

# *DICOM Conformance Statement*

*Oncentra<sup>®</sup> Prostate 4.1  
including  
Oncentra<sup>®</sup> Seeds*



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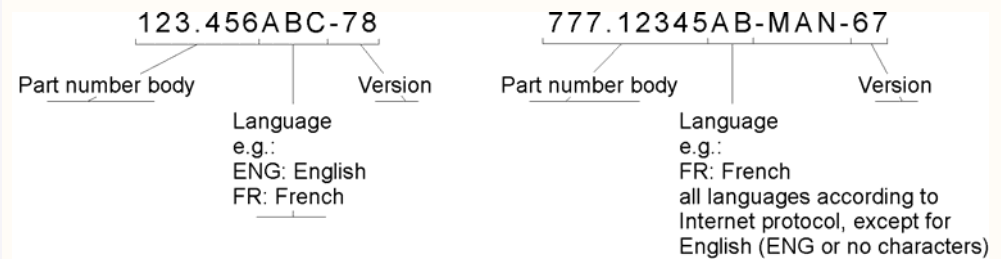
# Preface

## Identification

Manuals are identified by a part number. There are two types of part numbers:

Example 1:

Example 2



The part number is printed at the bottom of the title page. Numbers printed on other pages are for internal revision control and may differ.

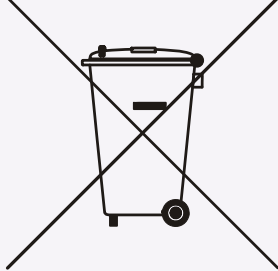

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For this reason mark  is used.

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| Symbol  | Meaning  | Remarks   |
|---|--|---|
| <br><b>Location:</b> Near or on the type identification plate. | Symbol for separated collection of electrical and electronic equipment per Directive 2002/96 of the European Parliament and the Council of the European Union (Directive on Waste of Electrical and Electronic Equipment - <b>WEEE</b> ). If applicable to the type of device, it indicates legally imposed obligations within EU member states, Iceland, Norway and Switzerland when the equipment is disposed of, at the end of its life-time. | Owners of marked equipment should contact the organization that imported the equipment into their country, when they want to dispose of the equipment, at the end of its lifetime. The Directive prioritizes re-use of equipment over re-use of components over re-use of materials over disposal as waste. Article 5 part 2d allows producers to decline the return of any used equipment that is or may be biologically or radiologically contaminated. |
|    | Legal manufacturer   |   |

## Conventions

Throughout this manual certain conventions are used. These are Warnings, Cautions and Notes. They provide a means of prioritizing information to be brought to the attention of the user. They are given as follows:

**Warning:** Designates a possibly dangerous situation. Non-observance may lead to death or the most severe injuries

**Caution:** Designates a possibly harmful situation. Non-observance may lead to minor injuries or damage to the product.

*Note:* Designates a possibly harmful situation. Non-observance may lead to damage to the product or the environment.

## Precautions

The user is expected to use the product (soft and hardware) in accordance with the instructions given in this manual, which must be read before the system is used. Any unauthorized deviation from the procedures laid down in this manual can affect the contractual obligations between purchaser and vendor.

**Warning:** Do not modify any part of Nucletron supplied computer's hardware, software or software configuration. Installing or running an application that has not explicitly been approved by Nucletron may compromise patient safety and will result in termination of all warranty and service contracts.

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This manual was originally drafted in the English language.



# Table of Contents

|           |   |          |
|-----------|---|----------|
| <b>1.</b> | <b>Introduction</b>                                 | <b>1</b> |
| 1.1       | Scope .....   | 1        |
| 1.1.1     | Oncentra Prostate.....                              | 1        |
| 1.1.2     | Smoothbase.....                                     | 1        |
| 1.2       | Intended Audience.....                              | 1        |
| <b>2.</b> | <b>Document History</b>                             | <b>2</b> |
| <b>3.</b> | <b>Related Documents</b>                            | <b>2</b> |
| <b>4.</b> | <b>Definitions, Terms and Abbreviations</b>         | <b>2</b> |
| <b>5.</b> | <b>Implementation Model</b>                         | <b>3</b> |
| 5.1       | Application Data Flow Diagram .....                 | 4        |
| 5.2       | Data Types .....                                    | 5        |
| 5.3       | Data Hierarchy.....                                 | 6        |
| 5.4       | Functional Definitions of AE's.....                 | 6        |
| 5.4.1     | Query/Retrieve SCU AE.....                          | 6        |
| 5.4.2     | Storage SCU AE.....                                 | 6        |
| 5.4.3     | Storage SCP AE .....                                | 6        |
| 5.4.4     | Print SCU AE.....                                   | 6        |
| 5.4.5     | Modality worklist SCU AE.....                       | 7        |
| 5.5       | Sequencing of Real-World Activities.....            | 7        |
| <b>6.</b> | <b>AE Specifications</b>                            | <b>7</b> |
| 6.1       | Query Retrieve SCU AE – Specification .....         | 7        |
| 6.1.1     | Association Establishment Policies.....             | 7        |
| 6.1.2     | Association Initiation by Real-World Activity ..... | 8        |
| 6.1.3     | Association Acceptance Policy.....                  | 8        |
| 6.2       | Storage SCU AE – Specification .....                | 9        |
| 6.2.1     | Association Establishment Policies.....             | 9        |
| 6.2.2     | Association Initiation by Real-World Activity ..... | 9        |
| 6.2.3     | Association Acceptance Policy.....                  | 10       |
| 6.3       | Storage SCP AE – Specification .....                | 10       |
| 6.3.1     | Association Establishment Policies.....             | 10       |
| 6.3.2     | Association Initiation by Real-World Activity ..... | 11       |
| 6.3.3     | Association Acceptance Policy.....                  | 11       |
| 6.4       | Print SCU AE – Specifications .....                 | 12       |
| 6.4.1     | Association Establishment Policies.....             | 13       |
| 6.4.2     | Association Initiation by Real-World Activity ..... | 13       |
| 6.4.3     | Association Acceptance Policy.....                  | 14       |
| 6.5       | Modality Worklist SCU AE – Specification .....      | 14       |
| 6.5.1     | Association Establishment Policies.....             | 14       |
| 6.5.2     | Association Initiation by Real-World Activity ..... | 15       |
| 6.5.3     | Association Acceptance Policy.....                  | 15       |

## Table of Contents

|                   |   |           |
|-------------------|---|-----------|
| 6.5.4             | SOP Specific Conformance - Modality Worklist Management .....                                 | 16        |
| <b>7.</b>         | <b>Communication Profiles</b>   | <b>17</b> |
| 7.1               | Supported Communication Stacks .....  | 17        |
| 7.2               | TCP/IP Stack.....   | 17        |
| 7.3               | Physical Media Support .....  | 18        |
| <b>8.</b>         | <b>Extensions/Specializations/Privatizations</b>  | <b>18</b> |
| 8.1               | Standard Extended/Specialized/Private SOPs.....   | 18        |
| 8.2               | Private Transfer Syntaxes.....  | 18        |
| <b>9.</b>         | <b>Configuration</b>  | <b>18</b> |
| 9.1               | AE Title/Presentation Address Mapping .....   | 18        |
| 9.2               | Configurable Parameters .....   | 19        |
| <b>10.</b>        | <b>Support of Extended Character Sets</b>   | <b>19</b> |
| <b>11.</b>        | <b>Codes and Controlled Terminology</b>   | <b>19</b> |
| <b>12.</b>        | <b>Security Profiles</b>  | <b>19</b> |
| <b>Appendix A</b> | <b>DICOM – Oncentra Prostate; DICOM – Oncentra Prostate; Specific Implementations Details</b> | <b>20</b> |
| A.1               | Definitions.....  | 20        |
| A.2               | CT Image Module Table (A.3).....  | 21        |
| A.3               | MR Image Module Table (A.4) .....   | 21        |
| A.4               | US Image Module Table (A.6).....  | 22        |
| A.5               | US Multi Frame Image Module Table (A.7).....  | 23        |
| A.6               | RT Structure Set Module Table (A.19).....   | 24        |
| A.7               | Patient Module Attributes (C.7.1.1).....  | 25        |
| A.8               | General Study Module Attributes (C.7.2.1) .....   | 25        |
| A.9               | Patient Study Module Attributes (C.7.2.2).....  | 26        |
| A.10              | General Series Module Attributes (C.7.3.1) .....  | 26        |
| A.11              | Frame Of Reference Module Attributes (C.7.4.1).....   | 27        |
| A.12              | General Equipment Module Attributes (C.7.5.1) .....   | 28        |
| A.13              | US Probe Module Attributes (Private).....   | 28        |
| A.14              | General Image Module Attributes (C.7.6.1) .....   | 28        |
| A.15              | Image Plane Module Attributes (C.7.6.2).....  | 29        |
| A.16              | Image Pixel Module Attributes (C.7.6.3) .....   | 29        |
| A.17              | CT Image Module Attributes (C.8.2.1) .....  | 30        |
| A.18              | MR Image Module Attributes (C.8.3.1) .....  | 31        |
| A.19              | US Image Module Attributes (C.8.5.6).....   | 32        |
| A.20              | General Acquisition Attributes (Private).....   | 35        |
| A.21              | General Geometry Attributes (Private).....  | 35        |
| A.22              | General Template Attributes (Private) .....   | 35        |
| A.22.1.           | General Template Components Attributes (Private).....   | 35        |
| A.23              | RT Series Module Attributes (C.8.8.1).....  | 36        |
| A.24              | Structure Set Module Attributes (C.8.8.5) .....   | 36        |
| A.25              | ROI Geometry Attributes.....  | 37        |
| A.26              | ROI Contour Module Attributes (C.8.8.6).....  | 38        |
| A.27              | RT ROI Observations Module Attributes (C.8.8.8) .....   | 38        |

|                   |   |           |
|-------------------|---|-----------|
| A.28              | VOI LUT Module Attributes (C.11.2).....                             | 39        |
| A.29              | SOP Common Module Attributes (C.12.1).....                          | 39        |
| <b>Appendix B</b> | <b>RT Treatment Plan &amp; RT Dose</b>                              | <b>40</b> |
| B.1               | RT Plan IOD (A.20).....   | 40        |
| B.2               | RT General Plan Module (C.8.8.9) .....                              | 41        |
| B.3               | RT Prescription Module (C.8.8.10) .....                             | 41        |
| B.4               | Fraction Scheme Module (C.8.8.13).....                              | 42        |
| B.5               | RT Brachy Application Setups Module (C.8.8.15).....                 | 43        |
| B.6               | Approval Module (C.8.8.9) .....                                     | 49        |
| B.7               | Marker Module (Private) – Patient-, Marker-, Applicator Points..... | 49        |
| B.8               | Settings Module (Private).....                                      | 50        |
|                   | B.8.1. Approval (C.8.8.16).....                                     | 50        |
| B.9               | SOP Common (C.8.8.9).....   | 50        |
| B.10              | RT Dose IOD Module Table.....                                       | 51        |
|                   | B.10.1. Patient Module.....   | 51        |
|                   | B.10.2. General Study Module .....                                  | 52        |
|                   | B.10.3. RT Series Module .....                                      | 52        |
|                   | B.10.4. Frame of Reference Module.....                              | 53        |
|                   | B.10.5. General Equipment Module.....                               | 53        |
|                   | B.10.6. General Image Module.....                                   | 53        |
|                   | B.10.7. Image Plane Module .....                                    | 54        |
|                   | B.10.8. Image Pixel Module.....                                     | 54        |
|                   | B.10.9. Multi-Frame Module .....                                    | 55        |
|                   | B.10.10. RT Dose Module.....  | 55        |
|                   | B.10.11. Structure Set Module .....                                 | 56        |
|                   | B.10.12. ROI Contour Module .....                                   | 57        |
|                   | B.10.13. RT Dose ROI Module.....                                    | 58        |
|                   | B.10.14. SOP Common Module .....                                    | 58        |
| <b>Appendix C</b> | <b>Private Data Elements</b>  | <b>59</b> |
| C.1               | US Probe Module Attributes (Private).....                           | 59        |
| C.2               | General Acquisition Attributes (Private).....                       | 60        |
| C.3               | General Geometry Attributes (Private).....                          | 60        |
| C.4               | General Template Attributes (Private) .....                         | 60        |
| C.5               | General Template Components Attributes (Private).....               | 61        |
| C.6               | ROI Geometry Attributes.....  | 61        |
| C.7               | Marker Module (Private) – Patient-, Marker-, Applicator Points..... | 62        |
| C.8               | Settings Module (Private).....                                      | 62        |



## 1. Introduction

This conformance statement specifies how the Oncentra Prostate 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. Oncentra Prostate uses the DICOM protocol to receive and transmit objects that are used in the radiation therapy process.

### 1.1 Scope

#### 1.1.1 Oncentra Prostate

Oncentra Prostate is a 'real time' treatment planning system for brachytherapy, specially designed for the treatment of prostate cancer. Direct 3D ultrasound imaging of the implant gives the possibility to update the treatment plan during insertion of the catheters in the prostate.

Before treatment, the software provides the physician with anatomical and dosimetric information, which is used to determine the positioning and loading of radioactive sources. The software also provides a variety of plan evaluation tools to assist in generating the most optimal dose distribution (e.g. dose verification at a point and dose volume histograms).

#### 1.1.2 Smoothbase

Oncentra Prostate uses Smoothbase as database to store plans and images. The Smoothbase database is used in different Nucletron products. The main features of Smoothbase are:

- User management.
- Store and retrieve images, treatment plans, etc.
- Import treatment plans, images, etc. from another DICOM source or,
- Export treatment plans, images, etc. to another DICOM destination or,
- Import or export treatment plans, images, etc. to a DICOM Media file.
- Print images to a DICOM printer
- Query and Retrieve User (SCU) functionality, which may be used to query and retrieve DICOM objects from a remote Query and Retrieve Provider (SCP).
- Query worklist functionality (SCU) and handling of query responses.

### 1.2 Intended Audience

This document is intended for:

- Users of Oncentra Prostate, who want to use DICOM with the Application.
- 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.

## 2. Document History

| Revision | Who            | Reason for Change  | Changes   |
|----------|----------------|--|---|
| 00       | John de Ridder | Initial version for Oncentra Prostate 4.0 including Oncentra Seeds | DICOM tag 3004,000C is now confirm DICOM Standard 2008.     |
| 01       | John de Ridder | Release of Oncentra Prostate v4.1 including Oncentra Seeds         | Two tags added for connectivity with Flexitron afterloader. |

## 3. Related Documents

| Reference     | Revision | Description   |
|---------------|----------|---|
| 777.00152 MAN | *        | Oncentra Prostate including Oncentra Seeds Reference Manual |
| 777.00153 MAN | *        | Oncentra Prostate including Oncentra Seeds User Manual      |
| 777.00154 MAN | *        | Oncentra Prostate including Oncentra Seeds Service Manual   |
| DICOM2003     | *        | Digital Imaging and Communications in Medicine              |

\* Latest version (available via the Nucletron Extranet).

## 4. Definitions, Terms and Abbreviations

This section provides the definitions of terms, acronyms, and abbreviations, which are used throughout the document.

| Abbreviation      | Description  |
|-------------------|--|
| Oncentra Prostate | Software tool to acquire ultrasound images and to perform and verify the prostate treatment plans.   |
| Smoothbase        | Database used in several Nucletron products to store and retrieve patient data and to exchange such data with other products using DICOM.                                      |
| AE                | Application Entity, according to DICOM terminology   |
| DICOM             | Digital Imaging and Communications in Medicine, a standard on image communications in medical applications   |
| DIMSE             | DICOM Message Service element  |
| IE                | Information Entity   |
| IOD               | Information Object Definition, according to DICOM terminology  |
| NEMA              | National Electrical Manufacturers Association  |
| PDU               | Protocol Data Unit   |
| SCU               | Service Class User, according to DICOM terminology   |
| SCP               | Service Class Provider, according to DICOM terminology   |
| SOP               | Service-Object-Pair, a definition of an information object (like an image) and of a service (like storage) that can be performed for the object                                |
| TCP/IP            | Transmission Control Protocol / Internet Protocol, a widely used computer networking protocol  |
| VR                | Value Representation, a data encoding method in DICOM  |
| UID               | Unique Identifier used to identify an object by a worldwide unique Identifier, according to DICOM terminology.   |
| C-MOVE            | DIMSE for transfer of object instance(s) from a remote AE, whose attributes match a specified set of attributes, to another remote AE, which could be the AE of the requestor. |
| C-FIND            | DIMSE for matching of a set of attributes to the attributes of a set of DICOM object instances on a remote AE.   |
| C-STORE           | DIMSE for transfer of a DICOM object instance to a remote AE.  |
| US                | Ultrasound System  |

| Abbreviation | Description                                    |
|--------------|--|
| ROI          | Region of Interest; defined contour on a slice |
| VOI          | Volume of interest; consists of multiple ROI's |

## 5. Implementation Model

In its current version Smoothbase is, very basically, an implementation of

- Export Command, which can send DICOM objects to a Remote Storage SCP.
- Import Command, which can receive DICOM objects from a Remote Storage SCU.
- DICOM Basic Print, which can send DICOM objects to a DICOM Basic Print SCP.
- Query and Retrieve User (SCU) functionality, which may be used to query and retrieve DICOM objects from a remote Query and Retrieve Provider (SCP).
- Query worklist (SCU) functionality, which can be used to query a worklist from a remote worklist provider.

The data flow diagram shown in Figure 1 represents all DICOM Application Entities present in an instantiation of the Oncentra Prostate product and maps these to real world activities and applicable user actions.

### 5.1 Application Data Flow Diagram

Figure 1 shows a diagram illustrating the data flow in the application model.

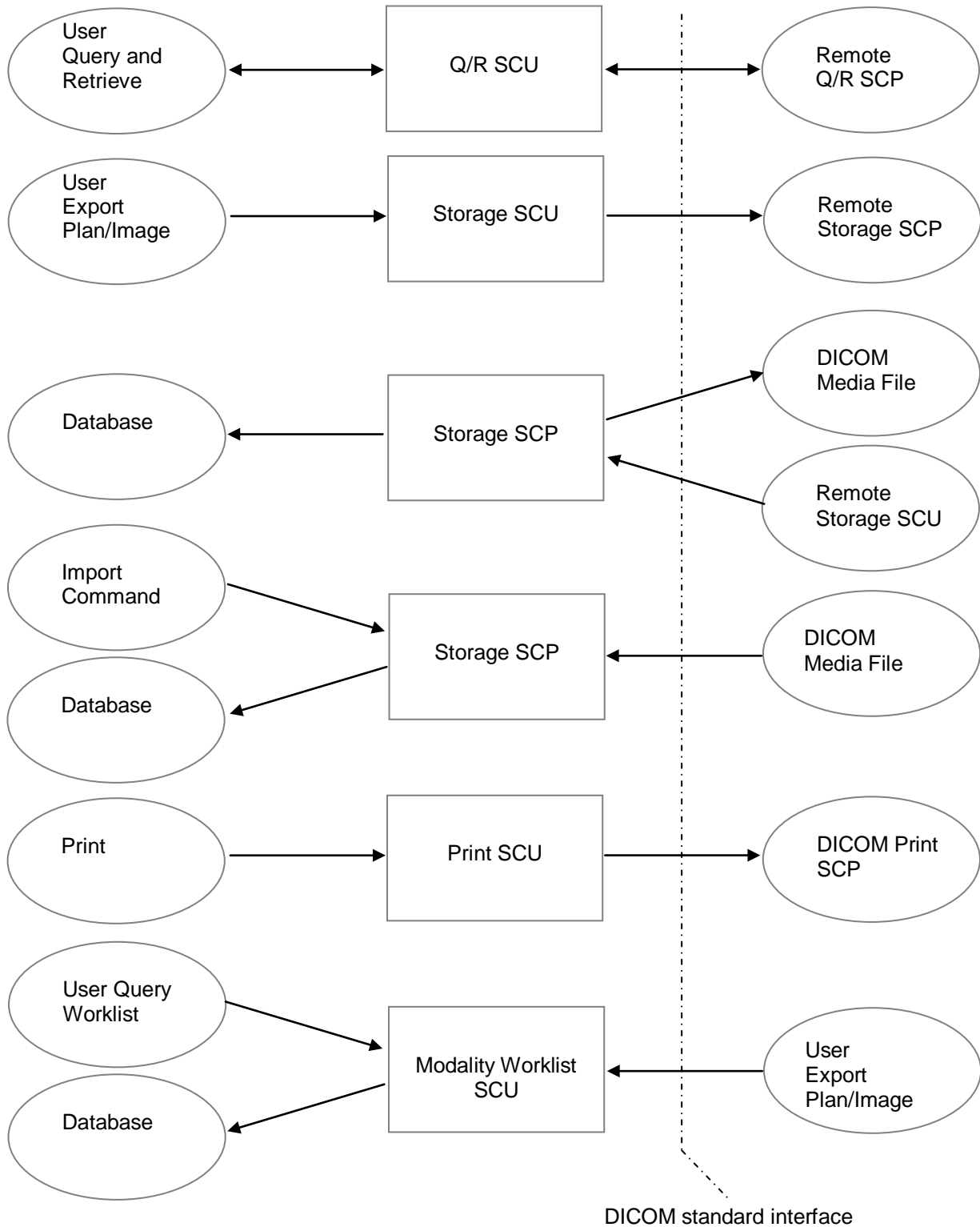


Figure 1 Application Data Flow Diagram

The Export Command is invoked when a user requests to transfer objects to a Remote Storage SCP. The objects are retrieved from the database and sent to the remote system.

The Storage SCP is a background process, which is started when the system boots. When an association is received, the incoming objects will be validated and stored in the database.

The Import command is invoked when a user requests to import from a DICOM media file. The selected DICOM media is imported and incoming objects will be validated and stored in the database.

The DICOM Print is invoked when a user requests to print images to a remote DICOM printer. The images are composed to the Basic Grayscale Print protocol and sent to the remote system.

On request of the user, the Modality Worklist is queried at the remote modality worklist SCP. The worklist items returned are made available to the user. The user can select a worklist item from the worklist. The attributes settings that belong to the selected worklist item will be applied to the objects created, at the moment that the requested task in the selected worklist item is carried out.

## 5.2 Data Types

Smoothbase supports the following data types:

- US frames including planning mode (PRE, LIFE, POST) (see Appendix A for details)
- CT Slices
- MR Slices
- Contours
- Treatment plans
- Images (Screenshots)

The previously handled volumes are calculated automatically from the frames during loading.

The supported data types are stored using the DICOM format using the following mapping to the supported DICOM standard:

| <b>Data Type</b> | <b>DICOM format</b> |
|------------------|---------------------|
| US frame         | DICOM US            |
| CT Slices        | DICOM CT            |
| MR Slices        | DICOM MR            |
| Contours         | RT Structure Set    |
| Treatment plans  | RT Brachy Plan      |
| Images           | Secondary Capture   |

### 5.3 Data Hierarchy

The following figure shows the relationship between the different data.

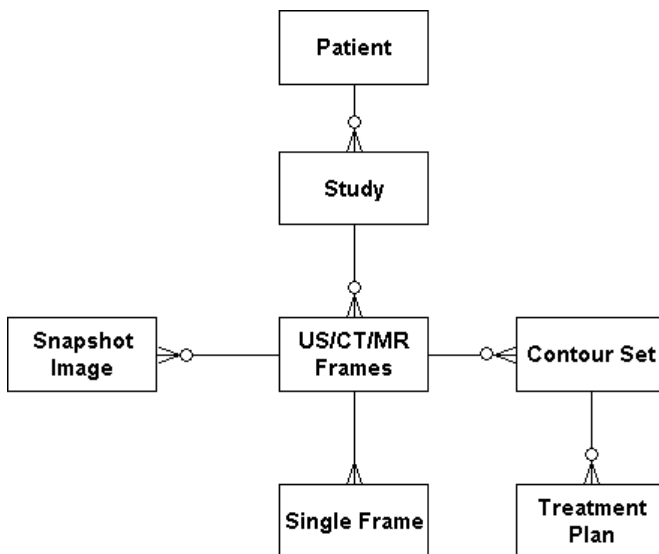


Figure 2 Data hierarchy

### 5.4 Functional Definitions of AE's

All communications and transfer with the remote application is accomplished utilizing the DICOM protocol over a network using the TCP/IP protocol stack or the DICOM Media File.

#### 5.4.1 Query/Retrieve SCU AE

The Query/Retrieve SCU AE supports negotiation and establishment of association with a Query/Retrieve SCP AE. It supports querying for patients, studies, series and series items (plans/images), as well as issuing of C-MOVE requests for selected information objects. If a Find or Move request is issued, the SCU AE will synchronously wait for a response from the remote SCP AE.

#### 5.4.2 Storage SCU AE

The Storage SCU AE establishes an association with a user selected remote AE just prior to sending a Store request to that AE.

#### 5.4.3 Storage SCP AE

The Storage SCP AE waits for an association to accept at the TCP/IP port number 104. When an association request is received with valid connections criteria, the Storage SCP AE responds with a list of SOP class UIDs that it will accept. It then waits for a Store request. If a Store is received, then from all incoming plans and images that are conformant to the association, Smoothbase domain objects are created. These domain objects are validated against their validation rules and stored in the database when valid.

#### 5.4.4 Print SCU AE

The Print SCU AE establishes an association with a user selected remote AE just prior to sending a Print request to that AE.

### 5.4.5 Modality worklist SCU AE

The modality worklist SCU AE supports negotiation and establishment of association with modality worklist SCP AE. It supports querying for the basic worklist.

## 5.5 Sequencing of Real-World Activities

Not applicable.

# 6. AE Specifications

## 6.1 Query Retrieve SCU AE – Specification

The Query Retrieve SCU AE provides Standard Conformance to the following DICOM V3.0 SOP Classes as a Query Retrieve SCU.

| SOP Class Name       | SOP Class UID                 |
|----------------------|-------------------------------|
| CT Image Storage     | 1.2.840.10008.5.1.4.1.1.2     |
| MR Image Storage     | 1.2.840.10008.5.1.4.1.1.4     |
| US Image Storage     | 1.2.840.10008.5.1.4.1.1.6.1   |
| US Multi Frame Image | 1.2.840.10008.5.1.4.1.1.3.1   |
| RT Structure Set     | 1.2.840.10008.5.1.4.1.1.481.3 |
| RT Plan Storage      | 1.2.840.10008.5.1.4.1.1.481.5 |
| RT Dose              | 1.2.840.10008.5.1.4.1.1.481.2 |

### 6.1.1 Association Establishment Policies

#### 6.1.1.1 General

The Query Retrieve SCU AE will initiate an association as a Query Retrieve Service Class User, requesting data about object instances and object instances themselves.

The PDU size is configurable and should be defined between 4096 bytes and 28672K bytes.

#### 6.1.1.2 Number of Associations

The maximum number of simultaneous associations is one.

#### 6.1.1.3 Asynchronous Nature

The Query Retrieve SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

#### 6.1.1.4 Implementation Identifying Information

The Implementation Identifying information is defined as followed:

- The implementation class UID is 2.16.840.1.
- The implementation version name is MergeCOM3\_321

## 6.1.2 Association Initiation by Real-World Activity

The Query Retrieve SCU AE initiates an association for the appropriate Query Retrieve Service Class that corresponds to the set of information objects that is requested for lookup or for transfer. The association is closed when all queries have been performed or all requested information objects have been transferred or when an error occurs.

The user selects a function for querying and retrieving messages from a known source that supports Query and Retrieve as a Provider.

### 6.1.2.1 Real-World Activity for Find and Move execution operations of Oncentra Application

The Oncentra application opens associations to do C-FINDs and C-MOVES. The associations are closed after an error or when the initiator requests them to be closed.

### 6.1.2.2 Associated Real-World Activity for the Find and Move operations

The Oncentra application can load patient data by means of a DICOM Query Retrieve dialog.

Based on operator supplied search parameters, the application selects an appropriate query model to be used in a C-FIND request to a selected Query Retrieve Provider.

The result returned from the Query Retrieve Provider, if any, is displayed in a dialog, from which the operator may select candidates for retrieval to the Smoothbase Storage Provider.

The selected retrieval candidate data, if any selected, is used in a new association with a C-MOVE request to the Query Retrieve Provider. The result, if successful, is displayed in the application and may be used for further processing.

### 6.1.2.3 Proposed Presentation Contexts

The presentation contexts that are proposed by the Query Retrieve SCU AE for the Query Retrieve operations are specified in the following table.

| Abstract Syntax                                    |                             | Transfer Syntax  |  | Role | Ext. Neg. |
|--|-----------------------------|--|--|------|-----------|
| Name   | UID                         | Name List  | UID List                                 |      |           |
| Study Root Query Retrieve Information Model - Find | 1.2.840.10008.5.1.4.1.2.2.1 | Explicit VR Little Endian<br>Implicit VR Little Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2 | SCU  | None      |
| Study Root Query Retrieve Information Model - Move | 1.2.840.10008.5.1.4.1.2.2.2 | Explicit VR Little Endian<br>Implicit VR Little Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2 | SCU  | None      |

**NOTE:**

*Big Endian is not yet supported in the current version of Smoothbase.*

## 6.1.3 Association Acceptance Policy

The Query Retrieve SCU AE never accepts an association.

## 6.2 Storage SCU AE – Specification

The Storage SCU AE provides Standard Conformance to the following DICOM V3.0 SOP Classes as a Storage SCU.

| SOP Class Name       | SOP Class UID                 |
|----------------------|-------------------------------|
| CT Image Storage     | 1.2.840.10008.5.1.4.1.1.2     |
| MR Image Storage     | 1.2.840.10008.5.1.4.1.1.4     |
| US Image Storage     | 1.2.840.10008.5.1.4.1.1.6.1   |
| US Multi Frame Image | 1.2.840.10008.5.1.4.1.1.3.1   |
| RT Structure Set     | 1.2.840.10008.5.1.4.1.1.481.3 |
| RT Plan Storage      | 1.2.840.10008.5.1.4.1.1.481.5 |
| RT Dose              | 1.2.840.10008.5.1.4.1.1.481.2 |

### 6.2.1 Association Establishment Policies

#### 6.2.1.1 General

The Storage SCU AE will initiate an association as an SCU of Storage Services when a local operator requests to send objects over the network to a remote Storage SCP. The association is closed when the object has been sent to the remote Storage SCP. The Storage SCU AE is able to abort the association when an error occurs.

The PDU size is configurable and should be defined between 4096 bytes and 28672K bytes.

#### 6.2.1.2 Number of Associations

The maximum number of simultaneous associations is one.

#### 6.2.1.3 Asynchronous Nature

The Storage SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

#### 6.2.1.4 Implementation Identifying Information

The Implementation Identifying information is defined as followed:

- The implementation class UID is 2.16.840.1.
- The implementation version name is MergeCOM3\_321

### 6.2.2 Association Initiation by Real-World Activity

The Storage SCU AE initiates an association for the appropriate Storage Services Class that corresponds to the set of objects requested for transfer. The association is closed when all objects have been sent to the remote DICOM system or when an error occurs.

#### 6.2.2.1 Real-World Activity for the Transfer Objects operation

The Storage SCU AE initiates associations for the transfer of objects to a remote DICOM system.

##### 6.2.2.1.1 Associated Real-World Activity

The user selects the Export Command and the DICOM destination. The DICOM destination can be configured with one or more DICOM Export adapters.

Once the association has been established, the Storage SCU AE sends a Store message.

## 6.2.2.1.2 Proposed Presentation Contexts

The presentation contexts that are proposed by the Storage SCU AE for the Transfer Objects operation are specified in the following table.

| Abstract Syntax                              |     | Transfer Syntax  |  | Role | Extended Negotiation |
|--|-----|--|--|------|----------------------|
| Name   | UID | Name List  | UID List                                 |      |                      |
| Applies to all supported storage SOP classes |     | Explicit VR Little Endian<br>Implicit VR Little Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2 | SCU  | None                 |

## 6.2.3 Association Acceptance Policy

The Storage SCU AE never accepts an association.

## 6.3 Storage SCP AE – Specification

The Storage SCP AE provides Standard Conformance to the following DICOM V3.0 SOP Classes as a Verification SCP.

| SOP Class Name         | SOP Class UID     |
|------------------------|-------------------|
| Verification SOP Class | 1.2.840.10008.1.1 |

The Storage SCP AE provides Standard Conformance to the following DICOM V3.0 SOP Classes as a Storage SCP.

### 6.3.1 Association Establishment Policies

| SOP Class Name       | SOP Class UID                 |
|----------------------|-------------------------------|
| CT Image Storage     | 1.2.840.10008.5.1.4.1.1.2     |
| MR Image Storage     | 1.2.840.10008.5.1.4.1.1.4     |
| US Image Storage     | 1.2.840.10008.5.1.4.1.1.6.1   |
| US Multi Frame Image | 1.2.840.10008.5.1.4.1.1.3.1   |
| RT Structure Set     | 1.2.840.10008.5.1.4.1.1.481.3 |
| RT Plan Storage      | 1.2.840.10008.5.1.4.1.1.481.5 |
| RT Dose              | 1.2.840.10008.5.1.4.1.1.481.2 |

#### 6.3.1.1 General

The Storage SCP AE will wait for an association as an SCP of Storage Services. When a Store request is received, the corresponding objects are validated and when valid, stored in the database.

The PDU size is configurable and should be defined between 4096 bytes and 28672K bytes.

#### 6.3.1.2 Number of Associations

The maximum number of simultaneous associations is one.

### 6.3.1.3 Asynchronous Nature

The Storage SCP AE does not support asynchronous communication (multiple outstanding transactions over a single association).

### 6.3.1.4 Implementation Identifying Information

The Implementation Identifying information is defined as followed:

- The implementation class UID is 2.16.840.1.
- The implementation version name is MergeCOM3\_321

## 6.3.2 Association Initiation by Real-World Activity

The Storage SCP AE never initiates an association.

## 6.3.3 Association Acceptance Policy

The Storage SCP AE accepts an association for the Verification and Storage Service Class. The Storage SCP is able to abort the association when an error occurs.

**NOTE:**

---

*Only those associations are accepted that are registered with the Storage SCP AE.*

### 6.3.3.1 Real-World Activity for the Echo Response operation

The Storage SCP AE waits for an association request and accepts associations to do, among other things, the Verification Service. The association is closed after an error or when the initiator requests it to be closed.

#### 6.3.3.1.1 Presentation Context table

Only the presentation context listed in the following table will be accepted by the Storage SCP AE for the Verification Service Class.

| Abstract Syntax            |                   | Transfer Syntax  |  | Role | Extended Negotiation |
|----------------------------|-------------------|--|--|------|----------------------|
| Name                       | UID               | Name List  | UID List                                 |      |                      |
| Verification Service Class | 1.2.840.10008.1.1 | Explicit VR Little Endian<br>Implicit VR Little Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2 | SCP  | None                 |

### 6.3.3.2 Real-World Activity for the Receive Objects operation

The Storage SCP AE waits for an association and offers to do the Storage service. The association is closed after an error or when the initiator requests it to be closed.

#### 6.3.3.2.1 Associated Real-World Activity

Once the association has been established, the Storage SCP AE waits for the transmission of conformant Storage Service messages.

#### 6.3.3.2.2 Presentation Context table

Only the presentation contexts listed in the following table will be accepted by the Storage SCP AE for the Storage Service Class.

| Abstract Syntax                              |     | Transfer Syntax  |  | Role | Extended Negotiation |
|--|-----|--|--|------|----------------------|
| Name   | UID | Name List  | UID List                                 |      |                      |
| Applies to all supported storage SOP classes |     | Explicit VR Little Endian<br>Implicit VR Little Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2 | SCP  | None                 |

**6.3.3.2.3 SOP Specific Conformance for all storage SOP Classes**

The Storage SCP AE, responds to a C-STORE request with one of the following response codes.

| Service Status | Status Description  | Status Code (0000,0900) | Related Fields |
|----------------|---|-------------------------|----------------|
| Success        |   | 0000                    | None           |
| Error          | Incoming object was not valid or could not be written to the database.  | 0110                    | None           |
| Error          | The new SOP Instance Value supplied by the invoking DIMSE-service-user was already registered for a SOP Instance of the specified SOP Class (Duplicate SOP Instance UID). | 0111                    |                |
| Error          | Data Set does not match SOP Class.  | A900                    |                |
| Error          | Send Study Instance UID (0020,000D) is already known under a different Patient ID (0010,0020).  | A9A8                    |                |
| Error          | Send Series Instance UID (0020,000E) is already known under a different Study Instance UID (0020,000D).   | A9A9                    |                |
| Warning        | Certain attributes have been changed in order to coerce the SOP Instance into the Query Model of the SCP.   | B000                    |                |

NOTE:

Attributes with a value type of 'Coded String (CS)' will only be accepted if they have a value as defined in the DICOM standard, unless stated otherwise in Appendix A. When the CS value is not recognized as a defined term, then status code 0110 is returned.

**6.3.3.2.4 Presentation Context Acceptance Criterion**

Not applicable since only a single presentation context for each Storage Service Class is supported.

**6.3.3.2.5 Transfer Syntax Selection Policies**

Transfer syntaxes are accepted in the following order.

| Transfer Syntax Name      |
|---------------------------|
| Explicit VR Little Endian |
| Implicit VR Little Endian |

**6.4 Print SCU AE – Specifications**

The Print SCU AE provides Standard Conformance to the following DICOM V3.0 SOP Classes as a DICOM Basic Print SCU.

| SOP Class Name                          | SOP Class UID          |
|---|------------------------|
| Basic Grayscale Print Management (META) | 1.2.840.10008.5.1.1.9  |
| Basic Film Session                      | 1.2.840.10008.5.1.1.1  |
| Basic Film Box                          | 1.2.840.10008.5.1.1.2  |
| Basic Grayscale Image Box               | 1.2.840.10008.5.1.1.4  |
| Printer                                 | 1.2.840.10008.5.1.1.16 |

## 6.4.1 Association Establishment Policies

### 6.4.1.1 General

The Print SCU AE will initiate an association as an SCU of Print Services when a local operator requests to print images over the network to a remote Basic Print SCP.

The maximum PDU size is 28672.

### 6.4.1.2 Number of Associations

The maximum number of simultaneous associations is one.

### 6.4.1.3 Asynchronous Nature

The Print SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

### 6.4.1.4 Implementation Identifying Information

The Implementation Identifying information is defined as followed:

- The implementation class UID is 2.16.840.1.
- The implementation version name is MergeCOM3\_321

## 6.4.2 Association Initiation by Real-World Activity

The Print SCU AE initiates an association for the appropriate Print Services Class that corresponds to the set of images requested to be printed. The association is closed when all images have been printed or when an error occurs.

### 6.4.2.1 Real-World Activity for the Print Image operation

The Print SCU AE initiates associations for the printing of images to a Basic Print SCP.

#### 6.4.2.1.1 Associated Real-World Activity

Once the association has been established, the Print SCU sends a Basic Film Session, N\_CREATE message to the Basic Print SCP. This is followed by a Basic Film Box, N\_CREATE message. The Print SCU then sends a Basic Grayscale Image Box, N\_SET message. Finally, an N\_ACTION message is sent to instruct the Basic Print SCP to print either at the Basic Film Session or at the Basic Film Box level.

#### 6.4.2.1.2 Proposed Presentation Contexts

The presentation contexts that are proposed by the Print SCU AE for the Print Image operation are specified in the following table.

| Abstract Syntax                         |                       | Transfer Syntax  |  | Role | Extended Negotiation |
|---|-----------------------|--|--|------|----------------------|
| Name                                    | UID                   | Name List  | UID List                                 |      |                      |
| Basic Grayscale Print Management (META) | 1.2.840.10008.5.1.1.9 | Explicit VR Little Endian<br>Implicit VR Little Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2 | SCU  | None                 |

*NOTE:*

*Big Endian is not yet supported in the current version of Smoothbase.*

#### 6.4.2.1.3 SOP Specific Conformance

Attribute values for SOP classes proposed by the Print SCU AE are specified in the following table.

| SOP Class Name            | Command                | Attribute Name             | Range              |
|---------------------------|------------------------|----------------------------|--------------------|
| Basic Film Session        | N_CREATE               | Number of Copies           |                    |
|                           |                        | Medium Type                |                    |
|                           |                        | Film Destination           |                    |
|                           |                        | Film Session Label         |                    |
| Basic Film Box            | N_CREATE               | Film Orientation           |                    |
|                           |                        | Magnification Type         |                    |
|                           |                        | Max Density                |                    |
|                           |                        | Border Density             |                    |
|                           |                        | Empty Image Density        |                    |
|                           |                        | Min Density                |                    |
| Basic Grayscale Image Box | N_SET                  | Image Position             |                    |
|                           |                        | Samples Per Pixel          | 1                  |
|                           |                        | Photometric Interpretation | Monochrome 1 or 2  |
|                           |                        | Rows                       | Depending on Image |
|                           |                        | Columns                    | Depending on Image |
|                           |                        | Pixel Aspect Ratio         | Depending on Image |
|                           |                        | Bits Allocated             | 16                 |
|                           |                        | Bits Stored                | 12                 |
|                           |                        | High Bit                   | 11                 |
|                           |                        | Pixel Representation       |                    |
|                           |                        | Pixel Data                 |                    |
| Printer                   | N_GET / N_EVENT_REPORT | Magnification Type         |                    |

**6.4.3 Association Acceptance Policy**

The Print SCU AE never accepts an association.

**6.5 Modality Worklist SCU AE – Specification**

The Modality Worklist SCU AE provides Standard Conformance to the following DICOM V3.0 SOP Classes as a Modality Worklist SCU.

| SOP Class Name                             | SOP Class UID          |
|--|------------------------|
| Modality Worklist Information Model - FIND | 1.2.840.10008.5.1.4.31 |

**6.5.1 Association Establishment Policies**

**6.5.1.1 General**

The Modality Worklist SCU AE will initiate an association as a Service Class User, requesting data about object instances and object instances themselves.

The PDU size is configurable and should be defined between 4096 bytes and 28672K bytes.

**6.5.1.2 Number of Associations**

The maximum number of simultaneous associations is one.

### 6.5.1.3 Asynchronous Nature

The Modality Worklist SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

### 6.5.1.4 Implementation Identifying Information

The Implementation Identifying information is defined as followed:

- The implementation class UID is 2.16.840.1.
- The implementation version name is MergeCOM3\_321

## 6.5.2 Association Initiation by Real-World Activity

The Modality Worklist SCU AE initiates an association for the appropriate Modality Worklist Service Class that corresponds to the set of worklist objects that is requested for lookup or for transfer. The association is closed when all queries have been performed or all requested information objects have been transferred or when an error occurs.

The Oncentra user selects a function for querying and retrieving messages from a known source that supports Modality Worklist as a Provider.

### 6.5.2.1 Real-World Activity for Find execution operations of Oncentra Prostate

The Oncentra application opens associations to do C-FINDs. The associations are closed after an error or when the initiator requests them to be closed.

#### 6.5.2.1.1 Associated Real-World Activity for the Find and Move operations

The Oncentra application can load worklist data by means of a DICOM Modality Worklist dialog.

Based on operator supplied search parameters, the application uses a C-FIND request to a selected Modality Worklist Provider.

The result returned from the Modality Worklist Provider, if any, is displayed in a list, from which the operator may select a worklist item. The attribute values that belong to the selected worklist item will be used by the application while performing the tasks requested in the selected worklist item or any other task for which these attribute values can be used.

#### 6.5.2.1.2 Proposed Presentation Contexts

The presentation contexts that are proposed by the Modality Worklist SCU AE for the Modality Worklist operation(s) are specified in the following table.

| Abstract Syntax                            |                        | Transfer Syntax  |  | Role | Extended Negotiation |
|--|------------------------|--|--|------|----------------------|
| Name                                       | UID                    | Name List  | UID List                                 |      |                      |
| Modality Worklist Information Model - Find | 1.2.840.10008.5.1.4.31 | Explicit VR Little Endian<br>Implicit VR Little Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2 | SCU  | None                 |

*NOTE:*

*Big Endian is not yet supported in the current version of Smoothbase.*

## 6.5.3 Association Acceptance Policy

The Modality Worklist SCU AE never accepts an association.

## 6.5.4 SOP Specific Conformance - Modality Worklist Management

### 6.5.4.1 Matching keys and return keys

The user can configure/select the matching keys that will be used in the query. The following keys are provided to the user:

| Module / Attribute Name             | Tag         | Match Key Type | Match    |
|-------------------------------------|-------------|----------------|----------|
| <b>Scheduled Procedure Step</b>     |             |                |          |
| Scheduled Station AE Title          | (0040,0001) | R              | SV       |
| Scheduled Procedure Step Start Date | (0040,0002) | R              | SV or RM |
| Scheduled Procedure Step Start Time | (0040,0003) | R              | SV or RM |

Start Date: The user can select the start date from a list, containing the following values: Today, (= everything from today and later), Yesterday, (=everything from yesterday and later), Last 3 days, Last 7 days, all values are mapped in Scheduled Procedure Start Date (0040,0002).

SV - single value

RM - range matching

WC - wildcard matching

SM - Sequence matching

The Oncentra application will provide support for requests on the following information:

| Module / Attribute Name               | Tag         | Return Key Type |
|---------------------------------------|-------------|-----------------|
| <b>Scheduled Procedure Step</b>       |             |                 |
| Scheduled Station AE Title            | (0040,0001) | 1               |
| Scheduled Procedure Step Start Date   | (0040,0002) | 1               |
| Scheduled Procedure Step Start Time   | (0040,0003) | 1               |
| Scheduled Performing Physician's Name | (0040,0006) | 2               |
| Scheduled Procedure Step Description  | (0040,0005) | 1C              |
| <b>Patient Identification</b>         |             |                 |
| Patient ID                            | (0010,0020) | 1               |
| Patients Name                         | (0010,0010) | 1               |
| <b>Patient Demographic</b>            |             |                 |
| Patients Birth Date                   | (0010,0030) | 2               |
| Patients Sex                          | (0010,0040) | 2               |
| Patients Weight                       | (0010,1030) | 2               |
| Patient's Age                         | (0010,1010) | 3               |
| Patient's Size                        | (0010,1020) | 3               |
| Patient Comments                      | (0010,4000) | 3               |
| <b>Imaging Service Request</b>        |             |                 |
| Accession Number                      | (0008,0050) | 2               |

| Module / Attribute Name    | Tag         | Return Key Type |
|----------------------------|-------------|-----------------|
| Referring Physician's Name | (0008,0090) | 2               |
| <b>Requested Procedure</b> |             |                 |
| Study Instance UID         | (0020,000D) | 1               |
| Study ID                   | (0020,0010) | 3               |
| Study Description          | (0008,1030) | 3               |
| Study Date                 | (0008,0020) | 3               |
| Study Time                 | (0008,0030) | 3               |
| <b>Visit Status</b>        |             |                 |
| Current Patient Location   | (0038,0300) | 2               |

#### 6.5.4.2 Status codes processed when receiving messages from a modality worklist SCP

| Service Status | Further Meaning  | Status Codes | Oncentra Prostate Behavior                |
|----------------|--|--------------|---|
| Refused        | Out of resources   | A700         | No worklist                               |
| Failed         | Identifier does not match SOP class  | A900         | No worklist                               |
|                | Unable to process  | Cxxx         | No worklist                               |
| Cancel         | Matching terminated due to cancel request  | FE00         | No worklist                               |
| Success        | Matching is complete - No final identifies will be supplied  | 0000         | Worklist displayed                        |
| Pending        | Matches are continued - Current match is supplied and any Optional Keys were supported in the same manner as required keys | FF00         | Indication that the Worklist is retrieved |
|                | Matches are continuing - Warning that one or more Optional Keys were not supported for this identifier                     | FF01         | Indication that the Worklist is retrieved |

## 7. Communication Profiles

### 7.1 Supported Communication Stacks

Smoothbase, in conjunction with MergeCOM-3, provides DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8.

### 7.2 TCP/IP Stack

Smoothbase uses the MergeCOM-3 Advanced DICOM Tool Kit to communicate over the TCP/IP protocol stack on any physical interconnection media supporting the TCP/IP stack. The tool kit inherits the TCP/IP stack from the Microsoft Windows operating system upon which it executes.

### 7.3 Physical Media Support

The Smoothbase AE is indifferent to the physical medium over which TCP/IP executes; it inherits this from the Microsoft Windows operating system upon which it executes.

## 8. Extensions/Specializations/Privatizations

### 8.1 Standard Extended/Specialized/Private SOPs

None supported.

### 8.2 Private Transfer Syntaxes

None supported.

## 9. Configuration

The lower-level configuration parameters are default set during the installation of the software. These settings work for the most systems, but it is possible that some modifications are needed to improve the communication with a remote system.

**Most parameters should NEVER be changed. Doing so could break DICOM conformance.** Never change lower-level communication parameters. Contact Nucletron service department for advice.

### 9.1 AE Title/Presentation Address Mapping

Presentation address mapping is configured through the Configure DICOM dialog of Smoothbase application.

The Presentation Address of the application is specified according to the following table:

| AE Title/Presentation Address Mapping | Defaults    | Description  |
|---------------------------------------|-------------|--|
| AE Title                              | Smoothbase  | The default SCU and SCP for Oncentra Prostate. Note that the AE title for SCU and SCP should be equal for correct working.     |
| TCP/IP port                           | 104         |  |
| AE Title                              | OncProstate | SCP for Oncentra Prostate. Can be configured in the Dynamic Imaging module. Only CT /MR images can be sent to StoreSCP server. |
| TCP/IP port                           | 105         |  |

These parameters are configurable by a Nucletron Service engineer.

In case there are multiple workstations with Smoothbase applications, each workstation must have a unique AE title for the storage provider to ensure that external systems can address them uniquely.

## **9.2 Configurable Parameters**

The logging of error messages, warning messages, informational messages and trace messages can be enabled or disabled in the configuration file.

The maximum PDU size can be configured in the configuration file.

- The default size is 28672 bytes.

## **10. Support of Extended Character Sets**

Not supported.

## **11. Codes and Controlled Terminology**

Not supported.

## **12. Security Profiles**

Not supported.

## Appendix A                      DICOM – Oncentra Prostate; DICOM – Oncentra Prostate; Specific Implementations Details

This appendix lists the supported Information Object Definitions (IODs). In each section header, a reference is given between brackets to the corresponding section in the official DICOM Standard document, part 3.

### A.1 Definitions

|                  | SCP (Importer)                                 | Description  |
|------------------|--|--|
| <b>Modules</b>   |  |  |
|                  | SCP - Not supported                            | The module is not supported by the application. That means that the received module is ignored during import.                      |
|                  | SCP - Not used                                 | The module is not used by the application, but the received module is made persistent. On an export the module is used for export. |
| <b>Attribute</b> |  |  |
|                  | SCP - Not Supported                            |  |
|                  | SCP - Used                                     | Means that the application uses this attribute.  |
|                  | SCP - Not used.                                | The attribute is not used by the application. The content of the attribute is remained and re-used on an export.                   |
|                  | SCP - Ignored                                  | The attribute is ignored by the application. The content of the attribute is lost on export.                                       |
|                  | SCP - Supported by application if supplied ... | The attribute is supported by the application when specified parameters are supplied.  |
|                  | SCP - Supported if supplied ...                | The attribute is supported by the 'Storage SCP' when specified parameters are supplied.  |

|                  | SCU (Exporter)     | Description  |
|------------------|--------------------|--|
| <b>Modules</b>   |                    |  |
|                  | SCU - Provided     | The Module as it initially is provided by the application. When the module has been imported, the original content is provided on export.  |
|                  | SCU - Not provided | The module is not provided by the application when a new IOD is made.  |
| <b>Attribute</b> |                    |  |
|                  | SCU - Provided     | The attribute as it initially is provided by the application. When the attribute is imported, this value is provided on an export.   |
|                  | SCU - Not provided | The attribute is not provided by the application on an export. When the attribute is imported, this value is provided on an export.<br><br>Note that:<br>DICOM type 1 is always sent. In case type 2 a 'null' value is sent. |

|  | SCU (Exporter)                   | Description  |
|--|----------------------------------|--|
|  | SCU – Not Provided Conditionally | The attribute is not provided by the application on an export. When the attribute is imported, this value is provided or not provided on an export depending on application activities.<br><br>Note that:<br>DICOM type 1 is always sent. In case type 2 a 'null' value is sent. |
|  | SCU - Supported values           | If not all options are supported, a list with supported options follows e.g. Beam Type: SCU: Supported Values 'Photons and Electrons'  |

## A.2 CT Image Module Table (A.3)

| IE                 | Module                 | Section | DICOM Usage   | Notes                                     |
|--------------------|------------------------|---------|---|---|
| Patient            | Patient                | C.7.1.1 | M   |   |
|                    | Clinical Trial Subject | C.7.1.3 | U   | SCP - Not used<br>SCU - Not provided      |
| Study              | General Study          | C.7.2.1 | M   |   |
|                    | Patient Study          | C.7.2.2 | U   | SCP - Used<br>SCU - Provided              |
|                    | Clinical Trial Study   | C.7.2.3 | U   | SCP - Not used<br>SCU - Not provided      |
| Series             | General Series         | C.7.3.1 | M   |   |
|                    | Clinical Trial Series  | C.7.3.2 | U   | SCP - Not used<br>SCU - Not provided      |
| Frame of Reference | Frame Of Reference     | C.7.4.1 | M   |   |
| Equipment          | General Equipment      | C.7.5.1 | M   |   |
| Image              | General Image          | C.7.6.1 | M   |   |
|                    | Image Plane            | C.7.6.2 | M   |   |
|                    | Image Pixel            | C.7.6.3 | M   |   |
|                    | Contrast/Bolus         | C.7.6.4 | C - Required if contrast media was used in this image | SCP - Not supported<br>SCU - Not provided |
|                    | CT Image               | C.8.2.1 | M   |   |
|                    | Overlay Plane          | C.9.2   | U   | SCP - Not supported<br>SCU - Not provided |
|                    | VOI LUT                | C.11.2  | U   | SCP - Used<br>SCU - Provided              |
|                    | SOP Common             | C.12.1  | M   |   |

## A.3 MR Image Module Table (A.4)

| IE      | Module                 | Section | DICOM Usage | Notes                                |
|---------|------------------------|---------|-------------|--------------------------------------|
| Patient | Patient                | C.7.1.1 | M           |                                      |
|         | Clinical Trial Subject | C.7.1.3 | U           | SCP - Not used<br>SCU - Not provided |
| Study   | General Study          | C.7.2.1 | M           |                                      |
|         | Patient Study          | C.7.2.2 | U           | SCP - Used<br>SCU - Provided         |
|         | Clinical Trial Study   | C.7.2.3 | U           | SCP - Not used<br>SCU - Not provided |
| Series  | General Series         | C.7.3.1 | M           |                                      |

| IE                 | Module                | Section | DICOM Usage   | Notes                                     |
|--------------------|-----------------------|---------|---|---|
|                    | Clinical Trial Series | C.7.3.2 | U   | SCP - Not used<br>SCU - Not provided      |
| Frame of Reference | Frame Of Reference    | C.7.4.1 | M   |   |
| Equipment          | General Equipment     | C.7.5.1 | M   |   |
| Image              | General Image         | C.7.6.1 | M   |   |
|                    | Image Plane           | C.7.6.2 | M   |   |
|                    | Image Pixel           | C.7.6.3 | M   |   |
|                    | Contrast/Bolus        | C.7.6.4 | C - Required if contrast media was used in this image | SCP - Not supported<br>SCU - Not provided |
|                    | MR Image              | C.8.3.1 | M   |   |
|                    | Overlay Plane         | C.9.2   | U   | SCP - Not supported<br>SCU - Not provided |
|                    | VOI LUT               | C.11.2  | U   | SCP - Used<br>SCU - Provided              |
|                    | SOP Common            | C.12.1  | M   |   |

#### A.4 US Image Module Table (A.6)

| IE                 | Module                     | Section  | DICOM Usage | Notes   |
|--------------------|----------------------------|----------|-------------|---|
| Patient            | Patient                    | C.7.1.1  | M           |   |
|                    | Clinical Trial Subject     | C.7.1.3  | U           | SCP - Not used<br>SCU - Not provided  |
| Study              | General Study              | C.7.2.1  | M           |   |
|                    | Patient Study              | C.7.2.2  | U           | SCP - Used<br>SCU - Provided  |
|                    | Clinical Trial Study       | C.7.2.3  | U           | SCP - Not used<br>SCU - Not provided  |
| Series             | General Series             | C.7.3.1  | M           |   |
|                    | Clinical Trial Series      | C.7.3.2  | U           | SCP - Not used<br>SCU - Not provided  |
| Frame of Reference | Frame Of Reference         | C.7.4.1  | M           |   |
|                    | US Frame of Reference      | C.8.5.1  | U           |   |
|                    | Synchronization            | C7..4.2. | U           | SCP - Used<br>SCU - Provided  |
| Equipment          | General Equipment          | C.7.5.1  | M           |   |
|                    | US Probes                  | Private  | U           | SCP - Used<br>SCU – Provided<br><br>Support of the optional Telemed Probe:<br>Only applicable for Oncentra Prostate v3.3 and higher |
| Acquisition        | General Acquisition        | Private  | M           |   |
| Geometry           | General Geometry           | Private  | M           |   |
| Template           | General Template           | Private  | M           |   |
|                    | General Template Component | Private  | U           | Only required when using the Utrecht Interstitial Fletcher Applicator Set   |
| Image              | General Image              | C.7.6.1  | M           |   |

| IE | Module                     | Section | DICOM Usage   | Notes  |
|----|----------------------------|---------|---|--|
|    | Image Plane                | C.7.6.2 | M   | Required for image positioning.<br>Additional added module. This module is required for Oncentra Prostate. |
|    | Image Pixel                | C.7.6.3 | M   |  |
|    | Contrast/Bolus             | C.7.6.4 | C - Required if contrast media was used in this image                               | SCP - Not supported<br>SCU - Not provided  |
|    | Palette Color Lookup Table | C.7.9   | C - Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR | SCP - Not supported<br>SCU - Not provided  |
|    | US Region Calibration      | C.8.5.5 | U   | SCP - Not supported<br>SCU - Not provided  |
|    | US Image                   | C.8.5.6 | M   |  |
|    | Overlay Plane              | C.9.2   | U   | SCP - Not supported<br>SCU - Not provided  |
|    | VOI LUT                    | C.11.2  | U   | SCP - Used<br>SCU - Supported  |
|    | SOP Common                 | C.12.1  | M   |  |
|    |                            |         |   |  |
|    | Curve                      | C.10.2  | U   |  |

### A.5 US Multi Frame Image Module Table (A.7)

| IE                 | Module                 | Reference | DICOM Usage                                  | Notes                                |
|--------------------|------------------------|-----------|--|--------------------------------------|
| Patient            | Patient                | C.7.1.1   | M  |                                      |
|                    | Clinical Trial Subject | C.7.1.3   | U  | SCP - Not used<br>SCU - Not provided |
| Study              | General Study          | C.7.2.1   | M  |                                      |
|                    | Patient Study          | C.7.2.2   | U  | SCP - Used<br>SCU - Provided         |
|                    | Clinical Trial Study   | C.7.2.3   | U  | SCP - Not used<br>SCU - Not provided |
| Series             | General Series         | C.7.3.1   | M  |                                      |
|                    | Clinical Trial Series  | C.7.3.2   | U  | SCP - Not used<br>SCU - Not provided |
| Frame of Reference | Frame Of Reference     | C.7.4.1   | M  |                                      |
|                    | US Frame of Reference  | C.8.5.1   | C - Required if images are spatially related |                                      |

| IE          | Module                     | Reference | DICOM Usage   | Notes   |
|-------------|----------------------------|-----------|---|---|
|             | Synchronization            | C.7.4.2   | C – Required if Modality (0008,0060) = IVUS. May be present otherwise.              |   |
| Equipment   | General Equipment          | C.7.5.1   | M   |   |
| Acquisition | General Acquisition        | Private   | M   |   |
| Geometry    | General Geometry           | Private   | M   |   |
| Template    | General Template           | Private   | M   |   |
|             | General Template Component | Private   | U   | Only required when using the Utrecht Interstitial Fletcher Applicator Set                         |
| Image       | General Image              | C.7.6.1   | M   |   |
|             | Image Plane                | C.7.6.2   | M   | Required for positioning. Additional added module. This module is required for Oncentra Prostate. |
|             | Image Pixel                | C.7.6.3   | M   |   |
|             | Contrast/Bolus             | C.7.6.4   | C - Required if contrast media was used in this image                               | SCP - Not supported<br>SCU - Not provided   |
|             | Cine                       | C.7.6.5   | M   |   |
|             | Multi-frame                | C.7.6.6   | M   |   |
|             | Palette Color Lookup Table | C.7.9     | C - Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR | SCP - Not supported<br>SCU - Not provided   |
|             | US Region Calibration      | C.8.5.5   | U   | SCP - Not supported<br>SCU - Not provided   |
|             | US Image                   | C.8.5.6   | M   |   |
|             | VOI LUT                    | C.11.2    | U   | SCP - Used<br>SCU - Supported   |
|             | SOP Common                 | C.12.1    | M   |   |
|             |                            |           |   |   |
|             | Curve                      | C.10.2    | U   |   |

### A.6 RT Structure Set Module Table (A.19)

| IE      | Module                 | Reference | DICOM Usage | Notes                                |
|---------|------------------------|-----------|-------------|--------------------------------------|
| Patient | Patient                | C.7.1.1   | M           |                                      |
|         | Clinical Trial Subject | C.7.1.3   | U           | SCP - Not used<br>SCU - Not provided |
| Study   | General Study          | C.7.2.1   | M           |                                      |

| IE            | Module                | Reference | DICOM Usage | Notes                                |
|---------------|-----------------------|-----------|-------------|--------------------------------------|
|               | Patient Study         | C.7.2.2   | U           | SCP - Used<br>SCU - Provided         |
|               | Clinical Trial Study  | C.7.2.3   | U           | SCP - Not used<br>SCU - Not provided |
| Series        | RT Series             | C.8.8.1   | M           |                                      |
|               | Clinical Trial Series | C.7.3.2   | U           | SCP - Not used<br>SCU - Not provided |
| Equipment     | General Equipment     | C.7.5.1   | M           |                                      |
| Structure Set | Structure Set         | C.8.8.5   | M           |                                      |
|               | ROI Geometry          | Private   | M           |                                      |
|               | ROI Contour           | C.8.8.6   | M           |                                      |
|               | RT ROI Observations   | C.8.8.8   | M           |                                      |
|               | SOP Common            | C.12.1    | M           |                                      |

### A.7 Patient Module Attributes (C.7.1.1)

| Attribute Name               | Tag         | Type | Internal value | Notes                                 |
|------------------------------|-------------|------|----------------|---------------------------------------|
| Patient's Name               | (0010,0010) | 2    |                |                                       |
| Patient ID                   | (0010,0020) | 2    |                |                                       |
| Patient's Birth Date         | (0010,0030) | 2    |                |                                       |
| Patient's Sex                | (0010,0040) | 2    |                |                                       |
| Referenced Patient Sequence  | (0008,1120) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Class UID    | (0008,1150) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Instance UID | (0008,1155) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| Patient's Birth Time         | (0010,0032) | 3    |                |                                       |
| Other Patient IDs            | (0010,1000) | 3    |                |                                       |
| Other Patient Names          | (0010,1001) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Ethnic Group                 | (0010,2160) | 3    |                |                                       |
| Patient Comments             | (0010,4000) | 3    |                |                                       |

### A.8 General Study Module Attributes (C.7.2.1)

| Attribute Name             | Tag         | Type | Internal value | Notes |
|----------------------------|-------------|------|----------------|-------|
| Study Instance UID         | (0020,000D) | 1    |                |       |
| Study Date                 | (0008,0020) | 2    | VOL3_STUDYDATE |       |
| Study Time                 | (0008,0030) | 2    |                |       |
| Referring Physician's Name | (0008,0090) | 2    |                |       |
| Study ID                   | (0020,0010) | 2    |                |       |
| Accession Number           | (0008,0050) | 2    |                |       |
| Study Description          | (0008,1030) | 3    |                |       |

| Attribute Name                        | Tag         | Type | Internal value | Notes                                 |
|---------------------------------------|-------------|------|----------------|---------------------------------------|
| Physician(s) of Record                | (0008,1048) | 3    |                |                                       |
| Name of Physician(s)<br>Reading Study | (0008,1060) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Referenced Study<br>Sequence          | (0008,1110) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Class<br>UID          | (0008,1150) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Instance<br>UID       | (0008,1155) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| Procedure Code Sequence               | (0008,1032) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Code Sequence Macro                  | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |

### A.9 Patient Study Module Attributes (C.7.2.2)

| Attribute Name                       | Tag         | Type | Internal value | Notes                                 |
|--------------------------------------|-------------|------|----------------|---------------------------------------|
| Admitting Diagnoses<br>Description   | (0008,1080) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Admitting Diagnoses Code<br>Sequence | (0008,1084) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Code Sequence Macro                 | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |
| Patient's Age                        | (0010,1010) | 3    |                |                                       |
| Patient's Size                       | (0010,1020) | 3    |                |                                       |
| Patient's Weight                     | (0010,1030) | 3    |                |                                       |
| Occupation                           | (0010,2180) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Additional Patient History           | (0010,21B0) | 3    |                | SCP - Not used<br>SCU - Not supported |

### A.10 General Series Module Attributes (C.7.3.1)

| Attribute Name                 | Tag         | Type | Internal value | Notes |
|--------------------------------|-------------|------|----------------|-------|
| Modality                       | (0008,0060) | 1    |                |       |
| Series Instance UID            | (0020,000E) | 1    |                |       |
| Series Number                  | (0020,0011) | 2    |                |       |
| Laterality                     | (0020,0060) | 2C   |                |       |
| Series Date                    | (0008,0021) | 3    |                |       |
| Series Time                    | (0008,0031) | 3    |                |       |
| Performing Physician's<br>Name | (0008,1050) | 3    |                |       |
| Protocol Name                  | (0018,1030) | 3    |                |       |
| Series Description             | (0008,103E) | 3    |                |       |
| Operators' Name                | (0008,1070) | 3    |                |       |

| Attribute Name                           | Tag         | Type | Internal value | Notes                                 |
|--|-------------|------|----------------|---------------------------------------|
| Referenced Study Component Sequence      | (0008,1111) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Class UID                | (0008,1150) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Instance UID             | (0008,1155) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| Body Part Examined                       | (0018,0015) | 3    |                |                                       |
| Patient Position                         | (0018,5100) | 2C   |                |                                       |
| Smallest Pixel Value in Series           | (0028,0108) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Largest Pixel Value in Series            | (0028,0109) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Request Attributes Sequence              | (0040,0275) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Requested Procedure ID                  | (0040,1001) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| >Scheduled Procedure Step ID             | (0040,0009) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| >Scheduled Procedure Step Description    | (0040,0007) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Scheduled Protocol Code Sequence        | (0040,0008) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >>Code Sequence Macro                    | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |
| Performed Procedure Step ID              | (0040,0253) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Performed Procedure Step Start Date      | (0040,0244) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Performed Procedure Step Start Time      | (0040,0245) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Performed Procedure Step Description     | (0040,0254) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Performed Protocol Code Sequence         | (0040,0260) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Code Sequence Macro                     | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |
| Comments on the Performed Procedure Step | (0040,0280) | 3    |                | SCP - Not used<br>SCU - Not supported |

### A.11 Frame Of Reference Module Attributes (C.7.4.1)

| Attribute Name               | Tag         | Type | Internal value | Notes |
|------------------------------|-------------|------|----------------|-------|
| Frame of Reference UID       | (0020,0052) | 1    |                |       |
| Position Reference Indicator | (0020,1040) | 2    |                |       |

**A.12 General Equipment Module Attributes (C.7.5.1)**

| Attribute Name                | Tag         | Type | Internal value | Notes                                 |
|-------------------------------|-------------|------|----------------|---------------------------------------|
| Manufacturer                  | (0008,0070) | 2    |                |                                       |
| Institution Name              | (0008,0080) | 3    |                |                                       |
| Institution Address           | (0008,0081) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Station Name                  | (0008,1010) | 3    |                |                                       |
| Institutional Department Name | (0008,1040) | 3    |                |                                       |
| Manufacturer's Model Name     | (0008,1090) | 3    |                |                                       |
| Device Serial Number          | (0018,1000) | 3    |                |                                       |
| Software Version(s)           | (0018,1020) | 3    |                | Export only                           |
| Spatial Resolution            | (0018,1050) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Date of Last Calibration      | (0018,1200) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Time of Last Calibration      | (0018,1201) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Pixel Padding Value           | (0028,0120) | 3    |                | SCP - Not used<br>SCU - Not supported |

**A.13 US Probe Module Attributes (Private)**

**A.14 General Image Module Attributes (C.7.6.1)**

| Attribute Name               | Tag         | Type | Internal value                               | Notes                                 |
|------------------------------|-------------|------|--|---------------------------------------|
| Instance Number              | (0020,0013) | 2    | Covers all required acquisition/image values |                                       |
| Patient Orientation          | (0020,0020) | 2C   |  |                                       |
| Content Date                 | (0008,0023) | 2C   |  |                                       |
| Content Time                 | (0008,0033) | 2C   |  |                                       |
| Image Type                   | (0008,0008) | 3    |  |                                       |
| Acquisition Number           | (0020,0012) | 3    |  |                                       |
| Acquisition Date             | (0008,0022) | 3    |  |                                       |
| Acquisition Time             | (0008,0032) | 3    |  |                                       |
| Acquisition Datetime         | (0008,002A) | 3    |  | SCP - Not used<br>SCU - Not supported |
| Referenced Image Sequence    | (0008,1140) | 3    |  | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Class UID    | (0008,1150) | 1C   |  | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Instance UID | (0008,1155) | 1C   |  | SCP - Not used<br>SCU - Not supported |
| >Referenced Frame Number     | (0008,1160) | 3    |  | SCP - Not used<br>SCU - Not supported |

| Attribute Name                | Tag         | Type | Internal value | Notes                                 |
|-------------------------------|-------------|------|----------------|---------------------------------------|
| Derivation Description        | (0008,2111) | 3    |                |                                       |
| Source Image Sequence         | (0008,2112) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Images in Acquisition         | (0020,1002) | 3    |                |                                       |
| Image Comments                | (0020,4000) | 3    |                |                                       |
| Quality Control Image         | (0028,0300) | 3    |                |                                       |
| Burned In Annotation          | (0028,0301) | 3    |                |                                       |
| Lossy Image Compression       | (0028,2110) | 3    |                |                                       |
| Lossy Image Compression Ratio | (0028,2112) | 3    |                |                                       |
| Icon Image Sequence           | (0088,0200) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Presentation LUT Shape        | (2050,0020) | 3    |                |                                       |

### A.15 Image Plane Module Attributes (C.7.6.2)

| Attribute Name              | Tag         | Type | Internal value | Notes |
|-----------------------------|-------------|------|----------------|-------|
| Pixel Spacing               | (0028,0030) | 1    |                |       |
| Image Orientation (Patient) | (0020,0037) | 1    | (USAQ_TGEOM)   |       |
| Image Position (Patient)    | (0020,0032) | 1    | (USAQ_TGEOM)   |       |
| Slice Thickness             | (0018,0050) | 2    |                |       |
| Slice Location              | (0020,1041) | 3    | (USAQ_TGEOM)   |       |

### A.16 Image Pixel Module Attributes (C.7.6.3)

| Attribute Name             | Tag         | Type | Internal value                               | Notes   |
|----------------------------|-------------|------|--|---|
| Samples per Pixel          | (0028,0002) | 1    | Covers all required acquisition/image values | only monochrome is supported, except for US, RGB is supported as well |
| Photometric Interpretation | (0028,0004) | 1    |  |   |
| Rows                       | (0028,0010) | 1    |  |   |
| Columns                    | (0028,0011) | 1    |  |   |
| Bits Allocated             | (0028,0100) | 1    |  |   |
| Bits Stored                | (0028,0101) | 1    |  |   |
| High Bit                   | (0028,0102) | 1    |  |   |
| Pixel Representation       | (0028,0103) | 1    |  |   |
| Pixel Data                 | (7FE0,0010) | 1    |  |   |
| Planar Configuration       | (0028,0006) | 1C   |  | SCP - Not used<br>SCU - Not supported                                 |
| Pixel Aspect Ratio         | (0028,0034) | 1C   |  |   |
| Smallest Image Pixel Value | (0028,0106) | 3    |  |   |
| Largest Image Pixel Value  | (0028,0107) | 3    |  |   |

| Attribute Name                              | Tag         | Type | Internal value | Notes                                 |
|---|-------------|------|----------------|---------------------------------------|
| Red Palette Color Lookup Table Descriptor   | (0028,1101) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| Green Palette Color Lookup Table Descriptor | (0028,1102) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| Blue Palette Color Lookup Table Descriptor  | (0028,1103) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| Red Palette Color Lookup Table Data         | (0028,1201) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| Green Palette Color Lookup Table Data       | (0028,1202) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| Blue Palette Color Lookup Table Data        | (0028,1203) | 1C   |                | SCP - Not used<br>SCU - Not supported |

**A.17 CT Image Module Attributes (C.8.2.1)**

| Attribute Name              | Tag         | Type | Internal value | Notes |
|-----------------------------|-------------|------|----------------|-------|
| Image Type                  | (0008,0008) | 1    |                |       |
| Samples per Pixel           | (0028,0002) | 1    |                |       |
| Photometric Interpretation  | (0028,0004) | 1    |                |       |
| Bits Allocated              | (0028,0100) | 1    |                |       |
| Bits Stored                 | (0028,0101) | 1    |                |       |
| High Bit                    | (0028,0102) | 1    |                |       |
| Rescale Intercept           | (0028,1052) | 1    |                |       |
| Rescale Slope               | (0028,1053) | 1    |                |       |
| KVP                         | (0018,0060) | 2    |                |       |
| Acquisition Number          | (0020,0012) | 2    |                |       |
| Scan Options                | (0018,0022) | 3    |                |       |
| Data Collection Diameter    | (0018,0090) | 3    |                |       |
| Reconstruction Diameter     | (0018,1100) | 3    |                |       |
| Distance Source to Detector | (0018,1110) | 3    |                |       |
| Distance Source to Patient  | (0018,1111) | 3    |                |       |
| Gantry/Detector Tilt        | (0018,1120) | 3    |                |       |
| Table Height                | (0018,1130) | 3    |                |       |
| Rotation Direction          | (0018,1140) | 3    |                |       |
| Exposure Time               | (0018,1150) | 3    |                |       |
| X-ray Tube Current          | (0018,1151) | 3    |                |       |
| Exposure                    | (0018,1152) | 3    |                |       |
| Exposure in uAs             | (0018,1153) | 3    |                |       |
| Filter Type                 | (0018,1160) | 3    |                |       |
| Generator Power             | (0018,1170) | 3    |                |       |
| Focal Spot                  | (0018,1190) | 3    |                |       |
| Convolution Kernel          | (0018,1210) | 3    |                |       |

**A.18 MR Image Module Attributes (C.8.3.1)**

| Attribute Name                 | Tag         | Type | Internal value | Notes                                 |
|--------------------------------|-------------|------|----------------|---------------------------------------|
| Image Type                     | (0008,0008) | 1    |                |                                       |
| Samples per Pixel              | (0028,0002) | 1    |                |                                       |
| Photometric Interpretation     | (0028,0004) | 1    |                |                                       |
| Bits Allocated                 | (0028,0100) | 1    |                |                                       |
| Scanning Sequence              | (0018,0020) | 1    |                |                                       |
| Sequence Variant               | (0018,0021) | 1    |                |                                       |
| Scan Options                   | (0018,0022) | 2    |                |                                       |
| MR Acquisition Type            | (0018,0023) | 2    |                |                                       |
| Repetition Time                | (0018,0080) | 2C   |                |                                       |
| Echo Time                      | (0018,0081) | 2    |                |                                       |
| Echo Train Length              | (0018,0091) | 2    |                |                                       |
| Inversion Time                 | (0018,0082) | 2C   |                |                                       |
| Trigger Time                   | (0018,1060) | 2C   |                |                                       |
| Sequence Name                  | (0018,0024) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Angio Flag                     | (0018,0025) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Number of Averages             | (0018,0083) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Imaging Frequency              | (0018,0084) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Imaged Nucleus                 | (0018,0085) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Echo Number(s)                 | (0018,0086) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Magnetic Field Strength        | (0018,0087) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Spacing Between Slices         | (0018,0088) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Number of Phase Encoding Steps | (0018,0089) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Percent Sampling               | (0018,0093) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Percent Phase Field of View    | (0018,0094) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Pixel Bandwidth                | (0018,0095) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Nominal Interval               | (0018,1062) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Beat Rejection Flag            | (0018,1080) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Low R-R Value                  | (0018,1081) | 3    |                | SCP - Not used<br>SCU - Not supported |
| High R-R Value                 | (0018,1082) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Intervals Acquired             | (0018,1083) | 3    |                | SCP - Not used<br>SCU - Not supported |

| Attribute Name               | Tag         | Type | Internal value | Notes                                 |
|------------------------------|-------------|------|----------------|---------------------------------------|
| Intervals Rejected           | (0018,1084) | 3    |                | SCP - Not used<br>SCU - Not supported |
| PVC Rejection                | (0018,1085) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Skip Beats                   | (0018,1086) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Heart Rate                   | (0018,1088) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Cardiac Number of Images     | (0018,1090) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Trigger Window               | (0018,1094) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Reconstruction Diameter      | (0018,1100) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Receiving Coil               | (0018,1250) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Transmitting Coil            | (0018,1251) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Acquisition Matrix           | (0018,1310) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Phase Encoding Direction     | (0018,1312) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Flip Angle                   | (0018,1314) | 3    |                | SCP - Not used<br>SCU - Not supported |
| SAR                          | (0018,1316) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Variable Flip Angle Flag     | (0018,1315) | 3    |                | SCP - Not used<br>SCU - Not supported |
| dB/dt                        | (0018,1318) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Temporal Position Identifier | (0020,0100) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Number of Temporal Positions | (0020,0105) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Temporal Resolution          | (0020,0110) | 3    |                | SCP - Not used<br>SCU - Not supported |

**A.19 US Image Module Attributes (C.8.5.6)**

| Attribute Name             | Tag         | Type | Internal value                               | Notes                                 |
|----------------------------|-------------|------|--|---------------------------------------|
| Samples per Pixel          | (0028,0002) | 1    | Covers all required acquisition/image values |                                       |
| Photometric Interpretation | (0028,0004) | 1    |  |                                       |
| Bits Allocated             | (0028,0100) | 1    |  |                                       |
| Bits Stored                | (0028,0101) | 1    |  |                                       |
| High Bit                   | (0028,0102) | 1    |  |                                       |
| Planar Configuration       | (0028,0006) | 1C   |  | SCP - Not used<br>SCU - Not supported |
| Pixel Representation       | (0028,0103) | 1    |  |                                       |

| Attribute Name                      | Tag         | Type | Internal value | Notes                                 |
|-------------------------------------|-------------|------|----------------|---------------------------------------|
| Frame Increment Pointer             | (0028,0009) | 1C   |                |                                       |
| Image Type                          | (0008,0008) | 2    |                |                                       |
| Lossy Image Compression             | (0028,2110) | 1C   |                |                                       |
| Number of Stages                    | (0008,2124) | 2C   |                |                                       |
| Number of Views in Stage            | (0008,212A) | 2C   |                |                                       |
| Ultrasound Color Data Present       | (0028,0014) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Referenced Overlay Sequence         | (0008,1130) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Class UID           | (0008,1150) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Instance UID        | (0008,1155) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| Referenced Curve Sequence           | (0008,1145) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Class UID           | (0008,1150) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Instance UID        | (0008,1155) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| Stage Name                          | (0008,2120) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Stage Code Sequence                 | (0040,000A) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Code Sequence Macro                | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |
| Stage Number                        | (0008,2122) | 3    |                | SCP - Not used<br>SCU - Not supported |
| View Name                           | (0008,2127) | 3    |                | SCP - Not used<br>SCU - Not supported |
| View Number                         | (0008,2128) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Number of Event Timers              | (0008,2129) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Event Elapsed Time(s)               | (0008,2130) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Event Timer Name(s)                 | (0008,2132) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Anatomic Region Sequence            | (0008,2218) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Code Sequence Macro                | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |
| >Anatomic Region Modifier Sequence  | (0008,2220) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >>Code Sequence Macro               | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |
| Primary Anatomic Structure Sequence | (0008,2228) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Code Sequence Macro                | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |

# DICOM Conformance Statement



| Attribute Name                                | Tag         | Type | Internal value | Notes                                 |
|---|-------------|------|----------------|---------------------------------------|
| >Primary Anatomic Structure Modifier Sequence | (0008,2230) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >>Code Sequence Macro                         | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |
| Transducer Position Sequence                  | (0008,2240) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Code Sequence Macro                          | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |
| >Transducer Position Modifier Sequence        | (0008,2242) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >>Code Sequence Macro                         | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |
| Transducer Orientation Sequence               | (0008,2244) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Code Sequence Macro                          | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |
| >Transducer Orientation Modifier Sequence     | (0008,2246) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >>Code Sequence Macro                         | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |
| Acquisition Datetime                          | (0008,002A) | 1C   |                |                                       |
| Trigger Time                                  | (0018,1060) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Nominal Interval                              | (0018,1062) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Beat Rejection Flag                           | (0018,1080) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Low R-R Value                                 | (0018,1081) | 3    |                | SCP - Not used<br>SCU - Not supported |
| High R-R Value                                | (0018,1082) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Heart Rate                                    | (0018,1088) | 3    |                | SCP - Not used<br>SCU - Not supported |
| IVUS Acquisition                              | (0018,3100) | 1C   |                |                                       |
| IVUS Pullback Rate                            | (0018,3101) | 1C   |                |                                       |
| IVUS Gated Rate                               | (0018,3102) | 1C   |                |                                       |
| IVUS Pullback Start Frame Number              | (0018,3103) | 1C   |                |                                       |
| IVUS Pullback Stop Frame Number               | (0018,3104) | 1C   |                |                                       |
| Lesion Number                                 | (0018,3105) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Output Power                                  | (0018,5000) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Transducer Data                               | (0018,5010) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Transducer Type                               | (0018,6031) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Focus Depth                                   | (0018,5012) | 3    |                | SCP - Not used<br>SCU - Not supported |

| Attribute Name                    | Tag         | Type | Internal value | Notes   |
|-----------------------------------|-------------|------|----------------|---|
| Processing Function               | (0018,5020) | 3    |                | SCP - Not used<br>SCU - Not supported   |
| Referenced Probe Number           | (1003,1002) | 3    |                | SCP - Used<br>SCU – Supported<br><br>Support of the optional Telemed Probe:<br>Only applicable for Oncentra Prostate v3.3 and higher. |
| Mechanical Index                  | (0018,5022) | 3    |                | SCP - Not used<br>SCU - Not supported   |
| Thermal Index                     | (0018,5024) | 3    |                | SCP - Not used<br>SCU - Not supported   |
| Cranial Thermal Index             | (0018,5026) | 3    |                | SCP - Not used<br>SCU - Not supported   |
| Soft Tissue Thermal Index         | (0018,5027) | 3    |                | SCP - Not used<br>SCU - Not supported   |
| Soft Tissue-focus Thermal Index   | (0018,5028) | 3    |                | SCP - Not used<br>SCU - Not supported   |
| Soft Tissue-surface Thermal Index | (0018,5029) | 3    |                | SCP - Not used<br>SCU - Not supported   |
| Depth of Scan Field               | (0018,5050) | 3    |                | SCP - Not used<br>SCU - Not supported   |
| Image Transformation Matrix       | (0018,5210) | 3    |                | SCP - Not used<br>SCU - Not supported   |
| Image Translation Vector          | (0018,5212) | 3    |                | SCP - Not used<br>SCU - Not supported   |
| Overlay Subtype                   | (60xx,0045) | 3    |                | SCP - Not used<br>SCU - Not supported   |

## A.20 General Acquisition Attributes (Private)

See section

General Acquisition Attributes (Private).

## A.21 General Geometry Attributes (Private)

See section General Geometry Attributes (Private).

## A.22 General Template Attributes (Private)

See section General Template Attributes (Private).

### A.22.1. General Template Components Attributes (Private)

See section General Template Components Attributes (Private).

### A.23 RT Series Module Attributes (C.8.8.1)

| Attribute Name                        | Tag         | Type | Internal value | Notes                                 |
|---------------------------------------|-------------|------|----------------|---------------------------------------|
| Modality                              | (0008,0060) | 1    |                |                                       |
| Series Instance UID                   | (0020,000E) | 1    |                |                                       |
| Series Number                         | (0020,0011) | 2    |                |                                       |
| Series Description                    | (0008,103E) | 3    |                |                                       |
| Referenced Study Component Sequence   | (0008,1111) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Class UID             | (0008,1150) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| >Referenced SOP Instance UID          | (0008,1155) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| Request Attributes Sequence           | (0040,0275) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Requested Procedure ID               | (0040,1001) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| >Scheduled Procedure Step ID          | (0040,0009) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| >Scheduled Procedure Step Description | (0040,0007) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Scheduled Protocol Code Sequence     | (0040,0008) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >>Code Sequence Macro                 | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |
| Performed Procedure Step ID           | (0040,0253) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Performed Procedure Step Start Date   | (0040,0244) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Performed Procedure Step Start Time   | (0040,0245) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Performed Procedure Step Description  | (0040,0254) | 3    |                | SCP - Not used<br>SCU - Not supported |
| Performed Protocol Code Sequence      | (0040,0260) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Code Sequence Macro                  | (8.8-,1)    |      |                | SCP - Not used<br>SCU - Not supported |

### A.24 Structure Set Module Attributes (C.8.8.5)

| Attribute Name                         | Tag         | Type | Internal value | Notes |
|--|-------------|------|----------------|-------|
| Structure Set Label                    | (3006,0002) | 1    |                |       |
| Structure Set Name                     | (3006,0004) | 3    |                |       |
| Structure Set Description              | (3006,0006) | 3    |                |       |
| Instance Number                        | (0020,0013) | 3    |                |       |
| Structure Set Date                     | (3006,0008) | 2    |                |       |
| Structure Set Time                     | (3006,0009) | 2    |                |       |
| Referenced Frame of Reference Sequence | (3006,0010) | 3    |                |       |

| Attribute Name                              | Tag         | Type | Internal value | Notes                                 |
|---|-------------|------|----------------|---------------------------------------|
| >Frame of Reference UID                     | (0020,0052) | 1C   |                |                                       |
| >Frame of Reference Relationship Sequence   | (3006,00C0) | 3    |                |                                       |
| >>Related Frame of Reference UID            | (3006,00C2) | 1C   |                |                                       |
| >>Frame of Reference Transformation Type    | (3006,00C4) | 1C   |                |                                       |
| >>Frame of Reference Transformation Matrix  | (3006,00C6) | 1C   |                |                                       |
| >>Frame of Reference Transformation Comment | (3006,00C8) | 3    |                |                                       |
| >RT Referenced Study Sequence               | (3006,0012) | 3    |                |                                       |
| >>Referenced SOP Class UID                  | (0008,1150) | 1C   |                |                                       |
| >>Referenced SOP Instance UID               | (0008,1155) | 1C   |                |                                       |
| >>RT Referenced Series Sequence             | (3006,0014) | 1C   |                |                                       |
| >>>Series Instance UID                      | (0020,000E) | 1C   |                |                                       |
| >>>Contour Image Sequence                   | (3006,0016) | 1C   |                |                                       |
| >>>>Referenced SOP Class UID                | (0008,1150) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| >>>>Referenced SOP Instance UID             | (0008,1155) | 1C   |                | SCP - Not used<br>SCU - Not supported |
| >>>>Referenced Frame Number                 | (0008,1160) | 3    |                |                                       |
| Structure Set ROI Sequence                  | (3006,0020) | 3    |                |                                       |
| >ROI Number                                 | (3006,0022) | 1C   |                |                                       |
| >Referenced Frame of Reference UID          | (3006,0024) | 1C   |                |                                       |
| >ROI Name                                   | (3006,0026) | 2C   |                |                                       |
| >ROI Description                            | (3006,0028) | 3    |                |                                       |
| >ROI Volume                                 | (3006,002C) | 3    |                |                                       |
| >ROI Generation Algorithm                   | (3006,0036) | 2C   |                |                                       |
| >ROI Generation Description                 | (3006,0038) | 3    |                |                                       |

## A.25 ROI Geometry Attributes

See section ROI Geometry Attributes.

### A.26 ROI Contour Module Attributes (C.8.8.6)

| Attribute Name                 | Tag         | Type | Internal value | Notes                                 |
|--------------------------------|-------------|------|----------------|---------------------------------------|
| ROI Contour Sequence           | (3006,0039) | 1    |                | SCP - Not used<br>SCU - Not supported |
| >Referenced ROI Number         | (3006,0084) | 1    |                |                                       |
| >ROI Display Color             | (3006,002A) | 3    |                |                                       |
| >Contour Sequence              | (3006,0040) | 3    |                |                                       |
| >>Contour Number               | (3006,0048) | 3    |                |                                       |
| >>Attached Contours            | (3006,0049) | 3    |                |                                       |
| >>Contour Image Sequence       | (3006,0016) | 3    |                |                                       |
| >>>Referenced SOP Class UID    | (0008,1150) | 3    |                |                                       |
| >>>Referenced SOP Instance UID | (0008,1155) | 3    |                |                                       |
| >>>Referenced Frame Number     | (0008,1160) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >>Contour Geometric Type       | (3006,0042) | 1C   |                |                                       |
| >>Contour Slab Thickness       | (3006,0044) | 3    |                |                                       |
| >>Contour Offset Vector        | (3006,0045) | 3    |                |                                       |
| >Number of Contour Points      | (3006,0046) | 1C   |                |                                       |
| >Contour Data                  | (3006,0050) | 1C   |                |                                       |

### A.27 RT ROI Observations Module Attributes (C.8.8.8)

| Attribute Name                        | Tag         | Type | Internal value | Notes                                 |
|---------------------------------------|-------------|------|----------------|---------------------------------------|
| RT ROI Observation Sequence           | (3006,0080) | 1    |                |                                       |
| >Observation Number                   | (3006,0082) | 1    |                |                                       |
| >Referenced ROI Number                | (3006,0084) | 1    |                |                                       |
| >ROI Observation label                | (3006,0085) | 3    |                |                                       |
| >ROI Observation Description          | (3006,0088) | 3    |                |                                       |
| >RT Related ROI Sequence              | (3006,0030) | 3    |                |                                       |
| >>Referenced ROI Number               | (3006,0084) | 1C   |                |                                       |
| >>RT ROI Relationship                 | (3006,0033) | 3    |                |                                       |
| >RT ROI Identification Code Sequence  | (3006,0086) | 3    |                | SCP - Not used<br>SCU - Not supported |
| >Related RT ROI Observations Sequence | (3006,00A0) | 3    |                |                                       |
| >>Observation Number                  | (3006,0082) | 1C   |                |                                       |
| >RT ROI Interpreted Type              | (3006,00A4) | 2    |                |                                       |
| >RT ROI Interpreted Class             | Private     | 3    | VOIClass       |                                       |
| >ROI Interpreter                      | (3006,00A6) | 2    |                |                                       |
| >Material ID                          | (3006,00E1) | 3    |                |                                       |
| >ROI Physical Properties Sequence     | (3006,00B0) | 3    |                |                                       |

| Attribute Name                | Tag         | Type | Internal value | Notes |
|-------------------------------|-------------|------|----------------|-------|
| >>ROI Physical Property       | (3006,00B2) | 1C   |                |       |
| >>ROI Physical Property Value | (3006,00B4) | 1C   |                |       |

### A.28 VOI LUT Module Attributes (C.11.2)

| Attribute Name                    | Tag         | Type | Internal value | Notes |
|-----------------------------------|-------------|------|----------------|-------|
| VOI LUT Sequence                  | (0028,3010) | 3    |                |       |
| >LUT Descriptor                   | (0028,3002) | 1C   |                |       |
| >LUT Explanation                  | (0028,3003) | 3    |                |       |
| >LUT Data                         | (0028,3006) | 1C   |                |       |
| Window Center                     | (0028,1050) | 3    |                |       |
| Window Width                      | (0028,1051) | 1C   |                |       |
| Window Center & Width Explanation | (0028,1055) | 3    |                |       |

### A.29 SOP Common Module Attributes (C.12.1)

| Attribute Name         | Tag         | Type           | Internal value | Notes |
|------------------------|-------------|----------------|----------------|-------|
| SOP Class UID          | (0008,0016) | See C.12.1.1.1 |                |       |
| SOP Instance UID       | (0008,0018) | See C.12.1.1.1 |                |       |
| Specific Character Set | (0008,0005) | 1C             |                |       |
| Instance Creation Date | (0008,0012) | 3              |                |       |
| Instance Creation Time | (0008,0013) | 3              |                |       |
| Instance Creator UID   | (0008,0014) | 3              |                |       |

## Appendix B RT Treatment Plan & RT Dose

### B.1 RT Plan IOD (A.20)

| IE                 | Module                       | Section  | DICOM Usage   | Comments  |
|--------------------|------------------------------|----------|---|---|
| Patient            | Patient                      | C.7.1.1  | M   |   |
|                    | Clinical Trial Subject       | C.7.1.3  | U   | SCP - Not used<br>SCU - Not provided                  |
| Study              | General Study                | C.7.2.1  | M   |   |
|                    | Patient Study                | C.7.2.2  | U   | SCP - Used<br>SCU - Supported                         |
|                    | Clinical Trial Study         | C.7.2.3  | U   | SCP - Not used<br>SCU - Not provided                  |
| Series             | RT Series                    | C.8.8.1  | M   |   |
|                    | Clinical Trial Series        | C.7.3.2  | U   | SCP - Not used<br>SCU - Not provided                  |
| Frame of Reference | Frame of Reference           | C.7.4.1  | U (see note in DICOM description)   | SCP - Not supported<br>SCU - Not provided             |
| Equipment          | General Equipment            | C.7.5.1  | M   |   |
| Plan               | RT General Plan              | C.8.8.9  | M   |   |
|                    | RT Prescription              | C.8.8.10 | U   | SCP - Not used<br>SCU - Not provided<br>Conditionally |
|                    | RT Tolerance Tables          | C.8.8.11 | U   | SCP - Not used<br>SCU - Not provided<br>Conditionally |
|                    | RT Patient Setup             | C.8.8.12 | U   | SCP - Used<br>SCU - Supported                         |
|                    | RT Fraction Scheme           | C.8.8.13 | U   | SCP - Not used<br>SCU - Not provided<br>Conditionally |
|                    | RT Beams                     | C.8.8.14 | C - Required if RT Fraction Scheme Module exists and Number of Beams (300A,0080) is greater than zero for one or more fraction groups                     | SCP - Not used<br>SCU - Not provided                  |
|                    | RT Brachy Application Setups | C.8.8.15 | C - Required if RT Fraction Scheme Module exists and Number of Brachy Application Setups (300A,00A0) is greater than zero for one or more fraction groups | SCP - Used<br>SCU - Provided                          |
|                    | Approval                     | C.8.8.16 | U   | SCP - Used<br>SCU - Provided                          |
|                    | Markers                      | Private  | U   | SCP - Used<br>SCU - Provided                          |
|                    | Settings                     | Private  | U   | SCP - Used<br>SCU - Provided                          |
|                    | Audio                        | C.10.3   | U   | SCP - Not supported<br>SCU - Not provided             |
|                    | SOP Common                   | C.12.1   | M   |   |

## B.2 RT General Plan Module (C.8.8.9)

| Attribute Name                    | Tag         | Type | Internal value | VR | VM | Notes  |
|-----------------------------------|-------------|------|----------------|----|----|--|
| RT Plan Label                     | 300A,0002   | 1    |                |    |    |  |
| RT Plan Name                      | 300A,0003   | 3    |                |    |    |  |
| RT Plan Description               | 300A,0004   | 3    |                |    |    |  |
| Instance Number                   | 0020,0013   | 3    |                |    |    |  |
| Operators' Name                   | 0008,1070   | 2    |                |    |    |  |
| RT Plan Date                      | 300A,0006   | 2    | PlannedAtDate  |    |    |  |
| RT Plan Time                      | 300A,0007   | 2    | PlannedAtTime  |    |    |  |
| Treatment Protocols               | 300A,0009   | 3    |                |    |    |  |
| Treatment Intent                  | 300A,000A   | 3    |                |    |    |  |
| Treatment Sites                   | 300A,000B   | 3    |                |    |    |  |
| RT Plan Geometry                  | 300A,000C   | 1    |                |    |    | Always PATIENT   |
| Referenced Structure Set Sequence | 300C,0060   | 1C   |                |    |    |  |
| Referenced Dose Sequence          | 300C,0080   | 3    |                |    |    |  |
| Referenced RT Plan Sequence       | 300C,0002   | 3    |                |    |    |  |
| Private attributes                | (300B,0010) | 3    |                |    |    | Used when plan is containing a Flexitron Plan Code. This is only used for brachy plans.<br>SCP Used if provided  |
| Flexitron Plan Code               | (300B,1029) | 3    |                |    |    | SCU - Provided.<br>The Flexitron Plan Code is provided to make the plan unique.<br>On the destination application (e.g. TCC v2.1) the same Flexitron Plan Code must be entered to be able to import the RT Plan.<br>SCP Used |
| End private attributes            |             |      |                |    |    |  |
| Referenced SOP Class UID          | 0008,1150   |      |                |    |    |  |
| Referenced SOP Instance UID       | 0008,1155   |      |                |    |    |  |

## B.3 RT Prescription Module (C.8.8.10)

| Attribute Name          | Tag       | Type | Internal value | VR | VM | Notes |
|-------------------------|-----------|------|----------------|----|----|-------|
| Dose Reference Sequence | 300A,0010 | 3    |                |    |    |       |

| Attribute Name                         | Tag       | Type | Internal value | VR | VM | Notes |
|--|-----------|------|----------------|----|----|-------|
| >Target Maximum Dose                   | 300A,0027 | 3    |                |    |    |       |
| Dose Reference Number                  | 300A,0012 |      |                |    |    |       |
| Dose Reference Structure Type          | 300A,0014 |      |                |    |    |       |
| Dose Reference Description             | 300A,0016 |      |                |    |    |       |
| Referenced ROI Number                  | 3006,0084 |      |                |    |    |       |
| Dose Reference Point Coordinates       | 300A,0018 |      |                |    |    |       |
| Dose Reference Type                    | 300A,0020 |      |                |    |    |       |
| Target Minimum Dose                    | 300A,0025 |      |                |    |    |       |
| Target Prescription Dose               | 300A,0026 |      |                |    |    |       |
| Nominal Prior Dose                     | 300A,001A |      |                |    |    |       |
| Constraint Weight                      | 300A,0021 |      |                |    |    |       |
| Delivery Warning Dose                  | 300A,0022 |      |                |    |    |       |
| Delivery Maximum Dose                  | 300A,0023 |      |                |    |    |       |
| Target Underdose Volume Fraction       | 300A,0028 |      |                |    |    |       |
| Organ at Risk Full-volume Dose         | 300A,002A |      |                |    |    |       |
| Organ at Risk Limit Dose               | 300A,002B |      |                |    |    |       |
| Organ at Risk Maximum Dose             | 300A,002C |      |                |    |    |       |
| Organ at Risk Overdose Volume Fraction | 300A,002D |      |                |    |    |       |
| Prescription Description               | 300A,000E |      |                |    |    |       |

**B.4 Fraction Scheme Module (C.8.8.13)**

| Attribute Name                            | Tag       | Type | Internal value | VR | VM | Notes |
|---|-----------|------|----------------|----|----|-------|
| Fraction Group                            | 300A,0070 | 1    |                |    |    |       |
| >Fraction Group Number                    | 300A,0071 | 1    |                |    |    |       |
| >Referenced Patient Setup Number          | 300C,006A | 3    |                |    |    |       |
| >Number of Fractions Planned              | 300A,0078 | 2    |                |    |    |       |
| >Number of Fraction Pattern Digits PerDay | 300A,0079 | 3    |                |    |    |       |

| Attribute Name                                     | Tag       | Type | Internal value | VR | VM | Notes                    |
|--|-----------|------|----------------|----|----|--------------------------|
| >Repeat Fraction Cycle Length                      | 300A,007A | 3    |                |    |    |                          |
| >Fraction Pattern                                  | 300A,007B | 3    |                |    |    |                          |
| >Number of Beams                                   | 300A,0080 | 1    |                |    |    | Must be 0 (Brachy plans) |
| >Number of Brachy Application Setups               | 300A,00A0 | 1    |                |    |    |                          |
| >Referenced Brachy Application SetupSequence       | 300C,000A | 1C   |                |    |    |                          |
| >>Referenced Brachy ApplicationSetup Number        | 300C,000C | 1C   |                |    |    |                          |
| >>Brachy Application Setup DoseSpecification Point | 300A,00A2 | 3    |                |    |    |                          |
| >>Brachy Application Setup Dose                    | 300A,00A4 | 3    |                |    |    |                          |

**NOTE:**

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.

**B.5 RT Brachy Application Setups Module (C.8.8.15)**

| Attribute Name                 | Tag       | Type | Internal value | VR | VM | Notes  |
|--------------------------------|-----------|------|----------------|----|----|--|
| Brachy Treatment Technique     | 300A,0200 | 1    |                |    |    | Next to types specified in DICOM, TCS also accepts value UNDEFINED |
| Brachy Treatment Type          | 300A,0202 | 1    |                |    |    | HDR, PDR   |
| Treatment Machine Sequence     | 300A,0206 | 1    |                |    |    | (AFTERLOADER)  |
| >Treatment Machine Name        | 300A,00B2 | 2    | Name           |    |    |  |
| >Manufacturer                  | 0008,0070 | 3    | Manufacturer   |    |    |  |
| >Institution Name              | 0008,0080 | 3    |                |    |    |  |
| >Institution Address           | 0008,0081 | 3    |                |    |    |  |
| >Institutional Department Name | 0008,1040 | 3    |                |    |    |  |
| >Manufacturer's Model Name     | 0008,1090 | 3    | Model          |    |    |  |
| >Device Serial Number          | 0018,1000 | 3    | Serial         |    |    |  |

| Attribute Name                    | Tag                  | Type | Internal value            | VR | VM  | Notes                |
|-----------------------------------|----------------------|------|---------------------------|----|-----|----------------------|
| >Type                             | Private<br>1001,1010 | 3    | Type                      | LO | 1   | HDR, PDR, ...        |
| >System Type                      | Private<br>1001,1012 | 3    | SystemType                | LO | 1   | HDR, PDR, ...        |
| >Number of sources                | Private<br>1001,1014 | 3    | Sources                   | SL | 1   | Must be 1            |
| >Number of hardware channels      | Private<br>1001,1016 | 3    | hardwareChannels          | SL | 1   |                      |
| >Number of software channels      | Private<br>1001,1018 | 3    | softwareChannels          | SL | 1   |                      |
| >Detection of catheter tip        | Private<br>1001,101A | 3    | catheterTipDetection      | SL | 1   |                      |
| >Name for Channel Length          | Private<br>1001,101C | 3    | channelLengthName         | LO | 1   |                      |
| >min Channel Length               | Private<br>1001,101E | 3    | MinChannelLength          | FL | 1   |                      |
| >max Channel Length               | Private<br>1001,1020 | 3    | MaxChannelLength          | FL | 1   |                      |
| >Source Movement Type             | Private<br>1001,1022 | 3    | SsMethod                  | SL | 1   |                      |
| >Number of Possible Step Sizes    | Private<br>1001,1024 | 3    | ssdPossibleSteps          | SL | 1   |                      |
| >Step                             | Private<br>1001,1026 | 3    | ssdSteps                  | FL | 1-n | VM: ssdPossibleSteps |
| >Default Step                     | Private<br>1001,1028 | 3    | ssDefStep                 | FL | 1   |                      |
| >Continuously min Step            | Private<br>1001,002A | 3    | sscMinStep                | FL | 1   |                      |
| >Continuously max Step            | Private<br>1001,102C | 3    | sscMaxStep                | FL | 1   |                      |
| >Common Stepping for all Channels | Private<br>1001,102E | 3    | commonSteppingAllChannels | SL | 1   |                      |
| >Drive Type                       | Private<br>1001,1030 | 3    | driveType                 | SL | 1   |                      |
| >max Number of Steps per Channel  | Private<br>1001,1032 | 3    | maxStepsPerChannel        | SL | 1   |                      |
| >Time Resolution                  | Private<br>1001,1034 | 3    | TimeResolution            | FL | 1   |                      |
| >max Time                         | Private<br>1001,1036 | 3    | maxTime                   | FL | 1   |                      |
| Source Sequence                   | 300A,0210            | 1    |                           |    |     |                      |
| >Source Number                    | 300A,0212            | 1    |                           |    |     |                      |
| >Source Type                      | 300A,0214            | 1    | geometricType             |    |     | Line, Point          |
| >Source Manufacturer              | 300A,0216            | 3    | manufacturer              |    |     |                      |

| Attribute Name                            | Tag                  | Type | Internal value                    | VR | VM  | Notes  |
|---|----------------------|------|-----------------------------------|----|-----|--|
| >Source ID                                | Private<br>1001,1040 | 3    | ID                                | LO | 1   |  |
| >Active Source Diameter                   | 300A,0218            | 3    | activeCoreDiameter                |    |     |  |
| >Active Source Length                     | 300A,021A            | 3    | activeCoreLength                  |    |     |  |
| >Material ID                              | 300A,00E1            | 3    | encapsulationMaterial             |    |     |  |
| > Encapsulation thickness tip             | Private<br>1001,1041 | 3    | tipThickness                      | FL | 1   |  |
| > Encapsulation thickness wire            | Private<br>1001,1042 | 3    | wireThickness                     | FL | 1   |  |
| > Encapsulation thickness lateral         | Private<br>1001,1043 | 3    | lateralThickness                  | FL | 1   |  |
| >Source Encapsulation NominalThickness    | 300A,0222            | 3    |                                   |    |     |  |
| >Source Encapsulation NominalTransmission | 300A,0224            | 3    |                                   |    |     |  |
| >Source Isotope Name                      | 300A,0226            | 1    | nuclide                           |    |     |  |
| >Source Isotope Half Life                 | 300A,0228            | 1    | decayHalfTime                     |    |     |  |
| > Half Life unit                          | Private<br>1001,1044 | 3    | Unit                              | SL | 1   |  |
| >Reference Air Kerma Rate                 | 300A,022A            | 1    | act_sstrength                     |    |     |  |
| >Air Kerma Rate Reference Date            | 300A,022C            | 1    | currentEntryDate                  |    |     |  |
| >Air Kerma Rate Reference Time            | 300A,022E            | 1    | currentEntryTime                  |    |     |  |
| > <i>Private attributes</i>               | (300B,0010)          | 3    |                                   |    |     |  |
| >Source Identification Number             | (300B,100C)          | 3    |                                   |    |     | Identification of the source as provided by the afterloader manufacturer |
| > <i>End private attributes</i>           |                      |      |                                   |    |     |  |
| > Lamda                                   | Private<br>1001,1045 | 3    | Lamda                             | FL | 1   |  |
| > Source strength conversion factor       | Private<br>1001,1046 | 3    | Source strength conversion factor | FL | 1   |  |
| > Number radial dose distances            | Private<br>1001,1047 | 3    | rdfRadialDistanceCount            | SL | 1   |  |
| > Radial dose distance                    | Private<br>1001,1048 | 3    | distance                          | FL | 1-n | VM:<br>rdfRadialDistanceCount  |
| > Radial dose value                       | Private<br>1001,1049 | 3    | radialDoseValue                   | FL | 1-n | VM:<br>rdfRadialDistanceCount  |

| Attribute Name                              | Tag                  | Type | Internal value            | VR | VM  | Notes   |
|---|----------------------|------|---------------------------|----|-----|---|
| > Number anisotropy radial distances        | Private<br>1001,104A | 3    | aRadialDistanceCount      | SL | 1   |   |
| > Anisotropy radial distance                | Private<br>1001,104B | 3    | aRadialDistances          | FL | 1-n | VM:<br>aRadialDistanceCount                             |
| > Number anisotropy polar angles            | Private<br>1001,104C | 3    | aPolarAngleCount          | SL | 1   |   |
| > Anisotropic polar angle                   | Private<br>1001,104D | 3    | aPolarAngles              | FL | 1-n | VM: aPolarAngleCount                                    |
| > Anisotropy function value                 | Private<br>1001,104E | 3    | anisotropyFunctions       | FL | 1-n | VM: aPolarAngleCount*<br>aRadialDistanceCount           |
| > Number anisotropy factor radial distances | Private<br>1001,104F | 3    | phiRadialDistanceCount    | SL | 1   |   |
| > Anisotropy factor radial distance         | Private<br>1001,1050 | 3    | distance                  | FL | 1-n | VM:<br>phiRadialDistanceCount                           |
| > Anisotropy factor data                    | Private<br>1001,1051 | 3    | anisotropyFactors         | FL | 1-n | VM:<br>phiRadialDistanceCount                           |
| > Anisotropy constant                       | Private<br>1001,1052 | 3    | anisotropyConstant        | FL | 1   |   |
| > Calibration date                          | Private<br>1001,1053 | 3    | calibrationDate           | DA | 1   |   |
| > Calibration time                          | Private<br>1001,1054 | 3    | calibrationTime           | DT | 1   |   |
| > Source strength                           | Private<br>1001,1055 | 3    | calibrationSourceStrength | FL | 1   |   |
| > Unit                                      | Private<br>1001,1056 | 3    | calibrationUnit           | LO | 1   |   |
| > Calibration entry date                    | Private<br>1001,1057 | 3    | calibrationEntryDate      | DA | 1   |   |
| > Calibration entry time                    | Private<br>1001,1058 | 3    | calibrationEntryTime      | DT | 1   |   |
| > User                                      | Private<br>1001,1059 | 3    | calibrationEntryUser      | LO | 1   |   |
| Application Setup Sequence                  | 300A,0230            | 1    |                           |    |     |   |
| >Application Setup Type                     | 300A,0232            | 1    |                           |    |     | Next to DICOM defined types, TCS also accepts UNDEFINED |
| >Application Setup Number                   | 300A,0234            | 1    |                           |    |     |   |
| >Application Setup Name                     | 300A,0236            | 3    |                           |    |     |   |
| >Application Setup Manufacturer             | 300A,0238            | 3    |                           |    |     |   |
| >Template Number                            | 300A,0240            | 3    | id                        | IS |     |   |
| >Template Type                              | 300A,0242            | 3    |                           | SH |     |   |

| Attribute Name                                 | Tag                  | Type | Internal value                   | VR | VM | Notes  |
|--|----------------------|------|----------------------------------|----|----|--|
| >Template Name                                 | 300A,0244            | 3    | name                             | LO |    |  |
| >Total Reference Air Kerma                     | 300A,0250            | 1    | TimeTrack.track                  |    |    |  |
| >Brachy Accessory Device Sequence              | 300A,0260            | 3    |                                  | SQ |    |  |
| >>Brachy Accessory Device Number               | 300A,0262            | 2C   |                                  | IS |    |  |
| >>Brachy Accessory Device ID                   | 300A,0263            | 2C   |                                  | SH |    |  |
| >>Brachy Accessory Device Type                 | 300A,0264            | 1C   |                                  | CS |    |  |
| >>Brachy Accessory Device Name                 | 300A,0266            | 3    |                                  | LO |    |  |
| >>Material ID                                  | 300A,00E1            | 3    |                                  | SH |    |  |
| >> Brachy Accessory Device NominalThickness    | 300A,026A            | 3    |                                  | DS |    |  |
| >> Brachy Accessory Device NominalTransmission | 300A,026C            | 3    |                                  | DS |    |  |
| >>Referenced ROI Number                        | 3006,0084            | 2C   |                                  | DS |    |  |
| >Channel Sequence                              | 300A,0280            | 1    |                                  |    |    |  |
| >>Channel Number                               | 300A,0282            | 1    |                                  |    |    | Def: index   |
| >>Channel Length                               | 300A,0284            | 2    | channel_length                   |    |    |  |
| >>Channel Total Time                           | 300A,0286            | 1    | Total time                       |    |    | Calculated (1)   |
| >>Source Movement Type                         | 300A,0288            | 1    |                                  |    |    | STEPWISE   |
| >>Number of Pulses                             | 300A,028A            | 1C   |                                  |    |    | Mandatory for PDR plans. If not available Number of Fractions Planned (300A,0078) is used instead. |
| >>Pulse Repetition Interval                    | 300A,028C            | 1C   |                                  |    |    |  |
| >>Source Applicator Number                     | 300A,0290            | 3    | index                            |    |    |  |
| >>Source Applicator ID                         | 300A,0291            | 2C   | id + virtual/life identification |    |    | Prefix V/L   |
| >>Source Applicator Type                       | 300A,0292            | 1C   | type                             |    |    |  |
| >>Source Applicator Name                       | 300A,0294            | 3    | name                             |    |    |  |
| >>Source Applicator Length                     | 300A,0296            | 1C   | Length - dist_tip2source         |    |    |  |
| >>Source Applicator Manufacturer               | 300A,0298            | 3    | --                               |    |    |  |
| >>Material ID                                  | 300A,00E1            | 3    | material                         |    |    |  |
| >> Density                                     | Private<br>1001,1070 | 3    | density                          | FD | 1  |  |

| Attribute Name                                | Tag                  | Type | Internal value     | VR | VM | Notes                  |
|---|----------------------|------|--------------------|----|----|------------------------|
| >> Outer diameter                             | Private<br>1001,1071 | 3    | outer_diameter     | FD | 1  |                        |
| >> Inner diameter                             | Private<br>1001,1072 | 3    | inner_diameter     | FD | 1  |                        |
| >> Min free length                            | Private<br>1001,1073 | 3    | min_free_length    | FD | 1  |                        |
| >> Dinstance tip to SDP                       | Private<br>1001,1074 | 3    | dist_tip2source    | FD | 1  |                        |
| >> Reconstructed length                       | Private<br>1001,1075 | 3    | reconstruct_length | FD | 1  |                        |
| >> Free length                                | Private<br>1001,1076 | 3    | free_length        | FD | 1  |                        |
| >> Retraction length                          | Private<br>1001,1077 | 3    | retraction_length  | FD | 1  |                        |
| >> Depth                                      | Private<br>1001,1078 | 3    | depth              | FD | 1  |                        |
| >> Catheter Template Mode                     | Private<br>1001,1079 | 3    | tpl_mode           | SL | 1  |                        |
| >> Template row                               | Private<br>1001,107A | 2C   | Template row       | SL | 1  | If tpl_mode = 0 or = 1 |
| >> Template column                            | Private<br>1001,107B | 2C   | Template column    | SL | 1  | If tpl_mode = 0 or = 1 |
| >> Applicator Control Point Sequence          | Private<br>1001,1080 | 3    |                    |    |    | (cath->cpkt_list)      |
| >>> CDP number                                | Private<br>1001,1081 | 3    | Unique number      | SL | 1  |                        |
| >>> CDP type                                  | Private<br>1001,1082 | 3    | type               | SL | 1  |                        |
| >>> CDP 3D Position                           | Private<br>1001,1083 | 3    | Coordinates        | FD | 3  |                        |
| >> Source Applicator Wall NominalThickness    | 300A,029C            | 3    |                    |    |    |                        |
| >> Source Applicator Wall NominalTransmission | 300A,029E            | 3    |                    |    |    |                        |
| >>Source Applicator Step Size                 | 300A,02A0            | 1C   | source_step        |    |    |                        |
| >>Transfer Tube Number                        | 300A,02A2            | 2    |                    |    |    |                        |
| >>Transfer Tube Length                        | 300A,02A4            | 2C   | channel_length     |    |    |                        |
| >>Channel Shield Sequence                     | 300A,02B0            | 3    |                    |    |    |                        |
| >>Referenced Source Number                    | 300C,000E            | 1    | Number of source   |    |    |                        |

| Attribute Name                               | Tag                  | Type | Internal value     | VR | VM | Notes   |
|--|----------------------|------|--------------------|----|----|---|
| >>Number of Control Points                   | 300A,0110            | 1    | Number active SDPs |    |    |   |
| >>Final Cumulative Time Weight               | 300A,02C8            | 1C   |                    |    |    | Always 100  |
| >>Brachy Control Point Sequence              | 300A,02D0            | 1    |                    |    |    | (active cath->spkt_list)  |
| >>>Control Point Index                       | 300A,0112            | 1    | Index from 0       |    |    | (2)   |
| >>>Cumulative Time Weight                    | 300A,02D6            | 2    |                    |    |    | (2)   |
| >>>Control Point Relative Position           | 300A,02D2            | 1    |                    |    |    | (2)   |
| >>>Control Point 3D Position                 | 300A,02D4            | 3    | ASDP coordinates   |    |    |   |
| >>>Brachy Referenced Dose Reference Sequence | 300C,0055            | 3    |                    |    |    |   |
| >>>>Referenced Dose Reference Number         | 300C,0051            | 1C   |                    |    |    |   |
| >>>>Cumulative Dose Reference                | 300A,010C            | 1C   |                    |    |    |   |
| >> Virtual Channel sequence                  | Private<br>1001,10FF | 3    |                    | SQ | 1  | To be set if Source Applicator ID points on life catheter and virtual catheter is present |
| >>>Same as standard Channel Sequence         |                      |      |                    |    |    |   |

**NOTE:**

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

## B.6 Approval Module (C.8.8.9)

| Attribute Name  | Tag       | Type | Internal value | VR | VM | Notes |
|-----------------|-----------|------|----------------|----|----|-------|
| Approval Status | 300E,0002 | 1    |                |    |    |       |
| Review Date     | 300E,0004 | 2C   |                |    |    |       |
| Review Time     | 300E,0005 | 2C   |                |    |    |       |
| Reviewer Name   | 300E,0008 | 2C   |                |    |    |       |

## B.7 Marker Module (Private) – Patient-, Marker-, Applicator Points

See section Marker Module (Private) – Patient-, Marker-, Applicator Points.

**B.8 Settings Module (Private)**

See section Settings Module (Private).

**B.8.1. Approval (C.8.8.16)**

| Attribute Name  | Tag         | Type | Notes                        |
|-----------------|-------------|------|------------------------------|
| Approval Status | (300E,0002) | 1    | SCP - Used<br>SCU - Provided |
| Review Date     | (300E,0004) | 2C   | SCP - Used<br>SCU - Provided |
| Review Time     | (300E,0005) | 2C   | SCP - Used<br>SCU - Provided |
| Reviewer Name   | (300E,0008) | 2C   | SCP - Used<br>SCU - Provided |

**B.9 SOP Common (C.8.8.9)**

| Attribute Name   | Tag       | Type | Internal Value | Notes |
|------------------|-----------|------|----------------|-------|
| SOP Class UID    | 0008,0016 | 1    |                |       |
| SOP Instance UID | 0008,0018 | 1    |                |       |

**B.10 RT Dose IOD Module Table**

| IE                 | Module                 | Reference | DICOM Usage   | Notes                                 |
|--------------------|------------------------|-----------|---|---------------------------------------|
| Patient            | Patient                | C.7.1.1   | M   |                                       |
|                    | Clinical Trial Subject | C.7.1.3   | U   | SCP - Not used<br>SCU - Not provided  |
| Study              | General Study          | C.7.2.1   | M   |                                       |
|                    | Patient Study          | C.7.2.2   | U   | SCP - Used<br>SCU - Supported         |
|                    | Clinical Trial Study   | C.7.2.3   | U   | SCP - Not used<br>SCU - Not provided  |
| Series             | RT Series              | C.8.8.1   | M   |                                       |
| Frame of Reference | Frame of Reference     | C.7.4.1   | M   |                                       |
| Equipment          | General Equipment      | C.7.5.1   | M   |                                       |
| Dose               | General Image          | C.7.6.1   | C-Required if dose data contains grid-based doses.                                      |                                       |
|                    | Image Plane            | C.7.6.2   | C-Required if dose data contains grid-based doses.                                      |                                       |
|                    | Image Pixel            | C.7.6.3   | C-Required if dose data contains grid-based doses.                                      |                                       |
|                    | Multi-Frame            | C.7.6.6   | C - Required if dose data contains grid-based doses and pixel data is multi-frame data. | SCU - Supported<br>SCP - Used         |
|                    | Overlay Plane          | C.9.2     | U   | SCU - Not supported<br>SCP - Not used |
|                    | Multi-Frame Overlay    | C.9.3     | U   | SCU - Not supported<br>SCP - Not used |
|                    | Modality LUT           | C.11.1    | U   | SCU - Not supported<br>SCP - Not used |
|                    | RT Dose                | C.8.8.3   | M   |                                       |
|                    | RT DVH                 | C.8.8.4   | U   | SCU - Not supported<br>SCP - Not used |
|                    | Structure Set          | C.8.8.5   | C-Required if dose data contains dose points or isodose curves.                         | SCU - Not supported<br>SCP - Not used |
|                    | ROI Contour            | C.8.8.6   | C-Required if dose data contains dose points or isodose curves.                         | SCU - Not supported<br>SCP - Not used |
|                    | RT Dose ROI            | C.8.8.7   | C-Required if dose data contains dose points or isodose curves.                         | SCU - Not supported<br>SCP - Not used |
|                    | Audio                  | C.10.3    | U   | SCU - Not supported<br>SCP - Not used |
|                    | SOP Common             | C.12.1    | M   |                                       |

**B.10.1. Patient Module**

| Attribute Name              | Tag         | Type | Notes   |
|-----------------------------|-------------|------|---|
| Patient Name                | (0010,0010) | 2    | SCU - Provided as specified in the Smoothbase database.<br>SCP - Used   |
| Patient ID                  | (0010,0020) | 2    | SCU - Provided as specified in the Smoothbase database.<br>SCP - Must be entered on import to Oncentra Prostate by user if not specified via DICOM. |
| Patient's Birth Date        | (0010,0030) | 2    | SCU - Provided as specified in the Smoothbase database.<br>SCP - Used   |
| Patient's Sex               | (0010,0040) | 2    | SCU - Provided as specified in the Smoothbase database.<br>SCP - Used   |
| Referenced Patient Sequence | (0008,1120) | 3    | SCU - Not provided<br>SCP - Not used  |

| Attribute Name               | Tag         | Type | Notes                                |
|------------------------------|-------------|------|--------------------------------------|
| >Referenced SOP Class UID    | (0008,1150) | 1C   | SCU - Not provided<br>SCP - Not used |
| >Referenced SOP Instance UID | (0008,1155) | 1C   | SCU - Not provided<br>SCP - Not used |
| Patient's Birth Time         | (0010,0032) | 3    | SCU - Not provided<br>SCP - Not used |
| Other Patient Ids            | (0010,1000) | 3    | SCU - Not provided<br>SCP - Not used |
| Other Patient Names          | (0010,1001) | 3    | SCU - Not provided<br>SCP - Not used |
| Ethnic Group                 | (0010,2160) | 3    | SCU - Not provided<br>SCP - Not used |
| Patient Comments             | (0010,4000) | 3    | SCU - Not provided<br>SCP - Not used |

**B.10.2. General Study Module**

| Attribute Name                     | Tag         | Type | Notes   |
|------------------------------------|-------------|------|---|
| Study Instance UID                 | (0020,000D) | 1    | SCU - Duplicated from Reference Image Series<br>SCP - Used to validate study/series contents. |
| Study Date                         | (0008,0020) | 2    | SCU - Duplicated from Reference Image Series<br>SCP - Not used                                |
| Study Time                         | (0008,0030) | 2    | SCU - Duplicated from Reference Image Series<br>SCP - Not used                                |
| Referring Physician's Name         | (0008,0090) | 2    | SCU - Duplicated from Reference Image Series<br>SCP - Not used                                |
| Study ID                           | (0020,0010) | 2    | SCU - Zero length.<br>SCP - Not used  |
| Accession Number                   | (0008,0050) | 2    | SCU - Duplicated from Reference Image Series<br>SCP - Not used                                |
| Study Description                  | (0008,1030) | 3    | SCU - Duplicated from Reference Image Series<br>SCP - Not used                                |
| Physician(s) of Record             | (0008,1048) | 3    | SCU - Not provided<br>SCP - Not used  |
| Name of Physician(s) Reading Study | (0008,1060) | 3    | SCU - Not provided<br>SCP - Not used  |
| Referenced Study Sequence          | (0008,1120) | 3    | SCU - Not provided<br>SCP - Not used  |
| >Referenced SOP Class UID          | (0008,1150) | 1C   | SCU - Not provided<br>SCP - Not used  |
| >Referenced SOP Instance UID       | (0008,1155) | 1C   | SCU - Not provided<br>SCP - Not used  |
| Procedure Code Sequence            | (0008,1032) | 3    | SCU - Not provided<br>SCP - Not used  |

**B.10.3. RT Series Module**

| Attribute Name                      | Tag         | Type | Notes   |
|-------------------------------------|-------------|------|---|
| Modality                            | (0008,0060) | 1    | SCU - 'RTDOSE'<br>SCP - Supported value 'RTDOSE'  |
| Series Instance UID                 | (0020,000E) | 1    | SCU - Created by Oncentra Prostate.<br>SCP - Used |
| Series Number                       | (0020,0011) | 2    | SCU - '1'<br>SCP - Required                       |
| Series Description                  | (0008,103E) | 3    | SCU - Not provided<br>SCP - Not used              |
| Referenced Study Component Sequence | (0008,1111) | 3    | SCU - Not provided<br>SCP - Not used              |

| Attribute Name               | Tag         | Type | Notes                                |
|------------------------------|-------------|------|--------------------------------------|
| >Referenced SOP Class UID    | (0008,1150) | 1C   | SCU - Not provided<br>SCP - Not used |
| >Referenced SOP Instance UID | (0008,1155) | 1C   | SCU - Not provided<br>SCP - Not used |

#### B.10.4. Frame of Reference Module

| Attribute Name               | Tag         | Type | Notes   |
|------------------------------|-------------|------|---|
| Frame of Reference UID       | (0020,0052) | 1    | SCU - Duplicated from Reference Image Series.<br>SCP - Required |
| Position Reference Indicator | (0020,1040) | 2    | SCU - Duplicated from Reference Image Series.<br>SCP - Not used |

#### B.10.5. General Equipment Module

| Attribute Name                | Tag         | Type | Notes   |
|-------------------------------|-------------|------|---|
| Manufacturer                  | (0008,0070) | 2    | SCU - 'Nucletron'<br>SCP - Used                 |
| Institution Name              | (0008,0080) | 3    | SCU - Not provided<br>SCP - Not used            |
| Institution Address           | (0008,0081) | 3    | SCU - Not provided<br>SCP - Not used            |
| Station Name                  | (0008,1010) | 3    | SCU - Windows logon username.<br>SCP - Not used |
| Institutional Department Name | (0008,1040) | 3    | SCU - Not provided<br>SCP - Not used            |
| Manufacturer's Model Name     | (0008,1090) | 3    | SCU - Not provided<br>SCP - Not used            |
| Device Serial Number          | (0018,1000) | 3    | SCU - Not provided<br>SCP - Not used            |
| Software Versions             | (0018,1020) | 3    | SCU - Not provided<br>SCP - Not used            |
| Spatial Resolution            | (0018,1050) | 3    | SCU - Not provided<br>SCP - Not used            |
| Date of Last Calibration      | (0018,1200) | 3    | SCU - Not provided<br>SCP - Not used            |
| Time of Last Calibration      | (0018,1201) | 3    | SCU - Not provided<br>SCP - Not used            |
| Pixel Padding Value           | (0028,0120) | 3    | SCU - Not provided<br>SCP - Not used            |

#### B.10.6. General Image Module

| Attribute Name      | Tag         | Type | Notes  |
|---------------------|-------------|------|--|
| Instance Number     | (0020,0013) | 2    | SCU - Zero length<br>SCP - Used              |
| Patient Orientation | (0020,0020) | 2C   | SCU - Zero length<br>SCP - Not used          |
| Content Date        | (0008,0023) | 2C   | SCU - Provided<br>SCP - Not used             |
| Content Time        | (0008,0033) | 2C   | SCU - Provided<br>SCP - Not used             |
| Image Type          | (0008,0008) | 3    | SCU - 'ORIGINAL\PRIMARY\DOSE'.<br>SCP - Used |
| Acquisition Number  | (0020,0012) | 3    | SCU - '1'<br>SCP - Not used                  |

| Attribute Name               | Tag         | Type | Notes                                |
|------------------------------|-------------|------|--------------------------------------|
| Acquisition Date             | (0008,0022) | 3    | SCU - Not provided<br>SCP - Not used |
| Acquisition Time             | (0008,0032) | 3    | SCU - Not provided<br>SCP - Not used |
| Referenced Image Sequence    | (0008,1140) | 3    | SCU - Not provided<br>SCP - Not used |
| >Referenced SOP Class UID    | (0008,1150) | 1C   | SCU - Not provided<br>SCP - Not used |
| >Referenced SOP Instance UID | (0008,1155) | 1C   | SCU - Not provided<br>SCP - Not used |
| Derivation Description       | (0008,2111) | 3    | SCU - Not provided<br>SCP - Not used |
| Source Image Sequence        | (0008,2112) | 3    | SCU - Not provided<br>SCP - Not used |
| >Referenced SOP Class UID    | (0008,1150) | 1C   | SCU - Not provided<br>SCP - Not used |
| >Referenced SOP Instance UID | (0008,1155) | 1C   | SCU - Not provided<br>SCP - Not used |
| Images in Acquisition        | (0020,1002) | 3    | SCU - Not provided<br>SCP - Not used |
| Image Comments               | (0020,4000) | 3    | SCU - Not provided<br>SCP - Not used |

**B.10.7. Image Plane Module**

| Attribute Name              | Tag         | Type | Notes                                |
|-----------------------------|-------------|------|--------------------------------------|
| Pixel Spacing               | (0028,0030) | 1    | SCU - Provided<br>SCP - Required     |
| Image Orientation (Patient) | (0020,0037) | 1    | SCU - Provided<br>SCP - Required     |
| Image Position (Patient)    | (0020,0032) | 1    | SCU - Provided<br>SCP - Required     |
| Slice Thickness             | (0018,0050) | 2    | SCU - '0'<br>SCP - Not used          |
| Slice Location              | (0020,1041) | 3    | SCU - Not provided<br>SCP - Not used |

**B.10.8. Image Pixel Module**

| Attribute Name             | Tag         | Type | Notes   |
|----------------------------|-------------|------|---|
| Samples per Pixel          | (0028,0002) | 1    | SCU - '1'<br>SCP - Required                     |
| Photometric Interpretation | (0028,0004) | 1    | SCU - 'MONOCHROME2'.<br>SCP - Required          |
| Rows                       | (0028,0010) | 1    | SCU - Provided<br>SCP - Required                |
| Columns                    | (0028,0011) | 1    | SCU - Provided<br>SCP - Required                |
| Bits Allocated             | (0028,0100) | 1    | SCU - '16'<br>SCP - Required                    |
| Bits Stored                | (0028,0101) | 1    | SCU - '16'<br>SCP - Required                    |
| High Bit                   | (0028,0102) | 1    | SCU - '15'<br>SCP - Required                    |
| Pixel Representation       | (0028,0103) | 1    | SCU - '0' (unsigned integer).<br>SCP - Required |
| Pixel Data                 | (7FE0,0010) | 1    | SCU - Provided<br>SCP - Required                |

| Attribute Name                              | Tag         | Type | Notes                                |
|---|-------------|------|--------------------------------------|
| Planar Configuration                        | (0028,0006) | 1C   | SCU - Not provided<br>SCP - Not used |
| Pixel Aspect Ratio                          | (0028,0034) | 1C   | SCU - Not provided<br>SCP - Not used |
| Smallest Image Pixel Value                  | (0028,0106) | 3    | SCU - Not provided<br>SCP - Not used |
| Largest Image Pixel Value                   | (0028,0107) | 3    | SCU - Not provided<br>SCP - Not used |
| Red Palette Color Lookup Table Descriptor   | (0028,1101) | 1C   | SCU - Not provided<br>SCP - Not used |
| Green Palette Color Lookup Table Descriptor | (0028,1102) | 1C   | SCU - Not provided<br>SCP - Not used |
| Blue Palette Color Lookup Table Descriptor  | (0028,1103) | 1C   | SCU - Not provided<br>SCP - Not used |
| Red Palette Color Lookup Table Data         | (0028,1201) | 1C   | SCU - Not provided<br>SCP - Not used |
| Green Palette Color Lookup Table Data       | (0028,1202) | 1C   | SCU - Not provided<br>SCP - Not used |
| Blue Palette Color Lookup Table Data        | (0028,1203) | 1C   | SCU - Not provided<br>SCP - Not used |

### B.10.9. Multi-Frame Module

| Attribute Name          | Tag         | Type | Notes                        |
|-------------------------|-------------|------|------------------------------|
| Number of Frames        | (0028,0008) | 1    | SCU - Provided<br>SCP - Used |
| Frame Increment Pointer | (0028,0009) | 1    | SCU - Provided<br>SCP - Used |

### B.10.10. RT Dose Module

| Attribute Name             | Tag         | Type | Notes   |
|----------------------------|-------------|------|---|
| Samples per Pixel          | (0028,0002) | 1    | SCU - '1'<br>SCP - Used                         |
| Photometric Interpretation | (0028,0004) | 1    | SCU - 'MONOCHROME2'.<br>SCP - Used              |
| Bits Allocated             | (0028,0100) | 1    | SCU - '16'<br>SCP - Used                        |
| Bits Stored                | (0028,0101) | 1    | SCU - '16'<br>SCP - Used                        |
| High Bit                   | (0028,0102) | 1C   | SCU - '15'<br>SCP - Required                    |
| Pixel Representation       | (0028,0103) | 1C   | SCU - '0' (unsigned integer).<br>SCP - Required |
| Dose Units                 | (3004,0002) | 1    | SCU - 'GY'<br>SCP - Used                        |
| Dose Type                  | (3004,0004) | 1    | SCU - 'PHYSICAL'<br>SCP - Used                  |
| Dose Comment               | (3004,0006) | 3    | SCU - Not provided<br>SCP - Not used            |
| Normalization Point        | (3004,0008) | 3    | SCU - Not provided<br>SCP - Not used            |
| Dose Summation Type        | (3004,000A) | 1    | SCU - 'BRACHY, FRACTION or 'PLAN'<br>SCP - Used |

| Attribute Name                                 | Tag         | Type | Notes   |
|--|-------------|------|---|
| Referenced RT Plan Sequence                    | (300C,0002) | 1C   | SCU - Provided<br>SCP - Required  |
| >Referenced SOP Class UID                      | (0008,1150) | 1C   | SCU - Provided<br>SCP - Required  |
| >Referenced SOP Instance UID                   | (0008,1155) | 1C   | SCU - Provided<br>SCP - Required  |
| >Referenced Fraction Group Sequence            | (300C,0020) | 1C   | SCU - Provided<br>SCP - Required  |
| >>Referenced Fraction Group Number             | (300C,0022) | 1C   | SCU - Provided<br>SCP - Required  |
| >>Referenced Beam Sequence                     | (300C,0004) | 1C   | SCU - Not provided<br>SCP - Not used  |
| >>>Referenced Beam Number                      | (300C,0006) | 1C   | SCU - Not provided<br>SCP - Not used  |
| >>Referenced Brachy Application Setup Sequence | (300C,000A) | 1C   | SCU - Provided<br>SCP - Required  |
| >>>Referenced Brachy Application Setup Number  | (300C,000C) | 1C   | SCU - Provided<br>SCP - Required  |
| Grid Frame Offset Vector                       | (3004,000C) | 1C   | SCU – Provided<br>The Z-values are relative to the position of the first dose plane support as defined in DICOM 2008 standards.<br>SCP – Required<br>Only option a is support as defined in DICOM 2008 standards. |
| Dose Grid Scaling                              | (3004,000E) | 1    | SCU - Provided<br>SCP - Used  |
| Tissue Heterogeneity Correction                | (3004,0014) | 3    | SPU - Provided<br>SCP – Used<br>The defined term IMAGE is always interpreted as ROI_OVERRIDE  |

**B.10.11. Structure Set Module**

| Attribute Name                            | Tag         | Type | Notes   |
|---|-------------|------|---|
| Structure Set Label                       | (3006,0002) | 1    | SCU – ‘PlanDosePoints’<br>SCP - Required  |
| Structure Set Name                        | (3006,0004) | 3    | SCU - ‘PlanDosePoints’<br>SCP - Not used  |
| Structure Set Description                 | (3006,0006) | 3    | SCU - Not provided<br>SCP - Not used  |
| Instance Number                           | (0020,0013) | 3    | SCU - Not provided<br>SCP - Not used  |
| Structure Set Date                        | (3006,0008) | 2    | SCU – Date of creation (i.e.: when saved in Oncentra Prostate).<br>SCP – Not used |
| Structure Set Time                        | (3006,0009) | 2    | SCU – Time of creation (i.e.: when saved in Oncentra Prostate).<br>SCP – Not used |
| Referenced Frame of Reference Sequence    | (3006,0010) | 3    | SCU – Not provided<br>SCP – Not used  |
| >Frame of Reference UID                   | (0020,0052) | 1C   | SCU – Not provided<br>SCP – Not used  |
| >Frame of Reference Relationship Sequence | (3006,00C0) | 3    | SCU – Not provided<br>SCP – Not used  |
| >>Related Frame of Reference UID          | (3006,00C2) | 1C   | SCU – Not provided<br>SCP – Not used  |
| >>Frame of Reference Transformation Type  | (3006,00C4) | 1C   | SCU – Not provided<br>SCP – Not used  |

| Attribute Name                              | Tag         | Type | Notes  |
|---|-------------|------|--|
| >>Frame of Reference Transformation Matrix  | (3006,00C6) | 1C   | SCU – Not provided<br>SCP – Not used                   |
| >>Frame of Reference Transformation Comment | (3006,00C8) | 3    | SCU – Not provided<br>SCP – Not used                   |
| >RT Referenced Study Sequence               | (3006,0012) | 3    | SCU – Not provided<br>SCP – Not used                   |
| >>Referenced SOP Class UID                  | (0008,1150) | 1C   | SCU – Not provided<br>SCP – Not used                   |
| >>Referenced SOP Instance UID               | (0008,1155) | 1C   | SCU – Not provided<br>SCP – Not used                   |
| >>RT Referenced Series Sequence             | (3006,0014) | 1C   | SCU – Not provided<br>SCP – Not used                   |
| >>>Series Instance UID                      | (0020,000E) | 1C   | SCU – Not provided<br>SCP – Not used                   |
| >>>Contour Image Sequence                   | (3006,0016) | 1C   | SCU – Not provided<br>SCP – Not used                   |
| >>>>Referenced SOP Class UID                | (0008,1150) | 1C   | SCU – Not provided<br>SCP – Not used                   |
| >>>>Referenced SOP Instance UID             | (0008,1155) | 1C   | SCU – Not provided<br>SCP – Not used                   |
| >>>>Referenced Frame Number                 | (0008,1160) | 3    | SCU – Not provided<br>SCP – Not used                   |
| Structure Set ROI Sequence                  | (3006,0020) | 3    | SCU – Provided<br>SCP – Required                       |
| >ROI Number                                 | (3006,0022) | 1C   | SCU – Provided<br>SCP – Required                       |
| >Referenced Frame of Reference UID          | (3006,0024) | 1C   | SCU – Provided<br>SCP – Required                       |
| >ROI Name                                   | (3006,0026) | 2C   | SCU – Provided if available<br>SCP – Used if available |
| >ROI Description                            | (3006,0028) | 3    | SCU – Not provided<br>SCP – Not used                   |
| >ROI Volume                                 | (3006,002C) | 3    | SCU – Duplicated from SCP.<br>SCP – Not used           |
| >ROI Generation Algorithm                   | (3006,0036) | 2C   | SCU – Provided<br>SCP – Used if provided               |
| >ROI Generation Description                 | (3006,0038) | 3    | SCU – Not provided<br>SCP – Not used                   |

### B.10.12. ROI Contour Module

| Attribute Name              | Tag         | Type | Notes                                |
|-----------------------------|-------------|------|--------------------------------------|
| ROI Contour Sequence        | (3006,0039) | 1    | SCU – Provided<br>SCP – Used         |
| >Referenced ROI Number      | (3006,0084) | 1    | SCU – Provided<br>SCP – Used         |
| >ROI Display Color          | (3006,002A) | 3    | SCU – Provided<br>SCP – Not used     |
| >Contour Sequence           | (3006,0040) | 3    | SCU – Provided<br>SCP – Required     |
| >>Contour Number            | (3006,0048) | 3    | SCU – Not provided<br>SCP – Not used |
| >>Attached Contours         | (3006,0049) | 3    | SCU – Not provided<br>SCP – Not used |
| >>Contour Image Sequence    | (3006,0016) | 3    | SCU - Not provided<br>SCP - Not used |
| >>>Referenced SOP Class UID | (0008,1150) | 1C   | SCU - Not provided<br>SCP - Not used |

| Attribute Name                 | Tag         | Type | Notes  |
|--------------------------------|-------------|------|--|
| >>>Referenced SOP Instance UID | (0008,1155) | 1C   | SCU - Not provided<br>SCP - Not used                     |
| >>>Referenced Frame Number     | (0008,1160) | 1C   | SCU - Not provided<br>SCP - Not used                     |
| >>Contour Geometric Type       | (3006,0042) | 1C   | SCU - Provided.<br>SCP - Required.<br>Valid value: POINT |
| >>Contour Slab Thickness       | (3006,0044) | 3    | SCU - Not provided<br>SCP - Not used                     |
| >>Contour Offset Vector        | (3006,0045) | 3    | SCU - Not provided<br>SCP - Not used                     |
| >>Number of Contour Points     | (3006,0046) | 1C   | SCU - Provided<br>SCP - Required                         |
| >>Contour Data                 | (3006,0050) | 1C   | SCU - Provided<br>SCP - Required.                        |

**B.10.13. RT Dose ROI Module**

| Attribute Name         | Tag         | Type | Notes                            |
|------------------------|-------------|------|----------------------------------|
| RT Dose ROI Sequence   | (3004,0010) | 1    | SCU - Provided<br>SCP - Required |
| >Referenced ROI Number | (3006,0084) | 1    | SCU - Provided<br>SCP - Required |
| >Dose Units            | (3004,0002) | 1    | SCU - Provided<br>SCP - Required |
| >Dose Value            | (3004,0012) | 1    | SCU - Provided<br>SCP - Required |

**B.10.14. SOP Common Module**

| Attribute Name         | Tag         | Type | Notes   |
|------------------------|-------------|------|---|
| SOP Class UID          | (0008,0016) | 1    | SCU - '1.2.840.10008.5.1.4.1.1.481.2'<br>SCP - Used |
| SOP Instance UID       | (0008,0018) | 1    | SCU - Created by Oncentra Prostate.<br>SCP - Used   |
| Specific Character Set | (0008,0005) | 1C   | SCU - 'ISO_IR 100'<br>SCP - Used                    |
| Instance Creation Date | (0008,0012) | 3    | SCU - Provided<br>SCP - Not used                    |
| Instance Creation Time | (0008,0013) | 3    | SCU - Provided<br>SCP - Not used                    |
| Instance Creator UID   | (0008,0014) | 3    | SCU - Not provided<br>SCP - Not used                |

## Appendix C Private Data Elements

### C.1 US Probe Module Attributes (Private)

Only applicable for Oncentra Prostate v3.3. Support of the optional Telemed Probe.

The Private Creator "PRIVAT\_CODE\_STRING\_1003", attribute tag (1003,0010) identifies the fixed implementation of these private attributes elements (1003,1000-10FF).

| Attribute Name                    | Tag         | Type | Internal value | Notes |
|-----------------------------------|-------------|------|----------------|-------|
| Number Of Probes                  | (1003,XX01) | 3    |                |       |
| US Probe Sequence                 | (1003,XX10) | 3    |                |       |
| > Identifier                      | (1003,XX11) | 3    |                |       |
| > Probe Name                      | (1003,XX12) | 3    |                |       |
| > Depth                           | (1003,XX13) | 3    |                |       |
| > Frequency                       | (1003,XX14) | 3    |                |       |
| > Gain                            | (1003,XX15) | 3    |                |       |
| > Power                           | (1003,XX16) | 3    |                |       |
| > Dynamic Range                   | (1003,XX17) | 3    |                |       |
| > Frame Averaging                 | (1003,XX18) | 3    |                |       |
| > Field Of View                   | (1003,XX19) | 3    |                |       |
| > TGC                             | (1003,XX20) | 3    |                |       |
| > Number Of Focus Sets            | (1003,XX2A) | 3    |                |       |
| > Current Focus Set               | (1003,XX2B) | 3    |                |       |
| > Focus Set Sequence              | (1003,XX40) | 3    |                |       |
| >> Identifier                     | (1003,XX41) | 3    |                |       |
| >> Number of focus zone           | (1003,XX42) | 3    |                |       |
| >> Focus                          | (1003,XX43) | 3    |                |       |
| >> Image Enhancement Filter Index | (1003,XX2C) | 3    |                |       |
| > Rejection Filter Low            | (1003,XX2D) | 3    |                |       |
| > Rejection Filter High           | (1003,XX2E) | 3    |                |       |
| > Brightness                      | (1003,XX2F) | 3    |                |       |
| > Contrast                        | (1003,XX30) | 3    |                |       |
| > Gamma                           | (1003,XX31) | 3    |                |       |
| > Speckle Enabled                 | (1003,XX32) | 3    |                |       |
| > Speckle Level                   | (1003,XX33) | 3    |                |       |

## C.2 General Acquisition Attributes (Private)

The Private Creator “PRIVAT\_CODE\_STRING\_0019”, attribute tag (0019,0010) identifies the fixed implementation of these private attributes elements (0019,1000-10FF).

| Attribute Name   | Tag          | Type | Internal value   | Notes  |
|------------------|--------------|------|------------------|--------|
| Calibration      | (0019, xx00) | 3    | USAQ_CALIBRATION | VM 1   |
| Depth Conversion | (0019, xx01) | 3    | USAQ_DEPTHINFO   | VM 1   |
| Stepsize         | (0019, xx02) | 3    | USAQ_STEPSIZE    | VM 1   |
| Warning          | (0019, xx03) | 3    | USAQ_WARNING     | VM 1-n |
| DataID           | (0019, xx04) | 3    | USAQ_DATA_ID     | VM 1   |

## C.3 General Geometry Attributes (Private)

The Private Creator “PRIVAT\_CODE\_STRING\_0021”, attribute tag (0021,0010) identifies the fixed implementation of these private attributes elements (0021,1000-10FF).

| Attribute Name                  | Tag          | Type | Internal value     | Notes              |
|---------------------------------|--------------|------|--------------------|--------------------|
| Distance Base Plane to Template | (0021, xx70) | 3    | USAQ_P2T           | VM 1               |
| Volume to Patient Matrix        | (0021, xx71) | 3    | VOL3_MVOL2PAT      | VM 1<br>4x4 Matrix |
| Patient to World Matrix         | (0021, xx72) | 3    | VOL3_PAT2WORLD     | VM 1<br>4x4 Matrix |
| Base Plane                      | (0021, xx73) | 3    | VOL3_BPLANE        | VM 1               |
| Reference Plane                 | (0021, xx74) | 3    | VOL3_RPLANE        | VM 1               |
| Apex Plane                      | (0021, xx75) | 3    | VOL3_APLANE        | VM 1               |
| Base Plane Offset               | (0021, xx76) | 3    | VOL3_BPLANE_OFFSET | VM 1               |

## C.4 General Template Attributes (Private)

| The Private Creator “PRIVAT_CODE_STRING_300B”, attribute tag (300B,0010) identifies the fixed implementation of these private attributes elements (300B,1000-10FF). Attribute Name | Tag          | Type | Internal value    | Notes  |
|--|--------------|------|-------------------|--|
| Template Mode  | (300B, xx00) | 3    |                   | Fixed Template<br>Free Template<br>Template free |
| Template ID  | (300B, xx01) | 2C   | VOL3_TPL_ID       | If not template free                             |
| Number of Columns  | (300B, xx02) | 2C   | VOL3_TPL_COL      | If not template free                             |
| Column Distance  | (300B, xx03) | 2C   | VOL3_TPL_COL_DIST | If not template free                             |
| Number of Rows   | (300B, xx04) | 2C   | VOL3_TPL_ROW      | If not template free                             |
| Row Distance   | (300B, xx05) | 2C   | VOL3_TPL_ROW_DIST | If not template free                             |

| The Private Creator "PRIVAT_CODE_STRING_300B", attribute tag (300B,0010) identifies the fixed implementation of these private attributes elements (300B,1000-10FF). <b>Attribute Name</b> | Tag          | Type | Internal value      | Notes  |
|---|--------------|------|---------------------|--|
| Origin  | (300B, xx06) | 2C   | VOL3_TPL_ORIGIN     | If not template free                             |
| Column Numbering  | (300B, xx07) | 2C   | VOL3_TPL_COL_NUM    | VM: "Number of columns"                          |
| Row Numbering   | (300B, xx08) | 2C   | VOL3_TPL_ROW_NUM    | VM: "Number of rows"                             |
| Used Holes Array  | (300B, xx09) | 2C   | VOL3_TPL_USED_HOLES | VM:<br>"Number of columns" x<br>"Number of rows" |
| Lock Status   | (300B, xx0A) | 3    |                     | If not template free                             |

### C.5 General Template Components Attributes (Private)

The Private Creator "PRIVAT\_CODE\_STRING\_300B", attribute tag (300B,0010) identifies the fixed implementation of these private attributes elements (300B,1000-10FF).

| Attribute Name       | Tag          | Type | Internal value<br>(Prostate configuration file) | Notes  |
|----------------------|--------------|------|---|--|
| Identifier           | (300B, xx0C) | 3    | Applicator Section → ID                         | ID of the Channel  |
| ModificationType     | (300B, xx0D) | 3    | Applicator Section →<br>Modification → Type     | Defines how the channel can be modified, depending on the used applicator.<br><br><b>Enumerations:</b><br>0. None<br>1. Translation<br>2. Rotation<br>3. PointPath |
| ModificationValue    | (300B, xx0E) | 3    |   | Value applied by the user.<br><br><b>Unit:</b><br>None: [--]<br>Translation: [mm]<br>Rotation: [°]<br>PointPath: [mm]  |
| TransformationMatrix | (300B, xx03) | 3    |   | Defining separate movement of a channel  |

### C.6 ROI Geometry Attributes

The Private Creator "PRIVAT\_CODE\_STRING\_3007", attribute tag (3007,0010) identifies the fixed implementation of these private attributes elements (3007,1000-10FF).

| Attribute Name               | Tag          | Type | Internal value          | Notes                       |
|------------------------------|--------------|------|-------------------------|-----------------------------|
| Volume to Patient Matrix     | (3007, xx00) | 3    | VOL3_MVOL2PAT           | VR: FD VM: 16<br>4x4 matrix |
| Volume Resolution Conversion | (3007, xx01) | 3    | VolResolutionConversion | VR: FD, VM:3                |

| Attribute Name          | Tag          | Type | Internal value     | Notes                       |
|-------------------------|--------------|------|--------------------|-----------------------------|
| Volume Data Conversion  | (3007, xx02) | 3    | MVolDataConversion | FD, VM:16<br>4x4 matrix     |
| Patient Data Conversion | (3007, xx03) | 3    | MVolPatConversion  | VR: FD, VM:16<br>4x4 matrix |
| DICOM Data Conversion   | (3007, xx04) | 3    |                    | VR: FD VM: 16<br>4x4 matrix |

### C.7 Marker Module (Private) – Patient-, Marker-, Applicator Points

The Private Creator “PRIVAT\_CODE\_STRING\_1001”, attribute tag (1001,0010) identifies the fixed implementation of these private attributes elements (1001,1000-10FF).

| Attribute Name       | Tag          | Type | Internal value | VR | VM  | Notes   |
|----------------------|--------------|------|----------------|----|-----|---|
| Marker sequence      | (1001, xxA0) | 3    |                |    | 1-n |   |
| > Marker type        | (1001, xxA1) | 1    |                | SL | 1   |   |
| > Marker number      | (1001, xxA2) | 1    | Index          | SL | 1   | Has to be unique for markers of the same type |
| > Marker 3D position | (1001, xxA3) | 1    | Coordinates    | FD | 3   |   |

### C.8 Settings Module (Private)

The Private Creator “PRIVAT\_CODE\_STRING\_1001”, attribute tag (1001,0010) identifies the fixed implementation of these private attributes elements (1001,1000-10FF).

| Attribute Name         | Tag          | Type | Internal value        | VR | VM | Notes  |
|------------------------|--------------|------|-----------------------|----|----|--------|
| Settings Sequence      |              |      |                       |    |    |        |
| >Distance unit         | (1001, xxB0) | 3    | distances             | SL | 1  | Cm/mm  |
| >Dose unit             | (1001, xxB1) | 3    | dose_unit             | SL | 1  | Gc/cGy |
| >Normalisation mode    | (1001, xxB2) | 3    | normalisation_mode    | SL | 1  |        |
| >Normalisation Factor  | (1001, xxB3) | 3    | normalization_factor  | FD | 1  |        |
| >F-Value               | (1001, xxB4) | 3    | f_value               | FD | 1  |        |
| >Prescribed Dose       | (1001, xxB5) | 3    | P_d                   | FD | 1  |        |
| >Absolute Dose Factor  | (1001, xxB6) | 3    | absolute_dose_factor  | FD | 1  |        |
| >Decoupled sk          | (1001, xxB7) | 3    | Decoupleddecoupled_sk | SL | 1  |        |
| >Absolute Time Factor  | (1001, xxB8) | 3    | absolute_time_factor  | FD | 1  |        |
| >Total Treatment Time. | (1001, xxB9) | 3    | TimeTrack.total_time  | FD | 1  |        |
| >TG 43 Model           | (1001, xxBA) | 3    | dose_calc.source_type | SL | 1  |        |
| >3D Dose Grid Size     | (1001, xxBB) | 3    | dose_calc.grid_step   | SL | 1  |        |
| >Dose grid corner 1    | (1001, xxBC) | 3    | pat_gridborder[0]     | FD | 3  |        |

| Attribute Name                            | Tag          | Type | Internal value               | VR | VM | Notes      |
|---|--------------|------|------------------------------|----|----|------------|
| >Dose grid corner 2                       | (1001, xxBD) | 3    | pat_gridborder[1]            | FD | 3  |            |
| >Patient Data conversion                  | (1001, xxBE) | 3    | Patient Data Conversion      | FD | 16 |            |
| >Volume Data conversion                   | (1001, xxBF) | 3    | Volume Data Conversion       | FD | 16 |            |
| >Volume Data Vector                       | (1001, xxC0) | 3    | Volume Resolution Conversion | FD | 3  |            |
| > DICOM Data Conversion                   |              | 3    |                              | FD | 16 | 4x4 Matrix |
| >Optimization method                      | (1001, xxC1) | 3    | opt_method                   | SL | 1  |            |
| >Display method                           | (1001, xxC2) | 3    | opt_method_out               | SL | 1  |            |
| >Geometrical Method                       | (1001, xxC3) | 3    | geoopt_onvol                 | SL | 1  |            |
| >VOI based optimization settings sequence | (1001, xxC4) | 3    |                              |    |    |            |
| >> VOI number                             | (1001, xxC5) | 3    | ID                           | SL | 1  |            |
| >> VOI name                               | (1001, xxC6) | 3    | name                         | LO | 1  |            |
| >> VOI type                               | (1001, xxC7) | 3    | type                         | SL | 1  |            |
| >> VOI class                              | (1001, xxC8) | 3    | VOIclass                     | SL | 1  |            |
| >> VOI Priority                           | (1001, xxC9) | 3    | VOI_priority                 | SL | 1  |            |
| >> No of Points                           | (1001, xxCA) | 3    | points                       | SL | 1  |            |
| >> Percent on Surface                     | (1001, xxCB) | 3    | perc                         | FD | 1  |            |
| >> Surface Margin                         | (1001, xxCC) | 3    | s_margin                     | FD | 1  |            |
| >> Selected                               | (1001, xxCD) | 3    | status                       | SL | 1  |            |
| >> Dose Limit                             | (1001, xxCE) | 3    | dose_limit                   | FD | 1  |            |
| >> Importance Factor                      | (1001, xxCF) | 3    | imp_factor                   | FD | 1  |            |
| >> Importance Factor from                 | (1001, xxD0) | 3    | imp_factor_from              | FD | 1  |            |
| >> Importance Factor to                   | (1001, xxD1) | 3    | imp_factor_to                | FD | 1  |            |
| >> Focus                                  | (1001, xxD2) | 3    | iobj_selected                | FD | 1  |            |
| >Surface Sampling Method                  | (1001, xxD3) | 3    | ptv_surf_tri                 | SL | 1  |            |
| >Number of sampling Points per ccm        | (1001, xxD4) | 3    | surf_points                  | FD | 1  |            |
| >Convergence Accuracy                     | (1001, xxD5) | 3    | accuracy                     | SL | 1  |            |
| >Max No of convergence Iterations         | (1001, xxD6) | 3    | iterations                   | SL | 1  |            |
| >Weight smoothing                         | (1001, xxD7) | 3    | weights_smooth               | FD | 1  |            |
| >Steps per importance factor              | (1001, xxD8) | 3    | step                         | SL | 1  |            |
| >Constraints PTV-Dmax                     | (1001, xxD9) | 3    | constr_ptv                   | FD | 1  |            |
| >Constraints NT-Dmax                      | (1001, xxDA) | 3    | constr_nt                    | FD | 1  |            |
| >Algorithmic Population size              | (1001, xxDB) | 3    | actual_popsiz                | SL | 1  |            |
| >Algorithmic Generations                  | (1001, xxDC) | 3    | gener                        | SL | 1  |            |

| Attribute Name                         | Tag          | Type | Internal value | VR | VM | Notes |
|--|--------------|------|----------------|----|----|-------|
| >Algorithmic Initializations           | (1001, xxDD) | 3    | initialization | SL | 1  |       |
| >Min No of SDP                         | (1001, xxDE) | 3    | min_sdp        | SL | 1  |       |
| >Depth Method                          | (1001, xxDF) | 3    | depth_mode)    | SL | 1  |       |
| >Depth Defined On                      | (1001, xxE0) | 3    | depth_sel      | SL | 1  |       |
| >Depth                                 | (1001, xxE1) | 3    | fixed_depth    | FD | 1  |       |
| >VOI based placement settings sequence | (1001, xxE2) | 3    |                |    |    |       |
| >> VOI number                          | (1001, xxC5) | 3    | ID             | SL | 1  |       |
| >> VOI name                            | (1001, xxC6) | 3    | name           | LO | 1  |       |
| >> VOI type                            | (1001, xxC7) | 3    | type           | SL | 1  |       |
| >> VOI class                           | (1001, xxC8) | 3    | VOIclass       | SL | 1  |       |
| >> VOI selected                        | (1001, xxE7) | 3    | status         | SL | 1  |       |
| >> Margin                              | (1001, xxE8) | 3    | margin         | FD | 1  |       |
| >Selection method                      | (1001, xxE9) | 3    | cath_sel       | SL | 1  |       |
| >Selection distance                    | (1001, xxEA) | 3    | cath_dist      | FD | 1  |       |
| >WBT On Contour Spacing                | (1001, xxEB) | 3    | s              | FD | 1  |       |
| >WBT Urethra Margin                    | (1001, xxEC) | 3    | du             | FD | 1  |       |
| >WBT Searching Radius PTV              | (1001, xxED) | 3    | d0             | FD | 1  |       |
| >WBT Searching Radius OAR              | (1001, xxEE) | 3    | dd             | FD | 1  |       |
| >WBT Starting Point                    | (1001, xxEF) | 3    | sPnt           | FD | 3  |       |
| >WBT Surface                           | (1001, xxF0) | 3    | surf           | FD | 4  |       |
| >WBT No of Interior Catheters          | (1001, xxF1) | 3    | cath_no        | FD | 4  |       |
| >WBT Relative Radius                   | (1001, xxF2) | 3    | rr             | FD | 4  |       |
| >Sorting Method                        | (1001, xxF3) | 3    | cath_sort      | SL | 1  |       |