IT CORNER

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IHE: Key to the Future of the Digital Hospital

It is often said that of the trends in evolution of healthcare technology, the "computerization" and "interconnection" of medical devices and systems are among the most significant. Computerization of medical devices is a natural consequence of the need to rapidly acquire, process, analyze and present ever-increasing amounts of data. Interconnection of those medical devices facilitates a direct (and therefore rapid and more accurate) exchange of data between disparate diagnostic, therapeutic and health information systems.

While computerization and interconnection of medical devices and systems represents a generally positive development, these trends are not without their stumbling blocks. Principle among the obstacles encountered is the diversity of technologies, the paucity of technical standards, and the industry's failure to agree to the adoption of those technical standards that do exist. The consequence is a technical "Tower of Babel" where diverse devices and systems from a variety of manufacturers are unable to effectively exchange critical health information because they format that information in different ways. When data cannot be exchanged directly, humans must "translate" outputs from one set of devices and systems and manually input that data into another set of devices and systems – an inherently inefficient and error-prone process.

Recognizing both these trends and the corresponding obstacles, the Radiological Society of North America (RSNA) and the Healthcare Information and Management Systems Society (HIMSS) launched an initiative called *Integrating the Healthcare Enterprise* (IHE) in 1999. IHE brought together medical professionals and the healthcare information and imaging systems industry "to agree upon, document and demonstrate standards-based methods of sharing information in support of optimal patient care."[1]

The IHE initiative is defining *integration profiles* for variety of systems. These integration profiles describe important, common, core processes (e.g. scheduled workflow, image presentation, information access, record retrieval, reporting, charge posting) in the clinical disciplines (e.g., radiology, laboratory, cardiology). IHE also adopts existing standards (e.g., DICOM, HL7) rather than attempting to create its own. By defining integration profiles and adopting existing standards, IHE is establishing guidelines for medical technology manufacturers to follow to insure their systems will interface and work with components produced by other manufacturers. So far, IHE has achieved considerable success in the area of medical imaging systems. Each year, the main sponsors of IHE host a "connect-athon" (held in conjunction with the annual RSNA conference in Chicago) where manufacturers bring their products and demonstrate interoperability of their products with those from other manufacturers. Using the IHE's integration profiles and adopted standards, participants at the connect-athons have demonstrated they can successfully conduct a variety of processes including ordering tests, cataloging orders, conducting tests, viewing test results (including images), recording analyses, and generating billing information with system components supplied by a diverse group of manufacturers.

After successful efforts in medical imaging, IHE is attempting to broaden its scope into clinical laboratory, cardiology and other areas that would benefit from the effective integration of biomedical and information technology systems. Key to the success of IHE's initial efforts in medical imaging was the sponsorship and strong support of HIMSS, RSNA and their constituents (e.g., manufacturers and providers). Likewise, achieving similar success in the development of interoperable technologies for other clinical disciplines depends on the sponsorship of and support of key organizations. To that end, the American College of Cardiology (ACC) and NCCLS (formerly the National Committee for Clinical Laboratory Standards) have joined with the IHE initiative to develop integration profiles for cardiology and laboratory systems. Most recently, the American College of Clinical Engineering (ACCE) has also joined the IHE initiative to work on the development of integration profiles and the adoption of standards for general *patient care devices*.

It is vitally important that we, as clinical engineers, support IHE efforts. Effectively implemented, medical technology can play a major role in improving the quality, safety, timeliness, and cost-effectiveness of healthcare. That role will only be fully real-

ized when the technology we employ is truly interoperable and interoperability is achievable only if a broad based initiative like IHE succeeds. Clinical engineers must participate in the process, joining with ACCE and other IHE sponsors, encouraging other stakeholders in their institutions to support the initiative, and pressuring manufacturers to provide products that have demonstrated IHE interoperability. The future of the "digital hospital" or healthcare provider depends on our active involvement.

Note: Anyone potentially interested in American College of Clinical Engineering's efforts in IHE should e-mail *ihechair@accenet.org*. ∎

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[1] Radiological Society of North America (RSNA)
   [Online] Available: http://www.rsna.org/IHE/index.shtml

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