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Meeting Minutes

DICOM WORKING GROUP SEVEN (RADIOTHERAPY)

Meeting Location	Online Meeting	
Dates and Times	Thursday, Dec 8, 2022	9:00 – 13:00 EDT
	Wednesday, Dec 14, 2022	9:00 – 13:00 EDT
Presiding Officers	Christof Schadt, Co-Chair	
	Jim Percy, Co-Chair	
Secretary	Shayna Knazik, MITA	

Participants

Company/Organization	Represented by	12/8	12/14
AAPM	Walter Bosch	X	X
AAPM	Bruce Curran		X
AAPM	Yulong Yan	X	X
Accuray	Bob Pekarek	X	
Advanced Oncotherapy	Ondrej Sevela	X	
Brainlab	Christof Schadt		X
Elekta	Jim Percy	X	X
IBA	David Wikler	X	X
Mevion	Bruce Rakes	X	X
MITA/DICOM	Shayna Knazik	X	X
RaySearch	Marcus Bergman	X	X
RaySearch	Stefan Páll Boman	X	
Self	Ulrich Busch	X	X
Varian	Kari Jyrkkälä	X	X
Accuray	Chuck McCrobie		X
Zap Medical	Rob Cessac		X
Leo Cancer Care	Mike Courtney		X

Actual Week Schedule

	Thursday, Dec 8	Wednesday, Dec 14
Session 1 09:00-09:55	Setup, Administrative, Opening CPs	Administrative, CPs
Session 2 10:00-10:50	CPs	Non-C-arm Discussion (ZAP Medical)
Session 3 11:10-12:00	General Discussions	
Session 4 12:05-13:00	General Discussions CPs	

For details on the topics, see the sections below.

Details

Administrative

- The meeting was called to order December 8, 2022 at 9:05am EDT.
- Introductions, identify participants.
- Shayna reminded the group of NEMA anti-trust rules and DICOM Patent Disclosure Policy
- Reviewed the agenda and revise as needed.
- Review of meeting minutes from the Oct/Nov 2022 meeting – Meeting minutes and action items were reviewed 12/14/22 and approved without objection or abstention.

Organizational

ACTION: Jim to post DSC Report from WG-07 on Teams.

CPs

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

CPs in Work

CP_2220 – Cone Beam CT Indicator

Proposal to include Detector Geometry attribute (CURVED, FLAT) was rejected by WG-21. WG-07 discussed alternative approaches to identifying CBCT. The group decided to investigate options involving minimal changes to the Standard, i.e., re-use of existing tags.

1. Use of new Defined Terms
2. Add new codes to existing coded attributes
3. Use of Image Type values 4 or 5

Yulong to examine options for identifying CBCTs for discussion on day two (Dec 14).

Further discussion of Potential Options for CBCT Identifier (Dec 14)

Two potential options were identified for indicating CBCT acquisition in the CT Image IOD: (1) Image Type (0008,0008) Type 1, and (2) Scan Options (0018,0022) Type 3. The former was deemed to be difficult to use for identifying CBCT.

Creation of a CP to add a Defined Term to the Scan Options (0018,0022) Attribute in the CT Image Module.

- Existing Defined Terms (for X-Ray Image): TOMO, CHASE, STEP, ROTA
- Proposal to create an RT-specific Defined Term indicating CBCT.
- This Attribute is Type 3: should be safe to add RT semantics
- Add statement that the *order of the values* of Scan Options is not significant.

ACTION: Yulong to draft a CP to add a CBCT Defined Term to the Scan Options (0018,0022) Attribute.

Cp_RT214 - 4D Imaging Support

Kari has discussed requirements for encoding parameters for 4D temporal reconstruction within Siemens. He reviewed the draft of a new Temporal Reconstruction Module (in preparation). Temporal information supports both respiratory and cardiac synchronization and is present at the Instance level.

Cp_RT219 – Update Interlock Code for Ions

The CP is awaiting review by the Ion subgroup. Uli has added references to IEC standard documents in the CP. The CP is otherwise ready for review by WG-06 to be assigned a CP number.

Cp_RT223 – Remove Scanning Spot Size from RT Ion Record

The CP is ready for review by WG-06 to be assigned a CP number.

Cp_RT224 – Synchronize 1st Generation BLD definitions

CP 2229 adds support for new MLC types. This CP updates the description of RT Beam Limiting Device Type (300A,00B8) in Modules not handled by CP 2229. Description enhancement only.

Cp_RT222 – Strengthen Dose Semantics of Dose Reference

Christof has drafted a CP to clarify the meaning of dose references. The CP adds Dose Value Purpose (TRACKING, QA) and Dose Value Interpretation (NOMINAL, ACTUAL) Attributes. The group discussed Use Cases for combinations of Dose Reference Structure Type (VOLUME/SITE, POINT/COORDINATE) and the proposed Dose Value Purpose, Dose Value Interpretation Attributes. No QA use case was identified for VOLUME/SITE doses or NOMINAL POINT/COORDINATE doses.

ACTION: Christof to continue work on CP_RT222.

General Discussions

Discussions of new RT Plan and RT Treatment Record for non-C-arm vendors

The group reviewed issues from the Oct 2022 discussion with non-C-arm vendors to identify what is needed to support their devices.

Discussion of how treatment plans and treatment records are to be represented for devices that deliver dose based on events and conditions that are not specified in the plan.

- Can the control point formalism be used to represent these asynchronous events/conditions?
- What minimum information is needed in the treatment record?
- What is needed to assure appropriate delivery of dose to the patient?
- Can low-level detail be suppressed or stored in a “dynamic log” or separate IOD?

Offline image review to verify patient positioning requires a minimum machine model.

- What is needed to accumulate dose? How is dose localized with respect to the patient (planning CT) or other geometric reference position?
- How do users expect to verify treatment delivery? What treatment plan/treatment record information is needed?

Discussion of strategy for supporting new treatment delivery approaches

- Creating a new IOD for each vendor is not practical or sustainable.
- Use of minimal “stub” plans may not be sufficient for all use cases, e.g., offline review
- Group members were encouraged to seek sustainable alternatives for planning/recording new treatment modalities.

[Meeting was adjourned 12/8/22 at 11:38am EST.]

[Meeting resumed 12/14/22 at 9:00am EST.]

Zap Medical Discussion

Rob Cessac joined the WG-07 discussion. The ZAP-X treatment machine has two independent gantries (separated by a pitch of 45 degrees). A mapping exists from ZAP-X Axial and Oblique gantry angles to IEC 61217 Gantry Pitch and Roll.

Use cases for interoperable exchange include

- Independent dose calculation by outside dose engine
- Capturing treatment records
- Exporting dose
- Offline review of verification images.

Currently, ZAP can export RT Structure Set, RT Dose, RT Image.

Discussion of TMS functionality.

- Scheduling of ZAP-X patients
- Offline review of setup images
- Offline review of treatment records
- Dose tracking

Discussion of how to organize/aggregate beams and control points for recording, since typical plans include several hundred beams, but TMSs may have difficulty in treating a large number of beams. What plan parameters are needed by the TMS to determine that the correct plan has been treated?

The majority of cases treated are single-fraction.

Leo Cancer Care Discussion

Discussion of Patient Position in the context of the Leo Cancer Care chair-based CT scanner.

- The patient is seated during CT scan and treatment. The chair can be tilted back.

- A coded representation of patient orientation is present in the NM/PET Orientation Module. It is not clear if this can be used for both CTs and plans.

Mike will continue work on identifying DICOM representation for images and plans.

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](#)

Next Teams Meeting

Next WG-07 meeting is March 6-7 and 13-14, 2023

Next Face-to-Face Meeting

WG-07 face-to-face meeting June 5-9, 2023 in Europe.

DECISION: Venue was confirmed for Stockholm. Hosted by Raysearch Labs.

ACTION: Marcus to make hotel arrangements.

PTCOG meeting: June 10-16, 2023 in Madrid.

Appendix: General Information

I. Project List

The list of major projects pursued by WG-07 can be found [here](#).

II. Presentation Material for 2nd Generation RT Objects

A folder is maintained containing material of presentations on 2nd Generation topics.

Everyone is invited to use any material out of that folder for presentations.

In turn everyone should to add his presentations to this folder, if they could be of general use. As needed, take care to remove any company- or institution-confidential parts before posting.

<ftp://medical.nema.org/MEDICAL/Private/Dicom/WORKGRPS/Wg07/2ndGeneration/Presentations>

Prepared by Walter Bosch
Submitted by Shayna Knazik
Legal Bezalel Stern 1-23-23