



A Survey of Staff Perceptions of an Emergency Medicine Pharmacist Program in a Community Hospital: A Brief Report

Jennifer Splawski, PharmD*; Deanna Horner, PharmD; Kevin Tao, MD

*Corresponding Author. E-mail: jsplawsk@macneal.com.

Study objective: For an emergency medicine pharmacist to become a well-integrated multidisciplinary team member, his or her services need to be accepted by the emergency department (ED) staff. There have been 2 published studies attesting the value of the emergency medicine pharmacist by ED staff: at an academic medical and trauma center in 2007 and a large academic medical center in 2011. The aim of this study is to determine whether the emergency medicine pharmacist's value, as perceived by ED staff, would be similarly accepted at a smaller community hospital with limited clinical pharmacist services.

Methods: This prospective, descriptive survey examined the perceptions of ED providers and nurses in regard to the emergency medicine pharmacist at a 26-bed Level II trauma center with 65,135 annual visits.

Results: Of the 90 participants polled, 50% (45) responded. Overall, the ED staff's perceptions of an emergency medicine pharmacist were positive. Eighty-six percent of all participants surveyed had consulted the emergency medicine pharmacist at least once in their last 5 shifts. Thirty-one percent answered that being available for consultation was the most important aspect of the emergency medicine pharmacist's role, whereas attending codes (22%) and patient education (20%) were the next most important activities. Providers consulted with the emergency medicine pharmacist most for antibiotic stewardship (including guided empiric therapy and culture callbacks) drug-drug and drug-disease state interactions, and dosing of pediatric medications. Nurses referred to the emergency medicine pharmacist most for compatibility consultations, medication retrieval, and high-risk medication verification.

Conclusion: As was previously found in academic settings, an emergency medicine pharmacist is an invaluable addition to the health care team and can be incorporated into an existing pharmacy staffing model at a small, community hospital. [Ann Emerg Med. 2017;69:308-314.]

Please see page 309 for the Editor's Capsule Summary of this article.

A [podcast](#) for this article is available at www.annemergmed.com.

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INTRODUCTION

One of the Agency for Healthcare Research and Quality's strategies for reducing medication errors is for clinical pharmacists to oversee the medication dispensing process. In 2007, the agency provided a research grant to study the effect of clinical pharmacists in the emergency department (ED).¹ Part of the grant was to complete a survey to determine whether the emergency medicine pharmacist role was accepted by the staff and demonstrate their value.² This study was conducted by Fairbanks¹ at an academic medical and trauma center, and the results showed that staff acceptance was not a barrier to the emergency medicine pharmacist program. This study was then repeated in 2011 at a large academic medical center and indicated that the staff perceived that the emergency

medicine pharmacist provided a benefit to their department.³

In general, the growth of emergency medicine pharmacist services has been relatively slow. The start was in the 1970s, during which the pharmacist focused mainly on cost containment and dispensing.⁴ As clinical pharmacy practice has developed, the goals of the emergency medicine pharmacist have also evolved. In 2001, a survey was completed to assess the prevalence and characteristics of pharmacy services in the ED. Of the 119 respondent facilities, 17 had some type of clinical services in the ED.⁵ Because of the increase in emergency medicine pharmacist presence and the literature proving their worth in patient safety and cost savings, the American College of Emergency Physicians Board of Directors (ACEP) released a statement

Editor's Capsule Summary*What is already known on this topic*

Emergency department (ED) pharmacists have been shown to improve care but have been studied almost exclusively in academic settings.

What question this study addressed

This study examines ED staff's perceptions of the value of the ED pharmacist at a single medium-sized private hospital without a residency program.

What this study adds to our knowledge

A high proportion of respondents believed that the pharmacist was an integral part of the ED team and improved the quality of care; two thirds consulted the pharmacist approximately once per shift.

How this is relevant to clinical practice

This study supports the extension of ED pharmacist programs beyond the teaching settings in which they were developed to include everyday emergency practice.

in 2015 reporting that pharmacists have a critical role in the ED and should be well integrated into the multidisciplinary team.⁶ Even with the support of ACEP challenges of starting a new emergency medicine pharmacist program still exist. Costs of the program, as well as ED staff buy-in, are 2 struggles that a new program may face.

Most patient care is conducted at community hospitals, which are not as well researched as larger academic medical centers. This study attempted to determine whether the emergency medicine pharmacist's value, as perceived by ED staff, would be similarly accepted at a smaller community hospital with limited clinical pharmacist services.

MATERIALS AND METHODS**Setting**

In June 2014, one full-time clinical pharmacist established the emergency medicine pharmacist program. Before this, pharmacy services provided to the ED included stocking automated dispensing cabinets (ADCs), reviewing medication orders for drugs not stocked in the ADC, and answering clinical questions on demand from a centralized pharmacy. Before implementation, one critical care pharmacist was employed and worked solely in the ICU. The emergency medicine pharmacist was a board-certified pharmacotherapy specialist through the Board of

Pharmacy Specialties, with a general postgraduate year 1 pharmacy residency and 2 years of ED experience, with certifications in basic life support, advanced cardiovascular life support, and pediatric advanced life support through the American Heart Association. The emergency medicine pharmacist's typical daily duties were as follows: antimicrobial stewardship, including culture callbacks and guided empiric therapy; drug information; emergency response for high-triage severity areas; prospective order review; discharge medication counseling; core measure improvement; medication history intake; and reconciliation of admission orders.

This study was conducted in MacNeal Hospital's ED, a 26-bed Level II trauma center with 65,135 annual visits (26% pediatric visits). Physicians are emergency medicine board certified and contracted from CEP America. Both providers and registered nurses had 22% part-time employees who worked minimal shifts per scheduled period. The annual funds for the emergency medicine pharmacist came from the pharmacy department. Because of the novelty of this program, hours varied initially for the first 6 months and subsequently were set at 5 days per week, 8 hours per day, with 2 evening shifts (1 PM to 9:30 PM) and 3 day shifts (9 AM to 5:30 PM). This allowed the emergency medicine pharmacist to be present at the busiest times and also available for administrative duties.

Selection of Participants

A descriptive survey tool was modified from 2 previous studies that assessed staff perceptions of the emergency medicine pharmacist.^{2,3} The survey had 12 questions total (Figure). The survey, released to the entire ED staff by e-mail through [SurveyMonkey.com](https://www.surveymonkey.com) (Palo Alto, CA), was active for 30 days, with an e-mail reminder after 15 days. The survey was also advertised on department billboards and during departmental meetings. At the release of the survey, the emergency medicine pharmacist program had been in effect for 1 year and 2 months.

The survey targeted anonymous responses from attending emergency physicians, advanced practice providers, and nurses. Providers were identified by CEP America listserv and nurses were identified by departmental roster. Medical residents were excluded from the survey because of their abbreviated time rotating in the ED. Surveys with less than 80% of the questions answered were also excluded.

Participants identified themselves as providers (attending physician or advanced practice provider) or registered nurses. All participants provided electronic consent by

1. How many times in your last 5 shifts in the ED, during which an emergency medicine pharmacist was on duty, have you consulted the pharmacist?
 - a. Multiple times per shift
 - b. At least once per shift
 - c. A few times
 - d. Not at all
 2. Which of the following do you think is the most important in maximizing the emergency medicine pharmacist contribution to medication safety?
 - a. Attend codes
 - b. Resuscitations
 - c. Order review
 - d. Being available for consultation
 - e. Staff education
 - f. Patient education
 3. Which of the following types of orders should the emergency pharmacist check before they are administered (select all that apply)?
 - a. All orders
 - b. Urgent orders
 - c. High-risk medications
 - d. Rarely used medications
 - e. Pediatric medications
 4. The presence of an emergency pharmacist improves quality of care in the ED.
 - a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
 5. The emergency pharmacist is an integral part of the ED team.
 - a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
 6. I make more use of pharmacy services when the pharmacist is located in the ED.
 - a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
 7. It is helpful when the ED pharmacist checks medication orders before they are carried out.
 - a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
 8. The availability of a pharmacist during resuscitations, conscious sedation, code stemi, and code stroke enhances my ability to deliver safe, quality care to my patients.
 - a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
 9. The ED pharmacist is a valuable teacher to the ED staff.
 - a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
 10. The ED pharmacist is a valuable patient educator.
 - a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
- For provider only**
- Please select in order what you use the pharmacist for
1. Antibiotic selection and streamlining
 2. Medication history/allergy review
 3. Consultation about drug-drug or drug-disease state interactions
 4. Pediatric dosing/drug information
 5. Toxicology consultation
 6. Patient education
 7. Medication dosing (excluding antibiotics and pediatrics)
 8. Drug information request (excluding pediatrics and antibiotics)

Figure. Survey.

For RN only Please select in order what you use the pharmacist for 1. Medication history/allergy review 2. Compatibility 3. Medication retrieval from pharmacy 4. Safety double check with high-risk meds (insulin, heparin, lovenox) 5. Drug information request 6. Patient education Demographic data 1. Role in the ED a. RN b. Midlevel practitioner c. MD attending	2. Years of experience in emergency medicine a. <1 b. 2-5 c. 6-10 d. >10 3. Years of experience in this ED a. <1 b. 2-5 c. 6-10 d. >10 4. Years of experience working with an emergency medicine pharmacist a. <1 b. 2-5 c. 6-10 d. >10 RN, Registered nurse.
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Figure. Continued

taking the survey, and no incentives were offered for completion. The researchers remained blinded to the participants. The MetroWest Institutional Review Board approved this study through expedited review.

Primary Data Analysis

Response rates were analyzed with descriptive statistics. “Strongly agree” and “agree” responses were combined in a single category. “Disagree” and “strongly disagree” were also combined in a single category. Descriptive statistics and 95% confidence intervals around proportions were analyzed with Excel (Microsoft, Redmond, WA).

RESULTS

Characteristics of Study Subjects

Forty-five responses were received from 13 attending physicians, 6 advanced practice providers, 25 registered nurses, and 1 person of undisclosed role. Twenty-seven respondents (61%) had 6 or more years of experience in emergency medicine. Twenty-two (50%) participants had 1 year or less, and 18 participants (41%) had between 2 and 5 years of experience working with an emergency medicine pharmacist in either their current or previous position.

Main Results

Of the 90 participants polled, 50% (45) responded. Overall, the ED staff's perceptions of an emergency medicine pharmacist were positive. Ninety-six percent of

survey respondents believed that the emergency medicine pharmacist was an integral part of the ED team and 93% indicated that the presence of an emergency medicine pharmacist improves the quality of care in the ED. Eighty-

Table 1. Staff's general perceptions of the emergency medicine pharmacist.

Survey Question	Selection	Overall, N = 45 (%)
Which of the following do you think is the most important in maximizing the emergency medicine pharmacist contribution to medication safety?	Available for consultation	14 (31)
	Attend codes/resuscitations	10 (22)
	Patient education	9 (20)
	Order review	7 (16)
	Staff education	5 (11)
Which of the following types of orders should the emergency pharmacist check before they are administered (select all that apply)?	High-risk medications	31 (69)
	Rarely used medications	23 (51)
	Pediatric medications	23 (51)
	Urgent orders	14 (31)
	All orders	12 (27)
N = 44		
How many times in your last 5 shifts in the ED, during which an emergency medicine pharmacist was on duty, have you consulted the pharmacist?	Multiple times	18 (41)
	At least once per shift	11 (25)
	A few times	9 (20)
	None	6 (14)

Table 2. Staff responses about the role of the emergency medicine pharmacist.

Survey Question	Median Score*	Strongly Agree/Agree			Neutral			Disagree/Strongly Disagree		
		Number	% of Total	95% CI	Number	% of Total	95% CI	Number	% of Total	95% CI
The presence of an emergency pharmacist improves quality of care in the ED	1	42	93	81–98	3	7	2–19	0	0	0–10
The emergency pharmacist is an integral part of the ED team	1	43	96	84–99	1	2	0–13	1	2	0–13
I make more use of pharmacy services when the pharmacist is located in the ED	1	40	89	75–96	3	7	2–19	2	4	1–16
It is helpful when the ED pharmacist checks medication orders before they are carried out	1	38	84	70–93	6	13	6–28	1	2	0–13
The availability of a pharmacist during resuscitations, conscious sedation, code stemi, and code stroke enhances my ability to deliver safe, quality care to my patients	1	40	89	75–96	4	9	3–22	1	2	0–13
The ED pharmacist is a valuable teacher to the ED staff	1	41	91	78–97	4	9	3–22	0	0	0–10
The ED pharmacist is a valuable patient educator	1	44	98	87–100	1	2	0–13	0	0	0–0

CI, Confidence interval.

*Median score is calculated with the following scale: 1=strongly agree, 2=agree, 3=neutral, 4=disagree, and 5=strongly disagree.

six percent of all participants surveyed had consulted the emergency medicine pharmacist at least once in their last 5 shifts, with 66% consulting the emergency medicine pharmacist at least once per shift.

In regard to the emergency medicine pharmacist's responsibilities, 31% of participants answered that being available for consultation was the most important aspect of the emergency medicine pharmacist's role. Attending codes (22%) and patient education (20%) were the next most important activities as perceived by the staff.

Providers indicated that they consulted the emergency medicine pharmacist most for antibiotic stewardship, drug-drug or drug-disease state interaction regimen reviews, and dosing of pediatric medications. Registered nurses conferred with the emergency medicine pharmacist most commonly for compatibility questions, medication retrieval, and verification of high-risk medications.

Currently, the ED has nonprofile dispense ADCs, programmed to allow open access to all stocked medications before pharmacist review and verification of medication orders. Before implementation of the emergency medicine pharmacist's role, the only medication orders reviewed were the ones not stocked in the ADC. Having an emergency medicine pharmacist present allows prospective order review. Most respondents indicated that the emergency medicine pharmacist should review high-risk medications (69%), rarely used medications (51%), and pediatric medications (51%). Twenty-seven percent of respondents answered that all medication orders should have a pharmacist review before dispensing. This is further delineated in [Table 1](#).

The staff responses about the role of the emergency medicine pharmacist are shown in [Table 2](#). The answers for all questions had an average Likert score between "strongly agree" and "agree."

LIMITATIONS

There were some limitations to our study. One was that 22% (n=20) of part-time staff in the ED may not have been able to access the survey during the allotted time frame. In addition to emergency medicine responsibilities, the emergency medicine pharmacist was involved in hospital-wide committees and at times was not present in the ED because of administrative responsibilities. The emergency medicine pharmacist program also had to fit into the pharmacy staffing model, so the emergency medicine pharmacist had inpatient staffing responsibilities taking them away from their bedside ED duties. Because the program was new, it took several months to develop a set schedule in the ED that allowed providers and nurses to gain more familiarity with the emergency medicine pharmacist's role. The overnight staff had the least amount of interaction with the emergency medicine pharmacist but did have access to the survey.

DISCUSSION

The previous studies by Fairbanks et al² and Coralic et al³ demonstrated the emergency medicine pharmacist's value as perceived by ED staff. One of the limitations noted in the study by Fairbanks et al² was a potential for reduced external validity in nonacademic medical centers or in new programs because their study context was a well-established emergency medicine pharmacist program.² This study indicated that the emergency medicine pharmacist was a highly valued and integral member of the ED team in a community hospital with limited exposure to clinical pharmacist specialists.

Our survey's response rate was at 50%, above the typical average and therefore a strength of this study. Internal surveys receive approximately a 30% to 40% response rate on average. The studies by Fairbanks et al² and Coralic et al³ had an 80% survey response rate.^{2,3,7}

At 1 year and 2 months postimplementation, 96% and 93% of respondents believed that the emergency medicine pharmacist was an integral part of the team and improved quality of care, respectively. Eighty-nine percent of respondents believed this positively affects patient care, whereas 22% of respondents selected this responsibility as the emergency medicine pharmacist's most important contribution to medication safety. One of the major achievements of the emergency medicine pharmacist was the ability to close the communication gap that previously existed between pharmacy, the ED staff, and the broader, multidisciplinary Stroke Committee. With the emergency medicine pharmacist's leadership, the medication management process for alteplase was simplified, allowing consistent administration of alteplase within the goal of 60 minutes for ischemic stroke patients and

improving core measure adherence. Additionally, the process was targeted to ensure reliable results even in the emergency medicine pharmacist's off hours, using closed-loop feedback to pharmacy staff.

Most respondents (98%) indicated that the emergency medicine pharmacist was a valuable patient educator, whereas 20% stated that patient education was the emergency medicine pharmacist's most important contribution to medication safety. For the emergency medicine pharmacist to fulfill this task regularly during daily operations, he or she provides discharge counseling focusing on the purpose and adverse effects of medications.

The majority of respondents (91%) agreed that the emergency medicine pharmacist was a valuable ED department educator. Eleven percent indicated that staff education was the most important emergency medicine pharmacist contribution positively affecting medication safety. Provider education efforts include physician in-services during monthly departmental meetings and monthly pharmacy clinical pearls newsletters. Most emergency medicine pharmacist education is completed in real time in response to patient care questions.

Before implementation of the program, the pharmacists reviewed only medications unavailable in the ADC. Having an emergency medicine pharmacist present allows prospective medication review and potential errors to be caught. Being located in the ED allows the emergency medicine pharmacist to interject on verbal orders and prepare emergency medications at bedside. In addition, 89% of survey respondents also used pharmacy services more when they were located in the ED. Only 27% of respondents believed that all medication orders should be checked before administration. A reason for this is the perception that having a pharmacist review orders may delay patient care⁸; however, as can be seen with the pharmacist's involvement in code stroke cases, time and quality of care can actually be improved.

Our study demonstrated that even in a small community hospital with limited resources, an emergency medicine pharmacist is an invaluable addition to the health care team and can be incorporated into an existing pharmacy staffing model. This is a unique setting because there are generally fewer highly specialized pharmacists in community settings and providers may not be as familiar with their services. This study showed that adding a pharmacist in this environment can mimic the pharmaceutical care provided at larger academic teaching institutions, with favorable results.

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Author affiliations: From the Department of Pharmacy (Splawski) and Department of Emergency Medicine (Tao), MacNeal Hospital, Berwyn, IL; the Department of Pharmacy, Tenet Healthcare, Berwyn, IL (Horner); and CEP America, Berwyn, IL (Tao).

Author contributions: JS submitted the study to the institutional review board, undertook recruitment of nurses, and managed and analyzed data. JS and DH drafted the article. DH and KT edited the article. KT recruited physician and advanced practice provider support. JS takes responsibility for the paper as a whole.

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IMAGES IN EMERGENCY MEDICINE

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DIAGNOSIS:

Raynaud's ischemia. Typically, Raynaud's disease symptoms can be quickly and easily reversed or avoided by warming or continuously rubbing the extremities.¹⁻³ However, extreme cases of Raynaud's disease put patients at risk for developing prolonged ischemia, ulcerations, or even gangrene.^{2,3} These unique cases require prompt recognition, and patients may benefit from pharmaceutical intervention, including calcium channel blockers (nifedipine 30 to 180 mg/day or amlodipine 5 to 20 mg/day),^{1,2} α -blockers,² and topical nitroglycerin to the affected areas.^{1,2} In cases that do not respond to oral or topical therapies, intravenous prostacyclin analogues are indicated.²⁻⁴ These medications promote vasodilatation and can help restore blood flow to the affected extremities.^{2,3}

The inside fingertips of nonlatex gloves were coated with nitroglycerin paste 4% and applied over the affected digits. The patient was given oral amlodipine and aspirin, and rheumatology and vascular specialists were consulted. Topical nitroglycerin was repeated every 6 hours during her stay. By the next morning, her pain and swelling was significantly improved and she was discharged home.

Author affiliations: From the Chicago College of Osteopathic Medicine, Midwestern University, Downers Grove, IL (Bickel); the Department of Emergency Medicine, Kaiser Permanente South Sacramento Medical Center, Sacramento, CA (Hannafin); and the Department of Emergency Medicine, Maricopa Medical Center, and Samaritan Regional Poison Control Center, Phoenix, AZ (Lovecchio).

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