

## DICOM Correction Item

Correction Number	CP-222
Log Summary: Clarification of discrete-valued attributes in RT Plan Control Point Sequence	
Type of Modification: Extension	Name of Standard PS 3.3-2000
Rationale for Correction:  Within the RT Plan IOD, the Control Point Sequence (300A,0111) describes the evolution of treatment beam parameters within a potentially dynamic treatment beam. The behavior of treatment beam parameters between control points is not intended to be addressed by the standard.  The Control Point Sequence attribute Wedge Position (300A,0018) has enumerated values of IN and OUT. Following the general principles of the control point concept, a change in value from IN to OUT during an irradiation would be represented in the following way, using four control points:  Control Point 0: Cumulative Meterset Weight = 0, Wedge Position = IN. Control Point 1: Cumulative Meterset Weight = 50, Wedge Position = IN. Control Point 2: Cumulative Meterset Weight = 50, Wedge Position = OUT. Control Point 3: Cumulative Meterset Weight = 100, Wedge Position = OUT.  However, if an implicit rule is applied that Wedge Position is constant over the segment following the control point, then a change in value from IN to OUT during an irradiation could be represented in the following way, using just three control points:  Control Point 0: Cumulative Meterset Weight = 0, Wedge Position = IN. Control Point 1: Cumulative Meterset Weight = 50, Wedge Position = OUT. Control Point 2: Cumulative Meterset Weight = 100, Wedge Position = OUT.  A similar situation arises for Nominal Beam Energy (300A,0114), where the energy could be coded using either a non-irradiation segment or an implicit rule that Nominal Beam Energy (300A,0114) is constant over the following segment.  This change proposal clarifies how these attributes are to be coded, namely: <ul style="list-style-type: none"><li>• Wedge Position (300A,0018) shall be defined only at the control point, so that the above example is to be encoded using four control points.</li><li>• Nominal Beam Energy (300A,0114) shall also be defined only at the control point (to allow for continuous variation of beam energy as with proton therapy).</li></ul>	
Sections of document affected:  Part 3 (Information Object Definitions), Section C.8.8.14 (RT Beams Module).	

Correction Wording:

In Part 3, Section C.8.8.14.5, add the following sentence immediately before “Some examples of beam specification using control points are as follows:”:

**Gantry Rotation Direction (300A,011F), Beam Limiting Device Rotation Direction (300A,0121), Patient Support Rotation Direction (300A,0123), and Table Top Eccentric Rotation Direction (300A,0126) are defined as applying to the segment following the control point, and changes to these parameters during treatment may be specified without use of a “non-irradiation” segment. All other Control Point Sequence attributes are defined only at the control point. To unambiguously encode changes in discrete-valued attributes such as Wedge Position (300A,0114) and Nominal Beam Energy (300A,0018), a non-irradiation segment where Cumulative Meterset Weight (300A,0134) does not change, shall be used.**