In search of excellence

Arizona's UMC succeeds with wireless asset tracking

Who/where
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Manager of Biomedical Engineering

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Tucson, Arizona

Challenge
Improve equipment management and utilization hospital-wide, reducing the time and cost associated with searching for and replacing assets that are lost, broken or stockpiled

Solution
Philips Asset Tracking Solution, using Wi-Fi-enabled tags, the hospital's recently updated 802.11 infrastructure; and Philips Implementation, Asset Management and Project Management Services

Back in 1977, Arizona's University Medical Center (UMC) was pioneering the use of radiology without film. Fast forward 30 years and the Tucson hospital, with plenty of other firsts to its credit, is at the forefront of another shift in healthcare practice: wireless tracking of the medical equipment clinicians need and patient care depends on, rather than nurses and technicians scrambling to find them.

Asset tracking is not new. But the hospital-wide implementation—which has Wi-Fi-enabled active-RFID tags on thousands of devices tracked across nine floors of existing wireless infrastructure—puts UMC squarely in the lead.

It's precisely the position that UMC is accustomed to holding.

In the lead and moving forward

"We're way ahead," confirmed Jeff Schaefer, director of diagnostic and therapeutic services and the administrative lead on the project. "This is a new technology for healthcare but we are in it for the long-term value. We've had a taste of what can be accomplished and we will keep moving forward."

That taste includes compelling reports on equipment movement, lack of movement, and utilization. UMC will use this information to save hundreds of thousands of dollars, based on now being able to find "lost" equipment and ensuring stored devices get used. Equally important is to identify where and when equipment is damaged.

Partners share passion for results

Calling the first year "a tremendous learning curve," Schaefer emphasized that working with Philips has been central to the progress made at UMC. "This is a partnership with Philips from start to finish, and a very big deal for all of us. Hospital administration is very excited about it."

"UMC administration recognizes the return on investment provided by asset tracking will come in reduced capital purchases and decreased operating costs," said Schaefer.

UMC also gets a daily return from another Philips investment. Serving as the hospital's director of biomedical engineering is Philips employee William Wood, who checks in every day as "a full-fledged member of the hospital leadership team."

Both Schaefer and Wood have been integral to the project. The greatest challenges have been working through the intricacies of tag deployments, replacements, and infrastructure updates. Each has been met through Philips consultative services, including Implementation and Asset Management Services, which have helped UMC set objectives, make progress and plan for the future.

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"This whole initiative is rooted in being able to improve the way things are done…We want to be the best. This is what the Philips solution enables."

William Wood
Manager of Biomedical Engineering

Finding more than equipment

That the UMC venture into asset tracking is a big deal is clear on many levels. It covers nine very large floors, about a million square feet. The degree of accuracy required for finding equipment depends on the floor, the device and the assigned urgency. Early results show equipment can be located to within an arm's length on specific floors, for example, or to within a 30-foot radius in other zones.

"A manual search for a device could send you eight floors down. You're looking for it and expect to be getting closer but instead it keeps moving," said Wood. "It's very common for a nurse or technician to head down to retrieve equipment only to find that it's been returned."

The wasted time and increased frustration are not good for anyone involved, but the promise of the Philips solution inside UMC has Wood and his hospital colleagues and customers very excited.

Awareness and education to reduce damage

One vexing and expensive problem UMC anticipates being able to solve is equipment damage.

"Central Supply sends equipment throughout the hospital, and too often when devices come back, they're broken," said Wood. "It's hard to know where or when the break occurs, but it's obvious when damage is not from normal wear and tear."

Schaefer estimated that equipment damage costs UMC in the $200,000 range each year. Both he and Wood are confident that tracking reports can help determine where equipment gets damaged because they will know where it was last used.

"Beyond holding units accountable for loss, we see an opportunity to develop and provide better training for unit personnel so devices are not broken," said Wood.

Own it, find it, and use it

Underutilization is another problem asset tracking can help to solve, which also will save money.

"When we see that a particular device is not in a patient care area for several days at a time, we can use that information to follow up and improve a process. Has it been waiting for repair all this time? Is it in storage when it could have been used? Do the nurses even know it's available?" explained Wood.

Added Schaefer, "If we can document that we have 10 or 20 percent more infusion pumps than we need, which would also be based on better utilizing what we already have, we reduce the need and the cost for new equipment. But it won't feel like we have less. Nurses will know that if they need it, they will be able find it."

Based on nurses and technicians being able to find what they need when they need it, whether for patient care or preventive maintenance, UMC already sees that accurate and automatic location will increase efficiency and effectiveness. "We're seeing that the whole cycle of equipment management can improve," said Schaefer. "We can track what we have and how it's used to better understand what we need. We can be assured of compliance with JCAHO regulations for preventive maintenance."

Continuous improvement the ultimate goal

The hospital is actively tracking everything from external pacemakers to wheelchairs and beds. Anything that moves frequently—or is of high value—can be tracked. The value to the hospital is tracked both in savings and business sense.

"This whole initiative is rooted in being able to improve the way things are done," said Wood. "Everyone here is very good at what they do, but we want to be the best. We're passionate about being the best.

"When our users—the physicians and nurses—are able to focus on delivering the highest quality patient care, and not equipment search and rescue, they love my department. This is what the Philips solution enables, using the technology so each of us can focus on doing what we do best."

Finding the way with state-of-the-art system

Think very small, highly mobile or both. Think expensive to buy, rent or lease and essential to have when you need it. Today, upwards of 2,000 devices meeting at least one of these criteria are actively tracked and readily found at Tucson's University Medical Center (UMC) using Philips asset tracking solution.

A year after launching the system hospital-wide, UMC finds itself on the cutting edge. Its partnership with Philips has assured a solution customized for healthcare, one that will transform simple location data into sophisticated process improvement analysis.

Active signal

The location data are collected with Wi-Fi-enabled, active RFID tags powered by AeroScout, Philips technology provider. UMC recently updated to a new generation of tags. Among the features that make it appropriate for tracking medical assets across the nine floors of UMC: long battery life, small size, a variety of ways to attach to devices—and signal transmission intervals based on whether the tagged equipment is stationary or in motion. The tags do not need to associate to the access point. This frees up valuable network bandwidth and IP addresses, further conserving battery life.

The latest wireless infrastructure

The location network is the hospital's existing 802.11 wireless infrastructure. Also recently updated, the network now supports the Lightweight Wireless Access Point Protocol (LWAPP). With only a single network infrastructure to support, asset management is simple and scalability is easy. Exciters, which are situated at the exits, entrances to restricted areas or other tightly defined "choke points," automatically communicate with the tags and alert the system—and therefore the right personnel—that a specific device is on the move.

Web-based location data

Authorized clinicians, clinical engineers or other personnel use a web-based application to find what they need when they need it. A map or tabular format can be accessed to see where assets are located.

Promising capabilities

Other behind-the-scenes capabilities give system administrators the ability to configure and manage tags. This includes temperature monitoring and advanced messaging.

Perhaps most promising for UMC is the powerful software enabling utilization and management reports. Already the hospital generates reports that can be applied to measuring and improving workflow and equipment processes.

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