IHE-RO Technical Committee
Conference Call
December 18, 2017
10:30 am – 12:00 pm EST

Technical Committee Chairs:
Scott Hadley, PhD, University of Michigan
Chris Pauer, Sun Nuclear

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.*

I. Call to Order
    a. Review Agenda

II. Connectathon 2017 Results - Walter

III. Assignments of New Use Cases: see below

IV. Jim Percy – ASTRO – Randy K. Note on Prescription White Paper. Can we comply or help with adhere to the

    ASTRO version. Profile should describe a uniform way of displaying prescription.

V. Discuss:

    a. MMRO-III

        i. (see MMRO17A06xx data)
            1. Does the primary image series need to be axial (in planes normal to an axis)?
            2. Does the primary image series need to be transverse?
            3. "Para-transversal" images (e.g., aligned to brachy applicator) are an important clinical use case.
            4. Consider defining Options for handling image orientation, i.e. General/Oblique Option:
                a. Orthogonal Primary (baseline): requires Image Orientation (Patient) be all +/-1s and 0s) What is the tolerance for rotations? How oblique can the Secondary image series be?
                b. General / Oblique Primary Option

    b. BRTO-II

        i. From Oct 14

1. BRTO-II Dosimetric Planner: Structure Set Storage [RO-2] should be *CONDITIONAL* (real world condition: if structure set is created/modified). Storage of Structure Set should not be mandatory for test tools.
2. BRTO-II allows MR-based, but language uniformly refers to CT images. Inconsistency to be repaired.
   a. ACTION 171004: Chris to update BRTO-II as to change requirements for Dose Comment -- requirement should be R<u>C</u>+

ii. From August:
1. CP for X Indicator – IHE requirement that *an attribute be absent*. This indicator applies only to Type 3 DICOM attributes.
   a. Proposal to use the X indicator comes from the Ion subgroup.
   b. DECISION: Consensus of the TC is to create a CP (CP-RO-003) to add the X indicator to Section 7.1.2 Requirements Definition in the BRTO-II Supplement. This change will allow use of the X indicator in future Content Definitions.
   c. ACTION 170809: Chris to add list of CPs to wiki Profile page to include affected CP titles and affected Profile(s).
   d. ACTION 170819: Walter to discuss IHE-RO specific Attribute Presence requirements with IHE Testing and Tools Committee.

c. TPPC

i. ACTION 171002: Walter to discuss with Steve Moore how updates to TF are to be identified and controlled? (This includes revving DICOM references.)
   1. How often do toolkit manufacturers update their libraries?
   - (Precipitating factor- Effective Wedge Angle (300A,00DE) was added in CP (attribute required by TPPC Profile, but not present in referenced Standard).
   ▪ Static Electron Beam – is "Fixed SSD" technique
     - ACTION 171005: Walter to update Test instructions for Static Electron Beam to use Patient Setup Technique (300A, 01B0) = FIXED_SSD.

d. Other Actions:

i. ACTION 171001: Chris to draft CP for MMRO-III, BRTO-II, and TPPC to reflect changes in the DICOM Beam Dose Verification Control Point Sequence (300A,008C) per DICOM 2017d (includes CP 1658)
ii. Revise MMRO, TPPC Checklists
   1. ACTION 171006: Bruce to revise MMRO-III, TPPC
   2. ACTION 171007: Scott to revise BRTO-II checklist

VI. Next Fact-to-Face Meeting – Melbourne, FL
a. Some focus items for January and/or February:
   i. CPs drafted
   ii. IHE naming / website of IHE-RO profiles brought into consistency with IHE-RO naming
   iii. Update on profile status (published, public comment, etc.)

VII.   New Business

VIII.   Next meeting: January 22, 2018 at 10:30am (not January 15th due to ????)

New Use Cases:
   a. 4D Image Import (Score 3.75) - This use case would define the data elements needed by a TPS to facilitate import and use of respiratory correlated 4D CT and MRI. A TPS would be able to import phases of 4D imaging with enough information to collect the data for a user to plan respiratory motion managed radiotherapy.
         i.   Scott Hadley / Bob Pekarek– Clinical Impact Statement – February Review?
         ii.   TC candidate
         iii. This is a content profile
         iv.   Not limited to CT, can also apply to MR, PET. Focused on respiratory motion.
         v.   Open issue: include cardiac motion? include "quasi-static" motion?

   b. Deformable Registration Objects (DRRO) (Score 3.88) - This profile addresses the need to exchange deformable image registration (DIR) information between different software systems for treatment planning and adaptive therapy.
         i.   Scott sent note for vendor to take on profile – CIS already exists, Rickard possibly has resource, revisit in February
         ii.   TC candidate – some work has been done already
         iii. How to gain more traction? Need to identify outstanding issues.

   c. RO History Exchange (Score 4.62) – This use case would give senders a path to package up treatment history records that are complete and concise; receivers get a concise package of DICOM that can be imported into planning systems and thoroughly document what the plan was and what was actually delivered. It would provide the vendors with an implementation of history exchange they can rely on to contain all the data elements to document treatment.
         i.   CIS – Scott will send to Chris. Chris to get new use cases on RO web page – Parminder Basran
         ii.   DICOM package for treatment plan that was actually delivered.

     iii. Use case includes both treatment planning and treatment delivery (record) information. It is relevant to cross-enterprise exchange of treatment planning data for re-treatment, clinical trials, registries.

     iv. This use case may include both content and workflow. However, i may be prudent to separate these.

     v. More analysis is needed to clarify scope, content/workflow.

d. Brachytherapy (Score 5.5) – UNDERWAY! - This profile addresses the need to transfer brachytherapy plan information from specialized brachytherapy planning systems to TMS or TPS software to facilitate planning of additional radiation treatments.

     i. Need to evaluate scope and relationship to other IHE-RO profiles

     ii. Addressing this Use Case with addition (or brachytherapy versions of) the BRTO-II, and TPPC Profiles was mentioned.

     iii. The broader topic of how to deal with non-C-arm photon therapy plans in DICOM 1st Gen RT was raised.

e. Multi-Modality Residual Dose Optimization (Score 5.62) - It is difficult to account for previously delivered radiation dose for individual patients when planning a second (or subsequent) treatment with a different vendor's radiotherapy treatment planning (RTP) system. DICOM (RT objects) in principle should contain the required information and communication protocol to transfer information between different vendor RTP systems. A Multi-Modality Residual Dose Optimization profile could require compliant RTP systems (also Oncology Information Management systems which act as a centralized data store) to support the transaction(s). The market interest as represented by the member clinics of the IHE-RO P.C. is high.

     i. The DCOM Profile already provides interoperable communication for Compositing Planner capabilities.

     ii. Clarification is needed regarding what other capabilities are expected for this Use Case. Some of these may be product features, rather than interoperability issues.

     iii. TC to push back on development at this time.

f. Integrated Patient QA Checker (Score 5.75 *tie) - UNDERWAY! - Today many effective patient QA solutions rely on stand-alone systems. Lack of integration of these important QA systems with TPS and TMS systems greatly hinders the reliability and efficiency of the patient specific QA checks and their verification. The lack of integration causes not only a lot of manual work for clinicians but also an increased risk that patient is treated before the required QA checks on the treatment have been successfully completed. Manpower and the lack of reliability of manual entering QA check results to multiple systems also discourage the adoption of these patient QA systems into everyday operations.

     i. Chris Pauer working on

     ii. This Use Case appears to be essentially the same as the QA Workflow Profile.

     iii. Consensus of the TC was to combine this Use Case with the QAW Profile.

g. Quality Assurance Workflow Supplement (QAW) (Score 5.75 *tie) - UNDERWAY! - Using the RT Plan, Planning Images, RT Structure Set and RT Dose (or equivalents) produced by a Quality Assurance Planning Analysis (QAPA) Planning Data Provider (such as a Treatment Planning System) as inputs, the QAPA Planning Analysis Performer assesses the dose that will be delivered to the

Structures and Dose References, and Reports on the findings. Results are stored with a QAPA Data Store actor (such as a Treatment Management System, PACS, or EMR). There is also the allowance that a QAPA Planning Session Manager would hold the order for the planning session, and would gather the outputs and progress of the Planning Analysis.

      i. See above

h. Archive of Radiation Oncology Plan and Treatment (Score 5.88) - This use case would create an IHERO profile that defines data content, storage, and retrieval.
      i. In parking lot for now.
      ii. "Time Capsule" use case to "future-proof" storage of treatment planning data.
      iii. Vendor neutral archiving in a form that will be usable in 20 years.
      iv. May include 1st to 2nd Gen DICOM re-coding

i. Query and Retrieve in Radiation Oncology (Score 6.0) - This profile facilitates seamless retrieval of data required at various stages in a radiotherapy planning/delivery process.
      i. Put on agenda for review for February

j. Survivorship Care Plan (Score 8.25) - This use case specifically addresses identity and formatting of data items to pass from radonc systems to hospital EMRs to meet the need for a Survivorship Care Plan.
      i. There has been some progress in the RO HIS group on working out the essential information to be sent to an EMR to report on what was treated with RT (HIS Dose Elements).
      ii. Treatment summary is a minimal subset of treatment plan information (at the level of detail of an RT prescription).
      iii. Some discussion of staging information.
      iv. The RT dose information is expected to be combined with surgery and medonc information in the Survivorship Care Plan.

IHE-RO expects to focus on HIS Dose Elements exchange and RXRO.