

Survey of physicians regarding clinical pharmacy services in academic emergency departments

JILLIAN M. SZCZESIUL, ROLLIN J. FAIRBANKS, JAMES M. HILDEBRAND,
DANIEL P. HAYS, AND MANISH N. SHAH

Studies have found that clinical pharmacists can positively affect patient safety, health outcomes, and drug costs.¹⁻³ The presence of clinical pharmacists in the emergency department (ED) was first reported in 1977.⁴ Recent reports have revealed that pharmacist interventions in the ED lead to cost savings and that ED staff believe that clinical pharmacists improve the quality of care and medication safety.⁵⁻⁷

In 2003, approximately 3% of institutions in the United States had dedicated clinical emergency pharmacists physically located in the ED, and only 14% made any type of clinical pharmacy services available to the ED.⁸ Recently, influential organizations such as the Institute of Medicine have supported the increased role of clinical pharmacists in the ED.^{9,10}

Purpose. The prevalence and nature of clinical pharmacy services in academic emergency departments (EDs) were studied.

Methods. A Web-based survey instrument consisting of questions regarding clinical pharmacy services available in the ED was developed based on a review of the current literature and expert consensus. The revised instrument was sent to a representative of all emergency medicine (EM) residency programs listed in the Society for Academic Emergency Medicine residency catalog in June 2006. The survey included questions addressing characteristics of the institution and the availability and nature of various pharmacy services in the ED. EM physicians were deliberately targeted so that the results would represent the ED staff's perceptions of their use of pharmacy services. Only respondents' primary residency hospital sites were considered. Data were compiled and analyzed using descriptive statistics and 95% confidence intervals.

Results. Of the 135 EM residency programs surveyed, 99 responses (73%) were received. Eight percent of institutions reported that a dedicated pharmacist was available in the ED 24 hours a day, 22% reported partial coverage in the ED, and 70% reported no coverage. Six percent reported the presence of a satellite pharmacy located in the ED that was staffed by a pharmacist. The most common clinical pharmacy services reported in EDs with pharmacy coverage were modification of inventory according to formulary status, provision of drug or toxicology information, and adverse-drug-event reporting.

Conclusion. A minority of respondents from academic EDs reported that clinical services are provided by a pharmacist working in the ED.

Index terms: Clinical pharmacists; Clinical pharmacy; Data collection; Hospitals; Pharmaceutical services; Physicians

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JILLIAN M. SZCZESIUL, PHARM.D., is Clinical Pharmacist, Department of Pharmacy, Allegheny General Hospital, Pittsburgh, PA; at the time of writing she was Clinical Pharmacy Specialist, Department of Pharmacy Services, University of Rochester (UR), Rochester, NY. ROLLIN J. FAIRBANKS, M.D., M.S., is Assistant Professor, Department of Emergency Medicine, UR. JAMES M. HILDEBRAND, B.A., is a medical student, UR School of Medicine. DANIEL P. HAYS, PHARM.D., is Clinical Pharmacy Specialist, Departments of Pharmacy Services and Emergency Medicine; and MANISH N. SHAH, M.D., M.P.H., is Associate Professor, Departments of Emergency Medicine, Community and Preventive Medicine, and Geriatrics, UR.

Address correspondence to Dr. Fairbanks at the Department of Emergency Medicine, University of Rochester, Medical Center Box 655,601 Elmwood Avenue, Rochester, NY 14642 (terry.fairbanks@rochester.edu).

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Academic EDs, defined as EDs with accredited emergency medicine (EM) residency programs, provide an educational environment to train EM physicians who will eventually guide future practice, and the clinical pharmacists in the ED can provide a significant educational benefit to these physicians.^{5,7,9,11} Physicians who work with an ED pharmacist during their training are likely to expect one in future practice, which may increase the demand. Although the presence of clinical pharmacists in the ED has previously been reported as low, their presence in EDs with EM physician residency programs is unknown. The purpose of this study was to determine the prevalence and nature of clinical pharmacy services in academic EDs.

Methods

Study design and population.

We developed a survey to be sent to all EM residency programs listed in the Society for Academic Emergency Medicine residency catalog in June 2006 (www.saem.org). EDs with residency programs were selected because practitioners at these institutions often lead the specialty in the integration of innovations and can shape the future of the specialty by influencing the new EM residency graduate's perception of what normal ED operations consist of.¹¹ This study was reviewed and approved by the university's institutional review board.

Survey content and administration. The survey instrument was developed based on a review of the current literature and expert consensus and was pilot tested and revised based on feedback received. The revised instrument included 10 questions addressing characteristics of the institution and the availability and nature of various pharmacy services in the ED (appendix). The estimated number of hours per week that pharmacy services were provided was also addressed. A dedicated ED clinical

pharmacist was defined as a pharmacist physically present in the ED.

The residency programs were contacted by telephone and asked to suggest a representative of the program who would be most knowledgeable about pharmacy services available in the ED. A Web-based survey instrument was then sent to this representative electronically (QuestionPro, Seattle, WA). If no response was received from the first representative after two attempts, a second representative was recruited in the same manner, and the survey was redistributed. Recruited representatives were given the option to refer the survey to a colleague if they believed someone else in their department was better able to answer the questions. EM physicians were deliberately targeted so that the results would represent the ED staff's perceptions of their use of pharmacy services. If residency programs were associated with multiple hospitals, respondents were asked to answer questions only as they applied to their primary residency training site.

Data analysis. Electronically downloaded data were deidentified and then transferred to an Access database (Microsoft Corporation, Redmond, WA). Responses were analyzed using descriptive statistics and 95% confidence intervals.

Results

The survey instrument was distributed between September 2006 and March 2007. Of the 135 EM residency programs surveyed, 99 responses (73%) were received. Respondents included residency directors (39%), EM faculty (19%), department chairs or vice chairs (15%), research directors (6%), chief residents (3%), and others (18%) (multiple selections were allowed). Responding institutions were characterized as nonprofit (32%), university (28%), or level 1 or regional trauma centers (21%) (multiple selections were allowed).

Eight percent of institutions reported that a dedicated pharmacist

was available in the ED 24 hours a day, 22% reported partial coverage in the ED, and 70% reported no coverage. Six percent reported the presence of a satellite pharmacy located in the ED that was staffed by a pharmacist. The types of services that respondents stated were provided by pharmacists are summarized in Table 1. The most common services provided were modification of inventory according to formulary status (52%), provision of drug or toxicology information (47%), and adverse-drug-event reporting (42%).

Discussion

The survey results indicate that 30% of EM residency programs utilized some form of clinical pharmacy services, about double the published rate reported for all types of EDs.⁸ The increased coverage was not surprising, since EDs that host EM residencies tend to receive a higher volume of patients and are more likely to be part of hospitals that use clinical pharmacists in other settings where they have been proven to improve care, such as the intensive care unit.¹⁻³

Although it is encouraging that nearly one third of respondents reported using some type of clinical pharmacy service, they did not appear to take full advantage of the skills and services available from a clinical pharmacist with a physical presence in the ED. For example, only a few EDs reported having clinical pharmacists provide drug therapy recommendations, cost-effectiveness advice, or patient counseling. And while clinical pharmacists have demonstrated successful involvement with the preceptorship and education of medical students and residents in the ED,⁵ very few EDs surveyed had pharmacists serve in these educational roles.

About half of the EDs did not consult their pharmacist to obtain drug or toxicology information. This is surprising, since the provision of

Table 1.
Survey Responses Regarding Clinical Pharmacy Services Provided in Emergency Departments (EDs)^a

Service Provided	No. (%) Respondents (95% Confidence Interval)
Modify inventory based on formulary status	51 (52) (41–62)
Provide drug or toxicology information	47 (47) (37–58)
Report medication errors or adverse drug reactions	42 (42) (33–53)
Provide advice on renal dosing ^b	38 (39) (29–50)
Clarify orders	39 (39) (30–50)
Teach at ED inservice education meetings	36 (36) (27–47)
Provide drug therapy recommendations ^b	34 (34) (25–44)
Provide antimicrobial selection or dosing advice	34 (34) (25–45)
Participate in research activities ^b	33 (34) (25–44)
Dispense medications	33 (33) (24–44)
Screen for drug interactions	32 (32) (23–42)
Assess patient contraindications to therapy ^b	31 (32) (23–42)
Participate in medical or trauma resuscitation	29 (29) (21–39)
Screen for allergies	29 (29) (21–39)
Provide advice on cost-effectiveness of therapy ^b	27 (28) (19–38)
Counsel and educate patients ^b	17 (18) (11–27)
Serve as preceptor for medical students or emergency medicine residents ^b	13 (13) (7–22)

^an = 99 unless otherwise noted.

^bn = 97.

such information would seem to be a primary function of the clinical pharmacist in the ED. Pharmacists modified inventory based on formulary status in about half of the EDs surveyed, despite the fact that this function has been shown to affect medication choice in the ED.¹² These roles for pharmacists in the ED are valued by staff in the EDs that use them⁵⁻⁷ and are core functions of a clinical pharmacist.

The value of the physical presence of clinical pharmacists in the ED has been repeatedly reported by clinicians in EDs with existing programs and in the patient-safety literature.¹³ EM residency programs should be leaders in implementing programs for clinical pharmacists in the ED. As EM residency graduates infiltrate the work force, the expectations that they developed in their residency will influence their new environments. As evidence for the value of clinical pharmacists in the ED grows, the presence of clinical pharmacists in EM residency programs will become

an important way to increase their use in all EDs.

It is important to recognize the limitations of this study. The respondents were selected based on referrals from the residency representatives listed in the residency catalog and may not have been the persons with the most knowledge about the ED's use of pharmacy services. To increase the likelihood of an appropriate representative, institutions were initially contacted directly, and a knowledgeable source was requested. The role of the pharmacist in the ED varied among locations, so the estimated hours per week and the significance of those hours may have been interpreted differently by respondents. It is also possible that respondents misinterpreted questions or misunderstood the meaning of terms such as pharmacy services, but we attempted to minimize this by clarifying terms in the survey and by pilot testing the instrument.

Approximately one third of EM residency primary training sites

had a clinical pharmacist physically located in the ED. Most of these programs did not utilize the clinical pharmacist's presence in a way that realizes the full potential of the role. Academic EDs should consider implementing emergency pharmacist programs to improve patient care and improve training. EDs that currently have clinical pharmacy services available should consider increasing their physical presence in the ED and expanding their involvement in clinical consultation and patient care activities. EM residency programs should lead the way in the integration of clinical pharmacists in the ED.

Conclusion

A minority of respondents from academic EDs reported that clinical services are provided by a pharmacist working in the ED.

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Appendix—Questionnaire

1. Which type is your hospital? (please select all that apply)

Nonprofit	For profit	Governmental	Academic/University
Community	Level 1/regional trauma center		Level 2/local trauma center
2. How many emergency department (ED) patient visits per year does your hospital have? _____
3. How many total emergency medicine (EM) residents (not including fellows) does your program have? _____
4. Does your hospital have an emergency pharmacy residency program? Yes [] No []
5. In the boxes below please list hours per week (0–168) that the following types of pharmacy services are available in your ED. If a service is not available, please put '0'. If you do not know exact numbers, please estimate.

<u>Type of service</u>	
Dedicated ED clinical pharmacist (physically present in ED for consultation)	[]
Satellite pharmacy located in ED (with tech only)	[]
Satellite pharmacy located in ED (with pharmacist)	[]
Hospital pharmacy available for phone consult	[]
Hospital pharmacist that attends codes/trauma	[]
Other (please explain) _____	[]
6. Are the following types of services provided by a pharmacist in your ED?

<u>Service</u>	<u>Yes</u>	<u>No</u>
• Order clarification	[]	[]
• Medication dispensing	[]	[]
• Drug or toxicology information	[]	[]
• Modification of inventory based on formulary status	[]	[]
• Medical/trauma resuscitation participation	[]	[]
• Allergy screening	[]	[]
• Medication-error or adverse-drug-reaction reporting	[]	[]
• Teaching at ED in-service meetings	[]	[]
• Drug interaction screening	[]	[]
7. Are the following types of services provided by a pharmacist in your ED?

• Antimicrobial selection or dosing advice	[]	[]
• Renal dosing advice	[]	[]
• Drug therapy recommendations (choice of medications)	[]	[]
• Patient education and counseling	[]	[]
• Research activities	[]	[]
• Assessment of patient contraindications to therapy	[]	[]
• Cost effectiveness advice	[]	[]
• Serving as a preceptor for medical students and EM residents	[]	[]
8. Is your ED currently doing medication reconciliation? Yes [] No [] I don't know []
9. If 'Yes,' who is doing medication reconciliation? (select all that apply)

MD []
RN []
Pharmacist []
Student []
Other _____
10. What is your role? (select all that apply)

Residency Director []
Residency Coordinator []
EM Faculty []
Research Director []
Department Chair/Vice-Chair []
Chief Resident []
Other _____