



**Canadian Society of Hospital Pharmacists
La Société canadienne des pharmaciens d'hôpitaux**

“Impact of Hospital Pharmacists on Patient Safety”

Background Paper

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- CSHP Vision 2006 -

*A revitalized Society
The influential voice for hospital pharmacy
Inspiring and supporting our members*

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Executive Summary

The Canadian Institute on Health Information (CIHI) and the Canadian Institutes of Health Research (CIHR) have collaborated to study the prevalence of adverse events within Canada's health care facilities. Similar studies done in other countries have suggested that adverse events occur in 5 – 10% of hospital admissions, many of which are preventable. There is no reason to expect that the findings in the current Canadian study will be significantly different.

There is great propensity for adverse event and failure within our health care systems, as increasingly ill patients are being cared for through complex processes in an environment stressed by limited resources. Health care professionals are obligated to continually improve systems and processes to ensure that where possible, adverse events are prevented.

An adverse event is defined as “an unintended injury or complication which results in disability, death or prolonged hospital stay and is caused by health care management”. Medication errors or incidents represent a significant category of preventable adverse events.

Within healthcare facilities, pharmacists play a pivotal role in the prevention and review of medication-related adverse events. They work proactively to address medication system issues so that the potential for medication-related adverse events is reduced. Through progressive services and initiatives, hospital pharmacists promote best practices which strive to improve medication use systems.

Examples of pharmacy services and programs that positively impact patient safety include:

- Direct patient care activities
- Use of Formulary systems
- Standardized medication policies and guidelines
- Drug order review
- Implementation of safe drug distribution systems
- Application of computer technology
- Provision of drug information/education to patients and health care workers
- Medication incident reporting and review systems

While pharmacists and other health care professionals have done much to reduce the risk of medication-related adverse events, the CIHI/CIHR report is expected to demonstrate that there is still a need for considerable improvements to our medication use system. Persistent efforts and continued system improvements are required to ensure patients are as safe as possible within our facilities. To that end, CSHP recommends that all stakeholders and decision-makers work together to accomplish the following:

1. Address staff shortages within our health care facilities
2. Increase involvement of pharmacists in direct patient care activities

3. Improve drug distribution systems
4. Expand use of technology and automation
5. Increase use of computerized prescriber order entry (CPOE) systems
6. Improve medication-related adverse event reporting and analysis
7. Foster a collaborative approach to adverse event prevention

With their considerable expertise and experience in drug use management, hospital pharmacists can continue to provide significant leadership in this area.

1. Introduction

“The paradox of medications, which can heal or cause great harm, demands that their properties be understood and that they be used safely.”⁽¹⁾

The Canadian Institute on Health Information (CIHI) and the Canadian Institutes of Health Research (CIHR) have collaborated to study the prevalence of adverse events within Canada’s health care facilities.⁽²⁾ Similar studies done in other countries have suggested that adverse events occur in 5 – 10% of hospital admissions, many of which are preventable. There is no reason to expect that the findings in the current Canadian study will be significantly different.

There is great propensity for adverse event and failure within our health care systems, as increasingly ill patients are being cared for through complex processes in an environment stressed by limited resources. Health care professionals are obligated to continually improve systems and processes to ensure that where possible, adverse events are prevented.

An adverse event is defined as “an unintended injury or complication which results in disability, death or prolonged hospital stay and is caused by health care management.”⁽²⁾ Medication errors or incidents represent a significant category of preventable adverse events. Through innovative practices such as automated drug distribution systems and direct patient care services, hospital pharmacists have continually strived to prevent medication-related adverse events and improve the safety of our medication use systems.

This paper was prepared by the Canadian Society of Hospital Pharmacists (CSHP) to describe the efforts of hospital pharmacists in preventing medication-related adverse events and improving patient safety. Representing over 2000 pharmacists, CSHP is the national voluntary organization of pharmacists committed to the advancement of patient-centred pharmacy practice in hospitals and related health care settings. CSHP members have a long-standing reputation for innovative leadership in advancing pharmacy practice, and in working collaboratively to improve medication use and patient outcomes.

2. Background

2.1 Who is CSHP?

Since its inception in 1947, the Canadian Society of Hospital Pharmacists has guided the advancement of hospital pharmacy practice. Through the development of practice standards and guidelines; provision of educational opportunities for improving clinical practice; and facilitating the sharing of new findings and best practices across its membership, CSHP continues to provide its members with the framework and skills to improve medication use and patient outcomes.

CSHP's commitment to practice excellence and care of patients is reflected in the Society's value statements:

Practice excellence and innovation

Collaboration

Professional development and mentorship

Accountability to members

The commitment of our members to our Society and the profession

CSHP also works in partnership with numerous other national and provincial health care associations to address and resolve issues related to safe and appropriate drug therapy, medication-related adverse event prevention and reporting, and the provision of seamless care.

Appendix I lists some of the Society's publications and initiatives targeted at improving the safety of medication use systems.

2.2 Hospital Pharmacists Make a Difference

There are approximately 4000 hospital pharmacists in Canada, practicing in over 500 healthcare facilities, including acute care hospitals, ambulatory clinics, and long-term care settings. These pharmacists have at minimum, four years of university education devoted to the study of drugs and their use in improving and maintaining health. In addition to formal training, all hospital pharmacists continually upgrade their knowledge and skills through continuing education sessions as well as through 'hands-on' experience gained in their clinical practices.

Many hospital pharmacists have also pursued additional formal training and education beyond their baccalaureate degree. A significant number have completed a residency program in hospital pharmacy practice, an additional year of experiential training that focuses on application of therapeutic knowledge to clinical practice. These residency programs are accredited by the Canadian Hospital Pharmacy Residency Board (operating under the auspices of CSHP) to ensure quality in content and learning experience. As well, a growing number of pharmacists have also obtained a Doctorate in Pharmacy (Pharm D.) degree. The Doctor of Pharmacy program is a two-year post-graduate program providing advanced education and training in many aspects of pharmacy practice, including direct patient care.

Working alongside physicians, nurses and other health care professionals, hospital pharmacists have demonstrated the significant contributions they can make to patient care, and progressively proven the value of their unique expertise. Involvement of the pharmacist in direct patient care programs has been shown to improve a patient's knowledge of their disease, improve medication adherence, decrease duplicate therapies, and reduce the incidence of side effects and adverse events. These contributions result in better disease management for the patient, a reduction in drug-related problems, and a decreased need for health services.⁽³⁻¹²⁾

A more detailed overview of the many roles and responsibilities of hospital pharmacists is provided in Appendix II.

3. How do Hospital Pharmacists Enhance Patient Safety?

Within healthcare facilities, pharmacists play a pivotal role in the prevention and review of medication-related adverse events. They work proactively to address medication system issues to reduce the potential for medication-related adverse events. Through progressive services and initiatives, hospital pharmacists promote best practices which strive to improve medication use systems. Several of these services and initiatives are described below.

3.1 Direct Patient Care

Medication use is a complex, multidisciplinary process that begins and ends with the patient. Pharmacists in many hospitals routinely practice pharmaceutical care where they work with the patient, as part of multidisciplinary patient care teams, to identify, resolve and prevent drug-related problems. Pharmacists specialize in pharmacotherapy and thus can make a significant impact in the optimization of patient medication choices. Working with physicians and other health care professionals, the goal of pharmacists is to ensure safe and appropriate prescribing decisions are made, patient outcomes are monitored, and adverse events are prevented.

Numerous studies have verified that pharmacist involvement in direct patient care activities results in a significant reduction in medication-related adverse events. In 1993, Kilroy and Iafate found that 724 medication-related adverse events were averted over a 4-year period because of pharmacist intervention in their intensive care unit.⁽¹³⁾ Bootman and Johnson showed that costs associated with drug-related problems could be cut by more than 50% if pharmaceutical care was provided to all patients.⁽¹⁴⁾ Another review reported that hospitals which increased the number of pharmacists providing pharmaceutical care were able to decrease medication-related adverse events and ‘near-misses’ by over 65%.⁽¹⁵⁾ A study by Kaushal et al. estimated that ward-based pharmacists could have prevented 94% of potential adverse events.⁽¹⁶⁾ Scarsi and colleagues reported a 51% reduction in medication errors on general medicine units when pharmacists participated in medical rounds.⁽¹⁷⁾ In a similar study, Kucukarlsan et al. found preventable adverse drug events were reduced by 78% when pharmacists participated in rounds.⁽¹⁸⁾ Leape’s group reported that having a pharmacist in the intensive care unit resulted in a two-thirds reduction in adverse drug events.⁽⁶⁾ Fortescue et al. reported similar results in pediatric units that had clinical pharmacist involvement (86% reduction).⁽¹⁹⁾

Hospital pharmacists have also shown they are very capable of assuming additional patient-related responsibilities, such as an increased role in prescribing drug therapies. A recent report by CSHP showed that a broad range of pharmacist-managed or

collaborative drug therapy programs exist in Canadian hospitals.⁽²⁰⁾ Collaborative practice models utilizing pharmacists in a prescribing capacity have been shown to result in improved outcomes and better patient care. As an example, there is extensive evidence in Canada and the U.S. that pharmacist-managed anticoagulant programs result in fewer adverse events and improved patient outcomes.⁽²¹⁻²⁶⁾

Teaching patients about their medications – what they are taking, why they are taking it, and how they should take it – is another way that pharmacists work to improve the safety of medication administration. Patients should be partners in the prevention of adverse events while hospitalized and they need to be educated to safely self-administer medications when they go home. As the drug experts, pharmacists are best equipped to perform this role.

A major source of preventable adverse drug events and errors is miscommunication of information during patient transfers in and out of hospital (i.e. “medication reconciliation errors”). In an effort to minimize these types of adverse events, hospital pharmacists participate in many activities designed to facilitate continuity of care for patients as they move across care settings (eg. from home to hospital to home). Examples of these ‘seamless care’ activities include taking medication histories from patients to help reduce errors on admission to hospital, communication with community providers and involvement in home visits. At the national level, CSHP initiated work in this area through establishment of a joint task force with the Canadian Pharmacists Association.

3.2 Formularies

A drug formulary is a list of pharmaceutical products approved for use in a particular setting. It reflects the combined current clinical judgment of pharmacists and physicians who select the most appropriate drugs to treat specific conditions. Working with other health professionals on the hospital’s committee responsible for drug selection, policies and safety (e.g. Pharmacy and Therapeutics Committee, Drugs and Therapeutics Committee), hospital pharmacists apply clinical, therapeutic, financial and pharmacoeconomic information in the formulary management process. Modern formularies used in a variety of settings today had their beginnings in hospital pharmacy practice.

In addition to containing costs, formularies can play a role in preventing medication-related adverse events. Formulary decisions may include restrictions on use, monitoring requirements, required use of protocols or specific order sheets, special labeling, as well as standardized preparation and administration. “Prescribing formulary medications improves the chances that all healthcare workers within a particular institution will be familiar with the medications and thus less likely to make errors dispensing or administering them.”⁽²⁷⁾

3.3 Medication Policies and Guidelines

Hospital pharmacists continue to play a prominent role in the development of facility/regional policies, protocols and guidelines related to medication use. Standardized policies, protocols, and guidelines all serve to promote consistent, accurate and complete medication-related processes while reducing reliance on individual variability. Examples include:

- policies and guidelines for standardizing prescribing (e.g. avoiding dangerous abbreviations, requiring use of metric system, using preprinted order sheets);
- standardizing medication-related processes (e.g. dose administration times, packaging and labeling);
- protocols for use and storage of high-alert drugs (e.g. storage of concentrated potassium solutions) and;
- drug administration guidelines (e.g. parenteral drug monographs).

3.4 Drug Order Review

In the majority of cases, medication orders are reviewed by a pharmacist prior to the medication being dispensed. Ninety-four percent of teaching hospitals and 83% of non-teaching hospitals reported that most of the time, a pharmacist sees the prescriber's order before the medication is dispensed.⁽²⁸⁾ When reviewing a drug order, the pharmacist applies knowledge of drug therapy and additional patient specific information (e.g. diagnosis, reported allergies, patient weight, etc.) to evaluate the appropriateness of the medication order for that specific patient. If a potential problem is identified, the pharmacist contacts the prescriber to clarify the order and/or discuss alternatives. This review process helps to avert many problematic orders before they can reach the patient, adding a crucial safety check to the medication use system.

3.5 Drug Distribution Systems

The Canadian Society of Hospital Pharmacists endorses the Unit-Dose/Intravenous (IV) Admixture system as the drug distribution system of choice in organized health care settings.⁽²⁹⁾ In unit-dose systems, medications are dispensed in a ready-to-administer form, usually for a 24-hour period. The Unit-Dose and IV Admixture systems are both based upon the principle that all drugs are compounded and dispensed by Pharmacy. The unit-dose system has been in use for several decades and has been shown to have significant advantages over other systems, including a reduction in the incidence of medication-related adverse events. In one study conducted in 1991 at the Toronto Hospital for Sick Children, the observed medication error rate decreased from 10.3% to 2.9% when the traditional drug distribution system was replaced with a unit-dose system.⁽³⁰⁾

The cornerstone of the unit-dose system is provision of a single dose of medication, individually packaged with contents clearly labeled using standardized nomenclature.

Although packaged in a ready to administer form, pharmacy does not dispense the dose until the medication order is reviewed by a pharmacist to ensure safety and appropriateness for the specific patient.

Over half of respondents to the recent annual report on hospital pharmacy indicated that unit-dose systems were in use in their facilities for at least some beds, while pharmacy-based IV admixture services were provided by 81% of responding hospitals.⁽²⁸⁾

Several hospital pharmacies have also moved towards the use of automated medication distribution systems. Automated dispensing systems are drug storage devices or cabinets that electronically dispense medications in a controlled fashion and track medication use. When used appropriately with inherent quality checks, these systems can help increase efficiency and decrease medication-related adverse events. Unit-based automated dispensing systems are in use in approximately 18% of Canadian hospitals.⁽²⁸⁾

A small number of Canadian hospital pharmacies (11%) reported using bar coding in their drug distribution processes, primarily to verify stocking of automated dispensing cabinets.⁽²⁸⁾ Broader use of this technology at various stages of the medication use system (including medication administration at the bedside) has the potential to increase accuracy, improve efficiencies, and improve overall safety of the medication use system.^(31, 32)

3.6 Computer Technology

Computerized prescriber order entry (CPOE), automated dispensing machines (ADM), barcoding, and computerized medication administration records (CMARs) are examples of technologies that have been proposed to improve medication safety. Hospital pharmacists have been at the forefront of these technologies from the beginning.

Computer technology has been in use in the majority of Canadian hospital pharmacies for a considerable time. Pharmacy computerized information systems are widely used to support drug order review, monitoring and documentation of administration (CMARs) as well as drug dispensing activities. Hospital pharmacists and technicians use computerized information systems to check for allergies, therapeutic duplication and drug-drug interactions.⁽²⁸⁾ Some systems also provide checks for drug-lab values as well as maximum dose alerts. Use of these systems improves the efficiency of pharmacy services and reduces the risk of preventable adverse drug events.

Computerized prescriber order entry (CPOE) systems have been implemented in a small number of Canadian hospitals.⁽²⁸⁾ Orders are entered directly into a computer system and integrated with patient information, including laboratory and prescription data. The order is then automatically checked for potential errors or problems. CPOE systems are designed to intercept errors when they most commonly occur – at the time medications are ordered. Electronic prescribing systems have been shown to decrease medication-related adverse events, improve the safety and appropriateness of prescribing, and increase the efficiency of the drug use process.⁽³³⁻³⁶⁾ Hospital pharmacists are intimately

involved in promoting, developing and implementing CPOE systems – incorporating processes and procedures in system design to reduce or eliminate errors associated with prescribing.

3.7 Drug Information / Education

The availability of relevant drug information for all health care providers connected to the medication use system is an important factor in reducing the potential for adverse event. Providing this information to patients and other health care providers continues to be a key responsibility of hospital pharmacists. Thirty one percent of respondents to the recent survey on hospital pharmacy reported that their hospitals had dedicated staff for the provision of drug information and drug use evaluation services.⁽²⁸⁾ In many cases, the growing need for relevant and timely drug information has resulted in the expansion of hospital pharmacy based drug information services to larger, more formal (e.g. regional) Drug Information Services.

3.8 Medication Incident Reporting and Review System

The CSHP Standards of Practice promote participation of pharmacy departments in medication incident and medication discrepancy reporting programs.⁽²⁹⁾ These programs are critical for analyzing medication-related adverse events or ‘near-misses’ to reduce the potential for future occurrences. It is noteworthy that in the recent national survey on hospital pharmacy, 92% of respondents reported that a medication incident reporting system was in place within their facilities.⁽²⁸⁾ Hospital pharmacists continue to play a key role in these important programs.

Hospital pharmacists share and exchange current information regarding a variety of professional practice issues through an organized information network (PSNs) supported by CSHP. PSNs enable pharmacists across the country to rapidly develop consensus guidelines on patient safety issues (e.g. SARS treatment).

4. What more can be done to prevent medication-related adverse events?

Hospital pharmacists and other health professionals have done much to reduce the potential for medication-related adverse events and enhance the safety of medication use systems. Yet, as demonstrated by the reports to date on preventable adverse events, greater efforts are needed. Key areas where additional resources and improvements would result in significant benefit to our medication use systems are noted below.

4.1 Address Staff Shortages

The availability of qualified health care professionals, including pharmacy personnel, continues to be a significant problem for hospitals and the health care system. Pharmacist vacancies in 2001/2002 were reported by 60% of respondents to the latest hospital pharmacy survey, indicating the magnitude of the problem.⁽²⁸⁾ Sixty percent of respondents noted that services had been cut due to the staff shortages. Of those, 80% indicated that direct patient care or clinical services had been curtailed.

Ongoing staff shortages have grave implications for patient safety, placing additional pressure and strain on a health system that is already trying to cope with increased patient loads and acuity. An integrated approach to human resource planning is urgently required to ensure sustainable levels of health professionals. All stakeholders, including health professional organizations and governments, must work together creatively to address the shortages and plan for the future.

CSHP is currently a member of the Steering Committee of Human Resources Development Canada (HRDC), which is investigating the pharmacy manpower shortage. This group will not only identify factors contributing to the shortage but will also develop strategies to help resolve the issue.

4.2 Increase Involvement of Pharmacists

Increasing involvement of pharmacists in direct patient care activities has been proven to result in many positive patient outcomes, including a significant reduction in medication-related adverse events.^(6,13-19) In a study of clinical pharmacy services in Ontario hospitals, pharmacists providing the highest level of direct patient care reported nine times as many recommendations per patient-day compared to those performing only the basic medication order review.⁽³⁾ Reportedly however, hospital pharmacists on average spend only 39% of their time in direct patient care activities.⁽²⁸⁾

To ensure adequate pharmacist resources are available to support increased involvement in direct patient care, medication use systems must increase the use of technology and automation, and utilize non-professional support staff (e.g. pharmacy technicians and assistants) to their fullest extent. Support and direction for the delegation of additional tasks to pharmacy technicians is provided in CSHP's recent paper entitled "An Information Paper on the Role of the Pharmacy Technician".⁽³⁷⁾

4.3 Improve Drug Distribution Systems

Conversion to a unit-dose system has been cited as one example of a system change that can improve patient safety.⁽³⁸⁾ Yet many hospitals still do not utilize unit-dose systems. Results from the most recent hospital pharmacy survey show there is considerable room for improvement in this area. Approximately 54% of respondents indicated that unit dose

drug distribution was used to support some beds, while only 24% reported that unit dose was used for 90% of beds in their facilities.⁽²⁸⁾

4.4 Expand Use of Technology and Automation

For the most part, health care facilities have been slow to capitalize on the benefits of technology for preventing patient harm. The 2001/2002 Annual Report on Hospital Pharmacy showed that automated drug distribution systems were in use in only 18% of Canadian hospitals.⁽²⁸⁾ Even fewer hospitals (11%) reported using bar coding, and the bar coding in those facilities was primarily used to verify stocking of automated dispensing cabinets.

Increased investments in technology would help address some of the workload pressures within hospital pharmacies, while improving the overall safety of the medication distribution and administration process. For example, a study at a Veterans Affairs Medical Centre that used bar code technology in their dispensing system reported that 5.7 million doses of medication were administered to patients with no medication errors.⁽³²⁾ The U.S. Food and Drug Administration (FDA) has estimated that using bar coding technology at the dispensing and drug administration stages would result in a 50% decrease in errors.⁽³²⁾ These early reports are certainly very encouraging; however, additional studies which thoroughly evaluate the costs and safety benefits of these new technologies would be of tremendous benefit to pharmacy and hospital administrators.

4.5 Increase Use of Computerized Prescriber Order Entry

Use of computerized prescriber order entry (CPOE) programs can result in huge improvements in detecting potential medication prescribing errors; one hospital experienced a 55% reduction in preventable adverse drug events after implementation of computerized prescriber order entry.⁽³³⁾ Currently though, CPOE is used in only a small number of Canadian hospitals. Nine respondents (17%) to the 2001/2002 survey on hospital pharmacy indicated that CPOE was operational in their facility.⁽²⁸⁾ On a more encouraging note, an additional 17 respondents noted that they had an approved plan in place to implement CPOE. It is imperative that this upward trend in implementation of CPOE programs continues.

4.6 Improve Medication Adverse Event Reporting and Analysis Systems

As we continue to move towards a “culture of safety” in our hospitals, we need to implement easy to use, point-of-care medication-related adverse event systems and tools. These systems will ensure that adverse events are reported voluntarily by those who are directly involved so that gaps or weaknesses in our medication systems can be identified and corrected based on actual risks. A robust adverse event reporting and analysis

system would also be beneficial in reinforcing and guiding educational strategies targeted at adverse event prevention.

4.7 Foster a Collaborative Approach to Adverse Event Prevention

While human error may be an unfortunate fact of life, medication-related adverse events are usually indicative of more fundamental systemic issues. Rather than placing blame on an individual or a specific discipline, all stakeholders (i.e. patients, pharmacists, nurses, physicians, etc) must work together, in a systems approach, to identify and resolve system flaws. “The health-care system must encourage partnerships among all consumers and providers of care. These partnerships, including those of individuals, professions and organizations, are necessary for making effective improvements to all operational/systemic deficiencies.”⁽³⁸⁾

5. Conclusion

Hospital pharmacists have demonstrated that effective use of their expertise can result in significant reductions in medication-related adverse events and improved patient safety. Undoubtedly though, there is still a need for considerable improvements to our medication use system. Persistent efforts and collaboration amongst all health care providers are needed to reduce the risk of harm to our patients. Increased automation of medication systems and consistently higher levels of pharmacist involvement in direct patient care would significantly reduce the occurrence of medication-related adverse events in our hospitals. With their considerable expertise and experience in drug use management, hospital pharmacists can continue to provide significant leadership in this area.

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Appendix I - CSHP Initiatives Related to Patient Safety

A. CSHP Professional Standards for Hospital Pharmacy Practice (2002)

CSHP Standards for Hospital Pharmacy Practice outline the responsibilities of the hospital pharmacist in advocating for safer medication systems. Standard 4 describes the responsibilities of the hospital pharmacist in acting as a patient advocate. One of the key components of practice in this standard (4.2) requires the pharmacist to “advocate for practice improvements including safer medication systems, evidence based practice, direct patient care and continuous care of the patient”.

B. CSHP Guidelines For Medication Incident Reporting and Medication Incident/Discrepancy Prevention (1999)

These guidelines provide guidance to hospital pharmacists and allied health professionals (e.g. nurses, physicians) in documenting, evaluating and taking corrective action on medication incidents and discrepancies, and in developing a quality assurance program for the facility’s medication system.

C. CSHP Statement on Unit-dose and IV Admixture Drug Distribution, Guidelines for Drug Packaging and Labeling for Manufacturers, and Guidelines for Liability and Risk Management

These CSHP statements and guidelines provide support for the implementation of safe medication distribution systems, support the goals of safe drug administration, and raise awareness amongst hospital pharmacists of the issues and risks of negligence litigation.

D. Participation in multidisciplinary initiatives focused on enhancing patient safety

CSHP has provided financial and in-kind contributions to national patient safety initiatives such as the development of a Business Plan for a Medication Incident Reporting and Prevention System for Canada [Canadian Coalition on Medication Incident Reporting and Prevention (CCMIRP)] and the report of the National Steering Committee on Patient Safety (Building a Safer System: A National Integrated Strategy for Improving Patient Safety in Canadian Health Care). CSHP co-hosted with Health Canada the original workshop where CCMIRP was formed.

E. Continuing Education

The provision of continuing education is a major component of CSHP’s services. Continuing education opportunities assist hospital pharmacists in developing quality improvement programs and undertaking practice changes to enhance the safety of their medication distribution system.

F. Commitment to the advancement of patient-centered pharmacy practice

Pharmacist involvement has been shown to decrease the incidence of adverse events and drug-related problems in patients, and improve patient safety. Advocacy efforts, educational programs (e.g. Direct Patient Care Modules), practice standards, statements and guidelines (e.g. Pharmaceutical Care, Home Health Care), and Task Forces (e.g. Seamless Care, Pharmacist Prescribing) are examples of CSHP initiatives that support an enhanced direct patient care role for the pharmacist.

G. Advocating for safer medication systems

CSHP's "Brief to the Romanow Commission on the Future of Health Care in Canada" highlighted the importance of system changes (e.g. expanded use of automated medication systems) and need for increased pharmacist involvement to enhance the safety and efficiency of medication use systems.

Appendix II - What do Hospital Pharmacists do?

The number of pharmacists within an institution, as well as their specific roles and responsibilities, varies considerably from facility to facility. Most hospital pharmacy departments have a mix of direct patient care services, drug use management responsibilities, administrative duties and other supporting functions such as education and research.

A. Direct Patient Care

Pharmacists in many hospitals routinely practice pharmaceutical care where they work with the patient to identify, resolve and prevent drug-related problems. They are frequently part of a multidisciplinary team where they are recognized as the drug experts. Like other members of the team, hospital pharmacists have access to relevant patient-specific information (e.g. diagnosis, lab results) in order to best capitalize on the expertise of each provider.

Hospital pharmacists can be found throughout the spectrum of patient care services, from preventive/health promotion activities (e.g. vaccination programs, risk assessment and modification of lifestyle), involvement in various acute care inpatient programs (e.g. cardiology, infectious diseases, intensive care), to various outpatient clinics and home care programs (e.g. anticoagulant service, asthma management clinic, home intravenous therapy programs, palliative programs). A recent report on hospital pharmacy in Canada showed that pharmacists are involved in many inpatient and outpatient programs, including ⁽²⁹⁾

Inpatient clinical services:

- general medicine
- intensive care
- infectious diseases
- geriatrics / Long Term Care
- surgical units
- mental health
- haematology-oncology
- rehabilitation services
- obstetrics/gynecology
- pediatrics

Outpatient clinical services:

- haematology-oncology
- diabetes clinic
- pain/palliative care
- emergency room
- Deep Vein Thrombosis/anticoagulant clinic
- infectious disease/AIDS
- renal/dialysis
- asthma/allergy
- geriatric day care
- cardiovascular/lipid clinic
- mental health
- transplantation
- neurology

Within these patient care programs, the pharmacist is typically responsible for a wide range of clinical services, such as taking medication histories, assessing and monitoring therapy (choice of therapy, dose, and formulation), reviewing and interpreting lab results, routine consultations with other health care professionals, and patient teaching.

In many institutional settings, pharmacists also have some level of authority and responsibility for prescribing. A recent report prepared by CSHP demonstrated that a broad range of pharmacist-managed or collaborative drug therapy programs exist in Canadian hospitals.⁽²¹⁾ Prescribing by pharmacists takes place in several different formats, including:

- Therapeutic interchange
- Selection of non-prescription drugs
- Aminoglycoside and pharmacokinetic dosing service
- Anticoagulation therapy for inpatients and outpatients
- Total parenteral and enteral nutrition support
- Cancer related analgesic management
- Chemotherapy related antiemetic management
- Insulin and oral hypoglycaemic drug dosing and adjustment
- Renal dysfunction dosage adjustment program
- Hypertension clinic
- Hyperlipidemia clinic
- Ambulatory patient medication refill clinic

Hospital pharmacists participate in many activities designed to facilitate continuity of care for patients as they move across care settings (e.g. from home to hospital to home). Examples of these ‘seamless care’ activities are provided below. Involvement in specific activities varies from institution to institution, and is often dependent on the specific type of facility as well as the pharmacy resources available.

- Taking medication histories from patients to help reduce errors on admission to hospital
- Communication with community providers regarding medication therapy prior to admission
- Discharge counseling, provision of patient specific drug information
- Provision of adherence aids
- Provision of relevant patient information (with patient consent) to community providers
- Provision of outpatient medications with appropriate counseling through outpatient pharmacies and outpatient clinics
- Involvement in home visits
- Provision of required medications and education for home parenteral therapy programs

B. Drug Use Management

For years, hospital pharmacists have had a strong emphasis on cost-effective use of drugs. Pharmacists contribute to the cost-effective use of drugs through the management of formularies, establishment of drug policy and guidelines, and drug use evaluation programs. Many hospital pharmacists also contribute to provincial “Formulary Committees” that make decisions regarding drug coverage in community settings.

A drug formulary is a list of pharmaceutical products approved for use in a particular setting. It reflects the combined current clinical judgement of pharmacists and physicians who select the most appropriate drugs to treat specific conditions. Working with other health professionals on the Drugs and Therapeutics Committee, hospital pharmacists apply clinical, therapeutic, financial, and pharmacoeconomic information in the formulary management process. The intended benefits include more cost-effective prescribing, improved quality of care through better identification of the best treatments, and elimination of inefficient treatments or those with avoidable risks of adverse events.

Pharmacists also play an integral role in development of drug policy. Many hospital pharmacists have been directly involved in developing Clinical Practice Guidelines (CPGs), both at the institutional level and on a much broader basis (e.g. provincial, national). CPGs are intended to reflect current medical opinion for the best treatment choices. These guidelines are used by physicians and other health care professionals to guide decisions related to patient care. These policies and guidelines impact the effectiveness of patient care as well as cost and drug resistance issues.

Many hospitals have Drug Use Evaluation (DUE) programs. Within the DUE process, pharmacists systematically evaluate drug usage against predetermined criteria. Hospitals and regions have used DUE programs to evaluate the appropriateness of drug therapy within their institutions, and measure the cost-effectiveness of drug use. DUE programs have been shown to more than pay for themselves through the savings achieved.⁽¹⁰⁾

C. Medication Distribution Systems

Hospital pharmacists are responsible for overseeing the facility’s medication distribution system. They work to ensure that systems and processes are safe, effective and efficient and are designed to minimize the likelihood of medication errors. Significant progress has been made over the years, in delegating the technical tasks related to drug distribution to trained pharmacy technicians and assistants. As well, several hospitals have moved towards the use of automated medication distribution systems, which help reduce workload and the opportunity for errors.

Within healthcare facilities, pharmacists play a pivotal role in the prevention and review of medication errors. They work proactively to address medication system issues so that the potential for medication errors is reduced. They promote best practices which include unit dose drug distribution in inpatient settings, computerized physician order entry,

standardizing and simplifying prescribing and drug administration processes, using error-preventative packaging, and instituting 24 hour pharmacy services.

Hospital pharmacists are key players in identifying adverse drug reactions and reporting them to Health Canada to fully develop the database of information on this subject.

D. Education

The education and training of students is a routine responsibility for most hospital pharmacists and in many hospitals, the involvement in teaching is extensive. Included is education of undergraduate pharmacy students, pharmacy technician students, hospital pharmacy residents and Pharm. D. students.

With respect to undergraduate pharmacy students, hospital pharmacists make significant contributions to curriculum development, and cross-appointments of hospital pharmacists to faculties/schools of pharmacy are common. Hospital pharmacists also participate as preceptors and mentors for students in their clinical rotations. Approximately 800 final year pharmacist students from Canadian faculties/schools of pharmacy spend a minimum of 3-4 weeks in a “Structured Practical Experience” (SPE) program set within the hospital environment. In addition, hospital pharmacists are involved in teaching and mentoring post-graduate pharmacy residents and Doctor of Pharmacy students.

Hospital pharmacists also contribute to the education of other health professionals, (e.g. physicians, nurses, dieticians, etc.) through in-services, medical and/or nursing rounds, participation in conferences, and submissions to reference texts and journals.

E. Research

In the hospital setting, clinical drug trials are typically multidisciplinary in nature, and participation of a pharmacist is routine. In addition, many pharmacists also conduct research in various facets of pharmacy practice.