

# Expansion of pharmacists' responsibilities in an emergency department

TIMOTHY C. RANDOLPH

The value of implementing clinical pharmacy services in the emergency department (ED) is well documented, and these services are being embraced by an increasing number of hospitals nationwide. Accordingly, many authors have written articles that focus on the establishment of clinical pharmacy services in the ED, along with some initial ideas for pharmacist involvement.<sup>1-3</sup> These articles also emphasize the cost-containing value of these services to inform practitioners of the return on investment associated with the implementation of clinical pharmacy services in the ED. While these publications are extremely valuable to institutions in the beginning phases of implementing dedicated ED clinical pharmacists, they do not focus on the long-term development of pharmacy services after implementation in the ED.

The American Society of Health-System Pharmacists supports the idea that every hospital pharmacy department should provide its ED with pharmacy services.<sup>4</sup> The support of such an idea is predicated on numerous statistics. For example, 114 million patient visits to EDs

**Purpose.** The role of pharmacists in the emergency department (ED) of an acute care hospital is described.

**Summary.** The ED staff at Carolinas Medical Center—NorthEast care for approximately 80,000 patients per year, with approximately 215 patient visits per day. In July 2007, clinical pharmacy services were implemented in the ED, and four dedicated ED pharmacists were hired with the primary responsibilities of medication reconciliation for admitted patients and prospective review of physician orders. As these pharmacists became more involved with clinical interventions and physician consultations, two pharmacy technicians were placed in the ED to manage medication reconciliation under the supervision of a pharmacist. This allowed the ED pharmacists to assume additional clinical

responsibilities, including management of patients' antimicrobial regimens, answering of medication-related telephone calls from discharged patients and the outpatient pharmacy, multidisciplinary team involvement, formal rounding, and participation in cardiopulmonary resuscitation.

**Conclusion.** ED pharmacists at one institution expanded their clinical role by taking on more direct patient care responsibilities. Pharmacists' interventions were well received by ED physicians, with an acceptance rate of 98%.

**Index terms:** Clinical pharmacists; Clinical pharmacy; Hospitals; Personnel, pharmacy; Pharmaceutical services; Pharmacy, institutional, hospital

**Am J Health-Syst Pharm.** 2009; 66:1484-7

occur annually nationwide, 98,000 medical errors result in death each year, and the rate of adverse drug events (ADEs) in EDs is increasing nationwide.<sup>4-6</sup> Clearly, there is significant room for improvement in overall patient safety, and it is imperative that ED pharmacists continue to actively pursue patient-focused clinical intervention opportunities. Such clinical services have been reported

to improve medical care and reduce medication errors in the ED.<sup>7</sup>

Carolinas Medical Center—NorthEast (CMC-NE) is a 453-bed acute care hospital and level 3 trauma center located in Concord, North Carolina. The 47-bed ED cares for approximately 80,000 patients per year, with approximately 215 patient visits daily. Clinical pharmacy services were implemented in our

TIMOTHY C. RANDOLPH, PHARM.D., is Clinical Pharmacy Specialist, Emergency Medicine, Pharmacy Services, Carolinas Medical Center—NorthEast, 920 Church Street N., Concord, NC 28025 (timothy.randolph@carolinashealthcare.org).

Andrea Parker, Pharm.D., Elizabeth Meyer, Pharm.D., and Renee Zeina, Pharm.D., are acknowledged for their contributions to the establishment and progression of emergency department pharmacy

services at Carolinas Medical Center—NorthEast.

The author has declared no potential conflicts of interest.

Copyright © 2009, American Society of Health-System Pharmacists, Inc. All rights reserved. 1079-2082/09/0802-1484\$06.00. DOI 10.2146/ajhp080698

ED in July 2007, and four dedicated ED pharmacists were hired to provide medication reconciliation for admitted patients and prospective review of physician orders. As our ED pharmacists became increasingly visible by performing these duties, the ED staff quickly realized the value of clinical pharmacists in the ED. Consequently, our scope of practice began to grow very quickly as we were recruited into the care of several patients daily. Increasing the number of clinical interventions and physician consultations in the ED conducted by pharmacists led to the inception of dedicated ED pharmacy technicians responsible for managing medication reconciliation.

Two pharmacy technicians staff our ED daily, yielding 16 hours of coverage (7:00 a.m. to 11:00 p.m.). ED pharmacy technicians monitor the ED tracking board for patients being admitted to our hospital. Once the decision is made to admit a patient, an ED pharmacy technician obtains a thorough medication history and prints the medication reconciliation form, which is reviewed by the ED pharmacist on duty. Once the medication reconciliation form is reviewed, the ED pharmacist signs it and places it on the patient's chart to accompany the patient to the floor.

The presence of pharmacy technicians in the ED has greatly enhanced the pharmacists' ability to embrace additional clinical job functions while maintaining the job functions upon which their position is predicated. These additional functions include managing patients' antimicrobial regimens, responding to medication-related telephone calls from patients and outpatient pharmacists, multidisciplinary team involvement, formal participation in rounds, and participation in cardiopulmonary resuscitation.

### Management of patients' antimicrobial regimens

Our ED pharmacists are directly

involved in the management of every patient who has a culture drawn in our ED. All types of culture reports are reviewed by the clinical pharmacists, including blood, urine, wound, stool, cerebrospinal fluid, and synovial fluid. Reports of positive gonorrhea and chlamydia cultures are also reviewed by the ED pharmacist on duty.

Each morning, culture and susceptibility reports are delivered to the ED pharmacist, who compares them with the therapy received by each patient. If patients are not receiving the appropriate antimicrobial therapy, the pharmacist consults with a physician and adjusts the regimen accordingly. When required, a new prescription is called in to the patient's outpatient pharmacy. Patients are then contacted and counseled by the ED pharmacist about their culture results and antimicrobial regimen. From August through December 2008, our ED clinical pharmacists reviewed 1006 culture reports, resulting in the modification of antimicrobial regimens for 344 patients.

ED pharmacists are also consulted about empirical antimicrobial coverage for patients suspected of having an infection. After assessing the patient and consulting with the physician, the most appropriate antimicrobial agents are selected and dosed by the ED pharmacist on duty. Blood samples for culture are drawn before antimicrobial administration. Timing, selection, and dosing of antimicrobial agents concur with the clinical indicators established by the Centers for Medicare and Medicaid Services and the Joint Commission for community-acquired pneumonia and surgical prophylaxis.<sup>8</sup>

On average, a thorough review of a single culture report takes 15 minutes. Provided we review approximately 200 culture reports per month, our ED pharmacists relieve the ED physicians of approximately 50 hours of work each month. This reduction in workload for the phy-

sicians allows them to focus on the patients they are treating without sacrificing the quality of antimicrobial management in our ED.

### Responding to medication-related telephone calls

Approximately 1 in every 8.3 visits to the ED is medication related. Of these visits, 68% are considered preventable.<sup>9</sup> Based on such statistics, we have implemented a process centered on patient education in an attempt to reduce such ED visits.

Anytime a patient arrives at our ED whose chief complaint is medication related or a patient experiences an adverse event in our ED, the pharmacist is consulted. Medication-related complaints include but are not limited to overdose, suspected allergic reaction, adverse drug reaction (ADR), and suspected drug-drug interaction. After consulting with the physician, the pharmacist counsels these patients on their medications in an effort to ensure adherence and prevent future ADEs from occurring. Furthermore, patients discharged from our ED with new prescriptions are instructed to call with any medication-related issues or questions in lieu of returning to the ED. These calls are then forwarded to the ED pharmacist on duty.

Many of the calls we receive on a daily basis are the result of adverse effects, allergic reactions, misunderstanding of directions, or an inability to tolerate medications. In cases that require medication or dosage modification, the ED pharmacist consults with an ED physician to recommend an appropriate therapeutic substitution or dosage adjustment. Patients are then counseled about their adjusted therapy, and prescriptions are called in to their local pharmacy. All changes made to patients' medication regimens after discharge are documented and scanned into an electronic medication records system and can be accessed by the primary care physician.

## ■ NOTE Pharmacists' responsibilities

Telephone calls from outpatient retail pharmacies are also forwarded to our ED pharmacists. These calls are primarily related to prescriptions that are missing a dosage, strength, or quantity, as well as questions about dosing, allergies, and drug–drug interactions. Depending on the nature of the call, there is a tremendous opportunity for the ED pharmacists to improve medication outcomes, safety, and continuity of care for patients discharged from the ED. From August through December 2008, our ED pharmacists received 460 telephone calls from patients and 607 calls from outpatient pharmacists. Responding to these medication-related queries has allowed the ED pharmacists to become more involved in the care of patients they may not have directly cared for in the ED.

As a direct result of these telephone conversations with patients and outpatient pharmacists, several educational opportunities regarding the prescribing habits of our ED physicians were realized.

### Multidisciplinary team involvement

The medical care that patients receive in the ED greatly affects patient outcomes and can either optimize or interfere with the continuity of care received as an inpatient. Accordingly, we placed each of our four ED pharmacists on multidisciplinary teams throughout the hospital—one on the stroke team, one on the ST-elevation myocardial infarction (STEMI) team, and two on the medication safety team.

The ED pharmacist on the stroke team developed and implemented a tissue plasminogen activator (t-PA) competency program for our hospital. The completion of this competency program is now required of all nurses working in the ED, neuroscience unit, intensive care unit, and cardiology unit. Aside from the development of the t-PA competency program, the pharmacist actively

participates in all team meetings and is involved in all decisions pertinent to the care of patients who have suffered a stroke. This involvement has enhanced and standardized the level of care these patients receive from the time they enter the ED to the day they are discharged from our hospital.

The STEMI team also benefits from the involvement of a pharmacist. The pharmacist's most notable contribution to the team has been the development and implementation of a STEMI-specific heparin protocol through in-depth communication with our interventional cardiologists and ED physicians. As a result, every patient who arrives at the ED with STEMI receives consistent, evidence-based care agreed on by our cardiologists, ED physicians, and ED pharmacists.

We have also placed two of our ED pharmacists on the medication safety team. Every medication error encountered in the hospital is reported to these pharmacists on a monthly basis. At CMC-NE, six clinical pharmacy specialists are dedicated to specific care areas, including emergency medicine, critical care, cardiology, surgery, pediatrics, and internal medicine.

For medication errors that occur in our ED, the ED pharmacists design, develop, and implement appropriate courses of action. For medication errors that occur outside of the ED, the ED pharmacists report directly to the appropriate clinical pharmacy specialist, who will determine the appropriate actions within the specific care area. The pharmacists on our medication safety team have also revised the outpatient deep venous thrombosis (DVT) protocol used by our ED physicians to increase the involvement of the ED pharmacists in patient education and medication dosing. All patients receiving outpatient DVT therapy in our ED are now counseled by the ED pharmacist and are not discharged without ensuring that they understand the importance

of adhering to their prescribed regimen and that proper follow-up care is arranged.

### Organized patient rounding

Many ED pharmacists have struggled with the idea of formal patient rounding, mainly due to the lack of formal physician rounds in most ED settings. Our ED is not unique in the sense that it is without formal ED physician rounds. In order to become more involved in direct patient care and increase our collaboration with ED physicians and nurses, CMC-NE implemented an organized ED pharmacist rounding program.

As pharmacists are on duty in our ED from 7:00 a.m. through 1:00 a.m., patient rounds occur seven days per week at 7:30 a.m., 2:30 p.m., and 9:00 p.m. The round at 2:30 p.m. includes two ED pharmacists during our shift change. Since patient turnover can be rapid, three separate rounding times were established to capture more patients.

Patients are prioritized based on the severity of their condition and need for additional pharmacist services. While much of this prioritization is dependent on professional judgment, conditions such as hemodynamic instability, trauma, cerebrovascular accident, unstable angina, and coagulopathy typically warrant ED pharmacist involvement. To monitor our progress, we selected four interventions to measure the effects of pharmacist involvement in rounds. These interventions include patient chart reviews, ADR identification, medication recommendations, and laboratory test recommendations. During August–December 2008, pharmacists reviewed the charts of 1499 patients in our ED. As a direct result of these chart reviews, 142 ADRs were identified and 580 medication recommendations and 126 laboratory test recommendations were made. Of these recommendations, 98% were accepted by the ED physicians.

At the end of each shift, the pharmacist on duty documents the number of patient charts reviewed, along with each of the aforementioned interventions associated with patient rounds. Completed patient forms are also filed in a binder and retained for at least two weeks. This allows us to refer back to patients throughout the course of their hospital stay or if they return to our ED within this time period.

Pharmacist involvement in formal rounds has greatly enhanced the relationship with ED physicians and nurses, as they consistently benefit from collaboration with our clinical pharmacists. As implied by the percentage of recommendations accepted by the ED physicians, our recommendations are well received.

### Participation in cardiopulmonary resuscitation

The presence of ED pharmacists during cardiopulmonary resuscitation enhances the ability of physicians and nurses to deliver safe, quality care to patients.<sup>10</sup> Since the implementation of pharmacy services in the ED at CMC-NE, the ED pharmacist on duty responds to all cardiac arrests and trauma codes that

occur during our hours of coverage. Potential roles of a pharmacist in resuscitation efforts are well documented and include providing drug therapy recommendations, preparing medications for administration, and documenting drug administration.<sup>11</sup> ED pharmacists at CMC-NE fulfill each of these roles and also retrieve medications not immediately accessible during cardiopulmonary resuscitation events. Consequently, ED physicians and nurses have come to view the pharmacist as an integral component of our resuscitation response efforts.

### Conclusion

ED pharmacists in one institution expanded their clinical role by taking on more direct patient care responsibilities. Pharmacists' interventions were well received by ED physicians, with an acceptance rate of 98%.

### References

1. Whalen FJ. Cost justification of decentralized pharmaceutical services for the emergency room. *Am J Hosp Pharm.* 1981; 38:684-7.
2. Levy DB. Documentation of clinical and cost-saving pharmacy interventions in the emergency room. *Hosp Pharm.* 1993; 28:624-7.
3. Lada PM, Delgado G Jr. Documentation of pharmacists' intervention in an emergency department and associated cost avoidance. *Am J Health-Syst Pharm.* 2007; 64:63-8.
4. American Society of Health-System Pharmacists. ASHP statement on pharmacy services to the emergency department. [www.ashp.org/s\\_ashp/docs/files/BP07/New\\_ED.pdf](http://www.ashp.org/s_ashp/docs/files/BP07/New_ED.pdf) (accessed 2008 Dec 2).
5. Kohn LT, Corrigan JM, Donaldson MS, eds. *To err is human: building a safer health system.* Washington, DC: National Academy Press; 1999.
6. Hafner JW Jr, Belknap SM, Squillante MD et al. Adverse drug events in emergency department patients. *Ann Emerg Med.* 2002; 39:258-67.
7. Fairbanks RJ, Hays DP, Webster DF et al. Clinical pharmacy services in an emergency department. *Am J Health-Syst Pharm.* 2004; 61:934-7.
8. Joint Commission. Current specification manual for national hospital quality measures. [www.jointcommission.org/PerformanceMeasurement/PerformanceMeasurement/Current+NHQM+Manual.htm](http://www.jointcommission.org/PerformanceMeasurement/PerformanceMeasurement/Current+NHQM+Manual.htm) (accessed 2009 Feb 27).
9. Zed PJ, Abu-Laban RB, Balen RM et al. Incidence, severity and preventability of medication-related visits to the emergency department: a prospective study. *CMAJ.* 2008; 178:1563-9.
10. Fairbanks RJ, Hildebrand JM, Kolstee KE et al. Medical and nursing staff highly value clinical pharmacists in the emergency department. *Emerg Med J.* 2007; 24:716-9.
11. Machado C, Barlows TG, Marsh WA et al. Pharmacists on the emergency cardiopulmonary resuscitation team: their responsibilities, training, and attitudes. *Hosp Pharm.* 2003; 38:40-9.