

DICOM Correction Item

Correction Number		CP-883
Log Summary: Clarify description of image and instance reference sequences		
Type of Modification	Name of Standard	
Clarification	PS 3.3 2008	
Rationale for Correction		
The language used in describing image and instance reference sequence attributes is unwieldy. Reword in terms of what the attributes mean, instead of how they are encoded.		
Sections of documents affected		
PS 3.3 C.7.6.1, C.7.6.16.2.5, C.7.6.16.2.6, C.8.7.1, C.8.8.9, C.8.8.13, C.8.8.14, C.8.8.17, C.8.8.25, C.8.13.2, C.8.15.2, C.8.19.2, C.10.4, C.10.5, C.10.8, C.11.8, C.11.11, C.13.2, C.13.4, C.19.1		
Correction Wording:		

Amend PS 3.3:

C.7.6.1 General Image Module

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

Attribute Name	Tag	Type	Attribute Description
...
Referenced Image Sequence	(0008,1140)	3	A sequence that references O ther images significantly related to this image (e.g. post-localizer CT image or Mammographic biopsy or partial view images). One or more Items may be included in this sequence.
<i>>Include 'Image SOP Instance Reference Macro' Table 10-3</i>			
...
Source Image Sequence	(0008,2112)	3	A Sequence that identifies T the set of Image SOP Class/Instance pairs of the Images that were used to derive this Image. Zero or more Items may be included in this Sequence. See C.7.6.1.1.4 for further explanation.
<i>>Include 'Image SOP Instance Reference Macro' Table 10-3</i>			
...
Referenced Instance Sequence	(0008,114A)	3	A sequence which provides reference to a set of N on-image SOP Class/Instance pairs composite SOP instances that are 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.
>Include SOP Instance Reference Macro Table 10-11			
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C.7.6.16.2.5 Referenced Image Macro

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**Table C.7.6.16-6
 REFERENCED IMAGE MACRO ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
Referenced Image Sequence	(0008,1140)	2	A sequence that provides reference to a set of SOP Class/Instance pairs identifying images or other composite SOP Instances used to plan the acquisition, if any, and or other significant related images. See Section C.7.6.16.2.5.1 for further explanation. Zero or more Items may be included in this Sequence.
>Include 'Image SOP Instance Reference Macro' Table 10-3			
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C.7.6.16.2.5.1 Use of Referenced Image Macro

Referenced Image Sequence (0008,1140) shall be used to ~~provide a reference to a set of SOP Class/Instance pairs~~ identifying other data objects used to plan the acquisition of this image, ~~where the images Instances referenced for this purpose~~ shall ~~share~~ have the same Frame of Reference UID (0020,0052) as this image. For each Item that contains such a reference, the value of the Purpose of Reference Code Sequence (0040,A170) shall be ("121311", DCM, "Localizer"). Applications can use the Referenced Image Sequence (0008,1140) in combination with data in Plane Position and Plane Orientation Macros to provide projections of the position of an image with respect to the referenced image.

The Referenced Image Sequence (0008,1140) may also be present when references to other images (or frames within other images) are required for other reasons, as specified by Purpose of Reference Code Sequence (0040,A170).

Note: An Image may contain references to itself (e.g. to other frames within itself).

C.7.6.16.2.6 Derivation Image Macro

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**Table C.7.6.16-7
 DERIVATION IMAGE MACRO ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
Derivation Image Sequence	(0008,9124)	2	A sequence that provides reference to T the set of SOP Class/Instance pairs of the Images or other composite SOP Instances which that were used to derive this frame. Zero or more Items may be included in this Sequence.
...
>Source Image Sequence	(0008,2112)	2	A Sequence which identifies T the set of Images or other Composite SOP Class/Instance pairs of the Instances which that were used to derive this frame. Zero or more Items may be included in this Sequence. See C.7.6.1.1.4 for further explanation.
<i>>>Include 'Image SOP Instance Reference Macro' Table 10-3</i>			
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C.8.7.1 X-Ray Image Module

**Table C.8-26
 X-RAY IMAGE MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
...
Referenced Image Sequence	(0008,1140)	1C	A sequence which provides reference to a set of Image SOP Class/Instance identifying O ther images significantly related to this image. Shall be present if Image Type (0008,0008) Value 3 is BIPLANE A or BIPLANE B. May be present otherwise. One or more items may be included in this sequence. See Section C.8.7.1.1.13.
<i>>Include 'Image SOP Instance Reference Macro' Table 10-3</i>			
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C.8.8.9 RT General Plan Module

Table C.8-45—RT GENERAL PLAN MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
...
Referenced Structure Set Sequence	(300C,0060)	1C	Introduces sequence of one Class/Instance pair describing instance of The RT Structure Set on which the RT Plan is based. Only a single item shall be permitted in this sequence. Required if RT Plan Geometry (300A,000C) is PATIENT.
<i>>Include 'SOP Instance Reference Macro' Table 10-11</i>			
Referenced Dose Sequence	(300C,0080)	3	Introduces sequence of related SOP Class/Instance pairs describing R related instances of RT Dose (for grids and named/unnamed point doses). One or more items may be included in this sequence. See Note 1.
<i>>Include 'SOP Instance Reference Macro' Table 10-11</i>			
Referenced RT Plan Sequence	(300C,0002)	3	Introduces sequence of related SOP Class/Instance pairs describing R related instances of RT Plan. One or more items may be included in this sequence.
<i>>Include 'SOP Instance Reference Macro' Table 10-11</i>			
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C.8.8.13 RT Fraction Scheme Module

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Table C.8-49—RT FRACTION SCHEME MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
...
<i>></i> Referenced Dose Sequence	(300C,0080)	3	Introduces sequence of related SOP Class/Instance pairs describing R related instances of RT Dose (for grids, isodose curves and named/unnamed point doses). One or more items may be included in this sequence. See Note 1.
<i>>>Include 'SOP Instance Reference Macro' Table 10-11</i>			
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C.8.8.14 RT Beams Module

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Table C.8-50—RT BEAMS MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
...
>Referenced Dose Sequence	(300C,0080)	3	Introduces sequence of related SOP Class/Instance pairs describing R related instances of RT Dose (for grids, isodose curves, and named/unnamed point doses). One or more items may be included in this sequence.
>>Include 'SOP Instance Reference Macro' Table 10-11			
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C.8.8.17 RT General Treatment Record Module

Table C.8-53—RT GENERAL TREATMENT RECORD MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
...
Referenced RT Plan Sequence	(300C,0002)	2	A sequence which provides r Reference to a RT Plan SOP Class/Instance pair . Only a single Item shall be permitted in this Sequence.
>Include 'SOP Instance Reference Macro' Table 10-11			
Referenced Treatment Record Sequence	(3008,0030)	3	A sequence which provides reference to RT Treatment Records SOP Class/Instance pairs to which the current RT Treatment Record is significantly related. The sequence may contain one or more items.
>Include 'SOP Instance Reference Macro' Table 10-11			

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C.8.8.25 RT Ion Beams Module

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**Table C.8.8.25-1
 RT ION BEAMS MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Description
...
>Referenced Dose Sequence	(300C,0080)	3	Introduces sequence of related SOP Class/Instance pairs describing R related instances of RT Dose (for grids, isodose curves, and named/unnamed point doses). One or more items may be included in this sequence.
>>Include SOP Instance Reference Macro Table 10-11			The Referenced Class SOP UID shall be

Attribute Name	Tag	Type	Description
			that of the RT Dose SOP Class (1.2.840.10008.5.1.4.1.1.481.2)
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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 Raw Data Sequence	(0008,9121)	3	<p>A sequence that identifies the set of Raw Data SOP Class/Instance pairs of the Raw data that which were used to derive this Image.</p> <p>One or more Items may be included in this Sequence.</p> <p>Note: The items of in this sequence may identify raw data that has not been stored or encoded as a DICOM object. This allows recognition that images and spectra in different instances have been reconstructed from the same raw data.</p>
>Include "Hierarchical SOP Instance Reference Macro' Table C.17-3			
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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 Raw Data Sequence	(0008,9121)	3	<p>A sequence that identifies the set of Raw Data SOP Class/Instance pairs of the Raw data that were used to derive this Image.</p>

			<p>One or more Items may be included in this Sequence.</p> <p>Note: The items of in this sequence may identify raw data that has not been stored or encoded as a DICOM object. This allows recognition that images in different instances have been reconstructed from the same raw data.</p>
>Include "Hierarchical SOP Instance Reference Macro" Table C.17-3			
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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 Other Plane Sequence	(0008,9410)	1C	<p>A sequence that identifies the SOP Class/Instance pairs The images of the corresponding plane for a Biplane acquisition device.</p> <p>Only a single Item shall be permitted in this Sequence.</p> <p>Required if Image Type (0008,0008) Value 3 is BIPLANE A or BIPLANE B.</p>
>Include 'Image SOP Instance Reference Macro' Table 10-3			
...
Referenced Instance Sequence	(0008,114A)	3	<p>A sequence which provides reference to a set of Non-image SOP Class/Instance pairs composite SOP instances that are significantly related to this Image, including waveforms that may or may not be temporally synchronized with this image.</p> <p>One or more Items may be included in this sequence.</p>
>Include 'SOP Instance Reference Macro' Table 10-11			
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C.10.4 Displayed Area Module

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**Table C.10-4
 DISPLAYED AREA MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
Displayed Area Selection Sequence	(0070,005A)	1	A sequence of Items each of which describes the displayed area selection for a group of images or frames. Sufficient Items shall be present to describe every image and frame listed in the Presentation State Relationship Module. One or more Items shall be present.
>Referenced Image Sequence	(0008,1140)	1C	Sequence of Items where each Item provides reference to a selected <u>The subset of Image SOP Class/SOP Instance pairs images and frames listed that are defined</u> in the Presentation State Relationship Module, <u>to which this displayed area selection applies</u>. One or more Items shall be present. Required if the displayed area selection in this Item does not apply to all the images and frames listed in the Presentation State Relationship Module.
<i>>>Include 'Image SOP Instance Reference Macro' Table 10-3</i>			
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C.10.5 Graphic Annotation Module

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**Table C.10-5
 GRAPHIC ANNOTATION MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
Graphic Annotation Sequence	(0070,0001)	1	A sequence of Items each of which represents a group of annotations composed of graphics or text or both. One or more Items shall be present.
>Referenced Image Sequence	(0008,1140)	1C	Sequence of Items where each Item provides reference to a selected <u>The subset of Image SOP Class/SOP Instance pairs images and frames listed that are defined</u> in the Presentation State Relationship Module, <u>to which this graphic annotation applies</u> . One or more Items shall be present. Required if graphic annotations in this Item do not apply to all the images and frames listed in the Presentation State Relationship Module.
<i>>>Include 'Image SOP Instance Reference Macro' Table 10-3</i>			
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C.10.8 Waveform Identification Module

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**Table C.10-8
 Waveform Identification Module Attributes**

Attribute Name	Tag	Type	Attribute Description
...
Referenced Instance Sequence	(0008,114A)	3	A sequence which provides reference to a set of SOP Class/Instance pairs <u>Composite SOP instances that are</u> significantly related to this Waveform. One or more Items may be included in this sequence.
<i>>Include 'SOP Instance Reference Macro' Table 10-11</i>			
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C.11.8 Softcopy VOI LUT module

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**Table C.11.8-1
 SOFTCOPY VOI LUT MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
Softcopy VOI LUT Sequence	(0028,3110)	1	Defines a sequence of VOI LUTs or Window Centers and Widths and to which images and frames they apply. No more than one VOI LUT Sequence containing a single Item or one pair of Window Center/Width values shall be specified for each image or frame. One or more Items shall be present.
>Referenced Image Sequence	(0008,1140)	1C	Sequence of Items where each Item provides reference to a selected The subset of Image SOP Class/SOP Instance pairs images and frames listed that are defined in the Presentation State Relationship Module, to which this VOI LUT or Window Center and Width applies. One or more Items shall be present. Required if the VOI LUT transformation in this Item does not apply to all the images and frames listed in the Presentation State Relationship Module.
<i>>>Include Image SOP Instance Reference Macro Table 10-3</i>			
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C.11.11 Presentation State Relationship Module

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**Table C.11.11-1b
 PRESENTATION STATE RELATIONSHIP MACRO ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
Referenced Series Sequence	(0008,1115)	1	Sequence of Items where each Item includes the Attributes of one Series to which the Presentation applies. One or more Items shall be present.
...
>Referenced Image Sequence	(0008,1140)	1	Sequence of Items where each Item provides reference to a selected <u>The</u> set of <u>Image SOP Class/SOP Instance pairs images and frames</u> to which the Presentation applies. <u>These shall be that are part</u> of the Study defined by Study Instance UID (0020,000D) and the Series defined by Series Instance UID (0020,000E). One or more Items shall be present. The referenced SOP Class shall be the same for all Images in any Item of this Referenced Series Sequence (0008,1115).
<i>>>Include Image SOP Instance Reference Macro, Table 10-3</i>			

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C.13.2 Basic Film Session Relationship Module

**Table C.13-2
 BASIC FILM SESSION RELATIONSHIP MODULE ATTRIBUTES**

Attribute Name	Tag	Attribute Description
Referenced Film Box Sequence	(2000,0500)	A Sequence which provides references to a set of Film Boxes SOP Class/Instance pairs . Zero or more Items may be included in this Sequence.
<i>>Include 'SOP Instance Reference Macro' Table 10-11</i>		

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C.13.4 Basic Film Box Relationship Module

**Table C.13-4
 BASIC FILM BOX RELATIONSHIP MODULE ATTRIBUTES**

Attribute Name	Tag	Attribute Description
Referenced Film Session Sequence	(2010,0500)	A sequence which provides references to a Film Session SOP Class/Instance pairs . Only a single Item shall be permitted in this Sequence.
<i>>Include 'SOP Instance Reference Macro' Table 10-11</i>		
Referenced Image Box Sequence	(2010,0510)	A sequence which provides references to a set

		of Image Boxes SOP Class/Instance pairs . One or more Items may be included in this Sequence.
>Include 'SOP Instance Reference Macro' Table 10-11		
Referenced Basic Annotation Box Sequence	(2010,0520)	A Sequence which provides references to a set of Basic Annotation Boxes SOP Class/Instance pairs . Zero or more Items may be included in this Sequence.
>Include 'SOP Instance Reference Macro' Table 10-11		
Referenced Presentation LUT Sequence	(2050,0500)	A sequence which provides references to a Presentation LUT related SOP Class/Instance pairs . Only a single Item shall be included in this sequence.
>Include 'SOP Instance Reference Macro' Table 10-11		

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C.19.1 Raw Data Module

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**Table C.19-1
 RAW DATA MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020,0013)	2	A number that identifies this image-raw data . The value shall be unique within a series.
...
Referenced Instance Sequence	(0008,114A)	3	A sequence that provides reference to a set of SOP Class/Instance pairs identifying Other Instances significantly related to this Instance. One or more Items may be included in this Sequence.
>Include 'Image SOP Instance Reference Macro' Table 10-3			
...