

DICOM Correction Proposal

STATUS	Final Text
Date of Last Update	2021/03/25
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Correction Number	CP-1227
Log Summary:	Remove ambiguous Estimated Dose Saving attribute
Name of Standard	PS3.3, PS3.6 202a
Rationale for Correction:	<p>Several concerns have been raised about the Estimated Dose Saving attribute:</p> <ol style="list-style-type: none"> 1) The attribute name "Estimated dose savings" may mislead customers to think it incorporates all dose reductions (i.e., active collimation, iterative recon, etc) when it only addresses tube current modulation. And even in the case of tube current modulation, it's not really "dose savings". 2) For larger patients, this field may show negative dose savings (dose increase) which might lead people to infer that Patient X got a higher dose with modulation turned "On" than they would have gotten with modulation "Off", encouraging them to turn off modulation for larger patients. 3) The algorithm for calculating the "Savings" value is not clearly stated and the actual value may be rather arbitrary. Assuming it is the percent difference between the mA value with modulation turned on and modulation turned off, the denominator is arbitrary/unfixed, the equation does not factor in patient body habitus, and the image quality is not considered so it's not so much that you "saved dose" as traded it off against something else. 4) FDA might interpret the field as being a dose claim by the manufacturer, which FDA does not allow. <p>It is proposed that the attribute be removed. No objections were raised in WG-21. Several reps of WG-28 agreed it was misleading.</p> <p>Another CP may add a new attribute with a name, definition and semantics that would be clearer and more appropriate.</p> <p>Also, if the mA value recorded currently (no pun intended) in each slice represents the nominal or average mA for the whole spiral acquisition, it might be useful to add an attribute that records the actual modulated mA for each slice (or for Enhanced CT in the Functional Group Macro). This would provide the full current modulation curve which would be helpful for analyzing outliers and population exposure in general. We might need to consider both simple z-modulation and more complex x-y-z modulation schemes.</p>
Correction Wording:	

Modify PS3.3 Table C.8-3 as shown:

C.8.2.1 CT Image Module

The table in this Section contains IOD Attributes that describe CT images.

**Table C.8-3
CT IMAGE MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
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...			
Exposure Modulation Type	(0018,9323)	3	A label describing the type of exposure modulation used for the purpose of limiting the dose. Defined Terms: NONE
Estimated Dose Saving	(0018,9324)	3	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.
CTDIvol	(0018,9345)	3	Computed Tomography Dose Index (CTDI _{vol}), in mGy according to IEC 60601-2-44, Ed.2.1 (Clause 29.1.103.4), The Volume CTDI _{vol} . It describes the average dose for this image for the selected CT conditions of operation.
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Modify PS3.3 Table C.8-124 as shown:

C.8.15.3.8 CT Exposure Macro

Table C.8-124 specifies the attributes of the CT Exposure Functional Group 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. Only a single Item shall be included in this sequence.
>Exposure Time in ms	(0018,9328)	1C	Duration of exposure for this frame in milliseconds. If Acquisition Type (0018,9302) equals SPIRAL the duration of the exposure time for this frame shall be the Revolution Time (0018,9305) divided by the Spiral Pitch Factor (0018,9311). See C.8.15.3.8.1. Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL. May be present otherwise.
>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. 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. 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: NONE Required if Frame Type (0008,9007) Value 1 of this frame is ORIGINAL. 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 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 and Exposure Modulation Type (0018,9323) is not equal to NONE.
>CTDIvol	(0018,9345)	2C	Computed Tomography Dose Index (CTDI _{vol}), in mGy according to IEC 60601-2-44, Ed.2.1 (Clause 29.1.103.4), The Volume CTDI _{vol} . 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. May be present otherwise.
>CTDI Phantom Type Code Sequence	(0018,9346)	3	The type of phantom used for CTDI measurement according to IEC 60601-2-44. Only a single Item is permitted in this Sequence.
>>Include Code Sequence Macro Table 8.8-1		Defined CID 4052	

Retire Estimated Dose Saving in (0018,9324) PS3.6