

Assessing the Need for a Pharmacist in the Emergency Department of an IHS Hospital

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The emergency department (ED) has been identified as having the highest number of preventable adverse drug reactions of any unit in the hospital. This study set out to determine whether adding a pharmacist to the ED could prevent medication errors and increase the quality of patient care.

Tuba City Regional Health Care Corporation (TCRHCC) is a tribally operated, 73-bed, regional hospital with adjacent outpatient clinics providing service to 75,000 Hopi, Navajo, and Paiute tribal members located on more than 7,000 square miles of the western Navajo Nation. Each year, the TCRHCC's pharmacy department dispenses approximately 300,000 medication doses to all areas of the hospital, including the emergency department (ED). The ED is one unit of the hospital in which the pharmacy department does not review medication orders prior to their administration by nursing staff. The orders are retrospectively reviewed and entered into the computer system after the medications have been administered and the patients have left the facility. This process bypasses various clinical interventions that a pharmacist would perform when entering a medication order. The only situation when pharmacists are directly involved in the ED is during a code blue. This model of pharmacy practice is similar for most hospitals within the IHS.

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In both 1999 and 2006, medication errors were identified by the Institute of Medicine as the most common type of error in health care.¹ In the United States, the ED has been noted to have the highest number of preventable adverse drug events of any hospital unit.¹ Therefore, the Joint Commission recently has started to emphasize the need for pharmacist involvement in the ED.¹ Many hospitals outside the IHS have been working toward placing a pharmacist in the ED full time; however, the IHS has been slow to adopt this new initiative. The discussion to place a pharmacist in the ED within the IHS often is met with skepticism and resistance because of the shortage of pharmacists as well as a deficit in federal funds, a lack of understanding of the pharmacist's role in the ED, and the absence of leadership support from both pharmacy and hospital administration.

The role of the pharmacist in the ED includes medication reconciliation; management of antimicrobial regimens; provision of drug information; identification and prevention of medication errors or duplications; formulary interchange; medication administration; and providing recommendations for dosage adjustments, discontinuation of medication, alter-

native therapies, and changes in route of drug administration. The pharmacist also is capable of answering questions from nurses and physicians, entering and clarifying medication orders, performing medical record reviews, preparing intravenous (IV) medications, participating in cardiopulmonary resuscitations or trauma emergencies, and other traditional clinical pharmacy services.^{2,3}

METHODS

Prior to the pharmacist starting in the ED, he/she enrolled in the American Society of Health System Pharmacists (ASHP) Patient Care Impact Program (PCIP) 2009: Introducing an Emergency Pharmacist into Your Institution. The program was a 6-month experiential, mentor-based training that enabled participants to make a significant impact on patient care. In addition, the pharmacist, the quality assurance pharmacist, and the chief of pharmacy initiated a meeting with the ED chief of medicine and the ED nursing supervisor in June 2009 to discuss this study and the possibility of placing a pharmacist in the ED. The primary concern of the ED chief of medicine was that the pharmacist was not trained in basic life support (BLS), advanced cardiac life support (ACLS), or pediatric advanced life

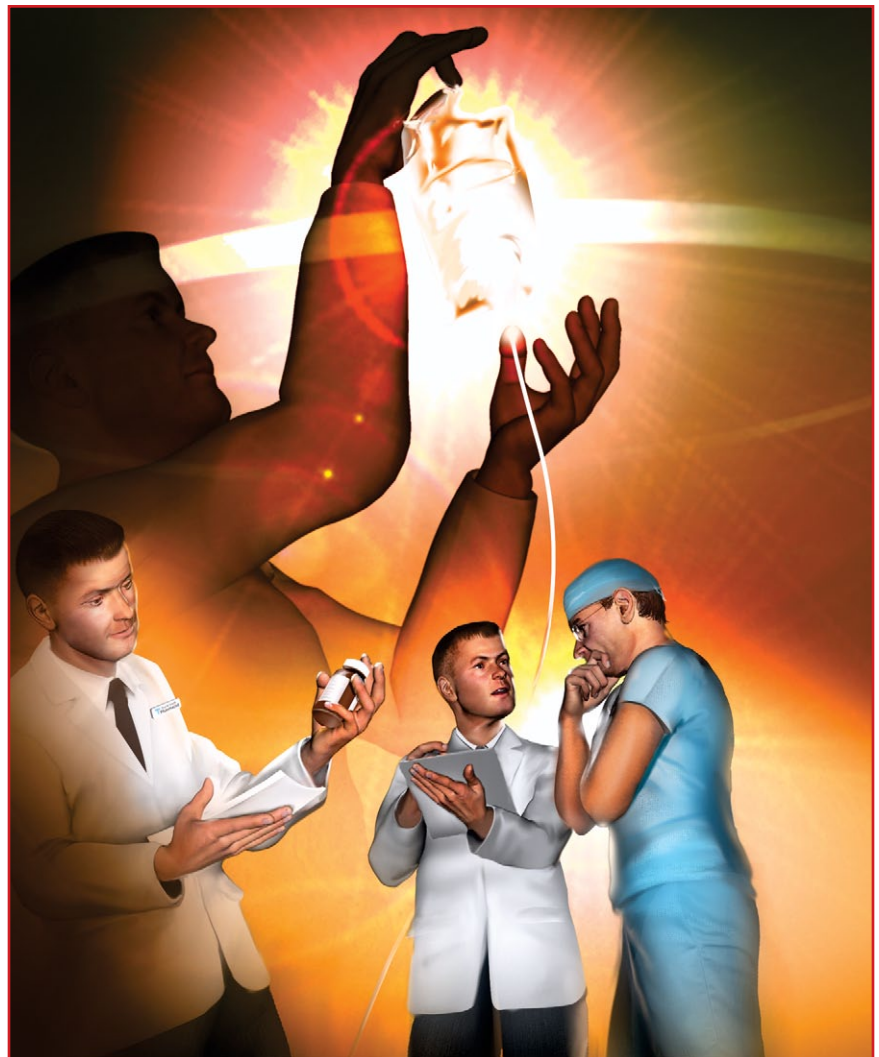
support (PALS). Therefore, the ED pharmacist enrolled in all 3 courses, in addition to a Trauma Nursing Core Course (TNCC) that was offered by the hospital's nursing education department.

The ED pharmacist read a review article by Cohen and colleagues, which provided a summary of pharmacist activities reported in the literature from 1976 to 2008.³ The categories of reported interventions fell within the scope of practice of a generalist-trained clinical pharmacist. The pharmacist then created a spreadsheet and documented each activity or intervention he/she performed in the ED from July 1, 2009, through September 30, 2009, during an 8-hour shift 1 day per week. The shifts primarily were from 9:00 AM to 5:00 PM with two 11:00 AM to 7:00 PM shifts occurring during the study period.

RESULTS

During the early stage of the study, the pharmacist experienced resistance from some of the ED clinical staff; this was to be expected since some of the ED clinical staff did not understand the role of a pharmacist in the ED. The ED clinical staff also was concerned that the ED pharmacist would disrupt their workflow since he/she was present only 1 day per week. The pharmacist also felt intimidated initially, but was able to overcome the resistance and initial fears with the help of group discussions with other members of the ASHP PCIP. It was clear during the discussions that many of the pharmacists in the group had experienced similar obstacles and found ways to overcome them.

The total number of ED visits during the 3-month period was 7,148, with an average of 78 visits per day. The pharmacist performed 22 sepa-



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rate activities for a total of 93 interventions during 13 shifts (104 hours) in the ED (Table). The most common interventions were preparing IVs (15%), performing medical record reviews (10%), medication reconciliation/history (9%), pediatric dosing (8%), provision of drug information (6%), nursing staff education (6%), and prospective review of medication orders (6%) (Figure). The pharmacist also participated in other activities, such as medical and surgical resuscitations, and procedural sedations.

In addition to performing a clinical role in the ED, the pharmacist per-

formed other nontraditional-pharmacist tasks, such as grabbing a blanket for a patient and getting warm fluids and IV tubing sets for the nurses when they were inundated with their other duties. These nontraditional tasks proved to be very important in building trust and teamwork with the ED clinical staff.

During the study, the presence of a pharmacist in the ED had a positive impact on the medication delivery time from the main pharmacy to the ED. Prior to this study, pharmacy delivery times for “non-STAT” orders ranged from 45 to 60 minutes. With a

pharmacist present in the ED, the delivery times for these medications improved significantly—averaging 15 to 30 minutes—due, in part, to the ED pharmacist being available to enter the medication orders in the ED, print the label at the main pharmacy, and retrieve the medication from the main pharmacy; thus bypassing the normal workflow of the main pharmacy department. Because of the decrease in medication delivery times, patients spent less time in the ED and were discharged more quickly. The pharmacist also prevented medication errors and adverse drug reactions that may have occurred without his/her presence in the ED. The net result of these activities is an improvement in the delivery of patient care.

Study limitations

The ED at TCRHCC was busier during the 11:00 AM to 7:00 PM shifts and the pharmacist performed more interventions if scheduled during these hours. The chief of medicine and pharmacist agreed that the services of the ED pharmacist would be better utilized during this shift. Also, the pharmacist was unable to spend an extended period of time in the ED because of the shortage of pharmacists in the hospital. Therefore, providing a pharmacist in the ED on a regular basis was difficult. As such, the length of the study was only 3 months to accommodate for other priorities of the pharmacy department.

DISCUSSION

We conducted this study to identify the role of a pharmacist in the ED at TCRHCC and to emulate the models that currently are available at other institutions outside of the IHS to determine the effectiveness of placing a pharmacist in the ED.

There are individuals who may dispute the importance of adding a

Intervention type	Patients, no.
Adult dose calculation	3
Adverse drug reactions	1
Assist nurse with calculating drip rates	2
Medical record reviews	9
Drug information provided	6
IV compatibility	3
Medication order entry	4
Medication reconciliation/history	8
Nursing/staff education	6
Participate in procedural sedations	2
Participate in drug distribution activities	2
Participate in cardiac related emergencies	5
Participate in trauma emergencies	1
Patient education	4
Pediatric dosing	7
Perform consultation	1
Prepare IVs	14
Prospectively review medication orders	6
Provide pharmacokinetics monitoring/dosing	2
Recommend appropriate pharmacotherapy	2
Recommend alternative route of administration	1
Therapeutic drug substitution	4
Total	93

pharmacist to the ED, such as Tom Scaletta, MD, past president of the American Academy of Emergency Medicine, who wrote in a 2007 issue of *Emergency Medicine News* that prospective pharmacy review of prescriptions in the ED is unnecessary and a waste of hospital resources.^{3,4} Other skeptics suggest it is better to hire more registered nurses (RNs) in the

ED. The hiring of more RNs, however, does not solve the issue of preventing medication errors that occur in the ED due to the lack of prospective review of medication orders by a pharmacist. Pharmacists possess the professional training and knowledge to improve the overall patient care in the ED by providing a variety of services that include preventing

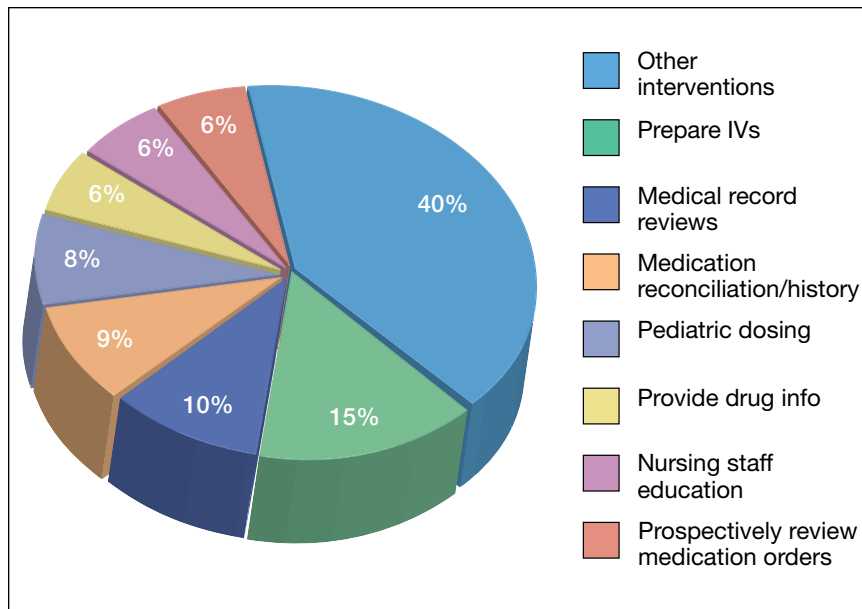


Figure. Top 7 emergency department pharmacist interventions.

medication errors and adverse drug reactions.

Additionally, the cost savings documented in other studies in the literature demonstrate a positive return on investment for adding a pharmacist to the ED. In a clinical report by Lada and Delgado, pharmacists documented the interventions they performed in the ED from September 1 to December 31, 2003.⁵ They documented 2,150 interventions and participated in the care of 1,042 patients triaged to the resuscitation area of the ED. On further reclassification of the pharmacists' interventions based on a model at a VA medical center, the number of interventions was reduced to 1,393 and the cost savings was estimated to be \$1,029,776. The interventions were extrapolated to 1 year and the annual cost savings was estimated to be \$3,089,328.

In a review article by Cohen and colleagues, the ED pharmacist at Children's Medical Center in Dallas, Texas, reported projected cost savings of over \$800,000 annually based

on an 80% reduction in medication errors after the implementation of clinical pharmacy services in the ED.³ Based on these figures, the salary of an ED pharmacist can be accounted for without additional cost to the hospital.

In a study by Brown and colleagues, ED pharmacists retrospectively reviewed 490 medication orders written for 198 patients.⁶ In the control group (n = 94), a pharmacist was not present in the ED to check the orders; a pharmacist was present in the intervention group (n = 104). The authors reported a 16.09 error rate per 100 orders for the control group vs a 5.38 error rate per 100 orders for the intervention group—a 66% difference. In other words, the presence of a pharmacist in this ED reduced medication errors by two-thirds. The ED pharmacists also made 183 recommendations with an acceptance rate of 98.6%. The most common recommendations were dosage calculations (29%); inappropriate dosages, drugs, routes, or schedules (26%);

order clarifications (16%); and drug allergies (12%).

In a study by Randolph, pharmacists at Carolinas Medical Center-NorthEast (CMC-NE) retrospectively reviewed medical records of 1,499 patients and identified 142 adverse drug reactions.² They also made 580 medication recommendations and 126 laboratory test recommendations with a 98% acceptance rate by the ED physicians. The ED pharmacists at CMC-NE also reviewed culture and susceptibility reports every morning to check if the patients were discharged on appropriate antimicrobial regimens. If the regimen was inappropriate, the pharmacist consulted with a physician and adjusted the regimen. The pharmacists averaged 200 culture reports per month; each report required approximately 15 minutes to review, resulting in a 50-hour per month reduction in workload for the ED physicians.

In a study conducted by Jellinek and colleagues, researchers compared the administration of medications by ED nurses vs inpatient nurses to determine whether a pharmacist's intervention could improve the timeliness of medication administration to patients in the ED.⁷ The most common reason for medications not being administered by nurses in the ED was insufficient time (51.4%) and, for inpatient nurses, the main reason was medication orders not being verified (77.8%). The interventions performed by the pharmacist included clarifying orders with the physician, expediting medications from the pharmacy, directly dispensing the medications to the nurse, and educating the nurse. A successful intervention was defined as the medication being administered within 1 hour from time of pharmacist intervention. The interventions were successful with a rate of 95.8% and 94.1%

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for the ED and inpatient nurses, respectively. This study demonstrates that ED pharmacist interventions can fill the gap in tasks performed by ED nurses, can ensure compliance with administration of medication orders for boarded patients, and can ensure the timely administration of medication to patients in the ED. In an effort to manage overcrowding issues in the ED, a multidisciplinary approach that involves pharmacists is needed.

CONCLUSIONS

The most commonly documented interventions performed by the ED pharmacist at TCRHCC were preparing IVs, medical record reviews, medication reconciliation/history, pediatric dosing, providing drug information and nursing staff education, and prospectively reviewing medication orders prior to their administration.

This study demonstrates the importance of pharmacist interventions and also suggests that there is a need for a pharmacist in at least 1 ED within the IHS. ●

Author disclosures

The author reports no actual or potential conflicts of interest with regard to this article.

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