

Using RFID to Track Equipment and Patients

After implementing radio frequency identification technology, a health system has saved \$2 million a year, improved efficiency, decreased labor costs, and increased operating room capacity.

In 2004, Bon Secours Richmond Health System, Richmond, Va., began using radio frequency identification (RFID) technology to track equipment. The technology employs radio frequency signals to remotely locate equipment that has been marked with bar codes.

Since installing the technology, Bon Secours Richmond, a system of four hospitals and 875 beds, has saved almost \$2 million annually. The technology has been so effective that the health system has implemented additional RFID initiatives, including tracking patients in the operating room (OR), which has resulted in improved efficiencies and greater volume.

Improved Utilization

Bon Secours worked with a locally-based technology company to become a beta site for RFID technology, which was deployed on 11,000 assets, such as IV pumps, wheelchairs, stretchers, and beds. Each item was given a bar code embedded with an RFID tag, or microchip.

The microchip transmits identification data to an RFID reader, which in turn sends those data to the hospital's computer system, enabling the supply to be tracked.

Prior to implementation of this technology, Bon Secours faced problems typical to large health systems. Equipment was often sitting unused in a hallway on one patient care floor, while staff on another floor were in need of the equipment but unable to easily locate it. With IV pumps, for instance, the health system had a utilization rate of only 40 percent, says

Kathy Santini, RN, vice president of surgical services. "The problem was nobody knew where all those pumps were. Now, our utilization of those pumps is 90 percent," she says.

The savings resulted from reducing the quantity of rental equipment used in the four hospitals by 38 percent and decreasing the incidence of lost and stolen equipment by 50 percent. Equipment service costs were also reduced by 15 percent.

The tracking system has also helped with infection control by ensuring that equipment receives preventive maintenance at the appropriate time. For example, once a patient care bed is disconnected from all monitoring devices, the technology transmits that information to the computer system. So, rather than having a bed sitting in a hallway until someone realizes it's ready for maintenance, immediate notification is sent to housekeeping, reducing the likelihood that the bed will be reused before being properly cleaned.

Efficiencies in the OR

Almost two years ago, Bon Secours took the technology a step further—using RFID in combination with a Six Sigma process improvement technique to reduce OR turnover time by 50 percent in surgical services at its largest hospital, St. Mary's Hospital, which has 20 inpatient operating rooms.

Upon arrival to the admitting room, patients are given a regular identification bracelet and one implanted with an RFID chip. "So, we can tell immediately when those patients are in the system," Santini says.

Although the Six Sigma technique supplied specific targets and methods for improvement, the RFID technology allowed patients to be tracked at the various steps in the surgical process.

Each clinician in the pre- and post-operative process completes his or her work and then lets everyone else know, by scanning the RFID bracelet, that the patient is ready for the next step in the process. For example, a holding room nurse performs a readiness assessment, then creates a note on the computer system indicating that the holding room has cleared the patient, letting the anesthesiologist know that the patient is ready for him. When the surgery is complete, the patient's RFID bracelet sends a signal to the computer that the patient is leaving the OR, alerting a clinical team that the room is ready to be cleaned and prepped for the next patient.

An additional benefit of the RFID system is that any instrument or piece of equipment that is included on the surgeon's preference list, but not available on or near the surgical case cart, can be located quickly via the RFID system.

Before implementing the RFID technology and the Six Sigma system, OR turnover time at St. Mary's averaged about 45 minutes; the goal was to reduce turnover time to 20 minutes, a target the staff was reaching just 10 percent of the time, Santini says.

Because the caseload in the inpatient OR rooms includes major surgeries, such as total joint replacements, craniotomies, and open heart, Santini says setting a 20-minute turnover time in between patients represents an aggressive target. One year after implementation, staff were able to reach the target turnover

time about 85 percent of the time—good, but not good enough. “Bon Secours is a type-A organization, and we always believe that our performance should be in the top decile. So we strive to reach our target 90 percent of the time or more,” she says.

Part of the improvement in turnover time has resulted from increased efficiency. Santini says the number of phone calls made among departments in the OR is down 75 percent because everyone has access to patient status information on the computer. Santini says processes are continuing to be refined to reach the organization’s target turnover rate.

Benefits in OR and Beyond

Use of RFID in the OR has helped improve productivity, decrease costs, and enhance the opportunity for increasing revenue. Because ORs are

being prepped faster, surgeons can use the additional time to add a case to their block of time in the OR schedule.

Santini says as the hospital’s surgical caseload has increased, so has revenue. “We figured out we could add about \$5 million, minimum, to our bottom line with additional cases,” she says. In addition, productivity is in excess of 100 percent, overtime is less than 2 percent of labor costs, which Santini says is typically 3 percent for most hospitals, and total cost per patient has decreased annually.

Bon Secours has since rolled out the new OR turnover process at St. Francis Hospital, which has the system’s second busiest OR, and will eventually use it at the organization’s other two hospitals. In the meantime, plans call for implementing the system in the emergency department at both St. Mary’s and St. Francis.

The health system also plans to use the RFID system to monitor hospital-acquired infections. One initiative will track whether patient care staff are washing their hands in patient rooms. Soap dispensers will be wired to send signals to a computer when the dispensers have been used. The technology also will be used to alert housekeeping when a room is ready for cleaning and alert clinical staff when the room is available for a patient.

Additionally, the technology will be used to help monitor patients with Alzheimer’s disease by using signals to notify hospital staff when a patient has left either the room or the floor.

“There are all kinds of things you can do with RFID technology,” Santini says. ☞



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