IHE – Radiation Oncology
Improving Quality and Safety in Radiation Oncology

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Acknowledgements

- IHE-RO Domain Committees

- IHE Resources
  - [http://www.ihe.net/](http://www.ihe.net/)
Disclosures

- Co-chair, IHE-RO Technical Committee
  - Funding from ASTRO for participation
- Vice-Chair, DICOM Working Group 7
  - Funding from AAPM for participation
- Member, Oncology Working Group
  - Certification Commission on Health Information Technology (CCHIT)
Outline

- What is IHE?
  - Mission / Vision
  - Structure
- What is IHE-RO?
  - Purpose
  - Activities
- How can IHE-RO improve Patient Safety?
Providers and Vendors
Working Together to Deliver
Interoperable Health Information Systems
in the Enterprise
and Across Care Settings
4 Steps of IHE Process

A defined, coordinated process for standards adoption. Repeated annually, promoting steady integration

- Identify Interoperability problems
- Specify Integration Profiles
- Test Integration Profiles at Connectathon
  - Vendor testing using Test Tool Suite
- Publish Integration Profiles for use in RFPs
How does IHE Function?

- **Participants include:**
  - Users - Clinicians, Staff, Administrators, CIOs, Governments (e.g. NIST, VA).
  - Vendors - Information Systems and Equipment
    - e.g., imaging, cardiology, devices
  - Consultants

- **Maintains formal liaison with Standards Development Organizations (SDOs):**
  - HL7, DICOM, ISO (Liaison D), others

- **ISO TC215 (including ANSI) approved IHE Process and Profiles to be published as technical reports**
IHE - Radiation Oncology

- DICOM WG-7 (April, 2004)
- ASTRO Board of Directors (June, 2004)
- NEMA Radiation Therapy Section (July, 2004)
- ASTRO Annual Meeting (October, 2004)
- Kick-off Committee Meeting (November, 2004)
- IHE-RO Technical Committee
  - First Meeting, January, 2005 w/ DICOM WG-7
IHE-RO GOALS

- Improve the connectivity of various radiation oncology hardware and software products
- Improve radiation oncology work flow
- Help to select products based on features, productivity and cost efficiency
- Improve patient care
IHE-RO Sponsors

INTEGRATING THE HEALTHCARE ENTERPRISE (IHE) – RADIATION ONCOLOGY (RO)

Participants in IHE-RO
- Advanced Technology Consortium (ATC)
- American Association of Physicists in Medicine (AAPM)
- American College of Radiology (ACR)
- American Society for Therapeutic Radiology and Oncology (ASTRO)
- Association of Radiation Oncologists of India (AROI)
- Canadian Association of Radiation Oncologists (CARO)
- Chinese Society of Radiation Oncologists (CSRO)
- CMS
- Egyptian Cancer Society - Radiation Oncology
- Elekta
- European Society for Therapeutic Radiology and Oncology (ESTRO)

International Atomic Energy Agency (IAEA)
- Impac
- Japanese Society for Radiation Oncology (JASTRO)
- Miranda Solutions
- National Cancer Institute (NCI)
- National Electrical Manufacturers Association (NEMA)
- Nucletron
- Philips
- Tomotherapy
- Radiological Society of North America (RSNA)
- Siemens
- Varian

Rhode Island Hospital
- A Lifespan Partner

Brown Alpert Medical School
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Elekta
European Society for Therapeutic Radiology and Oncology (ESTRO)
Common Issues in Information Transfer in Radiation Oncology

- Manufacturers have interpreted the DICOM Standard differently
  - DICOM was developed by consensus, not always one way to transfer information
- Different limits assigned to TPS information
  - # of ROIs, Contours, Points
  - Representation of a CT-Sim plan
  - Exchange of Dose Information
  - Safe handling when exchanging information
How Does IHE-RO Function?

- **Planning Committee**
  - Identifies information systems or components of information systems that produce, manage, or act on information associated with clinical and operational activities that require integration.

- **Technical Committee**
  - Identifies and implements standards for interactions between actors that communicate the required information through standards-based messages.

The PC and TC work together to Prioritize Efforts, Propose Solutions, and Eventually Demonstrate Connectivity.
IHE-RO Process

- Use Case
- Integration Profile
- Domain Pre-Testing
- Connectathon
- Public Release
IHE-RO Use Case
Multi-modality Registration

- A patient is scheduled for a planning CT in a radiation oncology clinic for treatment of an acoustic neuroma.
- A MRI image set, taken approximately 2 weeks prior, is available and pre-loaded on the hospital PACS.
- After CT imaging, it is determined that the tumor is not suitably visible on the CT image dataset and segmentation is done on the MRI axial image dataset. The target GTV, brain stem, and optic chiasm are drawn on the original MRI volume.
- The CT and MRI image datasets are then registered, using the CT-Simulation workstation, reviewed, and all image and segmentation data stored.
Multi-Modality Registration
Integration Profile
Domain Testing
IHE-RO Connectathon
ASTRO HQ

Elekta
Impac
CMS
Brainlab
Tomotherapy
Philips
Nucletron
Varian

Courtesy of ASTRO HQ
Public Demonstration
IHE-RO Technical Frameworks

IHE-Radiation Oncology
Sample RFP Language

Vendor shall provide an IHE integration statement for the System, which explicitly identifies which IHE Actor or Actors, as defined by the IHE Technical Frameworks, System implements. Vendor shall specify the version and release date of the Technical Frameworks used for such definition and shall note any later releases of the Technical Frameworks which alter the behavior of such Actor or Actors.

IHE-Radiation Oncology
Technical Framework
Volume 1 - Integration Profiles
IHE-RO Progress

- **2007**
  - Basic Interoperability

- **2008**
  - Multi-Modality Image Registration

- **2009**
  - Basic Worklist / Workflow Integration
  - Advanced Interoperability

- **2010**
  - Dose Compositing
  - Treatment Delivery Workflow
How can we improve Patient Safety?

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Thank you