IHE-RO Technical Committee
Face-to-Face with Conference call
February 24-27, 2014 at 8:30-5:30 PM PT, 8:30-12:00 on Feb 28

Technical Committee Chairs:
Bruce Curran, MS, ME
Chris Pauer, Accuray

IHERO Task Force Co-Chairs
Dick Fraass, Ph.D., FAAPM, FASTRO, FACR
John Buatti, MD

Mission Statement: *The American Society for Radiology Oncology (ASTRO) has formed a multi-society Task Force to undertake an initiative to promote the Integration of the Healthcare Enterprise (IHE) – Radiation Oncology (RO), fostering seamless connectivity and integration of radiotherapy equipment and the patient health information systems. The Task Force will include 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	Mon 2/24/14	Tues 2/25/14	Wed 2/26/14	Thurs 2/27/14	Fri 2/28/14
Chris Pauer	Accuray	X	X	X	X	X
Bruce Curran	Brown Univ./ASTRO	X	X	X	X	X
Amber Sims	ASTRO	X	X			
Walter Bosch	Wash. Univ. ATC / IROC	X	X	X	X	X
Uli Busch	Varian	X	X	X	X	X
Koua Yang	Philips	X	X	X	X	X
Dick Fraass	ASTRO	X	X			
Rickard Holmberg	RaySearch	X	X	X	X	X
Jim Percy	Elekta	X	X	X	X	X
Sanjay Bari	Elekta		X	X	X	X
Eli Steven	Mobius		W			
Matt Daniels	Sun Nuclear		W			
Harold Beunk	ICT					

X = in person W = via Webex / Teleconference

Minutes

I. Call to Order (2/24/14 at 9:00 am)
   a. Review Agenda
   b. Approval of minutes from Jan 16, 2014 Teleconference – **approved without objection**
   c. Other broad topics to add

II. Business
   a. Topic 1: Level Set (2/24/14 at 9:30 am)
      i. Updates on IHE-RO activities
         1. Planning, Oversight, Steering Committees (D. Fraass, B. Curran, C. Pauer) – discussion of how to engage the IHE-RO Clinical Advisory Committee
            a. Challenge of communication, synchronizing activity between TC and Clinical Advisory Committee
            b. The clinical impact statement can be used to communicate the *value* and *scope* of a profile.
            c. The Theory of Operations documents could be used to work through high-level approach and to identify clinical issues early in the Profile development cycle.
            d. Suggestion to focus on BRTO
         2. ICT Contracts
            a. Test tools in preparation for TDW-II (update from TDW)
            b. ICT is working on test tools QAPV (work in progress on Structure Report)
            c. Support contract is expected to be completed soon.
         3. Washington U./ATC Support Update (W. Bosch)
            a. A draft document specifying an Archive Round-Trip Testing procedure (addressing Storage and Transport Transparency issues) has been prepared by the ATC.
            b. Work continues to prepare Gazelle for use in IHE-RO testing. With the assistance of Steve Moore (WU Electronic Radiology Lab), test procedures for ARTI Actors have been entered into the Gazelle Master Model. A dry run of ARTI tests is underway.
            c. Gazelle support for ARTI testing to be prepared for April 2014 Connectathon.
            d. ACTION: Walter/Bill to prepare Gazelle tutorial (Webex in mid April). Date to be announced by April 1.
      ii. ACTION: Bruce to solicit an Archive (support) vendor for 2014 Connectathon by March 15.
      iii. ACTION: Amber to confirm IT readiness of ASTRO to support high-bandwidth communication for connectathon by April 1.
      iv. ASTRO news (A. Sims, B. Curran) - AHRQ has solicited comments on five questions regarding ACA Healthcare Information Exchanges. Bruce has reviewed and reported. No significant overlap with IHE-RO TC concerns in this
      v. DICOM Update (U. Busch)
         1. Work continues on finalizing Supplement 147 with DICOM WG-6. The hope is to complete this process early in 2015.
         2. Current work is focused on development on companion objects for content extension, dataset references "container" objects, Query/Retrieve services (for retrieving the latest version of an object).
         3. Supp 160, is being developed as a joint effort of DICOM WG-7 and IHE-RO DPDW Group. Various change proposals are in development, including those for DPDW, TDW-II, Dose Derivation codes.
         4. The WG-7 Brachy sub-group is working on a worklist implementation for brachytherapy delivery. Discussion is ongoing with AAPM and BRAPHYX groups on applicator modeling. There is a desire to share and reference source and applicator

models. May be a need to identify and reference proprietary specifications (esp. for new and non-standard models).

vi. Machine Characterization (J. Percy)
    1. The scope of this effort has been narrowed from an attempt to specify comprehensive physical beam model. The intent is now to provide assurance that the configurable parameters of a treatment machine to be used for delivery match those of the machine used for treatment planning. The strategy is to develop an extensible standard machine representation.

b. Topic 2: Connectathon Update (2/24/14 at 1:10pm)
    i. Survey Test – Review of online registration (qualtrics.com)
    ii. ACTION: Amber to make changes to survey by March 5:
        1. Remove profiles from list for formal testing: TDW-II, QAPV, TPPC.
        2. Remove "(General)" and "(Beam Specific)" suffixes from Actor names throughout.
    iii. Support Activities and Needs
        1. ACTION: follow-up: Chris to send list of DCOM actors to Amber - Done
    iv. Test Tools
        1. Test tools can be downloaded from www.ihe-ro.org (ZIP file dated Aug 2013 includes BRTO, ARTI, DCMP, MMRO-II)
        2. ACTION: Vendors who use Test Tools to provide feedback on opportunities to improve Test Tools and test datasets to Bruce and Chris. Chris to follow up by March 15.
        3. Note to vendors: submission of test tool results is a *prerequisite* for release of Connectathon results.
        4. ACTION: Bruce to update planning instructions to remove references to V80 machine specs by April 15.
        5. ACTION: ICT to update Test Tool Data Sets to include plans with V120 and remove V80 plans for March 15
    v. Test Data
        1. ACTION: Walter to prepare CT images HFP (to be treated FFP) and confirm dataset integrity [Data from Jim Percy – phantom with burned-in orientation] for ARTI testing by April 15.
        2. ACTION: Bruce/Lakshmi to include request to create non-square dose grids, non-uniform grid-frame offsets in planning instructions for BRTO, DCOM profiles by April 15.
    vi. Other Judges Issues
        1. ACTION: Walter to send existing judging checklists to Bruce and Lakshmi by April 1.
    vii. What prep is still needed? What can we do at this meeting?
    viii. Action (1/16): Chris to request RT Plan and Delivery Instruction from TMS, TDD vendors for TDW-II Profile for ICT – Complete
    ix. Action (1/16): Uli to request tags for Table Top Longitudinal, Lateral Parameters from TMS, TDD vendors to reconcile inconsistencies between Part 3 and Part 6 of DICOM CP – Done.
    x. ACTION: Uli to update TDW-II Profile to clarify Tx Record patient header data by April 15.

c. Topic 3: Revising and/or restructuring the BRTO Profile
    i. The greatest success of the BRTO Profile has been in improving the interoperability of segmentation for treatment planning. Several aspects of this profile are in need of updating, however, including requirements to combine multiple image series. Also, the requirement to handle block apertures on input is problematic for MLC-only treatment planning systems.
    ii. Several alternatives to restructuring BRTO were discussed:
        1. Among issues to address in updating the profile are the following:
            a. Remove requirement to combine multiple image series
            b. Make acceptance of geometric plans by dosimetric planners optional
            c. Remove CT-only requirement
        2. Alternatively, the profile could be restructured as two (or more) smaller profiles:

a. Image segmentation for treatment planning
b. Treatment planning dose export

iii. Proposal: small group to assess alternative approaches.
1. End-to-end workflow profiles are good for maintaining clinical relevance and connectedness of Actors
2. Granular building-blocks may make understanding the significance/scope easier

d. Topic 4: Making IHE-RO output more accessible
i. A more effective means of communicating the significance of profiles is needed.
ii. Theory of Operations document is intended to communicate what a Profile does to clinical physicists who are the end users of the Profile.
iii. IHE-RO Publication
iv. ACTION: Steering Committee to organize plan for connecting clinical and technical participants.

Adjourn for the day 2/24/14 at 5:35pm
Start of business 2/25/14 at 8:30pm

e. Topic 5: QAPV
i. Review latest changes to profile.
1. Documents reviewed are available under *Profiles* on www.ihe-ro.org (ihe-ro_qapv_supplement_1_17.doc and cp1288_09-_basic_sr.doc)
ii. Review the DICOM Change Proposal for the Structured Report and other content Include SOP Class of plan to be checked in Plan Check Result SR.
1. Include requirement that SOP Classes agree in finding matching plan instances in the Difference checker.
2. How should the QCR be identified in the Plan Check Result SR? Is its AE Title sufficient?
3. Change name of SR: "Radiotherapy Treatment ~~Plan~~ Check Result"
4. Codes for Candidate (plan) SOP Class and SOP Instance UIDs to be reviewed with DICOM WG-6.
5. It is not clear that the multi-level nested structure in the proposed SR is needed.
iii. ACTION: Chris to revisit a getting-started guide for UPS by April 1.
iv. ACTION: Chris to update the QAPV profile and release updated version on ihe-ro.org by March 8.
v. ACTION: Chris to update CP 1288 and forward to Uli by March 15.
vi. ACTION: Chris to set up a meeting of QA vendors to review dose check parameters by March 15.

f. Topic 6: Touch Base with Work Groups
i. DPDW (2/25/14 at 10:45am)
1. A new mailing list has been established for the DPDW work group: iherodpdw2014@mail.aapm.org
2. Uli provided an update of progress in DPDW working group.
a. Workflow scenarios have now stabilized.
b. The Treatment Session Manager initiates all other actions. Other Actors must initially register with the TSM.
c. Recovery from error conditions was discussed briefly: the *scope* of definition in terms of recovery should be stated in the profile.
d. Volunteers (5-6) have been given writing assignments for transactions.
e. Next meeting is scheduled for March 20th.

ii. Editorial Logbook – Clinical Impact Statements (2/25/14 at 11:25am)
1. List of Technical Committee and Clinical Advisory Sub-committee/Planning Committee authors for Clinical Impact Statements.

2. ACTION: Bruce to post current version of editorial logbook at the top of the Profiles page on www.ihe-ro.org - complete.

iii. ARTI Issues (2/25/14 at 11:45am)
1. For ARTI, how should the Wedge Angle (300A,00D5) tag in the Wedge Sequence (300A,00D1) be interpreted for Motorized Wedges? Is this the *effective wedge angle* or the angle of the *physical wedge* used in the motorized wedge? (There is a Wedge ID (300A,00D4), but no explicit tag for *effective* wedge angle.)
    a. The Wedge Sequence is a list of wedge devices. This is consistent with the understanding that the Wedge Angle (300A,00D5) is an attribute of the *physical* wedge used, and not the effective wedge angle.
    b. ACTION: Bruce to distribute to the TC an updated revision of ARTI with changes indicated by April 1:
        i. For Hard Wedge and Motorized Wedge the Wedge Angle parameter is to be interpreted the physical wedge angle.
        ii. For Virtual Wedge the parameter is to be interpreted as the equivalent physical wedge angle.
    c. ACTION: Uli to refer action on addition of a new Effective Wedge Angle attribute in RT Plan to DICOM WG-7 for March 24 WG-7 meeting.

Break for lunch at 12:30pm – 1:50pm

iv. ROI Templates (2/25/14 at 2:00pm)
1. Structure Naming and Coding – discussion of Santanam, Miller publications
2. Multiple/mixed Coding Schemes may be appropriate for coding target volumes and organs at risk in radiation oncology.
3. Discussion of transport of ROI Template data as DICOM (non-patient data, like Hanging Protocols)
    a. ROI templates are largely read-only (at the segmentation application)
    b. Defining non-patient-based DICOM IODs is one possibility. A Supplement (requires Work Item) would need to be written.
    c. XML (human readable) is more accessible than DICOM, but would still require some standards body to define a schema. (A Profile would need to reference an *existing* data standard.)
4. ACTION: Uli to make brief presentation to WG-6 to discuss the appropriateness of using DICOM non-patient objects for ROI Templates on March 31.
5. ACTION: Bruce and Chris to contact IHE to ask what constraints there are on organizations that issue standards referenced in IHE profiles by March 24 (next IHE DCC meeting).

v. TDW-II (2/5/14 at 3:55pm)
1. Open Issues in version 5.1 were last reviewed in June 2013.
2. Requirements issuing for Progress Update [TDW-RO-XX5] were discussed. Issuing a non-zero-percent progress update provides indication that delivery has started and can aid in recovery in case of a communication error. Knowing that beam delivery has started is clinically important information to be communicated to the TMS.
   DECISION: At least one Progress Update [TDW-RO-XX5] is to remain mandatory after beam-on to indicate that delivery has started. Additional updates are helpful, but are not required.
3. Need to clarify (in section 3.63.4.1.2) which patient identifiers in locally stored plan instances (in TDD) must match those in instances retrieved from the OST.
4. Character Set Specification has been moved to Appendix A.
5. Action (9/13): Uli to sort out the Concept Code for Treatment Delivery Type with WG-6 – CP is currently in letter ballot. (Results expected 3/31/14.)

vi. Other Actions

1. ACTION: Bruce to circulate the proposal to upgrade DCOM Profile to use DICOM 2011 and new MMRO-II version of the Utilize Spatial Registration Transaction to the IHE-RO TC list for comments. – Complete
2. ACTION: Group to prepare drafts of Clinical Impact Statements - Complete
3. ACTION: Bruce to post the revised BRTO CPs on ihe-ro.org by April 1.
4. ACTION: Bruce to update Gantry Pitch Angle (300A,014A) in ARTI – change Specific Rules from "If not present, shall be assumed to be nominal position, If present, may not be ignored." to "If not present, shall be assumed to be zero. If present, shall be zero." (Zero angle = no rotation.) - Complete
5. ACTION: Bruce to update attributes in ARTI: Table Top Eccentric Angle (300A,0125), Table Top Pitch Angle (300A,0140), and Table Top Roll Angle (300A,0144), change Specific Rules to "Shall be zero." - Complete
6. ACTION: Uli to update TDW-II Profile to clarify what "patient header data" means for Tx Record – by April 15.

Adjourn for the day at 5:30pm
Start of business 2/26/14 at 8:30pm

g. Topic 9: Treatment Delivery – Plan Content (TDPC)
   i. Uli presented draft document (V. 1.0)
      1. The Actors and architecture of the TDPC profile were discussed. Consensus to define a single storage transaction between a *Treatment Delivery Plan Content Producer Actor* (responsible for creating content) and a *Treatment Delivery Plan Content Consumer Actor* (accepts and acts on content).
      2. Can content definition be placed in Volume 3? Vol. 3 works for HL7 content modules, but probably will not work for DICOM.
      3. The Use Case section identifies the real-world systems that play the roles of profile actors.
      4. The Workflow Aspects section references dependent workflow profiles. It will also (eventually) reference dependent data transport profile(s).
      5. Content requirements are (currently) defined as modifications of the corresponding requirements of the TPPC Profile. Additional requirements are applicable only if the corresponding sequences/attributes are required to be present in TPPC. It is not yet clear if this will work for all beam types.
      6.
   ii. ACTION: Uli to update draft of TDPC profile and post to the ihe-ro.org wiki by April 15

h. Topic 10: Clinical Impact Statements – Review (2/26/14 at 11:00 am)
   i. The Clinical Advisory Sub-committee has primary responsibility for CIS.
   ii. Technical Committee to assist as requested by CAS.

i. BRTO Profile Review (2/26/14 at 11:40 am)
   i. Five CPs to BRTO are currently in Public Comment (no responses have been received).
      1. CP-RO-2013-001: Table A.3-10 Proposal removes Referenced Fraction Group Sequence (currently R+*) as this requirement is inconsistent with DICOM. (BRTO only allows Dose Summation Type of PLAN and the Referenced Fraction Group Sequence is not present for this Dose Summation Type.)
      2. CP-RO-2013-002: Table A.3-13 RT ROI Interpreted Type (currently O+*) is used by many applications. Proposal is to make it R+*.
         a. Currently requirements for values (Defined Terms) of this attribute are more restrictive than DICOM.
         b. This CP is to be re-issued with the following changes:
            i. Restrict to exactly one ROI Observation per ROI
            ii. Make ROI Interpreted Type of type R+*
            iii. Remove first paragraph of requirements for ROI Interpreted Type

iv. At minimum, the ROI Interpreted Type values listed must be accepted. All other ROI Interpreted Type values must be handled safely.

c. ACTION: Bruce to distribute updated version of this CP for public comment by April 1.

3. CP-RO-2013-003: Table A.1-1, Table A.3-4 Clarification: Frame of Reference UID requirement for Structure Set. Added Note 1 explaining that Frame of Reference UID in Structure Set is in Referenced Frame of Reference Sequence.
4. CP-RO-2013-004: Appendix A.2 Table A.2-1, Table A.2-2 Added explanatory sentence. "Extensions below indicate additional requirements ...."
5. CP-RO-2013-005: Added 3 paragraphs describing issues addressed by the BRTO profile: (a) multiple image series, (b) variable slice spacing, and (c) dose grid spacing.

ii. Appendix A in the TF lists attribute value constraints for the BRTO Profile, but does not adequately state the *scope* of these requirements. A review of the scope of these requirements is needed to decide which of these attribute requirements are

1. Transaction-specific (move into the respective transaction sections),
2. Profile-specific (move to an Profile-specific Appendix of Volume 2), and
3. General, i.e., apply to all RO profiles (move to a General Appendix of Volume 2).

ACTION: Profile owners to inspect Appendix A and evaluate the scope to see which pieces are applicable to their profiles, which are general, and which do not apply (and why). Chris to follow up by April 8.

iii. Restructuring Strategy for BRTO – brainstorming

1. Could retire current TF and replace with a new version?
2. Possible changes to BRTO Profile:
   a. Make combination of multiple image series optional
   b. Make geometric plan retrieval an optional input transaction to Dosimetric Planner
   c. Re-factor into more atomic actors
      i. Image segmentation – consumes images, structure sets; produces images, structure sets
      ii. Dose display – consumes images, structure sets, (plans), doses

   Or Geometric Planner – can this be realized within the TPPC profile?
3. In general, the plan is to work toward separate content, workflow, and data transport profile layers:
   a. create a library of modular content-based profiles,
   b. define workflow profiles (managed and non-managed versions),
   c. define separate data transport/storage profile(s).
4. More granular approach
   a. Define generic, fine-grained Actors, e.g., structure set producer, structure set consumer, etc.
   b. Combine fine-grained Actors as *required groupings*, e.g., Contourer = Structure Set Consumer + Structure Set Producer + Image Consumer (+ Image Producer).

j. RO-HIS – requires HL7 work to define messages for RO (2/26/14 at 4:15 pm)

i. What are the use cases? What are the pain points?

1. Billing
2. Scheduling? Further analysis
   a. What do users expect from an RO scheduler?
   b. Admission, discharge, transfer, referral
   c. Checking on patient progress…?
3. Prescription, lab reports
   a. Likely, reports are useful, could be delivered via CDA, as a PDF
   b. ESI profile has parent order issued from HIS / Child order status updates from TMS

ii. Next steps

1. Clinical people
    a. Where are the providers & payers spending money to get integration?
2. HIS Expertise
    a. What needs are not currently met with HIS base functionality and integration in RO
3. Discussed: is this a priority?
    a. There is strong feeling that this is an important issue in the clinical workflow, but not sure if this will be priority from CAS/PC point of view.
    b. Scoping, exploration is needed

iii. Related resources (wiki.ihe.net)

1. Radiation Oncology Workflow Exchange with HIS http://wiki.ihe.net/index.php?title=Radiation_Oncology_Workflow_Exchange_with_HIS
2. Radiation Oncology Schedule Work Flow (ROSWF) http://wiki.ihe.net/index.php?title=IHERO_UseCase_ROSWF

iv. ACTION: Chris to discuss next steps for RO-HIS Profile with IHE-RO Steering Committee by March 15 (next SC meeting).

Adjourn for the day 2/26/14 at 5:15pm
Start of business 2/27/14 at 8:30pm

k. ROI Templates (further discussion)

i. The ROI Label does not appear to be a long-term solution to standardizing identification
    1. ROI codes were discussed. Supp 147 and CP-1287 include an Additional RT ROI Identification Code Sequence (includes a coded Purpose for Additional Code).
    2. Could use SNOMED or other code to identify the ROI (store in the ROI Dictionary).
    3. The Protocol-based code is to be stored in the ROI Protocol Template.

ii. Incorporating prescription dose in target volume is problematic for some planning workflows, e.g., adaptive planning based on normal tissue complication probabilities.
    1. Prescription doses may be selected downstream of ROI segmentation.

iii. ACTION: Walter to update ROI Template draft for consistency with Supp 147 and CP-1287 (to be included in DICOM 2014 edition) with respect to coding and ROI parameters – to revisit next TC meeting.
    1. Add global ROI code to Dictionary
    2. Add protocol-based ROI code to ROI Protocol Template
    3. Also add "ALTERNATIVE" to the "ROI Required" attribute to indicate that one of a set of ROIs must be included. (Add an Alternative Set Label to identify the set of alternatives.)

iv. What is the next step?
    1. Create a schema – could use non-patient-oriented DICOM (like Hanging Protocols) or XML (need to constrain types to match DICOM VRs). ACTION: Chris to provide Walter with example XML schemas by April 8.
    2. Approach a standards body (published specification and is committed to maintain it) - What kind of standard can be referenced in IHE? NEMA? MITA?

l. Restructuring Profiles

i. Atomic actors will not have as much value to the PC, i.e., at the Use Case level … only by combining them would their value be seen at the Use Case level.

ii. For existing profiles, restructuring has dubious value. For future profiles, this approach has more value.

iii. Proposal: Establish a working group to review existing and planned profiles and construct a "profile schema" (roadmap) that would propose how to leverage atomic actors as building blocks for these profiles.

m. Review of Current RO Technical Framework (2/27/14 at 11:00am)

i. Volume II Appendix content and structure were reviewed. Issues to be resolved include the following:
    1. How to reference global requirements that apply to multiple Transactions (within multiple Profiles)?
    2. Is there a logical way to organize/segment the content in the Vol. II Appendices to facilitate development and improve clarity for readers?
ii. ACTION: (Restructuring WG) Appendix A to be re-structured and text to be edited appropriately (This will also require changes to MMRO, etc. Supplements.) – revisit next TC meeting
    1. Modules tables in Appendix A.2 to remain in Appendix A
    2. Content in A.3 that is specific to a transaction to be moved to that transaction in Volume II.
    3. Content in A.3 that is common to multiple Profiles/Transactions to remain in Appendix A.
iii. ACTION: Chris to upload modified TF Vol. 2 to ihe-ro.org for continuing work by March 8.

Break for lunch at 12:15pm – 1:30pm

n. TPIC / TDIC Content Discussion (2/27/14 at 1:30pm)
i. TPIC covers the content of reference images (DRRs) from TPS ~~or images from a physical simulator.~~ [DECISION: (2/28/14 at 9:40am) – Pre-planning simulation Use Case to be addressed in a separate Profile.]
ii. TDIC addresses transfer of treatment verification images from TDS to TMS.
iii. Profiles set minimum requirements for image *content.* This does not address workflow issues or instructions for acquisition of treatment verification images.
iv. CT Image / Cone-Beam Issues discussed include
    1. Frame of Reference Module is Mandatory for CT Image and RT Image.
    2. For CT Image, table top positions and rotations are required attributes.
    3. Images created under these profiles should have patient identifiers that conform to IHE-RO requirements for attribute consistency.
    4. General Equipment Module: Manufacturer must be present. Model? Version?
    5. Patient Position (0018,5100) – the following terms must be supported by image consumers: HFS, HFP, FFS, FFP, (SITTING for future Ion Plan - additional details concerning chair orientation may need to be resolved, see PS 3.3, section C.8.8.25.6.3)).
    6. Device Module – probably not relevant
    7. CT Image – make KVP (0018,0060), Table Height (0018,1130) attributes mandatory
    8. Use Referenced Image Sequence (0008,1140) to reference related RT Plan instance (type R). Also require Purpose of Reference Code Sequence (0040,A170) to specify that referenced instance is the associated RT Plan. (Need to define Purpose Codes.)
    9. Make Acquisition Date (0008,0022) and Acquistion Time (0008,0032) and/or Acquistion Date Time (0008,002A) Required.
    10. Investigate Cone-Beam indication. May use X-ray 3D Angiography as input modality?
v. RT Image Issues [DRRs]
    1. Same requirement for Patient and General Study Module attributes as for CT Image.
    2. RT Series Module – make Series Date and Series Time Required → This should be considered this for all new Profiles.
    3. Make Frame of Reference Module Mandatory and Frame of Reference UID Required.
    4. General Equipment Module: Manufacturer must be present. Model? Version?
    5. General Image: Image Type (DERIVED\SECONDARY for DRRs?)
    6. Cine Module – Consider this as an Option.
    7. Multiframe Module – needed for Cine
    8. Device Module – probably not relevant
    9. RT Image – consider requiring Pixel Intensity Relationship (0028,1040) and Pixel Intensity Relationship Sign (0028,1041)

10. Image Type (value 3 is OK as is, but needs better explanation, esp. FLUENCE).
11. Conversion Type (0008, 0064) – need to clarify semantics if used, otherwise leave as Type 2.
12. Reported Values Origin (3002,000A) – no additional requirements?
13. X-Ray Image Receptor Translation (3002,000D) – default is centered (half-image height, width); if present, must not be ignored.
14. X-Ray Image Receptor Angle (3002,000E) – default is zero; if present, must not be ignored.
15. RT Image Orientation – support for non-normal orientations must be an option
16. Image Plan Pixel Spacing – required
17. RT Image Position – make mandatory
18. Radiation Machine Name – make mandatory for acquired images only
19. Radiation Machine SAD – required
20. RT Image SID – required
21. Referenced RT Plan Sequence (300C,0002) to reference related RT Plan instance (type RC conditioned on the image being associated with a plan).
22. Attributes Referenced Beam Number (300C,0006) … End Cumulatrive Meterset Weight (300C,0009) are also RC, conditioned on the image being associated with a beam.
23. Exposure Sequence (3002,0030) – required
    a. KVP – 1C (DICOM condition unchanged)
    b. Primary Fluence Mode Sequence – 1C (same condition as KVP)
    c. X-Ray Tube Current – 1C (required for kV images)
    d. Exposure Time – 1C (same condition as KVP ??)
    e. Meterset Exposure – 1C (DICOM condition unchanged: Image Type (3) is PORTAL, i.e., image acquired using Primary Meterset (MU)
    f. RT Beam Limiting Device Sequence – requirements TBD (further discussion tabled) ACTION: TPS, TMS vendors to investigate the source of BLD and Diaphragm information in RT Image instances of type DRR and how/where it is used by April 8 (for discussion at next TC meeting).

Adjourn for the day 2/27/14 at 5:35pm
Resume discussion 2/28/14 at 8:40 am

    g. Gantry – required (refers to *imaging system*)
    h. Gantry Pitch Angle – required
    i. Beam Limiting Device Angle ← TBD: to be revisited with BLD discussion
    j. Patient Support Angle – required
    k. Table Top Pitch – required
    l. Table Top Roll – required
    m. Table Top Vertical, Longitudinal, Lateral – RC required for all *acquired* images, i.e., Image Type [1] is ORIGINAL.
    n. Applicator Sequence – RC required for images acquired with applicator – except Source to Applicator Mounting Distance (TBD should be consistent with handling of BLD)
    o. General Accessory Sequence – Required when present in acquired image
    p. General Accessory Type – Required when present in acquired image
    q. Block Sequence - (TBD should be consistent with handling of BLD)
        i. Review against ARTI
        ii. May not require items necessary for dose calculation
24. Fluence Map Sequence – out of scope for these profiles
25. Gantry Angle, Gantry Pitch Angle, … Table Top Lateral Position – required (same conditions as corresponding values inside Exposure Sequence) - need to clarify usage
26. Isocenter Position - required

27. Patient Position - required

28. Other issues discussed
    a. Burned-in information in RT Images
        i. Use of burned-in information in images should be discouraged (a) to protect patient identity (HIPAA compliance) and (b) to facilitate automated analysis.
        ii. As an alternative, it is possible to use RT Structure Set for contours on RT Images.

vi. ACTION: Uli to draft TPIC and TDIC Profiles for review (at least one by April 15).

o. DECISION: Include Treatment Records in TDPC Content Profile

p. Topic: Review of IHE-RO Profile Map
    i. ACTION: Uli to update current version of Profile Map to insert content boxes into workflow boxes and send to Chris for posting on ihe-ro.org by March 5.

q. ACTION: Chris to set up tickler to remind individuals responsible for action items by April 1.

III. Future Meetings
    a. IHE-RO Meetings
        i. IHE-RO Connectathon, Fairfax, VA - Apr 28–May 2, TC mtg May 4-6 (end at noon)
        ii. IHE-RO Post-ASTRO TC meeting, Sep (17?)*18-20, San Francisco
        iii. IHE-RO Domain Pre-Testing – Oct 6-10, TC mtg 12-15, *tentatively Baden, CH*
            * Consider extending TC meetings after ASTRO, and test events.

    b. Other meetings through 2014
        i. Mar 24-28 WG-7, NEMA, Washington, DC
        ii. Mar 31 WG-6, NEMA, Washington, DC
        iii. Apr 4-8 ESTRO, Vienna (possible meeting with IEC)
        iv. Jun 8-14 PTCOG, Shanghai
        v. Jul 20-24 AAPM, Austin, TX
        vi. Jul 24-26 DICOM WG-7, Austin, TX
        vii. Sep 14-18 ASTRO, San Francisco, CA
        viii. Nov 3-7 DICOM WG-7, Washington, DC

IV. Meeting adjourned at 12:00pm