

## DICOM Correction Proposal

STATUS	March 2020 Voting Package
Date of Last Update	2020-01-24
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Correction Number	CP-1976
Log Summary:	Add reference to ImageType as alternative to FrameType for Sequences added to CT Image
Name of Standard	PS3.16 2018
Rationale for Correction:	Add reference to ImageType as alternative to FrameType for Sequences added to CT Image as part of Sup 188.
Correction Wording:	

*<Modify C.8.15.3.3 CT Acquisition Details Macro>*

**Table C.8-119. CT Acquisition Details Macro Attributes**

Attribute Name	Tag	Type	Attribute Description
CT Acquisition Details Sequence	(0018,9304)	1	Contains the Attributes defining the details of the acquisition.  If Multi-energy CT Acquisition (0018,9361) is NO or is absent, only a single Item shall be included in this Sequence.  If Multi-energy CT Acquisition (0018,9361) is YES, one or more Items shall be included in this Sequence.
>Referenced Path Index	(0018,9378)	1C	References the X-Ray Path Index (0018,937A) in the Multi-energy CT Path Sequence (0018,9379) for this exposure.  Note  This attribute may contain multiple values if this item describes multiple paths.  Required if Multi-energy CT Acquisition (0018,9361) is YES.
>Rotation Direction	(0018,1140)	1C	Direction of rotation of the source about the gantry, as viewed while facing the gantry where the table enters the gantry.  Enumerated Values: <b>CW</b> clockwise <b>CC</b> counter clockwise

CP-1976 Add reference to ImageType as alternative to FrameType for Sequences added to CT Image

			<p>Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL , <b>or if Image Type (0008,0008) Value 1 is ORIGINAL</b> and Acquisition Type (0018,9302) is other than CONSTANT_ANGLE.</p> <p>Otherwise may be present if Frame Type (0008,9007) Value 1 of this frame is DERIVED <b>or if Image Type (0008,0008) Value 1 is DERIVED</b> and Acquisition Type (0018,9302) is other than CONSTANT_ANGLE.</p>
>Revolution Time	(0018,9305)	1C	<p>The time in seconds of a complete revolution of the source around the gantry orbit. This value is independent of the Reconstruction Angle (0018,9319) of the frame.</p> <p>Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL</b> and Acquisition Type (0018,9302) is other than CONSTANT_ANGLE.</p> <p>Otherwise may be present if Frame Type (0008,9007) Value 1 of this frame is DERIVED <b>or if Image Type (0008,0008) Value 1 is DERIVED</b> and Acquisition Type (0018,9302) is other than CONSTANT_ANGLE.</p>
>Single Collimation Width	(0018,9306)	1C	<p>The width of a single row of acquired data (in mm).</p> <p>Note</p> <p>Adjacent physical detector rows may have been combined to form a single effective acquisition row.</p> <p>Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL</b>. May be present otherwise.</p>
>Total Collimation Width	(0018,9307)	1C	<p>The width of the total collimation (in mm) over the area of active X-Ray detection.</p> <p>Note</p> <p>This will be equal to the number of effective detector rows multiplied by single collimation width.</p> <p>Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL</b>. May be present otherwise.</p>
>Table Height	(0018,1130)	1C	<p>The distance in mm from the top of the patient table to the center of rotation of the source (i.e., the data collection center or isocenter). The distance is positive when the table is below the data collection center.</p> <p>Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL</b>. May be present otherwise.</p>
>Gantry/Detector Tilt	(0018,1120)	1C	<p>Nominal angle of tilt in degrees of the scanning gantry. Not intended for mathematical computations. Zero degrees means the gantry is not tilted, negative degrees are when the top of the gantry is tilted away from where the table enters the gantry.</p> <p>Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL</b>. May be present otherwise.</p>
>Data Collection Diameter	(0018,0090)	1C	<p>The diameter in mm of the region over which data were collected. See <a href="#">Section C.8.15.3.6.1</a>.</p> <p>Note</p>

In the case of an Acquisition Type (0018,9302) of CONSTANT\_ANGLE, the diameter is that in a plane normal to the central ray of the diverging X-Ray beam as it passes through the data collection center.

Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL\_or if Image Type (0008,0008) Value 1 is ORIGINAL. May be present otherwise.

<Modify C.8.15.3.6 CT Geometry Macro>

**Table C.8-122. CT Geometry Macro Attributes**

Attribute Name	Tag	Type	Attribute Description
CT Geometry Sequence	(0018,9312)	1	Contains the Attributes defining the CT geometry.  If Multi-energy CT Acquisition (0018,9361) is NO or is absent, only a single Item shall be included in this Sequence.  If Multi-energy CT Acquisition (0018,9361) is YES, one or more Items shall be included in this Sequence.
...			
>Distance Source to Detector	(0018,1110)	1C	Distance in mm from source to detector center. See Section C.8.15.3.6.1.  Note  This value is traditionally referred to as Source Image Receptor Distance (SID).  Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL_or if Image Type (0008,0008) Value 1 is ORIGINAL. May be present otherwise.
>Distance Source to Data Collection Center	(0018,9335)	1C	Distance in mm from source to data collection center. See Section C.8.15.3.6.1.  Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL_or if Image Type (0008,0008) Value 1 is ORIGINAL. May be present otherwise.

<Modify C.8.15.3.8 CT Exposure Macro>

**Table C.8-124. CT Exposure Macro Attributes**

Attribute Name	Tag	Type	Attribute Description
CT Exposure Sequence	(0018,9321)	1	Contains the Attributes defining exposure information.  If Multi-energy CT Acquisition (0018,9361) is NO or is absent, only a single Item shall be included in this Sequence.

Attribute Name	Tag	Type	Attribute Description
			If Multi-energy CT Acquisition (0018,9361) is YES, one or more Items shall be included in this Sequence.
...			
>X-Ray Tube Current in mA	(0018,9330)	1C	Nominal X-Ray tube current in milliamperes.  Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL</b> . May be present otherwise.
>Exposure in mAs	(0018,9332)	1C	The exposure expressed in milliamperere seconds, for example calculated from exposure time and X-Ray tube current.  Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL</b> . May be present otherwise.
>Exposure Modulation Type	(0018,9323)	1C	A label describing the type of exposure modulation used for the purpose of limiting the dose.  Defined Terms: <b>NONE</b>  Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL</b> . May be present otherwise.
>Estimated Dose Saving	(0018,9324)	2C	A percent value of dose saving due to the use of Exposure Modulation Type (0018,9323). A negative percent value of dose savings reflects an increase of exposure.  Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL</b> and Exposure Modulation Type (0018,9323) is not equal to NONE.  Otherwise may be present if Frame Type (0008,9007) Value 1 of this frame is DERIVED <b>or if Image Type (0008,0008) Value 1 is DERIVED</b> and Exposure Modulation Type (0018,9323) is not equal to NONE.
>CTDIvol	(0018,9345)	2C	Computed Tomography Dose Index (CTDI <sub>vol</sub> ), in mGy according to IEC 60601-2-44, Ed.2.1 (Clause 29.1.103.4), The Volume CTDI <sub>vol</sub> . It describes the average dose for this frame for the selected CT conditions of operation.  Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL</b> . May be present otherwise.

<Modify C.8.15.3.9 CT X-Ray Details Macro

**Table C.8-125. CT X-Ray Details Sequence Macro Attributes**

CP-1976 Add reference to ImageType as alternative to FrameType for Sequences added to CT Image

Attribute Name	Tag	Type	Attribute Description
CT X-Ray Details Sequence	(0018,9325)	1	<p>Contains the Attributes defining the X-Ray information.</p> <p>If Multi-energy CT Acquisition (0018,9361) is NO or is absent, only a single Item shall be included in this Sequence.</p> <p>If Multi-energy CT Acquisition (0018,9361) is YES, one or more Items shall be included in this Sequence.</p>
...			
>KVP	(0018,0060)	1C	<p>Nominal peak kilo voltage output of the X-Ray generator used.</p> <p>If Multi-energy Source Technique (0018,9368) in Multi-energy CT X-Ray Source Sequence (0018,9365) (of the referenced Multi-energy CT Path Index (0018,937A)) is "SWITCHING_SOURCE", this value is the nominal peak value for a switching phase. The switching phase is identified by the value of X-Ray Source Index (0018,9366) in the Multi-energy CT Path Sequence (0018,9379) corresponding to the value of Referenced Path Index (0018,9378) in this Sequence.</p> <p>Due to limitations of the generating hardware the actual voltage may not reach the nominal peak value.</p> <p>Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL.</b> May be present otherwise.</p>
>Focal Spot(s)	(0018,1190)	1C	<p>Used nominal size of the focal spot in mm. The Attribute may only have one or two values, for devices with variable focal spot, small dimension followed by large dimension</p> <p>Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL.</b> May be present otherwise.</p>
>Filter Type	(0018,1160)	1C	<p>Type of filter(s) inserted into the X-Ray beam.</p> <p>Defined Terms:  <b>WEDGE</b>  <b>BUTTERFLY</b>  <b>MULTIPLE</b>  <b>FLAT</b>  <b>SHAPED</b>  <b>NONE</b></p> <p>Note</p> <p>Multiple type of filters can be expressed by a combination, e.g., BUTTERFLY+WEDGE.</p> <p>Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL <b>or if Image Type (0008,0008) Value 1 is ORIGINAL.</b> May be present otherwise.</p>
>Filter Material	(0018,7050)	1C	<p>The X-Ray absorbing material used in the filter. May be multi-valued.</p> <p>Defined Terms:  <b>MOLYBDENUM</b>  <b>ALUMINUM</b>  <b>COPPER</b></p>

CP-1976 Add reference to ImageType as alternative to FrameType for Sequences added to CT Image

Attribute Name	Tag	Type	Attribute Description
			<p><b>RHODIUM</b>  <b>NIOBIUM</b>  <b>EUROPIUM</b>  <b>LEAD</b>  <b>MIXED</b></p> <p>Note</p> <p>MIXED may be used to indicate a filter type of complex composition for which listing the individual materials would be excessive or undesirable; it is not intended to mean "unknown".</p> <p>Required if Frame Type (0008,9007) Value 1 of this frame is <b>ORIGINAL</b> <u>or if Image Type (0008,0008) Value 1 is ORIGINAL</u> and the value of Filter Type (0018,1160) is other than NONE. May be present otherwise.</p>
...			
>Energy Weighting Factor	(0018,9353)	1C	<p>The weighting factor of the data from this Sequence Item.</p> <p>Required if Required if Frame Type (0008,9007) Value 4 of this frame is <b>ENERGY_PROP_WT</b> <u>or if Image Type (0008,0008) Value 4 is ENERGY_PROP_WT</u>. May be present otherwise.</p>