

Tracking Medical Emergencies

A pilot project at a Memphis trauma center uses RFID in a search for ways to speed treatment of critically injured patients.

By Jonathan Collins

Apr. 22, 2004—Memphis-based systems integrator American Project Services has teamed up with the University of Memphis's FedEx Center for Supply Chain Management and the Shelby County Regional Medical Center's Trauma Emergency Department to deploy an RFID network so that the trauma center and others like it across the U.S. can improve patient care.

"Trauma centers deal with patients with the most critical physical injuries, and in many cases every second counts," says Andy Willis, president at American Project Services. Ultimately, the goal of the project is to record how long patients are at each location in the trauma center and thereby provide the center with data it could use to improve its processes and services, as well as its patients' experience.

The project's first phase, which ended mid April, was to determine if the technology is reliable and can produce usable results. During a period of three months, RFID tags were attached to patients (the trauma center sees an average of 60 a day) as they entered the facility. According to American Project Services, while tracking more than 5,000 patients, the technology worked faultlessly. "We had 100 percent accuracy in tracking every tagged patient throughout the center," says Willis.

Funded by a special grant from the Robert Wood Johnson Foundation, the trial is the latest in a number of attempts to examine issues critical to trauma centers nationwide. Previous studies include one in which researchers monitored trauma center workflow manually using clipboards and stopwatches. Later, a trial involving bar codes was tried. In both studies, the data was compromised because the research methods constantly reminded the staff at the trauma that their performance was being monitored. "When people know they are being watched, they tend to perform differently," says Willis.

By automating the collection of data, the American Project Services trial showed that RFID technology could track patients without distorting the study's results. Twenty-five RFID readers were deployed throughout the approximately 250,000-square-foot facility, which includes three X-ray rooms, two CAT (computed axial tomography) scan rooms, two intensive-care units, an operating room and several general areas. Only the MRI (magnetic resonance imaging) scan room was not covered. "There has not been enough research on the effects of an RFID reader on MRI readings," says Willis.

During the trial, an adhesive-backed RFID tag was attached to an ankle of arriving patients as soon as they entered the center. According to American Project Services, the ability of the tag to be read would have been impaired if the patient's body was between the tag and the reader. By attaching the tags to an ankle, that problem was avoided.

The trial used tags and readers from [Alien Technology](#). Operating at 2.45 GHz, the 2-inch by ¾-inch by ½-inch tags include a battery to enable a longer read range. According to American Project Services, the read range was up to 30 meters, compared with the 3 meters capable with passive tags. The tag comes with a

12-byte unique ID number that was used in the trial. Only each tag's unique ID was tracked, and no patient or injury data was recorded.

An RFID reader would take between 40 and 50 reads per minute of each tag within its read zone. Those read results were transmitted over a LAN to a central SQL database running on a PC in the hospital's data center. The database retained just the first and last read taken of each tag in each read zone so that a patient's location could be mapped at all times.

The next phase of the project will be to determine whether to broaden the pilot to other sections of the Shelby County Regional Medical Center or trauma centers in other parts of the United States. Alien says it has deployed the same tags in hospitals before, but for tracking assets instead of patients. "The trial has proven that the technology is capable of doing a wide variety of tasks," says Mark McDonald, director of program management at Alien Technology. In the meantime, the system put in place at the trauma center continues to track and collect data on patient locations, although no plans have been set on how to utilize that data to improve the center's processes and services.

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