

2

## DICOM Correction Proposal Form

Correction Number		CP-323	
Log Summary: Code Meaning for UCUM code value of 1			
Type of Modification		Name of Standard	
Modification		PS 3.3 and 3.16 2001	
<p>DICOM does not adequately provide for the case of unitless values (1, UCUM, <i>code meaning</i>). As result, the DCMR has diverging and non-compliant Templates and Context Groups.</p> <p>Section 7.2.2 of Part 16 specifies two options for the Code Meaning:</p> <ul style="list-style-type: none"> <li>– Use the same string as UCUM Code Value: in this case “1” However, there is risk that the numeric value “5” could be interpreted as “51” when an application implements the common practice of displaying the unit Code Meaning immediately adjacent to the numeric value. <b>DICOM should forbid this option.</b></li> <li>– Construct from the English names of components using Americanized or European spelling. This option is not applicable for unitless values.</li> </ul> <p>Therefore there is no satisfactory Code Meaning for unitless values. DICOM Templates and Context Groups deviate from what 7.2.2 specifies and do so case by case, inconsistently. Examples of non-compliant context groups and templates include:</p> <ol style="list-style-type: none"> <li>1. CID 3082 Cardiology Units of Measurement specifies (1, UCUM, “unary, no units”). [Or was the intended interpretation: (1, UCUM, “unary”) or (1, UCUM, “no units”)? ]</li> <li>2. TID 4014 specifies {0-100} for the code value but uses “Ordinal scale 0 to 100” for the Code Meaning.</li> <li>3. UCUM annotation in TID’s 3401, 34003, 3450</li> <li>4. Draft Public Comment Supplement templates add more variations: (“{0:4}”, UCUM, “scale 0:4”); DT (1, UCUM, “no units”);</li> </ol> <p>Therefore, this CP proposes to forbid option using “1” for Code Meaning and specify handling of ratios, counts and scores.</p>			
Sections of documents affected			
PS 3, 3			
Correction Wording:			

4

<b>Modify PS 3.16 Section 7.2.2 Units of Measurement</b>
--

6

The specialization of the UCUM standard as it is used in DICOM involves the following rules:

8

- the Coding Scheme Designator is specified as “UCUM”
- the version of UCUM from which a code is constructed is specified in Coding Scheme Version
- the Code Value will be constructed from UCUM and make use of the “case-sensitive” form of UCUM code (e.g. “ml/s”)
- the Code Meaning **for other than UCUM unity** may be one of three classes of synonyms:

10

12

14

- 2 • the same string as sent in the Code Value when an abbreviation is required (e.g. “ml/s”).
- 4 • constructed from the “names” of individual components using the Americanized form of name (e.g. “milliliters/second”).
- 6 • constructed from the “names” of individual components using the European form of name (e.g. “millilitres/second”).
- 8 • **In the case of UCUM unity (“1”, or curly bracket expression) it is forbidden to use “1” as a Code Meaning. Annex G provides Code Meanings for a Code Value (0008,0100) of 1. A Template or Context Group may constrain the Code Meaning according to the following rules:**
  - 12 • **UCUM default unit 1 shall use one of the Code Meaning synonyms specified in Annex G**
  - 14 • **Ratios of identically dimensioned values may use ({ratio}, UCUM, “ratio“)**
  - 16 • **Unitless numeric scores may use ({M:N}, UCUM, “range: M:N”) to specify the minimum and maximum value, for example, ({0:10}, UCUM, “range: 0:10”).**
  - 18 • **Counts using UCUM annotation shall always use the text within the curly braces as the Code Meaning, for example, ({masses}, UCUM, “masses”).**

18 Add to PS 3.16 Annex G, entry for UCUM Code Meaning synonym of UCUM default unit

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)
<b>UCUM</b>	<b>1</b>	<b><u>unary</u></b>
		<b><u>no units</u></b>
		<b><u>ratio</u></b>

20 Change Table in in PS 3.16 Annex B

22 **Context ID 3082**  
 24 **Cardiology Units of Measurement**  
**(Most Restrictive Use: Defined)**

Coding Scheme	Coding Scheme Version	Code Value	Code Meaning
UCUM	1.4	1	unary, no-units

26 **TID 1008 SUBJECT CONTEXT, FETUS**

Identifies (and optionally describes) a fetus who is the subject.

28 **TID 1008**  
**SUBJECT CONTEXT, FETUS**  
 30 **Type: Extensible**

NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
...	...	...	...	...	...	...	...

4			TEXT	EV (11951-1, LN, "Fetus ID")	1	MC	IF row 3 is absent	For separation of multiple fetuses during this procedure e.g. fetus "1" of "2" ... not for longitudinal comparisons.; ie. the "m" of fetus "m" of "n"
								<b>Units EV (1, UCUM, "1")</b>
5			NUM	EV (11878-6, LN, "Number of Fetuses")	1	U		i.e. the "n" of fetus "m" of "n"
								Units EV (1, UCUM, " <b>1no units</b> ")

2

## TID 4005

4

## MAMMOGRAPHY CAD COMPOSITE FEATURE BODY

Type: Non-Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
...	...	...	...	...	...	...	...	...
11			NUM	DCID (6037) "Mammography Quantitative Temporal Difference Type"	1-n	UC	May be present only if the value of (111016, DCM, "Composite type") is (111153, DCM, "Target content items are related temporally")	UNITS = DCID (7460) "Units of Linear Measurement", DCID (7461) "Units of Area Measurement", DCID (7462) "Units of Volume Measurement" or (1, UCUM, " <b>Unityno units</b> ")
...	...	...	...	...	...	...	...	...
24			NUM	(111038, DCM, "Number of calcifications")	1	UC	May be present only if value of parent is (F-01775, SRT, "Calcification Cluster")	UNITS = (1, UCUM, " <b>Unityno units</b> ") Value = Integer 1 - n

6

## TID 4010

8

## MAMMOGRAPHY CAD CALCIFICATION CLUSTER

Type: Non-Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
...	...	...	...	...	...	...	...	...
3			NUM	(111038, DCM, "Number of calcifications")	1	MC	At least one of rows 1, 2, 3, 4, 5 shall be present	UNITS = (1, UCUM, " <b>Unityno units</b> ") Value = Integer >= 1
...	...	...	...	...	...	...	...	...

10

## TID 4014

12

## CAD IMAGE QUALITY

Type: Non-Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
...	...	...	...	...	...	...	...	...
4	>	HAS PROPERTIES	NUM	EV(111029, DCM, "Image Quality Rating")	1	U		UNITS = EV({0-100}), UCUM, " <b>Rrange:0:100</b> ") Value = 0 - 100

14