Evaluation of Pharmacy Services in a Community Level 1 Trauma Center Emergency Department (ED) Through Use of an ED-Specific Intervention Database

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Primary Intended Outcomes

1. Categorize and quantify the interventions provided by the ED pharmacists.

2. Identify which types of pharmacy services are the main focus of the daily tasks of the ED pharmacist.

3. Identify interventions to further optimize and potentially include consistently in daily workflow, based on the needs of both the ED and pharmacy departments.

Relevant PPMI Recommendations

B23. The following characteristics or activities should be considered essential to pharmacist-provided drug therapy management in optimal pharmacy practice models:

B23e. Adjustment of medication doses based on patient response or pharmacokinetic characteristics of the medication.

B23n. Participation on rapid response teams.

B23o. Participation on resuscitation teams.

B24. Every pharmacy department should:

B24m. Track and trend pharmacist interventions.

Situation Analysis

The number of ED visits continues to rise each year. According to the National Center for Health Statistics, the estimated number of ED visits has risen from 119.2 million in 2006 to 129.8 million in 2010.¹

As more and more patients utilize the ED as a source of primary care, the result is further strain on an already overwhelmed system. Increased patient utilization combined with the fast-paced, stressful environment of the ED creates an atmosphere with greater potential
for adverse events and medication errors.

The presence of a pharmacist in an ED continues to gain popularity across U.S. healthcare systems, and the positive impact of ED pharmacist interventions on patient care has been extensively displayed in the literature. Although pharmacy departments have begun to include ED pharmacists in their staffing model, there is a lack of data on what types of interventions may be included in their workflow.

This project took place at WakeMed Health & Hospitals, Raleigh Campus. This facility is an 870-bed not-for-profit health care system, with a Level1 Trauma Center, nationally accredited Chest Pain Center, and Primary Stroke Center, based in Raleigh, North Carolina. The ED has 60 beds divided into four bays with an average daily census of 200 patients. Pharmacy services are available 24 hours a day, with a pharmacist physically located in the ED between the hours of 7:00 a.m. and 11:00 p.m.

This project was designed to reveal a mechanism by which interventions at a Level 1 Trauma ED of a community hospital could be recorded and analyzed to determine the types and rates of occurrence.

**Service Description**

An electronic intervention database was developed to categorize and quantify the interventions provided by the ED pharmacist. Intervention categories and actions were developed based on previous studies and clinical experience. The intervention entry form included collection of the following data: date of the intervention, time of the intervention, location of the patient within the ED affected by the intervention, a broad category of the type of intervention (e.g., code response/attendance), the specific type of intervention/action classified within the broad category (e.g., code stroke response, code blue response, etc.), and any additional comments. Interventions were voluntarily submitted by the pharmacists staffing in the ED either at the time of intervention or at the end of the shift.

The electronic intervention form was designed to capture only the most pertinent information, with the intent that it should only take 2–3 minutes to submit. Drop-down menus were used for each data collection point to reduce the number of clicks and facilitate quick submission. In addition, a free text comment field was included in which the pharmacist could record additional details about the intervention.

Clinical staff pharmacists in the ED were provided a quick tutorial on how to use the electronic data collection form prior to the project go-live. The data collected included the type and number of broad categories of interventions performed as well as the type and number of the specific interventions/actions performed between the dates of January 21 and June 7, 2013.

**Key Elements for Position Success**

1. Buy-in from clinical pharmacy staff dedicated to the ED and their willingness to document interventions,

2. A quick and simple electronic intervention submission form,

3. IT resources for electronic intervention form development and database set-up for generating reports, and

4. Development of a process to regularly collect, analyze, and utilize the data to provide consistency and further optimization of pharmacy services in the ED.

**Resource Utilization**

**Personnel:** If needed, recommend including pharmacist resources within the pharmacy department dedicated to ED coverage. These pharmacists should ideally be physically available and accessible in the ED. The actual number needed should be based on the
number and types of patient seen in the ED, services provided by the ED, and consideration of “peak times” to help evaluate the hours of coverage needed.

**IT and Other Infrastructure:** Development or utilization of an ED-specific intervention database that is quickly accessible and requires minimal time to enter information.

**Return on Investment**
Although no clinical or financial outcomes were tracked from this database, this project was the first step in quantitatively and qualitatively evaluating the daily activities of a clinical staff pharmacist functioning in an ED. Correlating these interventions to a dollar amount may still be possible by determining the most accurate cost savings for each intervention and then modifying the build of the database to include that information. Furthermore, the collection, organization, and analysis of the data may also be helpful to the department and hospital administration in describing the activities of the ED pharmacist and might display the need for extended coverage in the ED, if needed.

**Recognized Intangible Benefits**
1. Pharmacists are recognized for their ability to provide safe, evidence-based, cost-effective use of medications in a fast-paced, high-stress, emergency care environment.
2. Pharmacists are recognized as vital members of various ED code response teams.
3. Pharmacists are provided opportunities for clinical and professional development as they become more integrated into the emergency medicine health care team.
4. Recognition that intervention data in a searchable electronic database is a tremendous resource and can identify frequently repeating or rare drug information questions that may spur the development of continuing education programs or ED staff education.

**Outcome Measures**
1. A total of 868 interventions were recorded during the study period, with code response/attendance (n=369) as the most common broad category intervention. Drug information (n=129) and protocol/consult management (n=113) were the next most common types of interventions.
2. The types of interventions with the least number of occurrences were adverse drug event management (n=10), ambulatory ED patient interventions (n=13), and initiation of needed therapy (n=17).

**Lessons Learned**
1. When given the opportunity, clinical staff pharmacists practicing in the ED are highly motivated to contribute to a pharmacist intervention tracking database.
2. Intervention tracking is an effective method for identifying areas where pharmacy services can be implemented or expanded.
3. Consideration should be given to linking these interventions to the patient. This may help in further utilizing this data and correlating certain types of interventions with a specific patient demographic in the ED, resulting in early identification of high-risk patients and quicker initiation of interventions.

**Suggestions for Other Hospitals/Health Systems**
Tracking and categorizing interventions is an effective way to gain an overall perspective on the daily activities of front-line ED pharmacists. Depending on the size and level of care provided in the ED, it may take a minimum of 6 months to generate enough data to identify meaningful trends. It is also important that
all ED pharmacists document their interventions in a standardized and in a timely fashion. Monthly reviews can quickly identify variations in documentation, which can then be communicated to the team to achieve consistency in and help identify teaching opportunities for the individual and/or group, when needed.

**Helpful References**


