DICOM Correction Item

Correction Number	CP-876
Log Summary: CT Radiation Dose Reporting (Dose SR); change assignment of X-ray Aluminium equivalent.	
Type of Modification Addition	Name of Standard PS3.16 – 2008
Rationale for Correction The entry EV (113821, DCM, "X-ray Filter Aluminum Equivalent") depends on the X-ray source and may be different in some specific scan applications. Therefore this parameter shall be assigned with each X-ray tube system	
Sections of documents affected PS 3.16, TID 10013	
Correction Wording: n.a.	

Change to PS 3.16, TID 10013 **CT Irradiation Event Data**

TID 10013
CT IRRADIATION EVENT DATA
Type: Extensible

4								
5	>	CONTAINS	CODE	(G-C232, SRT, "Procedure Context")	1	U		DCID (10014) Contrast Imaging Technique
6	>	CONTAINS	UIDREF	EV (113769, DCM, "Irradiation Event UID")	1	M		
~~7~~	~~>~~	~~CONTAINS~~	~~NUM~~	~~EV (113821, DCM, "X-ray Filter Aluminium Equivalent")~~	~~1~~	~~U~~		~~Units = EV (mm, UCUM, "mm")~~
~~8~~7	>	CONTAINS	CONTAINER	EV (113822, DCM, "CT Acquisition Parameters")	1	M		
9~~8~~	>>	CONTAINS	NUM	EV (113824, DCM, "Exposure Time")	1	M		Units = EV (s, UCUM, "s")
10~~9~~	>>	CONTAINS	NUM	EV (113825, DCM, "Scanning Length")	1	M		Units = EV (mm, UCUM, "mm")
11~~0~~	>>	CONTAINS	NUM	EV (113826, DCM, "Nominal Single Collimation Width")	1	M		Units = EV (mm, UCUM, "mm")
12~~1~~	>>	CONTAINS	NUM	EV (113827, DCM, "Nominal Total Collimation Width")	1	M		Units = EV (mm, UCUM, "mm")
13~~2~~	>>	CONTAINS	NUM	EV (113828, DCM, "Pitch Factor")	1	MC	IF row 4 equals (P5-08001, SRT, "Spiral Acquisition") or equals (113804, DCM, "Sequenced Acquisition")	Units = EV ({ratio}, UCUM, "ratio")

1~~43~~	>>	CONTAINS	NUM	EV (113823, DCM, "Number of X-ray Sources")	1	M		Units = EV ({X-ray sources}, UCUM, "X-ray sources")
1~~54~~	>>	CONTAINS	CONTAINER	EV (113831, DCM, "CT X-ray Source Parameters")	1-n	M		
1~~65~~	>>>	CONTAINS	TEXT	EV (113832, DCM, "Identification Number of the X-ray Source")	1	M		
1~~76~~	>>>	CONTAINS	NUM	EV (113733, DCM, "KVP")	1	M		Units = EV (kV, UCUM, "kV")
1~~87~~	>>>	CONTAINS	NUM	EV (113833, DCM, "Maximum X-ray Tube Current")	1	M		Units = EV (mA, UCUM, "mA")
1~~98~~	>>>	CONTAINS	NUM	EV (113734, DCM, "Mean X-ray Tube Current"	1	M		Units = EV (mA, UCUM, "mA")
2~~01~~ 9	>>>	CONTAINS	NUM	EV (113834, DCM, "Exposure Time per Rotation")	1	MC	IF row 4 does not equal (113805, DCM, "Constant Angle Acquisition")	Units = EV (s, UCUM, "s")
20	**>>>**	**CONTAINS**	**NUM**	**EV (113821, DCM, "X-ray Filter Aluminum Equivalent")**	**1**	**U**		**Units = EV (mm, UCUM, "mm")**
21	>	CONTAINS	CONTAINER	EV (113829, DCM, "CT Dose")	1	MC	IF row 4 does not equal (113805, DCM, "Constant Angle Acquisition")	
22	>>	CONTAINS	NUM	EV (113830, DCM, "Mean CTDIvol ")	1	M		Units = EV (mGy, UCUM, "mGy")
23	>>	CONTAINS	CODE	EV (113835, DCM, "CTDIw Phantom Type")	1	M		DCID (4052) Phantom Devices
24	>>	CONTAINS	NUM	EV (113836, DCM, "CTDIfreeair Calculation Factor")	1	U		Units = EV (mGy/mAs, UCUM, "mGy/mAs")
25	>>	CONTAINS	NUM	EV (113837, DCM, "Mean CTDIfreeair")	1	U		Units = EV (mGy, UCUM, "mGy")
26	>>	CONTAINS	NUM	EV (113838, DCM, "DLP")	1	M		Units = EV (mGycm, UCUM, "mGycm")
27	>>	CONTAINS	NUM	EV (113839, DCM, "Effective Dose")	1	U		Units = EV (mSv, UCUM, "mSv")
28	>>>	HAS CONCEPT MOD	CODE	EV (G-C036, SRT, "Measurement Method")	1	MC	IF row 27 is present	DCID (10011) "Effective Dose Evaluation Method")
29	>>> >	HAS PROPERTIES	NUM	EV (113840, DCM, "Effective Dose Conversion Factor")	1	MC	IF row 28 is present and equals (113800, DCM, "DLP to E conversion via MC computation") or equals (113802, DCM, "DLP to E conversion via measurement")	Units = EV (mSv/mGycm, UCUM, "mSv/mGycm")
30	>	CONTAINS	TEXT	EV (121106, DCM, "Comment")	1	U		

Content Item Descriptions

Row 2	User-defined type of clinical acquisition protocol for creating images or image-derived measurements. May be taken from Protocol Name (0018,1030) or from Performed Procedure Step Description (0040,0254).

Row 3	The target region is the anatomy exposed.
Row 4	Description of the method used during acquisition of this CT irradiation event, may be derived from Acquisition Type (0018,9302).
Row 5	The acquisition was performed with or without contrast medium application.
~~**Row 7**~~	~~**Thickness of an equivalent filter constructed from aluminum.**~~
Row ~~**9**~~**8**	Total time the patient has received X-ray exposure during the irradiation event.
Row ~~**10**~~**9**	For Spiral scanning, the scanning length is normally the table travel in mm during the tube loading. For Sequenced scanning, the scanning length is the table travel between consecutive scans times the number of scans. For Stationary and Free scanning, the scanning length is the nominal width of the total collimation.
Row 1~~1~~**0**	The value of the nominal width (referenced to the location of the isocenter along the z axis) of a single collimated slice in mm.
Row 1~~2~~**1**	The value of the nominal width (referenced to the location of the isocenter along the z axis) of the nominal total collimation in mm over the area of active X-ray detection (z-coverage).
Row 1~~3~~**2**	Pitch Factor: For Spiral Acquisition, the Pitch Factor is the ratio of the Table Feed per Rotation to the Nominal Total Collimation Width. For Sequenced Acquisition, the Pitch Factor is the ratio of the Table Feed per single sequenced scan to the Nominal Total Collimation Width.
Row 1~~5~~**4**	CT X-ray source parameters related to the acquisition. For each X-ray source an item must be present.
Row 1~~6~~**5**	Identification Number of the X-ray source. Identifies the particular X-ray source (in a multi-source CT system) for which the set of X-ray source parameter values is reported.
Row 1~~7~~**6**	KVP value as measured/recorded by system.
Row 1~~9~~**8**	Mean tube current as measured/recorded by system.
Row ~~**20**~~**19**	Exposure time as measured/recorded by the system per rotation.
Row 20	**Thickness of an equivalent filter constructed from aluminum, in case of multi source CT systems AND if Row 4 is not present**
Row 21	CT Dose for one acquisition
Row 22	"Mean $CTDI_{vol}$" refers to the average value of the $CTDI_{vol}$ applied within this acquisition. $CTDI_{vol}$ is the volume $CTDI_w$, where $CTDI_w$ is the weighted computed tomography dose index 100 as defined in IEC 60601-2-44. For Sequenced and Spiral scanning, $CTDI_{vol} = CTDI_w$/Pitch Factor. For Stationary and Free scanning, $CTDI_{vol} = CTDI_w \times$ Cumulative Exposure Time/ Exposure Time Per Rotation. See also CTDIvol (0018,9345) and Spiral Pitch Factor (0018,9311) in the Enhanced CT Information Object Description (PS 3.3).
Row 23	The type of phantom used for CTDI measurement according to IEC 60601-2-44 (e.g. Head 16 cm diameter PMMA, Body 32 cm diameter PMMA).
Row 24	The $CTDI_{free\ air}$ Calculation Factor is the $CTDI_{free\ air}$ per mAs, expressed in units of mGy/mAs. The $CTDI_{free\ air}$ Calculation Factor may be used in one method calculating Dose. For example, for this acquisition, Effective Dose = Mean X-ray Tube Current $\times$ Cumulative Exposure Time $\times$ $CTDI_{free\ air}$ Calculation Factor $\times$ (Effective Dose/ $CTDI_{free\ air}$).
Row 25	Mean $CTDI_{free\ air}$ is the mean CTDI for this acquisition, evaluated free-in-air according to IEC 60601-2-44. Mean $CTDI_{free\ air}$ = Mean X-ray Tube Current $\times$ Cumulative Exposure Time $\times$ $CTDI_{free\ air}$ Calculation Factor. The $CTDI_{free\ air}$ may be used in one method of

	calculating Effective Dose.
Row 26	For Spiral scanning, DLP = $CTDI_{vol}$ × Scanning Length. For Sequenced scanning, DLP = $CTDI_{vol}$ × Nominal Total Collimation Width × Cumulative Exposure Time / Exposure Time per Rotation. For Stationary and Free scanning, DLP = $CTDI_{vol}$ × Nominal Total Collimation Width (according to IEC 60601-2-44).
Row 27	Effective Dose in mSv of the single continuous time-frame of the irradiation computed as described in TID 10012.
Row 29	The Effective Dose Conversion Factor is the ratio of the Effective Dose to the DLP, expressed in units of mSv/mGycm, and it is used as a factor in one method of estimating Effective Dose. Monte Carlo Simulations (or dosimetric measurements in an anthropomorphic phantom, e.g., the Alderson-Rando phantom) may be used as a basis for the evaluation of Effective Dose Conversion Factors.