

In Houston, a freestanding provider of emergency and diagnostic services leverages a real-time location system to offer a higher level of personalized health care.

By Beth Bacheldor

Oct. 9, 2007—The [Emergency Health Centre at Willowbrook](#), a freestanding provider of 'concierge' emergency, diagnostic and imaging services recently built in Houston, is using a real-time location system (RTLS) to improve its patient care. Concierge medical practices aim to offer a higher level of personalized care not typically found in a hospital-based emergency room.

To help it achieve that mission, Emergency Health Centre (EHC) will use the RTLS system to track how long patients wait before receiving care, as well as which caregivers are treating patients and how much time they spend with them. The system also alerts hospital employees when beds and rooms have been cleaned and are ready for incoming patients.

The RTLS combines [Sonitor's](#) ultrasound-based indoor positioning system (IPS) with Amelior EDTracker software from [Patient Care Technology Systems](#) (PCTS). Amelior EDTracker is designed to enable emergency departments to monitor and analyze patients' physical locations, as well as the status of their care, then display that information in charts and graphs via LCD screens and computers located throughout the hospital.

Sonitor's IPS utilizes battery-powered tags that transmit 20 kHz to 40 kHz acoustic signals to receivers. Through frequency modulation, each tag communicates a unique signal to the receivers, which employ Sonitor's patented Digital Signal Processing (DSP) algorithms to calculate the signals' locations and convert them to data. The receivers then transmit the location and tag data via an existing LAN to a central computer.

EHC opened on Sept. 1 with a strategic mission to get patients out of the waiting area and into a treatment room within 30 minutes of arrival. The facility is open around the clock. "Our aim is to provide better service to patients," says Monty Queener, EHC's chief technology officer. To that end, EHC has set several milestones, such as ensuring that a nurse attend to a patient within three minutes of when that person is placed in a room. "If that doesn't happen," Queener says, "on the [LCD] tracking board that everyone can see, a nursing icon will start flashing."

All patients receive tags upon admission. Each tag contains a clip so it can be attached to clothing. During admission, the tag's unique ID number is associated with the patient's name and other information. Physicians, nurses, technicians, patient liaisons and housekeeping staff also have tags with unique ID numbers, which are associated in the back-end system with employee information and roles. The tags are later cleaned and reused once the patients are discharged.

EHC currently has approximately 100 tags, and may add about 45 more depending on patient volume and the number of part-time physicians and nurses it ultimately employs. The system takes a tag read

whenever a tag comes within range of a receiver. EHC has installed receivers in its 14 patient rooms, five clinical areas and three main waiting areas, as well as in two patient overflow areas.

LCD tracking boards are located in both of the facility's major nursing stations. Amelior EDTracker can also be accessed via four charting machines at each nurse station, charting terminals in each patient room and a terminal at the admissions desk.

EHC opted for a system using ultrasound, as opposed to one that utilizes active RFID tags, largely because the hospital wanted to be able to pinpoint a patient or caregiver's location at the room level. "This technology can't be read through walls, whereas active RFID sometimes can," Queener says. "If a caregiver is standing against a wall in room A, it might show up as being in room B with a different patient. With ultrasound, we have a higher degree of confidence that we are properly locating our physicians and patients."

Queener acknowledges that because the hospital is new, it didn't have any legacy infrastructure to consider. "We are a brand-new facility," he says, "so we had the opportunity to put any infrastructure into place that we chose. [Ultrasound-based RTLS] does definitely require a significant higher number of locating devices and much more dense wiring network."

According to Queener, the system will enable the hospital to analyze the RTLS data over time, then use that data to improve operations. "We can integrate the information back into staffing models, for example. We can mine this data and use it to improve our entire processes."

Additionally, EHC is planning to start tracking the locations of devices, such as X-ray machines and the portable tablet PCs it uses for charting and for viewing radiology images so they can be more easily found when needed for patient treatment or for maintenance.