One of several factors, data indicate

Decline in Medication Errors a Part of Epic “Big Bang”?  

By Tyler Smith

Nearly 18 months after University of Colorado Hospital launched the Epic electronic medical record with a “big bang” in the Emergency Department, inpatient units and procedural areas, administrators and providers are piecing together data that indicate the transition to a new system, while still a work in progress, is paying real dividends.

The numbers of patient email addresses in Epic and My Health Connection accounts — important communication bridges between the hospital and patients — have each more than doubled, cash collections hit record levels in May 2012, and medical transcription has slowed to a trickle, saving upwards of $2 million a year, according to data from Steve Hess, chief information officer for University of Colorado Health System.

From a clinical perspective, however, one of the biggest wins at least partially attributable to the integrated EMR is a decrease in the number of medication errors. The number of instances patients received the wrong medication, missed a dose or were affected by an error with a high-risk drug fell by about one-third in the year after the September 2011 big bang, data show.

Risky business. “These were areas we had struggled with in the past,” said Pharmacy’s Sondra May, PharmD, medication safety coordinator for the hospital. To measure Epic’s effectiveness in reducing medication errors, May and colleagues in the Clinical Effectiveness and Patient Safety Department analyzed reports from Patient Safety Net (PSN), the hospital’s online system for reporting events that caused or could have caused patient harm.

“Overall, we have done significantly better since the Epic implementation,” May said. For example, in the year prior to the big bang, there were 19 PSN reports of “wrong patient” medication errors that required additional monitoring or treatment to prevent harm or that caused temporary harm. In the year following the big bang, that number fell to four.

Meanwhile, the number of “dose omission” PSN events that required treatment or monitoring to prevent harm fell from 49 in the year before the big bang to 24 the following year.

May credited visual cues in Epic for helping to reduce the number of PSNs in these areas. For example, when nurses scan the barcode on a patient’s wristband, an “administrative warning” with a large red ‘x’ appears if the scanned patient does not match the patient in the medical record. Similarly, a warning appears if a provider attempts to administer a medication that is not ordered for the patient. A yellow highlight alerts a nurse when a patient’s medication dose is overdue.

Electronic Rx. The big bang also ushered in computerized physician order entry (CPOE) of medications. Today, Hess said, physicians enter 89 percent of their medication orders in the EMR and send them electronically to the pharmacy to fill. Before Epic, they scribbled the orders on pieces of paper and faxed them to

Continued
the pharmacy, where staff had to manually enter them into the medication administration record.

Legibility was a frequent problem in the old system, but the transcription process also increased the chances of a pharmacy staffer getting distracted and making a data entry error, such as entering the medication order for the wrong patient, May said.

“CPOE has shifted the responsibility for ensuring the information is entered on the right patient from the pharmacist to the physician,” May said. Freed from the responsibility of reading and interpreting handwriting and transcribing orders, pharmacists have more time to identify potential errors, such as a medication that doesn’t appear to match a patient’s condition.

Today, Epic pulls the ptt value directly into the medication administration record and the heparin order. Nurses see only that value, which sharply reduces the chance of error. The result: in 2011, there were eight ptt-related PSN events. In 2012, there were four, and only one after July 1.

“By optimizing Epic, we’ve decreased the work for the nurses, and they can’t lose sight of pulling the correct ptt value in,” May said. The hospital is now considering using the same approach to help providers monitor and manage blood glucose, potassium and electrolyte values, she added.

“If we have success in one area and do the job right, we can extrapolate it to other areas,” she said.

Larger picture. But May and others emphasize that Epic is not solely responsible for medication safety improvements. For example, the hospital installed “quality safety advocates” on inpatient units early in 2012 to encourage staff to complete PSNs and increase the number of “near miss” reports, which yield important information that can help lead to safety improvements.

In August of last year, the Quality Safety Advocate and Medication Safety Steering committees rolled out a “6 Rights in 6 Months” campaign aimed at increasing attention to six key steps providers should follow to prevent medication errors.

In addition, as part of the 6 Rights campaign, the hospital also reemphasized the requirement that providers get an independent double-check before administering a high-risk medication such as heparin.

The efforts appear to have had an effect. In the year prior to the big bang launch, for example, staff reported just nine near miss “wrong patient” PSNs. Post-Epic, the number was 28. For calendar-year 2012, the total number of medication-related near miss PSN reports rose to 666 from 472 in 2011, a 41 percent increase.

“Epic can’t be seen as the only solution to patient safety,” May said. And she notes that the informational power that the EMR offers paradoxically can be a weakness.

“There is so much in Epic that the technology and the time it takes to sift through the information can be overwhelming,” she said. “We’re moving in the right direction, but we’re still looking for ways to minimize errors.”