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| 7 | | WG9 |
| 8 | Submission Date | 2018/01/22 |

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|----|---|--|
| 9 | Correction Number CP-1763 | |
| 10 | Log Summary: Source Instance Sequence for Images in Encapsulated Document IODs | |
| 11 | Name of Standard | |
| 12 | PS3.3, PS3.16 2018c | |
| 13 | Rationale for Correction: | |
| 14 | In Eye Care, devices generate PDF reports that are stored/displayed to users. This is a common feature that has been implemented | |
| 15 | for years by many vendors. These devices create reports often based on OP or OPT images and they have used Source Instance | |
| 16 | Sequence to reference those images, since the IOD did not contain Source Image Sequence. | |
| 17 | Changes introduced by CP1681 break Eye Care implementations and break DICOM backward compatibility of the Encapsulated | |
| 18 | PDF IOD. | |
| 19 | Specifically: | |
| 20 | 1. CP1575 (Add Purpose of Reference for Source Instance Sequence) and CP1559 (Add the General Reference Module) were | |
| 21 | simultaneously integrated in the standard in release 2016d. | |
| 22 | 2. Both General Reference module and Encapsulated Document module were then assigned the same Defined CID 7013 Source | |
| 23 | Instance Purpose of Reference, which included (121324, DCM, "Source Image"). | |
| 24 | 3. The definition of the Source Instance Sequence is different in the two modules: it does not exclude image composite SOP | |
| 25 | instances in the Encapsulated Document Module - the older definition - whereas it does exclude image composite SOP instances | |
| 26 | in the General Reference Module. | |
| 27 | 4. CP1681 renamed CID 7013 to "Non-Image Source Instance Purposes of Reference" and removed (121324, DCM, "Source | |
| 28 | Image"), in order to avoid replication of the function of Source Image Sequence. | |
| 29 | Now that Source Instance Sequence and CID 7013 no longer include images, Eye Care devices that produce Encapsulated Document | |
| 30 | IODs appear non-compliant. | |
| 31 | Create a new context group referenced from the Encapsulated Document Module that includes images, and note the inconsistency | |
| 32 | is for backward compatibility. | |
| 33 | This CP was already incorporated into 2018b as part of Supplement 205 Final Text, which specifically referenced this CP; only minor | |
| 34 | editorial changes to the note text remain. | |
| 35 | Correction Wording: | |

Amend DICOM PS3.3 as follows (changes to existing text are bold and underlined for additions and ~~struckthrough~~ for removals):

A.19.4 RT Structure Set IOD Content Constraints

The Defined CID for Purpose of Reference Code Sequence (0040,A170) within Source Instance Sequence (0042,0013) in the General Reference Module shall be CID 7019 "Segmentation Non-Image Source Purposes of Reference".

A.51.4 Segmentation IOD Content Constraints

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The Defined CID for Purpose of Reference Code Sequence (0040,A170) within Source Instance Sequence (0042,0013) in the General Reference Module shall be CID 7019 "Segmentation Non-Image Source Purposes of Reference".

A.57.4 Surface Segmentation IOD Content Constraints

The Defined CID for Purpose of Reference Code Sequence (0040,A170) within Source Instance Sequence (0042,0013) in the General Reference Module shall be CID 7019 "Segmentation Non-Image Source Purposes of Reference".

C.12.4 General Reference Module

Table C.12-10. General Reference Module Attributes

| Attribute Name | Tag | Type | Attribute Description |
|---|-------------|------|--|
| ... | ... | ... | ... |
| Source Image Sequence | (0008,2112) | 3 | The set of Image SOP Class/Instance pairs of the Images that were used to derive this Image. One or more Items are permitted in this Sequence. See Section C.12.4.1.2 for further explanation. |
| <i>>Include Table 10-3 "Image SOP Instance Reference Macro Attributes"</i> | | | |
| >Purpose of Reference Code Sequence | (0040,A170) | 3 | 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 is permitted in this Sequence. |
| <i>>>Include Table 8.8-1 "Code Sequence Macro Attributes"</i> | | | <i>Defined CID 7202 "Source Image Purposes of Reference".</i> |

| Attribute Name | Tag | Type | Attribute Description |
|--|-------------|------|--|
| >Spatial Locations Preserved | (0028,135A) | 3 | <p>The extent to which the spatial locations of all pixels are preserved during the processing of the source image that resulted in the current image</p> <p>Enumerated Values:</p> <p>YES NO REORIENTED_ONLY A projection radiograph that has been flipped, and/or rotated by a multiple of 90 degrees</p> <p>Note</p> <ol style="list-style-type: none"> This applies not only to images with a known relationship to a 3D space, but also to projection images. For example, a projection radiograph such as a mammogram that is processed by a point image processing operation such as contrast enhancement, or a smoothing or edge enhancing convolution, would have a value of YES for this attribute. A projection radiograph that had been magnified or warped geometrically would have a value of NO for this attribute. A projection radiograph that has been flipped, and/or rotated by a multiple of 90 degrees, such that transformation of pixel locations is possible by comparison of the values of Patient Orientation (0020,0020) would have a value of REORIENTED_ONLY. This attribute is typically of importance in relating images with Presentation Intent Type (0008,0068) values of FOR PROCESSING and FOR PRESENTATION. When the value of this attribute is NO, it is not possible to locate on the current image any pixel coordinates that are referenced relative to the source image, such as for example, might be required for rendering CAD findings derived from a referenced FOR PROCESSING image on the current FOR PRESENTATION image. |
| >Patient Orientation | (0020,0020) | 1C | <p>The Patient Orientation values of the source image.</p> <p>Required if the value of Spatial Locations Preserved (0028,135A) is REORIENTED_ONLY.</p> |
| Source Instance Sequence | (0042,0013) | 3 | <p>The set of non-image composite SOP instances that were used to derive this instance.</p> <p>One or more Items are permitted in this Sequence.</p> <p>See Section C.12.4.1.2 for further explanation.</p> |
| >Include Table 10-11 "SOP Instance Reference Macro Attributes" | | | |
| >Purpose of Reference Code Sequence | (0040,A170) | 3 | <p>Describes the purpose for which the reference is made, that is what role the source instance(s) played in the derivation of this instance.</p> <p>Only a single Item single Item is permitted in this Sequence.</p> |
| >>Include Table 8.8-1 "Code Sequence Macro Attributes" | | | Defined CID 7013 "Non-Image Source Instance Purposes of Reference". |

C.12.4.1 General Reference Module Attributes

C.12.4.1.2 Source Image Sequence

If an Image is identified to be a Derived Image (see Section C.7.6.1.1.2), Source Image Sequence (0008,2112) is an optional list of source images used to create the Derived image. Source Instance Sequence (0042,0013) is an optional list of non-image source instances that were used to create this instance. Source Image Sequence (0008,2112) and/or Source Instance Sequence (0042,0013) may be used whether or not there is a description of the way the instance was derived in Derivation Description (0008,2111) or Derivation Code Sequence (0008,9215).

Images shall not be referenced by Source Instance Sequence (0042,0013).

Note

Multiple Items may be present within Source Image Sequence (0008,2112) and/or Source Instance Sequence (0042,0013), in which case either:

- a. those instance were combined to make the derived instance (e.g., multiple source images to make an MPR or MIP), or
- b. each of the items represents a step in the successive derivation of an instance (e.g., when an image has had successive lossy compression steps applied to it),
- c. some combination of the above.

The Purpose of Reference Code Sequence (0040,A170) and the Attributes within the referenced instances themselves may be used to determine the history of the derivation, which is not otherwise explicitly specified.

C.24.2 Encapsulated Document Module

Table C.24-2. Encapsulated Document Module Attributes

| Attribute Name | Tag | Type | Attribute Description |
|--|-------------|------|--|
| ... | ... | ... | ... |
| Source Instance Sequence | (0042,0013) | 1C | <p>A sequence that identifies the set of Instances that were used to derive the encapsulated document.</p> <p>One or more Items shall be included in this Sequence.</p> <p>Required if derived from one or more DICOM Instances. May be present otherwise.</p> <p>Note</p> <p>Unlike other uses of Source Instance Sequence (0042,0013), such as in the General Reference Module, references to images are permitted in this Module; which This Module does not include the Source Image Sequence (0008,2112), and tThe Defined Context Group for Purpose of Reference Code Sequence (0040,A170) includes an appropriate concept.</p> |
| <i>>Include Table 10-11 "SOP Instance Reference Macro Attributes"</i> | | | |
| >Purpose of Reference Code Sequence | (0040,A170) | 3 | <p>Describes the purpose for which the reference is made, that is what role the source instances played in the derivation of this encapsulated document</p> <p>Only a single Item single Item is permitted in this Sequence.</p> |
| <i>>>Include Table 8.8-1 "Code Sequence Macro Attributes"</i> | | | <i>Defined CID 7060 "Encapsulated Document Source Purposes of Reference".</i> |

| Attribute Name | Tag | Type | Attribute Description |
|----------------|-----|------|-----------------------|
| ... | ... | ... | ... |

For reference, DICOM PS3.16 as already amended by Sup 205:

CID 7013 Non-Image Source Instance Purposes of Reference

Resources: HTML | FHIR JSON | FHIR XML | IHE SVS XML
 Type: Extensible
 Version: 20170914
 UID: 1.2.840.10008.6.1.1134

Table CID 7013. Non-Image Source Instance Purposes of Reference

| Coding Scheme Designator | Code Value | Code Meaning |
|--------------------------|------------|--------------------|
| DCM | 128224 | Source measurement |
| DCM | 128225 | Source report |
| DCM | 128226 | Source raw data |

Include CID 7019 "Segmentation Non-Image Source Purposes of Reference"

Note

This context group previously contained a code for "source image", which has been removed.

CID 7019 Segmentation Non-Image Source Purposes of Reference

Resources: HTML | FHIR JSON | FHIR XML | IHE SVS XML
 Type: Extensible
 Version: 20170914
 UID: 1.2.840.10008.6.1.1183

Table CID 7019. Segmentation Non-Image Source Purposes of Reference

| Coding Scheme Designator | Code Value | Code Meaning | SNOMED-CT Concept ID | UMLS Concept Unique ID |
|--------------------------|------------|-----------------------------|----------------------|------------------------|
| DCM | 128227 | Source real world value map | | |

CID 7202 Source Image Purposes of Reference

Resources: HTML | FHIR JSON | FHIR XML | IHE SVS XML
 Type: Extensible
 Version: 20170405
 UID: 1.2.840.10008.6.1.509

Table CID 7202. Source Image Purposes of Reference

| Coding Scheme Designator | Code Value | Code Meaning |
|--------------------------|------------|---|
| DCM | 121320 | Uncompressed predecessor |
| DCM | 121321 | Mask image for image processing operation |
| DCM | 121322 | Source image for image processing operation |
| DCM | 121329 | Source image for montage |
| DCM | 121330 | Lossy compressed predecessor |
| DCM | 121358 | For Processing predecessor |

| Coding Scheme Designator | Code Value | Code Meaning |
|--------------------------|------------|--|
| DCM | 113130 | Predecessor containing group of imaging subjects |
| DCM | 128250 | Structural image for image processing |
| DCM | 128251 | Flow image for image processing |

CID 7060 Encapsulated Document Source Purposes of Reference

Resources: HTML | FHIR JSON | FHIR XML | IHE SVS XML
Type: Extensible
Version: 20180403
UID: 1.2.840.10008.6.1.1201

Table CID 7060. Encapsulated Document Source Purposes of Reference

| Coding Scheme Designator | Code Value | Code Meaning |
|---|------------|--------------|
| DCM | 121324 | Source image |
| <i>Include CID 7013 "Non-Image Source Instance Purposes of Reference"</i> | | |