PHARMACY PRACTICE NEWS

OPERATIONS & MANAGEMENT

ISSUE: 10/2009 | VOLUME: 36

More Evidence Supports Key Role for Pharmacists On Emergency Care Team

Bruce Buckley

Boston—Having a pharmacist in the emergency department (ED) can significantly reduce medication errors and improve patient safety in that often-chaotic setting, according to two new studies presented this month at the annual meeting of the American College of Emergency Physicians (ACEP).

The investigators showed that they were able to prevent hundreds of errors caused by underdosing, overdosing, wrong-drug administration and other mishaps that could have severely compromised patient safety in the ED.

“These researchers have done an amazing job with a very difficult task: documenting the value that emergency pharmacists bring as members of the multidisciplinary team in the ED,” said Nicole M. Acquisto, PharmD, emergency medicine clinical pharmacy specialist at the University of Rochester Medical Center, in New York.

The studies, conducted with grants from the American Society of Health-System Pharmacists Foundation, each took a different tack to determine the impact of dedicated ED pharmacists on medication safety. One, a larger, multicenter study, used trained pharmacy residents to observe ED pharmacists’ interventions that prevented potentially harmful errors that had already occurred from reaching patients. The other study aimed to capture all medication use errors, from minor missteps of no consequence to those with a potential for serious patient harm.

During the multicenter study, ED pharmacists at four academic medical centers reviewed 17,320 medications over a six-month period in 2008. They discovered 505 errors (an average of 7.8 errors per 100 patients and 29.2 errors per 1000 medications), thus preventing these errors from reaching patients. The most common medication classes involved in errors were antimicrobials (32%), central nervous system agents (16%) and anticoagulants/thrombolytics (14%). Serious errors included underdosing (16.8%), overdosing (12.5%), drug omissions (10.5%) and wrong drugs (6.8%).

In one example of a wrong-drug error noted by researchers, an ED pharmacist’s recommendation that a physician change an order from succinylcholine to rocuronium for a severely hyperkalemic patient undergoing rapid-sequence intubation avoided a potentially serious adverse drug event. In another case, an ED pharmacist caught and corrected a nurse’s transcribing error that could have led to a massive heparin overdose.

Lessons That Translate To Other Facilities

This study demonstrated “the important role that emergency department pharmacists have in patient safety,” noted Jeffrey M. Rothschild, MD, MPH, an internist at Brigham and Women’s Hospital and patient safety expert. Dr. Rothschild, who led the multicenter study, which was conducted at Brigham and Women’s as well as Cedar-Sinai Medical Center, in Los Angeles, Grady Health System, in Atlanta, and the University of Wisconsin Hospital and Clinics, in Madison, said that the study offered lessons that could be “translated to other institutions” about the value of

allowing pharmacists to be more proactive in uncovering drug errors in the ED.

In the second study, a clinical pharmacist/researcher shadowed different ED nurses for 12-hour shifts over nine months at the University of Arizona Medical Center, in Tucson. All aspects of the medication use process, including medication errors, were recorded.

Asad Patanwala, PharmD, BCPS, clinical assistant professor of critical care/emergency medicine at the University of Arizona College of Pharmacy, in Tucson, identified a total of 178 medication errors in 192 patients—or one error for every five doses ordered—as he followed approximately 18 different nurses. The nurses quickly became accustomed to his presence, he said, avoiding the so-called Hawthorne effect in which the presence of an observer changes the behavior of the person being studied.

Dr. Patanwala found that nearly six out of 10 patients (59.4%) had one or more errors. Most errors were relatively minor. Almost four out of 10 patients (37%) had errors that reached the patient but did not cause harm—category C in the severity rating scale devised by the National Coordinating Council for Medication Error Reporting and Prevention. One category E error led to temporary harm and required intervention. Under the study protocol, Dr. Patanwala could intervene when he observed an error having the potential for patient harm. During his observations, there were no errors more serious than category E. (In the worst-case scenario, a category I medication error results in a patient's death.)

The study also looked at the point in the medication use process at which the errors occurred. It found that administration accounted for 34.8% of the total, prescribing 53.9%, transcribing 10.7% and dispensing 0.6%. Variables that were predictive of medication errors were the quantity of medication orders (odds ratio [OR], 1.25; $P<0.001$); boarded patient status (OR, 2.15; $P=0.043$); and presence of part-time versus full-time nurses (OR, 0.37; $P=0.021$). Other variables were not significant, including patient age and sex, years of nursing experience and day versus night shifts.

The study was conducted before the medical center's ED expanded from 40 to 80 beds and acquired the services of a full-time emergency pharmacist. Now, Dr. Patanwala said, the emergency pharmacist provides 40 hours of coverage and he works another 10 for a total of 50 daytime and evening hours each week.

The study was also done before the recent implementation of a computerized physician order entry (CPOE) system in the ED. Although Dr. Patanwala has no scientific evidence showing that the changes have improved ED medication error rates, he suspects that it might be the case, particularly because the CPOE system now requires the input of information that might have gone unspecified before, such as the route of administration for a morphine order. It also flags orders lacking a patient's drug allergies. "That was one of the trends we saw—people given medications they were allergic to," Dr. Patanwala said.

More Kudos for Research Efforts

Dr. Acquisto, of the University of Rochester, said the results of these studies validate the growing importance of having a specially trained clinical pharmacist involved in emergency care. And they underscore how well-positioned the profession is to provide that care.

"This environment poses unique medication safety challenges due to a multitude of factors including high patient volume, incomplete medical records, and frequent use of verbal and handwritten orders," she said. "The emergency pharmacist is uniquely poised to improve medication safety and has therefore gained the support of ED leadership at institutions across the country."

Daniel P. Hays, PharmD, BCPS, clinical pharmacist in the Department of Pharmacy and of Emergency Medicine at University Medical Center–University of Arizona, in Tucson, had been part of a team that won an ASHP Best Practices Award in 2005 for a study that showed pharmacists enhanced patient safety during trauma resuscitations. Dr. Hays and his former colleagues from the University of Rochester found that an emergency pharmacist improved "patient care by reducing errors and providing another layer of patient safety during a critical resuscitation period."

Dr. Hays noted that "from a sheer numbers perspective," the odds are great for a medication error to occur when many of the hundreds of doses dispensed daily from an automated dispensing machine are administered without a pharmacist's intervention. However, he added, "when an emergency pharmacist is present, we're not only able to review those orders but also to provide correct feedback to physicians when they're writing the orders and, in turn, to minimize any potential for medication error."
