



Nucletron

Customer Information Bulletin

Title

DICOM Conformance Statement

Scope

Oncentra TCS V3.1.1

Target Group

Customers

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1 Document History

Revision	Who	Reason for Change	Changes
00	AHT	Initial release	Not applicable
01	CGR	TCS version 3.1.1	-Corrected 'Implementation class UID' -Added private tag descriptions -Update usage descriptions

2 Related Documents

Reference	Revision	Description
[DICOM2004]	3.x-2004	Digital Imaging and Communications in Medicine

3 Introduction

3.1 Purpose

This conformance statement specifies how the Oncentra TCS application conforms to the DICOM 2003 V3.0 standard and the IEC Technical Report 61852. This document follows the guidelines for DICOM conformance statements of IEC technical Report 62266. TCS uses the DICOM protocol to receive and transmit objects that are used in the radiation therapy process.

3.2 Scope

Oncentra TCS is a brachytherapy treatment control system. The Oncentra TCS application enables an operator to apply, by remote control, a radionuclide source into the body (including interstitial, intracavitary, intraluminal, bronchial, endovascular and intra-operative) or to the surface of the body for radiation therapy using Nucletron's microSelectron afterloader.

Oncentra TCS supports amongst others the following functions:

- Make a new plan.
- Add a plan (from the Library).
- Import a plan (from a treatment planning system).
- Load a patient study (from the database).
- Edit, print and save Plan information.
- Execute treatment.
- Start and monitor treatment.
- Print a treatment report.
- Maintain procedures and information.

3.3 Audience

The intended audience is:

- Customers, who want to use DICOM with the Oncentra system
- Marketing and sales persons
- System integrators of medical equipment
- Other vendors offering interfacing via DICOM

It is assumed that the reader is familiar with the DICOM standard.

3.4 Definitions, terms and abbreviations

Term/abbreviation	Definition
FSR	File-set Reader
ILE	Implicit Little Endian
ELE	Explicit Little Endian

4 Networking

4.1 Implementation model

4.1.1 Application data flow

The data flow diagram depicted in **Error! Reference source not found.** represents all DICOM Application Entities present in an instantiation of the microSelectron V3 product and maps these to real world activities and applicable user actions.

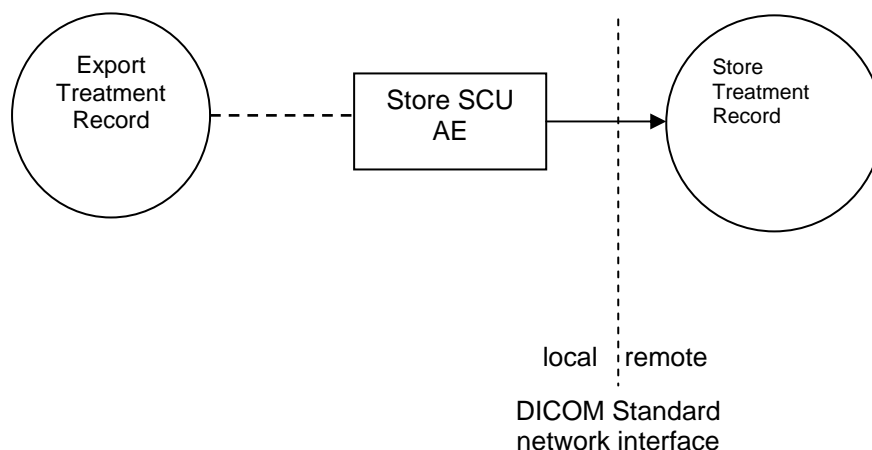


Figure 1 Application data flow

The Store SCU Application Entity of the TCS product sends RT records to a remote AE. This is associated with the real world activity Export Treatment Record. This activity is performed after a treatment has completed and the user has approved the human readable version treatment record, and at any later time when a user wants to (re)export the record. Whether or not the record is sent automatically upon treatment completion is a configuration setting that applies to all users of the system.

4.1.2 Functional definition of AEs

4.1.2.1 Store SCU application entity

The Store SCU Application Entity will export whenever a send job is available. An association request is send to the remote AE, and upon successful negotiation RT Record transfer is started. If the association negotiation is not successful, this is reported to the user and the user can decide whether or not to retry the job. No automatic retry mechanism is implemented.

4.1.3 Sequencing of real world activities

Only one real-world activity relates to the DICOM network interfaces, so no sequencing is required.

4.2 AE Specifications

4.2.1 Store SCU AE

4.2.1.1 SOP classes

Table 1 SOP Classes

SOP Class Name	SOP Class UID	SCU	SCP
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Yes	No
RT Treatment Summary Record Storage ¹	1.2.840.10008.5.1.4.1.1.481.7	Yes	No

¹Support for separately storing RT Treatment Summary Record is being investigated and *may* not be available in the final product.

4.2.1.2 Association policies

4.2.1.2.1 General

The DICOM Standard application context name for DICOM 3.0 is always proposed:

Application Context Name 1.2.840.10008.3.1.1.1

4.2.1.2.2 Number of associations

Maximum number of parallel associations 1.

4.2.1.2.3 Asynchronous nature

Asynchronous communications (multiple outstanding transactions within a single association) are not supported.

4.2.1.2.4 Implementation identifying information

The application entity title for this AE is as follows:

Table 2 Implementation identifying information

Implementation class UID	1.2.528.1.1007.189.1
Implementation version name	MergeCOM3_321

4.2.1.3 Association initiation policy

4.2.1.3.1 Activity export record

The export of RT Brachy Treatment Records or RT Treatment Summary Records is initiated automatically when the user signs of the treatment record –immediately after treatment has completed. As an alternative, it may be triggered by a user action ‘export record’ at any time after the record was created.

Store SCU AE will initiate an association, and upon successful negotiation send the record using C-STORE.

After successful store, the association is closed, and record export completion is confirmed to the user (this may be done asynchronously, by only setting a flag in the internal database).

4.2.1.4 Association acceptance policy

The treatment system only has a Store SCU interface, and as a consequence no incoming associations can and will be accepted.

4.3 Network interfaces

4.3.1 Physical network interface

TCP/IP is the only protocol stack supported by Oncentra, using the TCP/IP stack as supported by the underlying Operating System.

Supported physical media are limited to:

- IEEE 802.3-1995 100BASE-TX (Fast Ethernet)
- IEEE 802.3-1995 10BASE-TX

4.3.2 Additional protocols

The product supports DICOM protocols on top of the TCP/IP version 4 stack.

4.4 Configuration

4.4.1 AE title/presentation address mapping

The Store SCU application entity title can be configured through the configuration file of the application that uses it. In case of TCS this is the file tcs.exe.config. The following settings can be configured:

Table 3 Address mapping

Setting	Description	Default value
AETitle	Application entity title used by the Store SCU	Smoothbase
Port	Port used by Smoothbase SCP for listening – not applicable for the store SCU	104
ConfigFileSet	MergeCOM DICOM configuration file name base. This value, with 'MC3.[ini/app/pro]' added is used to identify configuration files. These files are expected in the directory indicated in the MC3CONFIGDIR environment variable.	Smoothbase

The text box below provides an example configuration block containing the settings explained above.

```
<dicomsettings>
  <AETitle>Smoothbase</AETitle>
  <Port>104</Port>
  <ConfigFileSet>Smoothbase</ConfigFileSet>
</dicomsettings>
```

4.4.1.1 Local AE titles

The local AE titles used by TCS are listed in the table below.

Table 4 Local Application Entity Titles

Application entity	Default AE title	Default TCP/IP port
Store SCU AE	Smoothbase	N/A

4.4.1.2 Remote AE title/presentation address mapping

4.4.1.2.1 Store SCU AE

Destinations for the Store SCU AE are configured by means of the Smoothbase service application. This application allows configuration of application entity title, port number and IP addresses or hostnames. Per application entity, the type of services expected can be configured, but TCS will only make use of entities marked as Storage SCP.

Only a single Storage SCP Application Entity configured using the Smoothbase application can be addressed from TCS at any point in time.

4.4.2 Parameters

The following parameters apply to Storage transfers using the Store SCU AE – none of them is configurable in TCS.

Table 5 Parameters

Parameter	Configurable (Yes/No)	Default value
General parameters		
Max PDU receive size	No	Not applicable
Max PDU send size	No	38672
Time-out waiting for acceptance or rejection response to an association request (Application level time-out)	No	15 s
Time-out waiting for a response to an association release request (Application level time-out)	No	60 s
Time-out waiting for completion of TCP-IP connect request (low level time-out)	No	15 s
Time-out awaiting a DIMSE request (Low level time-out)	No	15 s
Time-out waiting for data between TCP/IP packets (Low level time-out)	No	15 s
Storage parameters		
Storage SCU time-out waiting for a response to a C-STORE RQ	No	120 s
Number of times a failed job may be retried	No	0 (failed jobs are not retried)
Delay between retrying failed send jobs	No	N/A
Maximum number of simultaneously initiated associations by the storage AE	No	1
Supported Transfer Syntaxes	No	Implicit VR Little Endian Explicit VR Little Endian

5 Media interchange

5.1 Implementation model

The Media AE provides standard conformance for the DICOM Media Storage and File Format (PS 3.10). No support is implemented for Media Storage Application Profiles (PS 3.11).

5.1.1 Application data flow

As depicted in Figure 2, the Real World Activity Request Plan Import on TCS results in files being read from a storage location by the TCS Media AE.

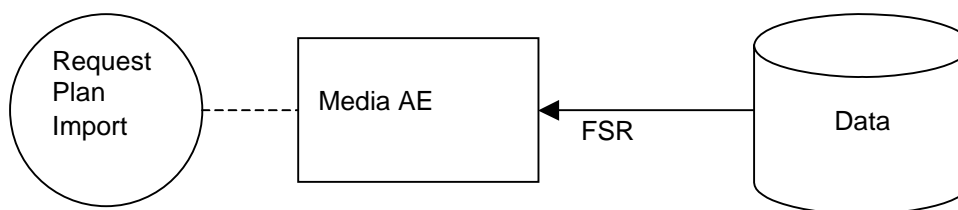


Figure 2 RT Plan Media Import Data Flow Diagram

5.1.2 Functional definition of AEs

5.1.2.1 Functional definition of the TCS media AE

The TCS Media AE supports reading of DICOM files from network drives and other media. It does not read DICOMDIR files, only DICOM Media files according PS3.10.

If contents of read files are supported by TCS, information from the files may be imported into the internal database and/or displayed on screen.

5.1.3 Sequencing of real world activities

TCS Media AE supports the SOP classes and transfer syntaxes listed in the Table 6.

Table 6 Media support

Presentation Context Table			
Abstract Syntax		Transfer Syntax	
Name	UID	Name List	UID List
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	ILE ELE	1.2.840.10008.1.2 1.2.840.10008.1.2.1

5.1.4 File meta information for implementation class and version

The TCS Media AE only implements an FSR, so no file meta information specific to TCS is ever written to the DICOM File Meta Header.

5.2 AE Specifications

5.2.1 Media AE

The following table, Table 7, shows that for one or more Application Profiles in the first column, there are a number of Real-World Activities in the second column, the roles required for each of these Real-World Activities in the third column, and the Service Class Option (Interchange or Print) is listed in the fourth column.

Table 7 Media profile support

Application Profile	Real World Activity	Roles	Service Class Option
STD-GEN-CD	Request Plan Import	FSR	Interchange

Note: The application is media neutral and dependent on the underlying hardware. Any (non-secure) General Purpose Profile can be supported. Reading DICOMDIR files is not supported.

5.2.1.1 File meta information for media AE

Not applicable.

5.2.1.2 Real world activities

5.2.1.2.1 Real world activity import DICOM plan

The FSR is activated through the user interface, when a user chooses to import a treatment plan. All media files in a user-selected location are partially read to obtain information about the contained plan (if any), study and patient, and some human readable identifying information is read for displaying. A user-selected plan is then imported by reading it completely from file and storing it to the TCS database.

5.3 Augmented and private application profiles

Not applicable.

5.4 Media configuration

Not applicable.

6 Support of Character Sets

The application supports all extended character sets defined in the [DICOM2004] standard, including single-byte and multi-byte character sets as well as code extension techniques using ISO 2022 escapes.

Support extends to correctly decoding and displaying the correct symbol for all names and strings found in storage instances from media and in the local database.

No specific support for sorting of strings other than in the default character set is provided in the browsers.

7 Security

No special security measures are taken.

8 Annexes

8.1 IOD contents

8.1.1 Created SOP instance(s)

Abbreviations used in the 'Presence of module' / 'Presence of value' columns of the tables below:

- VNAP Value Not Always Present (attribute has zero length if no value is present)
- ANAP Attribute Not Always Present (attribute may be absent)
- ALWAYS Always Present
- EMPTY Attribute is sent without a value

Abbreviations used for the source of the data values in the tables below:

- USER the attribute value source is from user input¹
- AUTO the attribute value is generated automatically
- PLAN the attribute value is identical to what is received from the DICOM Plan send by the Store SCP

- CONFIG the attribute value source is a configurable parameter

¹ Values for which the system provides a default that can be changed by the user are considered USER rather than AUTO values.

Prior to TCS version 3.0, the TCS product does not create any SOP Instances.

8.1.1.1 RT brachy treatment record IOD modules

Table 8 Brachy Treatment Record IOD Modules

IE	Module	Reference	Presence of module
Patient	Patient	Table 9	ALWAYS
	Clinical Trial Subject	Table 10	OPTIONAL1
Study	General Study	Table 11	ALWAYS
	Patient Study	Table 12	OPTIONAL2
	Clinical Trial Study	Table 13	OPTIONAL 1
Series	RT Series	Table 14	ALWAYS
	Clinical Trial Series	Table 15	OPTIONAL 1
Equipment	General Equipment	Table 16	ALWAYS
Treatment Record	RT General Treatment record	Table 17	ALWAYS
	RT Patient Setup		Not supported
	RT Treatment machine record	Table 18	ALWAYS
	Measured Dose Reference Record		Not supported
	Calculated Dose Reference Record		Not supported
	RT Brachy Session Record	Table 19	ALWAYS
	RT Treatment Summary Record	Table 20	OPTIONAL – included only if a summary record was created on TCS before exporting.
	Curve		Not supported
	SOP Common	Table 21	ALWAYS

¹ Clinical trial modules are supported in RT Record by TCS only as a means to pass through any Clinical Trial information contained in the RT Plan which execution is described in the RT Record. If they are not available in the RT Plan, they will also not be in the RT Record.

² Patient Study may be skipped by TCS export if all it's attributes are empty in the originating plan and in the TCS database

8.1.1.2 Common modules

Table 9 Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	0010,0010	PN		ALWAYS	PLAN/USER
Patient ID	0010,0020	LO		ALWAYS	PLAN/USER
Patient's Birth Date	0010,0030	DA		ALWAYS	PLAN/USER
Patient's Sex	0010,0040	CS		VNAP	PLAN/USER
Other ID's	0010,1000	LO		ANAP	PLAN/USER
Ethnic group	0010,2160	SH		ANAP	PLAN/USER
Comments	0010,4000	LT		ANAP	PLAN/USER

Table 10 Clinical Trial Subject Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Clinical Trial Sponsor Name	0012,0010	LO		ALWAYS	PLAN/USER
Clinical Trial Protocol ID	0012,0020	LO		ALWAYS	PLAN/USER
Clinical Trial Protocol Name	0012,0021	LO		VNAP	PLAN/USER
Clinical Trial Site ID	0012,0030	LO		VNAP	PLAN/USER
Clinical Trial Site Name	0012,0031	LO		VNAP	PLAN/USER
Clinical Trial Subject ID	0012,0040	LO		ANAP	PLAN/USER
Clinical Trial Subject Reading ID	0012,0042	LO		ANAP	PLAN/USER

Table 11 General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Instance UID	0020,0000	UI		ALWAYS	PLAN/AUTO
Study Date	0020,0020	DA		VNAP	PLAN/USER
Study Time	0020,0030	TM		VNAP	PLAN/USER
Referring Physician's Name	0020,0090	PN		VNAP	PLAN/USER
Study ID	0020,0010	SH		VNAP	PLAN/USER
Accession Number	0020,0050	SH		VNAP	PLAN/USER
Description	0008,1030	LO		ANAP	PLAN/USER
Physician of Record	0008,1048	PN		ANAP	PLAN

Table 12 Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Age	0010,1010	AS		ANAP	PLAN/USER
Patient's Size	0010,1020	DS		ANAP	PLAN/USER
Patient's Weight	0010,1030	DS		ANAP	PLAN/USER

Table 13 Clinical Trial Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Clinical Trial Time Point ID	0012,0050	LO		VNAP	PLAN/USER
Clinical Trial Time Point Description	0012,0051	ST		ANAP	PLAN/USER

Table 14 RT Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	0008,0060	CS		ALWAYS	PLAN
Series Instance UID	0020,000E	UI		ALWAYS	PLAN
Series Number	0020,0011	IS		VNAP	PLAN
Series Description	0008,103E	LO		ANAP	PLAN

Table 15 Clinical Trial Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Clinical Trial Coordinating Center Name	0012,0060	LO		VNAP	PLAN/USER

Table 16 General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	0008,0070	LO	Nucletron	ALWAYS	AUTO
Institution Name	0008,0080	LO	Configured name of institution	ALWAYS	PLAN/USER
Institution Address	0008,0081			ANAP	PLAN
Institutional Department Name	0008,1040			ANAP	PLAN
Manufacturer's Model Name	0008,1090	LO		ANAP	AUTO
Device Serial Number	0018,1000			ANAP	PLAN
Software Versions	0018,1020	LO		ANAP	AUTO

Table 17 RT General Treatment Record

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	0020,0013	IS		ALWAYS	AUTO
Treatment Date	3008,0250	DA		ALWAYS	AUTO
Treatment Time	3008,0251	TM		ALWAYS	AUTO
Referenced RT Plan Sequence	300C,0002	SQ		VNAP	AUTO
> Referenced SOP Class UID	0008,1150	UI		ANAP (1C)	AUTO
> Referenced SOP Instance UID	0008,1155	UI		ANAP (1C)	AUTO
Referenced Treatment Record Sequence	3008,0030	SQ		ANAP	AUTO
> Referenced SOP Class UID	0008,1150	UI		ANAP (1C)	AUTO
> Referenced SOP Instance UID	0008,1155	UI		ANAP (1C)	AUTO

Table 18 RT Treatment machine record

Attribute Name	Tag	VR	Value	Presence of Value	Source
Treatment Machine Sequence	300A,0206	SQ		ALWAYS	AUTO
> Treatment Machine Name	300A,00B2	SH	microSelectron V3	ALWAYS	AUTO
> Manufacturer	0008,0070	LO	Nucletron	VNAP	AUTO
> Institution Name	0008,0080	LO	Configured name of Institution	VNAP	PLAN/USER
> Institution Address	0008,0081	ST		ANAP	PLAN/USER
> Institutional Department Name	0008,1040	LO		ANAP	PLAN/USER
> Manufacturers Model Name	0008,1090	LO		VNAP	AUTO
> Device Serial Number	0018,1000	LO		VNAP	AUTO

Table 19 RT Brachy Session Record

Attribute Name	Tag	VR	Value	Presence of Value	Source
Operator Name	0008,1070	PN	Name of logged on user	ALWAYS	USER/AUTO
Referenced Fraction Group Number	300C,0022	IS		ALWAYS	AUTO
Number of Fractions Planned	300A,0078	IS		VNAP	PLAN
Brachy Treatment Technique	300A,0200	CS		ALWAYS	PLAN/USER
Brachy Treatment Type	300A,0202	CS		ALWAYS	PLAN/USER
<i>Private attributes</i>	300B,00xx	LO	"PRIVATE_CODE_STRING_300B"		
TU Dwell Time Precision	300B,xx10	DS		ALWAYS	AUTO
<i>End private attributes</i>					
Recorded Source Sequence	3008,0100	SQ		ALWAYS	AUTO
> Source Number	300A,0212	IS		ALWAYS	AUTO
> Source Type	300A,0214	CS		ALWAYS	AUTO
> Source Manufacturer	300A,0216	LO		VNAP	AUTO
> Source Serial Number	3008,0105	LO		VNAP	AUTO
> Source Isotope Name	300A,0226	LO		ALWAYS	AUTO
> Source Isotope Half Life	300A,0228	DS		ALWAYS	AUTO
> Reference Air Kerma Rate	300A,022A	DS		ALWAYS	AUTO/USER
> Air Kerma Rate Reference Date	300A,022C	DA		ALWAYS	AUTO/USER
> Air Kerma Rate Reference Time	300A,022E	TM		ALWAYS	AUTO/USER
> <i>Private attributes</i>	300B,00xx	LO	"PRIVATE_CODE_STRING_300B"		
>Calibration Reference Air Kerma Rate	300B,xx20	DS		ALWAYS	AUTO
>Calibration Air Kerma Rate Reference Date	300B,xx22	DA		ALWAYS	AUTO
>Calibration Air Kerma Rate Reference Time	300B,xx24	TM		ALWAYS	AUTO
> <i>End private attributes</i>					
Treatment Session Application Setup Sequence	3008,0110	SQ		ALWAYS	AUTO
> Application Setup Type	300A,0232	CS		ALWAYS	AUTO
> Referenced Brachy Application Setup Number	300C,000C	IS		ANAP	AUTO
> Application Setup Name	300A,0236	LO		ANAP	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
> Application Setup Manufacturer	300A,0238	LO		ANAP	AUTO
> Application Setup Check	3008,0116	CS		ANAP	AUTO
> Total Reference Air Kerma	300A,0250	DS		ALWAYS	AUTO/USER
> Referenced Measured Dose Reference Sequence	3008,0080	SQ	This sequence and it's contents are skipped – Oncentra V2 platform does not support dose measurements	Not supported	
>> Referenced Dose Reference Number	300C,0051	IS		Not supported	
>> Referenced Measured Dose Reference Number	3008,0082	IS		Not supported	
>> Measured Dose Value	3008,0016	DS		Not supported	
> Referenced Calculated Dose Reference Sequence	3008,0090	SQ	This sequence and it's contents are skipped – Oncentra V2 platform does not support dose calculations	ANAP	AUTO
>> Referenced Dose Reference Number	300C,0051	IS		ANAP (1C)	AUTO
>> Referenced Calculated Dose Reference Number	3008,0092	IS		ANAP (1C)	AUTO
>> Calculated Dose Reference Dose Value	3008,0076	DS		ANAP (1C)	AUTO
> Current Fraction Number	3008,0022	IS		VNAP	AUTO
> Treatment Delivery Type	300A,00CE	CS	TREATMENT for non-interrupted treatment, CONTINUATION for interrupted treatment.	ALWAYS	PLAN/USER
> Treatment Termination Status	3008,002A	CS		ALWAYS	AUTO
> Treatment Termination Code	3008,002B	SH		ANAP	AUTO
> Treatment Verification Status	3008,002C	CS	VERIFIED – based on the fact that pre-treatment record is verified in TCS.	ALWAYS	AUTO
> Recorded Brachy Accessory Device Sequence	3008,0120	SQ		Not supported	
>> Referenced Brachy Accessory Device Number	3008,0122	IS		Not supported	
>> Brachy Accessory Device ID	300A,0263	SH		Not supported	
>> Brachy Accessory Device Type	300A,0264	CS		Not supported	

Attribute Name	Tag	VR	Value	Presence of Value	Source
>> Brachy Accessory Device Name	300A,0266	LO		Not supported	
> Recorded Channel Sequence	3008,0130	SQ		ALWAYS	AUTO
>> Channel Number	300A,0282	IS		ALWAYS	AUTO
>> Channel Length	300A,0284	DS		VNAP	AUTO
>> Specified Channel Total Time	3008,0132	DS		ALWAYS	PLAN
>> Delivered Channel Total Time	3008,0134	DS		ALWAYS	AUTO
>> Source Movement Type	300A,0288	CS		ALWAYS	AUTO
>> Specified Number of Pulses	3008,0136	IS	This field is mandatory for PDR. For export of pre-TCS 3.0 records (i.e. after product upgrades) it always has a value of -1. TCS 3.0 supports at most 250 pulses per plan.	ANAP (1C)	PLAN
>> Delivered Number of Pulses	3008,0138	IS	This field is mandatory for PDR. For export of pre-TCS 3.0 records (i.e. after product upgrades) it always has a value of -1.	ANAP (1C)	AUTO
>> Specified Pulse Repetition Interval	3008,013A	DS	This field is mandatory for PDR. For export of pre-TCS 3.0 records (i.e. after product upgrades) it always has a value of -1.	ANAP (1C)	PLAN
>> Delivered Pulse Repetition Interval	3008,013C	DS	This field is mandatory for PDR. For export of pre-TCS 3.0 records (i.e. after product upgrades) it always has a value of -1.	ANAP (1C)	AUTO
>> Referenced Measured Dose Reference Sequence	3008,0080	SQ		Not supported	
>>> Referenced Dose Reference Number	300C,0051	IS		Not supported	
>>> Referenced Measured Dose Reference Number	3008,0082	IS		Not supported	
>>> Measured Dose Value	3008,0016	DS		Not supported	
>> Referenced Calculated Dose Reference Sequence	300C,0051	SQ		Not supported	
>>> Referenced Calculated Dose Reference Number	3008,0092	IS		Not supported	

Attribute Name	Tag	VR	Value	Presence of Value	Source
>>> Calculated Dose Reference Dose Value	3008,0076	DS		Not supported	
>> Recorded Source Applicator Sequence	3008,0140	SQ		ANAP	AUTO
>>> Referenced Source Applicator Number	3008,0142	IS		VNAP	AUTO
>>> Source Applicator ID	300A,0291	SH		ANAP (2C)	USER
>>> Source Applicator Type	300A,0292	CS		ANAP (1C)	USER
>>> Source Applicator Name	300A,0294	LO		ANAP	USER
>>> Source Applicator Length	300A,0296	DS		ANAP (1C)	USER
>>> Source Applicator Manufacturer	300A,0298	LO		ANAP	USER
>>> Source Applicator Step Size	300A,02A0	DS		Not supported	
>> Transfer Tube Number	300A,02A2	IS		VNAP	USER
>> Transfer Tube Length	300A,02A4	DS		ANAP (2C)	USER
>> Recorded Channel Shield Sequence	3008,0150	SQ		Not supported	
>>> Referenced Channel Shield Number	3008,0152	IS		Not supported	
>>> Channel Shield ID	300A,02B3	SH		Not supported	
>>> Channel Shield Name	300A,02B4	LO		Not supported	
>> Referenced Source Number	300C,000E	IS		ALWAYS	AUTO
>> Safe Position Exit Date	3008,0162	DA		ALWAYS	AUTO
>> Safe Position Exit Time	3008,0164	TM		ALWAYS	AUTO
>> Safe Position Return Date	3008,0166	DA		ALWAYS	AUTO
>> Safe Position Return Time	3008,0168	TM		ALWAYS	AUTO
>> Number of Control Points	300A,0110	IS		ALWAYS	AUTO
>> Brachy Control Point Delivered Sequence	3008,0160	SQ		ALWAYS	AUTO
>>> Reference Control Point Index	300C,00F0	IS		ALWAYS	AUTO
>>> Treatment Control Point Date	3008,0024	DA		ALWAYS	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
>>> Treatment Control Point Time	3008,0025	TM		ALWAYS	AUTO
>>> Control Point Relative Position	300A,02D2	DS		ALWAYS	AUTO
>>> Override Sequence	3008,0060	SQ		Not supported	
>>>> Override Parameter Pointer	3008,0062	AT		Not supported	
>>>> Operator Name	0008,1070	PN		Not supported	
>>>> Override Reason	3008,0066	ST		Not supported	
>> <i>Private attributes</i>	3009,00xx	LO	"PRIVATE_CODE_STRING_3009"	ALWAYS	AUTO
>> Brachy Control Point Planned Sequence	3009,xx10	SQ		ALWAYS	PLAN
>>> <i>Private attribute</i>	3009,00xx	LO	"PRIVATE_CODE_STRING_3009"	ALWAYS	AUTO
>>> Relative Position	3009,xx12	DS		ALWAYS	PLAN
>>> Dwell Time	3009,xx14	DS		ALWAYS	PLAN
>>> <i>End private attributes</i>					
>> <i>End private attributes</i>					
>> <i>Private attributes</i>	300B,00xx		"PRIVATE_CODE_STRING_300B"	ALWAYS	AUTO
>> Secondary Time	300B,xx26	DS		ALWAYS	AUTO
>> <i>End private attributes</i>					

Table 20 RT Treatment Summary Record

Attribute Name	Tag	VR	Value	Presence of Value	Source
Current Treatment Status	3008,0200	CS		ALWAYS	AUTO
Treatment Status Comment	3008,0202	ST		ANAP	USER
First Treatment Date	3008,0054	DA		ALWAYS	AUTO
Most Recent Treatment Date	3008,0056	DA		ALWAYS	AUTO
Faction Group Summary Sequence	3008,0220	SQ		ANAP	AUTO
> Referenced Faction Group Number	300C,0022	IS		ANAP	AUTO
> Faction Group Type	3008,0224	CS		ANAP (2C)	AUTO
> Number of Fractions Planned	300A,0078	IS		ANAP (2C)	PLAN
> Number of Fractions Delivered	3008,005A	IS		ANAP (2C)	AUTO
> Faction Status Summary Sequence	3008,0240	SQ		VNAP	AUTO
>> Referenced Fraction Number	3008,0223	IS		ANAP (1C)	AUTO
>> Treatment Date	3008,0250	DA		ANAP (2C)	AUTO
>> Treatment Time	3008,0251	TM		ANAP (2C)	AUTO
>> Treatment Termination Status	3008,002A	CS		ANAP (2C)	AUTO
Treatment Summary Measured Dose Reference Sequence	3008,00E0	SQ		ANAP	AUTO
> Referenced Dose Reference Number	300C,0051	IS		ANAP	AUTO
> Dose Reference Description	300A,0016	LO		ANAP	PLAN/USER
> Cumulative Dose to Dose Reference	3008,0052	DS		ANAP (1C)	AUTO
Treatment Summary Calculated Dose Reference Sequence	3008,0050	SQ		ANAP	AUTO
> Referenced Dose Reference Number	300C,0051	IS		ANAP	AUTO
> Dose Reference Description	300A,0016	CO		ANAP	PLAN/USER
> Cumulative Dose to Dose Reference	3008,0052	DS		ANAP (1C)	AUTO

Table 21 SOP Common

Attribute Name	Tag	VR	Value	Presence of Value	Source
SOP Class UID	0008,0016	UI		ALWAYS	AUTO
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO
Instance Creation Date	0008,0012	DA		ANAP	AUTO
Instance Creation Time	0008,0013	TM		ANAP	AUTO
Instance Creator UID	0008,0014	UI		ANAP	AUTO
Specific Character Set	0008,0005	CS		ANAP	AUTO

8.1.1.3 Common modules

8.1.2 Usage of attributes from received IODs

This section describes how the attributes of IODs received through the DICOM Plan FSR are handled.

8.1.2.1 RT Plan IOD

This section specifies what TCS expects to find in imported RT Plan IODs.

Terminology used in the tables:

- ALWAYS Presence of module or attribute is mandatory.
- IGNORE Presence of module or attribute is not required by TCS, nor by DICOM. If present it will be ignored.
- OPTIONAL Presences of module or attribute is not required. If present, it will be stored.

Attributes that are not mentioned explicitly, are treated as if their presence of attribute is set to IGNORE.

In all cases, except where specified explicitly, TCS will consider presences of DICOM Type 1 attributes to be mandatory. The DICOM requirement that Type 2 attributes *are always present but may be empty* is relaxed to allow complete omission of these attributes.

Table 22 Modules of the RT Plan IOD

IE	Module	Reference	Presence of Module
Patient	Patient	Table 23, C.7.1.1	ALWAYS
	Clinical Trial Subject	C.7.1.3	OPTIONAL
Study	General Study	Table 24, C.7.2.1	ALWAYS
	Patient Study	C.7.2.2	OPTIONAL
	Clinical Trial Study	C.7.2.3	OPTIONAL
Series	RT Series	Table 25, C.8.8.1	ALWAYS
	Clinical Trial Series	C.7.3.2	OPTIONAL
Frame of Reference	Frame of Reference	C.7.4.1	IGNORE
Equipment	General Equipment	Table 26, C.7.5.1	ALWAYS
Plan	RT General Plan	Table 27, C.8.8.9	ALWAYS
	RT Prescription	Table 28, C.8.8.10	OPTIONAL
	RT Tolerance Tables	C.8.8.11	IGNORE
	RT Patient Setup	C.8.8.12	OPTIONAL
	RT Fraction Scheme	Table 29, C.8.8.13	OPTIONAL (*)
	RT Beams	C.8.8.14	IGNORE (**)
	RT Brachy Application Setups	Table 30, C.8.8.15	OPTIONAL (**)
	Approval	Table 31, C.8.8.16	OPTIONAL
	Audio	C.10.3	IGNORE
	SOP Common	Table 32, C.12.1	ALWAYS

(*) RT Fraction Scheme is optional according to DICOM PS3.3-2004.

(**) TCS can only operate on RT Plan objects for Brachy, which do not contain an RT Beams module and one or more RT Brachy Application Setups. Note that if multiple Brachy Application Setups are found, TCS 3.0 will only use the first one. If multiple Brachy Application Setups are present, TCS will only use the first one.

Table 23 Patient Module

Attribute Name	Tag	DICOM Type	TCS Handling
Patient's Name	0010,0010	2	ALWAYS – given name and family name are mandatory for TCS database. If given name is empty, TCS will store it as “?” internally.
Patient ID	0010,0020	2	ALWAYS – used as primary key in database
Patient's Birth Date	0010,0030	2	ALWAYS – $1-1-1755 \leq \text{Patient's Birth Date} < \text{Tomorrow}$
Patient's Sex	0010,0040	2	OPTIONAL
Other	0010,1000	3	OPTIONAL
Ethnic	0010,2160	3	OPTIONAL
Comments	0010,4000	3	OPTIONAL

Table 24 General Study Module

Attribute Name	Tag	DICOM Type	TCS Handling
Study Instance UID	0020,000D	1	ALWAYS
Study Date	0080,0020	2	OPTIONAL
Study Time	0080,0030	2	OPTIONAL
Referring Physician's Name	0080,0090	2	OPTIONAL
Study ID	0020,0010	2	ALWAYS – value of "" is also accepted
Accession Number	0020,0050	2	OPTIONAL
Description	0008,1030	3	OPTIONAL
Physician of Record	0008,1048	3	OPTIONAL

Table 25 RT Series Module

Attribute Name	Tag	DICOM Type	TCS Handling
Modality	0008,0060	1	ALWAYS
Series Instance UID	0020,000E	1	ALWAYS
Series Number	0020,0011	2	OPTIONAL

Table 26 General Equipment Module

Attribute Name	Tag	DICOM Type	TCS Handling
Manufacturer	0008,0070	2	OPTIONAL
Institution Name	0008,0080	3	OPTIONAL
Institution Address	0008,0081	3	OPTIONAL
Institutional Department Name	0008,1040	3	OPTIONAL
Manufacturer's Model Name	0008,1090	3	OPTIONAL
Device Serial Number	0018,1000	3	OPTIONAL
Software Versions	0018,1020	3	OPTIONAL
Station Name	0008,1010	3	OPTIONAL

Table 27 RT General Plan Module

Attribute Name	Tag	DICOM Type	TCS Handling
RT Plan Label	300A,0002	1	ALWAYS
RT Plan Name	300A,0003	3	OPTIONAL
RT Plan Description	300A,0004	3	OPTIONAL
Instance Number	0020,0013	3	OPTIONAL
Operators' Name	0008,1070	2	OPTIONAL
RT Plan Date	300A,0006	2	OPTIONAL
RT Plan Time	300A,0007	2	OPTIONAL
Treatment Protocols	300A,0009	3	OPTIONAL
Treatment Intent	300A,000A	3	OPTIONAL
Treatment Sites	300A,000B	3	OPTIONAL
RT Plan Geometry	300A,000C	1	ALWAYS – If value is not equal to TREATMENT_DEVICE, TCS will still interpret it as such. This means that the Referenced Structure Set Sequence will always be ignored.
Referenced Structure Set Sequence	300C,0060	1C	IGNORE – entire sequence
>Referenced SOP Class UID	0008,1150	1C	
>Referenced SOP Instance UID	0008,1155	1C	
Referenced Dose Sequence	300C,0080	3	OPTIONAL – entire sequence
>Referenced SOP Class UID	0008,1150	1C	
>Referenced SOP Instance UID	0008,1155	1C	
Referenced RT Plan Sequence	300C,0002	3	OPTIONAL – entire sequence
>Referenced SOP Class UID	0008,1150	1C	
>Referenced SOP Instance UID	0008,1155	1C	
> RT Plan Relationship	300A,0055	1C	

Table 28 RT Prescription Module

Attribute Name	Tag	DICOM Type	TCS Handling
Prescription Description	300A,000E	3	IGNORED
Dose Reference Sequence	300A,0010	3	OPTIONAL
>Dose Reference Number	300A,0012	1C	OPTIONAL – required if 300A,0010 is present
>Dose Reference Structure Type	300A,0014	1C	OPTIONAL – required if 300A,0010 is present. Must have value COORDINATES
>Dose Reference Description	300A,0016	3	OPTIONAL
>Referenced ROI Number	3006,0084	1C	IGNORE
>Dose Reference Point Coordinates	300A,0018	1C	OPTIONAL – required if 300A,0010 is present
>Nominal Prior Dose	300A,001A	3	IGNORE
>Dose Reference Type	300A,0020	1C	OPTIONAL – required if 300A,0010 is present. Both TARGET and ORGAN_AT_RISK are accepted.
>Constraint Weight	300A,0021	3	IGNORE
>Delivery Warning Dose	300A,0022	3	IGNORE
>Delivery Maximum Dose	300A,0023	3	IGNORE
>Target Minimum Dose	300A,0025	3	IGNORE
>Target Prescription Dose	300A,0026	3	OPTIONAL
>Target Maximum Dose	300A,0027	3	OPTIONAL
>Target Underdose Volume Fraction	300A,0028	3	IGNORE
>Organ at Risk Full-volume Dose	300A,002A	3	IGNORE
>Organ at Risk Limit Dose	300A,002B	3	IGNORE
>Organ at Risk Maximum Dose	300A,002C	3	IGNORE
>Organ at Risk Overdose VolumeFraction	300A,002D	3	IGNORE

Table 29 Fraction Scheme Module

Attribute Name	Tag	DICOM Type	TCS Handling
Fraction Group Sequence	300A,0070	1	ALWAYS
>Fraction Group Number	300A,0071	1	ALWAYS
>Referenced Patient Setup Number	300C,006A	3	OPTIONAL
>Referenced Dose Sequence	300C,0080	3	IGNORE – entire sequence
>>Referenced SOP Class UID	0008,1150	1C	
>>Referenced SOP Instance UID	0008,1155	1C	
>Referenced Dose ReferenceSequence	300C,0050	3	IGNORE – entire sequence
>>Referenced Dose ReferenceNumber	300C,0051	1C	
>>Constraint Weight	300A,0021	3	
>>Delivery Warning Dose	300A,0022	3	
>>Delivery Maximum Dose	300A,0023	3	
>>Target Minimum Dose	300A,0025	3	
>>Target Prescription Dose	300A,0026	3	
>>Target Maximum Dose	300A,0027	3	
>>Target Underdose Volume Fraction	300A,0028	3	
>>Organ at Risk Full-volume Dose	300A,002A	3	
>>Organ at Risk Limit Dose	300A,002B	3	
>>Organ at Risk Maximum Dose	300A,002C	3	
>>Organ at Risk Overdose VolumeFraction	300A,002D	3	
>Number of Fractions Planned	300A,0078	2	OPTIONAL, needed if Number of Pulses is not specified (300A,028A) and brachy treatment type (300A,0202) is PDR. TCS 3.0 supports at maximum 250 fractions for one plan.
>Number of Fraction Pattern Digits Per Day	300A,0079	3	OPTIONAL
>Repeat Fraction Cycle Length	300A,007A	3	OPTIONAL
>Fraction Pattern	300A,007B	3	OPTIONAL
>Number of Beams	300A,0080	1	ALWAYS – must be 0 (zero, indicating brachy plans)
>Referenced Beam Sequence	300C,0004	1C	IGNORE
>>Referenced Beam Number	300C,0006	1C	IGNORE
>>Beam Dose Specification Point	300A,0082	3	IGNORE
>>Beam Dose	300A,0084	3	IGNORE

Attribute Name	Tag	DICOM Type	TCS Handling
>>Beam Meterset	300A,0086	3	IGNORE
>Number of Brachy Application Setups	300A,00A0	1	ALWAYS – must be 1 or more (indicating brachy plan).
>Referenced Brachy Application SetupSequence	300C,000A	1C	ALWAYS
>>Referenced Brachy ApplicationSetup Number	300C,000C	1C	ALWAYS
>>Brachy Application Setup DoseSpecification Point	300A,00A2	3	OPTIONAL
>>Brachy Application Setup Dose	300A,00A4	3	OPTIONAL – mapped to Reference Dose in TCS database and UI
>> <i>Private attributes</i>	300B,00xx	3	OPTIONAL
>>Fraction Dose Sequence	300B,xx40	3	OPTIONAL
>>> <i>Private attributes</i>	300B,00xx	3	OPTIONAL
>>>Reference Dose	300B,xx42	3	OPTIONAL
>>>Referring Fraction Number	300B,xx44	3	OPTIONAL
>>> <i>End private attributes</i>			
>> <i>End private attributes</i>			

Notes: 1. An RT Dose IOD referenced within the Referenced Dose Sequence (300C,0080) can be used for storing grid-based (pixel) data, isodose curves, and/or individual dose points (with optional dose point names) for the current Fraction Group.
 2. The fractionation pattern does not indicate the actual start of treatment, or the order or timing of fraction delivery. If treatment does not commence as outlined in the pattern, it is the application's responsibility to make any necessary adjustments.

Table 30 RT Brachy Application Setups Module

Attribute Nam	Tag	DICOM Type	TCS Handling
Brachy Treatment Technique	300A,0200	1	ALWAYS – For Brachy plans this shall always be present.
Brachy Treatment Type	300A,0202	1	ALWAYS – for TCS 2.2 value must be PDR – from TCS 3.0 onward HDR is also accepted.
<i>Private attributes</i>	300B,00xx	3	OPTIONAL
Origin	300B,xx30	3	OPTIONAL
Library Plan Name	300B,xx32	3	OPTIONAL
<i>End private attributes</i>			
Treatment Machine Sequence	300A,0206	1	ALWAYS
>Treatment Machine Name	300A,00B2	2	OPTIONAL
>Manufacturer	0008,0070	3	OPTIONAL
>Institution Name	0008,0080	3	OPTIONAL
>Institution Address	0008,0081	3	OPTIONAL
>Institutional Department Name	0008,1040	3	OPTIONAL
>Manufacturer's Model Name	0008,1090	3	OPTIONAL
>Device Serial Number	0018,1000	3	OPTIONAL
Source Sequence	300A,0210	1	ALWAYS
>Source Number	300A,0212	1	ALWAYS
>Source Type	300A,0214	1	ALWAYS
>Source Manufacturer	300A,0216	3	OPTIONAL
>Active Source Diameter	300A,0218	3	OPTIONAL
>Active Source Length	300A,021A	3	OPTIONAL
>Material ID	300A,00E1	3	OPTIONAL
>Source Encapsulation NominalThickness	300A,0222	3	OPTIONAL
>Source Encapsulation NominalTransmission	300A,0224	3	OPTIONAL
>Source Isotope Name	300A,0226	1	ALWAYS
>Source Isotope Half Life	300A,0228	1	ALWAYS
>Reference Air Kerma Rate	300A,022A	1	ALWAYS
>Air Kerma Rate Reference Date	300A,022C	1	ALWAYS
>Air Kerma Rate Reference Time	300A,022E	1	ALWAYS
Application Setup Sequence	300A,0230	1	ALWAYS
>Application Setup Type	300A,0232	1	ALWAYS
>Application Setup Number	300A,0234	1	ALWAYS – TCS also accepts the value 'UNDEFINED' next to what is specified in [DICOM2004]
>Application Setup Name	300A,0236	3	OPTIONAL
>Application Setup Manufacturer	300A,0238	3	OPTIONAL

Attribute Nam	Tag	DICOM Type	TCS Handling
>Template Number	300A,0240	3	OPTIONAL
>Template Type	300A,0242	3	OPTIONAL
>Template Name	300A,0244	3	OPTIONAL
>Referenced Reference ImageSequence	300C,0042	3	IGNORE – entire sequence
>>Referenced SOP Class UID	0008,1150	1C	
>>Referenced SOP Class Instance	0008,1155	1C	
>Total Reference Air Kerma	300A,0250	1	ALWAYS
>Brachy Accessory Device Sequence	300A,0260	3	OPTIONAL
>>Brachy Accessory Device Number	300A,0262	2C	OPTIONAL
>>Brachy Accessory Device ID	300A,0263	2C	OPTIONAL
>>Brachy Accessory Device Type	300A,0264	1C	ALWAYS
>>Brachy Accessory Device Name	300A,0266	3	OPTIONAL
>>Material ID	300A,00E1	3	OPTIONAL
>> Brachy Accessory Device NominalThickness	300A,026A	3	OPTIONAL
>> Brachy Accessory Device NominalTransmission	300A,026C	3	OPTIONAL
>>Referenced ROI Number	3006,0084	2C	OPTIONAL
>Channel Sequence	300A,0280	1	ALWAYS
>>Channel Number	300A,0282	1	ALWAYS
>>Channel Length	300A,0284	2	ALWAYS
>>Channel Total Time	300A,0286	1	ALWAYS
>>Source Movement Type	300A,0288	1	ALWAYS
>>Number of Pulses	300A,028A	1C	ALWAYS – Mandatory for PDR plans. In TCS, the number of pulses has to be the same for all channels. This is checked upon import. TCS 3.0 supports up to 250 pulses per plan.
>>Pulse Repetition Interval	300A,028C	1C	ALWAYS - Mandatory for PDR plans. If not available, TCS assumes a default of 1 hour. TCS requires this value to be equal for all channels and will take it from the first channel in the Channel Sequence (300A,0282) when interpreting an RT Plan.
>> <i>Private attributes</i>	300B,00xx	3	OPTIONAL
>>Length Changed	300B,xx50	3	OPTIONAL
>>Pulse Repetition Interval Changed	300B,xx52	3	OPTIONAL
>>Mapped Channel Number	300B,xx54	3	OPTIONAL
>> <i>End private attributes</i>			
>>Source Applicator Number	300A,0290	3	OPTIONAL

Attribute Nam	Tag	DICOM Type	TCS Handling
>>Source Applicator ID	300A,0291	2C	ALWAYS
>>Source Applicator Type	300A,0292	1C	OPTIONAL
>>Source Applicator Name	300A,0294	3	OPTIONAL
>>Source Applicator Length	300A,0296	1C	ALWAYS
>>Source Applicator Manufacturer	300A,0298	3	OPTIONAL
>>Material ID	300A,00E1	3	OPTIONAL
>> Source Applicator Wall NominalThickness	300A,029C	3	OPTIONAL
>> Source Applicator Wall NominalTransmission	300A,029E	3	OPTIONAL
>>Source Applicator Step Size	300A,02A0	1C	ALWAYS
>>Referenced ROI Number	3006,0084	2C	IGNORE
>>Transfer Tube Number	300A,02A2	2	OPTIONAL – TCS 3.0 and earlier do not support remapping of logical to physical channels.
>>Transfer Tube Length	300A,02A4	2C	OPTIONAL
>>Channel Shield Sequence	300A,02B0	3	IGNORE
>>>Channel Shield Number	300A,02B2	1C	IGNORE
>>>Channel Shield ID	300A,02B3	2C	IGNORE
>>>Channel Shield Name	300A,02B4	3	IGNORE
>>>Material ID	300A,00E1	3	IGNORE
>>>Channel Shield Nominal Thickness	300A,02B8	3	IGNORE
>>>Channel Shield NominalTransmission	300A,02BA	3	IGNORE
>>>Referenced ROI Number	3006,0084	2C	IGNORE
>>Referenced Source Number	300C,000E	1	ALWAYS
>>Number of Control Points	300A,0110	1	ALWAYS
>>Final Cumulative Time Weight	300A,02C8	1C	ALWAYS
>>Brachy Control Point Sequence	300A,02D0	1	ALWAYS
>>>Control Point Index	300A,0112	1	ALWAYS
>>>Cumulative Time Weight	300A,02D6	2	ALWAYS
>>>Control Point Relative Position	300A,02D2	1	ALWAYS
>>>Control Point 3D Position	300A,02D4	3	OPTIONAL

Attribute Nam	Tag	DICOM Type	TCS Handling
>>>Brachy Referenced Dose Reference Sequence	300C,0055	3	OPTIONAL
>>>>Referenced Dose Reference Number	300C,0051	1C	OPTIONAL
>>>>Cumulative Dose Reference	300A,010C	1C	OPTIONAL

Note: Material ID (300A,00E1) may also be specified within a referenced ROI, if an ROI is used to describe the object.

Table 31 Approval Module

Attribute Name	Tag	DICOM Type	TCS Handling
Approval Status	300E,0002	1	ALWAYS
Review Date	300E,0004	2C	OPTIONAL
Review Time	300E,0005	2C	OPTIONAL
Reviewer Name	300E,0008	2C	OPTIONAL

Table 32 SOP Common

Attribute Name	Tag	DICOM Type	TCS Handling
SOP Class UID	0008,0016	1	ALWAYS
SOP Instance UID	0008,0018	1	ALWAYS

8.1.3 Attribute mapping

8.1.4 Coerced/Modified fields

During RT Plan import, attributes of Patient, Study or Series objects in the imported data set may contain information that is not yet available in the TCS database, while the objects themselves already exist from previous imports. In this case, *empty database fields* will be filled using the attributes of the imported data set as input. Table 33 provides an overview of attributes and database fields to which this applies.

Table 33 Coerced/modified fields - database to DICOM tag mapping

Database entity	Database field	DICOM Attribute	DICOM Tag	Database action
Patient	Middle Name	Patient's Name	0010,0010	Extracted from this attribute
	Name Prefix	Patient's Name	0010,0010	Extracted from this attribute
	Name Suffix	Patient's Name	0010,0010	Extracted from this attribute
	Sex	Patient's Sex	0010,0040	Copied from this attribute
	Birth Date	Patient's Birth Date	0010,0030	Copied from this attribute
	Comments	Patient Comments	0010,4000	Copied from this attribute
Study	Date	Study Date	0008,0020	Copied from this attribute
	Referring Physician	Referring Physician's Name	0008,0090	Copied from this attribute
	Accession Number	Accession Number	0008,0050	Copied from this attribute
	Study ID	Study ID	0020,0010	Copied from this attribute
	Description	Study Description	0008,1030	Copied from this attribute
Series	Series Number	Series Number	0020,0011	Copied from this attribute
	Description	Series Description	0020,103E	Copied from this attribute

Note: the database entities and fields mentioned here may change in the database design. This DICOM conformance statement does not assume a specific database structure, the entities and fields are only mentioned here to indicate structure and provide reference to information displayed in TCS about these entities.

8.2 Data dictionary of private attributes

Tag	Attribute Name	Attribute Description	VR	VM
3009,xx10	Brachy Control Point Planned Sequence	Sequence of control points planned, adjusted to source strength at time of treatment start. Weights are rounded to the treatment unit's resolution (0.1 s). Part of pre-treatment record in TCS and derived from (300A,02D0) in original RT Plan.	SQ	1
3009,xx12	Relative Position	Distance between current Control Point Position and the distal-most possible Source position in current Channel (mm) - rounded as sent to treatment unit, thus different than DICOM 300A,02D2 as found in plan. Used in Pretreatment record.	DS	1
3009,xx14	Dwell Time	Part of control point planned. Rounded off dwelltime (s) sent to TU.	DS	1
300B,xx10	TU Dwell Time Precision	Use to round values of dwell times, due to treatment unit limitations. DwellTime will scientifically rounded off (e.g. With a TUDwellTimePrecision of 0.1, a dwelltime of 0.25 will be delivered with dwelltime = 0.3)	DS	1
300B,xx20	Calibration Reference Air Kerma Rate	Original calibrated air kerma rate in air of isotope. (Not the same as DICOM attribute Air Kerma Rate at date of treatment)	DS	1
300B,xx22	Calibration Air Kerma Rate Reference Date	Date at which 300B,xx20 was measured.	DA	1
300B,xx24	Calibration Air Kerma Rate Reference Time	Time at which 300B,xx20 was measured.	TM	1
300B,xx26	Secondary Time	The delivered secondary timer for a channel in seconds.	DS	1
300B,xx30	Origin	String identifying plan as created on "Plato BPS" or "Manual" on TCS.	CS	1
300B,xx32	Library Plan Name	Name of library plan used as basis for executed plan.	LO	1
300B,xx40	Fraction Dose Sequence	Sequence of user changed fraction doses per pulse (PDR). Used for boosting of individual fractions in PDRv2.	SQ	1
300B,xx42	Reference Dose	Dose delivered per fraction (in boosting scheme)	IS	1
300B,xx44	Referring Fraction Number	Sequence number of fraction in total fraction scheme.	DS	1
300B,xx50	Length Changed	Integer flag, indicating change in catheter length. 0 = length is not changed; 1 = length is changed	IS	1
300B,xx52	Pulse Repetition Interval Changed	Integer flag, indicating change in repetition interval. 0 = length is not changed; 1 = length is changed	IS	1
300B,xx54	Mapped Channel Number	Number mapping the catheter to a channel. Value range 0 or higher.	IS	1

The identification code (the value) of the Private Creator Data Elements shall be in the format "PRIVATE_CODE_STRING_<private group Number>" (e.g. "PRIVATE_CODE_STRING_3009").