DICOM Correction Item

Correction Number	CP-105 (Final Text)
Log Summary: Correct odd length padding of multi-valued string Attributes	
Type of Modification Clarification by addition of note	Name of Standard PS 3.5 - 1998

Rationale for Correction

Given the current definitions in PS 3.5, the maximum length of the last value of a multi-valued string Attribute can only be one less than the “normal” maximum length specified in the VR table, since the padding character is defined to be included within the length of the last value, and the need for a padding character is dictated not by the length of the last value itself, but by the total length of all the values and delimiters.

It is not acceptable to arbitrarily limit the length of a value in this manner depending on its position in a multi-valued attribute. In particular this may be a problem with matching values, including dates and UIDs, in a Q/R identifier (nor is this corrected by CP-67).

For example, the Attribute (0032,1021) Scheduled Study Location AE Titles of VR AE with a VM of 1-n and two 16 byte maximum values would have to truncate the second value to 15 bytes and be encoded (where ‘_’ represents the padding character space) as:

“0123456789012345\012345678901234_“

to be of even length, not exceed the allowed Length of Value of 16 and still accomodate the backslash delimiter. This truncation will create an invalid AET.

A similar example using a VR of UID could be constructed, for example using (0008,0058) failed SOP Instance UID List.

For example, a hypothetical Attribute of VR DA with a VM of 2 would have to be encoded (where ‘_’ represents the padding character space) as:

“YYYYMMDD\YYYYMMDD_“

to be of even length, yet would then violate the Length of Value fixed at 8.

As per CP 67, a key Attribute of VR DA with Range Matching would have to be encoded (where '_' represents the padding character space) as:

"YYYYMMDD-YYYYMMDD_"

to be of even length, yet would then violate the Length of Value fixed at 8.

Furthermore the requirement that padding be included in the Length of Value contradicts the note that a padding character may need to be appended to a fixed length character string.

This situation needs to be corrected to allow the multi-valued padding character not to count towards the Length of Value of the last Value.

Sections of document affected
6.2, 6.4.

Correction Wording:

6.2 VALUE REPRESENTATION (VR)

...

Values with VRs constructed of character strings, except in the case of the VR UI, shall be padded with SPACE characters (20H, in the Default Character Repertoire) when necessary to achieve even length. ...

An individual Value, including padding, shall not exceed the Length of Value**, except in the case of the last Value of a multi-valued field as specified in Section 6.4**. ~~**For multi-valued fields see Section 6.4.**~~

6.4 VALUE MULTIPLICITY (VM) AND DELIMITATION

...

Each string Value in a multiple valued character string may be of even or odd length, but the length of the entire Value Field (including "\" delimiters) shall be of even length. If padding is required to make the Value Field of even length, a single padding character shall be applied to the end of the Value Field (to the last Value**), in which case the length of the last Value may exceed the Length of Value by 1** .

Note: A padding character may need to be appended to a fixed length character string value in the above case.