Integrating the Healthcare Enterprise
White Paper

Portable Data for Imaging (PDI) Integration Profile

This white paper provides information regarding the <u>Portable Data for Imaging</u>, or simply "PDI", Integration Profile developed jointly by the IHE Cardiology and Radiology Committees.   Although this Profile in nearing completion of its revised technical specification, it is beyond the scope of Year 2 (2006) IHE Cardiology demonstrations.

Problem Statement:

At one point, cardiology data was transferred between cardiologists on cine and plain film and paper. The emergence of film-less cath labs in the early 1990's prompted the American College of Cardiology and European Society of Cardiology to work with the DICOM Committee to develop the DICOM Media Interchange and the Basic Cardiac X-ray Angiography specifications. Since their publication in 1995, cath lab cine film has universally been replaced by the "DICOM CD", and this is a major success story in electronic exchange of patient images.

However, a decade of advances in imaging technology is straining the capacity limits of the CD media, with megapixel x-ray angiography flat panels replacing the 512x512 vidicon detectors, and echocardiography moving to digital video imaging. There is increasing demand for more of the complete patient record to be placed on a single disc, not just one exam, and that record is likely to contain

advanced CT and MR angiography exams as well. In short, we need to move to DVD media as an option.

We also need to integrate more user friendly, web browser based access to the data on the exchanged media, to facilitate use by referring physicians and other new stakeholders accessing the media-exchanged electronic health record.

The PDI profile for cardiology specifies a consistent use of DVD media for exchange of imaging data, and mechanisms for including web-type content on the same disc.

Use Cases:

There are many reasons that cardiologists and other physicians need to exchange cardiology and radiology data. Specific examples include:

- A patient is seen by the local primary care facility for an apparent cardiac condition. During the course of the patient's workup, an echocardiogram and diagnostic cardiac catheterization are completed. The patient is diagnosed with severe triple vessel disease with associated ischemic mitral regurgitation and is transported to a regional tertiary cardiac facility for definitive care. The transferring facility needs a simple and concise method to transport the reports and images obtained during the diagnostic visit without losing the primary copy of the medical records.
- A patient suffering from severe congestive heart failure is moving to another state. The patient has had a number of serial echocardiograms during the course of care. The receiving cardiologist has requested that the echocardiograph images be transferred with patient to allow for later comparison.

Profile Benefits:

Benefits to cardiologists, administrators, and IT staff include:

- The cardiologist can quickly and easily choose significant reports and images to transfer with a patient, improving the receiving facilities understanding of the anatomical and functional abnormalities.
- The receiving cardiologist (who may be a specialist) can review the images and enhance the diagnostic and interventional process.
- The hospital administration is provided with a safe and economical method to relay the pertinent information to the receiving facility.
- The hospital retains full ownership and control of the original images for medical legal purposes.

- The receiving facility can quickly and easily import the reports and images into the local cardiovascular information system allowing for future retrieval and clinical correlation.
- Cardiac studies are often in excess of 1-2 Gigabytes in size, and a full patient record may exceed 5 Gigabytes. With PDI the IT staff does not need to determine a method to network transfer these large data sets across the Internet.

How the Profile actually works:

There are two pathways for this profile:

- The first pathway assumes that the receiving facility also has a cardiology workstation that is DICOM compatible. This path is documented below:
    - The source cardiology workstation (Portable Media Creator) writes a group of image dataset(s) and/or the associated report(s) onto a piece of interchange media (DVD).
    - The media is physically transported to a destination where the imaging-related information contained on the media will be used.
    - The receiving cardiology workstation (Portable Media Importer) reads DICOM objects (images, evidence documents and reports) on the media and imports them into the local information space. The receiving station reconciles the data as needed (e.g., to change the recorded Patient ID to the local Patient ID). If some classes of DICOM objects are present on the media and cannot be imported, it notifies the operator of the studies and series affected and makes clear that they are not supported by the importing application.
    - Other workstation applications may directly read the object types they support from the disc (without importing) and render them depending on the user's needs. If some objects are not supported by the reading application, it notifies the operator that those objects are not supported.
- The second pathway assumes that the receiving facility only has access to standard desktop or laptop PC which does not support the IHE PDI functionality. This path is documented below:
    - The source cardiology workstation (Portable Media Creator) writes a group of image dataset(s) and/or the associated report(s) onto a piece of interchange media (DVD). This time the files are also converted to JPEG, MPEG and PDF formats to allow for viewing from a standard PC.
    - The files are stored on the DVD so that the patient's information and files are accessible via a web browser.

- o The media is physically transported to a destination where the imaging-related information contained on the media will be used.
- o The DVD is viewed from a web browser on a standard PC.
- o The original DICOM image data is also available should the receiver forward the disc to a DICOM/PDI capable workstation.

Purchasing Using IHE:

One of the key concepts of IHE is the ability to definitively describe interfaces with a single sentence.   Using the statements below mitigates the need for hundreds of pages of technical documentation, interface engines, and on-site testing. For example, the following statements should be included in any request for proposal (RFP):

"The **modality** system shall support the IHE Portable Data Interchange Profile DVD Option as the Portable Media Creator Actor."

"The **Cardiology Information System** shall support the IHE Portable Data Interchange Profile DVD Option as the Portable Media Creator and Portable Media Importer Actors."

"The **Cardiology PACS** shall support the IHE Portable Data Interchange Profile DVD Option as the Portable Media Creator and Portable Media Importer Actors."

Other related Profiles to consider include Scheduled Workflow (SWF), Displayable Reports (DRPT), Evidence Documents (ED), Cardiac Catheterization Workflow (Cath), Echocardiography Workflow (Echo), and Nuclear Medicine (NM).

Summary:

Cardiology patients are frequently transferred between facilities for more definitive care. Patients may have more than one residence that requires different cardiologists to provide a care continuum. PDI is designed to allow for portability of the patient's reports and imaging studies between the care providers.

This profile provides mechanisms for the study information to be viewed from standard PCs as well as the ability to import the studies to the receiving cardiology PACS system.

IHE Integration Profiles standardize the exchange of healthcare information; accelerate the adoption of the EHR; and enhance patient care, safety, savings and satisfaction.

Consider joining the "IHE Cardiology Users' Group" which provides web seminars, teleconferences, and other educational opportunities on an informal basis.   For more information, send an email to ihe@acc.org.

It is worth your time to learn more about IHE and it is time to demand IHE Profiles from your vendors.   See www.ihe.net or www.acc.org/ihe.htm .