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Biomed Joins the Party

Savvy CIOs are considering biomedical devices in their overall strategic plans

by Mark Hagland

Trinity Health CIO Paul Brown (left), CMIO J. Michael Kramer, M.D. (center); and Lou Fierens, senior VP, supply chain management

It seems like only yesterday that the worlds of biomedical engineering and information technology were totally separate. On the one hand, there was the galaxy of biomedical devices, from patient monitors to intravenous pumps, oximeters, hemodialysis machines, and a host of other medical equipment, all managed by biomedical engineers and clinical department staff. On the other hand, there were computers of all sorts, with software for administrative, clinical and other purposes, managed by IS executives and staff.

The two worlds have collided just as hospital-based organizations are implementing EMRs and other advanced clinical information systems. Today, virtually every piece of biomed equipment is microchipped, and has in effect become a kind of computer, with many biomed devices that are highly sophisticated machines capable of providing clinicians with tremendous amounts of actionable clinical data.

Most agree that the potential improvements in care resulting from true integration between clinical information systems and biomedical devices are enormous. Yet a visitor to most U.S. hospitals will still see nurses reading live data from patients' vital sign monitors, then scribbling notes onto pieces of paper which later they will type into an EMR. Why? The answer is that most biomed equipment has remained in isolated electronic islands. That is until now.

In the past few years, pioneering hospitals and health systems have been moving to make biomedical device integration a reality. There are a host of issues involved, from the governance level to the clinical, practical, and yes, technological. But for CIOs, the opportunity to help co-lead teams of IT, biomedical engineering, and clinical professionals

towards device integration is an imperative emerging patient care environment.

And if any patient care organization exemplifies a systematic way of tackling this opportunity, it is Trinity Health, the 44-hospital system based in the Detroit suburb of Novi, Mich. At Trinity, a multidisciplinary team of IT, clinician, and biomed leaders are leading the charge to integrate a flotilla of devices (110,000 biomedical devices are registered in the system's database) into the organization's system-wide EMR. This initiative is occurring in tandem with the health system's strategic push towards advanced clinical computing (Trinity Health officials estimate that 25 to 30 percent of those devices have been integrated into its EMR to date).

“We have a great opportunity to become incredibly consistent in the care that's delivered,” says Paul Browne, senior vice president and CIO at Trinity Health, who leads a team of 1,300 IT professionals. “And when I think about clinician productivity, for example, the need for nurses to be constantly writing down vital signs, and just the fact of having the capability to automate some of that documentation, the potential productivity gains are exciting and interesting.”

What's exciting about the device-integration initiative, Browne notes, is that it aligns with Trinity Health's Project Genesis, a massive clinical computing plan that is bringing an integrated EMR to 34 of the system's 44 hospitals (Trinity Health runs several managed hospitals, some of which are on alternate EMRs). The EMR movement is driven partly by a system-wide quality improvement initiative.

Browne counts several executives as key partners in his effort, including J. Michael Kramer, M.D., MBA, Trinity Health's vice president and CMIO, and Lou Fierens, the health system's senior vice president, supply chain and capital projects management, to whom the biomedical engineering department reports.

The biomed integration initiative actually began several years ago in an effort to cut costs, Fierens reports. But as Project Genesis has moved ahead, and as the technology in the biomed equipment area has advanced, the broader goals of improved care quality and workflow have come more fully into focus, he says. The biggest challenge, says Fierens, is that “you've got to balance the economics with the infrastructure and support, along with the service element, along with the clinical outcome you're trying to support.”

And to do that, IT and biomedical engineering need to work as true partners. He strongly credits Browne with helping to create a great working relationship between the two men and the two areas. “The relationship I have with Paul is really an integrated partnership,” he says. “And I use the word ‘partnership’ very carefully, because in my world, I use that term to describe a situation in which you can leave the room, and know that they'll look out for your best interests. I feel we can do that for each other. And there's never a moment where I feel our priorities are not in alignment. We spend a lot of time talking about priorities, and aligning them. It's hard to overemphasize how important that working relationship is.”

Then of course, there is the task of linking clinical informatics goals with biomedical equipment strategy. And that's where Kramer comes in. Indeed, Kramer says, “a critical success factor is creating a compelling vision for automation-enabled patient care, and then translating that several levels down.” Such an approach requires a lot of collaborative thinking and work.

“A great case in point is the smart pump example,” he says. “We have a vision of truly automated ‘order to bloodstream’ when it comes to smart pumps (which are gradually being phased in system-wide), so that no nurse would have to program a pump where

they might possibly ‘fat-finger’ the entry. But we have to buy pumps that are compatible with our order entry system — Lou's people can't just buy the least expensive type of pump. And of course, we're cycling out pumps over time; and the life cycle of those pumps is about seven years. So we're thinking three to five years in advance. Part of my job too, is to go to Cerner (Kansas City, Mo.) and say, ‘this is where you need to be.’ So the vision, the collaboration across all the stakeholders, and the planning are the key.”

The result of all this collaboration is that at Trinity Health, a multidisciplinary committee of clinicians, biomed engineers, and IT managers, have created a menu of approved devices for purchase. Over time, all the vital signs monitors, infusion pumps, oximeters, and so on, will be replaced strategically and uniformly with integratable equipment that will create feed data into the health system's EMR and eliminate hand-scribbling. This is a multiple-year initiative, they concede, but perhaps within five years, theirs will be one of the most advanced organizations in the country in this regard.

Industry-wide clarity

Nationwide, the realization of the device-integration imperative is proceeding apace, even if the actual implementation process is beset with obstacles and resource limitations, say industry experts. “This is not so much conceptually difficult as it is practically challenging,” says former CIO Glenn Galloway, who currently serves as CEO of Minneapolis-based Healthia Consulting (a subsidiary of Ingenix and United HealthGroup). “A lot of these interfaces are new. And there are key decisions to be made — how much data do you move to the EMR, and how long do you keep it? For a lot of these in the critical care areas, you're doing monitoring pretty continuously.” What's more, he says, all the replacement devices have to be included in an organization's disaster recovery plan. “I think the key to success,” Galloway offers, “is focusing on the clinical workflows.”

Most hospital organizations that begin work in this area focus on the “plumbing” issues — the wiring, infrastructure, and other technical aspects of the integration challenge, — “and that's a mistake,” says Tim Gee, principal with Medical Connectivity Consulting in Beaverton, Ore., and a specialist in medical device integration issues. All the talk should be around workflow, he suggests. Even though “the plumbing piece is problematic, and it's a hassle,” says Gee.

Included in that hassle are a lot of nitty-gritty level standards issues, as well as issues with what Gee sees as a relatively immature vendor community when it comes to device-integration capability. Still, he says, focusing on the broader integration challenge is the strategic way to begin.

Erica Drazen, Sc.D., a partner in the Lexington, Mass.-based Emerging Practices division of the Falls Church, Va.-based CSC Corporation, agrees with both Galloway and Gee, but she adds that one of the reasons biomedical-device integration remains at or near the starting gate is the range of governance, management, and other people-related challenges involved.

“There's still a lot of resistance, on both sides,” she says, referring both to biomedical engineers and to IT professionals. “A lot of people don't want to have to do it. It's a very different kind of business, involving finding equipment, maintaining it, and so forth. And especially in large departments, nobody really wants to take it under them. So it's not actually a happy union on either side.” Still, Drazen believes that the IT complexity of new biomedical devices will compel the entire biomedical engineering department to come under the CIO in most organizations. “As everything becomes electronic, the hassle

factor of not integrating things becomes pretty high," she notes. "So it's got to happen."

Alan Soderblom

According to Tom Herzog, vice president of the DeviceWorks division of the Cerner Corporation, "The biggest challenge we've faced has been speed to implementation." DeviceWorks is leading Cerner's strategic goal of integration across all information systems and devices in patient care. "I've never been asked to move so quickly; we're being asked to install, implement, and go live with data connected to the EMR within six, seven weeks," he says. "And I believe that reflects a recognition of the value of this."

Cerner and some other vendors are collaborating with device manufacturers to promote integration.

Advancing piece by piece

Greg McGovern

Given the size of the task, most health systems are taking on the device-integration challenge one piece at a time, while attempting to approach it with some overall strategy.

At Roseville, Calif.-based Adventist Health — a 16-hospital health system serving four states — Vice President and CIO Alan Soderblom and Associate Vice President and CTO Greg McGovern agree that, given the size of their organization and its diversity of purchasing procedures, they will have to move slowly. First on tap: managing equipment purchasing cycles more carefully and getting clinicians involved.

Currently, Soderblom and McGovern report that laboratory equipment and ICU/step-down devices are being integrated, with plans for the regular medical and surgical floors to go next. The entire process is slated for completion near the end of 2010.

In terms of which clinical areas to prioritize for integration work, McGovern says, "We're really going by what the clinicians say are most important. For instance, in our ERs, they'd really like us to deal with the EKG machines, because that's the one machine that's not in the record. In the ICUs, it's pulse oximeters and the vital signs monitors."

Dan Pettus

Standardization is the biggest issue at the CIO level, says Soderblom. “We have different purchasing cycles across our hospitals and, in addition, our hospitals are different in size and scope. So by asking questions such as, ‘what kinds of investments do we make now,’ and ‘how do we attempt to make a standardized purchasing approach?,’ we're bringing together our purchasing department, our biomed department and IT, and trying to look three to five years out ahead of us as we make biomedical equipment purchases.”

In terms of governance, Soderblom says, it's possible that in the future, biomedical engineering might come under the CIO and IT department, but for now, the focus is on multidisciplinary collaboration rather than reorganization.

For smaller hospital organizations, a lack of resources — budgetary, staffing, and time — is the biggest obstacle to comprehensive biomedical-device integration. At Bellin Health, a three-hospital system based in Green Bay, Wis., director of IT Randy Ronsman confirms that the resources are simply not there to move as quickly as everyone would like. He has a team of 29 IT professionals, who are managing IT at the system's flagship 176-bed community hospital, as well as its 40-bed psychiatric hospital and 4-bed critical-access hospital.

“Probably the biggest challenge that we face is trying to bring a cross-functional group together — that means nursing, biomed and IT people — in a single room, to come up with a single purpose and a single understanding of the project,” Ronsman says. Part of the issue is simply that everyone is already stretched in terms of their ability to take on any new work. In addition, he says, “We find the nursing staff will say, ‘Hey, I need to do this,’ and that you tap a magic wand and it happens'.”

Nevertheless, movement is taking place. Among other things, Ronsman is helping to coordinate activity between the hospital system's main medical devices vendor (Chalfont St. Giles, U.K.-based GE Healthcare), and the system's EMR vendor (Westwood, Mass.-based Meditech). Ronsman says he anticipates the need for “some kind of middleware vendor to bring it all together.”

Vendor executives, another key stakeholder group in moving towards device integration, say they're ready to work with one another and with their customers to make it happen. “Device-EMR integration has been spotty to date, and the reasons are obvious,” says Dan Pettus, vice president of connectivity and IT support at the Dublin, Ohio-based Cardinal Health. “The standards implemented in the marketplace in the last 20 years have not been well adopted, and there have been several attempts to get medical devices to fit within a tight standard that would allow more plug-and-play capability,” Pettus notes. He adds, however, that CIOs are increasingly recognizing the need to bring vendors into the process as partners.

CIOs and others, see the ‘win-win’

With all the challenges involved, most agree that the potential improvements gained as a result of medical device/EMR integration makes it both an imperative for CIOs, and an opportunity for them to act as agents for change.

For one thing, says Katie Grechis, R.N. — a consultant with the Minneapolis-based Healthia Consulting who has spent several years helping hospitals move towards device integration — “Not only are you saving the nurses' time when you integrate such machines as patient monitors into the EMR, you have to consider that in a competitive labor environment, doing so is a satisfier” for prospective nursing staff. Given that hospital organizations are struggling with recruitment, saving nurses time means easier staffing, she says.

What's more, Grechis notes that the recently added goal 16 of the Washington-based Joint Commission's 2008 Hospital National Patient Safety Goals is to “Improve recognition and response to changes in a patient's condition,” which directly ties into the need for actionable vital signs data in real time. Public and private payers, she adds, are also trying to get hospitals to move more quickly to address potential Methicillin-resistant *Staphylococcus aureus* (MRSA) and other bacterial infections in inpatients.

Of course, the obstacles — governance, management, process, and technical — remain daunting. “One lesson we've learned,” Trinity Health's Browne says frankly, “is that this is hard to do. All the technology pieces are there, but it gets down to details like device drivers, and nits and nats like that.”

But for CIOs, the strategic focus must be paramount, he concludes. “CIOs need to help people understand the possibilities through some real-life scenarios. You should be developing relationships among all three internal stakeholder groups — your biomed support people, informatics people, and clinical leaders – because this is one of those areas where no single domain expert or leader can advance this on their own.”

Sidebar

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