

DICOM Correction Item

Correction Number	CP-585
Log Summary: MR Diffusion Dimension clarification	
Type of Modification	Name of Standard
Clarification	PS 3.3 2004
Rationale for Correction	
<p>There is a case in Enhanced MR where a diffusion set of frames in an image will contain a set of directional diffusion frames as well as "baseline" frames without diffusion. The frames with diffusion have a Diffusion Direction Sequence which need to be part of a dimension index while the images without diffusion encoding do not have such a sequence. It is however, useful to encode a Dimension of diffusion direction and to have a dimension index that is pointing to an attribute that may exist for some frames and not others.</p> <p>The standard does not specifically allow or disallow such uses of a Dimension Index (pointing to an attribute that is sometimes absent). It is proposed to specifically describe and allow this.</p> <p>This proposal was implemented as part of the SCAR 2005 demonstration no problem was caused for receiving systems.</p>	
Sections of documents affected	
PS 3.3 C.7.6.17.1	
Correction Wording:	

C.7.6.17.1 Dimension Indices

With the Dimension Index Sequence (0020,9222) , Data Element Tags are specified that identify the indices used for a particular SOP Instance.

The actual index values for each frame in a multi-frame header are stored in a single Dimension Index Values Attribute (0020,9157) defined in the Frame Content Functional Group. For each SOP Instance this Attribute has a Value Multiplicity equal to the number of Items in the Sequence. The ordering of the Items in the Sequence defines the ordering in the Dimension Index Values Attribute: Item 1 of the Sequence relates to Value 1, Item 2 to Value 2, etc.

The Dimension Index Pointer (0020,9165) stores ordinal numbers that comprise logical indices for a referenced Attribute. Each Attribute referenced in the Dimension Index Sequence (0020,9222) will have an index stored in the Dimension Index Values (0020,9157) for each frame. Frames assigned the same index shall contain nominally the same value for the underlying Attribute. **If the Attribute is not present for some frames, or is present but has no value, then a single index shall be assigned to indicate the lack of the value (i.e., all such frames shall have the same index value, which is different from other index values).** It is at the discretion of the SOP Instance creator whether the Attribute values are equivalent, and therefore appropriate for assignment to the same index value.

The Dimension Index Pointer (0020,9165) shall contain the Data Element Tag (gggg,eeee) of the Attribute being indexed.

Notes: 1. Dimension Index Pointer (0020,9165) may point to a Sequence containing a Functional Group. In that case all the Attributes of the Sequence are associated with the index value.

2. The Dimension Index Pointer (0020,9165) may point to a Data Element Tag (gggg,eeee) which is not present for all frames of an object, or does not have a value for all frames of an object. For such frames, index values are still assigned, as described above.

The Functional Group Pointer (0020,9167) value is the Data Element Tag (gggg,eeee) of the Functional Group Sequence that contains the Attribute being indexed. If the Dimension Index Pointer (0020,9165) contains a Data Element Tag that identifies a Functional Group Sequence then the Functional Group Pointer (0020,9167) shall not be present.

If the Dimension Index Pointer (0020,9165) attribute contains a Private Data Element, then the Dimension Index Private Creator (0020,9213) shall contain the Private Creator of the block of Private Data Elements.

If the Functional Group Pointer (0020,9167) attribute contains a Private Data Element, then the Functional Group Private Creator (0020,9238) shall contain the Private Creator of the block of Private Data Elements.

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