



Customer Technical Reference

DICOM Conformance Statement: Proton Treatment Console

Abstract	This document contains important information on the handling and use of the product as well as on the safety measures to be observed.
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1 Introduction

1.1 Overview

The Proton Treatment Console (PTC) is part of Varian's ProBeam proton therapy system. This document describes PTC compliance to DICOM® conformance requirements. The table below lists the network services supported by the PTC.

Tab. 1: Network services

Service	SOP Class	Service Class User (SCU)	Service Class Provider (SCP)
Transfer	Verification (Echo)	Yes	Yes
Transfer	RT Ion Plan Storage	Yes	Yes
Transfer	RT Treatment Summary Record Storage	No	Yes
Transfer	RT Ion Beams Session Record	Yes	No
Query/Retrieve	Study Root Query/Retrieve Information Model – MOVE	Yes	No

1.2 Audience

This document is written for the people who need to understand how Varian’s ProBeam system can be integrated into their healthcare facility. This includes both those responsible for overall imaging network policy and architecture, as well as integrators who need to have a detailed understanding of the DICOM features of the product.

This document contains some basic DICOM definitions so the reader can understand how this product implements the DICOM features. It is assumed that integrators are well-versed in DICOM, and that they fully understand DICOM terminology, how the tables in this document relate to the product's functionality, and how that functionality integrates with other devices that support compatible DICOM features.

1.3 Remarks

This Conformance Statement should be read and understood in conjunction with the DICOM Standard, 2011. DICOM by itself does not guarantee interoperability; the Conformance Statement, however, facilitates a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.

This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.

Because the DICOM Standard is subject to ongoing changes, enhancements and improvements, Varian Medical Systems reserves the right to advance their products by making use of upcoming DICOM features.

This document contains definitions which are specific to the Proton Treatment Console (PTC). For definitions that are specific to the Proton Therapy Imaging application (PTI), see *Proton Therapy Imaging Conformance Statement*. Otherwise, all definitions of the Varian System Server DICOM conformance statement apply as applicable; see *Varian System Server DICOM Conformance Statement*.

1.4 Terms and Definitions

The table below contains informal definitions of terms used in ProBeam DICOM Conformance Statements. The DICOM Standard is the authoritative source for formal definitions of these terms.

Abstract Syntax	The information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples: Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.
Application Entity (AE)	An end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.
Application Entity Title (AET)	The externally known name of an <i>Application Entity</i> , used to identify a DICOM application to other DICOM applications on the network.
Application Context	The specification of the type of communication used between <i>Application Entities</i> . Example: DICOM network protocol.
Association	A network communication channel set up between <i>Application Entities</i> .
Attribute	A unit of information in an object definition; a data element identified by a <i>tag</i> . The information may be a complex data structure (Sequence), itself composed of lower level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).
Information Object Definition (IOD)	The specified set of <i>Attributes</i> that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The <i>Attributes</i> may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C). Examples: MR Image IOD, CT Image IOD, Print Job IOD.
Media Application Profile	The specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs).

Module	A set of <i>Attributes</i> within an <i>Information Object Definition</i> that are logically related to each other. Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.
Negotiation	First phase of <i>Association</i> establishment that allows <i>Application Entities</i> to agree on the types of data to be exchanged and how that data will be encoded.
Presentation Context	The set of DICOM network services used over an <i>Association</i> , as negotiated between <i>Application Entities</i> ; includes <i>Abstract Syntaxes</i> and <i>Transfer Syntaxes</i> .
ProBeam	Varian's ProBeam System is a proton therapy system used to treat various forms of cancer and related conditions.
Protocol Data Unit (PDU)	A packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.
Security Profile	A set of mechanisms, such as encryption, user authentication, or digital signatures, used by an <i>Application Entity</i> to ensure confidentiality, integrity, and/or availability of exchanged DICOM data.
Service Class Provider (SCP)	Role of an <i>Application Entity</i> that provides a DICOM network service; typically, a server that performs operations requested by another <i>Application Entity</i> (<i>Service Class User</i>). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).
Service Class User (SCU)	Role of an <i>Application Entity</i> that uses a DICOM network service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU).
Service/Object Pair Class (SOP Class)	The specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.
Service/Object Pair Instance (SOP Instance)	An information object; a specific occurrence of information exchanged in a <i>SOP Class</i> . Examples: a specific x-ray image.
Tag	A 32-bit identifier for a data element, represented as a pair of four digit hexadecimal numbers, the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element].
Transfer Syntax	The encoding used for exchange of DICOM information objects and messages. Examples: <i>JPEG</i> compressed (images), little endian explicit value representation.

Transmission Control Protocol/Internet Protocol (TCP/IP)	A widely used computer networking protocol.
Treatment Management System	DICOM entity from which the ProBeam Imaging application retrieves structure set data.
Unique Identifier (UID)	A globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.
Value Representation (VR)	The format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

1.5 Abbreviations

AE	Application Entity
AET	Application Entity Title
CT	Computed Tomography
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
HIS	Hospital Information System
HL7	Health Level 7 standard
IHE	Integrating the Healthcare Enterprise
IOD	Information Object Definition
ISO	International Organization for Standards
JPEG	Joint Photographic Experts Group
MPEG	Moving Picture Experts Group
NEMA	National Electrical Manufacturers Association
PACS	Picture Archiving and Communication System
PDU	Protocol Data Unit
PET	Positron Emission Tomography
PTC	Proton Treatment Console treatment application for ProBeam
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
SPS	Scheduled Procedure Step
SR	Structured Reporting
TCP/IP	Transmission Control Protocol/Internet Protocol
U	Unique (Key Attribute)

UID	Unique Identifier
UL	Upper Layer
VR	Value Representation

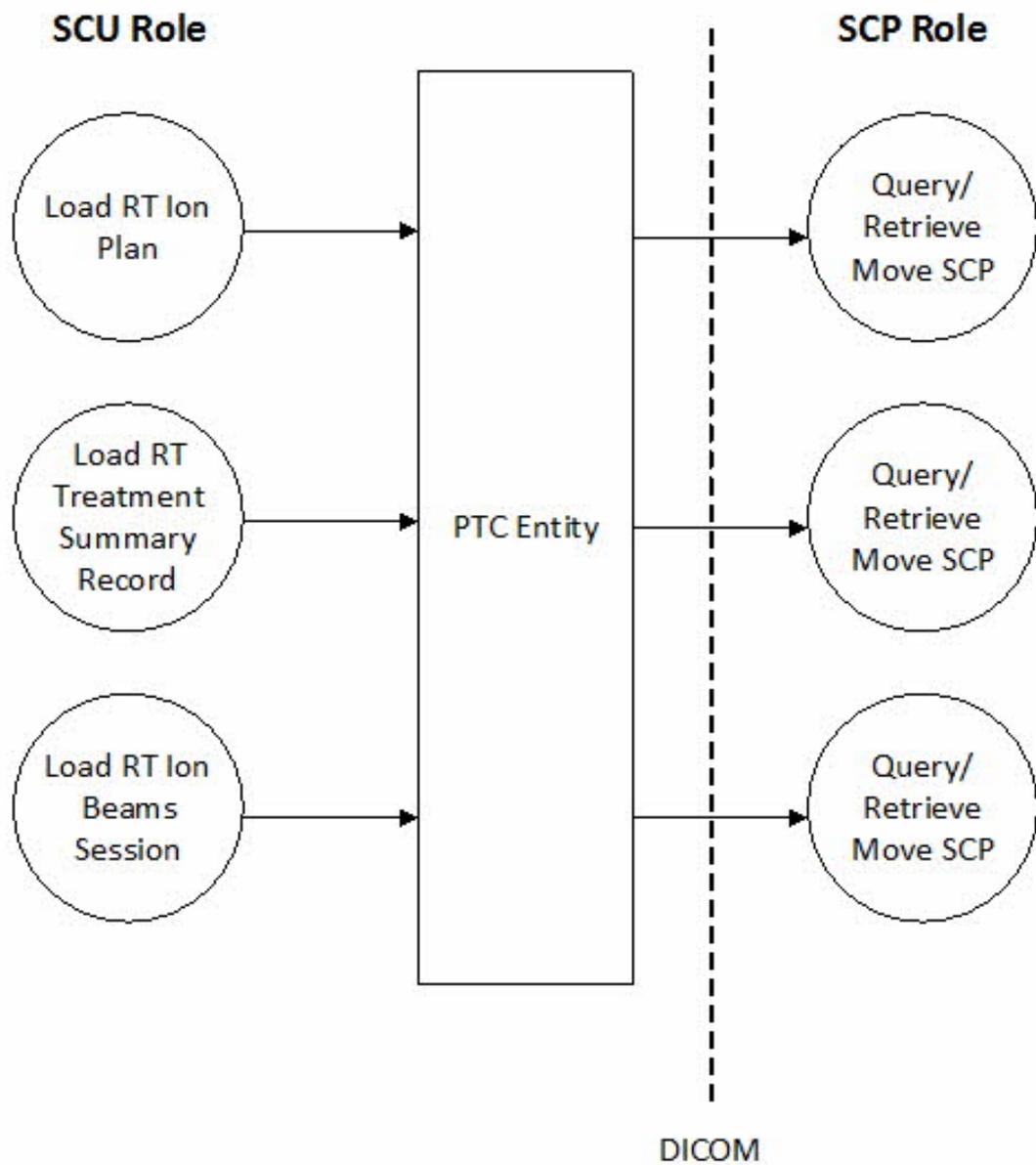
1.6 References

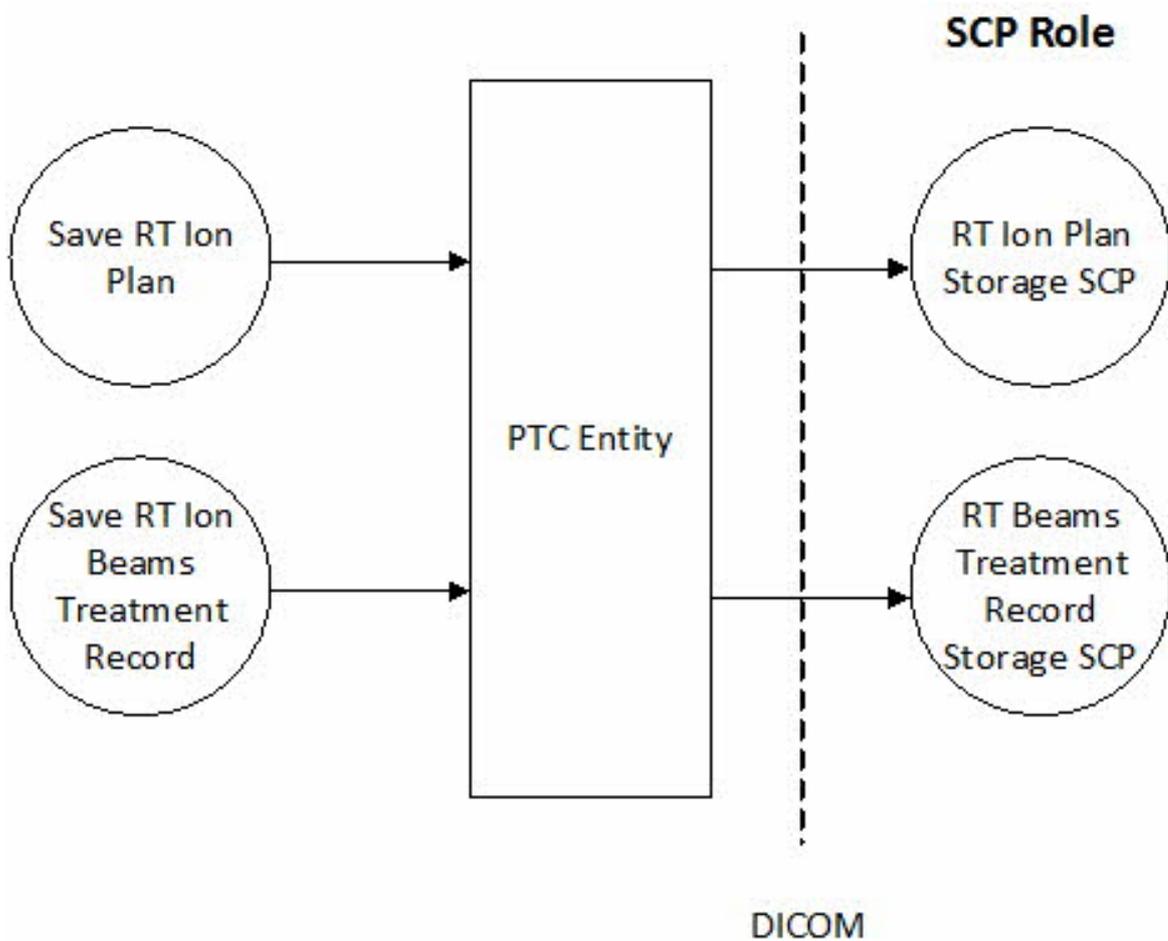
- [1] Digital Imaging and Communications in Medicine (DICOM), Parts 1-18 (2011), National Electrical Manufacturers Association (NEMA)
Rosslyn, VA, USA
available free at <http://medical.nema.org/>
- [2] Proton Therapy Imaging DICOM Conformance Statement
PB-CTR-00008-00
Varian Medical Systems Inc
Palo Alto, CA, USA
- [3] Varian System Server DICOM Conformance Statement
B VA1302D3CS (System Server version 13)
Varian Medical Systems International AG
Baden, Switzerland
- [4] TrueBeam Treatment Console DICOM Conformance Statement 100046014 February 2015, Palo Alto, U.S.A.

2 Networking

2.1 Implementation Model

2.1.1 Application Data Flow





The initial function to load the plan into the PTC is represented by Load RT Ion Plan (This function is typically performed by the application after the Patient and the Plan UIDs have been received by the Treatment Management System.) The PTC invokes a move command for each DICOM RT Ion Plan.

A Save issued by the operator invokes a storage command, which requires the remote application to provide a storage SCP as shown in the figure.

Closing the patient in the PTC results in a Save if the plan data have been modified and/or treatment records have been created. The PTC deletes the objects temporarily stored. If the Treatment Management System is not accessible, the PTC saves the changes into one or several DICOM Media File(s).

2.1.2 Functional Definition of AEs

The PTC Entity's main responsibility is to execute a patient treatment. Before treating, the PTC loads the patient data from the Treatment Management System using DICOM services. After treating, the PTC generates RT Ion Beams Treatment Record(s), and stores them back to the Treatment Management System again using DICOM services. The PTC has limited capabilities for modifying the RT Ion Plan(s).

2.1.3 Sequencing of Real-World Activities

The PTC executes the activities for loading a patient in the following order:

- C-Move RT Ion Plan SOP class
- C-Move RT Treatment Summary Record SOP class
- C-Move RT Ion Beams Session Record SOP class (if needed)

NOTE: The C-Move RT Ion Beams Treatment Record query is executed only to finalize the previous treated fraction.

The only requirement is to load the RT Ion Plan first, before the others. The above sequence is repeated for each RT Ion Plan in the treatment session.

The following sequence is for saving the patient from the PTC to the Treatment Management System:

- C-Storage RT Ion Plan SOP class (executed if a plan was changed at PTC)
- C-Storage RT Ion Beams Treatment Record SOP class (executed if a beam was treated)

The only requirement is to save RT Ion Plan(s) first, before the RT Beam Record(s).

2.2 AE Specifications

2.2.1 SOP Classes

The PTC Application Entity provides standard conformance to the DICOM SOP classes listed in the table below.

SOP Class Name	SCU/SCP Role	SOP Class UID
Verification (Echo)	SCU / SCP	1.2.840.10008.1.1
RT Ion Plan Storage	SCU / SCP	1.2.840.10008.5.1.4.1.1.481.8
RT Treatment Summary Record Storage	SCP	1.2.840.10008.5.1.4.1.1.481.7
RT Ion Beams Treatment Record Storage	SCU	1.2.840.10008.5.1.4.1.1.481.9

2.2.2 Association Establishment Policies

See [2], section 2.4.2 Association Establishment Policies.

2.2.3 Association Initiation Policy

See [2], section 2.4.3 Association Initiation Policy.

2.2.4 Association Acceptance Policy

See [2], section 2.4.4 Association Acceptance Policy.

2.3 Network Interfaces

See *TrueBeam Treatment Console DICOM Conformance Statement*, Section 2.5 Network Interfaces.

3 Media Interchange

The PTC Application Entity does not support Media Interchange.

4 Support of Character Sets

No support for character sets beyond the default character repertoire is available.

4.1 Overview

No dedicated support for character sets beyond the Default Character Repertoire is available. However, text fields containing characters not in the Default Character Repertoire when importing an instance appear unchanged when the same instance is re-exported.

4.2 Display Behavior

Correct display of characters not in the Default Character Repertoire depends on available/configured operating system support.

4.3 Encoding Value Database Support

Encoding	Value	Databases Supported
Unicode (UTF8)	ISO_IR 192	ARIA 13, and future Unicode-supporting databases

5 Security

5.1 Security Profiles

No Security Profiles are supported.

5.2 Association-Level Security

The PTC Entity checks the following values when determining whether to accept Association Open Requests:

- Called AE Title

5.3 Application-Level Security

Local administrative rights are required for installing the PTC.

The user also requires application-level OSP user rights to be able to load a patient plan and related data.

Appendix A

A.1 Supported IODs

The following tables define the modules that are and are not supported for a particular IOD.

The “Not supported” entries in the Support column indicate that the import of module is not supported or it is discarded on import of this IOD and will never appear in exported IOD.

RT Ion Plan IOD Module

IE	Module	Reference	DICOM Usage	Support
Patient	Patient	C.7.1.1	M	
Patient	Clinical Trial Subject	C.7.1.3	U	Not supported
Study	General Study	C.7.2.1	M	
Study	Patient Study	C.7.2.2	U	Not supported
Study	Clinical Trial Study	C.7.2.3	U	Not supported
Series	RT Series	C.8.8.1	M	
Series	Clinical Trial Series	C.7.3.2	U	Not supported
Frame of Reference	Frame of Reference	C.7.4.1	M	
Equipment	General Equipment	C.7.5.1	M	
Plan	RT General Plan	C.8.8.9	M	
Plan	RT Prescription	C.8.8.10	U	
Plan	RT Ion Tolerance Tables	C.8.8.24	U	
Plan	RT Patient Setup	C.8.8.12	U	
Plan	RT Fraction Scheme	C.8.8.13	U	
Plan	RT Ion Beams	C.8.8.25	C	
Plan	Approval	C.8.8.16	U	
Plan	SOP Common	C.12.1	M	

IE	Module	Reference	DICOM Usage	Support
Plan	DICOM Extended Interface	Private module	C	Additional features are supported with this module

RT Ion Beams Treatment Record IOD Module

IE	Module	Reference	DICOM Usage	Support
Patient	Patient	C.7.1.1	M	
Patient	Clinical Trial Subject	C.7.1.3	U	Not supported
Study	General Study	C.7.2.1	M	
Study	Patient Study	C.7.2.2	U	Not supported
Study	Clinical Trial Study	C.7.2.3	U	Not supported
Series	RT Series	C.8.8.1	M	
Series	Clinical Trial Series	C.7.3.2	U	Not supported
Equipment	General Equipment	C.7.5.1	M	
Treatment Record	RT General Treatment Record	C.8.8.17	M	
Treatment Record	RT Patient Setup	C.8.8.12	U	Supported
Treatment Record	RT Treatment Machine Record	C.8.8.18	M	
Treatment Record	Measured Dose Reference Record	C.8.8.19	U	Not supported
Treatment Record	Calculated Dose Reference Record	C.8.8.20	U	Not supported
Treatment Record	RT Ion Beams Session Record	C.8.8.26	M	
Treatment Record	RT Treatment Summary Record	C.8.8.23	U	Not supported
Treatment Record	SOP Common	C.12.1	M	

RT Treatment Summary Record IOD Module

IE	Module	Reference	DICOM Usage	Support
Patient	Patient	C.7.1.1	M	
Patient	Clinical Trial Subject	C.7.1.3	U	Not supported
Study	General Study	C.7.2.1	M	
Study	Patient Study	C.7.2.2	U	Not supported
Study	Clinical Trial Study	C.7.2.3	U	Not supported
Series	RT Series	C.8.8.1	M	
Series	Clinical Trial Series	C.7.3.2	U	Not supported
Equipment	General Equipment	C.7.5.1	M	
Treatment Record	RT General Treatment Record	C.8.8.17	M	
Treatment Record	RT Treatment Summary Record	C.8.8.23	M	
Treatment Record	SOP Common	C.12.1	M	

A.2 Modules and Attributes

A.2.1 Patient – C.7.1.1

Attribute Name	Tag	Type	Description	Handling
Patient's Name	(0010,0010)	2	Patient's full name.	Supported
Patient ID	(0010,0020)	2	Primary hospital identification number or code for the patient.	Supported
Patient's Birth Date	(0010,0030)	2	Birth date of the patient.	Supported
Patient's Sex	(0010,0040)	2	Sex of the patient. Enumerated values: <ul style="list-style-type: none"> • M = male • F = female • O = other 	Supported

Attribute Name	Tag	Type	Description	Handling
Referenced Patient Sequence	(0008,1120)	3	A sequence that provides reference to a patient SOP class/instance pair. Only a single item is permitted in this sequence.	Not Supported
>Referenced SOP Class UID	(0008,1150)	1C	Uniquely identifies the SOP class.	Not Supported
>Referenced SOP Instance UID	(0008,1155)	1C	Uniquely identifies the SOP instance.	Not Supported
Patient's Birth Time	(0010,0032)	3	Birth time of the patient.	Not Supported
Other Patient IDs	(0010,1000)	3	Other identification numbers or codes used to identify the patient.	Supported For Import, only the first item of the multi-valued tag is imported, matched against Patient ID2.
Other Patient IDs Sequence	(0010,1002)	3	A sequence of identification numbers or codes used to identify the patient, which may or may not be human readable, and which may or may not have been obtained from an implanted or attached device, e.g., an RFID or barcode. One or more items are permitted in this sequence.	Not Supported
Other Patient Names	(0010,1001)	3	Other names used to identify the patient.	Not Supported
Ethnic Group	(0010,2160)	3	Ethnic group or race of the patient.	Not Supported
Patient Comments	(0010,4000)	3	User-defined additional information about the patient.	Not Supported
Patient Species Description	(0010,2201)	1C	The species of the patient. Required if the patient is an animal and if Patient Species Code Sequence (0010,2202) is not present. May be present otherwise.	Not Supported
Patient Species Code Sequence	(0010,2202)	1C	The species of the patient. Only a single item shall be included in this sequence. Required if the patient is an animal and if Patient Species Description (0010,2201) is not present. May be present otherwise.	Not Supported
Patient Breed Description	(0010,2292)	2C	The breed of the patient. See C.7.1.1.1.1. Required if the patient is an animal and if Patient Breed Code (0010,2293) is empty. May be present otherwise.	Not Supported

Attribute Name	Tag	Type	Description	Handling
Patient Breed Code Sequence	(0010,2293)	2C	The breed of tthe patient. See C.7.1.1.1.1. Zero or more items shall be included in this sequence. Required if the patient is an animal.	Not Supported
Breed Registration Sequence	(0010,2294)	2C	Information identifying an animal within a breed registry. Zero or more items shall be included in this sequence. Required if the patient is an animal.	Not Supported
>Breed Registration Number	(0010,2295)	1	Identification number of an animal within the registry.	Not Supported
>Breed Registry Code Sequence	(0010,2296)	1	Identification of the organization with which an animal is registered. Only a single item shall be permitted in this sequence.	Not Supported
Responsible Person	(0010,2297)	2C	Name of person with medical decision-making authority for the patient. Required if the patient is an animal. May be present otherwise.	Not Supported
Responsible Person Role	(0010,2298)	1C	Relationship of responsible person to the patient. See C.7.1.1.1.2 for defined terms. Required if responsible person is present and has a value.	Not Supported
Responsible Organization	(0010,2299)	2C	Name of organization with medical decision-making authority for the patient. Required if patient is an animal. May be present otherwise.	Not Supported
Patient Identity Removed	(0012,0062)	3	The true identity of the patient has been removed from the attributes and pixel data. Enumerated values: <ul style="list-style-type: none"> • YES • NO 	Not Supported

Attribute Name	Tag	Type	Description	Handling
De-identification Method	(0012,0063)	1C	<p>A description or label of the mechanism or method used to remove the patient's identity. May be multi-valued if successive de-identification steps have been performed.</p> <p>Notes:</p> <ul style="list-style-type: none"> a) This may be used to describe the extent or thoroughness of the de-identification, for example, whether or not the de-identification is for a "Limited Data Set" (as per HIPAA Privacy Rule). b) The characteristics of the de-identifying equipment and/or the responsible operator of that equipment may be recorded as an additional item of the Contributing Equipment Sequence (0018,A001) in the SOP Common Module. De-identifying equipment may use a Purpose of Reference (109104,DCM,"De-identifying Equipment"). <p>Required if Patient Identity Removed (0012,0062) is present and has a value of YES and De-identification Method Code Sequence (0012,0064) is not present. May be present otherwise.</p>	Not Supported
De-identification Method Code Sequence	(0012,0064)	1C	<p>A code describing the mechanism or method used to remove the patient's identity. One or more items shall be included in this sequence. Multiple items are used if successive de-identification steps have been performed or to describe options of a defined profile. Required if Patient Identify Removed (0012,0062) is present and has a value of YES and De-identification Method (0012,0063) is not present. May be present otherwise.</p>	Not Supported

A.2.2 General Study - C.7.2.1

Attribute Name	Tag	Type	Description	Handling
Study Instance UID	(0020,000D)	1	Unique identifier for the study.	Supported
Study Date	(0008,0020)	2	Date the study started.	Supported
Study Time	(0008,0030)	2	Time the study started.	Supported

Attribute Name	Tag	Type	Description	Handling
Referring Physician's Name	(0008,0090)	2	Name of the patient's referring physician.	Supported
Referring Physician Identification Sequence	(0008,0096)	3	Identification of the patient's referring physician. Only a single item is permitted in this sequence.	Not Supported
Study ID	(0020,0010)	2	User- or equipment-generated study identifier.	Supported
Accession Number	(0008,0050)	2	A RIS-generated number that identifies the order for the study.	Supported
Issuer of Accession Number Sequence	(0008,0051)	3	Identifier of the assigning authority that issued the accession number. Only a single item is permitted in this sequence.	Not Supported
>Referenced SOP Class UID	(0008,1150)	1	Uniquely identifies the SOP class.	Not Supported
>Referenced SOP Instance UID	(0008,1155)	1	Uniquely identifies the SOP instance.	Not Supported
Study Description	(0008,1030)	3	Institution-generated description or classification of the study (component) performed.	Not Supported
Physician(s) of Record	(0008,1048)	3	Name(s) of the physician(s) responsible for overall patient care at time of study (see C.7.3.1 for Performing Physician).	Not Supported
Physician(s) of Record Identification Sequence	(0008,1049)	3	Identification(s) of the physician(s) responsible for overall patient care at time of study. One or more items are permitted in this sequence. If more than one item, the number and order shall correspond to the value of Physician(s) of Record (0008,1048), if present.	Not Supported
Name of Physician(s) Reading Study	(0008,1060)	3	Name(s) of the physician(s) reading the study.	Not Supported
Physician(s) Reading Study Identification Sequence	(0008,1062)	3	Identification(s) of the physician(s) reading the study. One or more items are permitted in this sequence. If more than one item, the number and order shall correspond to the value of Name of Physician(s) Reading Study (0008,1060), if present.	Not Supported
Requesting Service Code Sequence	(0032,1034)	3	Institutional department where the request initiated. Only a single item is permitted in this sequence.	Not Supported
Referenced Study Sequence	(0008,1110)	3	A sequence that provides reference to a study SOP class/instance pair. One or more items are permitted in this sequence.	Not Supported

Attribute Name	Tag	Type	Description	Handling
Procedure Code Sequence	(0008,1032)	3	A sequence that conveys the type of procedure performed. One or more items are permitted in this sequence.	Not Supported
Reason For Performed Procedure Code Sequence	(0040,1012)	3	Coded reason(s) for performing this procedure. Note: May differ from the values in Reason for the Requested Procedure (0040,100A) in Request Attribute Sequence (0040,0275); for example, if what was performed differs from what was requested. One or more items are permitted in this sequence.	Not Supported

A.2.3 RT Series – C.8.8.1

Attribute Name	Tag	Type	Description	Handling
Modality	(0008,0060)	1	Type of equipment that originally acquired the data. Enumerated values: <ul style="list-style-type: none"> • RTIMAGE = RT Image • RTDOSE = RT Dose • RTSTRUCT = RT Structure Set • RTPLAN = RT Plan • RTRECORD = RT Treatment Record. See C.8.8.1.1. 	Supported
Series Instance UID	(0020,000E)	1	Unique identifier of the series.	Supported
Series Number	(0020,0011)	2	A number that identifies this series.	Supported
Series Description	(0008,103E)	3	Description of the series.	Supported
Series Description Code Sequence	(0008,103F)	3	A coded description of the series. Only a single item is permitted in this sequence.	Not Supported
Operators' Name	(0008,1070)	2	Name(s) of the operator(s) supporting the series.	Import/Export Supported For Import, only the first value of the multi-valued attribute is imported.

Attribute Name	Tag	Type	Description	Handling
Referenced Performed Procedure Step Sequence	(0008,1111)	3	Uniquely identifies the performed procedure step SOP instance to which the series is related (e.g., a modality or general-purpose performed procedure step SOP instance). One or more items are permitted in this sequence.	Not Supported
Request Attributes Sequence	(0040,0275)	3	Sequence that contains attributes from the imaging service request. One or more items are permitted in this sequence.	Not Supported

A.2.4 Frame of Reference - C.7.4.1

Attribute Name	Tag	Type	Description	Handling
Frame of Reference UID	(0020,0052)	1	Uniquely identifies the frame of reference for a series. See C.7.4.1.1.1 for further explanation.	Supported
Position Reference Indicator	(0020,1040)	2	Part of the imaging target used as a reference. See C.7.4.1.1.2 for further explanation.	Supported For ocular treatments, this indicates the treatment eye: - LEFT EYE or CORNEAL_VERTEX_L - RIGHT EYE or CORNEAL_VERTEX_R

A.2.5 General Equipment – C.7.5.1

Attribute Name	Tag	Type	Description	Handling
Manufacturer	(0008,0070)	2	Manufacturer of the equipment that produced the composite instances.	Supported
Institution Name	(0008,0080)	3	Institution where the equipment that produced the composite instances is located.	Supported
Institution Address	(0008,0081)	3	Mailing address of the institution where the equipment that produced the composite instances is located.	Supported

Attribute Name	Tag	Type	Description	Handling
Station Name	(0008,1010)	3	User-defined name identifying the machine that produced the composite instances.	Supported
Institutional Department Name	(0008,1040)	3	Department in the institution where the equipment that produced the composite instances is located.	Supported
Manufacturer's Model Name	(0008,1090)	3	Manufacturer's model name of the equipment that produced the composite instances.	Supported
Device Serial Number	(0018,1000)	3	Manufacturer's serial number of the equipment that produced the composite instances. Note: This identifier corresponds to the device that actually created the images, such as a CR plate reader or a CT console, and may not be sufficient to identify all of the equipment in the imaging chain, such as the generator or gantry or plate.	Supported
Software Versions	(0018,1020)	3	Manufacturer's designation of software version of the equipment that produced the composite instances. See C.7.5.1.1.3.	Supported
Gantry ID	(0018,1008)	3	Identifier of the gantry or positioner.	Supported
Spatial Resolution	(0018,1050)	3	The inherent limiting resolution in mm of the acquisition equipment for high contrast objects for the data gathering and reconstruction technique chosen. If variable across the images of the series, the value at the image center.	Supported
Date of Last Calibration	(0018,1200)	3	Date when the image acquisition device calibration was last changed in any way. Multiple entries may be used for additional calibrations at other times. See C.7.5.1.1.1 for further explanation.	Supported
Time of Last Calibration	(0018,1201)	3	Time when the image acquisition device calibration was last changed in any way. Multiple entries may be used. See C.7.5.1.1.1 for further explanation.	Supported

Attribute Name	Tag	Type	Description	Handling
Pixel Padding Value	(0028,0120)	1C	<p>Single pixel value or one limit (inclusive) of a range of pixel values used in an image to pad to rectangular format or to signal background that may be suppressed. See C.7.5.1.1.2 for further explanation.</p> <p>Required if Pixel Padding Range Limit (0028,0121) is present and either Pixel Data (7FE0,0010) or Pixel Data Provider URL (0028,7FE0) is present. May be present otherwise only if Pixel Data (7FE0,0010) or Pixel Data Provider URL (0028,7FE0) is present.</p> <p>Notes:</p> <ul style="list-style-type: none"> a) The value representation of this attribute is determined by the value of Pixel Representation (0028,0103). b) This attribute is not used in presentation state instances; there is no means in a presentation state to “override” any pixel padding value specified in the referenced images. c) This attribute does apply to RT dose and segmentation instances, because they include pixel data. 	Supported

A.2.6 RT General Plan – C.8.8.9

Attribute Name	Tag	Type	Description	Handling
RT Plan Label	(300A,0002)	1	User-defined label for treatment plan.	Supported
RT Plan Name	(300A,0003)	3	User-defined name for treatment plan.	Supported
RT Plan Description	(300A,0004)	3	User-defined description of treatment plan.	Supported
Instance Number	(0020,0013)	3	A number that identifies this object instance.	Not Supported
RT Plan Date	(300A,0006)	2	Date treatment plan was last modified.	Supported
RT Plan Time	(300A,0007)	2	Time treatment plan was last modified.	Supported
Treatment Protocols	(300A,0009)	3	Planned treatment protocols.	Not Supported

Attribute Name	Tag	Type	Description	Handling
Plan Intent	(300A,000A)	3	Intent of this plan. Defined terms: <ul style="list-style-type: none"> • CURATIVE = curative therapy on patient • PALLIATIVE = palliative therapy on patient • PROPHYLACTIC = preventative therapy on patient • VERIFICATION = verification of patient plan using phantom • MACHINE_QA= Quality assurance of the delivery machine (independently of a specific patient) • RESEARCH = Research project • SERVICE = Machine repair or maintenance operation 	Supported
Treatment Sites	(300A,000B)	3	Planned treatment sites.	Not Supported
RT Plan Geometry	(300A,000C)	1	Describes whether RT Plan is based on patient or treatment device geometry. See C.8.8.9.1. Defined terms: <ul style="list-style-type: none"> • PATIENT = RT structure set exists • TREATMENT_DEVICE = RT Structure Set does not exist 	Supported
Referenced Structure Set Sequence	(300C,0060)	1C	The RT Structure Set on which the RT Plan is based. Only a single item shall be included in this sequence. Required if RT Plan Geometry (300A,000C) is PATIENT.	Supported
>Referenced SOP Class UID	(0008,1150)	1C	Uniquely identifies the SOP class.	Supported
>Referenced SOP Instance UID	(0008,1155)	1C	Uniquely identifies the SOP instance.	Supported
Referenced Dose Sequence	(300C,0080)	3	Related instances of RT Dose (for grids and named/un-named point doses). One or more items are permitted in this sequence. See Note 1.	Not Supported
Referenced RT Plan Sequence	(300C,0002)	3	Related instances of RT Plan. One or more items are permitted in this sequence.	Supported
>Referenced SOP Class UID	(0008,1150)	1C	Uniquely identifies the SOP class.	Supported
>Referenced SOP Instance UID	(0008,1155)	1C	Uniquely identifies the SOP instance.	Supported

Attribute Name	Tag	Type	Description	Handling
>RT Plan Relationship	(300A,0055)	1	Relationship of referenced plan with respect to current plan. Defined terms: <ul style="list-style-type: none"> • PRIOR = plan delivered prior to current treatment • ALTERNATIVE = alternative plan prepared for current treatment • PREDECESSOR = plan used in derivation of current plan • VERIFIED_PLAN = plan which is verified using the current plan. This value shall only be used if Plan Intent (300A,000A) is present and has a value of VERIFICATION. • CONCURRENT = plan that forms part of a set of two or more RT plan instances representing a single conceptual "plan," applied in parallel in one treatment phase 	Supported
Plan Integrity Sequence	(3287,XX00)	3	Introduces sequence of checksum on dose-relevant data in this RT Plan. Exactly one item may be included in this sequence. Present only if the Approval module is present and the Approval Status (300E, 0002) has the value "APPROVED".	Supported
>Plan Integrity Hash	(3287,XX01)	1	Hash value calculated from selected data of this RT Plan along a specific algorithm whose version number is specified in Plan Integrity Hash Version (3287,xx02).	Supported
>Plan Integrity Hash Version	(3287,XX02)	1	Version of hash algorithm used to calculate value of Plan Integrity Hash (3287,xx01).	Supported
Plan Integrity Extended Sequence	(3287, XX04)	3	Checksums on dose-relevant data in this RT Plan. One or more items may be included in this sequence.	Supported
>Plan Integrity Extended Information	(3287, XX03)	1	Hash value calculated from selected data of this RT Plan along an extended algorithm whose version number is specified in Plan Integrity Hash Version (3287,xx02).	Supported
>Plan Integrity Hash Version	(3287, XX02)	1	Version of hash algorithm used to calculate value of Plan Integrity Hash (3287,xx03).	Supported

A.2.7 RT Prescription – C.8.8.10

Attribute Name	Tag	Type	Description	Handling
Prescription Description	(300A,000E)	3	User-defined description of treatment prescription.	Supported
Dose Reference Sequence	(300A,0010)	3	Introduces sequence of Dose References. One or more items are permitted in this sequence.	Supported
>Dose Reference Number	(300A,0012)	1	Identification number of the Dose Reference. The value of Dose Reference Number (300A,0012) shall be unique within the RT Plan in which it is created.	Supported
>Dose Reference UID	(300A,0013)	3	A unique identifier for a Dose Reference that can be used to link the same entity across multiple RT Plan objects.	Supported
>Dose Reference Structure Type	(300A,0014)	1	Structure type of Dose Reference. Defined terms: <ul style="list-style-type: none"> • POINT = dose reference point specified as ROI • VOLUME = dose reference volume specified as ROI • COORDINATES = point specified by Dose Reference Point Coordinates (300A,0018) • SITE = dose reference clinical site 	Supported Values other than COORDINATES and SITE are discarded.
>Dose Reference Description	(300A,0016)	3	User-defined description of dose reference.	Supported
>Referenced ROI Number	(3006,0084)	1C	Uniquely identifies ROI representing the dose reference specified by ROI Number (3006,0022) in Structure Set ROI Sequence (3006,0020) in Structure Set Module within the RT structure set in Referenced Structure Set Sequence (300C,0060) in the RT General Plan module. Required if Dose Reference Structure Type (300A,0014) is POINT or VOLUME.	Supported
>Dose Reference Point Coordinates	(300A,0018)	1C	Coordinates (x,y,z) of reference point in the patient based coordinate system described in C.7.6.2.1.1 (mm). Required if Dose Reference Structure Type (300A,0014) is COORDINATES and Dose Reference Sequence (300A,0010) is sent.	Supported
>Nominal Prior Dose	(300A,001A)	3	Dose (in Gy) from prior treatment to this dose reference (e.g., from a previous course of treatment).	Supported

Attribute Name	Tag	Type	Description	Handling
>Dose Reference Type	(300A,0020)	1	Type of dose reference. Defined terms: <ul style="list-style-type: none"> TARGET = treatment target (corresponding to GTV, PTV, or CTV in ICRU50) ORGAN_AT_RISK = organ at risk (as defined in ICRU50) 	Supported Expected value: TARGET
>Constraint Weight	(300A,0021)	3	Relative importance of satisfying constraint, where high values represent more important constraints.	Not Supported
>Delivery Warning Dose	(300A,0022)	3	The dose (in Gy) that when reached or exceeded should cause some action to be taken.	Supported
>Delivery Maximum Dose	(300A,0023)	3	The maximum dose (in Gy) that can be delivered to the dose reference.	Supported
>Target Minimum Dose	(300A,0025)	3	Minimum permitted dose (in Gy) to dose reference if Dose Reference Type (300A,0020) is TARGET.	Not Supported
>Target Prescription Dose	(300A,0026)	3	Prescribed dose (in Gy) to dose reference if Dose Reference Type (300A,0020) is TARGET.	Supported
>Target Maximum Dose	(300A,0027)	3	Maximum permitted dose (in Gy) to dose reference if Dose Reference Type (300A,0020) is TARGET.	Supported
>Referenced Patient Volume ID	(3267,xx00)	3	The ID of the patient volume to which this dose reference is related.	Supported (Import/Export)
>Target Underdose Volume Fraction	(300A,0028)	3	Maximum permitted fraction (in percent) of target to receive less than the target prescription dose if Dose Reference Type (300A,0020) is TARGET and Dose Reference Structure Type (300A,0014) is VOLUME. See C.8.8.10.1.	Not Supported
>Organ at Risk Full-volume Dose	(300A,002A)	3	Maximum dose (in Gy) to entire dose reference if Dose Reference Type (300A,0020) is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) is VOLUME.	Not Supported
>Organ at Risk Limit Dose	(300A,002B)	3	Maximum permitted dose (in Gy) to any part of dose reference if Dose Reference Type (300A,0020) is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) is VOLUME.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>Organ at Risk Maximum Dose	(300A,002C)	3	Maximum dose (in Gy) to non-overdosed part of dose reference if Dose Reference Type (300A,0020) is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) is VOLUME.	Supported
>Organ at Risk Overdose Volume Fraction	(300A,002D)	3	Maximum permitted fraction (in percent) of the organ at risk to receive more than the organ at risk maximum dose if Dose Reference Type (300A,0020) is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) is VOLUME.	Not Supported

A.2.8 RT Ion Tolerance Tables – C.8.8.24

Attribute Name	Tag	Type	Description	Handling
Ion Tolerance Table Sequence	(300A,03A0)	1	Introduces sequence of ion tolerance tables to be used for delivery of treatment plan. One or more items shall be included in this sequence. See Note 1.	Supported
>Tolerance Table Number	(300A,0042)	1	Identification number of the tolerance table. The value of Tolerance Table Number (300A,0042) shall be unique within the RT ion plan in which it is created. Required if Tolerance Table Sequence (300A,0040) is sent.	Supported
>Tolerance Table Label	(300A,0043)	3	User-defined label for tolerance table.	Supported
>Gantry Angle Tolerance	(300A,0044)	3	Maximum permitted difference (in degrees) between planned and delivered gantry angle.	Supported
>Beam Limiting Device Angle Tolerance	(300A,0046)	3	Maximum permitted difference (in degrees) between planned and delivered beam limiting device angle.	Not Supported
>Beam Limiting Device Tolerance Sequence	(300A,0048)	3	Introduces sequence of beam limiting device (collimator) tolerances. One or more items are permitted in this sequence.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>RT Beam Limiting Device Type	(300A,00B8)	1	Type of beam limiting device (collimator). Enumerated values: <ul style="list-style-type: none"> • X = symmetric jaw pair in IEC X direction • Y = symmetric jaw pair in IEC Y direction • ASYMX = asymmetric jaw pair in IEC X direction • ASYMY = asymmetric pair in IEC Y direction • MLCX = multileaf (multi-element) jaw pair in IEC X direction • MLCY = multileaf (multi-element) jaw pair in IEC Y direction 	Not Supported
>>Beam Limiting Device Position Tolerance	(300A,004A)	1	Maximum permitted difference (in mm) between planned and delivered leaf (element) or jaw positions for current beam limiting device (collimator).	Not Supported
>Patient Support Angle Tolerance	(300A,004C)	3	Maximum permitted difference (in degrees) between planned and delivered patient support angle.	Supported
>Table Top Vertical Position Tolerance	(300A,0051)	3	Maximum permitted difference (in mm) between planned and delivered table top vertical position.	Supported
>Table Top Longitudinal Position Tolerance	(300A,0052)	3	Maximum permitted difference (in mm) between planned and delivered table top longitudinal position.	Supported
>Table Top Lateral Position Tolerance	(300A,0053)	3	Maximum permitted difference (in mm) between planned and delivered table top lateral position.	Supported
>Table Top Pitch Angle Tolerance	(300A,004F)	3	Maximum permitted difference (in degrees) between planned and delivered table top pitch angle.	Supported
>Table Top Roll Angle Tolerance	(300A,0050)	3	Maximum permitted difference (in degrees) between planned and delivered table top roll angle.	Supported
>Snout Position Tolerance	(300A,004B)	3	Maximum permitted difference (in mm) between planned and delivered snout position.	Supported
>Head Fixation Angle Tolerance	(300A,0152)	3	Maximum permitted difference (in degrees) between planned and delivered Head Fixation Angle (300A,0148).	Supported
>Chair Head Frame Position Tolerance	(300A,0153)	3	Maximum permitted difference (in mm) between planned and delivered Chair Head Frame Position (300A,0151).	Supported
>Fixation Light Azimuthal Angle Tolerance	(300A,0154)	3	Maximum permitted difference (in degrees) between planned and delivered Fixation Light Azimuthal Angle (300A,0356).	Supported

Attribute Name	Tag	Type	Description	Handling
>Fixation Light Polar Angle Tolerance	(300A,0155)	3	Maximum permitted difference (in mm) between planned and delivered Fixation Light Polar Angle (300A,0358).	Supported

A.2.9 RT Patient Setup – C.8.8.12

Attribute Name	Tag	Type	Description	Handling
Patient Setup Sequence	(300A,0180)	1	Introduces sequence of patient setup data for current plan. One or more items shall be included in this sequence.	Supported
>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.	Supported
>Patient Setup Label	(300A,0183)	3	The user-defined label for the patient setup.	Not Supported
>Patient Position	(0018,5100)	1C	Patient position descriptor relative to the equipment. Required if Patient Additional Position (300A,0184) is not present. See C.8.8.12.1.2 for defined terms and further explanation.	Supported
>Patient Additional Position	(300A,0184)	1C	User-defined additional description of patient position. Required if Patient Position (0018,5100) is not present.	Not Supported
>Referenced Setup Image Sequence	(300A,0401)	3	Introduces sequence of setup verification images for this patient setup. One or more items are permitted in this sequence. See C.8.8.12.1.1.	Supported
>>Setup Image Comment	(300A,0402)	3	Comment on the setup image.	Not Supported
>Fixation Device Sequence	(300A,0190)	3	Introduces sequence of fixation devices used in patient setup. One or more items are permitted in this sequence.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>Fixation Device Type	(300A,0192)	1	Type of fixation device used in patient setup. Defined terms: <ul style="list-style-type: none"> • BITEBLOCK • HEADFRAME • MASK • MOLD • CAST • HEADREST • BREAST_BOARD • BODY_FRAME • VACUUM_MOLD • WHOLE_BODY_POD • RECTAL_BALLOON 	Not Supported
>>Fixation Device Label	(300A,0194)	2	User-defined label identifier for fixation device.	Not Supported
>>Fixation Device Description	(300A,0196)	3	User-defined description of fixation device.	Not Supported
>>Fixation Device Position	(300A,0198)	3	Position/Notch number of fixation device.	Not Supported
>>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.	Not Supported
>>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.	Not Supported
>>Accessory Code	(300A,00F9)	3	An identifier for the accessory intended to be read by a device, e.g., a bar-code reader.	Not Supported
>Shielding Device Sequence	(300A,01A0)	3	Introduces sequence of shielding devices used in patient setup. One or more items are permitted in this sequence.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>Shielding Device Type	(300A,01A2)	1	Type of shielding device used in patient setup. Defined terms: <ul style="list-style-type: none"> • GUM • EYE • GONAD 	Not Supported
>>Shielding Device Label	(300A,01A4)	2	User-defined label for shielding device.	Not Supported
>>Shielding Device Description	(300A,01A6)	3	User-defined description of shielding device.	Not Supported
>>Shielding Device Position	(300A,01A8)	3	Position/Notch number of shielding device.	Not Supported
>>Accessory Code	(300A,00F9)	3	An identifier for the accessory intended to be read by a device, e.g., a bar-code reader.	Not Supported
>Setup Technique	(300A,01B0)	3	Setup technique used in patient setup. Defined terms: <ul style="list-style-type: none"> • ISOCENTRIC • FIXED_SSD • TBI • BREAST_BRIDGE • SKIN_APPOSITION 	Not Supported
>Setup Technique Description	(300A,01B2)	3	User-defined description of setup technique; maps to Field Setup Note. Import: To support individual setup notes for each beam, a Patient Setup Sequence (300A,0180) item is expected for every beam. Maximum length is 254 characters. Multi-byte character sets are supported, as long as they fit within the 254 characters.	Supported
>Setup Device Sequence	(300A,01B4)	3	Introduces sequence of devices used for patient alignment in patient setup. One or more items are permitted in this sequence.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>Setup Device Type	(300A,01B6)	1	Type of setup device used for patient alignment. Defined terms: <ul style="list-style-type: none"> • LASER_POINTER • DISTANCE_METER • TABLE_HEIGHT • MECHANICAL_PTR • ARC 	Not Supported
>>Setup Device Label	(300A,01B8)	2	User-defined label for setup device used for patient alignment.	Not Supported
>>Setup Device Description	(300A,01BA)	3	User-defined description for setup device used for patient alignment.	Not Supported
>>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.	Not Supported
>>Setup Reference Description	(300A,01D0)	3	User-defined description of setup reference used for patient alignment.	Not Supported
>>Accessory Code	(300A,00F9)	3	An identifier for the accessory intended to be read by a device, e.g., a bar-code reader.	Not Supported
>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.	Not Supported
>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.	Not Supported
>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.	Not Supported
>Motion Synchronization Sequence	(300A,0410)	3	Introduces sequence of motion synchronization. Only one item is permitted in this sequence.	Supported

Attribute Name	Tag	Type	Description	Handling
>>Respiratory Motion Compensation Technique	(0018,9170)	1	<p>Technique applied to reduce respiratory motion artifacts.</p> <p>Defined terms:</p> <ul style="list-style-type: none"> • 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, e.g., real-time averaging, diminishing variance, and motion-adaptive gating • RETROSPECTIVE = retrospective gating • CORRECTION = retrospective image correction • UNKNOWN = technique not known 	Supported Expected value: GATING
>>Respiratory Signal Source	(0018,9171)	1	<p>Signal source from which respiratory motion is derived.</p> <p>Defined terms:</p> <ul style="list-style-type: none"> • 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 	Supported Expected value: EXTERNAL_MARKER

Attribute Name	Tag	Type	Description	Handling
>>Respiratory Motion Compensation Technique Description	(0018,9185)	3	Description of respiratory motion compensation technique.	Not Supported
>>Respiratory Signal Source ID	(0018,9186)	3	Identifies the device providing the respiratory signal.	Not Supported

A.2.10 RT Fraction Scheme – C.8.8.13

Attribute Name	Tag	Type	Description	Handling
Fraction Group Sequence	(300A,0070)	1	Introduces sequence of fraction groups in current fraction scheme. One or more items shall be included in this sequence.	Supported
>Fraction Group Number	(300A,0071)	1	Identification number of the fraction group. The value of Fraction Group Number (300A,0071) shall be unique within the RT Plan in which it is created.	Supported
>Fraction Group Description	(300A,0072)	3	The user defined description for the fraction group.	Not Supported
>Referenced Dose Sequence	(300C,0080)	3	Related instances of RT dose (for grids, isodose curves, and named/unnamed point doses). One or more items are permitted in this sequence. See Note 1.	Not Supported
>Referenced Dose Reference Sequence	(300C,0050)	3	Introduces sequence of dose references for the current fraction group. One or more items are permitted in this sequence.	Not Supported
>>Referenced Dose Reference Number	(300C,0051)	1	Uniquely identifies dose reference specified by Dose Reference Number (300A,0012) within Dose Reference Sequence (300A,0010) in RT prescription module.	Not Supported
>>Constraint Weight	(300A,0021)	3	Relative importance of satisfying constraint, where high values represent more important constraints.	Not Supported
>>Delivery Warning Dose	(300A,0022)	3	The dose (in Gy), which when reached or exceeded should cause some action to be taken.	Not Supported
>>Delivery Maximum Dose	(300A,0023)	3	The maximum dose (in Gy) that can be delivered to the dose reference.	Not Supported
>>Target Minimum Dose	(300A,0025)	3	Minimum permitted dose (in Gy) to dose reference if Dose Reference Type (300A,0020) of referenced dose reference is TARGET.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>Target Prescription Dose	(300A,0026)	3	Prescribed dose (in Gy) to dose reference if Dose Reference Type (300A,0020) of referenced dose reference is TARGET.	Not Supported
>>Target Maximum Dose	(300A,0027)	3	Maximum permitted dose (in Gy) to dose reference if Dose Reference Type (300A,0020) of referenced Dose Reference is TARGET.	Not Supported
>>Target Underdose Volume Fraction	(300A,0028)	3	Maximum permitted fraction (in percent) of Target to receive less than the Target Prescription Dose (300A,0027) if Dose Reference Type (300A,0020) of referenced Dose Reference is TARGET and Dose Reference Structure Type (300A,0014) of referenced Dose Reference is VOLUME.	Not Supported
>>Organ at Risk Full-volume Dose	(300A,002A)	3	Maximum dose (in Gy) to entire dose reference if Dose Reference Type (300A,0020) of referenced Dose Reference is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) of referenced Dose Reference is VOLUME.	Not Supported
>>Organ at Risk Limit Dose	(300A,002B)	3	Maximum permitted dose (in Gy) to any part of Dose Reference if Dose Reference Type (300A,0020) of referenced Dose Reference is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) of referenced Dose Reference is VOLUME.	Not Supported
>>Organ at Risk Maximum Dose	(300A,002C)	3	Maximum dose (in Gy) to non-overdosed part of dose reference if Dose Reference Type (300A,0020) of referenced Dose Reference is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) of referenced Dose Reference is VOLUME.	Not Supported
>>Organ at Risk Overdose Volume Fraction	(300A,002D)	3	Maximum permitted fraction (in percent) of organ at risk to receive more than the organ at risk maximum dose if Dose Reference Type (300A,0020) of referenced Dose Reference is ORGAN_AT_RISK and Dose Reference Structure Type (300A,0014) of referenced Dose Reference is VOLUME.	Not Supported
>Number of Fractions Planned	(300A,0078)	2	Total number of treatments (fractions) prescribed for current Fraction Group.	Supported
>Number of Fraction Pattern Digits Per Day	(300A,0079)	3	Number of digits in Fraction Pattern (300A,007B) used to represent one day. See Note 2.	Not Supported
>Repeat Fraction Cycle Length	(300A,007A)	3	Number of weeks needed to describe treatment pattern. See Note 2.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>Fraction Pattern	(300A,007B)	3	String of 0s (no treatment) and 1s (treatment) describing treatment pattern. Length of string is 7 x number of fraction pattern digits per day x repeat fraction cycle length. Pattern shall start on a Monday. See Note 2.	Not Supported
>Number of Beams	(300A,0080)	1	Number of Beams in current Fraction Group. If Number of Beams is greater then zero, Number of Brachy Application Setups (300A,00A0) shall equal zero.	Supported
>Referenced Beam Sequence	(300C,0004)	1C	Introduces sequence of treatment beams in current fraction group. One or more items shall be included in this sequence. Required if Number of Beams (300A,0080) is greater than zero.	Supported
>>Referenced Beam Number	(300C,0006)	1	Uniquely identifies Beam specified by Beam Number (300A,00C0) within Beam Sequence (300A,00B0) in RT beams module.	Supported
>>Beam Dose Specification Point	(300A,0082)	3	Coordinates (x,y,z) of point at which Beam Dose is specified in the patient based coordinate system described in C.7.6.2.1.1 (mm). See Note 3.	Supported
>>Referenced Primary Dose Reference UID	(3249,xx10)	3	Uniquely identifies the primary Dose Reference as defined in Dose Reference Sequence (300A,0010). Used on import to connect to primary reference point.	Supported
>>Beam Dose	(300A,0084)	3	Dose (in Gy) at Beam Dose Specification Point (300A,0082) due to current beam.	Supported
>>Beam Dose Point Depth	(300A,0088)	3	The depth (in mm) in the patient along a ray from the source to the dose point specified by the Beam Dose Specification Point (300A,0082). See Note 6.	Not Supported
>>Beam Dose Point Equivalent Depth	(300A,0089)	3	The radiological depth in mm (water-equivalent depth, taking tissue heterogeneity into account) in the patient along a ray from the source to the dose point specified by the Beam Dose Specification Point (300A,0082). See Note 6.	Not Supported
>>Beam Dose Point SSD	(300A,008A)	3	Source to patient surface distance along a ray from the source to the dose point specified by the Beam Dose Specification Point (300A,0082). See Note 6.	Supported

Attribute Name	Tag	Type	Description	Handling
>>Beam Meterset	(300A,0086)	3	Machine setting to be delivered for current beam, specified in Monitor Units (MU) or minutes as defined by Primary Dosimeter Unit (300A,00B3) (in RT beams module) for referenced beam. See Note 4.	Supported
>>Maximum Treatment Time	(3249,xx00)	3	The maximum treatment time, which should not be exceeded. This item serves as a secondary safety limit in addition to the Beam Meterset value (300A,0086) itself. Units in [min].	Supported
>Number of Brachy Application Setups	(300A,00A0)	1	Number of brachy application setups in current fraction group. If number of brachy application setups is greater than zero, Number of Beams (300A,0080) shall equal zero.	Supported Expected value: 0
>Referenced Brachy Application Setup Sequence	(300C,000A)	1C	Introduces sequence of treatment brachy application setups in current fraction group. Required if Number of Brachy Application Setups (300A,00A0) is greater than zero. One or more items shall be included in this sequence.	Not Supported
>>Referenced Brachy Application Setup Number	(300C,000C)	1	Uniquely identifies brachy application setup specified by Brachy Application Setup Number (300A,0234) within Brachy Application Setup Sequence (300A,0230) in RT brachy application setups module.	Not Supported
>>Brachy Application Setup Dose Specification Point	(300A,00A2)	3	Coordinates (x,y,z) of point in the patient-based coordinate system described in C.7.6.2.1.1 at which Brachy Application Setup Dose (300A,00A4) is specified (mm).	Not Supported
>>Brachy Application Setup Dose	(300A,00A4)	3	Dose (in Gy) at Brachy Application Setup Dose Specification Point (300A,00A2) due to current brachy application setup.	Not Supported

A.2.11 RT Ion Beams – C.8.8.25

Attribute Name	Tag	Type	Description	Handling
Ion Beam Sequence	(300A,03A2)	1	Introduces sequence of setup and/or treatment beams for current RT ion plan. One or more items shall be included in this sequence.	Supported For ocular treatments, only 1 item is expected.

Attribute Name	Tag	Type	Description	Handling
>Beam Number	(300A,00C0)	1	Identification number of the beam; used as Field ID. The value of Beam Number (300A,00C0) shall be unique within the RT ion plan in which it is created. See C.8.8.25.1.	Supported
>Beam Name	(300A,00C2)	1	User-defined name for beam. See C.8.8.25.1.	Supported
>Beam Description	(300A,00C3)	3	User-defined description for beam. See C.8.8.25.1.	Supported
>Beam Type	(300A,00C4)	1	Motion characteristic of beam. Enumerated values: <ul style="list-style-type: none"> • STATIC = all beam parameters remain unchanged during delivery • DYNAMIC = one or more beam parameters changes during delivery 	Supported Expected value: STATIC
>Radiation Type	(300A,00C6)	1	Particle type of beam. Defined terms: <ul style="list-style-type: none"> • PHOTON • PROTON • ION 	Supported Expected value: PROTON
>Radiation Mass Number	(300A,0302)	1C	Mass number of radiation. Required if Radiation Type (300A,00C6) is ION.	Not Supported
>Radiation Atomic Number	(300A,0304)	1C	Atomic number of radiation. Required if Radiation Type (300A,00C6) is ION.	Not Supported
>Radiation Charge State	(300A,0306)	1C	Charge state of radiation. Required if Radiation Type (300A,00C6) is ION.	Not Supported
>Scan Mode	(300A,0308)	1	The method of beam scanning to be used during treatment. Defined terms: <ul style="list-style-type: none"> • NONE = No beam scanning is performed. • UNIFORM = The beam is scanned between control points to create a uniform lateral fluence distribution across the field. • MODULATED = The beam is scanned between control points to create a modulated lateral fluence distribution across the field. 	Supported Expected values: NONE, MODULATED
>Treatment Machine Name	(300A,00B2)	2	User-defined name identifying treatment machine to be used for beam delivery. See C.8.8.25.2.	Supported

Attribute Name	Tag	Type	Description	Handling
>Manufacturer	(0008,0070)	3	Manufacturer of the equipment to be used for beam delivery.	Supported
>Institution Name	(0008,0080)	3	Institution where the equipment is located that is to be used for beam delivery.	Not Supported
>Institution Address	(0008,0081)	3	Mailing address of the institution where the equipment is located that is to be used for beam delivery.	Not Supported
>Institutional Department Name	(0008,1040)	3	Department in the institution where the equipment is located that is to be used for beam delivery.	Not Supported
>Manufacturer's Model Name	(0008,1090)	3	Manufacturer's model name of the equipment that is to be used for beam delivery.	Supported
>Device Serial Number	(0018,1000)	3	Manufacturer's serial number of the equipment that is to be used for beam delivery.	Not Supported
>Primary Dosimeter Unit	(300A,00B3)	1	Measurement unit of machine dosimeter. Enumerated values: <ul style="list-style-type: none"> • MU = Monitor Unit • NP = number of particles 	Supported value Expected value: MU
>Referenced Tolerance Table Number	(300C,00A0)	3	Uniquely identifies tolerance table specified by Tolerance Table Number (300A,0042) within tolerance table sequence in RT ion tolerance tables module. These tolerances are to be used for verification of treatment machine settings.	Supported
>Virtual Source-Axis Distances	(300A,030A)	1	Distance (in mm) from virtual source position to gantry rotation axis or nominal isocenter position (fixed beamlines) of the equipment to be used for beam delivery. Specified by a numeric pair: the VSAD in the IEC Gantry X direction followed by the VSAD in the IEC Gantry Y direction. The VSAD is commonly used for designing apertures in contrast to the effective source-axis-distance (ESAD) that is commonly used with the inverse square law for calculating the dose decrease with distance. See C.8.8.25.4.	Supported
>Ion Beam Limiting Device Sequence	(300A,03A4)	3	Introduces sequence of beam limiting device (collimator) jaw or leaf (element) sets. One or more items are permitted in this sequence.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>RT Beam Limiting Device Type	(300A,00B8)	1	Type of beam limiting device (collimator). Enumerated values: <ul style="list-style-type: none"> • X = symmetric jaw pair in IEC X direction • Y = symmetric jaw pair in IEC Y direction • ASYMX = asymmetric jaw pair in IEC X direction • ASYMY = asymmetric pair in IEC Y direction • MLCX = multileaf (multi-element) jaw pair in IEC X direction • MLCY = multileaf (multi-element) jaw pair in IEC Y direction 	Not Supported
>>Isocenter to Beam Limiting Device Distance	(300A,00BB)	2	Isocenter to beam limiting device (collimator) distance (in mm) of the equipment that is to be used for beam delivery. See C.8.8.25.4.	Not Supported
>>Number of Leaf/Jaw Pairs	(300A,00BC)	1	Number of leaf (element) or jaw pairs (equal to 1 for standard beam limiting device jaws).	Supported Expected value: 0
>>Leaf Position Boundaries	(300A,00BE)	1C	Boundaries of beam limiting device (collimator) leaves (in mm) in IEC BEAM LIMITING DEVICE coordinate axis appropriate to RT Beam Limiting Device Type (300A,00B8), i.e., X-axis for MLCY, Y-axis for MLCX. Contains N+1 values, where N is the Number of Leaf/Jaw Pairs (300A,00BC), starting from Leaf (Element) Pair 1. Required if RT Beam Limiting Device Type (300A,00B8) is MLCX or MLCY. See C.8.8.25.3.	Not Supported
>Referenced Patient Setup Number	(300C,006A)	3	Uniquely identifies patient setup to be used for current beam, specified by Patient Setup Number (300A,0182) within patient setup sequence of RT patient setup module.	Supported
>Referenced Reference Image Sequence	(300C,0042)	3	Reference images used for validation of current beam. One or more items are permitted in this sequence.	Not Supported
>>Referenced SOP Class UID	(0008,1150)	1	Uniquely identifies the SOP class.	Supported
>>Referenced SOP Instance UID	(0008,1155)	1	Uniquely identifies the SOP instance.	Supported
>>Reference Image Number	(300A,00C8)	1	Uniquely identifies reference image within Referenced Reference Image Sequence (300C,0042).	Supported

Attribute Name	Tag	Type	Description	Handling
>Treatment Delivery Type	(300A,00CE)	1	<p>Delivery type of treatment.</p> <p>Defined terms:</p> <ul style="list-style-type: none"> TREATMENT = normal patient treatment OPEN_PORTFILM = portal image acquisition with open field (the source of radiation is specified by Radiation Type (300A,00C6)) TRMT_PORTFILM = portal image acquisition with treatment port (the source of radiation is specified by Radiation Type (300A,00C6)) CONTINUATION = continuation of interrupted treatment SETUP = no treatment beam is applied for this RT Beam. To be used for specifying the gantry, couch, and other machine positions where x-ray setup images or measurements shall be taken. 	Supported Expected values: TREATMENT, CONTINUATION
>Referenced Dose Sequence	(300C,0080)	3	<p>Related instances of RT Dose (for grids, isodose curves, and named/unnamed point doses).</p> <p>One or more items are permitted in this sequence.</p>	Not Supported
>Number of Wedges	(300A,00D0)	1	Number of wedges associated with current beam.	Supported (DICOM validation only) Expected value: 0
>Total Wedge Tray Water-Equivalent Thickness	(300A,00D7)	3	Shift of the wedge tray induced on the range of the ion beam as measured in water (in mm).	Not Supported
>Ion Wedge Sequence	(300A,03AA)	1C	<p>Introduces sequence of treatment wedges.</p> <p>Required if Number of Wedges (300A,00D0) is non-zero.</p> <p>The number of items shall be identical to the value of Number of Wedges (300A,00D0).</p>	Not Supported
>>Wedge Number	(300A,00D2)	1	<p>Identification number of the wedges.</p> <p>The value of Wedge Number (300A,00D2) shall be unique within the beam in which it was created.</p>	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>Wedge Type	(300A,00D3)	2	Type of wedge (if any) defined for beam. Defined terms: <ul style="list-style-type: none"> • STANDARD = standard (static) wedge • MOTORIZED = single wedge that can be removed from beam remotely • PARTIAL_STANDARD = wedge does not extend across the whole field and is operated manually • PARTIAL_MOTORIZED = wedge does not extend across the whole field and can be removed from beam remotely 	Not Supported
>>Wedge ID	(300A,00D4)	3	User-supplied identifier for wedge.	Not Supported
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Not Supported
>>Wedge Angle	(300A,00D5)	2	Nominal wedge angle (degrees).	Not Supported
>>Wedge Orientation	(300A,00D8)	2	Orientation of wedge, i.e. orientation of IEC WEDGE FILTER coordinate system with respect to the IEC BEAM LIMITING DEVICE coordinate systems (degrees).	Not Supported
>>Isocenter to Wedge Tray Distance	(300A,00D9)	1	Isocenter to downstream edge of wedge tray (mm). See section C.8.8.25.4	Not Supported
>Number of Compensators	(300A,00E0)	1	Number of compensators associated with current beam.	Supported (DICOM validation only) Expected value: 0
>Total Compensator Tray Water-Equivalent Thickness	(300A,02E3)	3	Water-equivalent thickness of the compensator tray (in mm) parallel to radiation beam axis.	Not Supported
>Ion Range Compensator Sequence	(300A,02EA)	1C	Introduces sequence of compensators. Required if Number of Compensators (300A,00E0) is non-zero. The number of items shall be identical to the value of Number of Compensators (300A,00E0).	Not Supported
>>Compensator Description	(300A,02EB)	3	User defined description for the compensator.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>Compensator Number	(300A,00E4)	1	Identification number of the compensator. The value of Compensator Number (300A,00E4) shall be unique within the beam in which it is created.	Not Supported
>>Material ID	(300A,00E1)	2	User-supplied identifier for material used to manufacture compensator.	Not Supported
>>Compensator ID	(300A,00E5)	3	User-supplied identifier for the compensator.	Not Supported
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Not Supported
>>Isocenter to Compensator Tray Distance	(300A,02E4)	1C	Isocenter to compensator tray attachment edge distance (in mm) for current range compensator. Required if Compensator Mounting Position (300A,02E1) is not DOUBLE_SIDED. See C.8.8.25.4	Not Supported
>>Compensator Divergence	(300A,02E0)	1	Indicates presence or absence of geometrical divergence of the range compensator. Enumerated values: <ul style="list-style-type: none"> PRESENT = the range compensator is shaped according to the beam geometrical divergence ABSENT = the range compensator is not shaped according to the beam geometrical divergence 	Not Supported
>>Compensator Mounting Position	(300A,02E1)	1	Indicates on which side of the compensator tray the compensator is mounted. Enumerated values: <ul style="list-style-type: none"> PATIENT_SIDE = the compensator is mounted on the side of the compensator tray that is towards the patient SOURCE_SIDE = the compensator is mounted on the side of the compensator tray that is towards the radiation source DOUBLE_SIDED = the compensator has a shaped (i.e., non-flat) surface on both sides of the compensator tray 	Not Supported
>>Compensator Rows	(300A,00E7)	1	Number of rows in the range compensator. A row is defined to be in the X direction of the IEC beam limiting device coordinate system.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>Compensator Columns	(300A,00E8)	1	Number of columns in the range compensator. A column is defined to be in the Y direction of the IEC beam limiting device coordinate system.	Not Supported
>>Compensator Pixel Spacing	(300A,00E9)	1	Physical distance (in mm) between the center of each pixel projected onto machine isocentric plane. Specified by a numeric pair - adjacent row spacing followed by adjacent column spacing. See 10.7.1.3 for further explanation of the value order.	Not Supported
>>Compensator Position	(300A,00EA)	1	The x and y coordinates of the upper left-hand corner (first pixel transmitted) of the range compensator, projected onto the machine isocentric plane in the IEC BEAM LIMITING DEVICE coordinate system (mm).	Not Supported
>>Compensator Column Offset	(300A,02E5)	1C	The offset distance (in mm) applied to the x coordinate of the Compensator Position (300A,00EA) for even-numbered rows. Required if the compensator pattern is hexagonal.	Not Supported
>>Compensator Thickness Data	(300A,00EC)	1	A data stream of the pixel samples that comprise the range compensator, expressed as physical thickness (in mm), either parallel to radiation beam axis if Compensator Divergence (300A,02E0) equals ABSENT, or divergent according to the beam geometrical divergence if Compensator Divergence (300A,02E0) equals PRESENT. The order of pixels sent is left to right, top to bottom (upper left pixel, followed by the remainder of row 1, followed by the remainder of the rows).	Not Supported
>>Isocenter to Compensator Distances	(300A,02E6)	1C	A data stream of the pixel samples that comprise the distance from the isocenter to the compensator surface closest to the radiation source (in mm). The order of pixels sent is left to right, top to bottom (upper left pixel, followed by the remainder of row 1, followed by the remainder of the rows). Required if Material ID (300A,00E1) is non-zero length, and Compensator Mounting Position (300A,02E1) is DOUBLE_SIDED. See C.8.8.14.9 and C.8.8.25.4.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>Compensator Relative Stopping Power Ratio	(300A,02E7)	3	Compensator linear stopping power ratio, relative to water, at the beam energy specified by the Nominal Beam Energy (300A,0114) of the first control point of the Ion Control Point Sequence (300A,03A8).	Not Supported
>>Compensator Milling Tool Diameter	(300A,02E8)	3	The diameter (in mm) of the milling tool to be used to create the compensator. The diameter is expressed as the actual physical size and not a projected size at isocenter.	Not Supported
>Number of Boli	(300A,00ED)	1	Number of boli associated with current Beam.	Supported (DICOM validation only) Expected value: 0
>Referenced Bolus Sequence	(300C,00B0)	1C	Introduces sequence of boli associated with beam. Required if Number of Boli (300A,00ED) is non-zero. The number of items shall be identical to the value of Number of Boli (300A,00ED).	Not Supported
>>Referenced ROI Number	(3006,0084)	1	Uniquely identifies ROI representing the bolus specified by ROI Number (3006,0022) in Structure Set ROI Sequence (3006,0020) in structure set module within RT structure set in Referenced Structure Set Sequence (300C,0060) in RT general plan module.	Not Supported
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a barcode reader.	Not Supported
>Number of Blocks	(300A,00F0)	1	Number of shielding blocks associated with beam.	Supported For ocular treatments, the expected value is 1. In other cases, the value of this property is used only for DICOM validation.
>Total Block Tray Water-Equivalent Thickness	(300A,00F3)	3	Water-equivalent thickness of the block tray (in mm) parallel to radiation beam axis.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>Ion Block Sequence	(300A,03A6)	1C	Introduces sequence of blocks associated with beam. Required if Number of Blocks (300A,00F0) is non-zero. The number of items shall be identical to the value of Number of Blocks (300A,00F0).	Supported for ocular treatments
>>Block Tray ID	(300A,00F5)	3	User-supplied identifier for block tray.	Supported for ocular treatments
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Supported for ocular treatments
>>Isocenter to Block Tray Distance	(300A,00F7)	1	Isocenter to downstream edge of block tray (mm). See C.8.8.25.4.	Supported for ocular treatments only Expected value: 0
>>Block Type	(300A,00F8)	1	Type of block. See C.8.8.14.4. Enumerated values: <ul style="list-style-type: none"> • SHIELDING = blocking material is inside contour • APERTURE = blocking material is outside contour 	Supported for ocular treatments only Expected value: APERTURE
>>Block Divergence	(300A,00FA)	1	Indicates presence or otherwise of geometrical divergence. Enumerated values: <ul style="list-style-type: none"> • PRESENT = block edges are shaped for beam divergence • ABSENT = block edges are not shaped for beam divergence 	Supported for ocular treatments only Expected value: ABSENT
>>Block Mounting Position	(300A,00FB)	1	Indicates on which side of the block tray the block is mounted. Enumerated values: <ul style="list-style-type: none"> • PATIENT_SIDE = the block is mounted on the side of the Block Tray that is towards the patient • SOURCE_SIDE = the block is mounted on the side of the Block Tray that is towards the radiation source 	Supported for ocular treatments only Expected value: SOURCE_SIDE
>>Block Number	(300A,00FC)	1	Identification number of the block. The value of Block Number (300A,00FC) shall be unique within the beam in which it is created.	Supported for ocular treatments only Expected value: 1

Attribute Name	Tag	Type	Description	Handling
>>Block Name	(300A,00FE)	3	User-defined name for block.	Supported for ocular treatments only
>>Material ID	(300A,00E1)	2	User-supplied identifier for material used to manufacture block.	Not Supported
>>Block Thickness	(300A,0100)	1	Physical thickness of block (in mm) parallel to radiation beam axis. See C.8.8.14.4.	Supported for ocular treatments only Expected value: 0
>>Block Number of Points	(300A,0104)	1	Number of (x,y) pairs defining the block edge.	Supported for ocular treatments only Expected value: 0
>>Block Data	(300A,0106)	1	A data stream of (x,y) pairs that comprise the block edge. The number of pairs shall be equal to Block Number of Points (300A,0104), and the vertices shall be interpreted as a closed polygon. Coordinates are projected onto the machine isocentric plane in the IEC BEAM LIMITING DEVICE coordinate system (mm).	Supported for ocular treatments only Expected value: NULL
>Snout Sequence	(300A,030C)	3	Introduces sequence of snouts associated with Beam. Only a single item is permitted in this sequence.	Supported
>>Snout ID	(300A,030F)	1	User- or machine-supplied identifier for snout.	Supported Expected value for ocular plans: Snout 250
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Supported
>Applicator Sequence	(300A,0107)	3	Introduces sequence of applicators associated with beam. Only a single item is permitted in this sequence.	Not Supported
>>Applicator ID	(300A,0108)	1	User- or machine-supplied identifier for applicator.	Not Supported
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>Applicator Type	(300A,0109)	1	Type of applicator. Defined terms: <ul style="list-style-type: none"> • ION_SQUARE = square ion applicator • ION_RECT = rectangular ion applicator • ION_CIRC = circular ion applicator • ION_SHORT = short ion applicator • ION_OPEN = open (dummy) ion applicator • INTEROPERATIVE = interoperative (custom) applicator • STEREOTACTIC = stereotactic applicator 	Not Supported
>>Applicator Description	(300A,010A)	3	User-defined description for applicator.	Not Supported
>General Accessory Sequence	(300A,0420)	3	Introduces a sequence of general accessories associated with this beam. One or more items are permitted in this sequence.	Not Supported
>>General Accessory Number	(300A,0424)	1	Identification number of the general accessory. The value shall be unique within the sequence.	Not Supported
>>General Accessory ID	(300A,0421)	1	User- or machine-supplied identifier for general accessory.	Not Supported
>>General Accessory Description	(300A,0422)	3	User-supplied description of general accessory.	Not Supported
>>General Accessory Type	(300A,0423)	3	Specifies the type of accessory. Defined terms: <ul style="list-style-type: none"> • GRATICULE = Accessory tray with a radio-opaque grid • IMAGE_DETECTOR = Image acquisition device positioned in the beam line • RETICLE = Accessory tray with radio-transparent markers or grid 	Not Supported
>>Accessory Code	(300A,00F9)	3	Machine-readable identifier for this accessory.	Not Supported
>Number of Range Shifters	(300A,0312)	1	Number of range shifters associated with current beam.	Supported For non-ocular plans, expected value is 0 or 1; for ocular plans, expected value is 1

Attribute Name	Tag	Type	Description	Handling
>Range Shifter Sequence	(300A,0314)	1C	Introduces sequence of range shifters associated with beam. Required if Number of Range Shifters (300A,0312) is non-zero. The number of items shall be identical to the value of Number of Range Shifters (300A,0312).	Supported
>>Range Shifter Number	(300A,0316)	1	Identification number of the range shifter. The value of Range Shifter Number (300A,0316) shall be unique within the beam in which it is created.	Supported For ocular plans, expected value is 1
>>Range Shifter ID	(300A,0318)	1	User- or machine-supplied identifier for range shifter.	Supported Expected value for ocular plans: RS
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Supported
>>Range Shifter Type	(300A,0320)	1	Type of range shifter. Defined terms: <ul style="list-style-type: none"> ANALOG = Device has a variable thickness and is composed of opposing sliding wedges, water column, or similar mechanism BINARY = Device is composed of materials of different thicknesses that can be moved in or out of the beam in various stepped combinations 	Supported Expected value for ocular plans is ANALOG; in other cases, expected value is BINARY
>>Range Shifter Description	(300A,0322)	3	User-defined description of range shifter.	Not Supported
>Number of Lateral Spreading Devices	(300A,0330)	1	Number of lateral spreading devices associated with current beam.	Supported For GTR/FBR plans, 2 supported. For non-ocular plans, expected value is 0 or 1; for ocular plans, expected value is 1

Attribute Name	Tag	Type	Description	Handling
>Lateral Spreading Device Sequence	(300A,0332)	1C	Introduces sequence of lateral spreading devices associated with beam. Required if Number of Lateral Spreading Devices (300A,0330) is non-zero. The number of items shall be identical to the value of Number of Lateral Spreading Devices (300A,0330).	Supported
>>Lateral Spreading Device Number	(300A,0334)	1	Identification number of the lateral spreading device. The value of Lateral Spreading Device Number (300A,0334) shall be unique within the beam in which it is created.	Supported
>>Lateral Spreading Device ID	(300A,0336)	1	User- or machine-supplied identifier for lateral spreading device.	Supported
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device such as a bar code reader.	Not Supported
>>Lateral Spreading Device Type	(300A,0338)	1	Type of lateral spreading device. Defined terms: <ul style="list-style-type: none"> • SCATTERER = metal placed into the beam path to scatter charged particles laterally • MAGNET = nozzle configuration of magnet devices to expand beam laterally 	Supported
>>Lateral Spreading Device Description	(300A,033A)	3	User-defined description for lateral spreading device.	Not Supported
>Number of Range Modulators	(300A,0340)	1	Number of range modulators associated with current beam.	Supported for ocular treatments only Expected value: 1
>Range Modulator Sequence	(300A,0342)	1C	Introduces sequence of range modulators associated with beam. Required if Number of Range Modulators (300A,0340) is non-zero. The number of items shall be identical to the value of Number of Range Modulators (300A,0340).	Supported for ocular treatments only

Attribute Name	Tag	Type	Description	Handling
>>Range Modulator Number	(300A,0344)	1	Identification number of the range modulator. The value of Range Modulator Number (300A,0344) shall be unique within the Beam in which it is created.	Supported for ocular treatments only Expected value: 1
>>Range Modulator ID	(300A,0346)	1	User- or machine-supplied identifier for range modulator.	Supported for ocular treatments only
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Not Supported
>>Range Modulator Type	(300A,0348)	1	Type of Range Modulator. Defined terms: <ul style="list-style-type: none"> FIXED = fixed modulation width and weights using ridge filter or constant speed wheel with constant beam current WHL_FIXEDWEIGHTS = selected wheel/track (range modulator ID) is spinning at constant speed. Modulation width is adjusted by switching constant beam current on and off at wheel steps indicated by range modulator gating values. WHL_MODWEIGHTS = selected wheel/track (range modulator ID) is spinning at constant speed. Weight per wheel step is adjusted by modulating beam current according to selected Beam Current Modulation ID (300A,034C). Only one item in the Range Modulator Sequence (300A,0342) can have a Range Modulator Type (300A,0348) of WHL_MODWEIGHTS.	Supported for ocular treatments only Expected value: FIXED
>>Range Modulator Description	(300A,034A)	3	User-defined description of range modulator.	Not Supported
>>Beam Current Modulation ID	(300A,034C)	1C	User-supplied identifier for the beam current modulation pattern. Required if Range Modulator Type (300A,0348) is WHL_MODWEIGHTS	Not Supported

Attribute Name	Tag	Type	Description	Handling
>Patient Support Type	(300A,0350)	1	Defined terms: <ul style="list-style-type: none"> • TABLE = Treatment delivery system table • CHAIR = Treatment delivery system chair See section C.8.8.25.6.3. Roundtrip supported.	Supported
>Patient Support ID	(300A,0352)	3	User-specified identifier for manufacturer-specific patient support devices. Roundtrip supported.	Supported
>Patient Accessory Code	(300A,0354)	3	A patient support accessory identifier to be read by a device (e.g., a bar code reader). Roundtrip supported.	Supported
>Fixation Light Azimuthal Angle	(300A,0356)	3	Azimuthal angle (degrees) of the fixation light coordinate around IEC BEAM LIMITING DEVICE Y-axis. Used for eye treatments. See C.8.8.25.6.4.	Supported for ocular treatments only
>Fixation Light Polar Angle	(300A,0358)	3	Polar angle (degrees) of the fixation light coordinate. Used for eye treatments. See C.8.8.25.6.4.	Supported for ocular treatments only
>Fixation Eye	(300A,0150)	3	The eye used for fixation. Enumerated Values: <ul style="list-style-type: none"> • L = left eye • R = right eye 	Supported for ocular treatments only
>Final Cumulative Meterset Weight	(300A,010E)	1C	Value of Cumulative Meterset Weight (300A,0134) for final control point in Ion Control Point Sequence (300A,03A8). Required if Cumulative Meterset Weight is non-null in control points specified within Ion Control Point Sequence. See C.8.8.14.1.	Supported
>Number of Control Points	(300A,0110)	1	Number of control points in beam. Value shall be greater than or equal to 2.	Supported

Attribute Name	Tag	Type	Description	Handling
>Ion Control Point Sequence	(300A,03A8)	1	Introduces sequence of machine configurations describing ion treatment beam. The number of items shall be identical to the value of Number of Control Points (300A,0110). See C.8.8.25.7.	Supported Note: Two control points per energy layer is expected. The second control point contains no weight values for the spots.
>>Control Point Index	(300A,0112)	1	Index of current Control Point, starting at 0 for first control point.	Supported
>>Cumulative Meterset Weight	(300A,0134)	2	Cumulative weight to current control point. Cumulative Meterset Weight for the first item in Control Point Sequence shall always be zero. Cumulative Meterset Weight for the final item in Ion Control Point Sequence shall always be equal to final Cumulative Meterset Weight.	Supported
>>Referenced Dose Reference Sequence	(300C,0050)	3	Introduces a sequence of Dose References for current Beam. One or more items are permitted in this sequence.	Supported
>>>Referenced Dose Reference Number	(300C,0051)	1	Uniquely identifies dose reference specified by Dose Reference Number (300A,0012) in Dose Reference Sequence (300A,0010) in RT prescription module.	Supported
>>>Cumulative Dose Reference Coefficient	(300A,010C)	2	Coefficient used to calculate cumulative dose contribution from this Beam to the referenced Dose Reference at the current Control Point.	Supported
>>Nominal Beam Energy	(300A,0114)	1C	Nominal beam energy at control point in MeV per nucleon. Defined at nozzle entrance before all beam modifiers. Required for first item of control point sequence, or if nominal beam energy changes during beam, and KVP (0018,0060) is not present.	Supported
>>KVP	(0018,0060)	1C	Peak kilo voltage output of the setup x-ray generator to be used. Required for first item of control point sequence, or if KVP changes during setup, and Nominal Beam Energy (300A,0114) is not present.	Not Supported
>>Meterset Rate	(300A,035A)	3	Specifies the speed of delivery of the specified dose in units specified by Primary Dosimeter Unit (300A,00B3) per minute.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>Ion Wedge Position Sequence	(300A,03AC)	1C	Introduces sequence of wedge positions for current control point. Required for first item of ion control point sequence if Number of Wedges (300A,00D0) is non-zero, and in subsequent control points if Wedge Position (300A,0118) or Wedge Thin Edge Position (300A,00DB) changes during beam. The number of items shall be identical to the value of Number of Wedges (300A,00D0).	Not Supported
>>>Referenced Wedge Number	(300C,00C0)	1	Uniquely references wedge described by Wedge Number (300A,00D2) in Wedge Sequence (300A,00D1).	Not Supported
>>>Wedge Position	(300A,0118)	1	Position of wedge at current control point. Enumerated Values: <ul style="list-style-type: none"> • IN • OUT 	Not Supported
>>>Wedge Thin Edge Position	(300A,00DB)	1C	Closest distance from the central axis of the beam along a wedge axis to the thin edge as projected to the machine isocentric plane (mm). Value is positive if the wedge does not cover the central axis, negative if it does. Required if Wedge Type (300A,00D3) of the wedge referenced by Referenced Wedge Number (300C,00C0) is PARTIAL_STANDARD or PARTIAL_MOTORIZ. See C.8.8.25.6.4.	Not Supported
>>Range Shifter Settings Sequence	(300A,0360)	1C	Introduces sequence of range shifter settings for the current control point. One or more items shall be included in this sequence. Required for first item of control point sequence if Number of Range Shifters (300A,0312) is non-zero, or if Range Shifter Setting (300A,0362) changes during beam.	Supported
>>>Referenced Range Shifter Number	(300C,0100)	1	Uniquely references range shifter described by Range Shifter Number (300A,0316) in Range Shifter Sequence (300A,0314).	Supported
>>>Range Shifter Setting	(300A,0362)	1	Machine-specific setting attribute for the range shifter. The specific encoding of this value should be documented in a Conformance Statement. See C.8.8.25.5.	Supported (DICOM validation only) Expected value: IN

Attribute Name	Tag	Type	Description	Handling
>>>Isocenter to Range Shifter Distance	(300A,0364)	3	Isocenter to downstream edge of range shifter (mm) at current control point. See C.8.8.25.4	Supported
>>>Range Shifter Water Equivalent Thickness	(300A,0366)	3	Water-equivalent thickness (in mm) of the range shifter at the central axis for the beam energy incident upon the device.	Supported
>>Lateral Spreading Device Settings Sequence	(300A,0370)	1C	Introduces sequence of lateral spreading device settings for the current control point. One or more items shall be included in this sequence. Required for first item of control point sequence if Number of Lateral Spreading Devices (300A,0330) is non-zero, or if Lateral Spreading Device Setting (300A,0372) changes during beam.	Supported
>>>Referenced Lateral Spreading Device Number	(300C,0102)	1	Uniquely references lateral spreading device described by Lateral Spreading Device Number (300A,0334) in Lateral Spreading Device Sequence (300A,0332).	Supported
>>>Lateral Spreading Device Setting	(300A,0372)	1	Machine-specific setting attribute for the lateral spreading device. The specific encoding of this value should be documented in a Conformance Statement. See C.8.8.25.5.	Supported Expected value: IN
>>>Isocenter to Lateral Spreading Device Distance	(300A,0374)	3	Isocenter to downstream edge of lateral spreading device (mm) at current control point. See C.8.8.25.4	Supported
>>>Lateral Spreading Device Water Equivalent Thickness	(300A,033C)	3	Water-equivalent thickness (in mm) of the lateral spreading device at the central axis for the beam energy incident upon the device.	Supported
>>Range Modulator Settings Sequence	(300A,0380)	1C	Introduces sequence of range modulator settings for current control point. One or more items shall be included in this sequence. Required for first item of control point sequence if Number of Range Modulators (300A,0340) is non-zero, or if range modulator setting changes during beam.	Supported for ocular treatments only
>>>Referenced Range Modulator Number	(300C,0104)	1	Uniquely references range modulator described by Range Modulator Number (300A,0344) in Range Modulator Sequence (300A,0342).	Supported for ocular treatments only

Attribute Name	Tag	Type	Description	Handling
>>>Range Modulator Gating Start Value	(300A,0382)	1C	Start value defines the range modulator position at which the beam is switched on. Required if Range Modulator Type (300A,0348) of the range modulator referenced by Referenced Range Modulator Number (300C,0104) is WHL_MODWEIGHTS or WHL_FIXEDWEIGHTS.	Not Supported
>>>Range Modulator Gating Stop Value	(300A,0384)	1C	Stop value defines the range modulator position at which the beam is switched off. Required if Range Modulator Type (300A,0348) of the range modulator referenced by Referenced Range Modulator Number (300C,0104) is WHL_MODWEIGHTS or WHL_FIXEDWEIGHTS.	Not Supported
>>>Range Modulator Gating Start Water Equivalent Thickness	(300A,0386)	3	If Range Modulator Type (300A,0348) is WHL_MODWEIGHTS or WHL_FIXEDWEIGHTS: Water-equivalent thickness (in mm) of the range modulator at the position specified by Range Modulator Gating Start Value (300A,0382). If Range Modulator Type (300A,0348) is FIXED: Minimum water-equivalent thickness (in mm) of the range modulator.	Supported
>>>Range Modulator Gating Stop Water Equivalent Thickness	(300A,0388)	3	If Range Modulator Type (300A,0348) is WHL_MODWEIGHTS or WHL_FIXEDWEIGHTS: Water-equivalent thickness (in mm) of the range modulator at the position specified by Range Modulator Gating Stop Value (300A,0384). If Range Modulator Type (300A,0348) is FIXED: Maximum water-equivalent thickness (in mm) of the range modulator.	Not Supported
>>>Isocenter to Range Modulator Distance	(300A,038A)	3	Isocenter to downstream edge of range modulator (mm) at current control point. See C.8.8.25.4.	Supported
>>Gantry Angle	(300A,011E)	1C	Gantry angle of radiation source, i.e., orientation of IEC GANTRY coordinate system with respect to IEC FIXED REFERENCE coordinate system (degrees). Required for first item of control point sequence, or if gantry angle changes during beam.	Supported For ocular treatments, expected value is 90 degrees (included for Plan Integrity Hash calculation)

Attribute Name	Tag	Type	Description	Handling
>>Gantry Rotation Direction	(300A,011F)	1C	Direction of gantry rotation when viewing gantry from isocenter, for segment following control point. Required for first item of control point sequence, or if gantry rotation direction changes during beam. See C.8.8.14.8. Enumerated values: <ul style="list-style-type: none"> • CW = clockwise • CC = counter-clockwise • NONE = no rotation 	Supported
>>Gantry Pitch Angle	(300A,014A)	2C	Gantry pitch angle of the radiation source, i.e., the rotation of the IEC GANTRY coordinate system about the X-axis of the IEC GANTRY coordinate system (degrees). Required for first item of control point sequence, or if gantry pitch rotation angle changes during beam. See C.8.8.25.6.5.	Supported (DICOM validation only)
>>Gantry Pitch Rotation Direction	(300A,014C)	2C	Direction of gantry pitch angle when viewing along the positive X-axis of the IEC GANTRY coordinate system, for segment following control point. Required for first item of control point sequence, or if gantry pitch rotation direction changes during beam. See C.8.8.14.8 and C.8.8.25.6.5. Enumerated values: <ul style="list-style-type: none"> • CW = clockwise • CC = counter-clockwise • NONE = no rotation 	Supported Expected value: NONE
>>Beam Limiting Device Angle	(300A,0120)	1C	Beam limiting device angle, i.e., orientation of IEC BEAM LIMITING DEVICE coordinate system with respect to IEC GANTRY coordinate system (degrees). Required for first item of control point sequence, or if beam limiting device angle changes during beam.	Supported Expected value: 0

Attribute Name	Tag	Type	Description	Handling
>>Beam Limiting Device Rotation Direction	(300A,0121)	1C	Direction of beam limiting device rotation when viewing beam limiting device (collimator) from radiation source, for segment following control point. Required for first item of control point sequence, or if beam limiting device rotation direction changes during beam. See C.8.8.14.8. Enumerated values: <ul style="list-style-type: none"> • CW = clockwise • CC = counter-clockwise • NONE = no rotation 	Supported Expected value: NONE
>>Scan Spot Tune ID	(300A,0390)	1C	User-supplied or machine code identifier for machine configuration to produce beam spot. This may be the nominal spot size or some other machine-specific value. Required if Scan Mode (300A,0308) is MODULATED.	Supported Expected values: "4.0" or 4
>>Number of Scan Spot Positions	(300A,0392)	1C	Number of spot positions used to specify scanning pattern for current segment beginning at control point. Required if Scan Mode (300A,0308) is MODULATED.	Supported
>>Scan Spot Position Map	(300A,0394)	1C	The x and y coordinates of the scan spots are defined as projected onto the machine isocentric plane in the IEC GANTRY coordinate system (mm). Required if Scan Mode (300A,0308) is MODULATED. Contains 2N values where N is the Number of Scan Spot Positions (300A,0392).	Supported
>>Scan Spot Meterset Weights	(300A,0396)	1C	A data set of meterset weights corresponding to scan spot positions. The order of weights matches the positions in Scan Spot Positions (300A,0394). The sum contained in all meterset weights shall match the difference of the cumulative meterset weight of the current control point to the following control point. Required if Scan Mode (300A,0308) is MODULATED.	Supported
>>Scanning Spot Size	(300A,0398)	3	The scanning spot size as calculated using the full width half maximum (FWHM). Specified by a numeric pair: the size measured in air at isocenter in the IEC GANTRY X direction followed by the size in the IEC GANTRY Y direction (mm).	Supported

Attribute Name	Tag	Type	Description	Handling
>>Number of Paintings	(300A,039A)	1C	The number of times the scan pattern given by Scan Spot Position Map (300A,0394) and Scan Spot Meterset Weights (300A,0396) shall be applied at the current control point. To obtain the meterset weight per painting, the values in the Scan Spot Meterset Weights (300A,0396) should be divided by the value of this attribute. Required if Scan Mode (300A,0308) is MODULATED.	Supported (DICOM validation only) Expected value: 1
>>Patient Support Angle	(300A,0122)	1C	Patient support angle, i.e., orientation of IEC PATIENT SUPPORT (turntable) coordinate system with respect to IEC FIXED REFERENCE coordinate system (degrees). Required for first item of control point sequence, or if patient support angle changes during beam.	Supported
>>Patient Support Rotation Direction	(300A,0123)	1C	Direction of patient support rotation when viewing table from above, for segment following control point. Required for first item of control point sequence, or if patient support rotation direction changes during beam. See C.8.8.14.8. Enumerated values: <ul style="list-style-type: none"> • CW = clockwise • CC = counter-clockwise • NONE = no rotation 	Supported
>>Table Top Pitch Angle	(300A,0140)	2C	Table top pitch angle, i.e., the rotation of the IEC TABLE TOP coordinate system about the X-axis of the IEC TABLE TOP coordinate system (degrees). Required for first item of control point sequence, or if table top pitch angle changes during beam. See C.8.8.25.6.2.	Supported

Attribute Name	Tag	Type	Description	Handling
>>Table Top Pitch Rotation Direction	(300A,0142)	2C	<p>Direction of table top pitch rotation when viewing the table along the positive X-axis of the IEC TABLE TOP coordinate system, for segment following control point.</p> <p>Required for first item of control point sequence, or if table top pitch rotation direction changes during beam. See C.8.8.14.8 and C.8.8.25.6.2.</p> <p>Enumerated values:</p> <ul style="list-style-type: none"> • CW = clockwise • CC = counter-clockwise • NONE = no rotation 	Supported Valid value: NONE
>>Table Top Roll Angle	(300A,0144)	2C	<p>Table top roll angle, i.e., the rotation of the IEC TABLE TOP coordinate system about the Y-axis of the IEC TABLE TOP coordinate system (degrees).</p> <p>Required for first item of control point sequence, or if table top roll angle changes during beam. See C.8.8.25.6.2.</p>	Supported
>>Table Top Roll Rotation Direction	(300A,0146)	2C	<p>Direction of table top roll rotation when viewing the table along the positive Y-axis of the IEC TABLE TOP coordinate system, for segment following control point.</p> <p>Required for first item of control point sequence, or if table top roll rotation direction changes during beam. See C.8.8.14.8 and C.8.8.25.6.2.</p> <p>Enumerated values:</p> <ul style="list-style-type: none"> • CW = clockwise • CC = counter-clockwise • NONE = no rotation 	Supported Valid value: NONE
>>Head Fixation Angle	(300A,0148)	3	<p>Angle (in degrees) of the head fixation for eye treatments with respect to the Table Top Pitch Angle (300A,0140) coordinate system. Positive head fixation angle is the same direction as positive table top pitch. See C.8.8.25.6.4.</p>	Supported (ocular plans only)
>>Table Top Vertical Position	(300A,0128)	2C	<p>Table top vertical position in IEC TABLE TOP coordinate system (mm).</p> <p>Required for first item of control point sequence, or if table top vertical position changes during beam. See C.8.8.14.6.</p> <p>For ocular plans, this value maps to Chair Vertical Position.</p>	Supported

Attribute Name	Tag	Type	Description	Handling
>>Table Top Longitudinal Position	(300A,0129)	2C	Table top longitudinal position in IEC TABLE TOP coordinate system (mm). Required for first item of control point sequence, or if table top longitudinal position changes during beam. See C.8.8.14.6. For ocular plans, this value maps to Chair Longitudinal Position.	Supported
>>Table Top Lateral Position	(300A,012A)	2C	Table top lateral position in IEC TABLE TOP coordinate system (mm). Required for first item of control point sequence, or if table top lateral position changes during beam. See C.8.8.14.6. For ocular plans, this value maps to Chair Lateral Position.	Supported
>>Snout Position	(300A,030D)	2C	Axial position of the snout (in mm) measured from isocenter to the downstream side of the snout (without consideration of variable length elements such as blocks, MLC, and/or compensators). Required for first item in control point sequence, or if snout position changes during beam.	Supported For ocular plans, the value is defaulted to 0.0
>>Isocenter Position	(300A,012C)	2C	Isocenter coordinates (x,y,z) in the patient based coordinate system described in C.7.6.2.1.1 (mm). Required for first item of segment control point sequence, or if segment isocenter position changes during beam.	Supported
>>Surface Entry Point	(300A,012E)	3	Patient surface entry point coordinates (x,y,z), along the central axis of the beam, in the patient based coordinate system described in C.7.6.2.1.1 (mm).	Not Supported
>Range (Planned Distal Target Distance)	(300B,xx04)	3		Import/Export Supported
>Nominal SOBP Width	(300B,xx0E)	3		Import/Export Supported

A.2.12 Approval – C.8.8.16

Attribute Name	Tag	Type	Description	Handling
Approval Status	(300E,0002)	1	Approval status at the time the SOP Instance was created. Enumerated values: <ul style="list-style-type: none"> APPROVED = Reviewer recorded that object met an implied criterion UNAPPROVED = No review of object has been recorded REJECTED = Reviewer recorded that object failed to meet an implied criterion 	Supported
Review Date	(300E,0004)	2C	Date on which object was reviewed. Required if Approval Status (300E,0002) is APPROVED or REJECTED.	Supported
Review Time	(300E,0005)	2C	Time at which object was reviewed. Required if Approval Status (300E,0002) is APPROVED or REJECTED.	Supported
Reviewer Name	(300E,0008)	2C	Name of person who reviewed object. Required if Approval Status (300E,0002) is APPROVED or REJECTED.	Supported

A.2.13 SOP Common – C.12.1

Attribute Name	Tag	Type	Description	Handling
SOP Class UID	(0008,0016)	1	Approval status at the time the SOP instance was created. Enumerated values: <ul style="list-style-type: none"> APPROVED = Reviewer recorded that object met an implied criterion UNAPPROVED = No review of object has been recorded REJECTED = Reviewer recorded that object failed to meet an implied criterion 	Supported
SOP Instance UID	(0008,0018)	1	Uniquely identifies the SOP instance. See C.12.1.1.1 for further explanation. See also PS 3.4.	Supported

Attribute Name	Tag	Type	Description	Handling
Specific Character Set	(0008,0005)	1C	Character set that expands or replaces the basic graphic set. Required if an expanded or replacement character set is used. See C.12.1.1.2 for defined terms.	Supported (DICOM validation only) Supported character set depends on client operating system version. No character translation is performed other than reading/writing contents of DICOM string attributes in corresponding Varian System Database attributes. Also, no support for multiple character sets within a single attribute.
Instance Creation Date	(0008,0012)	3	Date the SOP instance was created.	Supported
Instance Creation Time	(0008,0013)	3	Time the SOP instance was created.	Supported
Instance Creator UID	(0008,0014)	3	Uniquely identifies device which created the SOP instance.	Supported
Related General SOP Class UID	(0008,001A)	3	Uniquely identifies a related general SOP class for the SOP class of this instance. See PS 3.4.	Not Supported
Original Specialized SOP Class UID	(0008,001B)	3	The SOP class in which the Instance was originally encoded, but which has been replaced during a fall-back conversion to the current related general SOP class. See PS 3.4.	Not Supported
Coding Scheme Identification Sequence	(0008,0110)	3	Sequence of items that map values of Coding Scheme Designator (0008,0102) to an external coding system registration, or to a private or local coding scheme. One or more Items are permitted in this sequence.	Not Supported
>Coding Scheme Designator	(0008,0102)	1	The value of a coding scheme designator, used in this SOP instance, which is being mapped.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>Coding Scheme Registry	(0008,0112)	1C	The name of the external registry where further definition of the identified coding scheme may be obtained. Required if coding scheme is registered. Defined term: HL7.	Not Supported
>Coding Scheme UID	(0008,010C)	1C	The coding scheme UID identifier. Required if coding scheme is identified by an ISO 8824 object identifier compatible with the UI VR.	Not Supported
>Coding Scheme External ID	(0008,0114)	2C	The coding scheme identifier as defined in an external registry. Required if coding scheme is registered and Coding Scheme UID (0008,010C) is not present.	Not Supported
>Coding Scheme Name	(0008,0115)	3	The coding scheme full common name	Not Supported
>Coding Scheme Version	(0008,0103)	3	The coding scheme version associated with the Coding Scheme Designator (0008,0102).	Not Supported
>Coding Scheme Responsible Organization	(0008,0116)	3	Name of the organization responsible for the coding scheme. May include organizational contact information.	Not Supported

Attribute Name	Tag	Type	Description	Handling
Timezone Offset From UTC	(0008,0201)	3	<p>Contains the offset from UTC to the timezone for all DA and TM attributes present in this SOP instance, and for all DT attributes present in this SOP instance that do not contain an explicitly encoded timezone offset.</p> <p>Encoded as an ASCII string in the format "&ZZXX". The components of this string, from left to right, are & = "+" or "-", and ZZ = Hours and XX = Minutes of offset. Leading space characters shall not be present. The offset for UTC shall be +0000; -0000 shall not be used.</p> <p>Notes:</p> <ul style="list-style-type: none"> a) This encoding is the same as described in PS 3.5 for the offset component of the DT value representation. b) This attribute does not apply to values with a DT value representation that contains an explicitly encoded timezone offset. c) The corrected time may cross a 24-hour boundary. For example, if Local Time = 1.00 a.m. and Offset = +0200, then UTC = 11.00 p.m. (23.00) the day before. d) The "+" sign may not be omitted. <p>Time earlier than UTC is expressed as a negative offset. For example: UTC = 5.00 a.m. Local Time = 3.00 a.m. Offset = -0200 The local timezone offset is undefined if this attribute is absent.</p>	Not Supported
Contributing Equipment Sequence	(0018,A001)	3	<p>Sequence of items containing descriptive attributes of related equipment which has contributed to the acquisition, creation, or modification of the composite instance.</p> <p>One or more items are permitted in this sequence. See C.12.1.1.5 for further explanation.</p>	Not Supported
>Purpose of Reference Code Sequence	(0040,A170)	1	<p>Describes the purpose for which the related equipment is being referenced.</p> <p>Only a single Item shall be included in this sequence. See C.12.1.1.5 for further explanation.</p>	Not Supported

Attribute Name	Tag	Type	Description	Handling
>Manufacturer	(0008,0070)	1	Manufacturer of the equipment that contributed to the composite instance.	Not Supported
>Institution Name	(0008,0080)	3	Institution where the equipment that contributed to the composite instance is located.	Not Supported
>Institution Address	(0008,0081)	3	Address of the institution where the equipment that contributed to the composite instance is located.	Not Supported
>Station Name	(0008,1010)	3	User-defined name identifying the machine that contributed to the composite instance.	Not Supported
>Institutional Department Name	(0008,1040)	3	Department in the institution where the equipment that contributed to the composite instance is located.	Not Supported
>Operators' Name	(0008,1070)	3	Name(s) of the operator(s) of the contributing equipment.	Not Supported
>Operator Identification Sequence	(0008,1072)	3	Identification of the operator(s) of the contributing equipment. One or more items are permitted in this sequence. The number and order of Items shall correspond to the the number and order of values of Operators' Name (0008,1070), if present.	Not Supported
>Manufacturer's Model Name	(0008,1090)	3	Manufacturer's model name of the equipment that contributed to the composite instance.	Not Supported
>Device Serial Number	(0018,1000)	3	Manufacturer's serial number of the equipment that contributed to the composite instance.	Not Supported
>Software Versions	(0018,1020)	3	Manufacturer's designation of the software version of the equipment that contributed to the composite instance. See Section C.7.5.1.1.3.	Not Supported
>Spatial Resolution	(0018,1050)	3	The inherent limiting resolution in mm of the acquisition equipment for high contrast objects for the data gathering and reconstruction technique chosen. If variable across the images of the series, the value at the image center.	Not Supported
>Date of Last Calibration	(0018,1200)	3	Date when the image acquisition device calibration was last changed in any way. Multiple entries may be used for additional calibrations at other times. See C.7.5.1.1.1 for further explanation.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>Time of Last Calibration	(0018,1201)	3	Time when the image acquisition device calibration was last changed in any way. Multiple entries may be used. See C.7.5.1.1.1 for further explanation.	Not Supported
>Contribution DateTime	(0018,A002)	3	The date and time when the equipment contributed to the composite instance.	Not Supported
>Contribution Description	(0018,A003)	3	Description of the contribution the equipment made to the composite instance.	Not Supported
Instance Number	(0020,0013)	3	A number that identifies this composite object instance.	Not Supported
SOP Instance Status	(0100,0410)	3	A flag that indicates the storage status of the SOP Instance. Not Specified (NS) implies that this SOP Instance has no special storage status, and hence no special actions need be taken. Original (OR) implies that this is the primary SOP instance for the purpose of storage, but that it has not yet been authorized for diagnostic use. Authorized Original (AO) implies that this is the primary SOP instance for the purpose of storage, which has been authorized for diagnostic use. Any copies of an authorized original should be given the status of authorized copy. Authorized Copy (AC) implies that this is a copy of an authorized original SOP instance. Enumerated values: <ul style="list-style-type: none"> • NS • OR • AO • AC Note: Proper use of these flags is specified in Security Profiles. Implementations that do not conform to the Security Profiles may not necessarily handle these flags properly.	Not Supported
SOP Authorization DateTime	(0100,0420)	3	The date and time when the SOP Instance Status (0100,0410) was set to AO.	Not Supported
SOP Authorization Comment	(0100,0424)	3	Any comments associated with the setting of the SOP Instance Status (0100,0410) to AO.	Not Supported

Attribute Name	Tag	Type	Description	Handling
Authorization Equipment Certification Number	(0100,0426)	3	The certification number issued to the Application Entity that set the SOP Instance Status (0100,0410) to AO.	Not Supported
Encrypted Attributes Sequence	(0400,0500)	1C	Sequence of Items containing encrypted DICOM data. One or more Items shall be included in this sequence. Required if application level confidentiality is needed and certain recipients are allowed to decrypt all or portions of the encrypted attributes data set. See C.12.1.1.4.1.	Not Supported
>Encrypted Content Transfer Syntax UID	(0400,0510)	1	Transfer syntax used to encode the encrypted content. Only transfer syntaxes that explicitly include the VR and use little-endian encoding shall be used.	Not Supported
>Encrypted Content	(0400,0520)	1	Encrypted data. See C.12.1.1.4.2.	Not Supported
Original Attributes Sequence	(0400,0561)	3	Sequence of Items containing all attributes that were removed or replaced by other values in the main dataset. One or more items are permitted in this sequence.	Not Supported
>Source of Previous Values	(0400,0564)	2	The source that provided the SOP Instance prior to the removal or replacement of the values. For example, this might be the institution from which imported SOP instances were received.	Not Supported
>Attribute Modification DateTime	(0400,0562)	1	Date and time the attributes were removed and/or replaced.	Not Supported
>Modifying System	(0400,0563)	1	Identification of the system which removed and/or replaced the attributes.	Not Supported
>Reason for the Attribute Modification	(0400,0565)	1	Reason for the attribute modification. Defined terms: <ul style="list-style-type: none"> • COERCE = Replace values of attributes (e.g., patient name, ID, accession number); for example, during import of media from an external institution, or reconciliation against a master patient index. • CORRECT = Replace incorrect values (e.g., patient name or ID); for example, when incorrect worklist item was chosen or operator input error. 	Not Supported

Attribute Name	Tag	Type	Description	Handling
>Modified Attributes Sequence	(0400,0550)	1	Sequence that contains all the attributes, with their previous values, that were modified or removed from the main data set. Only a single Item shall be included in this sequence.	Not Supported
HL7 Structured Document Reference Sequence	(0040,A390)	1C	Sequence of items defining mapping between HL7 instance identifiers of unencapsulated HL7 structured documents referenced from the current SOP instance as if they were DICOM composite SOP class instances defined by SOP class and instance UID pairs. May also define a means of accessing the documents. One or more Items shall be included in this sequence. See C.12.1.1.6. Required if unencapsulated HL7 structured documents are referenced within the Instance. Every such document so referenced is required to have a corresponding Item in this sequence.	Not Supported
>HL7 Instance Identifier	(0040,E001)	1	Instance identifier of the referenced HL7 structured document, encoded as a UID (OID or UUID), concatenated with a caret (“^”) and extension value (if extension is present in instance identifier).	Not Supported
>Retrieve URI	(0040,E010)	3	Retrieval access path to HL7 structured document. Includes fully specified scheme, authority, path, and query in accordance with RFC 2396.	Not Supported
Longitudinal Temporal Information Modified	(0028,0303)	3	Indicates whether or not the date and time attributes in the instance have been modified during de-identification. Enumerated values: <ul style="list-style-type: none"> • UNMODIFIED • MODIFIED • REMOVED See PS 3.15.	Not Supported

A.2.14 Extended Interface – Private

Attribute Name	Tag	Type	Description	Handling
Extended Interface Format	(3253,XX02)	1	Identifier string defining format of Extended InterfaceData (3253,xx00). Applications should be able to unambiguously map this string to an XML schema definition.	Supported Expected value: The xsd definition described in the Varian System Server DICOM Conformance Statement (see Ref [3]) is applicable to the ProBeam DICOM Conformance Statement.
Extended Interface Data	(3253,XX00)	1	Contains private extensions as an XML stream. Schema of XML is defined by Extended Interface Format (3253,xx02).	Supported
Extended Interface Length	(3253,XX01)	1	Length of XML stream contained in Extended Interface Data (3253,xx00). Usually, is equal to attribute length of Extended Interface Data (3253,xx00) if length is even, and is one less than attribute length if length is odd.	Supported

A.2.15 RT General Treatment Record Module - C.8.8.17

Attribute Name	Tag	Type	Description	Handling
Instance Number	(0020,0013)	1	Instance number identifying this particular instance of the object.	Supported
Treatment Date	(3008,0250)	2	Date when current fraction was delivered, or date when last fraction was delivered in case of RT treatment summary record IOD. ¹	Supported
Treatment Time	(3008,0251)	2	Time when current fraction was delivered (begun), or Time when last fraction was delivered (begun) in case of RT treatment summary record IOD. ¹	Supported
Referenced RT Plan Sequence	(300C,0002)	2	Reference to a RT plan. Zero or one Item shall be included in this sequence.	Supported

Attribute Name	Tag	Type	Description	Handling
Referenced SOP Class UID	(0008,1156)	1C	Uniquely identifies the referenced SOP Class. Required if Referenced RT Plan Sequence (300C,0002) is sent. Roundtrip supported.	Supported
Referenced SOP Instance UID	(0008,1155)	1C	Uniquely identifies the referenced SOP Instance. Required if Referenced RT Plan Sequence (300C,0002) is sent. Roundtrip supported.	Supported
Referenced Treatment Record Sequence	(3008,0030)	3	Reference to RT treatment records to which the current RT treatment record is significantly related. One or more Items are permitted in this sequence.	Not Supported

¹The attributes Treatment Date (3008,0250) and Treatment Time (3008,0251) can be used to chronologically order a sequence of treatments, where each treatment is represented by an instance of an RT Beams Treatment Record or RT Brachy Treatment Record. In the case of a RT Treatment Summary Record, the instance can be used to identify the period for which the treatment summary is valid. Therefore, implementers are strongly advised to include values for these attributes whenever possible.

A.2.16 RT Treatment Machine Record Module - C.8.8.18

Attribute Name	Tag	Type	Description	Handling
Treatment Machine Sequence	(300A,0206)	1	Introduces sequence describing treatment machine used for treatment delivery. Only a single item shall be included in this sequence.	Supported
>Treatment Machine Name	(300A,00B2)	2	User-defined name identifying treatment machine used for treatment delivery.	Supported
>Manufacturer	(0008,0070)	2	Manufacturer of the equipment used for treatment delivery.	Supported
>Institution Name	(0008,0080)	2	Institution where the equipment is located that was used for treatment delivery.	Supported
>Institution Address	(0008,0081)	3	Mailing address of the institution where the equipment is located that was used for treatment delivery.	Not Supported
>Institutional Department Name	(0008,1040)	3	Department in the institution where the equipment is located that was used for treatment delivery.	Not Supported
>Manufacturer's Model Name	(0008,1090)	2	Manufacturer's model name of the equipment used for treatment delivery.	Supported

Attribute Name	Tag	Type	Description	Handling
>Device Serial Number	(0018,1000)	2	Manufacturer's serial number of the equipment used for treatment delivery.	Supported

A.2.17 RT Treatment Summary Record Module - C.8.8.23

Attribute Name	Tag	Type	Description	Handling
Current Treatment Status	(3008,0200)	1	Status of the treatment at the time the treatment summary was created. Enumerated values: <ul style="list-style-type: none"> • NOT_STARTED • ON_TREATMENT • ON_BREAK • SUSPENDED • STOPPED • COMPLETED See C.8.8.23.1.	Supported
Treatment Status Comment	(3008,0202)	3	Comment on current treatment status.	Not Supported
First Treatment Date	(3008,0054)	2	Date of delivery of the first treatment.	Supported
Most Recent Treatment Date	(3008,0056)	2	Date of delivery of the most recent administration.	Supported
Fraction Group Summary Sequence	(3008,0220)	3	Introduces sequence describing current state of planned vs. delivered fraction groups. Exactly one item is permitted in this sequence.	Supported
>Referenced Fraction Group Number	(300C,0022)	3	References Fraction Group Number (300A,0071) in Fraction Group Sequence (300A,0070) in the referenced RT plan.	Supported
>Fraction Group Type	(3008,0224)	2	Indicates type of fraction group. Enumerated values: <ul style="list-style-type: none"> • EXTERNAL_BEAM • BRACHY 	Supported Expected value: EXTERNAL_BEAM
>Number of Fractions Planned	(300A,0078)	2	Number of fractions planned for this fraction group.	Supported
>Number of Fractions Delivered	(3008,005A)	2	Number of fractions delivered as of treatment summary report.	Supported

Attribute Name	Tag	Type	Description	Handling
>Fraction Status Summary Sequence	(3008,0240)	3	Introduces sequence describing status of fractions in fraction group. One or more Items are permitted in this sequence.	Supported
>>Referenced Fraction Number	(3008,0223)	1	Identifies fraction.	Supported
>>Treatment Date	(3008,0250)	2	Date when fraction was delivered.	Supported
>>Treatment Time	(3008,0251)	2	Time when fraction was delivered.	Supported
>>Treatment Termination Status	(3008,002A)	2	Conditions under which treatment was terminated. Enumerated values: <ul style="list-style-type: none"> • NORMAL = treatment terminated normally • OPERATOR = operator terminated treatment • MACHINE = machine terminated treatment for other than NORMAL condition • UNKNOWN = status at termination unknown 	Supported
Treatment Summary Measured Dose Reference Sequence	(3008,00E0)	3	Introduces sequence of references to measured dose references. One or more Items are permitted in this sequence.	Supported
>Referenced Dose Reference Number	(300C,0051)	3	Uniquely identifies dose reference specified by Dose Reference Number (300A,0012) in Dose Reference Sequence (300A,0010) in RT prescription module of referenced RT plan referenced in Referenced RT Plan Sequence (300C,0002) of RT general treatment record module.	Supported
>Dose Reference Description	(300A,0016)	3	User-defined description of dose reference.	Supported
>Cumulative Dose to Dose Reference	(3008,0052)	1	Cumulative dose delivered to dose reference (Gy).	Supported
Treatment Summary Calculated Dose Reference Sequence	(3008,0050)	3	Introduces sequence of references to calculated dose references. One or more Items are permitted in this sequence.	Supported
>Referenced Dose Reference Number	(300C,0051)	3	Uniquely identifies dose reference specified by Dose Reference Number (300A,0012) in Dose Reference Sequence (300A,0010) in RT prescription module of referenced RT plan referenced in Referenced RT Plan Sequence (300C,0002) of RT general treatment record module.	Supported
>Dose Reference Description	(300A,0016)	3	User-defined description of dose reference.	Supported

Attribute Name	Tag	Type	Description	Handling
>Cumulative Dose to Dose Reference	(3008,0052)	1	Cumulative dose delivered to dose reference (Gy).	Supported
Additional Dose Value Sequence	(3259,xx00)	3	Introduces sequence of actual session dose. The sequence can contain one or more items.	Supported
>Referenced Dose Reference Number	(300C,0051)	3	Uniquely identifies Dose Reference specified by Dose Reference Number (300A,0012) in Dose Reference Sequence (300A,0010) in RT Prescription Module in RT Plan referenced in Referenced RT Plan Sequence (300C,0002) of RT General Treatment Record Module. Export supported.	Supported
>Actual Session Dose	(3259,xx02)	1C	Delivered session dose of actual session. Required if Actual Session Dose Sequence is sent. Export supported. Value: Total dose delivered to reference point on currently active session.	Supported
>Daily Dose	(3259,xx04)	1C	Total dose of current day. Required if Actual Session Dose Sequence is sent. Export supported. Value: Total dose delivered today to reference point.	Supported

A.2.18 RT Ion Beams Session Record Module - C.8.8.26

Attribute Name	Tag	Type	Description	Handling
Referenced Fraction Group Number	(300C,0022)	3	Identifier of fraction group within referenced RT ion plan.	Supported
Number of Fractions Planned	(300A,0078)	2	Total number of treatments (fractions) planned for current fraction group.	Supported
Primary Dosimeter Unit	(300A,00B3)	1	Measurement unit of the machine dosimeter. Enumerated values: <ul style="list-style-type: none"> • MU = Monitor Units • NP = Number of Particles 	Supported Expected value: MU
Treatment Session Ion Beam Sequence	(3008,0021)	1	Introduces sequence of setup and/or treatment beams administered during treatment session. One or more items shall be included in this sequence.	Supported

Attribute Name	Tag	Type	Description	Handling
>Referenced Beam Number	(300C,0006)	1	References beam specified by Beam Number (300A,00C0) in Ion Beam Sequence (300A,03A2) in RT ion beams module within the referenced RT ion plan.	Supported
>Beam Extended Interface	(3261,xx2A)	3	XML stream for the RT Beams Session Record Extended Interface Roundtrip. Contains information in XML format about dose overrides, tray specifications, and additional override user names.	Supported
>Beam Name	(300A,00C2)	1	User-defined name for beam. See C.8.8.25.1.	Supported
>Beam Description	(300A,00C3)	3	User-defined description for beam. See C.8.8.25.1. The treatment notes entered by the therapist go here. The treatment notes are applicable to the session, and are populated in all treatment records.	Supported
>Beam Type	(300A,00C4)	1	Motion characteristic of beam. Enumerated values: <ul style="list-style-type: none"> • STATIC = all beam parameters remain unchanged during delivery • DYNAMIC = one or more beam parameters changes during delivery 	Supported Expected value: STATIC
>Radiation Type	(300A,00C6)	1	Particle type of beam. Defined terms: <ul style="list-style-type: none"> • PHOTON • PROTON • ION 	Supported Expected value: PROTON
>Radiation Mass Number	(300A,0302)	1C	Mass number of radiation. Required if Radiation Type (300A,00C6) is ION.	Not Supported
>Radiation Atomic Number	(300A,0304)	1C	Atomic number of radiation. Required if Radiation Type (300A,00C6) is ION.	Not Supported
>Radiation Charge State	(300A,0306)	1C	Charge state of radiation. Required if Radiation Type (300A,00C6) is ION.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>Scan Mode	(300A,0308)	1	The method of beam scanning used during treatment. Defined terms: <ul style="list-style-type: none"> • NONE = No beam scanning is performed • UNIFORM = The beam is scanned between control points to create a uniform lateral fluence distribution across the field • MODULATED = The beam is scanned between control points to create a modulated lateral fluence distribution across the field 	Supported For ocular treatments, expected value is NONE; in other cases, expected value is MODULATED.
>Referenced Tolerance Table Number	(300C,00A0)	3	Uniquely identifies ion tolerance table specified by Tolerance Table Number (300A,0042) within ion tolerance table sequence in RT ion tolerance tables module. These tolerances are to be used for verification of treatment machine settings.	Supported
>Beam Limiting Device Leaf Pairs Sequence	(3008,00A0)	3	Introduces sequence of beam-limiting device (collimator) jaw or leaf (element) sets. One or more items are permitted in this sequence.	Not Supported
>>RT Beam Limiting Device Type	(300A,00B8)	1	Type of beam limiting device (collimator). Enumerated values: <ul style="list-style-type: none"> • X = symmetric jaw pair in IEC X direction • Y = symmetric jaw pair in IEC Y direction • ASYMX = asymmetric jaw pair in IEC X direction • ASYMY = asymmetric pair in IEC Y direction • MLCX = multileaf (multi-element) jaw pair in IEC X direction • MLCY = multileaf (multi-element) jaw pair in IEC Y direction 	Not Supported
>>Number of Leaf/Jaw Pairs	(300A,00BC)	1	Number of leaf (element) or jaw pairs (equal to 1 for standard beam limiting device jaws).	Not Supported
>Referenced Patient Setup Number	(300C,006A)	3	Uniquely identifies ion patient setup to be used for current beam, specified by Patient Setup Number (300A,0182) within patient setup sequence of RT patient setup module.	Supported

Attribute Name	Tag	Type	Description	Handling
>Referenced Verification Image Sequence	(300C,0040)	3	Introduces sequence of verification images obtained during delivery of current beam. One or more items are permitted in this sequence. See C.8.8.14.2.	Not Supported
>Referenced Measured Dose Reference Sequence	(3008,0080)	3	Introduces sequence of doses measured during treatment delivery for current beam. One or more Items are permitted in this sequence.	Not Supported
>>Referenced Dose Reference Number	(300C,0051)	1C	Uniquely references dose reference specified by Dose Reference Number (300A,0012) in Dose Reference Sequence (300A,0010) in RT prescription module of referenced RT ion plan. Required if Referenced Measured Dose Reference Number (3008,0082) is not sent.	Not Supported
>>Referenced Measured Dose Reference Number	(3008,0082)	1C	Uniquely references measured dose reference specified by Measured Dose Reference Number (3008,0064) in Measured Dose Reference Sequence (3008,0010). Required if Referenced Dose Reference Number (300C,0051) is not sent.	Not Supported
>>Measured Dose Value	(3008,0016)	1	Measured dose in units specified by Dose Units (3004,0002) in sequence referenced by Measured Dose Reference Sequence (3008,0010) or Dose Reference Sequence (300A,0010) in RT prescription module of Referenced RT ion plan as defined above.	Not Supported
>Referenced Calculated Dose Reference Sequence	(3008,0090)	3	Introduces sequence of doses estimated for each treatment delivery. One or more Items are permitted in this sequence.	Supported
>>Referenced Dose Reference Number	(300C,0051)	1C	Uniquely identifies dose reference specified by Dose Reference Number (300A,0012) in Dose Reference Sequence (300A,0010) in RT prescription module of referenced RT ion plan. Required if Referenced Calculated Dose Reference Number (3008,0092) is not sent.	Supported

Attribute Name	Tag	Type	Description	Handling
>>Referenced Calculated Dose Reference Number	(3008,0092)	1C	Uniquely identifies calculated dose reference specified by Calculated Dose Reference Number (3008,0072) within Calculated Dose Reference Sequence (3008,0070). Required if Referenced Dose Reference Number (300C,0051) is not sent.	Supported
>>Calculated Dose Reference Dose Value	(3008,0076)	1	Calculated dose (Gy).	Supported
>Number of Wedges	(300A,00D0)	1	Number of wedges associated with current beam.	Supported (DICOM validation only) Expected value: 0
>Recorded Wedge Sequence	(3008,00B0)	1C	Introduces sequence of treatment wedges. Required if Number of Wedges (300A,00D0) is non-zero. One or more items shall be included in this sequence. The number of items shall be identical to the value of Number of Wedges (300A,00D0).	Not Supported
>>Wedge Number	(300A,00D2)	1	Identification number of the wedges. The value of Wedge Number (300A,00D2) shall be unique within the beam in which it was created.	Not Supported
>>Wedge Type	(300A,00D3)	2	Type of wedge (if any) defined for beam. Defined terms: <ul style="list-style-type: none"> • STANDARD = standard (static) wedge • MOTORIZED = single wedge that can be removed from beam remotely • PARTIAL_STANDARD = wedge does not extend across the whole field and is operated manually • PARTIAL_MOTORIZED = wedge does not extend across the whole field and can be removed from beam remotely 	Not Supported
>>Wedge ID	(300A,00D4)	3	User-supplied identifier for wedge.	Not Supported
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Not Supported
>>Wedge Angle	(300A,00D5)	2	Nominal wedge angle (degrees).	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>Wedge Orientation	(300A,00D8)	2	Orientation of wedge, i.e., orientation of IEC WEDGE FILTER coordinate system with respect to the IEC BEAM LIMITING DEVICE coordinate systems (degrees).	Not Supported
>Number of Compensators	(300A,00E0)	1	Number of range compensators associated with current Beam.	Supported (DICOM validation only) Expected value: 0
>Recorded Compensator Sequence	(3008,00C0)	1C	Introduces sequence of treatment compensators. Required if Number of Compensators (300A,00E0) is non-zero. One or more items shall be included in this sequence. The number of items shall be identical to the value of Number of Compensators (300A,00E0).	Not Supported
>>Referenced Compensator Number	(300C,00D0)	1	Uniquely identifies compensator specified by Compensator Number (300A,00E4) within beam referenced by Referenced Beam Number (300C,0006).	Not Supported
>>Compensator ID	(300A,00E5)	3	User-supplied identifier for compensator.	Not Supported
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Not Supported
>Number of Boli	(300A,00ED)	1	Number of boli associated with current beam.	Supported (DICOM validation only) Expected value: 0
>Referenced Bolus Sequence	(300C,00B0)	1C	Introduces sequence of boli associated with beam. Required if Number of Boli (300A,00ED) is non-zero. One or more items shall be included in this sequence. The number of items shall be identical to the value of Number of Boli (300A,00ED).	Not Supported
>>Referenced ROI Number	(3006,0084)	1	Uniquely identifies ROI representing the bolus specified by ROI Number (3006,0022) in Structure Set ROI Sequence (3006,0020) in structure set module within RT structure set in Referenced Structure Set Sequence (300C,0060) in RT general plan module.	Not Supported
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>Number of Blocks	(300A,00F0)	1	Number of shielding blocks associated with beam.	Supported (DICOM validation only) For ocular plans, expected value is 1; for non-ocular plans, expected value is 0
>Recorded Block Sequence	(3008,00D0)	1C	Introduces sequence of blocks associated with beam. Required if Number of Blocks (300A,00F0) is non-zero. One or more items shall be included in this sequence. The number of items shall be identical to the value of Number of Blocks (300A,00F0).	Supported
>>Block Tray ID	(300A,00F5)	3	User-supplied identifier for block tray.	Supported
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Supported
>>Referenced Block Number	(300C,00E0)	1	Uniquely identifies block specified by Block Number (300A,00FC) within beam referenced by Referenced Beam Number (300C,0006).	Supported
>>Block Name	(300A,00FE)	3	User-defined name for block.	Supported
>Recorded Snout Sequence	(3008,00F0)	1C	Introduces sequence of snouts associated with beam. Required if Snout Sequence (300A,030C) is included in the RT ion plan referenced within the Referenced RT Plan Sequence (300C,0002). Only a single item shall be included in this sequence.	Supported
>>Snout ID	(300A,030F)	1	User- or machine-supplied identifier for snout.	Supported
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Supported
>Applicator Sequence	(300A,0107)	1C	Introduces sequence of applicators associated with beam. Required if Applicator Sequence (300A,0107) is included in the RT ion plan referenced within the referenced RT plan sequence (300C,0002). Only a single item shall be included in this sequence.	Not Supported
>>Applicator ID	(300A,0108)	1	User- or machine-supplied identifier for applicator.	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Not Supported
>>Applicator Type	(300A,0109)	1	Type of applicator. Defined terms: <ul style="list-style-type: none"> • ION_SQUARE = square ion applicator • ION_RECT = rectangular ion applicator • ION_CIRC = circular ion applicator • ION_SHORT = short ion applicator • ION_OPEN = open (dummy) ion applicator • INTEROPERATIVE = interoperative (custom) applicator • STEREOTACTIC = stereotactic applicator 	Not Supported
>>Applicator Description	(300A,010A)	3	User-defined description for applicator.	Not Supported
>General Accessory Sequence	(300A,0420)	3	Introduces a sequence of general accessories associated with this beam. One or more items are permitted in this sequence.	Not Supported
>>General Accessory Number	(300A,0424)	1	Identification number of the general accessory. The value shall be unique within the sequence.	Not Supported
>>General Accessory ID	(300A,0421)	1	User- or machine-supplied identifier for general accessory.	Not Supported
>>General Accessory Description	(300A,0422)	3	User-supplied description of general accessory.	Not Supported
>>General Accessory Type	(300A,0423)	3	Specifies the type of accessory. Defined terms: <ul style="list-style-type: none"> • GRATICULE = Accessory tray with a radio-opaque grid • IMAGE_DETECTOR = Image acquisition device positioned in the beam line • RETICLE = Accessory tray with radio-transparent markers or grid 	Not Supported
>>Accessory Code	(300A,00F9)	3	Machine-readable identifier for this accessory	Not Supported
>Number of Range Shifters	(300A,0312)	1	Number of range shifters associated with current beam.	Supported

Attribute Name	Tag	Type	Description	Handling
>Recorded Range Shifter Sequence	(3008,00F2)	1C	Introduces sequence of range shifters recorded with beam. Required if Number of Range Shifters (300A,0312) is non-zero. One or more items shall be included in this sequence. The number of items shall be identical to the value of Number of Range Shifters (300A,0312).	Supported
>>Referenced Range Shifter Number	(300C,0100)	1	Uniquely identifies range shifter specified by Range Shifter Number (300A,0316) within Beam referenced by Referenced Beam Number (300C,0006).	Supported
>>Range Shifter ID	(300A,0318)	1	User- or machine-supplied identifier for range modulator.	Supported
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Supported
>Number of Lateral Spreading Devices	(300A,0330)	1	Number of lateral spreading devices associated with current beam.	Supported
>Recorded Lateral Spreading Device Sequence	(3008,00F4)	1C	Introduces sequence of lateral spreading devices associated with beam. Required if Number of Lateral Spreading Devices (300A,0330) is non-zero. One or more items shall be included in this sequence. The number of items shall be identical to the value of Number of Lateral Spreading Devices (300A,0330).	Supported for ocular treatments only
>>Referenced Lateral Spreading Device Number	(300C,0102)	1	Uniquely identifies lateral spreading device specified by Lateral Spreading Device Number (300A,0334) within beam referenced by Referenced Beam Number (300C,0006).	Supported
>>Lateral Spreading Device ID	(300A,0336)	1	User- or machine-supplied identifier for lateral spreading device.	Supported
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Not Supported
>Number of Range Modulators	(300A,0340)	1	Number of range modulators associated with current beam.	Supported

Attribute Name	Tag	Type	Description	Handling
>Recorded Range Modulator Sequence	(3008,00F6)	1C	Introduces sequence of range modulators associated with beam. Required if Number of Range Modulators (300A,0340) is non-zero. One or more items shall be included in this sequence. The number of items shall be identical to the value of Number of Range Modulators (300A,0340).	Supported for ocular treatments only
>>Referenced Range Modulator Number	(300C,0104)	1	Uniquely identifies range modulator specified by Range Modulator Number (300A,0344) within beam referenced by Referenced Beam Number (300C,0006).	Supported for ocular treatments only
>>Range Modulator ID	(300A,0346)	1	User- or machine-supplied identifier for range modulator.	Supported for ocular treatments only
>>Accessory Code	(300A,00F9)	3	An accessory identifier to be read by a device, e.g., a bar code reader.	Supported for ocular treatments only
>>Range Modulator Type	(300A,0348)	1	Type of range modulator. Defined terms: <ul style="list-style-type: none"> FIXED = fixed modulation width and weights using ridge filter or constant speed wheel with constant beam current WHL_FIXEDWEIGHTS = selected wheel/track (range modulator ID) is spinning at constant speed. Modulation width is adjusted by switching constant beam current on and off at wheel steps indicated by range modulator interrupt values. WHL_MODWEIGHTS = selected wheel/track (range modulator ID) is spinning at constant speed. Weight per wheel step is adjusted by modulating beam current according to selected Beam Current Modulation ID (300A,034C). Only one item in the Recorded Range Modulator Sequence (3008,00F6) can have a Range Modulator Type (300A,0348) of WHL_MODWEIGHTS.	Supported for ocular treatments only Expected value: FIXED

Attribute Name	Tag	Type	Description	Handling
>>Beam Current Modulation ID	(300A,034C)	1C	User-supplied identifier for the beam current modulation pattern. Required if Range Modulator Type (300A,0348) is WHL_MODWEIGHTS	Not Supported
>Patient Support Type	(300A,0350)	1	Defined terms: <ul style="list-style-type: none"> • TABLE = Treatment delivery system table • CHAIR = Treatment delivery system chair See section C.8.8.25.6.3. Roundtrip supported.	Supported
>Patient Support ID	(300A,0352)	3	User-specified identifier for manufacturer-specific patient support devices. Roundtrip supported.	Supported
>Patient Support Accessory Code	(300A,0354)	3	A patient support accessory identifier to be read by a device (e.g., a bar code reader). Roundtrip supported.	Supported
>Fixation Light Azimuthal Angle	(300A,0356)	3	Azimuthal angle (degrees) of the fixation light coordinate around IEC PATIENT SUPPORT Y-axis. Used for eye treatments. See C.8.8.25.6.4.	Supported for ocular treatments only
>Fixation Light Polar Angle	(300A,0358)	3	Polar angle (degrees) of the fixation light coordinate. Used for eye treatments. See section C.8.8.25.6.4.	Supported for ocular treatments only
>Fixation Eye	(300A,0150)	3	The eye used for fixation. Enumerated Values: <ul style="list-style-type: none"> • L = left eye • R = right eye 	Supported for ocular treatments only
>Current Fraction Number	(3008,0022)	2	Fraction number for this beam administration.	Supported

Attribute Name	Tag	Type	Description	Handling
>Treatment Delivery Type	(300A,00CE)	2	<p>Delivery type of treatment.</p> <p>Defined terms:</p> <ul style="list-style-type: none"> TREATMENT = normal patient treatment OPEN_PORTFILM = portal image acquisition with open field (the source of radiation is specified by Radiation Type (300A,00C6)) TRMT_PORTFILM = portal image acquisition with treatment port (the source of radiation is specified by Radiation Type (300A,00C6)) CONTINUATION = continuation of interrupted treatment SETUP = no treatment beam was applied for this RT Beam. To be used for specifying the gantry, couch, and other machine positions where X-Ray set-up images or measurements were taken. VERIFICATION = Treatment used for Quality Assurance rather than patient treatment 	Supported
>Treatment Termination Status	(3008,002A)	1	<p>Conditions under which treatment was terminated.</p> <p>Enumerated values:</p> <ul style="list-style-type: none"> NORMAL = treatment terminated normally OPERATOR = operator terminated treatment MACHINE = machine terminated treatment UNKNOWN = status at termination unknown 	Supported
>Treatment Termination Code	(3008,002B)	3	Treatment machine termination code. This code is dependent upon the particular application and equipment.	Supported
>Treatment Verification Status	(3008,002C)	2	<p>Conditions under which treatment was verified by a verification system.</p> <p>Enumerated values:</p> <ul style="list-style-type: none"> VERIFIED = treatment verified VERIFIED_OVR = treatment verified with at least one out-of-range value overridden NOT_VERIFIED = treatment verified manually 	Supported Expected values: VERIFIED, VERIFIED_OVR
>Specified Primary Meterset	(3008,0032)	3	Desired machine setting of primary meterset in units specified by Primary Dosimeter Unit (300A,00B3). See C.8.8.26.1.	Supported

Attribute Name	Tag	Type	Description	Handling
>Specified Secondary Meterset	(3008,0033)	3	Desired machine setting of secondary meterset. See C.8.8.26.1.	Not Supported
>Delivered Primary Meterset	(3008,0036)	3	Machine setting actually delivered as recorded by primary meterset in units specified by Primary Dosimeter Unit (300A,00B3). See C.8.8.26.1.	Supported
>Delivered Secondary Meterset	(3008,0037)	3	Machine setting actually delivered as recorded by secondary meterset. See C.8.8.26.1.	Not Supported
>Specified Treatment Time	(3008,003A)	3	Treatment time set (sec).	Supported
>Delivered Treatment Time	(3008,003B)	3	Treatment time actually delivered (sec).	Supported
>Treatment Machine Note	(3251,xx00)	3	A textual description that can be supplied by the treatment machine to describe technical details. Roundtrip supported.	Supported
>Number of Control Points	(300A,0110)	1	Number of control points in beam.	Supported
>Ion Control Point Delivery Sequence	(3008,0041)	1	Introduces sequence of beam control points for current ion treatment beam. One or more items shall be included in this sequence. The number of items shall be identical to the value of Number of Control Points (300A,0110). See C.8.8.21.1.	Supported
>>Referenced Control Point Index	(300C,00F0)	1	Uniquely identifies control point specified by Control Point Index (300A,0112) within the beam referenced by Referenced Beam Number (300C,0006).	Supported
>>Treatment Control Point Date	(3008,0024)	1	Date when the delivery of radiation at this control point began. For the final control point this shall be the date when the previous control point ended.	Supported
>>Treatment Control Point Time	(3008,0025)	1	Time when the delivery of radiation at this control point began. For the final control point this shall be the time when the previous control point ended.	Supported
>>Specified Meterset	(3008,0042)	2	Desired machine setting for current control point in units specified by Primary Dosimeter Unit (300A,00B3).	Supported
>>Delivered Meterset	(3008,0044)	1	Machine setting actually delivered at current control point in units specified by Primary Dosimeter Unit (300A,00B3).	Supported

Attribute Name	Tag	Type	Description	Handling
>>Meterset Rate Set	(3008,0045)	3	The specified speed of delivery of the specified dose in units specified by Primary Dosimeter Unit (300A,00B3) per minute. Imports the value from the plan.	Supported
>>Meterset Rate Delivered	(3008,0046)	3	The delivered speed of delivery of the specified dose in units specified by Primary Dosimeter Unit (300A,00B3) per minute.	Supported
>>Nominal Beam Energy	(300A,0114)	1C	Nominal beam energy at control point in MeV per nucleon. Defined at nozzle entrance before all beam modifiers. Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041) or if Nominal Beam Energy (300A,0114) changes during beam administration, and KVp (0018,0060) is not present.	Supported
>>KVp	(0018,0060)	1C	Peak kilo voltage output of the setup x-ray generator used. Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041), or if KVp changes during setup, and Nominal Beam Energy (300A,0114) is not present.	Not Supported
>>Ion Wedge Position Sequence	(300A,03AC)	1C	Introduces sequence of wedge positions for current control point. Required for first item of ion control point sequence if Number of Wedges (300A,00D0) is non-zero, and in subsequent control points if Wedge Position (300A,0118) or Wedge Thin Edge Position (300A,00DB) changes during beam. One or more items shall be included in this sequence. The number of items shall be identical to the value of Number of Wedges (300A,00D0).	Not Supported
>>>Referenced Wedge Number	(300C,00C0)	1	Uniquely references wedge described by Wedge Number (300A,00D2) in Wedge Sequence (300A,00D1).	Not Supported
>>>Wedge Position	(300A,0118)	1	Position of wedge at current control point. Enumerated values: <ul style="list-style-type: none"> • IN • OUT 	Not Supported

Attribute Name	Tag	Type	Description	Handling
>>>Wedge Thin Edge Position	(300A,00DB)	1C	Closest distance from the central axis of the beam along a wedge axis to the thin edge as projected to the machine isocentric plane (mm). Value is positive if the wedge does not cover the central axis, negative if it does. Required if Wedge Type (300A,00D3) of the wedge referenced by Referenced Wedge Number (300C,00C0) is PARTIAL_STANDARD or PARTIAL_MOTORIZ.	Not Supported
Beam Limiting Device Position Sequence	(300A,011A)	1C	Introduces sequence of beam limiting device (collimator) jaw or leaf (element) positions. One or more items shall be included in this sequence. Required for first item of Control Point Sequence, or if Beam Limiting Device changes during Beam.	Not Supported
>>Range Shifter Settings Sequence	(300A,0360)	1C	Introduces sequence of range shifter settings for the current control point. One or more items shall be included in this sequence. Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041) or if Range Shifter Setting (300A,0362) changes during beam administration, and Number of Range Shifters (300A,0312) is non-zero.	Supported for ocular treatments only
>>>Referenced Range Shifter Number	(300C,0100)	1	Uniquely references range shifter described by Range Shifter Number (300A,0316) in Range Shifter Sequence (300A,0314).	Supported for ocular treatments only
>>>Range Shifter Setting	(300A,0362)	1	Machine-specific setting attribute for the range shifter. The specific encoding of this value should be documented in a Conformance Statement. See C.8.8.25.5.	Supported for ocular treatments only
>>Lateral Spreading Device Settings Sequence	(300A,0370)	1C	Introduces sequence of lateral spreading device settings for the current control point. One or more items shall be included in this sequence. Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041) or if Lateral Spreading Device Setting (300A,0372) changes during beam administration, and Number of Lateral Spreading Devices (300A,0330) is non-zero.	Supported for ocular treatments only
>>>Referenced Lateral Spreading Device Number	(300C,0102)	1	Uniquely references lateral spreading device described by Lateral Spreading Device Number (300A,0334) in Lateral Spreading Device Sequence (300A,0332).	Supported for ocular treatments only

Attribute Name	Tag	Type	Description	Handling
>>>Lateral Spreading Device Setting	(300A,0372)	1	Machine-specific setting attribute for the lateral spreading device. The specific encoding of this value should be documented in a Conformance Statement. See C.8.8.25.5.	Supported for ocular treatments only
>>Range Modulator Settings Sequence	(300A,0380)	1C	Introduces sequence of range modulator settings for current control point. One or more items shall be included in this sequence. Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041), or if range modulator settings change during beam administration, and Number of Range Modulators (300A,0340) is non-zero.	Supported for ocular treatments only
>>>Referenced Range Modulator Number	(300C,0104)	1	Uniquely references range modulator described by Range Modulator Number (300A,0344) in Range Modulator Sequence (300A,0342).	Supported for ocular treatments only
>>>Range Modulator Gating Start Value	(300A,0382)	1C	Start position defines the range modulator position at which the beam is switched on. Required if Range Modulator Type (300A,0348) of the range modulator referenced by Referenced Range Modulator Number (300C,0104) is WHL_MODWEIGHTS or WHL_FIXEDWEIGHTS.	Not Supported
>>>Range Modulator Gating Stop Value	(300A,0384)	1C	Stop position defines the range modulator position at which the beam is switched off. Required if Range Modulator Type (300A,0348) of the range modulator referenced by Referenced Range Modulator Number (300C,0104) is WHL_MODWEIGHTS or WHL_FIXEDWEIGHTS.	Not Supported
>>Gantry Angle	(300A,011E)	1C	Treatment machine gantry angle, i.e., orientation of IEC GANTRY coordinate system with respect to IEC FIXED REFERENCE coordinate system (degrees). Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041) or if gantry angle changes during beam administration.	Supported

Attribute Name	Tag	Type	Description	Handling
>>Gantry Rotation Direction	(300A,011F)	1C	Direction of gantry rotation when viewing gantry from isocenter, for segment beginning at current control point. Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041), or if gantry rotation direction changes during beam administration. Enumerated values: <ul style="list-style-type: none"> • CW = clockwise • CC = counter-clockwise • NONE = no rotation 	Supported
>>Gantry Pitch Angle	(300A,014A)	2C	Gantry Pitch Angle. i.e. the rotation of the IEC GANTRY coordinate system about the X-axis of the IEC GANTRY coordinate system (degrees). Required for first item of control point sequence, or if gantry pitch rotation angle changes during beam. See C.8.8.25.6.5.	Supported Expected value: 0.0
>>Gantry Pitch Rotation Direction	(300A,014C)	2C	Direction of gantry pitch angle when viewing along the positive X-axis of the IEC GANTRY coordinate system, for segment following control point. Required for first item of control point sequence, or if gantry pitch rotation direction changes during beam. See C.8.8.14.8 and C.8.8.25.6.5. Enumerated values: <ul style="list-style-type: none"> • CW = clockwise • CC = counter-clockwise • NONE = no rotation 	Supported Expected value: NONE
>>Beam Limiting Device Angle	(300A,0120)	1C	Beam limiting device (collimator) angle, i.e., orientation of IEC BEAM LIMITING DEVICE coordinate system with respect to IEC GANTRY coordinate system (degrees). Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041) or if beam limiting device (collimator) angle changes during beam administration.	Supported Expected value: 0

Attribute Name	Tag	Type	Description	Handling
>>Beam Limiting Device Rotation Direction	(300A,0121)	1C	Direction of beam limiting device rotation when viewing beam limiting device (collimator) from radiation source, for segment beginning at current control point. Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041) or if beam limiting device rotation direction changes during beam administration. Enumerated values: <ul style="list-style-type: none"> • CW = clockwise • CC = counter-clockwise • NONE = no rotation 	Supported Expected value: NONE
>>Scan Spot Tune ID	(300A,0390)	1C	User-supplied or machine code identifier for machine configuration to produce beam spot. This may be the nominal spot size or some other machine-specific value. Required if Scan Mode (300A,0308) is MODULATED.	Supported
>>Number of Scan Spot Positions	(300A,0392)	1C	Number of spot positions used to specify scanning pattern for current segment beginning at control point. Required if Scan Mode (300A,0308) is MODULATED.	Supported
>>Scan Spot Position Map	(300A,0394)	1C	The x and y coordinates of the scan spots are defined as projected onto the machine isocentric plane in the IEC GANTRY coordinate system (mm). Required if Scan Mode (300A,0308) is MODULATED. Contains 2N values where N is the Number of Scan Spot Positions (300A,0392).	Supported
>>Scan Spot Metersets Delivered	(3008,0047)	1C	A data set of metersets delivered to the scan spot positions. The order of metersets matches the positions in Scan Spot Position Map (300A,0394). The sum contained in all metersets shall match the difference of the Delivered Meterset of the current control point to the following control point. Required if Scan Mode (300A,0308) is MODULATED.	Supported
>>Scanning Spot Size	(300A,0398)	3	The scanning spot size as calculated using the full width half maximum (FWHM). Specified by a numeric pair: the size measured in air at isocenter in IEC GANTRY X direction followed by the size in the IEC GANTRY Y direction (mm).	Supported

Attribute Name	Tag	Type	Description	Handling
>>Number of Paintings	(300A,039A)	1C	The intended number of times the scan pattern given by Scan Spot Position Map (300A,0394) and Scan Spot Meter-set Weights (300A,0396) in the referenced RT plan was to be applied at the current control point. Note: The actual number of paintings is not known or recorded. The Scan Spot Metersets Delivered (3008,0047) contains the sum of all complete and partial repaints. Required if Scan Mode (300A,0308) is MODULATED.	Supported Expected value: 1
>>Patient Support Angle	(300A,0122)	1C	Patient Support angle, i.e. orientation of IEC PATIENT SUPPORT (turntable) coordinate system with respect to IEC FIXED REFERENCE coordinate system (degrees). Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041) or if patient support angle changes during beam administration.	Supported
>>Patient Support Rotation Direction	(300A,0123)	1C	Direction of patient support rotation when viewing table from above, for segment beginning at current control point. Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041), or if patient support rotation direction changes during beam administration. Enumerated values: <ul style="list-style-type: none"> • CW = clockwise • CC = counter-clockwise • NONE = no rotation 	Supported Expected value: NONE
>>Table Top Pitch Angle	(300A,0140)	2C	Table top pitch angle, i.e., the rotation of the IEC TABLE TOP coordinate system about the X-axis of the IEC TABLE TOP coordinate system (degrees). Required for first item of control point sequence, or if table top pitch angle changes during beam. See C.8.8.25.6.2.	Supported for non-ocular treatments only.

Attribute Name	Tag	Type	Description	Handling
>>Table Top Pitch Rotation Direction	(300A,0142)	2C	<p>Direction of table top pitch rotation when viewing the table along the positive X-axis of the IEC TABLE TOP coordinate system, for segment following control point.</p> <p>Required for first item of control point sequence, or if table top pitch rotation direction changes during beam. See C.8.8.14.8 and C.8.8.25.6.2.</p> <p>Enumerated values:</p> <ul style="list-style-type: none"> • CW = clockwise • CC = counter-clockwise • NONE = no rotation 	Supported for non-ocular treatments only.
>>Table Top Roll Angle	(300A,0144)	2C	<p>Table top roll angle, i.e., the rotation of the IEC TABLE TOP coordinate system about the Y-axis of the IEC TABLE TOP coordinate system (degrees).</p> <p>Required for first item of control point sequence, or if table top roll angle changes during beam. See C.8.8.25.6.2.</p>	Supported for non-ocular treatments only.
>>Table Top Roll Rotation Direction	(300A,0146)	2C	<p>Direction of table top roll rotation when viewing the table along the positive Y-axis of the IEC TABLE TOP coordinate system, for segment following Control Point.</p> <p>Required for first item of control point sequence, or if table top roll rotation direction changes during beam. See C.8.8.14.8 and C.8.8.25.6.2.</p> <p>Enumerated values:</p> <ul style="list-style-type: none"> • CW = clockwise • CC = counter-clockwise • NONE = no rotation 	Supported for non-ocular treatments only.
>>Head Fixation Angle	(300A,0148)	3	<p>Angle (in degrees) of the head fixation for eye treatments with respect to the Table Top Pitch Angle (300A,0140) coordinate system. Positive head fixation angle is the same direction as positive table top pitch. See C.8.8.25.6.4.</p>	Supported for ocular treatments only.

Attribute Name	Tag	Type	Description	Handling
>>Chair Head Frame Height	(300A,0151)	3	A device-specific value that specifies the relationship between the chair in which the patient is sitting and the head frame in which their head is fixed. It shall be expressed as a distance in mm, such that positive is towards the patient's head away from the seat. Note: This value is not intended to be used for geometric calculations; however, for the same device, the relative distance is meaningful. Typically used for eye treatments	Supported for ocular treatments only.
>>Table Top Vertical Position	(300A,0128)	2C	Table Top Vertical position in IEC TABLE TOP coordinate system (mm). This value is interpreted as an absolute, rather than relative, table setting. Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041) or if table top vertical position changes during beam administration.	Supported
>>Table Top Longitudinal Position	(300A,0129)	2C	Table top longitudinal position in IEC TABLE TOP coordinate system (mm). This value is interpreted as an absolute, rather than relative, table setting. Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041) or if table top longitudinal position changes during beam administration.	Supported
>>Table Top Lateral Position	(300A,012A)	2C	Table top lateral position in IEC TABLE TOP coordinate system (mm). This value is interpreted as an absolute, rather than relative, table setting. Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041) or if table top lateral position changes during beam administration.	Supported
>>Snout Position	(300A,030D)	2C	Axial position of the snout (in mm) measured from isocenter to the downstream side of the snout (without consideration of variable length elements such as blocks, MLC, and/or compensators). Required for control point 0 of Ion Control Point Delivery Sequence (3008,0041) or if snout position changes during beam administration.	Supported for non-ocular treatments only.

Attribute Name	Tag	Type	Description	Handling
>>Corrected Parameter Sequence	(3008,0068)	3	Introduces a sequence of items describing corrections made to any attributes prior to delivery of the next control point. One or more Items are permitted in this sequence.	Not Supported
>>>Parameter Sequence Pointer	(3008,0061)	1	Contains the data element tag of the parent sequence containing the attribute that was corrected. The value is limited in scope to the Treatment Session Ion Beam Sequence (3008,0021) and all nested sequences therein.	Not Supported
>>>Parameter Item Index	(3008,0063)	1	Contains the ones-based sequence item index of the corrected attribute within its parent sequence as indicated by Parameter Sequence Pointer (3008,0061).	Not Supported
>>>Parameter Pointer	(3008,0065)	1	Contains the data element tag of the attribute that was corrected.	Not Supported
>>>Correction Value	(3008,006A)	1	The value that was added the value referenced by the Parameter Sequence Pointer (3008,0061), Parameter Item Index (3008,0063), and Parameter Pointer (3008,0065).	Not Supported
>>Override Sequence	(3008,0060)	3	Introduces sequence of parameters that were overridden during the administration of the beam segment immediately prior to the current control point. One or more Items are permitted in this sequence.	Supported
>>>Parameter Sequence Pointer	(3008,0061)	1	Contains the data element tag of the parent sequence containing the attribute that was overridden. The value is limited in scope to the Treatment Session Ion Beam Sequence (3008,0021) and all nested sequences therein.	Supported
>>>Override Parameter Pointer	(3008,0062)	1	Contains the data element tag of the attribute that was overridden.	Supported
>>>Parameter Item Index	(3008,0063)	1	Contains the ones-based sequence item index of the overridden attributes within its parent sequence. The value is limited in scope to the Treatment Session Ion Beam Sequence (3008,0021) and all nested sequences therein.	Supported
>>>Operators' Name	(0008,1070)	2	Name of operator who authorized override.	Supported
>>>Override Reason	(3008,0066)	3	User-defined description of reason for override of parameter specified by Override Parameter Pointer (3008,0062).	Supported

A.3 Data Dictionary of Private Attributes

A.3.1 Privatization for RT Plan Storage SOP class

The DICOM Extended Interface is a private module added to the RT Plan IOD. This module contains an XML stream that contains the Plan Extended Interface described in A.2.14 Extended Interface - Private.

Module	Attribute Name and Tag	Description	Type	VR
DICOM Extended Interface	Extended Interface Data (3253, XX00)	XML stream.	3	LT
DICOM Extended Interface	Extended Interface Length (3253, XX01)	Data length of the XML stream.	3	IS
DICOM Extended Interface	Extended Interface Format (3253, XX03)	Extended interface format tag. A possible value is ExtendedIF.	3	CS

A.3.2 Privatization for RT Beams Treatment Record Storage SOP class

Module	Attribute Name and Tag	Description	Type	VR
RT Beam Session Record/Treatment Session Beam Sequence	Treatment Machine Note (3251, XX00)	A description of the treatment machine details.	3	LO
RT Beam Session Record/Treatment Session Beam Sequence	Treatment Session Beam Data (3261, XX2A)	Extended interface in XML format (see 4.2.2).	3	OB

A.3.3 Privatization for RT Treatment Summary Record Storage SOP class

Module	Attribute Name and Tag	Description	Type	VR
RT Treatment Summary Record	Additional Dose Value Sequence (3259, XX00)	Introduces sequence of actual session dose sequence. The sequence may contain one or more items. Sequence for additional dose information to a reference point. The reference point must be connected to referenced plan of this treatment summary record, but also the dose of other plans that have the same reference point has influence on this value.	3	SQ

Module	Attribute Name and Tag	Description	Type	VR
RT Treatment Summary Record/ Additional Dose Value Sequence	Actual Session Dose (3259, XX02)	Session dose delivered of actual session. Required if actual session dose sequence is sent.	1C	DS
RT Treatment Summary Record/ Additional Dose Value Sequence	Daily Dose (3259, XX04)	Daily dose of current day. Required if actual session dose sequence is sent.	1C	DS
RT Treatment Summary Record/ Additional Dose Value Sequence	Life Time Total Dose (3259, XX06)	Total dose of reference point over all plans. Required if actual session dose sequence is sent.	1C	DS
RT Treatment Summary Record	Total Number of Fractions (3265, XX00)	Total number of fractions planned for the current plan and all its former plans.	1	SL
RT Treatment Summary Record	Last Treated Fraction (3265, XX01)	The index of the last fraction treated across the cur- rent plan and all its former plans. In other words, this tag will always contain the fraction that was last treated (completely or partially). So, it will be same as in the Fraction Status Summary Sequence (3008,0240) on the last item of the sequence in the tag Referenced Fraction Number (3008,0223), as soon as the sequence is no longer empty (i.e., after the first treatment has gotten at least 1 MU). If completing a partial treatment, the plan's current fraction number is equal to Last Treated Fraction (3265,1001).	1	SL