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# MINUTES

## DICOM WORKING GROUP SEVEN (RADIOTHERAPY)

<b>Meeting Location</b>	RaySearch HQ, Stockholm	
<b>Dates and Times</b>	Monday, June 05, 2023	8:30 – 17:30 CET
	Tuesday, June 06, 2023	8:30 – 17:30 CET
	Wednesday, June 07, 2023	8:30 – 17:30 CET
	Thursday, June 08, 2023	8:30 – 17:30 CET
	Friday, June 09, 2023	8:30 – 12:00 CET
<b>Presiding Officers</b>	Christof Schadt, Brainlab, Co-Chair	
	Jim Percy, Elekta, Co-Chair	
<b>Secretary</b>	Shayna Knazik, MITA	

## PARTICIPANTS

Company/Organization	Represented by	6/5	6/6	6/7	6/8	6/9
AAPM	Walter Bosch	X	X	X	X	X
AAPM	Bruce Curran	T	T	T	T	
AAPM	Yulong Yan	X	X	X	X	X
Accuray	Bob Pekarek	T	T	T	T	
Brainlab	Christof Schadt	X	X	X	X	X
Cosylab / Leo Cancer Care	Markus Hager	T			T	
Elekta	Jim Percy	X	X	X	X	X
Elekta	Stuart Swerdloff				T	
IBA	David Wikler	X	X	X	X	X
Leo Cancer Care	Mike Courtney	T			T	
Leo Cancer Care	Dan Farber				T	
Mevion	Bruce Rakes	X	X	X	X	X
Mevion	Angus Reid				T	
MITA/DICOM	Shayna Knazik	X		X	X	X
RaySearch	Marcus Bergman	X	X	X	X	X
RaySearch	Stafan Beck				X	
RaySearch	Martin Janssen				X	
RaySearch	Jon Treffert				T	
Raysearch	Stefan Páll Boman	X		T	X	
Self	Ulrich Busch	X	X	X	X	X
Sun Nuclear	Chris Pauer	T				
Varian	Kari Jyrkkälä	X	X	X	X	X

X = In person, T = via Teams

## Week Overview

**Meeting Focus:** Hybrid 1<sup>st</sup>/2<sup>nd</sup> Gen Approach

ACTUAL topics discussed are shown in the table below.

	Monday	Tuesday	Wednesday	Thursday	Friday
Session 1 08:30-10:15	Setup, Introduction, Administrative Review Meeting Minutes	Determine Work Packages	Assertion Collection	Extended RT Dose E-R Diagram Fraction vs. Session	Future Work Mode Next Meetings
10:15-10:30	Break				
Session 2 10:30-12:30	General Discussions	Determine Work Packages	Work Breakout Sessions	Assertion Collection	Review
12:30-13:30	Lunch				Adjournment
Session 3 13:30-15:30	Hybrid Overview	Discuss details of work packages	Discussion of Results	Tomo	
15:30-15:45	Break				
Session 4 15:45-17:30	General Hybrid Discussions	Discuss details of work packages	Discussion of Results	Discuss Leo Positioning Device	

For details on the topics, see the sections below.

Note: there will be no CP sessions during the face-to-face meeting.

## Details

### Administrative

- The meeting was called to order June 5, 2023 at 8:50 am CET.
- Introductions, identified participants.
- The group was reminded of NEMA anti-trust rules and the DICOM Patent Disclosure Policy.
- Reviewed the agenda and revised as needed.
  - Emphasis is on identifying topics for work and developing a project plan.
  - Tomo and Leo discussions to be scheduled for afternoon sessions.
- Reviewed meeting minutes from the last meetings.
  - Minutes from DICOM WG-07 online meeting March 6-7 and 13-14, 2023 were reviewed. Motion to approve by Kari, second by Christof. Approved without objection or abstention.
  - Minutes from DICOM WG-07 May 30, 2023 CP call were reviewed. Motion to approve by Christof, second by Jim. Approved without objection or abstention.

### Subgroups and related Group Status

Update reports will be only presented as needed:

- Brachytherapy Subgroup
  - Profile essentially complete.
  - Applications are in development. Will need to schedule testing.
- Ion Subgroup
  - Subgroup to meet June 11-12, 2023 in conjunction with PTCOG meeting in Madrid. They will be working on CPs and discussing seated treatments. Shayna circulated the draft agenda for their meeting, and a Teams meeting will be available for virtual participation.
- Motion Management Subgroup
  - No update at this time.
- IEC
  - Discussion of coordinates and changes in the IEC standard.
  - Reference to IEC 61217 as a well-known Frame of Reference in DICOM creates a dependency on IEC safety standard. Changes to current standards will adversely break interoperability.
  - **ACTION:** WG-07 chairs to request a meeting with Geoff Ibbott regarding the relationship of the IEC 61217 successor standard to DICOM.
- IHE-RO
  - DICOM CPs
  - High-Definition Structure Sets – discussion of contour orientation, and at what stage interpolation is applied, minimizing differences in DVH calculation
  - Radiation Oncology Treatment History - Use of Assertion Collection
  - Surface scanning
  - Testing of TLS Encryption and non-default Character Sets

- FHIR applications in RT include treatment summary (XRTS), treatment history (ROTH), workflow (alternative to DICOM UPS), and prescription.
- WG-28
  - WG-02 and WG-28 met in Boston in May 2023.
  - They are working on a new Supplement on DX and RF, and are nearly ready for a First Read on their Supplement on Informative annex on implementation of RDSR in these modalities.
- Other Subgroup reports as needed.

## Organizational

Future work Mode for WG-07

- 1 week CPs, 2 week Substantial Work
- Time-boxed CP discussion (20min)
- Schedule break-out sessions

## General Discussions

### UniteRT

What is the background of this initiative? What does it expect from the DICOM RT Standardization work in this Working Group?

What should we as DICOM WG-07 expect from the initiative?

- This appears to be an advocacy organization to promote open interfaces, open communication, and open competition. The organization seems to be operating at a marketing/ motivational level rather than a technical level.
- No immediate expectations for WG-07 were noted.
- DICOM can provide the means to achieve open communication, but must remain neutral.

### Prescription

- The role of DICOM and FHIR in representing RT prescriptions was discussed. Defining the boundary between them is beyond the scope of WG-07.
- Application of standards to solve clinical problems is in the domain of IHE. WG-07 will follow the direction of IHE-RO in this area and provide guidance as needed.

### Follow-up on CPs

- CP2220 Differentiate acquisition types of CT imaging
  - Include 3D RT Cone-Beam Imaging Geometry Macro, but make Referenced Defined Device Index (300A,0602) conditional (Type 1C), required if Acquisition Device Sequence (3002,0117) is present.
  - Calibration of CBCT (HU mapping to electron density or mass density) may differ depending on Scan Arc Type (3002,012E) as well as equipment.
  - CP2220 to be updated for reading with WG-06.

## Clarification of Units Deformable Registration Vector Grid Data

Request from David Clunie to clarify the units of the Vector Grid Data (0064,0009) in the Deformable Registration IOD. Insert "(in mm)" in section C.20.3.1.3

**ACTION:** Walter to draft a CP to insert "(in mm)" in section C.20.3.1.3

The vector describes the direction and magnitude (in mm) of the deformation at the center of the deformation voxel.

## Hybrid DICOM RT

Overall Hybrid Discussions - Review of topics to be discussed.

### Topics

#### Most urgent use cases

- Tomotherapeutic device support?
- Leo Patient Support Device?

#### General

- Conceptual Volume use in
  - o RT Structure Set
    - Combinations? Where?
  - o RT Plan Dose - Reference UID vs CV UID
    - Dose References, relationship to CV?
  - o RT Dose
    - DVH (see discussion on DVH Module vs. RT Dose Metrics Module below)
    - Plan Overview: add CV?
- Multiple RT Structure Sets for a single plan?
  - o Effects on RT Plan and RT Dose

#### Hybrid RT (Ion) Plan

- RT Prescription Module --> Dose Reference Module
- Retire RT Prescription Module, introduce Dose Reference Module
  - o Limited parameters for Dose Tracking only
- Support of non-Standard devices
  - o Include parametrized devices
- Support "matrix" approach to register the patient to the device
- What is the statement of WG-07 on Setup Beams now?
- Recording?
  - o What can we take over?
    - Sessions/Fractions
  - o See comment from T. Schwere regarding couch movement in Appendix.
- Plan Record?
  - o Optimization Parameters
    - Ancillary information (biological optimization)

#### Hybrid RT Dose

- How to proceed in general?
  - o See [HybridRTDose.pptx](#)
  - o There is a proposal to include an Enhanced RT Dose Module in the RT Dose Module. Is this a path to go?
  - o Also the DVH Module could be retired and replaced by the RT Dose Metrics Module. Is this a valid path?
  - o What happens to the content of the RT Dose Samples IOD?
- LET maps / Dose Rate maps/Dose Ensemble
  - o Parametric Maps or Enhanced RT Dose

- RT Dose Metrics
  - o Also use for LET/\*-Volume Histograms?
- Flexibility of RT Dose Annotation in combination with one or more Parametric Maps is lost
  - o As RT Dose already has a “dual use” (pixel data and/or DVH data): what about an “enhanced” RT Dose with no pixel data, that takes the role of the former RT Dose Annotation and one or more RT Dose Instances with minor modifications that take the role of the Parametric Map Instances?
    - This still raises the question how self-contained a former Parametric Map/new “pure RT Dose Volume” shall be?

### Hybrid RT Structure Set

Discussion Points from last meeting:

- Document logical combination of ROIs
  - o How do we take the concept of CV combinations over to the RTSS?
    - See considerations in [Combination ER diagram.drawio.svg](#)
- Annotate “historic” ROIs from previous plans
- Use RT Segment Characteristics?
- Editorial: Factor out ROI Definition from RT Structure Set Module and create a new ROI Module

### Existing Image/Surface IODs

- Add IEC positions?
  - o Isocenter

### Hybrid Extension of Patient Setup Sequence

This topic was added 6/6/23 by request of Bob Pekarek. It extends the Patient Setup IOD to support new Patient Setup Devices.

### Goal of the Session

Define

- Goal and Scope of the Hybrid Approach
- Supplements and Correction Proposals
- Milestones
- Responsibilities

### 1<sup>st</sup> Gen Hybrid Work Packages

1. Tomotherapeutic device support – binary MLC
2. New patient setup system (e.g., Leo)
3. Consistent use of Conceptual Volume
4. Multiple Structure Set Instances for a single plan
5. Dose Reference Module in RT (Ion) Plan
6. Support of non-Standard devices in RT (Ion) Plan
7. Use of Equipment Mapping Matrix in RT (Ion) Plan
8. Use of RT Patient Position Acquisition Instruction instead of Setup Beams
9. Recording of clinical fraction
10. Recording of couch movement
11. Planning Record (ancillary plan object)
12. Enhance RT Dose with 2<sup>nd</sup> Gen Dose Parameters

13. Dose Metrics (also for LET/\*-Volume Histogram) instead of DVH
14. LET maps/Dose Rate maps/Dose Ensemble
15. Multi-resolution Dose (multi-frame or multi-instance)
16. Logical combinations of ROIs/CVs
17. Use of RT Segment Characteristics for ROIs
18. Add IEC parameters to non-RT IODs (e.g., Surface Segmentation)
19. Hybrid Extension of Patient Setup Sequence

WG-07 members were asked to rate the work packages above according to

- Ease of Development (in DICOM)
- Clinical Need
- Likelihood of Implementation (by vendors)

A separate tab in the [RatingOfTopics.xlsx](#) spreadsheet to be created for each member (de-identified after the meeting).

### Scoring of 1st Gen Hybrid Work Packages

- Hybrid Extension of Patient Setup Sequence (requested by Bob) was added to the list as #19.
- Group members entered scores in the categories shown below for each of the 19 work packages in the WG7\_RatingOf19Topics.xls spreadsheet (sum of scores in each category = 38 points). Scores were weighted as follows:
  - Ease of development for WG-07 (weight = 1)
  - Clinical Need (weight = 3)
  - Likelihood of implementation for vendors (weight = 2)

### Result Overview

Votes			Weighted Sum	Raw Sum * 2	Weighted - Raw Sum	Rank	Responsible
1	2	3					

Tomotherapeutic device support	25	24	25	147	148	-1	3	Bob
“New” patient setup systems (e.g. Leo)	17	32	37	187	172	15	1	Bruce R.
Consistent use of Conceptual Volume	25	16	12	97	106	-9		
Multiple structure sets instances for a single plan	15	7	9	54	62	-8		
Dose Reference Module in RT (Ion) Plan	16	18	15	100	98	2		
Support of non-Standard devices in RT (Ion) Plan	7	31	16	132	108	24	5	Kari/Jim
Use of Equipment Mapping Matrix in RT (ion) Plan	10	6	6	40	44	-4		
Use of RT Patient Position Acquisition Instruction instead of Setup Beams	12	9	7	53	56	-3		
Recording of clinical fraction	27	26	35	175	176	-1	2	David

Recording of couch movement	20	30	23	156	146	10	4	Jim
Planning Record (ancillary plan object)	8	6	6	38	40	-2		
Enhance RT Dose with 2 <sup>nd</sup> Gen Dose Parameters	16	14	8	74	76	-2		
Dose Metrics (also for LET/*-Volume Histograms) instead of DVH	12	10	11	64	66	-2		
LET maps/Dose Rate maps/Dose Ensemble	10	24	25	132	118	14	5	Walter
Multi-resolution dose (multi-frame or multi-instance)	9	8	5	43	44	-1		
Logical combinations of ROIs/CVs	21	5	12	60	76	-16		
Use of RT Segment Characteristics for ROIs	17	10	13	73	80	-7		
Add IEC parameters to non-RT IODs (e.g. surface seg)	26	12	23	108	122	-14	6	Christof
Hybrid Extension of Patient Setup Sequence	12	16	16	92	88	4		

As an example, the recording couch movements using RT Patient Position Modification Result Module was discussed briefly.

### Detailed Review of Assigned Work Items

1. "New" patient setup systems (e.g. Leo) - Bruce R.
  - a. Short-term solution for recording patient setup using Leo device.
  - b. Identify actors in workflow
  - c. Possible solutions discussed
    - i. Structured Report (template, CIDs)
    - ii. Setup Plan (Patient Setup Sequence), Treatment Record
    - iii. General Series Module in CT Image IOD (Fixation attributes)
  - d. **ACTION**: Continue discussion Thurs afternoon with Mike Courtney
2. Recording of clinical fraction – David
  - a. Currently have in BDI, RT Beams Session Record, etc.:
    - i. Current Fraction Number
    - ii. Treatment Session UID
  - b. The Current Fraction Number resets (starts at 1) each time a plan is adapted. The 2<sup>nd</sup> Gen Clinical Fraction Number does not reset.
  - c. Add Clinical Fraction Number (300A,0705) 2<sup>nd</sup> Gen Attribute to
    - i. Beams Delivery Instruction
    - ii. RT Beams Session Record
    - iii. RT Image
  - d. **ACTION**: David to draft CP
3. Tomotherapeutic device support – Bob
  - a. DICOM RT Plan, RT Beams Session Record delivery parameters
    - i. Gantry Rotation – NOT an issue
    - ii. Collimator Leaf device description – currently supported
    - iii. Collimator opening/closing - between control points
    - iv. Jaws can move between control points, independently of collimator leaves
    - v. Table Speed, Gantry Revolution Time – derived from time and position of CPs

- vi. Constant dose rate
    - vii. Time is primary meterset
    - viii. ~1000 control points / plan
  - b. **ACTION:** Bob to extract 2<sup>nd</sup> Gen Tomotherapeutic Radiation attributes, use these to enrich the RT Plan (as a Standard Extended SOP Class), and evaluate the cost and adequacy of the solution.
- 4. Recording of couch movement – Jim
  - a. Approaches to recording couch movement were discussed. These include
    - i. RT Patient Position Modification Result Module - see Appendix III below (“Tracking of Couch Positions during a treatment session”) containing email from Thomas Schwere.
    - ii. “Setup Plan”
    - iii. Patient Preparation IOD / Patient Preparation Record IOD
    - iv. Assertion Collection IOD – Instruction, SROs, Surface Scan
  - b. **ACTION:** Jim to evaluate approaches
- 5. Support of non-Standard devices in RT (Ion) Plan – Kari
  - a. Levels of integration with TMS:
    - i. Dose Tracking - low-hanging fruit
      - 1. Surrogate Beam Sequence – annotate as tracking
      - 2. Include guidance and/or Sequences for including private information?
    - ii. Offline Image Review
    - iii. Token plan for treatment delivery workflow management (TDW)
  - b. **ACTION:** Kari to draft proposal
- 6. LET maps/Dose Rate maps/Dose Ensemble? - Walter
  - a. Approaches
    - i. Extended or Enhanced Hybrid RT Dose
      - 1. Units
      - 2. Calculation methods and parameters
    - ii. Parametric Map IOD
      - 1. Codes
  - b. **ACTION:** Walter to evaluate options
- 7. Add IEC parameters to non-RT IODs (e.g. surface seg) - Christof
  - a. Parameters to add
    - i. 6DOF
    - ii. Transformation Matrix?
    - iii. Isocenter?
    - iv. Session UID (confirm presence)
    - v. Referenced plan, beam
  - b. IODs to include
    - i. Surface Scan Mesh IOD
    - ii. Surface Scan Point Cloud IOD
    - iii. CT Image, Enhanced CT Image
    - iv. MR Image, Enhanced MR Image
    - v. PET Image
    - vi. XA Image, X-ray 3D Angiographic Image
  - c. **ACTION:** Christof to draft proposal.

## Result from Breakout Sessions of 6/7/23

### Recording of couch movement using Assertion Collection – Jim

- RT Treatment Positioning Assertion Collection Identification TID
- Assertion Collection has a General Series Module that includes the Treatment Session UID.
- Should a Beam be referenced?
- Treatment Positioning Device Actor? Which device?
- Transformation Matrix is what is asserted.
- Patient Position and Rotation Parameters: Relative vs. Absolute?

### Add IEC parameters to non-RT IODs (e.g. surface seg) - Christof

Discussion of using RT Equipment Mapping Matrix And Plan Reference Macro attributes in addition to IEC parameters in non-RT IODs (e.g. surface seg):

- What is the relationship of the existing IEC parameters to the proposed 4x4 Mapping Matrix?
- Which representation is authoritative and which is annotation?

Example of supporting Upright Patient Positioning System

- Define codes for chair parameters.
- Some parameters are matrix relevant (e.g., seat height), others are not (e.g., arm rest position)

Proposed Changes

- Remove 10-27 from CT Image Module
- Define RT Equipment Mapping Matrix and Plan Reference Macro. In this Macro, add new macro based on RT Treatment Preparation Macro
- CP: CP\_RTXXX Add RT Equipment And Plan Reference to Image IODs

**ACTION:** Bruce R. to notify patient positioning manufacturers (Leo, etc.) of the proposed changes and make them aware of concerns.

**ACTION:** Christof to update CP.

### Support of non-Standard devices in RT (Ion) Plan - Kari

- a. Is it possible to modify the RT (Ion) Plan to support dose tracking by TMSs for non-C-arm plans? Need to keep dose tracking information in existing places to avoid breaking TMSs, but make plans undeliverable by delivery devices for safety.
- b. What is needed for a safe “stub” plan? Is there a class solution? Is a change to the DICOM standard required?
- c. Check out what is possible now. What is the most cost-effective implementation?
- d. **ACTION:** Kari to investigate minimal attributes needed to import a plan into his TMS.

### LET maps/Dose Rate maps/Dose Ensemble? - Walter

- e. Approaches discussed
  - i. Extend Enhanced Hybrid RT Dose
    1. Dose Units = CONTEXT\_DEFINED

- a. LET: (keV/μm) or (MeV/cm)
    - b. Dose Rate: Gy/s
    - c. Dose Ensemble: Gy
  - 2. Calculation Methods and Parameters
  - 3. Identification / Related Instances
    - a. Dose Context UID
    - b. Related Instance Reference Sequence
  - 4. Dose Metrics Module – keep this?
- ii. Parametric Map IOD
  - 1. Would need to define TID with Extended RT Dose content
  - 2. (-) Additional complexity to support another SOP Class
  - 3. (+) More flexible support for energy distribution per voxel, addition dimensions in a single instance
- f. Energy Distribution per Voxel is easier with Parametric Map, but can also use multiple instances of Extended RT Dose.
- g. Acceptance of RT Dose SOP Class by applications is an important consideration. Additional support for another SOP Class may be prohibitive for the use of Parametric Maps.
- h. Consensus that support for dose ensembles in DICOM is not warranted at this time. This has been dropped for now.

**ACTION:** Walter to evaluate changes needed in Hybrid RT Dose Sup 177 draft 4 to support \* Maps.

#### **Recording of clinical fraction – David**

- i. E-R Diagram for RT Course: Fraction vs Session Proposal
  - i. Concepts of RT Course, Phase, Fraction and Session were discussed. Real-world Model was reviewed and revised: Patient --> Course --> Phase --> Plan --> Fraction --> Session
- j. RT Plan Organization
  - i. Suggestion to retire multiple Fraction Groups in an RT Plan
  - ii. Discussion of Dose Reference in the context of adaptive plans
  - iii. Proposal to adapt/reuse section C.36.20.1.2 RT Radiation Set Delivery Number and Clinical Fraction Number

**ACTION:** David to continue development of proposal.

#### **Tomotherapeutic device support – Bob**

- k. Discussion of options for encoding jaw transitions and MLC leaf transitions in the RT Plan Control Point Sequence, as these may occur at different intervals in Tomo plans.
- l. Proposal to support boutique treatment delivery devices:
  - i. Add “boutique machine” flag
  - ii. Include Manufacturer’s Device Class UID (0018,100B) to identify machine type for this plan
  - iii. Store a safe (zero-fluence) beam (closed jaws) in the existing Control Point sequence.
  - iv. Store Referenced Dose Reference Sequence per Beam.
  - v. Use Raw Data approach to store a Radiation Sequence with Referenced Beam Number (if it matches a Beam) and device-specific machine parameters.
- m. **ACTION:** Kari to draft proposal.

Related: strengthen semantics of dose references for general treatment delivery.  
Christof to draft changes to Prescription (see below).

**“New” patient setup systems (e.g. Leo) - Bruce R.**

- a. Features of the Leo Cancer Care upright patient support system and the workflow for its use in radiotherapy were reviewed by the group. There is a need to capture patient positioning system parameters, especially the degrees of freedom of the base platform at patient simulation (in CT Image) and reproduce them during treatment.
- b. A generic solution for representing patient positioning parameters using the Patient Treatment Preparation Procedure Sequence was discussed and an example of using this approach was reviewed.
- c. Extend the RT Equipment Correlation And Plan Reference Macro using coded positioning parameters.
- d. Mapping CP:
  - i. Add coded parameters to Image mapping matrix for CT Image
  - ii. Add additional “scan direction” to CT Image
- e. New Plan CP:
  - i. Add Patient Treatment Preparation Module to RT Plan
  - ii. Define codes for TID 15302 Patient Support Position Parameters to represent chair
  - iii. Define codes for Table CID 9573. Patient Treatment Preparation Device for chair
  - iv. Update treatment records accordingly

**ACTION:** Shayna to reach out to Leo Cancer Care, CosyLab, Mevion regarding use of parameters in the DICOM Standard.

## Supplements

For the status of the Supplements and the corresponding naming conventions and nomenclatures see documents on top level of the Supplement folder on the ftp server:

<ftp://medical.nema.org/MEDICAL/Private/Dicom/WORKGRPS/Wg07/Sup/>

For a document overview see here:

[Project Status](#)

### Supplement 238 – Assertion Collection

- Christof presented an overview of the status of the Supplement ([https://nemaorg137.sharepoint.com/:w:/r/sites/DICOMWG-07Radiotherapy/Shared%20Documents/Sup238%20Assertion%20Collection/sup238\\_01\\_AssertionCollection.docx?d=w7a22429e85284f8488cba022ca49582c&csf=1&web=1&e=Mv7bHf](https://nemaorg137.sharepoint.com/:w:/r/sites/DICOMWG-07Radiotherapy/Shared%20Documents/Sup238%20Assertion%20Collection/sup238_01_AssertionCollection.docx?d=w7a22429e85284f8488cba022ca49582c&csf=1&web=1&e=Mv7bHf)), including overall architecture, E-R Diagram ([https://nemaorg137.sharepoint.com/:p:/r/sites/DICOMWG-07Radiotherapy/Shared%20Documents/Sup238%20Assertion%20Collection/ppt/sup238\\_AssertionCollection.pptx?d=wf296fa87e8234514a3e3af2e6fd6df38&csf=1&web=1&e=dli8HS](https://nemaorg137.sharepoint.com/:p:/r/sites/DICOMWG-07Radiotherapy/Shared%20Documents/Sup238%20Assertion%20Collection/ppt/sup238_AssertionCollection.pptx?d=wf296fa87e8234514a3e3af2e6fd6df38&csf=1&web=1&e=dli8HS))
  - Assertion Collections contain object references, collection State, and references to evidence supporting the state
  - Assertion Collections are non-RT-specific. They are made RT-specific by means of TIDs that are mapped to Concept Name Codes. Instructions will be needed to avoid inconsistent use of Assertion Collections.
  - Assertions are state, not workflow.
  - Assertion Collection instances are queried by Concept Name Code and DateTime.

The following topics require discussion:

- Use Cases
  - What are the detailed use cases? Currently envisioned
    - Reference Collection/Assertions for a Treatment Planning Process
    - Reference Collection/Meta Information for a Treatment Session
    - Treatment History?
- To what extent is additional information expected to be transferred?
  - Is there “only” meta-information that helps in identifying the Assertion Collection
  - Or is there also information that cannot be transferred in other instances
    - E.g. see TID TNNN3 Treatment Session Annotation, which comprises some of the information that was defined in the foreseen Treatment Session Record IOD, basically resulting in a combination of a Comprehensive SR IOD and a KOS IOD?
- Codes
  - Based on the use case discussion, the current codes need to be reviewed and adapted
- Open issues:
  - Are predecessor assertions copied in or referenced by successors?
  - Signatures at the level of individual assertions?
  - Must an assertion reference a persistent object? Can it reference itself?
  - References to non-DICOM instances?
- Assertion Model
  - User
  - State
  - Collection (Label, Index, UID)

- An AC instance can contain M States x N Collections
- Assertion Collection Context
  - Assertion Context UID (Type 2)
  - Assertion Context Code (Type 2)
  - Assertion Context Label (Type 1C – required if UID has value)
- Assertion Collection Identification
  - Assertion Collection Identification Content Item Sequence
  - Assertion Collection Content Item Sequence – additional information
- Add Collection references to non-DICOM instances: PDFs, CDAs
  - References to either DICOM or non-DICOM instances (or both) must be present in Reference Collection Sequences
  - Can (should) FHIR Resources be references also be included?
- **ACTION:** Christof to schedule subgroup calls to work on TIDs for each Assertion Context
  - Planning Result
  - Treatment Session Results
  - Patient Position Verification

## Correction Proposals

### CP\_RT227\_01\_Add Ref To Series in UPS – David

Proposal to add Input Information Series Sequence and Output Information Series Sequence in UPS.

**ACTION:** David to create new “Referenced Series and Access Macro” (based on “Referenced Instance and Access Macro” with Instance-level attributes removed)

### CP\_RTXXX\_01\_Retire RT Prescription Module

CP retires a subset of RT Prescription Module attributes and moves the remainder to RT Fraction Scheme Module. Retained attributes are for dose tracking rather than prescribing.

- Further discussion is needed to decide which prescription attributes to retire.
- Suggestion to rename the RT Prescription Module first.
- **ACTION:** WG-07 members to review Prescription attributes in preparation for discussion of which to be retained.

## Next Meeting and other Administrative Topics

### Future Work Mode

- Separate sessions allocated for CPs. Coordinate with WG-06 meetings.
- Schedule meetings for work on special topics.

## Schedule

Meetings were planned for 2023 (see [Teams Meeting List](#))

### CP Meetings (before WG-06 meetings)

- Before Aug 2023 WG-06 meeting:
  - o Wed. Aug. 23 9am – 1pm ET
  - o Fri., Aug. 25. 8am – 12pm ET
- Before Nov 2023 WG-06 meeting:
  - o Wed. Aug. 18, 9am – 1pm ET
  - o Wed. Aug. 25, 9am – 1pm ET

### Topical Meetings

- Generic Patient Support (Leo)
  - o Wed., Jul. 5, 8am – 1pm ET
- Boutique Plan Support
  - o Wed., Sep 6, 8-10am ET
  - o Wed., Sep 8, 8-10am ET

### 2024 WG-07 Face-to-Face

- June 10-14, 2024 (tentatively, Alexandria (AAPM HQ))
- **ACTION:** Walter to request meeting space at AAPM HQ

**Meeting Adjourned 6/9/23 at 11:26pm CEST**