

## **The Emergency Pharmacist: Safety Measure in Emergency Medicine**

### **Justification Summary Document**

45 References

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### **Introduction**

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 University of Rochester has undertaken a project is to implement and optimize a formal Emergency Pharmacist (EPH) Program at the University of Rochester Medical Center, and to study the effects of this safe practice intervention. A large prospective study is underway to quantitatively look at the effect of the EPH program on the rate of adverse drug events and medication related quality measures.

This document provides a review of the current literature supporting the use of Emergency Pharmacists. Further information and resources for hospitals interested in initiating similar programs can be found at [www.EmergencyPharmacist.org](http://www.EmergencyPharmacist.org).

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### **Summary of the Literature**

Since the Institute of Medicine released the 1999 report *To Err is Human*, the medical community has devoted significant time, effort, and money to reduce medical errors.<sup>4</sup> In the IOM report, medication errors were highlighted as a significant and under-recognized cause of adverse outcomes. Medication-related events have been found to account for 19% of adverse events, and 4% of all inpatients experience medication errors.<sup>10</sup> The use of medications was the leading cause of injury found in the Harvard Medical Practice Study of hospitals in New York State.<sup>6</sup>

*Medication Error in the Emergency Department (ED).* Data suggest that medication errors are a significant cause of errors in the ED as well,<sup>14</sup> and that there are a higher prevalence of preventable adverse events in the ED.<sup>9</sup> One analysis of adverse drug events reported to a national database showed a more than doubling of the rate of medication errors resulting in harm in the ED as compared to the inpatient setting.<sup>15</sup> A study analyzing the CDC's National Hospital Ambulatory Medical Care Survey from 1992-2000 showed that emergency physicians frequently prescribe inappropriate medications and the rate of inappropriate prescribing has not changed over the years analyzed.<sup>16</sup> Another study found that 3.6% of patients were prescribed an inappropriate medication in the ED and 5.6% were prescribed one upon discharge.<sup>8</sup> Prescription of an inappropriate medication was associated with worse functioning on components of the health-related quality of life score. An Austrian study found that 5.4% of all patients who received medications had the potential for an adverse reaction.<sup>17</sup> Finally, patients also perceive a risk in the ED. A recent study found that 38% of patients who presented to a variety of EDs worried that a medical error might affect them.<sup>18</sup>

*The high-risk environment of the ED.* Some of the unique ED system challenges may contribute to this. Unlike most healthcare settings, medications in the ED are usually ordered, dispensed and administered at the point of care. There is also a higher prevalence of verbal orders, particularly in urgent and high stress situations.<sup>19</sup> In the ED, the physicians are usually not familiar with the patient, and often do not have access to the complete medical record. As a result, they are not familiar with the patient's medications, medical history, or allergies. Medications are often dispensed directly without prospective pharmacy review of orders. In emergency situations, there is also an increased use of higher risk intravenous medications.<sup>10</sup> Both physician and nursing staff are often treating multiple patients at once, with frequent interruptions.<sup>20</sup> The ED lacks the ability for direct follow-up, and thus adverse interactions between medications prescribed in the ED may go unnoticed by the providers.<sup>17</sup>

ED and hospital overcrowding also contributes to the high-risk environment in the ED, and this is largely due to the boarding of inpatients in the ED for long periods of time.<sup>21 22</sup> As a result the ED has become a small hospital, caring for emergencies, providing primary care to patients without doctors,<sup>23</sup> and caring for ill patients who wait for scarce inpatient beds. In these chaotic conditions where inpatients, outpatients and critically ill patients coexist, few, if any, medication safeguards exist.

*The clinical pharmacist as a system-level solution.* Traditionally, error reduction in medicine has focused on the responsibility of the individual health professionals and less on the system.<sup>11</sup> A systems-approach to error reduction can create multiple layers of protection that will greatly reduce the effect of human error, before it reaches the patient.<sup>24 25</sup> Leape and colleagues describe the objectives of system design for safety as having a two-fold approach. First, make it difficult for errors to occur and then "absorb" errors that do occur. That is, these errors should be detected and corrected before harm occurs.<sup>26</sup> The addition of a clinical pharmacist to the patient-care team "at the bedside" is a system-level patient safety intervention that serves both of these functions.

The role of the hospital pharmacist has evolved into one that involves active prevention of medication errors, in part by screening physician orders for accuracy in dosing, drug interactions, contradictions, and allergies. Traditionally this role has been carried out remote from the clinical setting, usually in a centralized hospital pharmacy area. However, many hospitals have established inpatient and ambulatory clinical pharmacist positions that enable the pharmacist to develop personal relationships with nurses and physicians, and to have access to more patient information and clinical data. It has been shown that pharmacists as members of an inpatient care team reduce the number of adverse drug events,<sup>27 28 29 30</sup> and that pharmacist involvement in care is financially advantageous for health care institutions.<sup>31</sup> Several authors

mandate that including a pharmacist in the clinical team is a critically important patient safety solution,<sup>32 33 34</sup> and the Agency for Healthcare Research and Quality's (AHRQ) recent analysis of patient safety practices devotes an entire chapter to advocating for the clinical pharmacist's role in preventing adverse events.<sup>35</sup>

But the potential of a clinical pharmacist has gone largely unrealized in emergency care.<sup>2</sup><sup>36</sup> In a 2000 consensus committee report that included recommendations regarding the initial steps that should be taken to address error in the emergency care environment, there was no mention of pharmacist involvement.<sup>37</sup> Similarly, an article describing teamwork in the ED and its relationship to patient safety did not describe the pharmacist as a member of the extended team, although they included resources such as radiology, laboratory, respiratory, phlebotomy, and dietary.<sup>38</sup> And although many hospitals have programs in place in which the pharmacist responds to the ED for cardiac arrests or trauma team activations,<sup>13 39 40 41 42</sup> very few have reported programs which involve a clinical pharmacist assigned exclusively to the emergency department.<sup>12 36 43</sup> Some have recognized this deficit, as published reports have asserted that ED-based pharmacists would have the potential to increase patient safety,<sup>10 11</sup>

Emergency departments with established emergency pharmacist programs, have reported on both cost savings<sup>44</sup> and a perception among physician and nursing staff that medication safety and quality of care are improved.<sup>45</sup>

Approximately 110 million patients receive care in the ED each year in the US, more than four times the number of patients who undergo surgery each year.<sup>7</sup> Given these numbers and the evidence that emergency departments have the highest rate of preventable adverse events of any other clinical environment, adverse drug events that occur in the ED are clearly a significant public health problem in the US, and the presence of a clinical pharmacist in the ED is a necessary but yet grossly underutilized intervention.

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