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Bangalore Heart Center Uses Passive RFID Cards to Track Outpatients

The Bhagwan Mahaveer Jain (BMJ) Heart Center in Bangalore, India, is using passive UHF RFID tags to help maintain patient records, monitor patient flow and care, and track assets

throughout the hospital's outpatient department.

Since the fall of 2006, the cardiac hospital—part of the Vivus Group—has employed the Clinical Information Processing Platform (CLIP), from Aventyn, a wireless technology company based in San Diego, Calif. The facility now tracks an average of 100 new patients a day, as well as returning patients, as they check into its outpatient department.

“We were aware of some hospitals in the United States using [RFID] for asset tracking,” says Dr. Satish Chandra, BMJ's director of noninvasive cardiology, “and were interested in how this could really benefit patient care.”

The Web-based CLIP system includes software and EPC Gen 2 interrogators and tags. In addition, Aventyn helps its customers plan for and implement the software and hardware. In May, the company announced an updated version of its CLIP solution, able to support Microsoft's BizTalk RFID platform for managing auto-ID devices.

Patients checking into BMJ's outpatient department receive RFID-tagged patient cards. The unique ID number on each tag is associated with that patient's electronic record in the CLIP Personal Health Manager. “Initially, the goal was to issue patient health cards at the outpatient department's registration front desk and track the patients as they went through cardiologist consultation and diagnosis,” Chandra says, “so that the electronic health records were received automatically based on patient identification. This eliminated the tedious manual effort of paper registration, and [the] use of paper forms for clinical records.”

Aventyn uses RFID interrogators from ThingMagic and Alien Technology. These readers are positioned in the facility's waiting room, consultation rooms and labs, and they document whenever a patient enters and leaves those areas. When a patient visits a consultation room, for example, the

interrogator reads that person's card and communicates its data, via CLIP middleware, to the CLIP Personal Health Manager software. This enables a doctor or nurse to find and access the patient's records on a PC. The RFID interrogators can also document how long a patient stays in a particular area—such as a waiting room—so BMJ can track the individual's care and movement through the facility. The Personal Health Manager is also integrated with the hospital's billing system, enabling the staff to use patient care and workflow information for accurate billing.

“We are monitoring patient flow and the health records' movement in the OPD [outpatient department],” Chandra says. “The data collected is the number of patients processed, time spent at various locations in the OPD waiting room, consultation, lab and eventually billing.”

Additionally, BMJ is attaching EPC Gen 2 RFID tags to stents, pacemakers, wheelchairs, gurneys and other high-value items, as well as certain mobile devices, such as those used in diagnostics labs. The company then uses the CLIP AssetLIVE application to track the locations of those assets. AssetLIVE utilizes a mapping technology known as Scalable Vector Graphics (SVG), a World Wide Web Consortium (W3C) specification with XML-based grammar that defines instructions for rendering rich, interactive graphics, as well as multimedia applications.

“We use vector graphics to map out a grid on the screen,” says Navin Govind, founder and CEO of Aventyn. “What we do is not very different from [real-time locating systems], although ours is somewhat static in nature.” Instead of tracking tagged objects in real time, the system documents their location by analyzing RFID data reads and rendering their last known position in a graphic, as part of the AssetLIVE application.

Chandra says it is still too early to share hard data illustrating how RFID is saving the hospital money and

improving patient care and inventory and workflow processes. However, the hospital says it has definitely benefited from the technology. "Increased patient throughput, reduced paper forms, and more visibility into our stores [supplies] show specific benefits," he says. And while BMJ policies preclude Chandra from sharing more specifics, he claims the hospital plans to expand the use of CLIP to track and manage processes very specific to patient care in the inpatient and acute-care departments.

As the hospital increases its use of RFID to improve patient care and save money, Chandra has a wish list of sorts for the technology. For example, he'd like to see smaller antennas. "Hospital infrastructure is quite tight in terms of space for accommodating IT and new technology," he notes. "The RFID antennas take up valuable space." If that's not possible, he says he hopes to see increased ranges of coverage. Currently, a CLIP system requires two interrogators and four antennas to cover a 3,000-square-foot area.

In addition, Chandra would like to see costs come down. "We hear a lot about cheap tags, but the tags for use in health care are quite expensive," he says. "When all is said and done, tags should be easily affordable if we are to use [the technology] widely." And any tags BMJ uses to monitor patients in its inpatient department will have to be tamper-proof and able to withstand the requirements of a sterile environment.



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