

**IHE-RO Technical Committee  
Face-to-Face  
April 3-6, 2023, 8:30-17:30 EDT  
April 7, 2023 8:30-12:00 EDT**

**Technical Committee Chairs:  
Scott Hadley, PhD  
Jon Treffert**

**IHERO Working Group Co-Chairs  
Bruce Curran, MS, ME, FAAPM, FACMP, FACR, AAPM / VCU Health  
Bridget Koontz, MD, CMO, Genesis Healthcare**

**Mission Statement:** *The American Association of Physicists in Medicine (AAPM) sponsors a multi-society Task Force to undertake an initiative to promote the Integration of the Healthcare Enterprise (IHE) – Radiation Oncology (RO). Originally formed by the American Society for Radiation Oncology (ASTRO), it fosters seamless connectivity and integration of radiotherapy equipment and the patient health information systems. The Technical Committee of IHE-RO will undertake use cases defined by members from ASTRO, RSNA, American Association of Physicists in Medicine (AAPM), the American College of Radiology (ACR) and the Medical Imaging and Technology Alliance (MITA). In addition, members of the International community have also been invited to participate in IHE-RO. The IHE-RO Task Force, in close collaboration with radiotherapy product manufacturers, will develop appropriate integration profiles for radiation therapy and setup a demonstration of seamless communication among the full array of radiotherapy products.*

**Attendees:**

Name	Affiliation	Email	4/3	4/4	4/5	4/6	4/7
Scott Hadley	U. Mich.	<a href="mailto:swhadley@umich.edu">swhadley@umich.edu</a>	X	X	X	X	X
Jill Moton	AAPM	<a href="mailto:Jill@aapm.org">Jill@aapm.org</a>	X	X	X	X	X
Walter Bosch	Wash. Univ.	<a href="mailto:wbosch@wustl.edu">wbosch@wustl.edu</a>	X	X	X	X	X
Bruce Curran	AAPM / VCU	<a href="mailto:bhcurran@gmail.com">bhcurran@gmail.com</a>	X	X	X	X	X
Jim Percy	Elekta	<a href="mailto:Jim.percy@elekta.com">Jim.percy@elekta.com</a>	X	X	X	X	X
David Wikler	IBA	<a href="mailto:David.Wikler@iba-group.com">David.Wikler@iba-group.com</a>	X	X	X	X	X
Bruce Rakes	Mevion	<a href="mailto:rbrakes@mevion.com">rbrakes@mevion.com</a>	Z	X	X	X	X
Harold Beunk	Demcon	<a href="mailto:harold@beunk.eu">harold@beunk.eu</a>	Z		Z		
Bob Pekarek	Accuray	<a href="mailto:bpekarek@accuray.com">bpekarek@accuray.com</a>	Z	Z	Z	Z	Z
Richard Voegele	Brainlab	<a href="mailto:richard.voegele@brainlab.com">richard.voegele@brainlab.com</a>	Z	Z	Z	Z	
Sanjay Bari	Elekta	<a href="mailto:Sanjay.Bari@elekta.com">Sanjay.Bari@elekta.com</a>	Z	X	X	X	X
Marcus Bergman	Raysearch Labs	<a href="mailto:Marcus.bergman@raysearchlabs.com">Marcus.bergman@raysearchlabs.com</a>	Z	Z		Z	
Thomas Schwere	Varian	<a href="mailto:Thomas.Schwere@varian.com">Thomas.Schwere@varian.com</a>	Z	Z	Z	Z	Z
Martin von Siebenthal	Varian	<a href="mailto:martin.vonsiebenthal@varian.com">martin.vonsiebenthal@varian.com</a>	Z	Z	Z		
Rishabh Kapoor	VCU/VHA	<a href="mailto:Rishabh.kapoor@va.gov">Rishabh.kapoor@va.gov</a>	Z	Z			
Mike Courtney	Leo Cancer Care		Z				
Markus Hager	Cosylab		Z				
Michael Owens	Reflexion		Z				
Niek Schreuder	Leo Cancer Care		Z				
Bjorn Hardemark	Raysearch Labs			Z			
Bridget Koontz	Genesis Care			Z			
Yi Rong	Mayo Scottsdale			Z		Z	

**X = In person, Z = Via Zoom**

## Minutes:

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*Monday 4/3/23*

I. Meeting was called to order 4/3/23 at 9:04am EDT

II. Meeting Scope

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A. Minutes from the Feb 16, 2023 and Mar 16, 2023 TC teleconferences were reviewed on 4/7/23:

1. Minutes from the Feb 16, 2023 IHE-RO TC Teleconference were reviewed and approved as amended. Motion by Bruce Curran was seconded Bob Pekarek and approved without objection.
2. Minutes from the Mar 16, 2023 IHE-RO TC Teleconference were reviewed and approved as amended. Motion by Bob Pekarek was seconded by Bruce Curran and approved without objection.

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B. Review Agenda

III. Topic 1: Use Case: Seated Treatment (Leo, P-Cure)

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A. Mike Courtney reported on discussions with Markus Hager and members of DICOM WG-07 on parameters for patient support used for seated treatments. Currently, a DICOM Structured Report can be used to capture immobilization parameters for simulation. This approach does not work as well for treatment delivery.

B. Markus Hager provided details for parameters that define positions of the Leo chair. This device is used both for (a) CT simulation and (b) treatment positioning and verification. The Treatment Delivery System interacts with the Upright System (chair), TMS, and TPS. Positioning parameters captured in simulation are retrieved and used for setup before each treatment to reproduce the original position.

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C. The Treatment Preparation IOD can be instantiated by the CT Simulator during simulation and TDD during treatment setup to record positioning parameters.

1. A proposal to develop an IHE-RO content Profile to address capture of setup parameters, treatment plan reference, DRRs, Beams Delivery Instruction, etc. was discussed.
2. Consensus that *content* has priority, workflow will follow.
3. A champion is need for this Profile.

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IV. Topic 2: Beyond TDW-II

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A. David Wikler reviewed the context and outstanding needs for exchange of imaging and setup information in treatment delivery. The scope is currently limited to X-ray/CT/MVCT. (Surface imaging is excluded.)

1. Discussion of what inputs for patient positioning and verification should be included in the UPS.
2. A mechanism for referencing image *Series* in the Input Information Sequence is being developed in DICOM WG-07.

B. Imaging/Positioning Instruction

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1. Discussion of a Single UPS with dedicated Work Item Codes vs. Multiple Imaging and Delivery UPSs.

- a. Multiple UPSs require linkage by a Treatment Session UID.
  - i. Multiple UPSs require query for multiple UPS. How many? Use a separate UPS for each image?
  - ii. Is a distinct Imaging Instruction needed? Use the BDI with (only) setup beam(s) as an imaging instruction. (Some TDD require treatment beams.)
- b. Options discussed: (a) add requirements to perform additional imaging tasks with additional input data to the existing TDW Profile or (b) create a separate Profile.
  - i. Use cases for imaging discussed: (a) Setup images used at therapist's discretion and (b) Explicit sequence of setup imaging. Explicit imaging protocol is not currently supported in TDW-II.
  - ii. What is gained by explicitly specifying imaging: Explicit reference image in Input Information Sequence and Treatment Session UIDs in output images?
  - iii. Support for TDOR requires Treatment Session UID in N-CREATE.
  - iv. TDW-II allows support of additional Workitem Codes.

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c. Survey of options discussed (**Option 2 received a plurality of those present**).

- i. Option 1: TDW-II with option for "delivery and imaging" workitem code
- ii. **Option 2: TDW-III with "delivery and imaging" workitem code (with option for no imaging)**
- iii. Option 3: "IPDW-II" with "generic imaging for patient position verification" workitem code, without requiring new IODs.

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d. Further discussion 4/5/23

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## C. Delivery of QA Plans

### 1. Verification Plan Delivery

#### a. Scheduled vs. Ad Hoc Delivery?

- i Variants: (a) TMS has special QA Mode, (b) TDD has special QA Mode, or (c) Data driven mode selection in either TMS or TDD

#### b. Approval (planning approval vs. treatment approval) – A plan that is not approved for treatment cannot be delivered to a patient. Currently, this condition is enforced by the TMS: only treatment approved plans are exposed by the TDD in treatment mode.

#### c. Proposal to define a QA Delivery Workflow (QADW) Profile

- i Require RT (Ion) Beams Treatment Record to be stored for QA plan delivery. The value of the RT (Ion) Beams Treatment Record is primarily *its existence*. Its content is likely to be used only for troubleshooting.

- ii Scope: includes simulated delivery

- iii Decision to start with Scheduled Workflow.

#### d. Content Requirements

- i Plan Intent in RT General Plan Module = VERIFICATION

- ii Treatment Delivery Type in RT (Ion) Beams Session Module = VERIFICATION

- iii BDI may not be required in the Input Information Sequence.

#### e. Only complete delivery of QA Plans are to be recorded. (No resumption of partial deliveries.)

#### f. Consider option to add QA Manager as an observer of UPS. This depends on interest of QA vendors, but may delay development of the Profile.

#### g. Justification: the RT2 standard (available through AAMI) requires enhanced prevention of delivery of unapproved plans

#### h. **ACTION 230401**: Bruce to draft a Clinical Impact Statement.

## D. Online adaptation – discussion was deferred.

## V. Topic 3: Use Case Discussion – discussion was deferred.

### A. New Use Cases

### B. Priority

## VI. Topic 5: General Updates

### A. XRTS

#### 1. Martin von Siebenthal reported on the status of XRTS

- a. Renamed Transaction XRTS-01 to “Create or Update Treatment Summary”

- b. Removed “planned number of session” and “planned start/end date”

- c. Editorial corrections

- d. Updated FHIR specification to CodeX RT STU1, mCODE STU2.1 (released, includes latest SNOMED CT we requested for RT)

- e. Referenced CodeX RT FHIR Capability Statement for RO Rosource Repository

#### 2. See <https://build.fhir.org/ig/HL7/codex-radiation-therapy/>

#### 3. IHE-RO TC to consider promotion of XRTS to Trial Implementation, pending formal approval of CodeX RT STU1 by HL7 cross-project working group. IHE-RO TC to schedule Connectathon for first half of 2024.

### B. TDRC-Ion

#### 1. David Wikler has submitted the TDRC-Ion Profile for Public Comment.

- a. Editorial comments were reviewed by the TC.

- b. TDRC-Ion is a Content Profile. It does not define Transactions.

- c. The Profile has been approved for Public Comment by the TC.

- d. **ACTION 230415**: David will submit the reviewed Profile to Mary Jungers for two month Public Comment.

## C. Test Tools

### 1. Access Policy and Status

- a. Content Validator – IHE-RO Members, no expiration

- 140           b. UPS Validator – IHE-RO Members, no expiration  
              c. DRRO Validator – DRRO vendors, IHE-RO Members, renewing 90-day expiration  
              d. XRTS Validator – XRTS vendors, IHE-RO Members, renewing 90-day expiration
2. Policy for DRRO and XRTS Validators reflect a strategy to provide wide access to test tools for Profiles in development.
- 145           3. Licensing for vendor access to source code  
              a. **ACTION 230416**: Walter to check on Demcon update of BitBucket repository
4. Continuing access to test tools for non-IHE-RO Members participating in DRRO and XRTS Workshops to be considered.

150   VII.   Day 1 Wrap-up

*Adjourned for the day 4/3/23 at 5:00pm*

**Tuesday 4/4/23**

155   *Resume meeting 4/4/23 at 9:00am*

VIII.   Topic 5 (continued): General Updates

- 160           A. DRRO – Stina Svensson presented an update of DRRO subgroup activities.  
              B. The DRRO Profile includes DRRO Content definitions for  
                  1. Deformable Spatial Reg IOD  
                  2. General modules (Deformed Image)  
                  3. Dose-related modules (Deformed Dose)
- 165           C. Deformed Spatial Registration is “done”. CT-CT deformed registration has been tested.  
              D. Moving on to Deformed Image  
                  1. Software updates for deformed images  
                  2. Phantom data updates  
                  3. Demcon Test Tool updates  
                  4. Validation methods for application of deformations image content.  
170           5. Aim: first tests before May DRRO subgroup meeting  
              E. DRRO (v. 1.2) is in Trial Implementation  
                  1. Review and clarify requirements for display of attribute values. Code Values and Code Scheme Designators need not be displayed. Code Values may be displayed in a localized manner.  
175           2. Referenced Image Sequence (0008,1140) Attribute Note should read “Shall be Empty or shall include all items...”. (See example in MMRO-III.)  
                  3. **ACTION 230402**: Stina to revise Profile as (v. 1.2.1) and upload to DRRO Box folder.
- F. DRRO does not include RT Structure Set. However, RT Structure Sets can reference deformed images.

IX. Topic 6: BRTO-III

- 180           A. Jim Percy reviewed BRTO-III Profile concepts.  
                  1. Proposed Changes from DICOM CPs:  
                      a. CP2037 - use of COPLANAR\_XOR  
                      b. CP2150 – use of OAR for Interpreted Type  
185                   c. CP2151 – use of codes (ROI Obs Module)  
                      d. CP2184 – Add Conceptual Volume Identification (type 3 add on)  
                      e. Use of Common Instance Reference to allow Study/Series references (D. Wikler)
2. Relationship with other Profiles  
                  a. Overlap with HDSS – incorporate HDSS as an Option within BRTO-III?  
                  b. Add Plan Overview (hybrid) parameters in RT Dose?  
190                   c. Include Treatment Preparation IOD?
3. BRTO-II to BRTO-III for Contourer?  
                  a. Expected testing for this Profile:  
                      i. Input/output of BRTO-II: YES.  
                      ii. Input/output of BRTO-III: YES

- 195           iii Up conversion from BRTO-II to BRTO-III: YES  
              iv Backward conversion from BRTO-III to BRTO-II: NO
- b. Need to identify a marker for BRTO-III conformant objects and test for its presence.  
          c. Open question: do we need to validate the quality of upconversion? Working assumption is NO. Only  
              test the adherence of output to the relevant requirements (BRTO-II or BRTO-III).
- 200    B. Content Requirements for BRTO-III
1. Referenced Standard is DICOM 2023b.  
          2. Referenced Structure Set Sequence in RT Plan does not currently include references to Study and Series  
              Instance UIDs. Proposal to require use of Common Instance Reference Module in RT Plan and RT Ion  
              Plan to provide Study and Series Instance references for RT Structure Sets.  
205           3. Consider including RT Structure Set reference in RT Dose. However, this reference is inside RT DVH  
              Module and requires include of DVH, as well. This issue may require a DICOM CP.  
          4. Require Coding for ROIs  
          5. Require Contour Geometric Type in RT Structure Set to be POINT or CLOSEDPLANAR\_XOR.  
          6. Conceptual Volume Identification Sequence – CV Identification Macro attributes to be listed in Profile.  
210           7. Require Dose Summation Type in RT Dose to be PLAN\_OVERVIEW. Requirements for attributes in  
              Plan Overview Sequence to be reviewed.  
          8. Decision to exclude DVHs from RT Dose in BRTO-III.
- C. **ACTION: 230417**: Jim to continue work on development of BRTO-III. BRTO-III documents to be exchanged  
              in Box > IHERO TC share > BRTO-III folder.
- 215           D. **ACTION 230418**: Jim investigate CP to allow RT SS reference in RT Dose.

X. Topic 7: ROTH

- A. Scott Hadley reviewed concepts in development the ROTH subgroup.  
          B. The group has discussed creating a manifest to reference collections of DICOM objects for treatment planning  
220           and delivery, involving several use cases. Current discussions focus on the use of XRTS/FHIR to support the  
              creation of the manifest.  
          C. A parallel effort in DICOM WG-07 is working to define an Assertion Collection IOD (Sup 238). There is  
              some overlap with XRTS.  
225           D. A range of use cases is envisioned for creating ROTH collections. These include both fully integrated/  
              automated updating environments and manual collection of treatment artifacts. For manual collections, the  
              process of creating the manifest provides an indication of missing information.  
          E. DICOM RT Treatment Summary Record provides pointers to treatment plans and delivered fractions.  
          F. Discussion of using the XRTS model as a basis for a ROTH manifest.  
230           1. XRTS Data Model <https://build.fhir.org/ig/HL7/codex-radiation-therapy/branches/master/overview.html>  
              2. Add pointers to DICOM Instances.  
              3. Consensus to continue exploration of XRTS Data Model with DICOM object references as basis for a  
              Manifest.

XI. Topic 8: Planning Committee Discussion

- 235           A. QA Delivery Workflow (QADW)
1. Scheduled workflow for delivery and recording of QA plans, as distinct from delivery and recording of  
              treatment plans to patients.  
              2. The TC is drafting a Clinical Impact Statement.
- 240           B. RO Treatment History (ROTH)
1. Extension of XRTS (FHIR) could be used to capture treatment history and catalog treatment planning data
- C. Deformable Registration in Radiation Oncology (DRRO)
1. The DRRO Profile is now in Trial Implementation  
              2. Work continues on test methods and test data (phantoms).  
245           3. Formal testing is anticipated in 2024.

XII. Topic 6 (cont'd): BRTO-III

- A. Review of Transactions
1. Multi-Series CT – (BRTO test series #10) – retire merged Series and replace with variably-spaced CT.  
              2. Variably-spaced CT – include in BRTO-III

- 250 3. Retire Off-slice Structure Set Storage [RO-BRTO-II-1]  
4. Retire Off-slice Structure Set Retrieval [RO-BRTO-II-2]  
5. Retire DVH Dose Storage [RO-BRTO-II-3]  
6. Retire DVH Dose Retrieval[RO-BRTO-II-4]  
7. The Geometric Planner Actor has been retired: retire Geometric Plan Retrieval [RO-8]  
255 8. Add Hi-def Structure Set Storage/Retrieval (*tentative*)  
9. Add Dose with Plan Overview Storage/Retrieval
- B. Testing upconversion from BRTO-II input to BRTO-III output? – this is probably a qualitative check. Only check the content of the output with respect to the Profile.
- C. Options for BRTO-III Actors are (a) Decubitus and (b) Feet-First Re-orientation
- 260 D. Common Instance Reference Module
1. Need Study and Series Instance of RT Structure Set in RT Plan for Query/Retrieve
  2. Need Study and Series Instance of RT Structure Set in RT Dose for Query/Retrieve.
- E. **ACTION 230403**: Jim to investigate adding Study reference using Common Instance Reference Module for RT Plan and RT Dose.

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### XIII. Day 2 Wrap-up

*Adjourned for the day 4/4/23 at 5:15pm*

270 **Wednesday 4/5/23**

*Resumed meeting 4/5/23 at 9:00am*

### XIV. Topic 2 (cont'd): Beyond TDW-II

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- A. Scheduled Adaptive Workflow / TSM Discussion
1. David Wikler presented a *proposal* for an Adaptive Extension to TDW-II (“TDW-IV”)
    - a. Assumptions:
      - i TMS and OST Actors are grouped with internal communications between them
      - ii Multiple UPSs are grouped by Treatment Session UIDs
    - 280 b. The first UPS contains the original plan and BDI is for imaging (position verification) only. The UPS has an “Adaptive Session with Position Verification” workitem code.
    - c. A UPS for delivery of the original plan is prepared with Input Readiness (static inputs) initially in the NO state.
    - d. A TSM Actor was introduced.
      - 285 i The TSM can modify Input Information Sequence and Input Readiness of the second UPS before it is locked.
      - ii The TSM manages selection of original plan or planning and QA of adapted plan and sets Input Readiness when the (original or adapted) plan is ready. Alternatively, adapted treatment is rejected and the TSM requests cancellation of the UPS.
      - 290 iii Adapted plans and QA artifacts are stored (in OST) and referenced in output information sequence if used. Details of QA and approval artifacts to be addressed using Assertion Collection Instance(s) or enhance approval module within these (Plan) instances (TBD).
      - iv The TSM is an abstraction. Details of the communication between TSM and the TPS/QA devices may be out of band for this Profile.
      - 295 v Open Issue: The TSM may be implemented as a component of the TDD, TMS, or other (third party). How is this to be handled in the Profile? How to manage multiple TSMs? Can it be managed by configuration? This issue needs to be resolved.
  2. Discussion
    - a. The QA and approval process for adaptive delivery is abbreviated.
    - 300 b. Current adaptive systems integrate TPS and TDD via back-channel communication. The TMS is out of the interactive delivery loop.
    - c. Multiple TSMs may be a problem.
  3. **ACTION 230404**: David and Sanjay to update the proposal and distribute documents in Box > IHERO TC Share > TDW Extensions. (Use free drawing tool available at [www.diagrams.net](http://www.diagrams.net))

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B. Device Integration (DPDW) / FHIR

1. Thomas Schwere introduced a discussion of plans for future DPDW development.
  - a. Most common delivery workflow use cases are covered by TDW and successors.
  - b. Support for optical imaging?
  - 310 c. Bi-directional communication with patient positioners?
  - d. Patient ID verification:
    - i See IHE-ITI Profile for patient devices, e.g., infusion pumps, FHIR?
    - ii Barcode solutions
  - e. DICOM Surface Scan Mesh / Surface Scan Point Cloud IODs
  - 315 f. Transport technology: DIMSE, DICOMweb, FHIR
2. **ACTION 230405**: Thomas to schedule a subgroup session with surface scanning vendors (cc: Jon Treffert)
  - a. Vision-RT
  - b. C-Rad
  - c. Dyn'R
  - 320 d. Anzai (Japan)
  - e. Varian Identify
  - f. Brainlab Exactrac Dynamic
3. FHIRcast – enable synchronization of context between applications.

325 XV. Topic 9: TDRC-Brachy Review

- A. Jim Percy updated the group on Brachy subgroup activities. The next group call is 4/21/23.
  1. TPPC-Brachy is now in Trial Implementation. No testing is currently scheduled.
  2. Three types of plans are supported in TPPC-Brachy: HDR/PDR, Premanent LDR, Temporary LDR. However, TDRC-Brachy supports only HDR/PDR treatments. (The RT Treatment Record requires reporting of a Safe Position, but this is not defined for LDR.)
  - 330 3. Open question for public comment: Override information is not required in the Profile since the override takes place at the Channel level and overrides are not recorded at the Channel level. There is no consistent way for this information to be captured. A channel override is recorded as a partial treatment. Is this acceptable?
    - 335 a. Proposal to use the Override Sequence (3008,0060) inside the Control Point Sequence to record continuation of delivery after a channel failure.
- B. TPPC-Brachy Testing
  1. Remote testing of TPPC-Brachy appears to be workable.
  2. Content of the TPPC-Brachy Profile is now stable.
  - 340 3. **ACTION 230406**: Walter to request Demcon to assess effort for Content Validator update for TPPC-Brachy.

XVI. Topic 9.5: Face-to-Face IHE-RO TC Meetings

- A. **DECISION**: IHE-RO to continue to meet face-to-face once a year, either in US or Europe/UK, alternating with Connectathon venues.
- 345 B. Default US meeting location is AAPM HQ in Alexandria, VA.
- C. It is expected that DICOM WG-07 will also hold face-to-face meetings once a year, alternating between US and Europe.

350 XVII. Topic 10: DICOM TLS encryption

- A. Security is topic of growing importance. A Standard exists for secure transport, but provisioning of certificates remains a challenge.
- 355 B. Work is in progress (FIDO Alliance, <https://fidoalliance.org/iot-specifications-overview-2/#:~:text=The%20FIDO%20Alliance's%20IoT%20specification,securely%20with%20an%20IoT%20platform>) on technology for IoT onboarding (secure certificate).
- C. Is a Profile needed for this purpose? Are there options to be constrained?
- D. Proposal to test secure transport of DICOM as a separate Profile.
- 360 E. **ACTION 230407**: Walter Bosch and Bruce Curran to consult with Colby Rogness (CNI) regarding what infrastructure is needed to test DICOM encrypted transport.

XVIII. Topic 11: Transfer with non-default character sets (e.g., Unicode)

- A. Default character set is ISO IR-6. Unicode is harmonized with ISO IR-192.
- B. What character repertoire requirements should be included in future (and updated?) IHE-RO Profiles?
- C. The Merge DICOM library supports all character repertoires and translates to Unicode (ISO IR-192).
- D. Proposed Demonstration to test handling of character sets: Add Unicode for non-Roman characters in BRTO-II test data:
  - 1. Patient Name
  - 2. Study Description
  - 3. ROI Names
  - 4. Structure Set Label
  - 5. Plan Names
  - 6. Dose Label
- E. **ACTION 230408**: Walter to prepare a version of BRTO-II test data with ISO IR 192 character repertoire.

XIX. Topic 12: Use case: Dynamic Delivery

- A. Scintix, Unity, etc. – discussion was deferred.

XX. Day 3 Wrap-up

*Adjourned for the day 4/5/23 at 4:00pm*

**Thursday 4/6/23**

*Resumed meeting 4/6/23 at 9:00am*

XXI. Topic 13: High-Definition Structure Sets

- A. Richard Voegele presented a review and status update.
  - 1. Currently RT Structure Set with contours are attached to CT sliced and aligned with CT slices.
  - 2. “Unattached contours” address topology, but do not provide the needed resolution to define small volumes in the CT Frame of Reference.
  - 3. Brainlab has demonstrated the utility of HDSS for accurate representation of small volumes, e.g., brain metastases.
  - 4. Questions for discussion
    - a. Should the Profile require the use of high-def structure set for all ROIs? No - not all ROIs need to be HD.
    - b. Should the Profile allow orientations of contours other than that of the CT slices? Yes.
    - c. Is there an indicator that an RT Structure Set Instance contains HD ROIs? Yes: the presence of Source Pixel Planes Characteristics Sequence. This should be Conditional. Indication of HD status should be required for ROIs.
    - d. What are safety considerations for legacy applications? Is a breaking change needed for safe use of this Profile?
- B. Jill has distributed a call for interest in a HDSS subgroup, with eight responses to date, mostly from industry.
- C. **ACTION 230409**: Richard and Jill to create a poll for availability of interested participants.

XXII. Topic 14: Use Case: Offline Review

- A. David Wikler presented a proposal to combine TPIC and TDIC as a single Profile: “IGRT-IC”.
  - 1. This profile defines the content of IGRT reference and treatment images for patient position verification during online/offline review. The scope of this profile is limited to anatomic transmission radiographic imaging.
    - a. Only two Actors are defined: IGRT Image Producer and IGRT Image Consumer
    - b. This Profile is a Content Profile. Content requirements are determined by Context, which is based on Use Case.
    - c. Restrict Actors to those that produce and consume *transmission images*.
    - d. Concepts of “Simulation” and “Patient Simulation”.

- e. Open question: Include terms “Reference Image” and “Treatment Image” in IHE Glossary?

XXIII. Topic 14.5: Planning Committee: Marketing of IHE-RO

- 420 A. Yi Rong discussed ideas for publicity of IHE-RO activities
1. Editorial in JACMP or other publications. Some cost may be involved.
  2. Advertise IHE-RO on AAPM Annual Meeting – Vendor/Innovation Showcase.
  3. Session at Spring Clinical or Annual Meeting (SAMS session 2020)
  4. Educational sessions at ASTRO (last one with RO-ILS)
  5. Booth at ESTRO?
- 425 B. **ACTION 230410**: Bruce Curran to investigate booth/presentation at ESTRO annual meeting
- C. **ACTION 230411**: Yi to reach out to JACMP and PMB for editorial placement.
- D. **ACTION 230412**: Bruce to check on opportunities for presence at AAPM Annual Meeting (Vendor Showcase)

430 XXIV. Topic 14.7: European physicist participation in judging 2023 Connectathon

- A. A call for participation by European physicists as judges has been drafted.
- B. Suggestion to reach out to EFOMP, DGMP for distribution.
- C. Check dates: 30 Oct – 3 Nov (8:30am – 5:30pm each day)
- 435 D. **ACTION 230413**: Jill to distribute to EFOMP (Patty Gilligan, IE) and DGMP (?) contacts.

XXV. Topic 14: Use Case: Offline Review (continued)

- A. Discussion of the definition of Reference and Treatment Images.
1. Reference Images can be a radiograph, DRR, or CT. Images whose Frame of Reference is used to create a treatment plan qualify as Reference Images.
  - 440 2. Treatment Images can be a radiograph, DRR, or CTs produced during a treatment session. Treatment Images include information which enable them to be localized into the Frame of Reference of the TDD.
    - a. Treatment Images may be used as Reference Images when used for treatment planning.
    - b. Treatment Images may also be used for repositioning, but in this context are not considered Reference Images.
  - 445 3. Review Images (re-computed image instances created by an offline review application) were discussed. – Is this a third type that needs to be defined?
- B. Use Cases discussed
1. Use case #1: Virtual Simulation DRR Reference Images
  2. Use case #2: Treatment Radiograph Images
  - 450 3. Use case #3: Treatment DRR Images
  4. Use case #4: Treatment CT Images
- C. **ACTION 230419**: David will continue work on IGRT-IC draft (see IHERO TC share > IGRT-IC folder).

455 XXVI. Topic 15: TF Review

- A. Consistency of Transactions / New Transactions / Maintenance of Transactions & Actors
1. David Wilker reviewed an attempt to re-use existing TDW-II Transactions for TDOR.
    - a. It was noted that Use Case sections and sequence diagrams are non-normative.
    - b. Recommended naming conventions for Transactions were reviewed.
    - 460 c. Content-specific requirements can be re-factored in the Content section, while behavioral requirements must be specified as Trigger Events for Transactions.
    - d. Three candidate Transactions for re-factoring were identified.
  2. **ACTION 230414**: David and Thomas to attempt re-factoring / re-use of [RO-64]

465 XXVII. Day 4 Wrap-up

*Adjourned for the day 4/6/23 at 5:30pm*

**Friday 4/7/23**

470 *Resumed meeting 4/7/23 at 9:00am*

XXVIII. Summary of Week's Work

475 XXIX. Topic 1 (continued): Seated Treatment

A. Bruce Rakes described the use of the Performed Procedure Step Summary Macro in the General Series Module (of CT Images) to record codes and parameters used for patient simulation setup. This approach might be extended to support patient setup workflow.

480 XXX. Meeting Wrap-up

XXXI. Adjournment 4/7/23 at 11:00am EDT

485

	Monday 4/3	Tuesday 4/4	Wednesday 4/5	Thursday 4/6	Friday 4/7
8:30 ET PT ET CET JT	Welcome Admin	Admin	Admin	Admin	Admin
[ 6 ] 09 [15][22]	Use Case: Seated Treatment <i>Leo/P-Cure</i>	DRRO Update	Beyond TDW II -cont <i>TSM/Device Integration (DPDW) FHIR</i>	High Definition Structures <i>Status/Review</i>	Summary of week's work
[ 7 ] 10 [16][23]	Beyond TDW II <i>Imaging/Positioning Instruction Online-adaptation</i>	BRTO III		Use Case: Offline Review TPIC/TDIC	Goals and Action Plan and Responsibilities for 2023
[ 8 ] 11 [17][0*]		ROTH			
[ 9 ] 12 [18][1*]	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Wrap-up</b>
[10] 13 [19][2*]	Use Case Discussion New Use Cases Priority	ROTH	TDRC-Brachy Review	TBD - Homework	
[11] 14 [20][3*]	IHE-RO Outreach Vendor Participation	Planning Committee Discussion <i>Planning Committee</i>	DICOM TLS encryption		
[12] 15 [21][4*]	General Updates: XRTS, TDRC-Ion, test tools (access policy and status)	BRTO III	Transfer with non-default character sets (e.g. Unicode)	TF Review <i>Consistency of transactions New transactions Maintenance of transactions/actors</i>	
[13] 16 [22][5*]			Use Case: Dynamic Delivery <i>SCINTIX, Unity...</i>		
17:30 EDT	<b>Wrap-up</b>	<b>Wrap-up</b>	<b>Wrap-up</b>	<b>Wrap-up</b>	