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8	Correction Number CP-1523	
9	Log Summary: Requirements for items in Quantity Definition Sequence	
10	Name of Standard	
11	PS3.3	
12	Rationale for Correction:	
13	RWV examples in CP 1448 (and in PS3.17 Annex QQQ from Sup 172) highlight the issue of the meaning of multiple Content Items	
14	in the Quantity Definition Sequence (0040,9220). Additional text should be added to PS3.3 Section C.7.6.16.2.11 Table C.7.6.16-12.	
15	One of the items should be required to specify the quantified characteristic, and whether or not the order of the items is significant	
16	should be specified (e.g., whether the quantified characteristic is required to be first or not).	
17	Correction Wording:	

Amend DICOM PS3.3 as follows:

C.7.6.16.2.11 Real World Value Mapping Macro

...

Table C.7.6.16-12b. Real World Value Mapping Item Macro Attributes

Attribute Name	Tag	Type	Attribute Description
...
Measurement Units Code Sequence	(0040,08EA)	1	Units of measurement. Only a single Item shall be included in this Sequence. See Section C.7.6.16.2.11.1 for further explanation.
<i>>Include Table 8.8-1 "Code Sequence Macro Attributes"</i>			Defined CID 7181 "Abstract Multi-dimensional Image Model Component Units", or as specified in the macro invocation.
Quantity Definition Sequence	(0040,9220)	3	A list of name-value pairs that describe the characteristics of the quantity represented by the Real World Value. One or more Items are permitted in this Sequence. <u>One of the items shall have a concept name that specifies the quantified characteristic, though it is not required that (G-C1C6, SRT, "Quantity") be used if there is a reason to use a similar concept from a different coding scheme. Other items may be concept modifiers, such as (G-C036, SRT, "Measurement Method"). The order of the items is not significant.</u>
<i>>Include Table 10-2 "Content Item Macro Attributes Description"</i>			Baseline CID for Concept Name Code Sequence is CID 9000 "Physical Quantity Descriptors". Baseline CID for Concept Code Sequence for Concept Name of (G-C1C6, SRT, "Quantity") is CID 7180 "Abstract Multi-dimensional Image Model Component Semantics".

C.7.6.16.2.11.1 Real World Value Representation

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C.7.6.16.2.11.1.2 Real World Values Mapping Sequence Attributes

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The physical units for the real world values obtained from the sequence item are given by the Measurement Units Code Sequence (0040,08EA).

The quantity that the real world values represent may be described by the Quantity Definition Sequence (0040,9220), which consists of a list of name-value pairs, in which the coded concept name specifies what aspect of the physical quantity is being described.

Note

For example, Cerebral Blood Flow (CBF) may be described by units and quantity as follows:

- Measurement Units Code Sequence (0040,08EA) = (ml/[100]g/min, UCUM, "milliliter per 100 gram per minute")
- Quantity Definition Sequence (0040,9220):
 - (G-C1C6, SRT, "Quantity") = (113055, DCM, "Regional Cerebral Blood Flow")

1 The Quantity Definition Sequence (0040,9220) describes only the stored pixel values that are mapped using the Real World Values
2 Mapping, and does not describe derived values from multiple pixels to which the Real World Values Mapping applies.

3 **Note**

4 I.e., the mapping is a "point" operation, and as a consequence various modifiers that might be applied to a group of pixels,
5 such as in an ROI, should not be used. E.g., an ROI encoded in a Structured Report using TID 1419 "ROI Measurements"
6 might be the mean or maximum value (e.g., SUVbw mean or SUVbw max), and be encoded with (121401, DCM, "Derivation")
7 = (R-00317, SRT, "Mean") or (G-A437, SRT, "Maximum"), respectively. These would not be appropriate to use within
8 Quantity Definition Sequence (0040,9220), unless the individual pixel values were themselves derived in such a manner,
9 e.g., when multiple images are averaged together. Thus the content items used in an SR to describe an ROI might be a
10 superset of the name-value pairs used in Quantity Definition Sequence (0040,9220).