

DICOM Correction Item

Correction Number		CP-984
Log Summary: Diffusion changes and additional Defined Term for Enhanced MR and Diffusion Gradient Direction sequence correction		
Type of Modification	Name of Standard	
Addition	PS 3.3 - 2009	
Rationale for Correction		
Changes were required by IHE and WG16 for Diffusion, and Perfusion use cases:		
<ul style="list-style-type: none"> — Add DIFFUSION_ISO to Derived Pixel Contrast values — Remove part of condition Diffusion b-value — Diffusion Gradient Direction Sequence description and number of items in sequence. 		
For some postprocessing algorithms it is important to know about the exact polarity of the diffusion sensitizing gradients applied to acquire the image. As it is not possible to deduce this polarity from the bmatrix values, it is also necessary to allow the optional storage of the diffusion gradient directions sequence in the case of BMatrix.		
Sections of documents affected		
PS 3.3 C.8.13.3.1.1.4 and C.8.13.5.9		
Correction Wording:		

C.8.13.3.1.1.4 Derived Pixel Contrast

Table C.8-84 specifies the Defined Terms for MR additional to those defined in C.8.16.1.4 for Value 4 for Image Type (0008,0008) and Frame Type (0008,9007).

Table C.8-84
MR-SPECIFIC IMAGE TYPE AND FRAME TYPE VALUE 4

Defined Term Name	Defined Term Description
ADC	Apparent Diffusion Coefficient
DIFFUSION	Diffusion weighted
DIFFUSION_ANISO	Diffusion Anisotropy
DIFFUSION_ATTNTD	Diffusion Attenuated. Derived by removing the T2 contributions from a Diffusion Weighted image.
<u>DIFFUSION_ISO</u>	<u>Isotropic images derived from Directional Diffusion images</u>
METABOLITE_MAP	Metabolite Maps from spectroscopy data
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C.8.13.5.9 MR Diffusion Macro

Table C.8-96 specifies the attributes of the MR Diffusion Functional Group macro.

**Table C.8-96
MR DIFFUSION MACRO ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
MR Diffusion Sequence	(0018,9117)	1	Identifies the diffusion parameters of this frame. One Item shall be included in this sequence.
>Diffusion b-value	(0018,9087)	1C	Diffusion sensitization factor in sec /mm ² . This is the actual b-value for original frames and those derived from frames with the same b-value, or the most representative b-value when derived from images with different b-values. Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL- and Diffusion b-matrix Sequence (0018,9601) is not present . May be present otherwise.
>Diffusion Directionality	(0018,9075)	1C	Specifies whether diffusion conditions for the frame are directional, or isotropic with respect to direction. Defined Terms: DIRECTIONAL BMATRIX ISOTROPIC NONE = to be used when Frame Type (0008, 9007) value 4 equals DIFFUSION_ANISO or Diffusion b-value (0018, 9087) is 0 (zero). Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL. May be present otherwise.
>Diffusion Gradient Direction Sequence	(0018,9076)	1C	Sequence containing orientations of all diffusion sensitization gradients that were applied during the preparation phase acquisition of for this frame. One or more items may be present. <u>Only a single item shall be permitted in this sequence.</u> Required if Diffusion Directionality (0018,9075) equals DIRECTIONAL. <u>May be present if Diffusion Directionality (0018,9075) equals BMATRIX.</u>
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