DICOM Correction Item

Correction Number | CP 950
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Log Summary: | Inapplicable VR referenced for LUT Data
Type of Modification | Name of Standard
Correction | PS 3.5, 3.6 – 2008

Rationale for Correction:

PS 3.6 specifies that LUT Data (0028,3006) may have one of the Following VRs: US or SS or OW;

However when LUT data (0028,3006) is specified in PS3.3, it is always unsigned (range from 0 to $2^n - 1$, where $n$ specifies the number of bits for each entry in the LUT Data. (3rd value of LUT Descriptor), as specified everytime in the section describing the usage of this element in PS3.3 (See Sections C.8.11.3.1.5, C.11.1.1, C.11.2.1, C.11.4.1 and C.11.6.1.1)

As a reminder, “Real World Value LUT Data” that may generate signed output is specify as another Data Element, i.e. tag (0040,9212)

Having SS as a possible VR in PS3.6 for element (0028,3006) could mislead implementers.

PS3.5 also mentions these 3 VRs for LUT Data (0028,3006) and must be fixed as well.

Sections of documents affected

PS 3.6 – 6 Registry of DICOM data elements - PS 3.5 A1 DICOM IMPLICIT VR LITTLE ENDIAN TRANSFER SYNTAX - PS 3.5 A.1 DICOM IMPLICIT VR LITTLE ENDIAN TRANSFER SYNTAX - PS 3.5 A.3 DICOM BIG ENDIAN TRANSFER SYNTAX (EXPLICIT VR) - PS 3.5 A.4 TRANSFER SYNTAXES FOR ENCAPSULATION OF ENCODED PIXEL DATA

Correction Wording

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**PS 3.6 6 Registry of DICOM data elements**

<table>
<thead>
<tr>
<th>Tag</th>
<th>Name</th>
<th>VR</th>
<th>VM</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0028,3006)</td>
<td>LUT Data</td>
<td>US or SS</td>
<td>1-n</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or OW</td>
<td>1</td>
</tr>
</tbody>
</table>

**PS3.5 A.1 DICOM IMPLICIT VR LITTLE ENDIAN TRANSFER SYNTAX**

...  

— Data Element (0028,3006) **Lookup TableUT** Data has the Value Representation US, SS or OW and shall be encoded in Little Endian.
Note: Previous versions of the Standard did not specify the encoding of these Data Elements in this Part, but specified a VR of US or SS in PS 3.6 (1998). A VR of OW has been added to support explicit VR transfer syntaxes. Moreover this element is always unsigned, therefore the VR of SS has been removed. The actual encoding of the values and their byte order would be identical in each case.

PS 3.5 A.2 DICOM LITTLE ENDIAN TRANSFER SYNTAX (EXPLICIT VR)

...  
— Data Element (0028,3006) **Lookup Table** Data has the Value Representation US, SS or OW and shall be encoded in Little Endian.

Note: Previous versions of the Standard did not specify the encoding of these Data Elements in this Part, but specified a VR of US or SS in PS 3.6 (1998). However, an explicit VR of US or SS cannot be used to encode a table of $2^{16}$ elements, since the Value Length is restricted to 16 bits. Hence a VR of OW has been added. Moreover this element is always unsigned, therefore the VR of SS has been removed. The actual encoding of the values and their byte order would be identical in each case, though the explicitly encoded VR field would be different.

PS 3.5 A.3 DICOM BIG ENDIAN TRANSFER SYNTAX (EXPLICIT VR)

...  
— Data Element (0028,3006) **Lookup Table** Data has the Value Representation US, SS or OW and shall be encoded in Little Endian.

Note: Previous versions of the Standard did not specify the encoding of these Data Elements in this Part, but specified a VR of US or SS in PS 3.6 (1998). However, an explicit VR of US or SS cannot be used to encode a table of $2^{16}$ elements, since the Value Length is restricted to 16 bits. Hence a VR of OW has been added. Moreover this element is always unsigned, therefore the VR of SS has been removed. The actual encoding of the values and their byte order would be identical in each case, though the explicitly encoded VR field would be different.

PS 3.5 A.4 TRANSFER SYNTAXES FOR ENCAPSULATION OF ENCODED PIXEL DATA

...  
— Data Element (0028,3006) **Lookup Table** Data has the Value Representation US, SS or OW and shall be encoded in Little Endian.

Note: Previous versions of the Standard did not specify the encoding of these Data Elements in this Part, but specified a VR of US or SS in PS 3.6 (1998). However, an explicit VR of US or SS cannot be used to encode a table of $2^{16}$ elements, since the Value Length is restricted to 16 bits. Hence a VR of OW has been added. Moreover this element is always unsigned, therefore VR of SS has been removed. The actual encoding of the values and their byte order would be identical in each case, though the explicitly encoded VR field would be different.