

Principal Investigator/Program Director (Last, First, Middle): Fairbanks, Rollin Jonathan

## **The ED Pharmacist as a safety measure in Emergency Medicine**

AHRQ U18 HS15818 “Partnerships in Implementing Patient Safety”

*Principal Investigator:*

Rollin J. (Terry) Fairbanks, MD, MS  
Department of Emergency Medicine  
University of Rochester School of Medicine and Dentistry

*Co-Principal Investigator:*

Manish N. Shah, MD, FACEP  
Department of Emergency Medicine

*Co-Investigators:*

Colleen Davis, MD, MPH; Erik Rueckmann, MD; Sandra Schneider, MD; Department of Emergency Medicine  
Robert J. Panzer, MD, Chief Quality Officer; J. Edward Bell, PharmD, Associate Chief Quality Officer  
University of Rochester Medical Center

*Advisory Board:*

Daniel J. Cobaugh, PharmD, Research Director, American Society for Health-System Pharmacists  
Robert L. Wears, MD, MS, Professor, University of Florida Dept of Emergency Medicine

Research Coordinator: Karen E. Kolstee, BSN, MPA  
Research Nurses: Karen Dewar, RN; Heather Martin, MS, RN  
Research Assistant: Lindsey Clark, BS

### **ABSTRACT**

**BACKGROUND:** The Emergency Department (ED) is a unique environment in medicine, and many safety mechanisms used in other hospital settings cannot be applied in the ED. For example, clinical pharmacists have traditionally provided extra layers of protection to hospital inpatients by cross-checking provider orders for appropriate dosing, contraindications, and interactions. Because medications in the ED must be accessed immediately and are often one-time doses, the use of central pharmacy services would introduce an unacceptable delay to the administration of medication. Although some hospitals have programs in place in which a pharmacist responds to the ED for cardiac arrests or trauma team activations, few have reported programs which involve a clinical pharmacist assigned exclusively to the emergency department. Nonetheless, published reports have asserted that ED-based pharmacists can increase patient safety. Although this concept appears logical, no study has attempted to show that these programs reduce potential adverse drug events in the ED.

**PROJECT SUMMARY:** We propose to implement and optimize an ED Pharmacist (EDP) program as a safe practice intervention in a large ED. The hospital has provided funding for two permanent full time positions starting at the beginning of the award period. In the initial phase interviews of physicians, nurses, pharmacists, and patients will be conducted and the results will be used to optimize the EDP role. A large-scale chart review study will then be conducted to evaluate whether there is a reduction in frequency of potential and adverse drug events during times that the EDP is on duty. Staff perceptions of the effectiveness of this program will also be evaluated. The overall goal of this initiative is to create an effective EDP program that will decrease the rate of adverse drug events in ED patients, and to create a “toolkit” to facilitate the introduction of similar programs into other EDs. This toolkit will include a description of the formal, optimized role of the EDP, challenges and solutions in implementation, and evidence to support the efficacy of such a program.

**RELEVANCE:** The use of a pharmacist has been proven to reduce medication error and adverse events in the hospital setting. Applying this concept to the ED setting is expected to have the same effect, thus will have an impact on public health by reducing the rate of medication error and harm to patients cared for in the ED.

## **RESEARCH PLAN**

### **A. Specific Aims**

Involvement of clinical pharmacists in patient care in the inpatient hospital setting results in safer and more effective medication use.<sup>1</sup> These pharmacists are involved in assuring appropriate prescribing and administration, monitoring patient adherence to therapy, providing drug information consultation to providers, monitoring patient responses and laboratory values, and providing patient and caretaker education.

Emergency department (ED)- based clinical pharmacy services are relatively rare.<sup>2</sup> This is likely due to the unique and complex nature of the ED. The paucity of ED-based clinical pharmacy services is perplexing given that the ED is known to be a particularly high-risk environment with frequent medication errors.<sup>3</sup> The 1999 Institute of Medicine report To Err is Human found that the ED had the highest rate of preventable adverse events among clinical environments studied, with a potential of 3.8 million events thought to be preventable each year.<sup>4 5 6</sup> EDs care for approximately 110 million patients per year in the US,<sup>7</sup> 5% experience potential adverse drug events,<sup>8</sup> and 70% of these, or 3.8 million events, are thought to be preventable.<sup>9</sup> Clearly, adverse drug events that occur in the ED are a significant public health problem in the US and need to be dramatically reduced without making the ED less efficient.

Published reports have asserted that ED-based pharmacists have the potential to reduce iatrogenic harm to patients.<sup>10 11 12 13</sup> But although this concept appears logical, no study has attempted to demonstrate that these programs reduce preventable adverse drug events in the ED. **The overall objective of this project is to implement and optimize a formal Emergency Department Pharmacist (EDP) Program at the University of Rochester Medical Center, and to study the effects of this safe practice intervention in three high risk populations - children, the elderly, and the critically ill.** Specifically, this project aims to:

**Specific Aim 1 (Implementation Plan): Implement and optimize a formal EDP Program that places dedicated, full-time pharmacists in the ED, working side-by-side with the nurses and physicians.**

The University of Rochester Medical Center has pledged salary support for two full-time EDPs starting at the beginning of the award period and continuing indefinitely. During a two-month start-up period, the role of the EDP will be optimized using qualitative research methods to obtain feedback from attending and resident emergency physicians, emergency nurses, hospital pharmacists, hospital inpatient nurses and physicians, ED patients, and the EDPs themselves. This process will result in an optimized, formal definition of roles for the EDP.

**Specific Aim 2: Evaluate the impact of the EDP Program** by examining the rate of adverse drug events (ADE) and potential adverse drug events (PADE) when the EDP is present as compared to when the EDP is not present among pediatric, geriatric, and critically ill populations through a retrospective chart review.

*Hypothesis 1: The ADE and PADE rate will decrease by at least 25% when the EDP is present in the ED as compared to periods when the EDP is not present in the ED.*

*Hypothesis 2: Compliance with published medication-related quality indicators which are relevant to emergency medicine will be improved when the EDP is present.*

**Specific Aim 3: Assess the acceptability of and satisfaction with the EDP by physicians and nurses.**

*Hypothesis 3: Physicians and nurses value the EDP as a member of the healthcare team and perceive that EDP involvement in patient care results in improved patient safety.*

**Specific Aim 4: Develop and disseminate a comprehensive "Toolkit" to facilitate implementation of an EDP program in emergency departments at other institutions.**

At the conclusion of this grant, we will have implemented and optimized an EDP program in our emergency department, quantitatively studied its effect on the rate of adverse drug events, and qualitatively studied its acceptance among providers. We will have disseminated the design and results of the program to other hospitals to facilitate their implementation of similar programs, provided them with an evidence-based justification for the EDP program, disseminated the results through conferences and peer-reviewed literature, and promoted the implementation of EDP programs.

**G. Literature Cited**

- <sup>1</sup> Society of Critical Care Medicine and the American College of Clinical Pharmacy. Position Paper on Critical Care Pharmacy Services, *Pharmacotherapy*, 2000; 20(11): 1400-1406.
- <sup>2</sup> Thomasset KB, Faris R. Survey of pharmacy services provision in the emergency department. *Am J Health Syst Pharm*. 2003;60:1561-4.
- <sup>3</sup> Croskerry P, Sinclair D. Emergency Medicine: A practice prone to error? *Canadian J of Emerg Med*; 2001: 3(4)
- <sup>4</sup> Kohn LT, Corrigan JM, Donaldson MS (eds), Institute of Medicine, *To Err is Human: Building a Safer Health System*. 2000, Washington, D.C.: National Academy Press.
- <sup>5</sup> Thomas EJ, Studdert DM, Burstin HR et al. Incidence and types of adverse events and negligent care in Utah and Colorado. *Medical Care* 2000; 38 (3):261-71.
- <sup>6</sup> Leape LL, Brennan TA, Laird N et al. The nature of adverse events in hospitalized patients. Results of the Harvard Medical Practice Study II. *New England Journal of Medicine* 1991; 324 (6):377-84.
- <sup>7</sup> American Hospital Association Hospital Statistics. 2000. AHA: Chicago
- <sup>8</sup> Chin MH, Wang LC, Jin L, et al. Appropriateness of medication selection for older persons in an urban academic emergency department. *Acad Emerg Med*. 1999;6:1232-42.
- <sup>9</sup> Brennan TA, Leape LL, Laird NM et al. Incidence of adverse events and negligence in hospitalized patients. Results of the Harvard Medical Practice Study I. *New England Journal of Medicine* 1991; 324 (6):370-6.
- <sup>10</sup> Peth HA. Medication errors in the emergency department: a systems approach to minimizing risk. *Emergency Medicine Clinics of North America*, 2003. 21(1): p. 141-58.
- <sup>11</sup> Schenkel S. Promoting patient safety and preventing medical error in emergency departments. *Academic Emergency Medicine* 2000; 7 (11):1204-22.
- <sup>12</sup> Powell MF, Solomon DK, McEachen RA. Twenty-four hour emergency pharmaceutical services. *American Journal of Hospital Pharmacy* 1985; 42 (4):831-5.
- <sup>13</sup> Fairbanks RJ, Hays DP, Webster DF, Spillane LL, *Clinical Pharmacy Services in an Emergency Department*, *Am J Health Syst Pharm*, May 2004; 61:934-7.