

Reported by (Name):	Bruce Curran
Organization:	IHE-RO (WG, TC, PC, Connectathons, and IHE Board)
Position Title:	Member, IHE-RO Planning & Technical Committees; Co-chair, WG on IHE-RO (Science Council); Monitor, IHE-RO Connectathons; IHE-RO representative to IHE International Board
Activity:	Meeting Attendance (virtual)
Meeting Dates:	TC: 1/16, 2/20, 3/19, 4/6-10, 5/21, 6/11/2020 PC: 1/10, 2/18, 6/23/2020 WG: 1/3, 2/7, 3/10, 4/14, 5/26, 6/9/2020 IHE Board: 1/9, 2/13, 3/12, 4/9, 5/14, 5/15, 5/27, 5/29, 6/11, 6/15, 6/17/2020
Meeting Location:	Virtual meetings / monthly TCons
Payment \$:	0
Reasons for Attending or not Attending	Attended most meetings (also some sub-group meetings, also virtual)
Issues from Previous Meetings or Year:	Continuing work on development of profiles, test tools, and testing of issues found in the IT workflows in radiation oncology.
General Description of Activities of the Organization and/or Meeting:	Promotes interoperability of vendor IT systems in radiation oncology. IHE-RO has, in addition to the main Planning and Technical Committees, working groups under the TC working on brachytherapy, ion therapy, motion management, and interfacing with HIS systems.
Issues for AAPM:	Current work (see attached Annual Report to IHE) has been limited by the number of vendors and attendance. The required move to virtual meetings has increased overall attendance, though time-limited due to time-zone limitations for attendees (the group is highly international). Working now on how to hold a virtual connectathon (scheduled for November) assuming that travel restrictions are still in place. IHE-RO membership has, after decreasing for several years due to corporate consolidations, been increasing as new companies enter the market and its activities with HIS systems expand.
Budget Request (\$):	IHE-RO is budget-neutral – supported by vendor dues. Expenses are generally about 60% test tools, 20% travel, 20% staffing. With travel restrictions, travel budget is essentially \$0 so far this year.

Board Report: IHE Radiation Oncology Domain 2020

Sponsors:

- American Association of Physicists in Medicine (AAPM)
- Supporting Organizations
 - American Society for Radiation Oncology (ASTRO)
 - Association of Radiation Oncologists of India (AROI)
 - Canadian Association of Radiation Oncology (CSRO)
 - Egyptian Cancer Society – Radiation Oncology
 - European Society for Therapeutic Radiology and Oncology (ESTRO)
 - Japanese Society for Therapeutic Radiology and Oncology (JASTRO)
 - Spanish Medical Physics Society (SEFM)

Leadership:

- Secretariat: Jill Moton, AAPM, jill@aapm.org
- Board Representative: Bruce Curran, VCU Health System (AAPM), Bruce.Curran@vcuhealth.org
Alternate: Bridget Koontz, Duke University Medical Center, Bridget.koontz@duke.edu
- Plan Cmte Co-chair: Mary Feng, University of California San Francisco, Mary.Feng@ucsf.edu
- Plan Cmte Co-chair: Björn Hårdemark, RaySearch Laboratories,
bjorn.hardemark@raysearchlabs.com
- Plan Cmte Co-chair: Alf Siochi, West Virginia University, rasiochi@hsc.wvu.edu
- Tech Cmte Co-chair: Chris Pauer, Sun Nuclear Corporation, chrispauer@sunnuclear.com
- Tech Cmte Co-chair: Scott Hadley, University of Michigan, swhadley@med.umich.edu

Membership Rosters:

- Planning Cmte: <https://www.dropbox.com/s/afiu6q9cysgmthf/2020.03%20IHE-RO%20PC%20Roster%20by%20Company.xlsx?dl=0>
- Technical Cmte: <https://www.dropbox.com/s/3mxkihg3vkhok2r/2020.03%20IHE-RO%20TC%20Roster%20by%20Company.xlsx?dl=0>

Activity:

- Domain Scope: Radiation Oncology addresses information sharing, workflow, and patient care issues pertinent to radiation oncology.
- Current Cycle Timeline/Milestones: https://wiki.ihe.net/index.php/Radiation_Oncology
- 2019 was a productive year for IHE-RO. Several profiles were advanced and sent to public comment or final draft. The Connectathon was held in the fall with and allowed testing of 3 new profiles. IHE-RO held a session at AAPM annual meeting which resulted in new profile ideas. Finally, the transition of IHE-RO from ASTRO sponsorship to AAPM was completed.
- Background: IHE-RO was established by ASTRO in 2004. The first independent Connectathon was held in 2007 at ASTRO HQ, and a connectathon has been held each year since. In 2019, the Connectathon was held October 7-12, in Stockholm, Sweden. The 2020 IHE-RO Connectathon will be held in Arlington, VA at NEMA / MITA headquarters on November 16-20, 2020.

Most Significant Profiles:

Title	# vendor (Cthon)	# product (Registry)	Description	Significance
Treatment Planning - Plan Content (TPPC)	3 (3 products)	TBD	Treatment plan information exchange for c-arm gantries.	The vast majority of RT plan exchanges are handled by TPPC.

Multi-modality Image Registration for Radiation Oncology III (MMRO III)	4 (6 products)	TBD	Allows objective assessment that products can handle PET, CT, MR, and other imaging modalities to position a patient for treatment. Allows flexibility with primary image set with advances in MR-planned and guided RT.	Handles exchange of image fusion and datasets that are critical to RT treatment planning and image guided radiotherapy. Prevents confusion and errors in frame of reference which could lead to ineffective patient position and treatment.
Basic Radiotherapy Objects II (BRTO II)	3 (5 products)	TBD	Defines minimum standards for information exchange in each step of treatment planning, from CT import, to contour creation and transfer, through radiation dose display.	Allows many software systems that are outside of treatment planning workstations to exchange RT information used for simulation, contouring as well as inputs to treatment planning.
Treatment Delivery Workflow II (TDW II)	5 (5 products)	TBD	Enforces seamless plan transfer from the Treatment Management System to the Delivery Device.	Standardizes and automates radiation therapist workflow to ensure treatment of correct plan on the correct patient and body site on the correct days. Transfers patient schedule and plan information between hardware vendors and treatment management vendors.

Significant Deployment Activity:

- In general, the field is small, 3-4 major vendors, 10-12 smaller ones
- Several vendors have deployed software that supports TPPC, MMRO III and BRTO II profiles, tested at the Connectathon in 2019.
- 2019 saw the first successful testing for the TDW-II profile, the domain's first workflow profile.
- Beginning to make inroads to HIS integration with radiation oncology. HIS profile is finishing drafting soon and will move to trial implementation in 2020.

Demonstrations and Other Events:

- The Technical Committee held several phone calls as well as face to face meetings to draft and advance IHE-RO profiles. In 2019, face-to-face meetings were held at Sun Nuclear in Melbourne, FL on January 14-18, following the AAPM Spring Clinical in Orlando, FL on April 2-5, at the AAPM Annual Meeting in San Antonio, TX on July 15-17, following the IHE-RO Connectathon on October 11, and in Hayward, CA on December 9-13. In 2020, the Technical Committee planned to hold 4 face-to-face meetings, however, meetings in April and July have been replaced with virtual meetings due to COVID-19 concerns.
- A Connectathon was hosted in Stockholm, Sweden and hosted by RaySearch. Results have been approved and were released. 3 vendors passed BRTO-II, 3 vendors passed TPPC (however, limited by a lack of participants), 4 vendors passed TDW-II, and 4 vendors passed MMRO-III.
- TestTool development continued this year under the ICT contract. ICT recorded several "How To" webinars that were posted to YouTube for later viewing. Development continues on test tools looking to complete a general "content validation" software tool.

New Profiles:

- TPPC and TDW-II successfully tested at the last Connectathon. Along with BRTO-II and MMRO-III, this profile is being formatted for inclusion in the Technical Framework.
- RXRO is finishing up drafting and will move to trial implantation soon.
- RO HIS profile is targeted to exchange RT prescription information and basic treatment delivery records for accessibility in HIS system.

Trends:

- Increasing need for integration of OIS and HIS systems leading to focused profile in this area and collaboration with similar efforts in other organizations such as ASTRO.

- Exchange of RT treatment information between clinics, not just within, is increasing and will be addressed by IHE-RO.

Summary of Future Plans:

- Continue to implement DICOM for RT prescription, proton radiotherapy, brachytherapy, and other RT standards in DICOM.
- Integration with HIS and exchange of RT treatment plans and records between hospital systems.
- The current profile pipeline is balanced between those finishing trial implementation, public comment, drafting, those proposed. We need to focus on moving HIS and RXRO to trial implementation.

In order of importance from high to low,

- 1) IHE-RO needs to get existing profiles into products,
- 2) continue creating clinically relevant profiles, with incorporate new technologies, and
- 3) get existing products deployed in clinical sites. IHE-RO efforts are currently limited by the following:
 - Resources – the IHE-RO effort is small, generally involving 8-12 vendors and organizations in the development of profiles and 3-7 vendor products in any specific profile.
 - Clinical Resources - A small group of clinicians (Radiation Oncologists and Medical Physicists) support the IHE-RO Planning Committee and technical committee. More clinical engagement is required, along with definition of tasks and processes and closer integration of medical and technical expertise.
 - Technical Resources - The IHE-RO Technical Committee has 10-15 active individuals (most of whom also participate in DICOM WG7). Each effort requires 4-5 weeks of meetings/year, requiring significant corporate and society backing. In addition, TC members are roughly 50% US-based, 40% Europe-based, and 10% other, resulting in significant expenses in time and money for meetings.