERIC	EV (130092, DCM, "High Dose Fraction Transition Dose")	1	U		Units = EV (Gy, UCUM, "Gray")
12		NUMERIC	EV (130093, DCM, "Atomic Number")	1-n	U		Units = EV (1, UCUM, "no units")
13	>	NUMERIC	EV (130094, DCM, "Elemental Composition Atomic Mass Fraction")	1	M		Units = EV ({ratio}, UCUM, "ratio")
14		NUMERIC	EV (130095, DCM, "alpha gEUD value")	1	U		Units = EV ({ratio}, UCUM, "ratio")
15		**CODE**	**EV (130737, DCM, "RT Segment Material")**	**1**	**U**		**DCID 9579 "RT Segment Materials"**

Content Item Descriptions

Rows 12, 13	The value of (130094, DCM, "Elemental Composition Atomic Mass Fraction") annotates the fractional weight of the elements identified by the (130093, DCM, "Atomic Number") with respect to the total mass of the segment. The allowed value is in the range of [0, 1].

Add to Part 16 Annex D

DICOM CONTROLLED TERMINOLOGY DEFINITIONS (NORMATIVE)

Code Value	Code Meaning	Definition	Notes
130736	Titanium alloy (Titanium Molybdenum-15 Zirconium-5 Aluminium-3)	Wrought titanium 15-molybdenum 5-zirconium 3-aluminium alloy.	
130737	RT Segment Material	Material identifiers used during or for an RT planning process.	