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Clinical pharmacy services in the emergency department

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ABSTRACT

The emergency department (ED) is a fast-paced, high-risk, and often overburdened work environment. Formal policy statements from several notable organizations, including the American College of Emergency Physicians (ACEP) and the American Society of Health-System Pharmacists (ASHP), have recognized the importance of clinical pharmacists in the emergency medicine (EM) setting. EM clinical pharmacists work alongside emergency physicians and nurses at the bedside to optimize pharmacotherapy, improve patient safety, increase efficiency and cost-effectiveness of care, facilitate antibiotic stewardship, educate patients and clinicians, and contribute to scholarly efforts. This paper examines the history of EM clinical pharmacists and associated training programs, the diverse responsibilities and roles of EM clinical pharmacists, their impact on clinical and financial outcomes, and proposes a conceptual model for EM clinical pharmacist integration into ED patient care. Finally, barriers to implementing EM clinical pharmacy programs and limitations are considered.

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1. Background

1.1. Need for emergency medicine clinical pharmacists

Emergency medicine (EM) is a complex field. It demands management of diverse patient populations and medical problems that call upon a variety of clinical disciplines—from pediatrics to geriatrics and primary care to critical care. Utilization of time-sensitive and high-risk medications is common in the emergency department (ED). These complexities place the ED among the most high-risk patient care environments [1]. Including EM clinical pharmacists in treatment decisions and in implementation of therapy mitigates some of the risk and decreases medication errors [2–7]. EM clinical pharmacist services complement existing interprofessional teams of physicians, advanced practice providers, nurses, respiratory therapists, and prehospital providers.

Historically, hospital pharmacists focused on distributive functions (e.g., medication procurement, preparation, and delivery to the patient bedside). Today's clinical pharmacists focus on patient care that optimizes medication therapy and thereby promotes health, wellness, and disease prevention. Clinical pharmacists provide expertise in the therapeutic use of medications and assume responsibility and accountability for managing therapy in direct patient care settings while collaborating with other healthcare professionals [8]. Their contributions to patient care and improved outcomes have been well documented and include reductions in patient mortality, hospital readmission rates, and medication errors [2,4,5,9–12]. They have also been shown to be highly valued team members in an EM environment [13,14].

1.2. History of emergency medicine clinical pharmacists

The introduction of clinical pharmacists in the ED was first reported in the 1970s [15–17]. Initial publications described their role in terms of

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medication distribution but also noted the provision of cognitive and consultative services based on the EM clinical pharmacist's unique knowledge of pharmacology and therapeutics. In the first physician survey of EM clinical pharmacist services in a single center study, all respondents (physician and nurses) supported the EM clinical pharmacist as an integral team member, and 87% supported pharmacist delivery of care to certain patients after physician diagnosis [15]. In medical resuscitations, the role of the pharmacist included recognition as a drug therapy consultant for clinicians [18].

In more recent years, the role of the EM clinical pharmacist has expanded to include an increasing emphasis on comprehensive direct patient care services. Such services are centered on bedside patient assessment with the EM medical team and timely provision of patient-specific and disease-specific pharmacotherapy recommendations. EM clinical pharmacists aid in medication selection, optimal dosing and delivery, provision of drug information to patients and the interprofessional medical team, research and scholarly activities, and administrative and operational responsibilities to optimize the efficiency of care delivered to ED patients [19].

In 2005, the Agency of Healthcare Research and Quality (AHRQ) funded a project titled "Emergency Department Pharmacist as a Safety Measure in Emergency Medicine" (HS015818). The goal was to optimize the role of the EM clinical pharmacist and to develop a toolkit to aid institutions in the justification and creation of EM pharmacy services. This program, related publications from the grant, and an offshoot mentorship program [20] ultimately increased the national visibility and understanding of the value clinical pharmacists present in the ED, and this has contributed to the rapid expansion of their services over the past decade [13,21–23].

1.3. Non-pharmacist organizational support

In December 2013, the American Society of Health-System Pharmacists (ASHP) Section of Clinical Specialists and Scientists Advisory Group on Emergency Care (SAG EC) began drafting an American College of Emergency Physicians (ACEP) resolution to recognize EM clinical pharmacists as valuable members of the interdisciplinary EM team and to create a policy statement supporting clinical pharmacy services in the ED. The SAG EC is a volunteer group of practicing EM clinical pharmacists whose responsibilities include advancement of EM pharmacy practice and creation of educational content [24]. In October 2014, SAG EC and the American College of Clinical Pharmacy, Emergency Medicine Practice and Research Network (ACCP EMED PRN), in collaboration with and support of the ACEP's New York Chapter, submitted resolution 44 (14) to the ACEP Council. Titled "Support for Clinical Pharmacists as Part of the Emergency Medicine Team," the resolution was adopted with strong support after a presentation to the ACEP Council Reference Committee. A formal policy statement followed in June 2015 [25]. It represented the first time that ACEP formally recognized the critical role EM clinical pharmacists play in ensuring efficient, safe, and effective medication use in the ED and advocated for dedicated clinical pharmacists within the ED.

Furthermore in October 2017, the American College of Medical Toxicology (ACMT) published a statement that clinical pharmacists are integral to the care and safety of adult and pediatric ED patients [26]. The organization highlights the benefits of EM clinical pharmacists in time dependent emergencies, optimization of pharmacotherapy, safety, and cost avoidance and supports 24-hour staffing of dedicated EM clinical pharmacists in EDs.

One additional mention is that clinical pharmacists have been elected to leadership positions in interprofessional societies that relate to EM such as the American College of Toxicology and the Society of Critical Care Medicine.

2. Current state assessment

2.1. Current roles and responsibilities

EM clinical pharmacists play a variety of roles in practice sites, ranging from large academic and community centers to small and rural EDs. An updated guideline for EM pharmacist services published in 2011 defined the role of the clinical pharmacist in the ED, suggested goals for pharmacy services to meet institutional needs, and established best practices [27]. Activities of EM clinical pharmacists have most recently been summarized by a 2015 national survey study [19]. An extensive list is available in Table 1. Fig. 1 introduces a conceptual model of integration of EM clinical pharmacists into ED patient care and maps these activities in relation to ED patient flow; the majority take place at or

Table 1
Activities of emergency medicine clinical pharmacists [19,27,28].

<p>Bedside clinical activities</p> <ul style="list-style-type: none"> ● Emergency department resuscitation team (cardiopulmonary arrest, trauma and burn resuscitation, myocardial infarction, stroke, sepsis) ● Direct bedside care during high risk medication use (rapid sequence intubation, procedural sedation) ● Pharmacotherapy consultation ○ Drug information ○ Medication selection ○ Medication dose (based on patient specific factors; age, weight, route of administration, renal function) ○ Medication therapy monitoring <ul style="list-style-type: none"> ● Drug interaction analysis ● Drug identification ● Drug compatibility for admixing or administration ● Error and adverse event reporting ● Patient counseling and education ● Toxicology recommendations ● Targeted disease state counseling (e.g., anticoagulation, anaphylaxis) ● Antimicrobial stewardship activities including microbiological culture and susceptibility follow-up ● Prospective medication order review and verification ● Assistance with medication procurement/preparation (advanced knowledge of medication storage and distribution and institutional policies and procedures) ● Medication administration ● Vaccine administration ● Emergency preparedness ● Facilitation of medication histories ● Oversight of pharmacist extenders (e.g., technicians, students) <p>Training and education</p> <ul style="list-style-type: none"> ● Medication therapy updates and education on optimal medication therapy for ED team members (often takes place at the bedside or in the ED) ● Education through conference and pharmacology rotations for EM attendings and residents ● Implementation and execution of post-graduate EM pharmacy residency training programs ● Participation in interdisciplinary simulation <p>Performance improvement</p> <ul style="list-style-type: none"> ● Guideline/protocol/process development ● Formulary management ● Medication dispensing cabinet optimization ● Optimization of medication procurement workflows ● Medication safety initiatives ● Participation in root cause analysis (RCA) and failure mode and effects analysis (FMEA) ● Assistance with adherence to regulatory and institutional medication use policies <p>Scholarly activities</p> <ul style="list-style-type: none"> ● Interdisciplinary EM clinical research ● Identification of patients for enrollment of investigational drug studies recruiting in the ED ● Participation in interdisciplinary research committees that review ED related research protocols ● EM related research grant preparation ● EM medical resident research projects or quality improvement projects ● Participation in articles, book chapters, case reports, or other collaborations with EM physicians

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