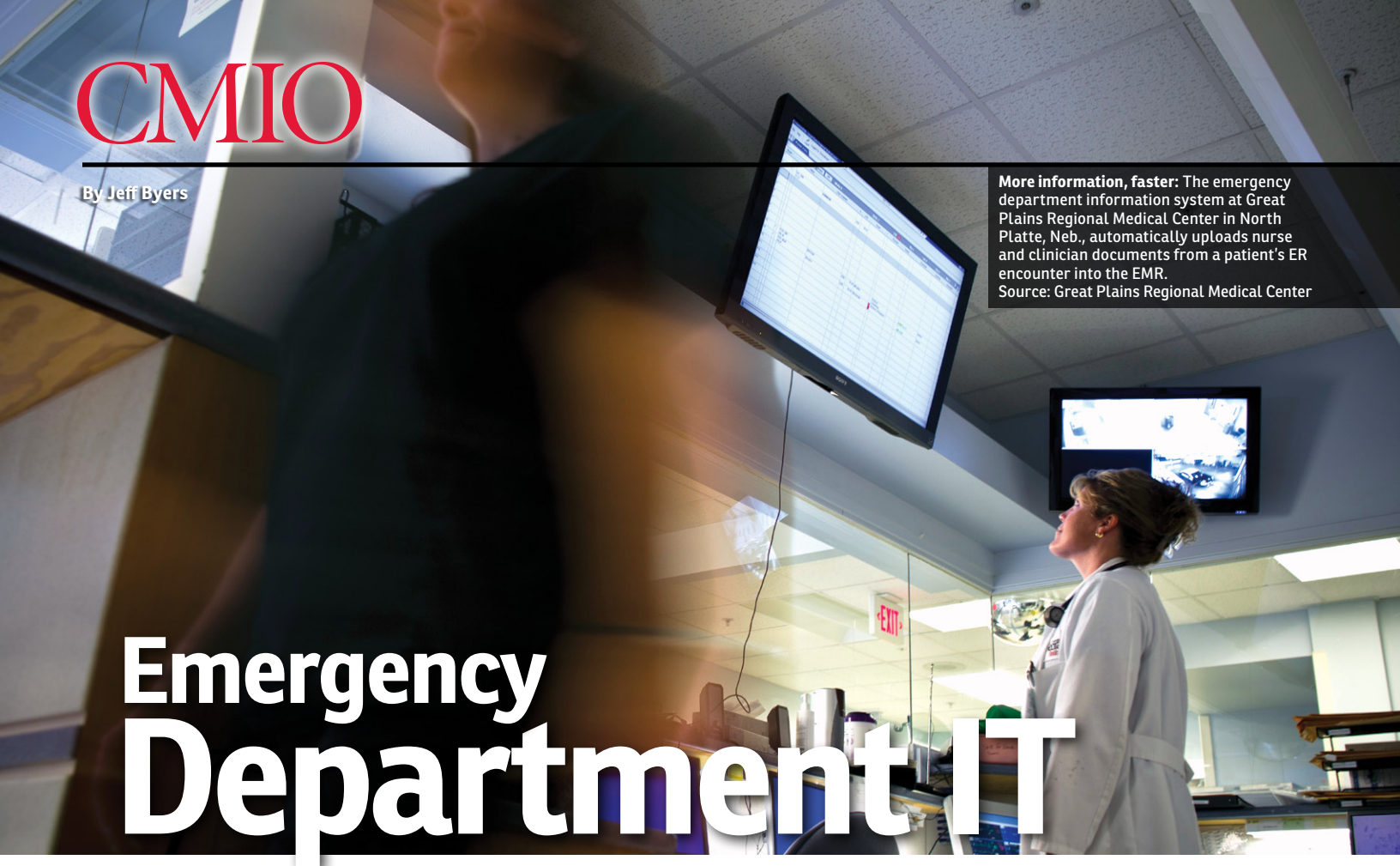
By Jeff Byers



More information, faster: The emergency department information system at Great Plains Regional Medical Center in North Platte, Neb., automatically uploads nurse and clinician documents from a patient's ER encounter into the EMR.
Source: Great Plains Regional Medical Center

Emergency Department IT

Throughput Is Key

Swift, effective care and smart economics rest on getting patients through the emergency room as soon as possible. IT that delivers patient flow data plays a major role in maximizing efficiencies within the emergency department (ED).

"One of the challenges to driving [ED] throughput down is it can be difficult to dissect the processes and determine which interventions are making a difference," says Neal Sikka, MD, emergency physician at the George Washington University Hospital in Washington, D.C. "Unfortunately, individual components of the throughput process are not [taking place] in a vacuum, and something that's out of your control can and might change."

In 2005, to help improve care for the rising number of patients in the ED and to begin collecting data on patient throughput, GW Hospital, whose 36-bed ED receives 65,000 patients annually, implemented an ED information system/EMR (Picis ED Pulsecheck).

Before then, few data or metrics were gathered, says Sikka. But once the ED data spigot was turned on, clinicians started getting real-time data, which enabled them to examine workflows and make a variety of changes to expedite care. For example, EMR data analysis showed that the peak ED arrivals began at 9:00 a.m., not 11:00 a.m., as had previously been thought. "We now plan to staff for triage earlier and we reduce the risk of getting behind," he says.

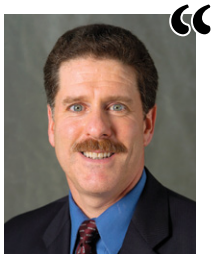
As part of the hospital's initiative to leverage EMR data to improve ED throughput, a variety of time intervals were examined. Insight gained from tracking greet arrival patterns and intervals such as greet to triage, triage to bed, and bed to disposition have lead to process modifications. In addition to matching nurse staffing in triage to the highest arrival rates, the hospital has shifted to electronic communication between greeting ED technicians and triage nurses, and now uses nurse-initiated triage protocols to start workups.

"Over the past few years since we began collecting data, our greet-to-triage times have improved nearly 50 percent," Sikka notes, and the total length of stay in the ER has dropped by more than 15 percent.

GW Hospital plans to migrate to a Cerner EMR platform this fall. Like many other medical centers, the facility is moving to an integrated system for the entire hospital as compared to the current, disparate IT environment, according to Sikka. ED staff at all levels have been a part of the development and implementation team in planning for the changeover to the EMR. "Every effort is being made to ensure that there is no loss of functionality and that the ED can take advantage of the benefits that come with an integrated hospitalwide EMR," he says.

Managing the patient

Throughput issues aren't limited to large urban hospitals. Great Plains Regional Medical Center (GPRMC), a 116-bed full-service medical



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> Carl Chudnofsky, MD, Chair, Department of Emergency Medicine, Albert Einstein Medical Center, Philadelphia

center in North Platte, Neb., went live with a system developed by T-System in 2004 to document patient throughput within the ED.

One of the big concerns was whether the new system would actually slow care, says GPRMC CIO Jim Anderson. "As CIO, I worried that the implementation of a computer system in a high-volume, fast-paced environment might slowdown total ED throughput."

By uploading patient throughput data, the system assists with clinical decision support. Because decisions must be made quickly in the ED, GPRMC needed a system to quickly access a patient's symptoms and record, Anderson reports. The T-System EDIS automatically uploads nurse and clinician documents from a patient's ED encounter into the EMR. The EDIS matches ED flow in terms of the symptoms the patient presents with when he or she enters into triage. Those are followed up with nurses and the initial visit from the physician through to the ordering of labs or exams, says Anderson.

The facility was so pleased with the EDIS' capabilities that when GPRMC implemented its EMR system (Eclipsys) in 2009, the hospital opted to integrate the ED documentation software into the EMR because the functionality was richer in the EDIS environment, Anderson says. Clinicians can see the integrated EDIS data as part of the patient's EMR, which enables them to quickly make decisions based on a more complete view of the patient's history, according to Anderson.

The average ED throughput time before implementation of the system (2004) was 121 minutes. GPRMC experienced a 10 percent jump in ED volume between 2009 and 2010, and the average throughput time last year was 129 minutes. "Our focus was to not increase length of stay when moving to the electronic system and to improve care in terms of sharing information," says Anderson, who reports he's satisfied with the results.

Infra-ready

In 2002, Philadelphia's Albert Einstein Medical Center (AEMC) was experiencing a host of ailments, including high emergency department walkout rates and poor ED throughput times. To alleviate the issues, the hospital began a renovation of the ED to improve throughput and "reduce the perception of chaos," says Carl Chudnofsky, MD, chair at the department of emergency medicine at AEMC.

AEMC has a high-acuity ED—Chudnosky estimates that the ED will see about 90,000 patients in 2011.

They wanted an automatic patient tracking system to reduce long waits. A first-generation infrared technology (Versus) was deployed in 2004. The infrared patient badges required a line of sight between the censors, the ceiling and the badges that patients wear. "If the badges flipped or were covered by a gown or sheet, you lost the tracking," says Chudnofsky. AEMC developed a workaround by putting the badges on IV pulls.

"The tracking was better than any tracking screen, since those can look like an Excel spreadsheet bogged down with icons which becomes less helpful," says Chudnofsky.

Five years later, AEMC upgraded to an ultrasound-based tracking system for patient tracking. The software never worked. "We spent about a year troubleshooting," he says. AEMC subsequently replaced the faulty ultrasound system with a second-generation infrared system (Centrak) earlier this year, which doesn't require the line of sight.

The long road has paid off for AEMC—automatic tracking of patients has helped drive down the average monthly ED diversion from 170 hours in fiscal year 2004 to less than 20 hours in fiscal 2010. Triage time currently averages nine to 12 minutes: The average was nearly twice that time prior to the tracking system being implemented, says Chudnofsky.

The infrared system, thanks to badges attached to patients, automatically tracks patients on large plasma screens in the ED in front of physicians and on desktops. Information will be integrated into the hospital's Cerner EMR platform when it goes live this month.

"In the past, to know what patients were in the waiting room, you had to physically go there. When admitting in the past, you had to make phone calls. You don't have to do either now," says Chudnofsky. Tracking patients has helped AEMC optimize patient prioritization and distribution, identify bottlenecks and improve time intervals. In addition, the number of ED patients leaving without being seen has gone from 4 percent in 2003 to about 2.75 percent in 2010, he says.

Once numbers on physician exam throughput times were available, the clinicians' competiveness spurred a cultural change to improve their personal throughput times: "The goal is 15 minutes in between a patient getting to the room and being seen by a physician," says Chudnofsky. "Once physicians' times were shown to everyone, no one wanted to be last. There was no prodding to get times within that 15 minute average. We keep a tight range."

The total throughput time differs if a patient is admitted or discharged. It may be much shorter for a low-acuity patient who is discharged, for example, notes Chudnofsky. At AEMC, 2.5 hours is the average time to disposition decision, he says.

Although many initiatives are under way at AEMC and elsewhere to reduce patients' dependence on the ED, such a reduction won't happen overnight—if it happens at all. In the meantime, hospitals of all sizes are tapping ED information systems, EMR data integration tools and other options to reduce the amount of time patients spend in the ED and increase physician efficiency, all the while improving the care they provide. CMIO