



Intensive Care
Surgical Waiting Area B ↑

For hospitals, going mobile is chaotic, but the benefits are often off the charts

Healthcare unplugged

BY AMY LARSEN DeCARLO

The split-second exchange of diagnostic, drug or triage information among nurses, doctors and staff can mean the difference between comfort and pain — or life and death. Yet at resource-hungry hospitals, where shifts are long and bed turnover is relentless, there is little time for face-to-face consultation. Too often, the reality is inertia, overlooked symptoms or worse.

Medical centers are trying to compensate for nursing shortages and pinched budgets with information technology that promises a better clinical path for patient information.

But unless an IT solution is tailored to fit the physical environment and culture of an institution, it can cause frustration and fuzzy communication.

Chief information officers say hospitals need systems that can keep up with a highly mobile workforce. Increasingly, hospitals are turning to wireless devices that allow providers to roam among patients but stay connected with one another.

“After all, nurses and physicians are really mobile workers,” said Dr. Christoph Lehmann, director of clinical IT at the Children’s Medical and Surgical Center at Johns Hopkins University.

A field in motion

Mobile wireless technology can support a wide range of applications at hospitals — from training and staff communications to records management and drug administration. When a system is designed and executed well, the results are profound.

Consider the case of Vassar Brothers Medical Center in Poughkeepsie, N.Y., which used a Vocera Communications wireless system to improve communications and support a bar coding system that helped eliminate errors in bedside medication delivery.

With help from HealthServe, the IT division of the Health Quest system that operates the center and two sister facilities in the Hudson Valley, the Vassar center was able to find intravenous drug pumps that could work with its wireless infrastructure to read bar codes and accurately dispense patient medications. The facility migrated to an all-frequency wireless system to avoid interference issues.

One year after installing the technology, Vassar had captured and prevented 5,331 adverse drug events — an order of magnitude greater than the hospital had anticipated.

Nicholas Christiano, vice president and CIO at Health Quest,

DAVID ZIOLKOWSKI,
SAMPSON REGIONAL MEDICAL CENTER

STEVE EXUM/WPN



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WIRELESS INFRASTRUCTURE

said that although most of the incidents were not life-threatening, two to four of them could have resulted in medically serious situations.

The hospital learned several important lessons from the exercise, he said. As diligent as his team was in documenting adverse drug events, staff members initially estimated that only 200 incidents occurred annually. That meant the facility was overlooking thousands of events every year.

The wireless bar coding system helped nurses deliver better care and helped the facility avoid expenses associated with poor medication administration.

The wireless infrastructure provides a far more efficient communications channel, Christiano said. It allows nurses and other medical staff members to reach one another whether they are at a patient’s bedside or walking down a corridor.

HealthServe deployed more than 600 Vocera devices — small badges attached to lanyards — to every nurse and physical therapist and to some physicians. The payoff was significant.

“We captured a minimum of 30 minutes of saved time per shift,” Christiano said. “We were able to eliminate our need for a nursing agency, [and] we estimated \$1 million in salary savings the first year alone.”

Hands-free nursing

Other hospitals have had similarly dramatic results from going mobile. Johns Hopkins Children’s Medical and Surgical Center was a clinical test bed for a Bluetooth technology project that enabled nurses on the move to communicate solely via voice commands.

Avaya Labs designed and installed the system — dubbed the Mobile Access to Converged Communications Systems (MACCS). It uses hands-free headsets and an intelligent voice agent to locate and connect staff members who are in different loca-

tions within the facility.

Deployed on a floor serving toddlers and school-age children, MACCS gave the 32 nurses and other staff members the ability to page or call a medical service desk simply by saying the department name or job function, such as “Page Ortho” or “Call charge nurse,” into a lightweight headset.

“The voice command interacting with the phone and pager system was smart enough to know who the resident on call was and then connect to the phone or pager of that person to summon help,” Lehmann said.

The voice-recognition technology shortened the time it took to set up pages and calls and eliminated the time it took to answer phones at central nursing stations. Lehmann estimates that each nurse saved between three and 11 hours per week.

In a total of 3,460 outgoing calls and pages in a six-week period, the nursing staff saved full days of staff time — ranging from one nurse who saved 19 hours and another who racked up a savings of 68 hours. Lehmann said the savings translate directly into more time spent interacting with patients, family members and other caregivers.

Take two aspirin...

Although hospitals can benefit from mobile technology, success is not a sure bet. Hospitals require special considerations and configurations beyond dealing with myriad devices that are often more complex than their wired counterparts — including the challenge of ensuring patient privacy and security.

“A hospital is really like no other environment, and the mobile world is a lot like the Wild West anyway,” said Kitty Weldon, principal analyst at market research firm Current Analysis. “So imposing that kind of rigorous superstructure on the technology can be a challenge.”

The first step is sorting through the number of choices on the market today. From advanced paging to

wireless imaging, the abundance of mobile systems can overwhelm hospital network managers.

Competing platforms contribute to the complexity, with a smorgasbord that includes voice over wireless local-area network, voice over Wi-Fi, and cellular services for voice, data and image-transmission services.

Moreover, because most patient information is sensitive or confidential, wireless data demands special care. For starters, hospital systems must adhere to the Health Insurance Portability and Accountability Act. To meet the act’s requirements, some hospitals mandate encryption and other security measures, which have the potential to slow other applications on the network.

Weldon said that to maximize flexibility while minimizing complexity, hospital administrators and IT managers must decide how to centralize control of all wireless devices.

Unfortunately, the mobile system and the network management platform that controls other hospitals devices can often be difficult to integrate, which can make it especially difficult for IT managers to configure, control and, when necessary, disable wireless devices.

“You need to not just be able to see what is on the device but how you influence that device in order to control the safety and security of a device and information,” said Jim Rapp, account development manager for enterprise mobility solutions at Avnet Technology Solutions. “We’ve all seen too much about missing disks, missing laptops showing up in the press to know that you can’t afford to let information get loose.”

Companies can avoid some of the problems by relying on what Rapp describes as functionally rich, vendor-specific management software. Enterprise network management can provide all the features necessary to control devices, from configuration and deployment through monitoring and decommissioning.

“Any time you can ‘single-vendor’ a solution, you are getting closer to nirvana,” Rapp said.

Weldon agreed that simplicity is the answer. At the very least, she said, sticking

with one mobile operating system will help reduce headaches for beleaguered network managers and increase their chances for success.

But as desirable as it is from a management perspective to go with a single-vendor solution, hospitals often end up with something much more complex.

“It is going to be very difficult for one [vendor] to become the best in everything because networking is moving from Ethernet to mobility to wireless to mobility to wide mesh,” he said.

David Ziolkowski, senior vice president and CIO at the Sampson Regional Medical Center in Clinton, N.C., said the benefits of wireless health care systems outweigh their challenges. The center recently activated a wireless phone system that integrates more than 20 information, facility and clinical systems.

The phones give nurses a virtual desk in their pockets, and they help expedite messages and increase productivity. For instance, the system automatically alerts appropriate employees when a critical threshold or “panic value” is crossed during a treatment. If a lab result produces a panic reading, the patient’s physician is notified immediately. If there is a problem with a building’s security system, the proper staff members are alerted.

“People say you have a duplicate infrastructure, and yes, I have a duplicate infrastructure,” Ziolkowski said. “But when you are talking about voice-grade communications, I can live with that.”

Improvements in staff productivity, patient care and user satisfaction made the wireless system an almost immediate success, he said. Based on studies conducted six months before and six months after the system was installed, the hospital saw a 14.5 percent increase in productivity, Ziolkowski said.

That gain was achieved for the most part without increasing staff. But even given an increased number of patients to care for, nurses expressed satisfaction with the technology, Ziolkowski said. The center achieved a complete return on its investment within 11 months.

“Personally and professionally, it’s the most successful project I’ve been involved with,” he said. ■

Tips on going wireless

Deciding which clinical or business needs to address using mobile technology can be a trial in itself. Then, determining what technology is best for your setting and accurately calculating its costs require even more due diligence.

Nicholas Christiano, vice president and chief information officer at Health Quest, said a hospital considering mobile technology should first determine what it is trying to accomplish and then examine how deep its pockets are.

The Health Quest team took a full year to identify every possible expense upfront before deploying any device at Vassar Brothers Medical Center. Christiano said that effort was rewarded with an implementation process that took only six months and had no financial surprises.

However, he said he suspects that too many organizations approach mobile technology as a project when it is really a long-term process. “Once you go down this path, it is not a one-time deal,” he said. “It is like a highway. You are constantly repairing it, improving it, repaving it. You can’t just do it once and walk away and say, ‘See you in 20 years.’”

It is vital to engage the users upfront, educating them on the general objectives of the project and getting their feedback on what capabilities they would like to see, said David Ziolkowski, senior vice president and CIO at the Sampson Regional Medical Center in Clinton, N.C. He added that voice communications should be part of the initial deployment because they have so much immediate value.

“It is a quick win. You will get a lot of credit and become a real hero,” he said. “You can use that momentum to keep the implementation going even when you run into a few hiccups.”

When it comes to choosing devices, never forget aesthetics and ergonomics, said Dr. Christoph Lehmann, director of clinical IT at the Children’s Medical and Surgical Center at Johns Hopkins University. For aesthetic reasons, Hopkins rejected a headset attached to a headband and a device with a long boom microphone even though it had superior voice-recognition capabilities. He added that wearing a headset for eight or more hours can be uncomfortable, so hospitals should choose that kind of device wisely.

Although a mobile or wireless technology project might yield some big productivity and financial benefits, Ziolkowski said, ultimately there are other, potentially bigger, benefits to consider.

“This really isn’t all about money,” he said. The real benefit is making patients and users happy.

— Amy Larsen DeCarlo