

DICOM Correction Proposal Form

Tracking Information - Administration Use Only	
Correction Proposal Number	CP-987
STATUS	Assigned
Date of Last Update	2009/08/14
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Submission date	2009/06/16

Correction Number	CP-987
Log Summary: Move Related Series Sequence to image level	
Type of Modification	Name of Standard
Change	PS 3.3 – 2008 + Supplement 117
<p>Rationale for Correction</p> <p>Both the PET and CT SOP Instances organize a volume as a set of slices within on series. So in PET/CT, we can use the Related Series Sequence in the PET SOP Instance to reference the CT series that is related.</p> <p>But in SPECT, the basic NM SOP Instance is a multi-frame object. It is quite common to place all of the multi-frame images created during a single acquisition into the same Series. It would be nice if each of these images could reference a different CT Series, but Related Series Sequence is a Series level attribute, i.e. it relates on Series to another Series. There does not seem to be an equivalent way for a single image in one Series to reference another Series.</p> <p>The same is applicable for Enhanced PET SOP Instances where more than one instance in a series needs to reference a different CT Series.</p> <p>Proposed is to move the Related Series Sequence from the General Series Module to the General Image Module and other equivalent places. This has no consequences for the encoding of the data set, it is a documentation change only to allow a more flexible usage.</p>	
Sections of documents affected	
PS 3.3 Sections 10, C.7.3.1, C.7.6.1, C.8.13.2, C.8.15.2, C.8.17.2, C.8.19.2, C.8.21.1, C.8.X.3 (Supp 117)	
Correction Wording:	

10.X REFERENCED SERIES MACRO

Table 10-X specifies the attributes of the Referenced Series Macro.

**Table 10-X
 REFERENCED SERIES MACRO ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
Related Series Sequence	(0008,1250)	3	Identification of Series significantly related to this Series. Zero or more Items may be present. Notes: <ol style="list-style-type: none"> 1. For example, for a combined CT and PET acquisition, the CT images and PET images would be in separate series that could cross-reference each other with multiple purpose of reference codes meaning same anatomy, simultaneously acquired and same indication. 2. The related series may have different Frames of Reference and hence require some sort of registration before spatial coordinates can be directly compared. 3. This attribute is not intended for conveying localizer reference information, for which Referenced Image Sequence (0008,1140) should be used.
>Study Instance UID	(0020,000D)	1	Instance UID of Study to which the related Series belongs
>Series Instance UID	(0020,000E)	1	Instance UID of Related Series
>Purpose of Reference Code Sequence	(0040,A170)	2	Describes the purpose for which the reference is made. Zero or more Items may be present. When absent, implies that the reason for the reference is unknown.
>>Include Code Sequence Macro Table 8.8-1		Defined Context ID is DCID 7210	

C.7.3.1 General Series Module

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**Table C.7-5a
 GENERAL SERIES MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
...			
Referenced Performed Procedure	(0008,1111)	3	Uniquely identifies the Performed Procedure

Step Sequence			Step SOP Instance to which the Series is related (e.g. a Modality or General-Purpose Performed Procedure Step SOP Instance). The Sequence shall have zero or one Item.
<i>>Include SOP Instance Reference Macro Table 10-11</i>			
Related Series Sequence	(0008,1250)	3	Identification of Series significantly related to this Series. Zero or more Items may be present. Notes: 1. For example, for a combined CT and PET acquisition, the CT images and PET images would be in separate series that could cross-reference each other with multiple purpose of reference codes meaning same anatomy, simultaneously acquired and same indication. 2. The related series may have different Frames of Reference and hence require some sort of registration before spatial coordinates can be directly compared. 3. This attribute is not intended for conveying localizer reference information, for which Referenced Image Sequence (0008,1140) should be used.
>Study Instance UID	(0020,000D)	1	Instance UID of Study to which the related Series belongs
>Series Instance UID	(0020,000E)	1	Instance UID of Related Series
>Purpose of Reference Code Sequence	(0040,A170)	2	Describes the purpose for which the reference is made. Zero or more Items may be present. When absent, implies that the reason for the reference is unknown.
>>Include Code Sequence Macro Table 8.8-1		DCID 7210	
Body Part Examined	(0018,0015)	3	Text description of the part of the body examined. See PS 3.16 Annex on Correspondence of Anatomic Region Codes and Body Part Examined for Defined Terms Note: Some IODs support the Anatomic Region Sequence (0008,2218), which can provide a more comprehensive mechanism for specifying the body part being examined.
...			

C.7.6.1 General Image Module

Table C.7-9 specifies the Attributes that identify and describe an image within a particular series.

**Table C.7-9
 GENERAL IMAGE MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
...			
Referenced Instance Sequence	(0008,114A)	3	A sequence which provides reference to a set of non-image SOP Class/Instance pairs significantly related to this Image, including waveforms that may or may not be temporally synchronized with this image . One or more Items may be included in this sequence.
<i>>Include SOP Instance Reference Macro Table 10-11</i>			
>Purpose of Reference Code Sequence	(0040,A170)	1	Code describing the purpose of the reference to the Instance(s). Only a single Item shall be permitted in this sequence.
<i>>>Include 'Code Sequence Macro' Table 8.8-1</i>		<i>Defined Context ID is CID 7004 for referenced waveforms.</i>	
<i>Include 'Referenced Series Macro' Table 10-X</i>			
Images in Acquisition	(0020,1002)	3	Number of images that resulted from this acquisition of data
...			

C.8.13.2 MR Image and Spectroscopy Instance Macro

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**Table C.8-81
 MR IMAGE AND SPECTROSCOPY INSTANCE MACRO**

Attribute Name	Tag	Type	Attribute Description
...			
Referenced Grayscale Presentation State Sequence	(0008,9237)	1C	References to Grayscale Presentation State instances acquired in conjunction with this instance. Note: May only be used to reference Presentation States belonging to the acquired data and not to reference Presentation States generated subsequently such as during interpretation. One or more Items may be included in this sequence. Required if Presentation State is

			generated during acquisition, shall not be present otherwise.
>Include "Hierarchical SOP Instance Reference Macro" Table C.17-3			
Include 'Referenced Series Macro' Table 10-X			
Content Qualification	(0018,9004)	1	Content Qualification Indicator Enumerated Values: PRODUCT RESEARCH SERVICE See C.8.13.2.1.1 for further explanation.
...			

C.8.15.2 Enhanced CT Image Module

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**Table C.8-114
 ENHANCED CT IMAGE MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
...			
Referenced Grayscale Presentation State Sequence	(0008,9237)	1C	References to Grayscale Presentation State instances acquired in conjunction with this instance. Note: May only be used to reference Presentation States belonging to the acquired data and not to reference Presentation States generated subsequently such as during interpretation. One or more Items may be included in this sequence. Required if Presentation State is generated during acquisition, shall not be present otherwise.
>Include "Hierarchical SOP Instance Reference Macro" Table C.17-3			
Include 'Referenced Series Macro' Table 10-X			
Samples per Pixel	(0028,0002)	1	Number of samples (planes) in this image. This value shall be 1.
...			

C.8.17.2 Ophthalmic Photography Image Module

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**Table C.8.17.2-1
 OPHTHALMIC PHOTOGRAPHY IMAGE MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
...			
Source Image Sequence	(0008,2112)	2C	A Sequence that identifies the Images that were used to derive this Image. Required if Image Type Value 1 is DERIVED. Zero or more items may be present in the sequence. See C.7.6.1.1.4 for further explanation.
<i>>Include Image SOP Instance Reference Macro, Table 10-3</i>			
>Purpose of Reference Code Sequence	(0040,A170)	1	Describes the purpose for which the reference is made, that is what role the source image or frame(s) played in the derivation of this image. Only a single Item shall be permitted in this sequence.
<i>>>Include 'Code Sequence Macro' Table 8.8-1</i>			<i>Defined Context ID is 7202.</i>
<i>Include 'Referenced Series Macro' Table 10-X</i>			
Lossy Image Compression	(0028,2110)	1	Specifies whether an Image has undergone lossy compression. Enumerated Values: 00 = Image has NOT been subjected to lossy compression. 01 = Image has been subjected to lossy compression. See C.7.6.1.1.5
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C.8.19.2 Enhanced XA/XRF Image Module

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**Table C.8.19.2-1
Enhanced XA/XRF Image Module Table**

Attribute Name	Tag	Type	Attribute Description
...			
Referenced Instance Sequence	(0008,114A)	3	A sequence which provides reference to a set of non-image SOP Class/Instance pairs significantly related to this Image, including waveforms that may or may not be temporally synchronized with this image. One or more Items may be included in this sequence.
<i>>Include 'SOP Instance Reference Macro' Table 10-11</i>			
>Purpose of Reference Code Sequence	(0040,A170)	1	Code describing the purpose of the reference to the SOP Instances. Only a single Item shall be permitted in this sequence.

>>Include 'Code Sequence Macro' Table 8.8-1			Defined Context ID is CID 7004 for referenced waveforms.
Include 'Referenced Series Macro' Table 10-X			
Image Comments	(0020,4000)	3	User-defined comments about the image.
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C.8.21.1 X-Ray 3D Image Module

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**Table C.8.21.1-1
X-Ray 3D IMAGE MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
...	(0008,0008)	1	Image identification characteristics. See C.8.21.1.1.1 for specialization.
Referenced Image Evidence Sequence	(0008,9092)	1C	Full set of Composite SOP Instances referred to inside the Referenced Image Sequences of this SOP Instance. See C.8.13.2.1.2 for further explanation. One or more Items may be permitted in this sequence. Required if the Referenced Image Sequence (0008,1140) is present.
>Include 'SOP Instance Reference Macro' Table C.17-3			
Include 'Referenced Series Macro' Table 10-X			
Image Comments	(0020,4000)	3	User-defined comments about the image.
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C.8.X.3 Enhanced PET Image Module

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**Table C.8-X3
ENHANCED PET IMAGE MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
...	(0008,0008)	1	Image characteristics. See sections C.8.X.3.1.1.

Source Image Evidence Sequence	(0008,9154)	1C	<p>Full set of Composite SOP Instances used as source image SOP Instances inside the frames of this Enhanced PET Image SOP Instance. See C.8.13.2.1.2 for further explanation.</p> <p>One or more Items may be included in this sequence.</p> <p>Required if the Source Image Sequence (0008,2112) is present.</p>
<i>>Include 'SOP Instance Reference Macro' Table C.17-3</i>			
<i>Include 'Referenced Series Macro' Table 10-X</i>			
Samples per Pixel	(0028,0002)	1	Number of samples (planes) in this image. This value shall be 1.
...	(0028,0004)	1	<p>Specifies the intended interpretation of the pixel data. Enumerated Value: MONOCHROME2.</p> <p>See C.7.6.3.1.2 for definition of this term.</p>
Bits Allocated	(0028,0100)	1	Number of bits allocated for each pixel sample. Each sample shall have the same number of bits allocated. This value shall be 16.