

DICOM Correction Proposal

STATUS	Letter Ballot
Date of Last Update	2024/03/21
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Submission Date	2023/07/06

Correction Number	CP-2344
Log Summary: Update RT Patient Setup Module	
Name of Standard	PS 3.3, PS3.6
<p>Rationale for Correction:</p> <p>The RT Treatment Preparation Module introduces a new and more flexible approach for encoding patient treatment procedures and related devices.</p> <p>This definition from the Second Generation RT Objects shall be made available in the First Generation RT Plan IOD's Patient Setup Module. As the existing attributes in the Patient Setup Module are partially in clinical use, it shall be possible to use both approaches in parallel. Therefore, a corresponding note to the implementers is added.</p>	
Correction Wording:	

Add to Part 3

This macro is extracted from Table C.36.25-1. There is no change in content, except for the reference to the section below the table.

C.36.2.3. RT Second Generation Positioning Macros

C.36.2.3.n RT Patient Treatment Preparation Macro

Table C.36.2.3.n-1 RT Patient Treatment Preparation Macro Attributes

Attribute Name	Tag	Type	Attribute Description
Patient Treatment Preparation Method Code Sequence	(300A,078D)	1	Method used to prepare the Patient for treatment. Only a single Item shall be included in this Sequence.
<i>>Include Table 8.8-1 "Code Sequence Macro Attributes".</i>			<i>BCID 9571 "Patient Treatment Preparation Method".</i>
Patient Treatment Preparation Method Description	(300A,0792)	3	User-defined description of patient treatment preparation technique.
Referenced Patient Setup Photo Sequence	(300A,078C)	3	References to photos illustrating the patient setup. One or more Items are permitted in this Sequence.
<i>>Include Table 10-11 "SOP Instance Reference Macro Attributes"</i>			
>Patient Setup Photo Description	(300A,0794)	2	User-defined description of patient setup photo.

Attribute Name	Tag	Type	Attribute Description
>Referenced Patient Setup Procedure Index	(300A,0796)	1C	The value of Patient Treatment Preparation Procedure Index (300A,0795) from Patient Treatment Preparation Procedure Sequence (300A,0790) corresponding to the Patient Treatment Preparation Procedure to which this Sequence Item refers. Required if this Patient Setup Photo is associated with a Patient Treatment Preparation Procedure.
Patient Treatment Preparation Procedure Sequence	(300A,0790)	2	Procedures for preparing for the treatment of the patient. Zero or more Items shall be included in this Sequence.
>Patient Treatment Preparation Procedure Index	(300A,0795)	1	Index of the Patient Treatment Preparation Procedure in this Sequence. The value shall start at 1 and increase monotonically by 1.
>Patient Treatment Preparation Procedure Code Sequence	(300A,0791)	1	Procedure performed to prepare the patient for treatment. Only a single Item shall be present in this Sequence.
>>Include Table 8.8-1 "Code Sequence Macro Attributes"			BCID 9577 "Patient Treatment Preparation Procedure".
>Patient Treatment Preparation Device Sequence	(300A,078F)	3	Devices used for preparing the patient for treatment. Only a single Item is permitted in this Sequence.
>>Include Table C.36.2.2.3-1 "RT Accessory Device Identification Macro Attributes"			BCID 9573 "Patient Treatment Preparation Device".
>Patient Treatment Preparation Procedure Parameter Description	(300A,078E)	2	User-defined description of patient treatment preparation procedure parameter(s).
>Patient Treatment Preparation Procedure Parameter Sequence	(300A,0793)	2	Parameters for the Patient Treatment Preparation Procedure. Zero or more Items shall be included in this Sequence.
>>Include Table 10.2.1-1 "Content Item with Modifiers Macro Attributes"			See C.36.2.3.n.1.1 for Baseline TID.

C.36.2.3.n.1 RT Patient Treatment Preparation Macro Attribute Description

C.36.2.3.n.1.1 Patient Treatment Preparation Procedure

In Table 10-X.1, if the Patient Treatment Preparation Procedure Code Sequence (300A,0791) has the code value specified in the left column, the Template for Patient Treatment Preparation Procedure Parameter Sequence (300A,0793) shall be the one specified in the right column.

Table C.36.2.3.n.1.1-1 Patient Treatment Preparation Procedure Parameter Codes

Patient Treatment Preparation Procedure Code Sequence (300A,0791)	Patient Treatment Preparation Procedure Parameter Sequence (300A,0793)
(72641008, SCT, "Patient Sedation")	BTID 8182 "Exogenous Substance Administration"
(130637, DCM, "Patient Fixation Setup")	BTID 15305 "Patient Setup Fixation Device Parameters"

Patient Treatment Preparation Procedure Code Sequence (300A,0791)	Patient Treatment Preparation Procedure Parameter Sequence (300A,0793)
(130638, DCM, "Patient Alignment Setup")	BTID 15306 "Patient Setup Alignment Device Parameters"
All others	No Baseline TID defined.

Update in C.36.25.

This only removes the content of the macro in the existing table to move it in section 10.X above and adds a macro reference.

C.36.25 RT Treatment Preparation Module

Table C.36.25-1 specifies the Attributes of the RT Treatment Preparation Module, which contain information describing the procedures to prepare the patient for a radiotherapeutic treatment. These procedures may include aligning the patient position, setting up required accessories, such as fixation and shielding devices applied to the patient, administering medications, etc.

Table C.36.25-1. RT Treatment Preparation Module Attributes

Attribute Name	Tag	Type	Attribute Description
<i>Include Table 10.32-1 "Entity Long Labeling Macro Attributes".</i>			See Section C.36.25.1.1.
RT Patient Position Scope Sequence	(300A,0784)	1	The RT Plan, RT Beam Number, RT Radiation Set, RT Radiation Instances or the Treatment Position Groups to which the treatment preparation parameters apply. Only a single Item shall be included in this Sequence.
<i>>Include Table C.36.2.3.3-1 "RT Patient Position Scope With Legacy Support Macro Attributes".</i>			
RT Treatment Preparation Patient Position Sequence	(300A,078A)	1	The position of the patient at the start of the treatment preparation. Only a single Item shall be included in this Sequence.
<i>>Include Table C.36.2.3.2-1 "RT Patient Position Macro Attributes".</i>			
<u>>Include Table C.36.2.3.n-1 "RT Patient Treatment Preparation Macro"</u>			
Patient Treatment Preparation Method Code Sequence	(300A,078D)	4	Method used to prepare the Patient for treatment. Only a single Item shall be included in this Sequence.
<i>>Include Table 8.8-1 "Code Sequence Macro Attributes".</i>			BCID 9571 "Patient Treatment Preparation Method".
Patient Treatment Preparation Method Description	(300A,0792)	3	User-defined description of patient treatment preparation technique.
Referenced Patient Setup Photo Sequence	(300A,078C)	3	References to photos illustrating the patient setup. One or more Items are permitted in this Sequence.
<i>>Include Table 10-11 "SOP Instance Reference Macro Attributes"</i>			

Attribute Name	Tag	Type	Attribute Description
>Patient Setup Photo Description	(300A,0794)	2	User-defined description of patient setup photo.
>Referenced Patient Setup Procedure Index	(300A,0796)	1C	The value of Patient Treatment Preparation Procedure Index (300A,0795) from Patient Treatment Preparation Procedure Sequence (300A,0790) corresponding to the Patient Treatment Preparation Procedure to which this Sequence Item refers. Required if this Patient Setup Photo is associated with a Patient Treatment Preparation Procedure.
Patient Treatment Preparation Procedure Sequence	(300A,0790)	2	Procedures for preparing for the treatment of the patient. Zero or more Items shall be included in this Sequence.
>Patient Treatment Preparation Procedure Index	(300A,0795)	1	Index of the Patient Treatment Preparation Procedure in this Sequence. The value shall start at 1 and increase monotonically by 1.
>Patient Treatment Preparation Procedure Code Sequence	(300A,0791)	1	Procedure performed to prepare the patient for treatment. Only a single Item shall be present in this Sequence.
>>Include Table 8.8-1 "Code Sequence Macro Attributes"			BCID 9577 "Patient Treatment Preparation Procedure".
>Patient Treatment Preparation Device Sequence	(300A,078F)	3	Devices used for preparing the patient for treatment. Only a single Item is permitted in this Sequence.
>>Include Table C.36.2.2.3-1 "RT Accessory Device Identification Macro Attributes"			BCID 9573 "Patient Treatment Preparation Device".
>Patient Treatment Preparation Procedure Parameter Description	(300A,078E)	2	User-defined description of patient treatment preparation procedure parameter(s).
>Patient Treatment Preparation Procedure Parameter Sequence	(300A,0793)	2	Parameters for the Patient Treatment Preparation Procedure. Zero or more Items shall be included in this Sequence.
>>Include Table 10.2.1-1 "Content Item with Modifiers Macro Attributes"			See C.36.25.1.2 for Baseline TID.

C.36.25.1 RT Treatment Preparation Module Attribute Description

C.36.25.1.1 Treatment Preparation Instruction Description

A free-text description of the treatment preparation instruction, if present, shall be encoded in Attribute Entity Description (3010,0037) of the Entity Labeling Macro.

C.36.25.1.2 Patient Treatment Preparation Procedure

In ~~Table C.36.25-2, if the Patient Treatment Preparation Procedure Code Sequence (300A,0791) has the code value specified in the left column, the Template for Patient Treatment Preparation Procedure Parameter Sequence (300A,0793) shall be the one specified in the right column.~~

Table C.36.25-2. Patient Treatment Preparation Procedure Parameter Codes

Patient Treatment Preparation Procedure Code Sequence (300A,0791)	Patient Treatment Preparation Procedure Parameter Sequence (300A,0793)
(72641008, SCT, "Patient Sedation")	BTID 8182 "Exogenous Substance Administration"
(130637, DCM, "Patient Fixation Setup")	BTID 15305 "Patient Setup Fixation Device Parameters"
(130638, DCM, "Patient Alignment Setup")	BTID 15306 "Patient Setup Alignment Device Parameters"
All others	No Baseline TID defined.

Update in C.8.8.12

C.8.8.12 RT Patient Setup Module

The RT Patient Setup Module contains information describing the positioning of the patient with respect to the treatment machine, along with any fixation devices used. It also describes the shielding devices applied to the patient. The Module contains a Sequence of patient setup descriptions, each of which may be referenced by one of more beams or brachy application setups.

Table C.8-48. RT Patient Setup Module Attributes

Attribute Name	Tag	Type	Attribute Description
Patient Setup Sequence	(300A,0180)	1	Sequence of patient setup data for current plan. One or more Items shall be included in this Sequence.
>Patient Setup Number	(300A,0182)	1	Identification number of the Patient Setup. The value of Patient Setup Number (300A,0182) shall be unique within the RT Plan in which it is created.
>Patient Setup Label	(300A,0183)	3	The user-defined label for the Patient Setup.
>Patient Position	(0018,5100)	1C	Patient position descriptor relative to the equipment. Required if Patient Additional Position (300A,0184) is not present See Section C.8.8.12.1.2 for Defined Terms and further explanation.
>Patient Additional Position	(300A,0184)	1C	User-defined additional description of patient position. Required if Patient Position (0018,5100) is not present.
<u>>Patient Treatment Preparation Sequence</u>	<u>(gggg,0001)</u>	<u>3</u>	<u>Procedures and devices required to prepare a patient for treatment.</u> <u>Only a single Item is permitted in this Sequence.</u> <u>See C.8.8.12.1.N.</u>
<u>>>Include Table C.36.2.3.n-1 RT Patient Treatment Preparation Macro Attributes</u>			

The rest of the table will be removed from this CP before FT. It is still included for the initial discussion, as the addition of the new macro covers the existing sequences.

>Referenced Setup Image Sequence	(300A,0401)	3	Sequence of setup verification images for this patient setup. One or more Items are permitted in this Sequence. See Section C.8.8.12.1.1
>>Setup Image Comment	(300A,0402)	3	Comment on the Setup Image.
<i>>>Include Table 10-3 "Image SOP Instance Reference Macro Attributes"</i>			
>Fixation Device Sequence	(300A,0190)	3	Sequence of Fixation Devices used in Patient Setup. One or more Items are permitted in this Sequence.
>>Fixation Device Type	(300A,0192)	1	Type of Fixation Device used during in Patient Setup. Defined Terms: BITEBLOCK HEADFRAME MASK MOLD CAST HEADREST BREAST_BOARD BODY_FRAME VACUUM_MOLD WHOLE_BODY_POD RECTAL_BALLOON
>>Fixation Device Label	(300A,0194)	2	User-defined label identifier for Fixation Device.
>>Fixation Device Description	(300A,0196)	3	User-defined description of Fixation Device.
>>Fixation Device Position	(300A,0198)	3	Position/Notch number of Fixation Device.
>>Fixation Device Pitch Angle	(300A,0199)	3	The Fixation Device Pitch Angle, i.e., orientation of PITCHED FIXATION DEVICE coordinate system with respect to IEC PATIENT SUPPORT coordinate system (degrees). Pitching is the rotation around IEC PATIENT SUPPORT X-axis.
>>Fixation Device Roll Angle	(300A,019A)	3	The Fixation Device Roll Angle, i.e., orientation of ROLLED FIXATION DEVICE coordinate system with respect to IEC PITCHED FIXATION DEVICE coordinate system (degrees). Rolling is the rotation around IEC PATIENT SUPPORT Y-axis.
>>Accessory Code	(300A,00F9)	3	An identifier for the accessory intended to be read by a device such as a bar-code reader.
>Shielding Device Sequence	(300A,01A0)	3	Sequence of Shielding Devices used in Patient Setup. One or more Items are permitted in this Sequence.
>>Shielding Device Type	(300A,01A2)	1	Type of Shielding Device used in Patient Setup. Defined Terms: GUM EYE GONAD

>>Shielding Device Label	(300A,01A4)	2	User-defined label for Shielding Device.
>>Shielding Device Description	(300A,01A6)	3	User-defined description of Shielding Device.
>>Shielding Device Position	(300A,01A8)	3	Position/Notch number of Shielding Device.
>>Accessory Code	(300A,00F9)	3	An identifier for the accessory intended to be read by a device such as a bar-code reader.
>Setup Technique	(300A,01B0)	3	Setup Technique used in Patient Setup. Defined Terms: ISOCENTRIC FIXED_SSD TBI BREAST_BRIDGE SKIN_APPPOSITION
>Setup Technique Description	(300A,01B2)	3	User-defined description of Setup Technique.
>Setup Device Sequence	(300A,01B4)	3	Sequence of devices used for patient alignment in Patient Setup. One or more Items are permitted in this Sequence.
>>Setup Device Type	(300A,01B6)	1	Type of Setup Device used for patient alignment. Defined Terms: LASER_POINTER DISTANCE_METER TABLE_HEIGHT MECHANICAL_PTR ARC
>>Setup Device Label	(300A,01B8)	2	User-defined label for Setup Device used for patient alignment.
>>Setup Device Description	(300A,01BA)	3	User-defined description for Setup Device used for patient alignment.
>>Setup Device Parameter	(300A,01BC)	2	Setup Parameter for Setup Device in appropriate IEC 61217 coordinate system. Units shall be mm for distances and degrees for angles.
>>Setup Reference Description	(300A,01D0)	3	User-defined description of Setup Reference used for patient alignment.
>>Accessory Code	(300A,00F9)	3	An identifier for the accessory intended to be read by a device such as a bar-code reader.
>Table Top Vertical Setup Displacement	(300A,01D2)	3	Vertical Displacement in IEC TABLE TOP coordinate system (in mm) relative to initial Setup Position, i.e., vertical offset between patient positioning performed using setup and treatment position.
>Table Top Longitudinal Setup Displacement	(300A,01D4)	3	Longitudinal Displacement in IEC TABLE TOP coordinate system (in mm) relative to initial Setup Position, i.e., longitudinal offset between patient positioning performed using setup and treatment position.

>Table Top Lateral Setup Displacement	(300A,01D6)	3	Lateral Displacement in IEC TABLE TOP coordinate system (in mm) relative to initial Setup Position, i.e., lateral offset between patient positioning performed using setup and treatment position.
>Motion Synchronization Sequence	(300A,0410)	3	Sequence of Motion Synchronization. One or more Items are permitted in this Sequence.
>>Respiratory Motion Compensation Technique	(0018,9170)	1	Technique applied to reduce respiratory motion artifacts. Defined Terms: NONE BREATH_HOLD REALTIME image acquisition shorter than respiratory cycle GATING Prospective gating TRACKING prospective through-plane or in-plane motion tracking PHASE_ORDERING prospective phase ordering PHASE_RESCANNING prospective techniques, such as real-time averaging, diminishing variance and motion adaptive gating RETROSPECTIVE retrospective gating CORRECTION retrospective image correction UNKNOWN technique not known
>>Respiratory Signal Source	(0018,9171)	1	Signal source from which respiratory motion is derived. Defined Terms: NONE BELT NASAL_PROBE CO2_SENSOR NAVIGATOR MR navigator and organ edge detection MR_PHASE phase (of center k-space line) ECG baseline demodulation of the ECG SPIROMETER Signal derived from flow sensor EXTERNAL_MARKER Signal determined from external motion surrogate INTERNAL_MARKER Signal determined from internal motion surrogate IMAGE Signal derived from an image UNKNOWN Signal source not known
>>Respiratory Motion Compensation Technique Description	(0018,9185)	3	Description of respiratory motion compensation technique.
>>Respiratory Signal Source ID	(0018,9186)	3	Identifies the device providing the respiratory signal.

C.8.8.12.1 RT Patient Setup Module Attribute Descriptions

C.8.8.12.1.1 Referenced Setup Image Sequence

Images with modality SC or VL serve as visible light photos for visual setup control. Images with modality RTIMAGE serve as reference images on plan level. RT Images present in this Sequence shall not be referenced in the Referenced Reference Image Sequence (300C,0042) of the RT Beams Module.

C.8.8.12.1.2 Patient Position

Defined Terms for Patient Position shall be those specified in Section C.7.3.1.1.2, plus the following:

Defined Terms:

SITTING In the sitting position, the patient's face is towards the front of the chair

C.8.8.12.1.N Patient Treatment Preparation Sequence

The Fixation Device Sequence (300A,0190), the Shielding Device Sequence (300A,01A0), Setup Technique (300A,01B0) and Setup Device Sequence (300A,01B4), and the Motion Synchronization Sequence (300A,0410) only allowing encoding of specific devices and procedures for treatment preparation.

The Patient Treatment Preparation Procedure Sequence (300A,0790) within the Patient Treatment Preparation Sequence (gggg,nnn1) allows generic encoding of the procedures and devices.

Note:

Information in the Fixation Device Sequence (300A,0190), the Shielding Device Sequence (300A,01A0), Setup Technique (300A,01B0) and Setup Device Sequence (300A,01B4), and the Motion Synchronization Sequence (300A,0410), if present, shall be consistent with the information in the Patient Treatment Preparation Procedure Sequence (300A,0790), if present.

Add to PS 3, Part 6, Chapter 6

Table 6-1. Registry of DICOM Data Elements

Tag	Name	Keyword	VR	VM	
...					
<u>(gggg,nnn1)</u>	<u>Patient Treatment Preparation Sequence</u>	<u>PatientTreatmentPreparationSequence</u>	<u>SQ</u>	<u>1</u>	