

# RFID Remedy for Medical Errors

Exavera's eShepherd combines RFID with Wi-Fi and voice over IP to deliver a single system to track patients, staff and hospital assets.

By Jonathan Collins

May 28, 2004—Start-up company Exavera Technologies has unveiled its eShepherd system which, by combining RFID and Wi-Fi technology, the company says can bring enormous savings to hospitals and healthcare centers across the U.S.

“We estimate that for an average-sized hospital with, say, 250 beds, deploying our solution will create savings of \$4 million a year. That is for an investment of \$400,000 to cover the equipment and its installation,” says Evan Bontemps, president and CEO of Exavera, which is based in Portsmouth, N.H. According to the company, a good deal of those savings will come from using its systems to ensure patients receive correct treatments and medications.

Some estimates indicate that many as 98,000 people die in the U.S. each year because of medical errors, says Bontemps, adding that in cases where a patient does not die from an error, the mishap winds up costing the hospital an average of \$4,700 per Adverse Drug Event (ADE), given that hospital beds can cost between \$1,500 to \$2,500 a day.

Many of those errors could be avoided by using information technology, says Bontemps, adding that only 3 percent of the 64,000 hospitals in the U.S. have an integrated Hospital Information System (HIS) to manage patients' records and care. In addition, 60 percent of those hospitals with an HIS are using bar code technology to ensure patients receive the right treatment, but limitations in that technology still raise issues. Exavera believes its technology will deliver an integrated hardware and software platform that all hospital departments can use to intercommunicate.

Because the reading of bar codes needs a line of sight between the patient's ID tag and a bar code scanner, healthcare workers often fail to scan the patient's ID bracelet's bar code or must wake the patient to do so. That means that staff members often choose to either bypass the required bar code scan or verify a patient by sight and scan a copy of the patient's bar code on their clipboard instead, says Bontemps.

Exavera's eShepherd information system combines RFID with Wi-Fi and voice over IP (VoIP) to deliver a single system to track patients, staff and hospital assets. Key to the system is the company's specifically designed VeraFi Wi-Fi (802.11a/b/g) network router, which connects to the hospital's LAN via an Ethernet port. To enable for telephone calls over the Wi-Fi network, the VeraFi unit has two RJ11 ports to connect regular analog telephones and converts the analog calls into VoIP using SIP protocol. The unit also includes an RFID transceiver to read RFID tags placed on patient bracelets, staff ID badges and hospital equipment.

EShepherd will help ensure that patients get the correct treatment by using both the Wi-Fi and RFID capabilities of the router. Nurses and doctors wearing RFID-tagged badges will also carry Wi-Fi-enabled PDA's or tablet PCs. Whenever the RFID transceiver detects the proximity of a hospital staff member to a patient, the Wi-Fi network will deliver the patient's records on the caretaker's handheld device.

In addition to reducing medical errors, the eShepherd system will cut costs by savings improving efficiency. By carrying Wi-Fi-enabled computers, nurses and doctors will be able to view any patient's complete record whenever they need to, rather than having to repeatedly walk to a central filing area to retrieve records between seeing patients, according to the company. "That could mean saving each doctor or nurse 3 minutes for each patient seen in a day," says Bontemps.

The system's tracking capabilities can also be used to locate equipment, as well as staff and patients. For example, the PDA or tablet PC could notify doctors of each patient's location, so they can structure their schedules to suit.

Exavera says it will offer RFID tags operating at either 433 MHz or 915 MHz for the U.S. market and 868 MHz for the European market, as well as 2.4 GHz. "Hospitals will select which frequency they use depending upon the frequency that their telemetry equipment such as EKG and infusion pumps use," says Bontemps. The RFID tags can be embedded into patient bracelets, replacing bar-coded or handwritten information currently used on the bracelet. Exavera's family of Vera-T bracelets can also be printed with human-readable characters, if the institution so desires. The company believes, however, that RFID will streamline the patient identification process, eliminating the need for human-readable printing on the ID bracelets.

According to the company, because of the way the RFID transceivers have been designed to read only one tag at a time, the devices have read ranges of up to 45 feet with the passive tags worn by patients and up to 90 feet with the active tags that would be worn by staff.

Currently, Exavera's eShepherd system is being tested in two New England hospitals. Those two trials—one involving 25 beds; the other, 99—are expected to last until the end of the year. The 25-bed trial, deployed in an 8,000 square-foot wing of the hospital, required just two VeraFi Wi-Fi router transceivers, according to the company.

Exavera says it will work with specialist healthcare integrators to deploy its systems, but it has developed middleware to link its system into the proprietary existing electronic health records systems such as those from sold by IDX, Meditech, Siemens Medical and GE.

Exavera says its eShepherd system will help hospitals meet security and privacy regulations set by the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and requirements regarding positive patient identification established by the Joint Commission on Accreditation of Health Care Organizations (JCAHO). However, JCAHO guidelines currently stipulate bar code use, and not RFID, as a safety measure for patient care. Exavera says it is working to have those guidelines expanded to include RFID.

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