Unit-Specific Pharmacists: A Proactive Approach to the Continuum of Care

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ABSTRACT The need to respond to required mandates and to improve patient care has prompted hospital pharmacies to redefine their role as a part of a multidisciplinary health care team. This article discusses one hospital’s proactive approach to satisfying these mandates while simultaneously enhancing outcomes using the resources of a community hospital’s pharmacy. Using a unit-specific pharmacist (USP) allows smaller hospitals to focus on patient care with greater flexibility and minimal increases in staffing.

INTRODUCTION

The Institute of Medicine (IOM) and the Institute for Safe Medication Practices (ISMP) have highlighted serious hospital and medication errors, many of which have culminated in fatalities. Health care institutions, along with the Clinton administration, joined in a nationwide push to implement programs to prevent medication errors. On the governmental level, task forces were developed and hospitals responded by integrating efforts and mobilizing many departments (e.g., pharmacy, nursing, administration, information systems) to a degree not seen before. Multilevel expectations increased exponentially, and computer prescriber order entry (CPOE), for the most part, was only a futuristic idea.

The John T. Mather Memorial Hospital, with 248 beds, is unique; it is not affiliated with any university hospital or with any other multihospital system. Our staff strives for excellence and provides modern, state-of-the-art health care services to patients in the community. We responded to the challenge to prevent medication errors by developing a unit-specific pharmacist (USP) program.

To bring this program to fruition, we realized that careful scrutiny of the limited, available resources was essential. Our pilot program showed us that one full-time pharmacist could effectively handle one floor of the hospital. This floor included an intensive-care step-down unit, a coronary-care unit, a telemetry area, and a medical–surgical patient-care area. We assumed that we could accurately keep the expenses in check and that we could realize a return on our investment through a proactive approach to pharmacy practice.

The hospital, like many others, was plagued with the problem of illegible handwriting—a factor often exacerbated by the hospital-wide faxing system. Many of the common problems outlined in pharmaceutical publications (e.g., medication abbreviations, look-alike and sound-alike drugs, trailing and leading zeros, and lag time from the actual order to the administration of the medication as a result of unclear medication orders) also needed to be addressed. Our management information systems department had completed the first few phases of a wireless charting system for the nursing staff, physical therapists, social workers, respiratory technicians, and dietitians, thus eliminating the handwriting problem in this step of the process.

The patient-care units were equipped with laptop and wall-mounted personal computers to handle the increased number of health care professionals who needed access to the new charting system. With the physical structure and tools for the unit-specific pharmacist system in place, we then had the opportunity to introduce a clinical program in which the pharmacist was removed from the physical confines of the pharmacy department in order to become more visible and accessible to patients (Figure 1).

Because the hospital lacked many of the scientific resources that were needed for original research and evaluation, we did not have the guidance of research-design experts to facilitate these goals. Despite these obstacles, however, we were not hindered in our commitment to maximize effective and safe patient care and to minimize medication “occurrences” (defined as administration and dispensing errors, along with prescribing and handwriting problems). In fact, our smaller size has allowed us to communicate effectively within our multidisciplinary health care team and to react to our findings and observations quickly and efficiently.

After evaluating our resources and the tools at hand, we developed a campaign to prevent medication occurrences. The program, which emerged in early 2001, has since expanded to include clinical patient programs that were not initially intended. It is still expanding dynamically, driven by needs arising from all of the various hospital disciplines.

ROLE OF THE UNIT-SPECIFIC PHARMACIST

When the program began, our hospital established the reduction of medication occurrences as its principal performance improvement initiative; it remains the chief criterion today. Although the literature has pointed to CPOE systems as a veritable panacea, it may be many years before CPOE can be a reality for all community hospitals. The unit-specific pharmacist fills that void and is targeted at most of our institution’s populations, from psychiatric to medical–surgical to oncology patients.

The program was organized to have an impact on the following areas covered in the Comprehensive Accreditation Manual for Hospitals: the care of patients, the continuum of care, the improvement of organizational performance, and the management of information, medical staff, and nursing. Along the
same lines, our program adopted the following measures of performance from the handbook: efficacy, appropriateness, effectiveness, safety, efficiency, timeliness, and availability.

The idea seemed promising at its inception. The foundation of the unit-specific pharmacist approach would consist of order entry by the clinical pharmacist directly from the patient’s chart soon after the prescriber completed the order. This strategy would bypass the established faxing system that had carried its own set of problems (e.g., errant lines, dots, and marks misconstrued as decimal points or actual parts of the written medication orders). The pharmacist would be able to address all incongruities and ambiguities arising from the orders sooner, instead of hours after they were originally written and faxed to the pharmacy for processing and dispensing. Currently, as the pharmacist inputs the medication orders from the laptop computers on the patient-care units, the pharmacists and appropriate support personnel can instantly generate the labels in the pharmacy for rapid filling and checking.

After this initial step was addressed, we focused on a clinical package to include consistency of procedures, such as switching from intravenous-to-oral routes of administration of a pre-approved group of medications and careful reduction of the dosage of a particular medication group after a thorough evaluation of the patient’s renal function. This innovation, in turn, clearly helped us to update our indicators for medication occurrences.

The unit-specific pharmacist program aided us in realizing an evolution of “intervention indicators,” that is, the point at which we could intervene (Figure 2). Our pharmacist-intervention categories, revised by this program, easily increased in number and were tracked and reported to reflect a more accurate picture of the value of the pharmacist’s role.

During the course of the program, we noticed that the reporting of adverse drug reactions (ADRs) increased and the documentation of errors became more precise and better defined. Many of these reports would have “fallen through the cracks” of our previous reporting system; with the new program in place, the valuable and unequaled expertise of the pharmacist could play a more important role in the detection of medication errors. As a result, all other associated medical professionals, armed with downloaded personal digital assistants (PDAs), were able to field pharmacists’ questions and obtain responses from them quickly and efficiently.

THE IMPLEMENTATION PROCESS

Readers of the best-selling book Who Moved My Cheese? know the difficulty of attaining any change in an ingrained and learned procedure. Our plan was a sound one, and initially only two pharmacists were interested in “swimming in this fishbowl,” that is, out of the normal pharmacy department environment.

As we presented our proposal to our administrative staff, interest in our ideas spread throughout the system. Our administration, carefully concentrating on the theme of preventing medication errors, was easily convinced of the validity of the program and agreed to hire a full-time pharmacist for the day shift if the smaller-scale pilot program turned out to be successful. By comprehensively reorganizing and restructuring the daily tasks of the pharmacy staff, we were able to dispatch one of our pharmacists to a medical–surgical floor (including the cardiac care unit). After a few months, our administrators agreed to hire the additional full-time pharmacist and we extended our program to another floor that housed the oncology, medical–surgical, psychiatric, and intensive-care units. The improved rapport that soon developed with the staff of each nursing unit was later found to be the pivotal step in the success in our program.

As expected, the nursing administration and nursing education staffs were extremely supportive of our efforts. Their enthusiasm
was evident, and they, too, shared in the hospital-wide mission to prevent medication errors. The medical staff and members of the P&T committee and the hospital’s medical board listened to our plans and accepted our goals as presented.

The reporting of accumulated adverse drug reactions (Figure 3) is ongoing. All reports are funneled to the clinical pharmacist for research and follow-up. We have re-educated our professional staff on the importance of documenting adverse drug reactions. We promoted error-reporting as an educational tool, which was an integral part of the continuum of patient care and safety. The pharmacist has thus become the first line of defense in the process of defining and documenting adverse drug reactions and other intervention data.

The data accumulation for the intravenous-to-oral conversions occurs several times per week as the unit-specific pharmacist makes rounds with pharmacy computer-generated drug profiles. This allows the pharmacist to categorize the five medications approved by the P&T committee for automatic intravenous-to-oral conversion (Table 1) and to identify the patients who are receiving them. The pharmacist can then refer to the patient’s chart to see whether the patient profiles satisfy the pre-approved criteria, and the change can then be noted on the chart.

Decreasing the dosage of some medications that affect the renal system, such as nizatidine and the quinolones, is accomplished in a similar way. The pharmacy computer generates profiles of drug usage to quickly highlight the changes needed. The pharmacist then makes the necessary entry into the patient’s chart if the patient qualifies for a change in drug dosing.

REPORTING OF OUTCOMES

In a hospital environment, performance measurement and its proper organization and communication are crucial to any new performance improvement initiative. Our pharmacist intervention indicators were changed to reflect those areas that our clinical pharmacists considered to be problematic; interestingly enough, these areas had not been noticed before but they arose from observations and early experiences on the patient-care units. Pharmacy intervention indicators are opportunities for pharmacists to intervene, in a timely fashion, in prescribed ordering and patient care. These indicators include allergies, order legibility, drug interactions, dose adjustments, drug information, dosages, frequency and usage of medication, missing medications, nonformulary drug requests, and switches from intravenous to oral medications.

We first identified useful methodologies for conducting outcomes assessments by reviewing the literature...
and by interviewing project leaders at other hospitals to learn how to apply their successes to our institution. Through this communication with end-users of information, we were able to determine the degree of effectiveness at our own institution.

We addressed the challenge of improving our patient care and pharmacy services primarily from the federal Agency for Healthcare Research and Quality (AHRQ) model. This agency had developed a process of evaluating pharmaceutical outcomes to assess the outcomes projects that it was funding. We found this methodical tool simple enough to execute and develop within the limitations of our resources, and we used it successfully to evaluate our progress. Each “challenge” was presented with a “plan of approach,” a “data source,” and an evaluation of the “outcomes and impact of intervention.” Our goal was to seek new knowledge about clinical outcomes to influence our pharmacy practice guidelines and drug therapy policies. We believed that measuring the cost-effectiveness of pharmaceutical interventions and evaluating changes in patient therapies was the best way to ensure the success of our program. Over time, we created our own model of expertise through the routine exercise of communicating within our multidisciplinary health care team, which then allowed everyone involved to comprehend what we were trying to accomplish and how we were going to achieve it.

All of our energies focused on clinical pharmacy interventions for ambiguous orders, incorrect dosing, drug interactions, intravenous-to-oral conversions, and adjustments to renal dosing. Through this practice, we continuously built upon our efforts by identifying important factors relating to pharmacy and patient care. Unexpected findings during the course of the program helped us to expand our goals. Using the AHRQ model’s performance measurement table, we evaluated our success by presenting challenges in the form of what we hoped to accomplish. We then established an approach and simply explained how we would accomplish it.

After we executed our planned approach and gathered our data, we evaluated the impact of our intervention to assess our accomplishments. After evaluating the challenge, we reflected on the entire process to determine whether we could apply the findings to other areas. Table 2 presents our actual performance measurement.

Our collected data included the number of missing medications, dosing adjustments, intravenous-to-oral drug conversions, and adverse drug reactions. The information was documented and obtained primarily via direct observation by clinical pharmacists on a daily basis.

Our program’s success has prompted the hospital’s administrators to expand the clinical pharmacy program from three nursing units to all patient-care areas with patient stays longer than 24 hours, with a proposal to extend this period to seven days a week. We obtain patient laboratory data directly from our laboratory department through electronic resources in the institution or from the patient’s chart. We record the data pertaining to all of our interventions on Microsoft Excel® spreadsheets once a month to present to the P&T committee, and we confirm the accuracy and completeness of our data when the clinical pharmacists consult with colleagues on the multidisciplinary team. Despite the small size of our hospital, we have developed the ability to communicate effectively with the entire multidisciplinary team on a daily basis.

After the program became part of the daily pharmacist roster assignment and the pharmacists became familiar with the routine, we reported our first experiences to other committees that were also concerned with preventing medication errors. Although the data were uniform and consistent, the emphasis varied, depending on the focus of the committee. We notified administrators to expand the clinical pharmacy program from three clinical pharmacists on a daily basis.

Table 2 presents our actual performance measurement.
### Table 2 Performance Measurement of the Unit-Specific Pharmacist Program

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Plan of Approach</th>
<th>Data Source</th>
<th>Outcome and Impact of Intervention</th>
<th>Other Findings</th>
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<tbody>
<tr>
<td>Optimize drug-distribution methods.</td>
<td>Make efficient use of staff for drug distribution.</td>
<td>Observation by clinical pharmacy and nursing staff.</td>
<td>Creation of a schedule for optimal delivery of medications to facilitate nursing administration of drugs.</td>
<td>Pharmacy products to be returned to pharmacy more quickly to reduce overstocking of patient medications in refrigerators.</td>
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<td>Decrease turn-around time of new medication orders.</td>
<td>Institute clinical pharmacy program.</td>
<td>Nursing staff input, journal references, professional organizations.</td>
<td>Pharmacist on nursing units; direct-order entry of pharmacy orders by clinical pharmacist.</td>
<td>Positive reactions by nursing and administration; decreased number of medication errors; improved order entry and drug delivery.</td>
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<td>Increase clinical pharmacy staff to include more nursing units.</td>
<td>Utilize the positive impact of nursing to convince administration of cost savings and patient care.</td>
<td>Nursing administration, pharmacy interventions, medical staff.</td>
<td>Expansion of clinical pharmacy services to all units with patient stays over 24 hours, Monday through Friday.</td>
<td>Nursing’s request to expand service to include weekends; administration has asked pharmacy to submit proposal.</td>
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<tr>
<td>Use CrCl laboratory data for proper dosing of histamine H₂ inhibitors.</td>
<td>Use clinical pharmacists to evaluate dosing of nizatidine (Axid®).</td>
<td>Laboratory data, drug dosing data.</td>
<td>Dosing of histamine H₂ inhibitors to be monitored; P&amp;T committee suggests dose adjustments by pharmacist when needed.</td>
<td>Therapeutic substitution of Axid® for all histamine H₂ inhibitors; evaluation of other drugs according to CrCl laboratory data.</td>
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<tr>
<td>Consider therapeutic substitution policy.</td>
<td>Include nizatidine (Axid®), ciprofloxacin (Cipro®), gatifloxacin (Tequin®), simvastatin (Zocor®), and pantoprazole sodium (Protonix®).</td>
<td>Dosing data, cost information, policy information.</td>
<td>Therapeutic substitution change policy; reduction of pharmacy costs.</td>
<td>Renal dosing of some medications to be addressed; individualized dosing should improve patient care.</td>
</tr>
<tr>
<td>Suggest to medical staff when drug dosage changes are necessary because of impaired renal function.</td>
<td>Evaluate patients who are taking medications that are affected by renal impairment.</td>
<td>Dosing data, patient laboratory data.</td>
<td>Automatic dose changes approved for Axid®, Tequin®, and Cipro®. Dosing adjustments to be suggested when renal laboratory data warrant.</td>
<td>Doctors are slow to change from IV to PO therapy; patients would benefit if clinical pharmacists suggested oral dose therapy when possible.</td>
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<tr>
<td>Initiate an IV-to-PO conversion policy.</td>
<td>Suggest conversion from IV to PO route when possible.</td>
<td>Dietary, nursing, and drug data.</td>
<td>Ensure automatic conversion from the IV to the PO route for Diflucan®, Cipro®, Tequin®, Pepcid®, and Protonix®. Reduction of pharmacy costs.</td>
<td>Policy to be expanded to include other drugs.</td>
</tr>
<tr>
<td>Provide drug information to nursing and medical staff.</td>
<td>Obtain PDAs with drug information software.</td>
<td>Literature, colleagues, journal ads.</td>
<td>Increased demand for drug information; requests from other professions as well.</td>
<td>Recording and documentation of pharmacy intervention data to justify increase in staff and to satisfy regulatory recommendations.</td>
</tr>
<tr>
<td>Expand clinical pharmacy intervention reporting.</td>
<td>Document all pharmacy interventions; tabulate.</td>
<td>Clinical pharmacists.</td>
<td>Increased number of ADR reports.</td>
<td>Satisfaction of medical and nursing staff noted; increased number of clinical interventions and requests for information.</td>
</tr>
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<td>Expand clinical pharmacy to nutrition team.</td>
<td>Have clinical pharmacist enter laboratory orders needed by nutrition-support team.</td>
<td>Dietary department, laboratory, nutrition-support team.</td>
<td>Improved utilization of pharmacy staff and laboratory data.</td>
<td>Information technology available within the hospital to assist with drug monitoring; need for expansion of psychiatric units to monitor drug therapy when a prolonged QT interval is a common ADR.</td>
</tr>
<tr>
<td>Monitor all drugs that prolong QT interval to identify possible torsades de pointes in cardiac patients.</td>
<td>Train clinical pharmacists to read ECGs and to apply knowledge to improve patient care.</td>
<td>Journal articles, cardiac nursing education, drug information sources for QT syndrome.</td>
<td>P&amp;T committee and administration convinced of need for monitoring of drugs that prolong QT interval.</td>
<td></td>
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ADR = adverse drug reaction; CrCl = creatinine clearance; ECG = electrocardiogram; IV = intravenous; PDA = personal digital assistant; PO = oral.
by virtue of their positive interpretation. Our presence on the patient-care units has added a degree of security that may not be easy to quantify, although it has been felt and greatly appreciated. Our attitudes, as well as our responsibilities and accountability, have changed. As time passes and growth continues, methods of data collection may be altered to absorb new clinical plans.

We are now researching the development of a patient-safety program devoted to cardiac anomalies to screen patients who are taking drugs that interact with the specific cardiac indicators. As we peruse the available literature, we expect to uncover new areas that need to be addressed, thereby expanding our services to patients and to specialties within allied health care.

The unit-specific pharmacist program, originally designed to prevent medication errors prospectively, has had a beneficial effect on the hospital’s other departments and services. The program has defined and improved our role with respect to the nutrition-support team and to the pharmacists who accompany the clinical dietitians on daily rounds as they diligently evaluate each patient and custom-tailor their respective nutrition formulas. The clinical dietitians and the pharmacists have worked together to create an interdisciplinary “performance improvement key process” for the past year, which has been very educational.

We have discovered that many of our allied health staff members are flourishing because of the improved communication from the pharmacy. In response to this benefit and as an extension of the program, we have created “Newsletter Live,” an educational, quarterly seminar presented by the director of pharmacy. Since its inception, the seminar, which is open to all hospital staff members, has become a well-attended and a highly anticipated event. Sessions feature current medication information, pharmacy policy updates, and relevant facts, extracted from our pharmaceutical journal readings that we have compiled into an easy-to-follow outline. This program has greatly improved communication channels within the multidisciplinary team and has allowed a forum for the exchange of ideas between professionals.

It was also a challenge for us to convince the pharmacy staff of the benefits of the new program. Some pharmacists who had originally been skeptical about the sudden role change needed reassurance that their expertise would be necessary on both sides of the program. With time, some staff members became interested in participating in the program as they grew comfortable in becoming more visible within the hospital. We needed to ensure that the functions of the pharmacists who remained in the pharmacy complemented, but did not impede, the development of the new system. We considered it essential that each person be incorporated into the new plan and not be ignored or forced into a role that would foster resentment or insecurity.

**SUMMARY**

Our goal with the unit-specific pharmacist program was to address the need to prevent medication errors and to use the pharmacist’s knowledge and expertise, virtually at the patient’s bedside. The benefits of the program were far greater than we anticipated. A major benefit was an increased awareness that flexibility can be incorporated into any hospital structure by using resources that are already in place within the multidisciplinary team.

**SUGGESTED READINGS**


Massaro FJ. Improving a medication error monitoring program at an acute-care hospital. *Hosp Pharm* 2002;37(3):259–266.


