IHE-RO Goals

- Improve the connectivity of various radiation oncology hardware and software products
- Improve radiation oncology work flow
- Help end users select products based on features, productivity and cost efficiency

Improve patient care
Steps of IHE Process

A defined, coordinated process for standards adoption.

- Repeated annually, promoting steady integration

- Identify Interoperability problems – use cases
- Specify Integration Profiles – solutions
- Develop test tools for these profiles – in house testing
- Test systems at Connectathon against profiles
- Publish Integration profiles for use in RFPs
- Publish Users success stories
Completed Use Cases

- Simple treatment planning use case
  - Basic RT Objects Integration Profile
  - Tested in 2007
  - Illustrates basic functionality for transferring data between treatment planning systems.
  - 5 Treatment planning systems passed this profile.
Basic RT Objects Integration profile
Completed Use Cases

- Multimodality image registration for Radiation Oncology use case
  - Multimodality registration Integration Profile
  - Tested in 2008
  - Illustrates functionality for transferring multimodality registration data between treatment planning systems.
  - 5 Treatment planning systems passed this profile.
Multimodality Image Registration for Radiation Oncology
Completed Use Cases

- Advanced treatment planning use case
  - Advanced RT Integration Profile
  - Tested in 2009, 2010
  - This is an extension to the basic treatment planning profile.
  - 4 Treatment planning systems passed this profile.
Completed Use Cases

- RT Treatment workflow use case
  - Treatment delivery workflow Integration Profile
  - Tested in 2009, 2010
  - First step towards departmental workflow management.
  - 2 Treatment management systems & 2 treatment delivery devices passed this profile.
Treatment delivery workflow profile
Use Cases Being Developed into Integration Profiles

- Dose Compositing use case
  - Dose Compositing Integration Profile
  - Summing multiple dose distributions defined in a common frame of reference.
  - Should have been tested in 2010/2011?
Dose Compositing profile
Use Cases Being Developed into Integration Profiles

- Structure template creation use case
  - Consistent naming of organs at risk and target volumes
    - Clinical workflow – to facilitate automation in prescription and plan evaluation
    - Clinical trials and data registries – to facilitate quality assurance and outcomes analysis across subjects
  - TC working on a structured XML template.
    - Standardized structure names to be used for segmentation.
    - Clinical and clinical trials workflow, including prescription, planning, plan analysis, plan review, and automated QA.
Use Cases Being Developed into Integration Profiles

- Radiation Oncology workflow exchange with HIS use case
  - Transfer of patient demographics data between HIS and each system in the RT workflow.
  - Active sub-group working on this use-case.
    - CT-Simulator receive demographics from TMS
    - Moving towards workflow based profiles.
Use Cases Being Developed into Integration Profiles

- Integrated Patient QA checker use case
  - Quality Assurance with Plan Veto Profile
## IHE-RO Results

<table>
<thead>
<tr>
<th>Software name, Version, Release date</th>
<th>Basic RT Objects</th>
<th>Multimodality Registration for RT</th>
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</thead>
<tbody>
<tr>
<td><strong>Accuray</strong> CyberKnife</td>
<td>Contour</td>
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<tr>
<td><strong>Brainlab</strong> iPlan</td>
<td>Geometric Planner</td>
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<td><strong>Elekta</strong> Ergo</td>
<td>Dosimetric Planner</td>
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<td>Focal</td>
<td>Dose Display</td>
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<tr>
<td>Mosaix</td>
<td>Basic Objects Archive</td>
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<tr>
<td>Synergy</td>
<td>Registror</td>
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<td>Xiao</td>
<td>Registered Contour</td>
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<tr>
<td>MOSAIQ Oncology PACS 4.5.2</td>
<td>Registered Display</td>
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<tr>
<td>Released before Connectathon</td>
<td>Registered Dose Display</td>
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<tr>
<td><strong>Nucletron</strong></td>
<td>RT Modality Archive</td>
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<td><strong>General Electric</strong> Advantage Sim</td>
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<td><strong>MIMVista</strong> Workstation</td>
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<td><strong>Archive</strong></td>
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<td><strong>Nucletron</strong> Oncentra</td>
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<td><strong>Philips</strong> Tchnical</td>
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<td><strong>Siemens</strong> Archive</td>
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<td><strong>SyngoRT</strong></td>
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<td><strong>Tomotherapy Treatment Unit</strong></td>
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<td><strong>Planning System</strong></td>
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<td><strong>Varian Aria</strong></td>
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</tbody>
</table>
IHERO Helper

What is it?

- A Web application that allows users to evaluate interconnectivity and interoperability (IHERO Compliance) of radiotherapy devices in a straightforward and intuitive manner

Specific Objectives:

- Provide ready access to connectathon results of Clinical Use Cases
- Present technical results in the context of clinical application
- Allow proactive assessment of connectivity issues for
  - new equipment purchase
  - Provide language for interconnectivity and interoperability in a RFP
IHERO Helper – Conceptual Model

Connectathon Results >> Clinical Context >> Connectivity Chart

University of Florida
IHERO Helper – Conceptual Model

Connectivity

TPS ↔ TPS

Note:
1. Not all features shown.
2. Only connectivity for a wedge feature is illustrated.
IHERO Helper – Web Architecture

Input:
- Connectivity type
- Treatment techniques
- Products & versions

Query the DB

Return Connectathon results

Display compliant results
- using table/textual format?
- using diagram flow
Thanks!!