



# *Integrating the Healthcare Enterprise International*

*Free Educational Webinar Series 2011*

*Learn More: [www.ihe.net/events/webinars2011.cfm](http://www.ihe.net/events/webinars2011.cfm)*





# Cardiology Domain

*Harry Solomon*

*GE Healthcare*



# Cardiology Domain Agenda



- Domain & Committee Overview
- Domain Profiles & Technical Frameworks
  - Overview of Profiles developed
  - New Profile developed in 2010-2011 year
  - Profiles in development (white papers)
- How to Participate?
  - IHE International Membership
  - Planning & Technical Committees
- Q&A Session

# Cardiology Domain Overview

- Scope: interoperability in the *in-patient* and *ambulatory* cardiology practice
- Sponsors: American College of Cardiology, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Rhythm Society
- Established 2003
- Close working relationship with other IHE domains
  - Radiology
  - Patient Care Coordination
  - IT Infrastructure
  - Patient Care Devices
  - Quality, Research and Public Health

# Profiles & Technical Frameworks



## *Overview*

- IHE Technical Frameworks
  - Final Text: Current version 4.0 
  - Trial Implementation: Supplements 
  - [http://www.ihe.net/Technical\\_Framework/index.cfm#cardiology](http://www.ihe.net/Technical_Framework/index.cfm#cardiology)
- Brief descriptions of Profiles developed by Cardiology Domain
  - [http://wiki.ihe.net/index.php?title=Profiles#IHE Cardiology Profiles](http://wiki.ihe.net/index.php?title=Profiles#IHE_Cardiology_Profiles)

# Profiles & Technical Frameworks

## *Workflow in the in-patient environment*

- **Profiles aligned with IHE Radiology workflow**
  - Scheduled and unscheduled cardiac imaging exams, including multimodality
  - Management of data, demographic and procedure identifiers
  - *Cardiovascular Information Systems, PACS, imaging and waveform modalities: X-ray and hemo (cath lab), Echo, Nuc; imaging analysis and reporting workstations*
  - **Consistent, robust workflow minimizes manual procedure management tasks**

- Cath Workflow 
- Echocardiography Workflow
- Stress (ECG+imaging) Workflow 
- Evidence Documents (cardiology specialization)
- Displayable Reports Workflow

# Displayable Reports (DRPT) Workflow

- Cardiology reports typically include lots of graphics
- Addresses workflow between a reporting application and the departmental info system and/or the EMR
  - Possible report archiving to PACS
- Report format may be PDF or HL7 CDA
- Applicable to other clinical domains!

The collage displays various medical report formats and graphics. It includes a 'Wait Motion Score Report' form with patient information and a grid of 12 circular motion score diagrams. Below this is a 'Lactation Imaging Associates Cardiac MRI' report, which features sections for 'Left Ventricle', 'Right Ventricle', and 'Other', each containing a table of measurements and a small circular graphic. To the right of the MRI report is a 'HEALTH CARE FACILITY NAME' report header and a table of patient data. At the bottom right are two echocardiogram images and a diagram of a heart cross-section with colored regions.

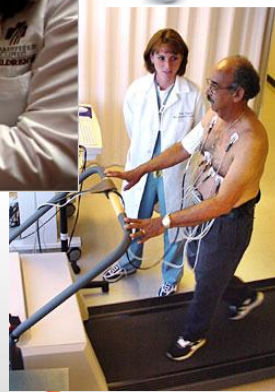


# Profiles & Technical Frameworks

## *Workflow in the ambulatory environment*

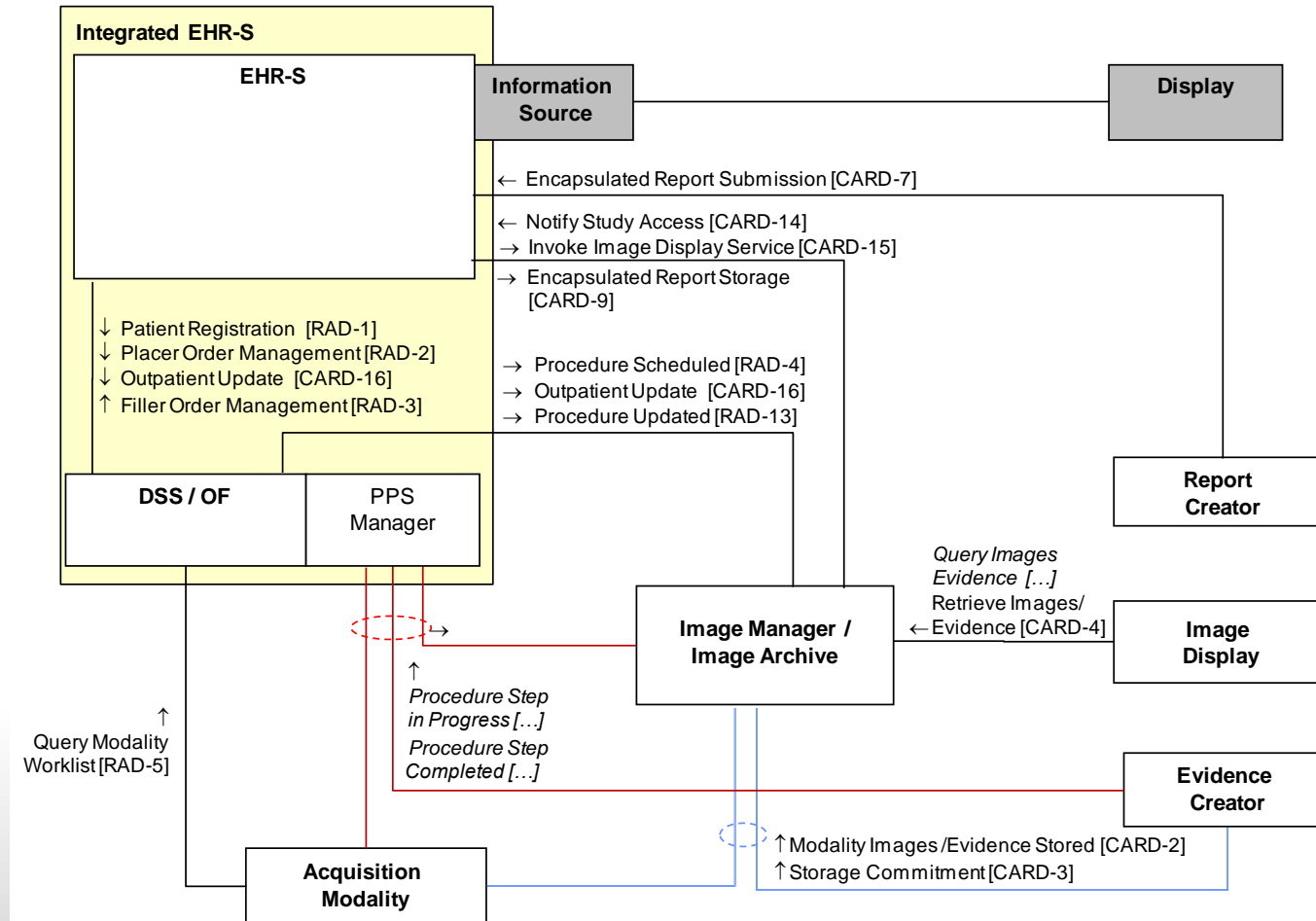
- **Image-Enabled Office**

- Bi-directional integration of medical imaging equipment and office EMR
- Not limited to cardiology – applies to orthopedics, women’s health, gastroenterology, even primary care
- *Ambulatory office EMRs, mini-PACS (or cloud PACS), imaging modalities*
- **Supports the draft Meaningful Use criteria for EMR with imaging**



TRIAL

# Image-Enabled Office (IEO) Workflow



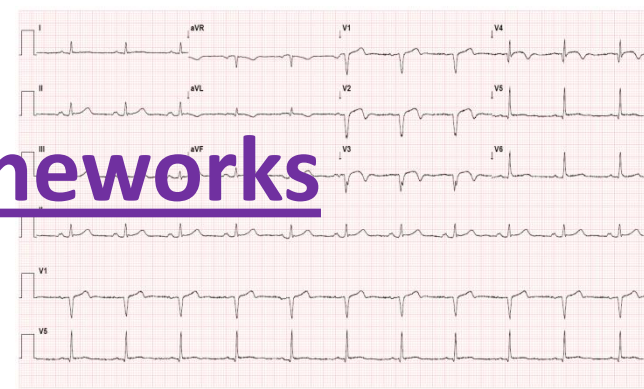
# Image-Enabled Office

- Leverages in-patient workflow concepts to minimize impact on imaging devices, but adapted to use with office EMR (EHR-S)
- EMR – PACS image display integration using Web technologies
- *Integrated EHR-System* is an optional integration of an EMR with the image “order filler” (scheduling and management) function
  - Can be implemented with 3<sup>rd</sup> party software components without having to expose internal order transactions
- Agnostic to EMR and PACS deployment technology (on-site, hosted, SaaS, cloud, etc.)



# Profiles & Technical Frameworks

## *ECG Workflow*



- **Retrieve ECG for Display**
  - Access to ECGs from everywhere in the hospital
  - Resting ECGs, Holter ECGs
  - *ECG Management Systems, EMRs, workstations*
  - **Simplified and standardized Web-based access to ECGs; No need for ‘printed ECGs’**

FINAL

- **Resting ECG Workflow**
  - Multi-system workflow for the most common cardiology exam
  - Scheduled/unscheduled, post-exam reconciliation
  - *Cardiovascular Information Systems, ECG Management Systems, ECG devices and workstations, PACS and imaging workstations, EMRs*
  - **Components and workflow shared with imaging**

TRIAL



# Resting ECG Workflow

- Familiar Actors and Transactions from other workflow profiles
- *Integrated ECG Manager* is an optional integration of the actors in the “middle”
  - Makes it easier for traditional ECG management products to adopt this profile without having to expose transactions between the integrated components
- Individual actors are still present so traditional departmental management and archive products can implement Resting ECG Workflow like other scheduled workflows

TRIAL

# Profiles & Technical Frameworks

## *New Profile in 2011*

- **Cardiac Imaging Report Content**
  - CDA structured report (XML) to facilitate consistency, accuracy, and semantic interoperability of imaging findings
  - Based on ACC/AHA 2008 Key Data Elements for Cardiac Imaging
  - *Cardiovascular Information Systems, EMR systems, imaging analysis and reporting workstations*
  - **Aligned with draft 2014 Meaningful Use requirements for care coordination**

```
<ClinicalDocument xmlns='urn:hl7-org:v3'>
  <typeId extension="POCD_HD000040"
  root="2.16.840.1.113883.1.3"/>
  <templateId root='1.3.6.1.4.1.19376.1.5.3.1.1'
  <templateId root='1.3.6.1.4.1.19376.1.4.1.1.1'
  <templateId root='2.16.840.1.113883.10.20.18.
  <id root=' ' extension=' '/>
  <code code='18748-4' displayName='Diagnostic
  Imaging Study report'
    codeSystem='2.16.840.1.113883.6.1'
    codeSystemName='LOINC' />
  <title>Cardiac Imaging Report</title>
  <effectiveTime value='20111004012005' />
  <confidentialityCode code='N' displayName='No
    codeSystem='2.16.840.1.113883.5.25'
    codeSystemName='Confidentiality' />
  <languageCode code='en-US' />
  <componentOf>
    <encompassingEncounter
      xmlns:ihecard='urn:ihe:card'>
      <templateId root='1.3.6.1.4.1.19376.1.4.1.
      <effectiveTime value="20110407"/>
      <responsibleParty>
        <assignedEntity>
```

TRIAL

# Cardiac Imaging Report Content

- HL7 Clinical Data Architecture (CDA) supports both human readable narrative and robust XML-encoded data elements
- ~100 discrete cardiology data elements, fully modeled using non-proprietary SNOMED, LOINC, and DICOM terminologies
  - Cardiac superset of HL7 CDA Procedure Note
- Data importable into longitudinal patient tracking databases
- First step to wider secondary use of report data (outcomes research, quality metrics and quality improvement)

TRIAL

# Profiles & Technical Frameworks

## *2011 White Papers for Profiles in Development*

- **Electrophysiology Data Elements**

- Common nomenclature for EP for semantic interoperability
- Based on ACC/AHA/HRS 2006 Key Data Elements for EP Studies
- Preparatory step to profiles for exchange of discrete data elements (Cardiac EP Report Content)

WHITE PAPER 2011  
for Public Comment

- **3D/4D Echocardiography**

- Explore clinical workflows for new technology
- Define data requirements for supporting that workflow
- Preparatory step to profiles for exchange of 3D/4D imaging data and associated data products

WHITE PAPER 2011  
for Public Comment

# Profiles & Technical Frameworks

## *Cardiology Related Profiles in Other Domains*

- Radiology
  - Scheduled Workflow (CT/MR/NM)
  - Nuclear Medicine Image (cardiac)
  - Evidence Documents, Key Image Note
  - Portable Data for Imaging, XDS-I, Import Reconciliation
- Patient Care Devices
  - Implanted Device Cardiac Observations
  - Device Enterprise Communication
  - Waveform Content
- Patient Care Coordination
  - Medical Summary
  - ED Referral
- IT Infrastructure
  - XDS, ATNA, Consistent Time
  - PIX, PDQ, PAM
  - Retrieve Form for Data Capture

# How to Participate in IHE Cardiology?

***IHE International Membership is Free.***

- Apply for IHE International Organizational Membership
  - Visit: [www.ihe.net/apply](http://www.ihe.net/apply)
  - Approved monthly by IHE International Board
  - [Review IHE's 400+ Organizational Members](#)
- Participate in IHE Domains & Committees
  - *IHE Organizational Members only*
  - *12 Clinical and Operational Domains*
  - Each Domain has one planning and one technical committee
- Non-members participate in comment periods and implement IHE Technical Frameworks

# IHE Cardiology Planning Committee

## Responsibilities

- Identifying priority issues for the cardiology community
  - Liaison to sponsor organizations
- Soliciting and developing IHE Profile Proposals
  - *Now soliciting proposals!*
- Evaluation of Technical Committee work
- Marketing IHE Cardiology profiles to user community

## Contact Information

- Secretary Dan Roman  
[droman@acc.org](mailto:droman@acc.org)
- Co-Chair Alan Katz, MD  
[alan.katz@chsli.org](mailto:alan.katz@chsli.org)
- Co-Chair David Slotwiner, MD  
[dslotwin@nshs.edu](mailto:dslotwin@nshs.edu)
- Committee's wiki page  
[http://wiki.ihe.net/index.php?title=Cardiology\\_Planning\\_Committee](http://wiki.ihe.net/index.php?title=Cardiology_Planning_Committee)



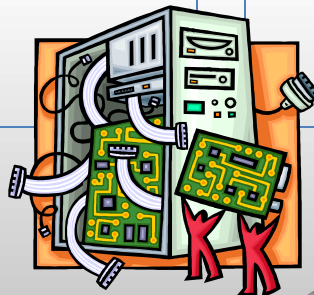
# IHE Cardiology Technical Committee

## Responsibilities

- Development of IHE Profiles and white papers
- Maintenance of IHE Cardiology Technical Frameworks
- Liaison with other IHE domains
- Support for Planning Committee marketing

## Contact Information

- Secretary Dan Roman  
[droman@acc.org](mailto:droman@acc.org)
- Co-Chair Tom Dolan  
[tom.dolan@philips.com](mailto:tom.dolan@philips.com)
- Co-Chair Antje Schroeder  
[aschroeder@siemens.com](mailto:aschroeder@siemens.com)
- Committee's wiki page  
[http://wiki.ihe.net/index.php?title=Cardiology\\_Technical\\_Committee](http://wiki.ihe.net/index.php?title=Cardiology_Technical_Committee)



# How to Participate in IHE Cardiology?

## *IHE's Profile Development Cycle*

- Committee work follows the IHE Profile Cycle
  - Annual cycle
  - ~18 months from profile proposal to Connectathon
  - Each IHE domain has its own independent schedule
  - Opportunities for IHE members and non-members to participate in cycle
- Detailed overview of IHE Cycle next

# IHE Profiles Drafted & Revised



Published For Public Comment

Trial Implementation Posted



# Test at IHE Connectathons



Publish in IHE's Product Registry

months 12-18

IHE Technical Framework Supplement Developed

months 5-11



Demonstrate at a  
**HIMSS INTEROPERABILITY SHOWCASE**

or  
**ACC / HRS / ESC ...**

Profile Selection by Committees

IHE Call for Proposals Opens

months 1-4

***IHE Improves, Safety, Quality and Efficiency in Clinical Settings***

Install Interoperable products in Clinical Settings worldwide



[www.ihe.net](http://www.ihe.net)



IHE Profile Cycle Stages	Participation Status	Open Date	Close Date	Learn More
<b><i>Call for Proposal</i></b>	Open	<i>Open now!</i>	Sept 19, 2011	<a href="ftp://ftp.ihe.net/Document_templates/IHE_Profile_Proposal_Template-Brief.docx">ftp://ftp.ihe.net/Document_templates/IHE_Profile_Proposal_Template-Brief.docx</a>
<b><i>Profile Selection</i></b>	Members only	Sept 20, 2011	Nov 30, 2011	
<b><i>IHE Profiles drafted in IHE Tech Committees</i></b>	Members only	Dec 1, 2011	April 15, 2012	
<b><i>Public Comment</i></b>	Open	April 15, 2012	May 15, 2012	<a href="http://www.ihe.net/Technical_Framework/public_comment.cfm">http://www.ihe.net/Technical_Framework/public_comment.cfm</a>
<b><i>Trial Implementation Published – Implementation Period</i></b>	Open	June 15, 2012	continuing	<a href="http://www.ihe.net/Technical_Framework/index.cfm">http://www.ihe.net/Technical_Framework/index.cfm</a>
<b><i>IHE North America Connectathon Registration</i></b>	Open	Aug 15, 2012	Sept 20, 2012	<a href="#">IHE N.A. Connectathon Registration.</a>
<b><i>IHE Connectathon</i></b>	Open	Jan 14, 2013	Jan 19, 2013	<a href="#">IHE N.A. Connectathon.</a>

Dates are subject to change; please check

<http://wiki.ihe.net/index.php?title=Cardiology> for current dates

[www.ihe.net](http://www.ihe.net)





*Thank you for your attention*  
*Questions?*

# Learn More about IHE International

## *Important Links and Information*

- IHE Webinar Series runs June-September 2011
  - Visit [www.ihe.net](http://www.ihe.net) for the full list of webinars
  - Registration is free!
- All webinar recordings and slide decks will be posted online at: [www.ihe.net/Events/webinars2011.cfm](http://www.ihe.net/Events/webinars2011.cfm)
- Sign up for the IHE International News
  - Email [secretary@ihe.net](mailto:secretary@ihe.net)
  - Sign up for the [IHE Webinar Series listserv](#)
- Apply for IHE International's Free Membership
  - Visit: [www.ihe.net/apply](http://www.ihe.net/apply)

# Learn More about IHE Connectathons

- IHE Connectathons: [www.iheusa.org/connectathon.aspx](http://www.iheusa.org/connectathon.aspx)
- IHE N.A. Connectathon is January 9-14, 2012
  - Testing dates extended this year. Read more: [http://www.iheusa.org/connectathon\\_participant.aspx#testingextended](http://www.iheusa.org/connectathon_participant.aspx#testingextended)
- IHE N.A. Connectathon Registration Opens: August 22-September 30, 2011
  - View the Participate Guidelines online: <http://www.iheusa.org/connectathon.aspx>
- Attend information webinars on the Connectathon during the IHE Webinar Series. View the full agenda online at [www.ihe.net](http://www.ihe.net)