

DICOM Correction Proposal

STATUS	Letter Ballot
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Correction Number	CP-2341
Log Summary: Remove LUT restrictions for Ophthalmic Tomography Images	
Name of Standard	PS3.3
<p>Rationale for Correction:</p> <p>Ophthalmic Optical Coherence Tomography (OCT) images are grayscale images with a wide dynamic range. Optimal presentation of the data typically requires applying a grayscale LUT operation to highlight details in patient anatomy.</p> <p>Ophthalmic Tomography Image IOD explicitly denies implementers from using VOI LUT module when creating instances of the Ophthalmic Tomography Image Storage SOP Class. This leads implementers to pre-apply necessary LUT operations in the pixel data, optimized for human interpretation. This lossy LUT transformation is counter-productive for any algorithmic use of OCT images.</p> <p>To allow implementers to retain original grayscale dynamics and still provide necessary windowing and LUT specification for presentation of OCT images, the IOD should encourage usage of standard LUT operations, potentially at frame-by-frame level.</p> <p>Similar approach has already been taken with closely related Ophthalmic Optical Coherence Tomography B-scan Volume Analysis IOD, which specifies usage of Frame VOI LUT With LUT Functional Group Macro as Mandatory, and with Intravascular Optical Coherence Tomography IOD, which specifies Frame VOI LUT Functional Group Macro as User Optional.</p> <p>Making Frame VOI LUT With LUT Macro User Optional for Ophthalmic Tomography IOD would allow implementers to keep full dynamic range and include LUT instructions in new SOP Instances while keeping all existing implementations conformant.</p>	
Correction Wording:	

Add VOI LUT With LUT Macro to Ophthalmic Tomography Image Functional Group Macros

A.52.4.3 Ophthalmic Tomography Image Functional Group Macros

Table A.52.4.3-1 specifies the use of the Functional Group Macros used in the Multi-frame Functional Groups Module for the Ophthalmic Tomography Image IOD.

Table A.52.4.3-1. Ophthalmic Tomography Image Functional Group Macros

Functional Group Macro	Section	Usage
Pixel Measures	C.7.6.16.2.1	M

Functional Group Macro	Section	Usage
Frame Content	C.7.6.16.2.2	M - May not be used as a Shared Functional Group.
Plane Position (Patient)	C.7.6.16.2.3	C - Required if no Ophthalmic Photography Reference Image is available or if Ophthalmic Volumetric Properties Flag (0022,1622) is YES; May be present otherwise
Plane Orientation (Patient)	C.7.6.16.2.4	C - Required if no Ophthalmic Photography Reference Image is available or if Ophthalmic Volumetric Properties Flag (0022,1622) is YES; May be present otherwise
Referenced Image	C.7.6.16.2.5	C - Required if Ophthalmic Photography Reference Image is available.
Derivation Image	C.7.6.16.2.6	C - Required if the image or frame has been derived from another SOP Instance.
Frame Anatomy	C.7.6.16.2.8	M
Cardiac Synchronization	C.7.6.16.2.7	C - Required if Cardiac Synchronization Technique (0018,9037) equals other than NONE. May be present otherwise.
Frame VOI LUT With LUT	C.7.6.16.2.10	U
	b	
Contrast/Bolus Usage	C.7.6.16.2.12	C - Required if Contrast/Bolus Agent Sequence (0018,0012) is used. May not be used as a Shared Functional Group
Ophthalmic Frame Location	C.8.17.10.1	U

Add clarification note about Frame VOI LUT With LUT Functional Group Macro

A.52.4.2 Overlay Plane Module and VOI LUT Module

The Overlay Plane Module and VOI LUT Module shall not be used in a Standard Extended SOP Class of the Ophthalmic Tomography Image.

Note

1. In order to annotate images, whether during acquisition or subsequently, SOP Instances of the Grayscale Softcopy Presentation State Storage or the Structured Report Storage SOP Classes that reference the image SOP Instance may be used.

2. The VOI LUT function is provided by a Frame VOI LUT With LUT Functional Group

Pseudo-color presentation information may be applied through the use of separate Pseudo-color Softcopy Presentation State SOP Instances.

No standard mechanism is provided for inclusion of annotations within the image SOP Instance itself and implementers are discouraged from using private extensions to circumvent this restriction.