

Mercy Medical Tracks Cardiovascular Consumables

The Des Moines, Iowa, hospital is employing passive HF tags to inventory its supply of stents, balloons and other devices used in its catheterization lab—and, eventually, to bill patients.

By Beth Bacheldor

June 5, 2007—Mercy Medical Center, a 917-bed hospital in Des Moines, Iowa, is using an RFID system to help track its inventory of cardiovascular stents, balloons, filter wires, thrombectomy devices and many other medical consumables in its six-room catheterization laboratory.

The RFID system, provided by WaveMark, leverages passive 13.56 MHz tags complying with the ISO 15693 standard; intelligent cabinets with built-in RFID interrogators that read items on the shelves every 12 minutes; point-of-service (POS) fixed RFID readers that companies can install in places where items are used in order to track actual usage; and Web-based software to monitor, analyze and manage inventory. Based in Boxborough, Mass., WaveMark manages the system as a hosted service in a secure data center in Dallas. Edwards Lifesciences, an Irvine, Calif., maker of heart valves and other health-care products, introduced Mercy to WaveMark and participated in the initial testing of the system by supplying pre-tagged items.

Mercy is a member of Catholic Health Initiatives and Mercy Health Network. The hospital is employing the system to track 1,600 items ranging in value from about \$100 to \$2,500 in 16 intelligent cabinets, according to Lynda Wilson, Mercy's administrative project analyst. Six of the cabinets are in the hospital's peripheral vascular storeroom, with five in the cardiac storeroom and one apiece in its four catheterization procedure rooms. Wilson says the hospital also plans to install a cabinet in each of its two electrophysiology procedure rooms. POS interrogators have been placed in two control rooms, where hospital personnel document each patient's case.

Hospital employees affix two RFID tags to the sides of each device's outer box. Tags are not reused. "We suggest using two tags per box because we insist on 100 percent read rates," explains Carola Endicott, WaveMark's VP of hospital services. Each tag contains its own unique ID number. The ID numbers are associated with a bar-code number applied by the device's manufacturer before shipment; hospital employees scan the bar code with a bar-code reader, and that data is correlated with the RFID tag numbers. The cabinet readers and the POS devices are connected to the Internet, and both update the status of all tagged products in the WaveMark system, three times per hour.

Because the cabinets automatically read all the tags numerous times daily, the system has a near-real-time count of inventory levels, which continually change whenever an item is removed or put into the intelligent cabinets. This enables the hospital to track which stents are pulled out for patients, which are ultimately used and which are put back. Typically, more than one stent is pulled for a patient because physicians don't know the exact type and/or size of stent that will be used until the implantation begins.

Once the procedure is completed, employees return the unused stents to the cabinets. Sometimes, however,

unused stents aren't returned to the cabinets and turn up missing. By checking the WaveMark Web-based application, inventory personnel can determine approximately when the stents were removed, making it easier to track them down.

The RFID system replaces labor-intensive, manual inventory processes requiring hospital personnel to hand-count and restock items—a time-consuming task prone to errors. The manual inventory counts used to reconcile financial records, for example, took approximately three days.

The hospital has been using an inventory management system from enterprise application provider Lawson Software, but that system is imprecise because it depends on inventory data collected manually. "Although it is an okay system, it is very manually intensive," says Wilson. "If the computer says you have five of something on the shelf, it's not telling you what you really have. It's just telling you what it thinks you have."

Now, the intelligent cabinets automatically count inventory. With that information easily accessible, the hospital knows what is going on with its inventory at all times, and can compare that data with the par level—a set quantity of a product determined to be the proper amount to keep on hand. Using the WaveMark software, the hospital can analyze product usage and cut back on, or get rid of, products it doesn't use. It can also keep better track of lot numbers and expiration dates, removing items that are expired or are about to expire, and in some cases returning them to the vendors at no cost (many of the medical devices are on consignment, so Mercy Medical Center pays only for those it uses).

Drug-eluting stents, for example—which contain pharmaceuticals that are released over time—typically have a shelf life of only three months, Endicott explains. Keeping track of expiration dates also ensures that the hospital stays in compliance with the Joint Commission on the Accreditation of Healthcare Organizations, which makes regular, unscheduled visits to check quality and expiration dates, among other things. The WaveMark software enables the hospital to identify items that have expired, or are expected to expire within 30 days. The inventory analysis has also enabled the hospital to establish more accurate par levels.

"We use the reporting a lot," Wilson says. During a recent audit using the system, for instance, the hospital analyzed four months of data collected from the cabinet and POS RFID readers, as well as the patient billing system and WaveMark inventory software. In doing so, it discovered several items that had been scanned for particular patients but never charged for. "We found out, after the fact, that the items couldn't be used for those patients, and while they were supposed to be returned to inventory, they weren't," Wilson says. "We might have been able to return those items to the vendor, but didn't. And now, those are lost dollars."

RELATED_ARTICLES To prevent such a problem from happening again, the hospital plans to integrate the RFID system with its materials and patient billing systems within the next few months. Thus, whenever a product is pulled from a cabinet and actually used, it will automatically be charged to a patient bill. "Right now," Wilson says, "there is no direct connection between inventory and charges." Though plans are still being formulated, the likely scenario will enable nurses and physicians to input the patient's ID number into a procedure room computer, then utilize a POS reader to scan the RFID tag on the medical device actually used for that patient.

While the process will still require the manual inputting of the patient ID number, it will replace the current practice of literally peeling off the bar code from the box of the device used, then sticking it onto the patient's chart so personnel can later scan the bar codes while reconciling patient charts and bills. Once that new process is instituted, there will be an electronic record of the exact item used on a particular patient, which can be compared with actual inventory at any given time. That would make it easier for the hospital to track items pulled from the shelves but ultimately not used or returned to inventory.