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# MINUTES

## DICOM WORKING GROUP SEVEN (RADIOTHERAPY)

<b>Meeting Location</b>	Brainlab AG Olof-Palme-Str. 9 81829 Munich Germany	Room 4-B-11
<b>Dates and Times</b>	Monday, May 12, 2025 Tuesday, May 13, 2025	9:00 – 17:30 CEST 9:00 – 17:30 CEST
<b>Presiding Officers</b>	Christof Schadt, Co-Chair Jim Percy, Co-Chair	
<b>Secretary</b>	Shayna Knazik, MITA	

## Meeting Overview

	Monday	Tuesday
08:30	Setup	
Session 1 09:00-10:30	Administrative, Opening, Subgroup reports, General Discussions	DICOM ISO Standard Synthetic CT IHE-RAD Profile on AI Identify Table Top
	Coffee Break	
Session 2 11:00-12:30	Review Project List	Imaging Parameters in Patient Setup Positioning Results Hybrid Plan Additional Approval
	Lunch Break	
Session 3 13:30-15:00	Check and align agenda with all call-in participants (China and USA). Imaging in Patient Setup	Anatomical Site RT Structure Set: "Precedence" and Hybrid Prescription / Physician Intent in RT Structure Set
	Coffee Break	
Session 4 15:30-17:30	RT Structure Set: "Precedence" and Hybrid Prescription	Next Meetings - CP meetings Discuss face-to-face meeting

For details on the topics, see the sections below.

## Participants

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Company/Organization	Represented by	5/11	5/12
Brainlab	Christof Schadt	X	X
AAPM / WashU	Walter Bosch	X	X
Self	Ulrich Busch	X	X
AAPM / UTSW	Yulong Yan	X	X
Varian/Siemens	Kari Jyrkkälä	X	X
IBA	David Wikler	X	X
United Imaging	Jingjie Zhou	T	
United Imaging	Ruifei Liu	T	
Elekta	Adam Zhu	T	T
Raysearch Labs	Marcus Bergman	T	T
Raysearch Labs	Wilhelm Sjöstedt	T	T
Self	Jim Percy	T	T
Elekta	Sanjay Bari		X
United Imaging	Jia You	T	T
AAPM/VCU	Bruce Curran	T	
United Imaging	Su Ji		T
United Imaging	Bin Yang		T

X = In person,  
= via Teams

## Details

### Call to Order

- Meeting was called to order at 9:10 am CEST

### Administrative

- Introductions, identify participants.
- Remind anti-trust rules and DICOM Patent Disclosure Policy
- Review the agenda and revise as needed.
- Review meeting minutes from the last meeting(s).

### Subgroups and related Group Status

Update reports were presented as needed:

- Brachytherapy Subgroup
  - IHE-RO TPPC-Brachy, TDRC-Brachy Profiles are in TI
  - No other changes to DICOM at this time
- Ion Subgroup
  - CP adds support for ion arc technique, multi-particle therapy
  - IHE-RO TDRC-Ion Profile is in TI, TPPC-Ion is in PC (changes pending)
  - Discussion regarding setup beams
- Motion Management Subgroup
  - Scope and membership of this group are unclear
  - 4D CT Imaging
    - CP to encode phase information. Adding structured, Series-level information in CT Image was rejected by WG-21.
    - 4D Enhanced CT unlikely to be implemented in treatment delivery. IHE-RO Profile could require reference images to be re-instantiated as legacy CT Image Series.
  - **ACTION:** Christof to ask Bob Pekarek for update on subgroup activities and plans.
- IHE-RO
  - Technical Committee F2F meeting in April 2025. Several Supplements and CPs have been sent for publication.
    - TDW-II added Timezone support
    - Renamed Actors to facilitate re-use. To be reviewed by Domain Coordination Cmte.
    - DRRO has been tested.
    - HDSS, CDEB in PC
    - SMRT is in development, expected to use FHIR
- IEC
  - Treatment Planning safety standard 62083 is moving forward
  - Treatment Management safety standard 62274 (R&V) - no progress
  - Scales standard 61217 – new model for tabletop conflicts with existing model
- WG-28
  - No report was given.
- No other Subgroup reports at this time.

## Organizational

### New CP List

The prior CP list in Excel has been retired. The CPs will now be managed directly with the folder view of the related Sharepoint page. C. Schadt presented the current state and how to work with the new list.

- Sharepoint page content can be opened in Teams Channel “Correction Proposals” under “Files”
- CPs are tagged by status, assignment, creation date, etc.
- Documents in development are maintained in Teams/Sharepoint. Final product is published in the NEMA FTP site (see the existing [“WG-07 Document Procedures”](#)).

## General Discussions

### Review the Project List

The project list was reviewed in Stockholm in 2023 and Alexandria 2024.

Review the current state and re-align, if necessary.

- Use of Treatment Preparation instead of Setup Beams
  - Treatment preparation may not be associated with a beam. Making RT Beams Session Record Module conditional or user optional in the RT Beams Treatment Record IOD was discussed.
  - Discussion of adding enumerated value to Treatment Record Content Origin (300A,0709) in CP 2469, currently in Letter Ballot.
- Event Logs in Treatment Records
- DVH Data Representation – DVH Data encoding as UN when Explicit VR Transfer Syntax is used for VL > 65536. CP adds description re use of UN VR in these contexts.
- Hybrid RT Dose – add 2<sup>nd</sup> Gen Dose concepts to RT Dose
  - Discussion of encoding dose-related data, e.g., LET, Dose Rate, and SAR (for hyperthermia), as dose grid data in the RT Dose IOD. This may be included with Hybrid RT Dose. Minimum changes needed to accommodate these data in RT Dose are the following:
    - Dose Type (Defined Term)
    - Dose Units (Enumerated Value)
- Dose Summation Type for deformed dose
  - Need designation for deformed dose to avoid misinterpretation, i.e., confusion with undeformed dose. Need to use a Type 1 Attribute: e.g., Dose Type or Dose Summation Type.
    - Add CODED to Enumerated Value to Dose Units and unit codes.
    - Add CODED to Defined Terms of Dose Type.
    - Dose Type Code Sequence with the following codes: Radiation Dose, Dose Rate, LET, SAR (Specific Absorption Rate)
    - Code Modifier (multi-value)
      - For treatment delivery / For evaluation / For verification
    - Spatial Transformation of Dose (Type 1C: Required if Dose Type is CODED).
    - Dose Radiobiological Interpretation Sequence (Type 2)
  - **ACTION:** Schedule a CP session (1 hour)
  - **ACTION:** David and Walter to review Dose Type Code descriptions

- **ACTION:** Christof to review Code Modifier Code descriptions

## ISO 12052

K. Jyrkkälä discussed the ISO Standard.

- ISO/DIS 12052 requires publication of DICOM Conformance Statement, effectively making DICOM an International Standard.

## Synthetic CT

There is a request to discuss how to annotate a synthetic CT that was derived from an MR:

“One potential is to use Image Type (0008,0008) value 4, however it may have already been used for multi-energy CT images.

After discussed with my colleagues, we think the alternative solution is to leverage the following attributes:

Derivation Code Sequence (0008,9215) to describe the method used to derive the image. We may need to add a few new codes, e.g. “deep learning” to the current table:

[https://dicom.nema.org/medical/dicom/current/output/chtml/part16/sect\\_CID\\_7203.html](https://dicom.nema.org/medical/dicom/current/output/chtml/part16/sect_CID_7203.html)

Purpose of Reference Code Sequence (0040,A170) to indicate the image is intended for dose calculation/treatment planning

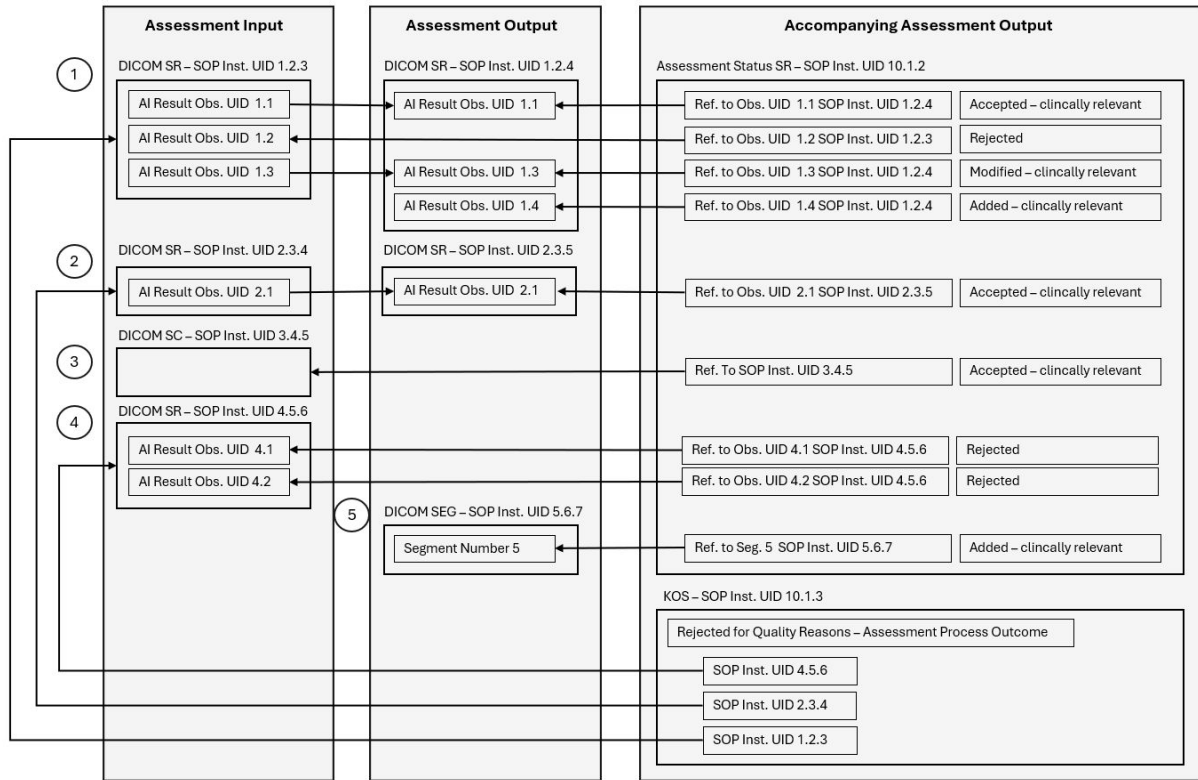
It could also be used for sCT derived from CBCT.”

- “Synthetic CT” is a pragmatic approach to use MR as the basis for treatment planning.
- No information is available for acquisition parameters (Type 2 and 3) Attributes.
- There is a need to distinguish sCT from CT and to identify the source of imaging data (MR, CBCT). The use of Proposal to use Value 4 of Image Type (0008,0008) for this purpose was discussed. However, this approach has been rejected in the context of CBCT.
- Review of Derivation Description and Derivation Code in General Reference Module.
  - Could include code in DCID 7203 ‘Image Derivation’
  - Add Derivation Algorithm Sequence to annotate sCT algorithm
- Proposed course of action
  - Confer with WG-21 regarding AI image transformation use cases
  - Draft CP to add Image Derivation code and Image Derivation Algorithm
  - Draft CP on use of Defined Terms for Value 4 of Image Type.
- **ACTION:** Christof to inquire with Till Hönig and Antje Schröder regarding similar use cases already addressed by WG-21

## IHE-RAD Profile on AI

Discuss the new IHE RAD AIRAI (AI Result Assessment for Imaging) profile and the proposed changes for the RT Structure Set.

- WG-21 proposes to include Content Creator (Extended SOP Class)
- ROI Interpreter and ROI Interpreter Sequence already exist at the ROI level in the RT ROI Observations Module.



## Identify Table Top

Discuss the need to identify the used table top. Options:

“a) Fixation Device Sequence (300A,0190) in RT Patient Setup module with a new defined term TABLE\_TOP or

b) Introduce Patient Support Identification Macro that is already used in RT ION Plan to RT Plan with a new defined term TABLE\_TOP.”

Alternatively, use Patient Treatment Preparation Device Sequence in the RT Patient Treatment Preparation Macro.

## “Hybrid” Discussions

### Imaging Parameters in Patient Setup

Continue the discussion from the last face-to-face meeting. (CP RT252)

- Abandon Setup Beams
- Use Patient Preparation
- Extend to record imaging/positioning results
- Use Instruction IOD for setup? Would also need recording.

## Positioning Results

At the last face-to-face meeting it was discussed how the result of a positioning procedure (e.g. x-ray or surface imaging) should be stored. One option was with the DICOM Treatment Record. This on the other hand requires a beam to be available that has been treated and implicitly prevents storing results that are the outcome of any positioning procedure before the treatment. A potential option would be to document the performed procedure using FHIR and reference the DICOM artefacts.

Continue the discussion to find an answer to how and where the data should be stored.

- **ACTION:** Organize meeting with Thomas Schwere to discuss the need for adding imaging prescription information in Patient Preparation Sequence. If so, evaluate options.

## Hybrid Dose

Re-evaluate the Hybrid Dose and where we currently are.

Check CP235 that adds the Conceptual Volume Macro to the Plan Overview Sequence. This has not been followed up.

## Hybrid Plan

The discussion about the Hybrid Plan stalled after the addition of the 2<sup>nd</sup> Gen MLC definitions. But there is still e.g. CP RT152 open that introduces the link from the RT Plan to the RT Physician Intent (see also below CP2446 whether this need would go away).

- Consensus to continue with CP RT152 and continue with representing prescription parameters in the RT Plan.

## Alternate Machine Module

Jim Percy reported that he is waiting for feedback from Michael Owens.

## CPs

### CP RT273 General Anatomy RT Structure Set

- Adds General Anatomy Optional Macro in the Structure Set Module
- Includes BCID 4 "Anatomic Region"

CP is ready for review with WG-06.

See also: [WG-07 CP Status List](#)

### CP-2446 Add Segment Characteristics Precedence to Structure Set

During the last review, concerns were raised regarding the use and proper location for the 2<sup>nd</sup> Gen Precedence attribute in the RT Structure Set. The main point was that the precedence parameter is

rather a prescriptive parameter for planning/optimization and not a property of a segmented object (e.g. such as density).

During the discussion a point was made to add the content of the RT Physician Intent to the RT Structure Set, like the “Hybrid RT Dose”, where the 2<sup>nd</sup> Gen dose modules are integrated in the 1<sup>st</sup> Gen RT Dose IOD. See the proposed [CP RT275 “Add Physician Intent to RT Structure Set”](#).

- It is unclear that the weighted precedence of material properties can be standardized across implementations. More information is needed to determine how to proceed.
- CP 2446 was tabled.
- **ACTION:** Yulong to provide example of use cases for this feature for review in CP meeting.

### **Hybrid Prescription/Physician Intent in RT Structure Set**

Discussion of a RT Structure Set with no contour data, containing Prescription/Physician Intent

Other alternatives for conveying this information include the following:

- Physician Intent IOD
- Enhance Prescription in RT Plan
- FHIR/JSON/XML Document

### **CP\_RT275**

CP adds RT Physician Intent and RT Enhanced Prescription Modules (Type U) to RT Plan to document the prescription associated with a plan.

- **ACTION:** Christof to check that there is no overlap with other RT Plan Attributes and prepare CP for further discussion.
- **ACTION:** Christof to check whether he wants to proceed with this CP.

## **Future Meeting Dates, Agenda for the Next Meeting and other Administrative Topics**

### **Schedule**

The list should be reviewed again whether any adaptations are required since the last meeting.

### [Teams Meeting List](#)

Two days may not be enough time for all topics that benefit from face-to-face discussions.

- Suggestion that three days is a minimum for meetings involving international travel.
- F2F meeting for 2026
  - Tentative Dates: April 20-24, 2026
  - Venue options:
    - AAPM (Alexandria, VA)
    - NEMA (Arlington, VA)
    - Brainlab (Chicago, IL)
    - UTSW (Dallas, TX)
- CP Meetings
  - Dose Summation Type – June 3, 2025 at 9:30-11:30 am EDT
  - Synthetic CT – TBD (Doodle Poll)

- CP Session – Aug 5, 2025 at 9:00 – 11:00 am EDT
- CP Session – Oct 29, 2025 at 10:00 am – 12:00 pm EDT
- CP Session – Dec 10, 2025 at 10:00 am – 12:00 pm EST

Meeting was adjourned at 5:00 pm CEST