

DICOM Correction Proposal Form

Correction Number		CP-400
Log Summary: Lossy Compression Method and Original Images		
Type of Modification	Name of Standard	
Clarification / Addition	PS 3.3, 3.6 2003	
Rationale for Correction:		
<p>A lossy compressed image may be ORIGINAL rather than DERIVED.</p> <p>Rather than use Derivation Description (0008,2111), which only applies to DERIVED images, a specific attribute is needed to describe the method of compression.</p>		
Sections of documents affected		
PS3.3 C.7.6.1		
PS3.6 Section 6		
Correction Wording:		

Modify C.7.6.1...

C.7.6.1 General Image Module

Table C.7-9 specifies the Attributes that identify and describe an image within a particular series.

Table C.7-9
GENERAL IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Lossy Image Compression	(0028,2110)	3	Specifies whether an Image has undergone lossy compression. Enumerated Values: 00 = Image has NOT been subjected to lossy compression. 01 = Image has been subjected to lossy compression. See C.7.6.1.1.5
Lossy Image Compression Ratio	(0028,2112)	3	Describes the approximate lossy compression ratio(s) that have been applied to this image. See C.7.6.1.1.5 for further explanation. May be multivalued if successive lossy compression steps have been applied. Notes: 1. For example, a compression ratio of 30:1 would be described in this Attribute with a single value of 30. 2. For historical reasons, the lossy compression ratio should may also be described in Derivation Description (0008,2111). Since uncompressed DICOM Transfer Syntaxes are restricted to byte boundaries for bits per pixel, the compression ratio is expressed relative to the number of bytes of uncompressed DICOM encoded data versus bytes of compressed DICOM encoded data.
Lossy Image Compression Method	(0028,2114)	3	<u>A label for the lossy compression method(s) that have been applied to this image.</u> <u>See C.7.6.1.1.5 for further explanation.</u> <u>May be multivalued if successive lossy compression steps have been applied; the value order shall correspond to the values of Lossy Image Compression Ratio (0028,2112).</u> <u>Note: For historical reasons, the lossy compression method may also be described in Derivation Description (0008,2111).</u>

C.7.6.1.1.5 Lossy Image Compression

The Attribute Lossy Image Compression (0028,2110) conveys that the Image has undergone lossy compression. It provides a means to record that the Image has been compressed (at a point in its lifetime) with a lossy algorithm and changes have been introduced into the pixel data. Once the value has been set to "01", it shall not be reset.

Note: If an image is compressed with a lossy algorithm, the attribute Lossy Image Compression (0028,2110) is set to "01". Subsequently, if the image is decompressed and transferred in uncompressed format, this attribute value remains "01".

The value of the Lossy Image Compression (0028,2110) Attribute in SOP Instances containing multiple frames in which one or more of the frames have undergone lossy compression shall be "01".

Note: It is recommended that the applicable frames be noted in the Attribute Derivation Description (0008,2111).

If an image is originally obtained as a lossy compressed image from the sensor, then Lossy Image Compression (0028,2110) is set to "01" and Value 1 of the Attribute Image Type (0008,0008) shall be set to ORIGINAL.

If an image is a compressed version of another image, Lossy Image Compression (0028,2110) is set to "01", Value 1 of the Attribute Image Type (0008,0008) shall be set to DERIVED, and **if the predecessor was a DICOM image, then** the Image shall receive a new SOP Instance UID.

Note: 1. It is recommended that the approximate compression ratio be provided in the Attribute Derivation Description (0008,2111). Furthermore, it is recommended that Derivation Description (0008,2111) be used to indicate when pixel data changes might affect professional interpretation. (see C.7.6.1.1.3).

2. The attribute Lossy Image Compression (0028,2110) is defined as Type 3 for backward compatibility with existing IODs. It is expected to be required (i.e., defined as Type 1C) for new Image IODs and for existing IODs that undergo a major revision (e.g. a new IOD is specified).

The Defined Terms for Lossy Image Compression Method (0028,2114) are:

- ISO_10918_1 = JPEG Lossy Compression**
- ISO_14495_1 = JPEG-LS Near-lossless Compression**
- ISO_15444_1 = JPEG 2000 Irreversible Compression**
- ISO_13818_2 = MPEG2 Compression**

Add new attribute to Part 6

Tag	Name	VR	VM
(0028,2114)	Lossy Image Compression Method	CS	1-n