

# Interplay Between IT and CE Benefits Patients, Hospitals

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John Glaser, PhD

**BI&T:** How does your facility ensure that the clinical engineering department participates in the discussion of the need for and types of IT strategy?

**John Glaser:** We have several mechanisms for ensuring that clinical engineering is part of the IT strategy and operations discussions. Project teams include both IT and clinical engineering staff. Regular meetings are held, and the two groups cross-fertilize each other's committees.

These mechanisms are based on a strong foundation of mutual respect and understanding of the overlap between the domains of the departments, as well as the fundamental differences between the two departments' expertise, focus, and nature of work.

**BI&T:** Can you describe how Partners HealthCare System views its clinical engineering department?

**Glaser:** We believe that involvement from clinical engineering is critical to the advances of the leadership roles of our academic medical centers, particularly wherever patient care technologies are being interfaced at the bedside. We respect and depend on the close relationships that our clinical engineers have with direct-care providers and their understanding of clinical issues.

Collaboration between the IT and the clinical engi-

neering departments is critical in several areas:

- Application of technologies to improve patient safety
- Efforts to improve the remote monitoring of chronically ill patients
- Development of processes for ensuring safe interoperability of medical devices with networks and application systems
- Management of the wireless spectrum in care settings
- Acquisition and implementation of application systems that have significant medical device capabilities
- Technologies to improve patient throughput and provider workflow
- Support of the shared IT and clinical engineering infrastructure, e.g. workstations and networks
- Virus protection for medical devices on networks.

The CE staff are quite comfortable with their ability to engage their IT colleagues in vigorous debate and influence IT application and infrastructure decisions, and vice versa. Our relationship is truly collaborative.

**BI&T:** What are some of the biggest healthcare IT projects on the horizon for Partners' clinical engineering department? And how does the department plan to accomplish these projects?

**Glaser:** Our clinical engineering departments (they are connected at the corporate level but may implement projects differently at the local level) are involved in many projects that are intimately interfaced with our IT organizations. I mentioned some of these earlier. Some of the most exciting and highly leveraged are:

- Planning and implementing wireless communications for clinical applications involving medical technologies close to the patient
- Connectivity of medical devices to networks and electronic medical records (our clinical engineering group has taken the lead on implementing and supporting the automated anesthesia record in one hospital)
- Physiological monitoring archiving systems connectivity to our longitudinal medical record

- Expansion of automated anesthesia record keeping, which our CE group implemented and manages in one hospital
- Connecting approximately 5,000 infusion pumps to the IT network on many of the 17 campuses of Partners HealthCare
- Using radio frequency, positive-ID and indoor location systems and more portable/wearable monitoring to improve efficiency, quality and safety in patient-care environments throughout Partners
- Developing connectivity and perhaps middleware for synergistic operation of several devices in harmony to enhance safety, patient throughput and managing capacity, e.g., in the Emergency Department

And, we are now looking carefully at how we will integrate the IT and CE networks.

**BI&T:** *What are some of the biggest healthcare IT challenges for Partners' CE department?*

**Glaser:** The overarching challenge is the convergence of biomedical and IT technologies and operations. There are increasing similarities in direct patient care technologies and IT applications, the biggest difference being that the medical technologies are connected directly to patients.

CE departments are increasingly asked to do more things that have IT-like development, implementation, and management functions but are acted out at the patient's bedside. The challenge is to get these departments and personnel to continue to work collaboratively, recognizing the differences in education, history, and culture.

A critical challenge is presented by the huge expansion in the numbers and complexity of biomedical technologies. That expansion has and will continue to place excessive demands on the workforce. Our own CE department is addressing that challenge by expanding its in-house training organization and by developing extended relationships with local universities and colleges to increase the numbers of skilled engineers and technicians over the coming years.

Another example is how our clinical engineering organization will develop its own capabilities for additional high-level software and gateway/server/"service-oriented-architecture" engineering expertise, since that is being driven by the demands of its clinical stakeholders and the need to implement workable "device-IT-connectivity." The clinical engineering group will have to acquire additional capabilities for developing and

managing those issues with more of its own programmers and analysts.

**BI&T:** *How does the clinical engineering department help Partners do better than the competition? (For example, has the clinical engineering department successfully made recommendations on what type of healthcare IT tools to acquire?)*

**Glaser:** One way is through our strategic efforts to improve the quality of our patient care (this effort is called the Signature Initiatives), one of which is directed at patient safety and includes our objective to create an error-free drug administrative system.

Our clinical engineering organization has taken the lead in developing a critical aspect of that system in creating the concept of "smart pumps" with an industry collaborator. It is also a leader in the development of "wearable" monitoring technologies. These allow patient mobility and extension of monitoring throughout the patient care environment, and will be critical in a healthcare future that has more care being delivered in the home.

Clinical engineering also is the instigator of RFID tracking of medical devices, which will extend to many other movable assets and give us a competitive advantage in the efficiency of our operations. And, clinical engineering has a leading role in developing standards for "plug and play" of medical devices to networks, which is pivotal for the safety and effectiveness of devices as they are increasingly connected to each other and to other systems.

Our CE department has been a significant contributor to Partners' efforts to improve the quality, effectiveness, and efficiency of its patient care in many other ways. The department:

- Collaborates with IT to define our organization's approach to implementing a secure and robust wireless infrastructure
- Is leading in developing strategies for achieving interoperability between devices and technologies throughout the patient care environment
- Guides the strategic planning and acquisition process of patient care technologies in many areas
- Is creating the means to supply a cadre of skilled staff to allow us to continue to provide cost-effective in-house services. ■

**Ideas on healthcare executives to profile?**

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