

DICOM Correction Proposal

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Correction Number	CP-1502
Log Summary:	Pixel Intensity Relationship in RT Image
Name of Standard	PS 3.3 2015c
Rationale for Correction:	The Pixel Intensity Relationship is not always linear or logarithmic. Therefore the definition of the allowed terms should follow the C.8.19.6.4 X-Ray Frame Pixel Data Properties Macro generally used in most of the Image-related modules, rather than the initially used definition of the C.8.11.3 DX Image Module.
Correction Wording:	

In Part 3, add the following in section C.8.8.2 RT Image Module.

C.8.8.2 RT Image Module

...

Table C.8-38. RT Image Module Attributes

Attribute Name	Tag	Type	Description
...			
Pixel Intensity Relationship	(0028,1040)	3	The relationship between the Pixel sample values and the X-Ray beam intensity. Enumerated Values: LIN Linearly proportional to X-Ray beam intensity LOG Logarithmically proportional to X-Ray beam intensity See Section C.8.11.3.1.2 for further explanation. See Section C.8.19.6.4.1.1 Pixel Intensity Relationship
Pixel Intensity Relationship Sign	(0028,1041)	1C	The sign of the relationship between the Pixel sample values stored in Pixel Data

Attribute Name	Tag	Type	Description
			(7FE0,0010) and the X-Ray beam intensity. Required if Pixel Intensity Relationship (0028,1040) is present. Enumerated Values: 1 Lower pixel values correspond to less X-Ray beam intensity -1 Higher pixel values correspond to less X-Ray beam intensity See Section C.8.11.3.1.2 for further explanation.
...			

The following existing section is cited only for readability of the CP (no change requested).

C.8.19.6.4.1.1 Pixel Intensity Relationship

Pixel Intensity Relationship (0028,1040) shall identify the relationship of the pixel values to the X-Ray beam intensity.

Defined Terms:

- LIN** Approximately proportional to X-Ray beam intensity.
- LOG** Non-linear "Log Function"; A Pixel Intensity Relationship LUT shall be included with the image to allow it to be mapped back to its proportional value to X-Ray beam intensity.
- OTHER** Not proportional to X-Ray beam intensity. If a TO_LINEAR Pixel Intensity Relationship LUT item is supplied, scaling back to X-Ray beam intensity is possible.

Note

1. When the relationship can be better defined (e.g., square root data) a more precise Defined Term can be used than OTHER.
2. Providing a TO_LINEAR Pixel Intensity Relationship LUT is encouraged.