

## CURRENT ISSUE

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### FEATURES

## Giving a Nod to the Neighbors to the North

Landmark Medical Center's platform for hospital-wide connectivity.

By Robert N. Mitchell

In the northeastern Rhode Island city of Woonsocket, with its French Canadian heritage as an early working-class community with its beginnings in the textile industry, patients who come to Landmark Medical Center are being monitored with technology that is commonly used by its larger neighboring health systems to the north in Boston.

Because of Landmark's relationship with Boston-based, Harvard-affiliated Beth Israel Deaconess Medical Center (BIDMC), emergency department physicians were looking to use technologies similar to those they were accustomed to using in downtown Boston.

InterSystems Corp. of Cambridge, Mass., and Waltham, Mass.-based Forerun worked with Landmark to implement the Forerun ED system. Using InterSystems Ensemble technology as the integration engine, Forerun ED went live in late 2007, and is now delivering improvements in patient management and care delivery.

"This system provides a global view of what's happening in the emergency department in real time," said Victor Pinkes, MD, chairman of emergency medicine at Landmark. "In addition to tracking the true time that a patient spends in the emergency department prior to hospital admittance or discharge after treatment, Forerun ED rapidly identifies life-threatening conditions that must be addressed immediately. The result is optimal response and care delivery, as well as improved patient management."

### Technology choice

Colleen Ryan, director of IT at Landmark, said the initial reason for the request for the software is that Dr. Pinkes and other emergency room doctors were familiar with the technology because they had used it at BIDMC. "They thought it would add benefits here, helping us move patients throughout the emergency department, and helping staff better manage patients, not only in the emergency department, but those waiting to come into other hospital departments from the waiting area," she said.

Forerun, an InterSystems application partner, developed technology services that allow providers to deliver high quality outcomes and high patient satisfaction.

Approximately 70 percent of Landmark's admissions come through the emergency department, which treats approximately 47,000 patients each year. "We use a mid-level triage model whereby the patient is first registered, then triaged by mid-level clinicians and then treated by a physician," Dr. Pinkes said. "It's important to know how many patients are waiting for treatment and exactly where they stand in the treatment process."

Ryan said that Landmark's team worked with InterSystems and Forerun to build Forerun ED. "The emergency department physician, mid-level nurse practitioners and physician assistants, along with nursing staff in the

emergency department needed to be as efficient as possible," she said. "It's physically not a large emergency department, so we don't have a lot of patients in beds waiting, but because of our historical high patient volumes, we needed to make sure that patients were seen as quickly as possible and treated appropriately, so that their wait times for services were kept to a minimum."

Another reason for implementing the Forerun ED technology, Ryan said, was that the hospital doesn't have clinical documentation. "This technology gave us a visual overview, without requiring documentation in multiple places, but would give us a picture by looking at the EDDashboard," she said.

A large screen replaces the whiteboard at the nurses' station in the emergency department, which shows which patients are located in which rooms. The screen uses icons to identify different activities. "For instance, we have a link from our health information system where lab and radiology results are stored, and this data populates the dashboard, alerting clinicians that their lab work has been ordered, performed or that results are back," Ryan said.

Forerun ED color-codes categories and conditions, giving clinicians "at-a-glance" status updates. The physician no longer has to look for or call other departments to find a paper record, Ryan said. They also don't have to have a verbal communication with a secretary or a nurse to get results. In the radiology system, for example, as soon as a test result is received, the color changes the flag on the EDDashboard. "This helps patients move through the hospital and reduces delays. Physicians and nurses can make quick decisions about the patient's treatment. We also feed the dashboard information about medications," she said.

When it is time for the patient to be discharged, transferred to another facility or admitted to the hospital, "we have an area on the dashboard that denotes that information, as well. We know where the patient is, and where any backlogs may be occurring," she said.

Once the patient is ready to leave the hospital, the system triggers the patient's review of discharge-planning instructions. The physician may note that the patient is going home. The nurse then discharges the patient and releases the bed in Forerun ED. Once a bed assignment has been made, the expectation is that the patient will be transferred up to the unit, Ryan said. Clocks built into the technology track the time of discharge from the emergency department to the time of bed assignment, from the time of bed assignment to the time of transfer out of the department.

### **Interface technology**

Using InterSystems Ensemble interface technology, information from the hospital's registration, lab, pharmacy and radiology systems flows into Forerun ED. "With Ensemble-based Forerun ED, we have an awareness of what's happening with each patient," Dr. Pinkes said. "Everything that is clinically relevant -- tests ordered and completed, prescriptions ordered and clinical notes -- are visible on a single screen. This builds confidence among clinicians that they aren't missing critical information while simultaneously improving the emergency department's workflow."

Landmark provides information to Forerun ED by sending admission/ discharge/ transfer (ADT) data about the patient, creates the feeds and sends ADT data through the local interface engine to populate the dashboard. "That appears on monitors and desktop systems," Ryan noted. "Our staff can view data from our tracking board. The board can be reviewed remotely, as well. If a physician had recommended to their patient to come to the ED, the physician may want to see what's going on with the patient before returning to the office or home."

From an administration perspective, a hospital administrator or department administrator can "see" what's going on in the emergency department. "If we have a busy day in the emergency department, and if there's a question of whether we need to go onto deferral mode, administrators can remotely view the system and recommend how to get patients moving through," she noted.

Dr. Pinkes said it's still too soon to assess benefits of the system statistically, "but we intend to do that soon. I can say that there have been a number of positive and qualitative changes. By far the biggest is the impact on patient safety," he said in an e-mailed response.

"We now have a virtual view of the emergency department using the Forerun system. In less than two minutes any supervising member of the team can size up the department," Dr. Pinkes said. "Handoffs are easier, faster and more complete. And, with all members of the team having the same universal view, we have many pairs of eyes looking for potential trouble areas." A loop in critical value reporting has been closed in the emergency department and "we have achieved all EKG tests for chest pain in under 10 minutes due to our enhanced viewing capabilities," he said.

#### **What's ahead?**

Dr. Pinkes said he expects to implement a number of enhancements related to physician charting, medication reconciliation and additional alerts. "As we gain more experience, we will have even more ideas and feel we have a receptive partner in Forerun," he said.

InterSystems, in working behind the scenes with the Forerun technology, is performing ongoing development in Caché and Ensemble. Forerun is using Ensemble to develop interfaces that pass HL7 messages from Landmark's other applications into radiology, lab and pharmacy data to the Forerun EDDashboard application.

At press time, Forerun noted that it has just received \$1.35 million in venture capital funding from the Massachusetts Development Technology Corporation (MTDC) and existing investors. MTDC is a lead investor in the Series B-1 funding, which also includes investors and Forerun founders. Forerun will use the capital from this round of funding to deliver products and technology enhancements at the five hospitals that are using the application in their emergency departments for more than 200,000 patients a year. Forerun will also invest in infrastructure to support implementation at additional hospitals in the coming year.

"Forerun has already demonstrated its ability to address a growing and serious need in the delivery of health care services," MTDC Vice President Jerry Bird said in a statement. "Hospitals recognize that they can ill-afford to have an emergency department that fails to meet the growing demand for services and would result in patient dissatisfaction, loss of revenue and increased risk of malpractice. Forerun is commercializing clinical tools that were developed over the years at BIDMC and have proven to help caregivers serve more patients, faster and more safely."

Over the next year to 18 months, Forerun plans to make its software available throughout the United States, utilizing its scalable software as a service delivery model. By offering its software in this format, Forerun enables hospitals to adopt transformational technology while minimizing incremental IT support costs.

*Mr. Mitchell is managing editor of ADVANCE for Health Information Executives.*

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