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1	Status	Final Text
2	Date of Last Update	2017/04/18
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7	Submission Date	2016/06/07

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8	Correction Number CP-1645	
9	Log Summary: Add Unassigned Shared and Per-Frame Converted Attributes functional groups to Parametric Map	
10	Name of Standard	
11	PS3.3	
12	Rationale for Correction:	
13	Parametric maps are not modality specific and contain no standard acquisition technique specific Attributes. However, typically they are derived from acquired images and sometimes it is useful or important for the use case to copy the values of selected acquisition Attributes. E.g., the echo time, flip angle or diffusion b-value might be required to interpret a parametric map from an MR acquisition.	
14	Add the Unassigned Shared Converted Attributes or Unassigned Per-Frame Converted Attributes as a standard place to include such Attributes, since there is no other convenient place, despite the fact that there are no "legacy" parametric SOP Classes from which these parametric maps have been created (unless one is creating them from legacy modality-specific objects).	
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16	Correction Wording:	
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Amend DICOM PS3.3 as follows (changes to existing text are bold and underlined for additions and ~~struckthrough~~ for removals):

## A.75.5 Parametric Map Functional Groups

Table A.75-2 specifies the use of the Functional Group Macros used in the ??? for the Parametric Map IOD.

**Table A.75-2. Parametric Map Functional Group Macros**

Functional Group Macro	Section	Usage
Pixel Measures	???	M
Plane Position (Patient)	???	M
Plane Orientation (Patient)	???	M
Referenced Image	???	U
Derivation Image	???	C - Required if the image or frame has been derived from another SOP Instance.
Frame Content	???	M - Shall not be used as a Shared Functional Group
Cardiac Synchronization	???	U
Frame Anatomy	???	M
Identity Pixel Value Transformation	???	M
Frame VOI LUT With LUT Macro	???	M
Real World Value Mapping	???	M
Contrast/Bolus Usage	???	U
Respiratory Synchronization	???	U
Parametric Map Frame Type	???	M
<b><u>Unassigned Shared Converted Attributes</u></b>	<b><u>C.7.6.16.2.25.1</u></b>	<b><u>U - May not be used as a Per-Frame Functional Group</u></b>
<b><u>Unassigned Per-Frame Converted Attributes</u></b>	<b><u>C.7.6.16.2.25.2</u></b>	<b><u>U - May not be used as a Shared Functional Group</u></b>

### A.75.5.1 Parametric Map Functional Groups Description

For the Derivation Image Functional Group Macro, the Baseline CID for:

- Purpose of Reference Sequence (0040,A170) is ????.
- Derivation Code Sequence (0008,9215) is ????.

For the Real World Value Mapping Functional Group Macro, which defines the type of quantity, the method of generation and the units for the pixel values, the Baseline CID for:

- Concept Name Code Sequence of Quantity Definition Sequence (0040,9220) is ????.
- Concept Code Sequence for Concept Name of (G-C1C6, SRT, "Quantity") of Quantity Definition Sequence (0040,9220) is ????.
- Measurement Units Code Sequence (0040,08EA) is ????.

**The Unassigned Shared and Per-Frame Converted Attributes Macros are included to allow acquisition-specific Attributes to be conveyed when they are relevant to the use-case. E.g., the echo time, flip angle or diffusion b-value might be useful to interpret a parametric map from an MR acquisition. Since some of these values may vary per-frame, it is appropriate to include them in the functional groups, rather than in the top level data set.**

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## C.7.6.16.2.25 Unassigned Shared and Per-Frame Converted Attributes Macros

Attributes that are present in the Classic images to be converted but that are not defined in specific Modules or specific Functional Groups required or supported by the IOD, or have their values changed during conversion, either may:

- be identical in all images, in which case they shall be included in the top level Data Set or in the Unassigned Shared Converted Attributes Sequence, or
- only be present in some images, or have a different number of values, or different values, in which case they shall be included in the Unassigned Per-Frame Converted Attributes Sequence.

### Note

1. An example of an Attribute that might be included in the Unassigned Shared Converted Attributes Macro is Filter Type (0018,1160), which typically would be the same for all Classic CT images in a set, and is not included in any modality-specific Module or Functional Group Macro.
2. An example of an Attribute that might be included in the Unassigned Per-Frame Converted Attributes Macro is Slice Location (0020,1041), which typically would be different for each Classic CT image in a set, and is not included in any modality-specific Module or Functional Group Macro.
3. An example of an Attribute that might be included in the Unassigned Shared Converted Attributes Macro is Series Number (0020,0011), which typically would be the same for all Classic CT images in a set (but is not required to be), and will be replaced with a different value in the top-level Data Set, and hence if the original is to be preserved, needs to be recorded.
4. An example of an Attribute that might be included in the Unassigned Per-Frame Converted Attributes Macro is Instance Number (0020,0013), which typically would be different for each Classic CT image in a set, and will be replaced with a different value in the top-level Data Set, and hence if the original is to be preserved, needs to be recorded.
5. The UIDs of the converted instances are recorded in the Conversion Source Attributes Sequence, and are not included in the Unassigned Shared and Per-Frame Converted Attributes Macros.

For the purpose of comparing values, an Attribute that is not present in a Classic image to be converted is considered the same as an Attribute that is present but has no value. Sequence Attributes match when they have the same number of Items and Item contents in the same order (irrespective of whether the Sequences or Items are encoded with fixed or variable length).

The Unassigned Shared Converted Attributes Sequence, and the Unassigned Per-Frame Converted Attributes Sequence may be absent, if there are no such Attributes available to be included. E.g., there may be no shared Attributes with the same values, all the shared Attributes may be included in the top-level Data Set, there may be no Attributes that vary per-frame or an individual frame may have no such Attribute.

The necessary Private Creator Data Element within each Sequence Item accompanies Private Data Elements. There is no requirement to preserve the private block of Data Elements used in the Classic images to be converted. Nor is there a requirement that a Private Data Element use the same private block in all of the Classic images.

Matching of Private Attribute Values for the purpose of determining whether they are shared or per-frame may be performed using the equivalent meaning if the Value Representation is Explicit and not UN, or known through other means, otherwise, byte matching of the UN VR shall be performed.

### C.7.6.16.2.25.1 Unassigned Shared Converted Attributes Macro

Table C.7.6.16.2.25.1-1 specifies the attributes of the Unassigned Shared Converted Attributes Functional Group Macro.

**Table C.7.6.16.2.25.1-1. Unassigned Shared Converted Attributes Macro Attributes**

Attribute Name	Tag	Type	Attribute Description
Unassigned Shared Converted Attributes Sequence	(0020,9170)	1C	<p>Contains all of the Standard and Private Attributes that are present in all of the converted Classic images, that have the same number of values, that have the same values, and that are not in the top-level Data Set.</p> <p>Only a single Item shall be included in this Sequence.</p> <p>Required if any unassigned shared attributes are present.</p>

**C.7.6.16.2.25.2 Unassigned Per-Frame Converted Attributes Macro**

Table C.7.6.16.2.25.2-1 specifies the attributes of the Unassigned Per-Frame Converted Attributes Functional Group Macro.

**Table C.7.6.16.2.25.2-1. Unassigned Per-Frame Converted Attributes Macro Attributes**

Attribute Name	Tag	Type	Attribute Description
Unassigned Per-Frame Converted Attributes Sequence	(0020,9171)	1C	<p>Contains all of the Standard and Private Attributes that are present in only some of the converted Classic images, or that have a different number of values, or that have different values.</p> <p>Only a single Item shall be included in this Sequence.</p> <p>Required if any unassigned per-frame attributes are present for this frame.</p>