

Seton Medical Center Deploying Ultrasound and RFID Systems

The project will use an ultrasound-based, indoor-positioning technology to track assets and patients, and radio frequency identification to manage the administration of drugs.

By Beth Bacheldor

Sept. 19, 2006—Seton Medical Center in Austin, Texas, has embarked on a multiyear project that will leverage ultrasound-based indoor positioning technology and radio frequency identification to manage assets and patients. The goal: to boost the hospital's efficiency, patient safety and security.

In the first phase of the project, Seton will install an ultrasound-based indoor positioning system from Sonitor Technologies, as well as asset-management software from RedPrairie. The medical center is part of the Seton Family of Hospitals, a not-for-profit organization owned by Ascension Health, which provides health-care services in central Texas and serves a population of 1.4 million.

Sonitor Technologies' ultrasound system uses ID tags that emit acoustic analog signals to determine the rooms in which assets are located. The medical center has also started planning the second phase of the project, in which it will use the ultrasound tags on patients to help locate them for treatment, and to ensure their safety. Finally, as part of phase three, the center plans to add passive RFID to the mix to ensure patients are given the proper medicines.

Seton will affix Sonitor Technologies' battery-powered ultrasound ID tags, operating at a frequency of 35 kHz to 45 kHz, to approximately 2,600 pieces of equipment. Devices to be tagged will include IV pumps, pain-medication pumps, blood-pressure monitors, thermometers and specialized wheelchairs, according to Jeff Falwell, a senior project consultant with Dell Professional Services. Seton outsourced its IT to Dell about two years ago.

Each tag is about the size of a AA battery cut in half, with the two parts set side by side, and will be set to emit a signal every five seconds. The signals will be picked up by 1,020 strategically placed receivers, in every one of the more than 400 patient rooms, with four more in each hallway. Each signal is unique, and the receivers convert the analog signals into digital numbers. The tags will also emit their signals if tampered with, or if the item to which they are affixed is moved.

The Sonitor receivers will send their location information and the tag ID numbers via the Power-over-Ethernet network to RedPrairie's Mobile Resource Solution asset-management software. With that software, nurses and doctors will be able to use any computer in the hospital to search for equipment by perusing a menu of pick lists and clicking on the equipment they're trying to locate. The software has a mapping function, allowing it, for example, to illustrate digitally all rooms containing IV pumps, says Jim Dachelet, CIO of RadiantWave, which is providing design, integration, installation and consulting services. Seton staffers will be able to search by vendors, serial numbers and other criteria. Seton expects the ultrasound indoor positioning system to be up and running by Thanksgiving. Falwell says the system will help Seton more efficiently use the

medical equipment, which is leased.

Hospitals often end up with more than they really need because equipment gets misplaced and can't be found. "Suppliers tell you how many pieces of equipment you need based on how many beds you have. With IV pumps, for example, we are about 20 percent over [the recommended amount], and we want to reduce that overage, which we hope will save about a quarter of a million dollars a year," he says. Overall, Seton hopes to improve its equipment utilization, currently at about 45 percent, to about 75 percent.

In addition to tracking assets, Seton plans to use the ultrasound tags on patients so the hospital can track and locate them. "If a respiratory therapist is looking for a particular patient, the therapist might have to spend a lot of time looking—checking rooms, or other parts of the hospital—because the patient might have been moved to the X-ray department for X-rays," says Falwell. The ultrasound system, combined with the RedPrairie software, will make it easier to locate the patients.

Seton originally considered using RFID tags for the asset- and patient-tracking system. In fact, that was the plan a year ago, Falwell says. But after the hospital found out about the ultrasound system, it decided the ultrasound technology better met its needs. "For our business needs, we needed room-level accuracy of 100 percent, so if I want to know if a tag is in room 303, I need it to be in room 303. RF signals can transmit through walls." This, he says, may cause the tracking system to misidentify the location of an asset. Ultrasound signals, however, can't penetrate walls, reducing the likelihood of the tracking error. "One of our big drivers," Falwell explains, "was for nurses to find needed equipment immediately."

Seton Medical Center's choice of ultrasound technology from Sonitor is also being tested at Boston's [Brigham and Women's Hospital](#) (see [Testing Ultrasound to Track, Monitor Patients](#)).

Seton has decided it won't be using the ultrasound system to manage drug administration, however. If more than one patient were in a room, the ultrasound system would not be able to identify one from the other—it would only know that those particular patients were there. The hospital plans to use passive RFID tags embedded in wristbands to help nurses and doctors determine the exact medicine and dosage each patient should get. The RFID tags will carry unique IDs, each of which will be associated with patient names housed in a patient-management system software containing the patients' medical histories, prescriptions and other information. The tags will replace the bar-coded wristbands the hospital currently uses. Seton has not yet made any decisions as to which RFID hardware and software it will choose.

"Ascension Health has a goal of zero preventable deaths. That is a very lofty goal when you have hospitals all over the country," Falwell says. "This technology is only part of the solution, but it is a step."

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