

# "Pharmacist Needed in the ER, Stat"

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## INTRODUCTION

The provision of health care often begins in the emergency department. A patient's drug therapy is frequently started in the emergency department, and where there is a need for a drug, there is a need for a pharmacist. Over the past decade, the practice of pharmacy has evolved toward the notion of pharmaceutical care: the concept of complete patient pharmacotherapy monitoring.<sup>1</sup> Pharmacists must concurrently integrate clinical activities with their primary and traditional role of distributing medications. The purposes of this article are to describe the implementation of full pharmacy service in the emergency department and to assess the impact of this service upon patient care.

The Sir Mortimer B. Davis-Jewish General Hospital (JGH) is a 637-bed acute care teaching hospital in Montreal. The pharmacy department is especially proud of its decentralized pharmaceutical services. Drug distribution is accomplished through 6 satellite pharmacies by means of a unit-dose. Clinical activities include pharmacokinetic dosing, detection and reporting of adverse drug reactions (ADRs), and monitoring of pharmacotherapy. Each year approximately 51 830 visits are made to the emergency department, 8800 of which result in hospital admissions. Studies abroad indicate that 2.9% to 15.4% of emergency department visits and hospital admissions are due to drug-induced illnesses, including ADRs, substance abuse, noncompliance, drug interactions, and toxicity.<sup>2-10</sup>

Before the JGH introduced a pharmacist position to the emergency department team, much of nurses' and orderlies' time was occupied with pharmacy responsibilities, such as locating and distributing pharmaceutical products. Medications were obtained either from floor stock, which was extensive but poorly organized, or through distribution of nonstock medications on an

individual prescription basis providing a 72-h supply of drugs. Patients often stayed in the emergency department for up to 24 h with no transfer of medications to nursing wards; thus, drugs were wasted or lost. As a result of the wastage and improper control, errors were committed, time was used inefficiently, and medication costs were elevated. The Department of Pharmacy recognized that an emergency department pharmacist could address these issues; this had been done twice as a residency project, and the results had been excellent. During the projects, a pharmacy resident had been available on site to answer questions, dispense medications, collect data on drug usage and wastage, and make clinical interventions. Emergency department staff had responded positively, clinical interventions had increased significantly, and savings of drug costs had been achieved. Although an emergency department pharmacist was clearly justified, the position had not materialized because of a lack of funds. However, when the hospital was faced with the challenge of dealing with an overcrowded emergency department, a task force was created to maximize efficiency. The Department of Pharmacy presented the case for an emergency department pharmacist, and the recommendation was accepted. Therefore, our challenge was to achieve, over the long term, the theoretical benefits that had been suggested by the results of the residency projects.

## DESCRIPTION OF THE PRACTICE

To assess the pharmacy service needs of our particular emergency department, 4 steps were undertaken. The first was a site inspection. We spoke informally with nurses, physicians, and patients to gain an understanding of the department. The second step involved visiting other hospital sites. Third, we did a literature search

using the terms “emergency department” and “pharmaceutical services”. We searched MEDLINE and the Ovid Core Biomedical Collection for the period January 1985 to November 1998 and the subject index of *CJHP* for the period 1990 to 1998. However, none of the articles we found were helpful in light of our particular setting.

Finally, an emergency department pharmacy task force was developed. It consisted of 2 delegated emergency department physicians, 2 assistant head nurses, and 2 pharmacists. The task force provided guidance only, and after its first meeting, the task force was directed by the Department of Pharmacy. That relationship was instrumental to the pharmacy department's success in the emergency department, since it gave us the mandate to make decisions. Once a decision was made, it was communicated to the medical, nursing, and pharmacy staff by newsletters and intradepartmental meetings. The Department of Pharmacy worked closely with the task force on key issues such as design of the distribution system and procedures for implementing pharmaceutical care. Throughout the entire process we adapted quickly to the changing needs of the emergency department, because we realized that much was expected of us. Unfortunately, our resources were limited to one full-time pharmacist position (Monday to Friday from 8:00 AM to 4:00 PM) and one part-time technician position, which eventually became full-time. The technician's tasks included distribution of ward stock and dispensing of prescriptions, preparation of prefilled syringes for injectable drugs, and computer data entry.

After evaluating the needs of the emergency department, we were ready to proceed. We set 3 fundamental goals: (i) to improve the distribution system as a first priority; (ii) to implement pharmaceutical care, and (iii) to attain status as a university-accredited teaching site for pharmacy students and residents.

Improvements to the existing distribution system were made by:

- reassessing the choice and quantity of stock medications on the basis of urgency, usage, and cost;
- limiting the storage of stock medications to 3 areas only;
- creating a separate, locked medication stock room adjacent to the satellite pharmacy (accessible only to the emergency department nurse in charge, in case of a shortage of stock medications);
- supplying all medications in a unit-dose format, recycling unused medications, and preparing prefilled syringes for certain stable parenteral products;
- ordering and distributing narcotics and controlled substances; and

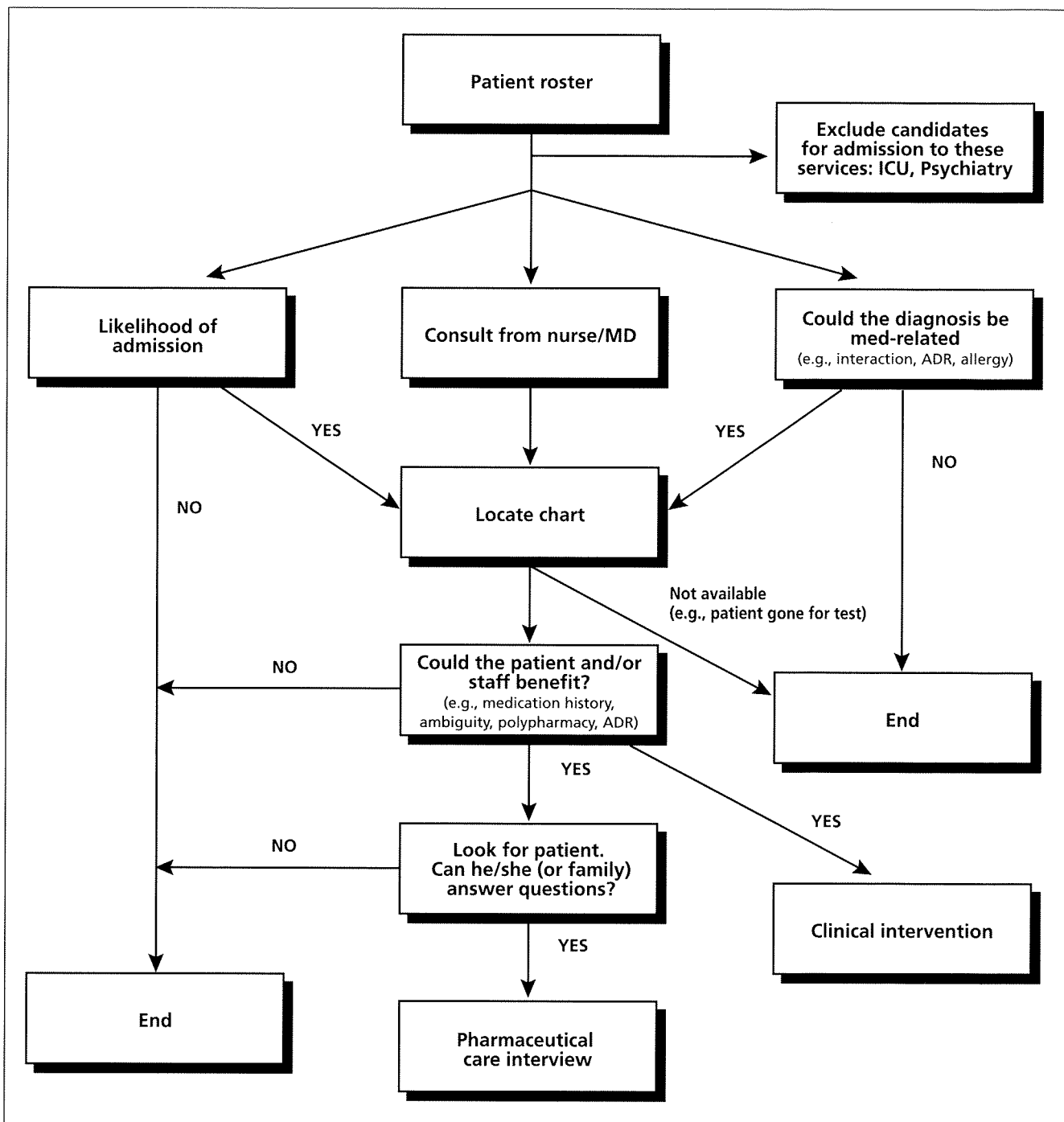
- supplying nonstock medications and relevant printed information in a plastic bag format that could be easily transferred with the patient on admission to a ward.

We found that these changes enhanced the efficiency of the drug distribution system and reduced nursing and orderly time spent on pharmacy-related technical tasks.

Our next goal related to the implementation and documentation of pharmaceutical care. We documented all relevant interventions in patients' charts using the SOAP (subjective, objective, analysis, plan) format when appropriate, in addition to informing the physicians verbally, whenever possible. Working quickly was critical to ensuring that as many patients as possible were benefiting from our interventions. We focussed on patient counselling, pharmacokinetic assessment of dosages (for example, aminoglycosides), identification of medications, medication history interviews, and identification of suspected ADRs and drug interactions. Given the quick turnover of patients in the emergency department (typical stay is about 6 h), we had to develop a method of targeting the appropriate patients. We developed an algorithm for patient selection that was based on information in the emergency department roster, including age, sex, diagnosis, and admission status (Figure 1). We also hoped that the emergency department staff would identify patients for us. To that end, we created a “pharmacist intervention request” form for completion by a nurse or physician. However, the form was never used. Staff members preferred to refer patients to us verbally, so it was important for the pharmacist to be present in a central location. The perception was that if the emergency department staff had to complete a request form for pharmacy services, it was a consultation process. However, the intention was not for us to be consultants, but rather to be an integral part of the emergency department team. Upon interviewing patients, we completed an emergency department-specific pharmaceutical care form (see Appendix 1). For a patient transferred to a ward, the emergency department pharmacist communicated relevant patient information to the ward pharmacist using the pharmacy department's computer system.

A total of 202 actual or potential drug-related problems (DRPs) led to interventions for patients seen in the emergency department between July 1997 and November 1998 (see Figure 2 for classification of DRPs according to Strand and colleagues<sup>11</sup>). ADRs accounted for 65 (32%) of all DRPs. Of these, 23 (35%) were classified as mild, 29 (45%) as moderate, and 13 (20%) as severe, according to the clinical judgement of the



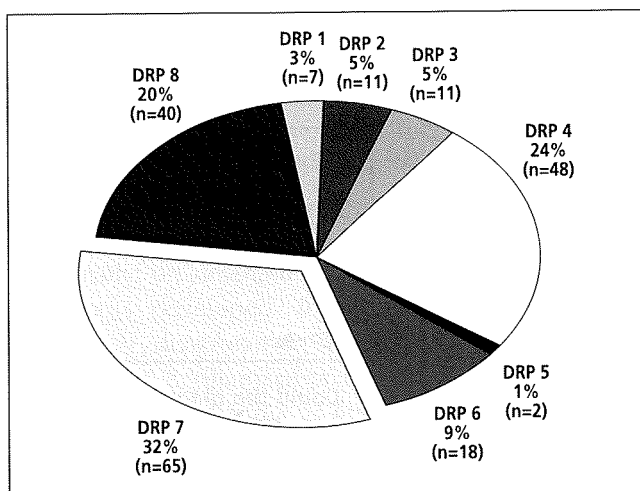


**Figure 1.** Algorithm for selecting patients for pharmaceutical care in the emergency department. ICU = intensive care unit, ADR = adverse drug reaction, MD = physician.

pharmacists directly involved in the management of patients experiencing ADRs. All suspected serious ADRs and those involving recently marketed drugs (commercially available for less than 5 years) were reported to the Quebec Regional ADR Centre. The second most frequent type of DRP involved patients receiving high doses of medications. On the basis of pharmacokinetic calculations, dosage adjustments were recommended.

Thirty-three (68%) of these recommendations involved antimicrobial agents. The third most frequent type of DRP involved drug interactions, particularly with warfarin.

A total of 1787 clinical activities were recorded over the 17-month period (Figure 3). Nearly half of all clinical activities (744 or 42%) were responses to requests for information on the availability and identification of drugs, side effects and toxicology, interactions,



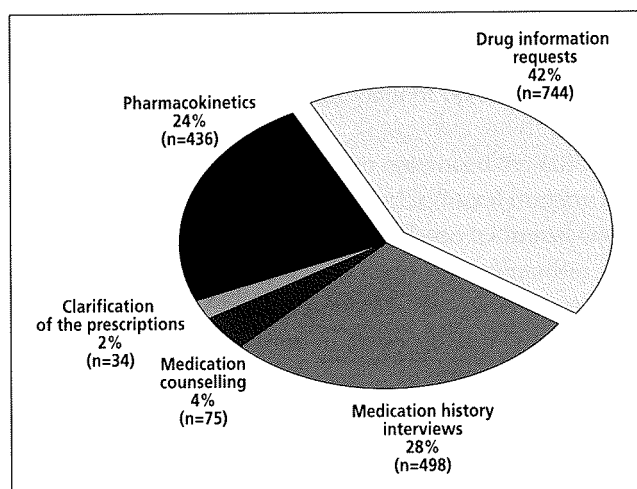
**Figure 2.** Classification of 202 drug-related problems (DRPs)<sup>1</sup> identified by the emergency department pharmacist over the 17-month period July 1997 to November 1998. DRP 1 = drug use without indication, DRP 2 = untreated indication, DRP 3 = improper drug selection, DRP 4 = dose too high, DRP 5 = dose too low, DRP 6 = not receiving or taking drug, DRP 7 = adverse drug reactions, DRP 8 = drug interactions.

compatibilities, and infusion methods. Patient medication interviews represented 498 (28%) of all clinical activities. These interviews helped in the identification of DRPs and also provided information that would be useful to ward pharmacists after the patients were transferred. Pharmacokinetic calculations represented 436 (24%) of all clinical activities; they were performed to verify doses of medications in cases of renal failure.

With regard to our third goal, to attain accreditation from the Faculty of Pharmacy at the University of Montreal, it was necessary to establish a record of direct involvement with the patient's pharmacotherapy, that is, provision of pharmaceutical care. Our application to the university was followed by an on-site inspection and interviews with the emergency department pharmacists and an emergency department physician. In September 1998, the emergency department pharmacy was recognized as a university-accredited teaching site for pharmacy students and residents.

## DISCUSSION

Our improvements to the drug distribution system in the emergency department cannot be underestimated. A smoothly functioning distribution system allows the pharmacist in the patient care area to focus on clinical work.<sup>12,13</sup>



**Figure 3.** Clinical activities of pharmacists in the emergency department over the 17-month period July 1997 to November 1998.

We were not surprised to learn that the 3 most frequent DRPs detected by the emergency department pharmacist were ADRs, excessive doses of medications, and drug interactions. The JGH is located in an area of Montreal that has a significant elderly population. This group is at high risk of DRPs<sup>14</sup> since polypharmacy and multiple medical problems are common.<sup>14,15</sup>

Having a pharmacist on site in the emergency department led to more questions concerning drugs. One of our observations was that, unless the pharmacist was physically accessible, he or she would not be used to his or her full potential. Another advantage of having a pharmacist on site is that comprehensive medication history interviews can be conducted at the appropriate time. We found that a greater number of patients interviewed translated into a higher frequency of interventions, particularly dose adjustments. We anticipate that extended pharmacy hours would also lead to a significant increase in clinical interventions.

Although most of our goals have been attained in the limited time since we began the emergency department service, we would have liked to have measured patient outcomes from our interventions. However, given the nature of the emergency department, this was very difficult. Perhaps this could be done as a future project. To date, the emergency department medication budget has been reduced by approximately \$12 000 per year. Our next priority is to further reduce drug expenditures by increasing the preparation of prefilled syringes and establishing prescribing guidelines for expensive drugs such as thrombolytic and antimicrobial agents. To enhance resuscitation procedures, we are

going to develop intubation kits, conscious sedation kits, and an antidote section, as well as implement the use of thrombolysis kits. To improve drug administration, we plan to create a medication guide for nurses with pertinent information in a format that can be updated easily and used rapidly and reliably. Our hope is that pharmacists may, through greater acceptance and confidence, play a more active role in the emergency department setting.

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## Appendix 1. Pharmaceutical Care Form

Hôpital Général Juif - Sir Mortimer B. Davis  
 Sir Mortimer B. Davis - Jewish General Hospital

**PHARMACY DEPARTMENT**  
**ER PHARMACY**

### Patient Medication History

#### SUBJECTIVE

Presentation (major complaints)

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#### OBJECTIVE

##### Patient Demographics

Height: \_\_\_\_\_ ABW: \_\_\_\_\_ IBW (if applicable): \_\_\_\_\_  
 Pregnancy / Breastfeeding: \_\_\_\_\_  
 Additional information: Cr (if available): \_\_\_\_\_ µmol/L Clcr: \_\_\_\_\_ mL/min  
 Drug levels (if applicable or pending): \_\_\_\_\_

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**Appendix 1. Pharmaceutical Care Form ... continued**

**Allergies and Intolerances**

No allergies

Allergen	Reaction	Real allergy?

**Non-prescription Drug Therapy Prior To Admission**

- Analgesics: \_\_\_\_\_
- Allergies: \_\_\_\_\_
- Cold and flu: \_\_\_\_\_
- Vitamins and minerals: \_\_\_\_\_
- Eyes/ears/nose: \_\_\_\_\_
- Skin: \_\_\_\_\_

- Antacids: \_\_\_\_\_
- Laxatives/Antidiarrheals: \_\_\_\_\_
- Natural products: \_\_\_\_\_
- Homeopathy: \_\_\_\_\_
- Other: \_\_\_\_\_

**Prescription Drug Therapy**

<i>List of current medications with approximate date of start of therapy</i>	<i>F/U on past medications if appropriate (e.g., recent change of dose, of Rx, suspected interaction)</i>

Pharmacy contact (name and tel.# if possible): \_\_\_\_\_

**ANALYSIS AND PLAN**

**Drug-Related Problems/Issues**

1. Patient's understanding of medications and compliance (e.g., conditions affecting compliance such as impaired vision, arthritis, language)
2. Verification of medication on hospital formulary, POM, or appropriate substitution.
3. Recommendations to drug-related problems/issues (e.g., suspected clinically significant interaction, ADR, response to MD's questions)

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Completed by \_\_\_\_\_

Time to complete \_\_\_\_\_

