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Hospital Pharmacists: Information Paper on Enhancing Quality and Safety in Medication Use (2010)



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Hospital Pharmacists: Information Paper on Enhancing Quality and Safety in Medication Use

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EXECUTIVE SUMMARY

Issues related to quality and safety in the healthcare system have been clearly identified. Medication errors and adverse drug events (ADEs) are important causes of patient harm, and failure to translate evidence-based guidelines into clinical practice creates further gaps in the quality of patient care. Quality of care and patient safety depend on the efforts of many people. Hospital pharmacists, as members of the healthcare team, play an essential role in ensuring that people receive high-quality, safe care while they are patients in the healthcare system.

Current data suggest a gap between hospital pharmacists' clinical skills and the services that they provide; as such, their skills are currently underutilized. Efforts to narrow or close this gap should enhance the quality and safety of care provided to patients.

This paper has the following objectives:

- to increase awareness of the potential roles of hospital pharmacists, as members of the multidisciplinary healthcare team, in ensuring that patients receive high-quality care and in ensuring safe medication use through their provision of care to individual patients; and
- to increase awareness of the leadership and participatory roles of hospital pharmacists in patient safety and quality initiatives, such as Accreditation Canada standards and the Safer Healthcare Now! campaign.

Referring to the latest published evidence, this paper highlights for healthcare system managers, healthcare providers, and patients and their caregivers the critical role that pharmacists play in quality care and patient safety. This role focuses on direct patient care activities provided at the bedside but also includes system-wide initiatives.

Improvements in Quality of Care and Medication Safety through Hospital Pharmacists' Direct Patient Care Activities

Pharmacists specialize in pharmacotherapy and can therefore contribute to the optimization of drug therapy choices. The goals of pharmacists, working with physicians and other healthcare professionals, are to ensure that safe and appropriate prescribing decisions are made, that patient outcomes are monitored, and that ADEs are prevented and/or appropriately managed.

Substantial evidence is now available to support the effect of direct patient care activities, as provided by pharmacists, in reducing the incidence of preventable ADEs, generating clinically meaningful patient outcomes (e.g., in terms of mortality or readmission to hospital), and improving the quality of medication use. Pharmacists can help to improve the quality and safety of medication use by prescribing appropriately, conducting patient education, and providing seamless care services (e.g., medication reconciliation).

Pharmacists have the ability to influence medication use not only at the bedside but also at other stages of the medication-use process; as such, they are taking leadership roles and are contributing to efforts to enhance quality of care and medication safety. Examples of such areas of influence are reviewing medication orders as part of the dispensing process; removing hazardous medications from wards; using specialized procedures for high-risk medications; and standardizing processes for medication dosing, timing, labelling, and packaging. Pharmacy departments also play an important role in creating a culture of patient safety by anticipating, recognizing, and managing high-risk situations for patients and by systematically monitoring, recognizing, and reporting system performance and adverse events.

CSHP Mission:

CSHP is the national voice of pharmacists committed to the advancement of safe, effective medication use and patient care in hospitals and related healthcare settings.



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Hospital Pharmacists' Involvement in Quality and Safety Initiatives

Hospital pharmacists are ready to be active leaders within and contributors to the quality and patient safety movements, as evidenced by their leadership of and contributions to several initiatives and to Canadian Society of Hospital Pharmacists (CSHP) partnerships, including the CSHP 2015 practice excellence initiative, initiatives of the Canadian Patient Safety Institute and the Institute for Safe Medication Practices Canada, the Safer Healthcare Now! campaign, and the new Accreditation Canada medication management standards. Finally, working with the CSHP staff, hospital pharmacists contribute to the quality and safety of patient care through their contributions to advocacy efforts, education programs, and publications, all of which promote enhancement of the role of pharmacists in direct patient care.

Conclusion

Direct patient care services provided by hospital pharmacists improve both the quality of medication use and patient safety. If the potential for pharmacists to improve the quality of care and patient safety is to be fully realized, they must be involved in direct patient care activities at the bedside as part of the multidisciplinary healthcare team. Furthermore, pharmacy departments and pharmacists should be leading or should be involved in system-wide quality and safety initiatives. Adequate investment of time and resources will be required to maximize the effect of pharmacists' activities in improving the quality and safety of patient care.

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

Hospital pharmacists are important members of the healthcare team and play an essential role in ensuring that people receive high-quality, safe care while they are patients in healthcare systems. However, current data suggest a gap between hospital pharmacists' clinical skills and the services that they provide; as such, their skills are currently underutilized.²

This paper has the following objectives:

- to increase awareness of the potential roles of hospital pharmacists, as members of the multidisciplinary healthcare team, in ensuring that patients receive high-quality care and in ensuring safe medication use through their provision of care to individual patients; and
- to increase awareness of the leadership and participatory roles of hospital pharmacists in patient safety and quality initiatives, such as Accreditation Canada standards and the Safer Healthcare Now! campaign.

Quality and patient safety depend on the efforts of many people. Improving patient safety is a multifaceted task that requires the involvement of many players in the healthcare system.³ Although this paper focuses on how pharmacists' direct patient care activities (i.e., clinical care services) influence safe medication use, it also highlights the role of the pharmacist as a member of the multidisciplinary team and the leadership and supporting roles that pharmacists may play in ensuring quality and safety. Also, since direct patient care is only one aspect of hospital pharmacy services, this paper addresses the many other ways in which pharmacists contribute to an optimal medication-use system, for example, by ensuring safe and effective drug use during purchasing, ordering and prescribing, dispensing, administration, and monitoring.⁴ These topics are considered from the perspectives of front-line pharmacists, pharmacy managers, professional organizations, and the profession at large.

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2. BACKGROUND

2.1 Issues of Quality and Safety in the Healthcare System

A wealth of data is now available describing the various aspects of ensuring high quality of care and patient safety in the healthcare system. In this paper, quality is defined as “increasing the likelihood of desired health outcomes ... consistent with current professional knowledge”⁵ whereas safety involves “the reduction and mitigation of unsafe acts within the healthcare system”⁶ or “freedom from accidental injury”.⁷ Attention to both quality of care and patient safety is important. Although the 2 concepts are complementary, safety can be viewed as raising the floor of quality of care, whereas quality improvement raises its ceiling.⁸ As argued by Woolf,⁹ patient safety is essential for better healthcare, but overinvestment in this area carries the risk of creating a safer but lower-quality healthcare system. As such, efforts to improve healthcare must strike a balance, emphasizing a range of goals that go beyond safety to encompass overall healthcare quality, such as patient centredness, timely access, effectiveness, efficiency, and equity.¹⁰ Many of these issues have been highlighted in a series of reports produced by the Institute of Medicine^{7,11-13} (United States). A glossary with further definitions of the terms used throughout this document appears at the end of this document (page 27).

2.2 Rate of Medication Errors and Adverse Drug Events

It is well recognized that people who use medications are at risk of adverse drug events (ADEs). Recent Canadian studies have estimated that 5% to 10% of all hospital admissions are related to medications in some way, as are a large proportion (4%–28%) of all emergency department visits.^{14,15} Zed et al.¹⁶ found that 1 of every 9 emergency department visits by adults was due to medication-

related causes, and over two-thirds of these incidents were preventable.

In the Canadian Adverse Events Study, the rate of in-hospital adverse events was 7.5 (95% confidence interval [CI] 5.7–9.3) per 100 hospital admissions, and 36.9% (95% CI 32.0%–41.8%) of these events were judged to be preventable.¹⁷ Drug- or fluid-related events were the second most common type of adverse events. Several authors have documented that between 11% and 17% of in-hospital medication errors occur during dispensing, and these data are roughly similar to those reported from other countries, including England, New Zealand, Australia, and the United States.^{10,18-20} This leaves the majority of medication errors outside the dispensing realm. In one study the majority of medication errors were related to poor knowledge of drug therapy (30%), poor knowledge of patient factors that affect drug therapy (29.3%), and factors related to calculations and the expression of units and rates (17.5%).¹⁸

In another recent Canadian study, 23% (95% CI 19%–28%) of 328 patients recently discharged from hospital experienced at least one adverse event, and ADEs accounted for 72% of these adverse events. The overall incidence of preventable or ameliorable adverse events was 12% (95% CI 9%–16%).²¹

2.3 Need to Close Care Gaps

A care gap is a discrepancy between processes of care that have been identified as best practice on the basis of high-quality evidence and the care provided in usual medical practice.²² Several recent studies have documented care gaps in the use of evidence-based guidelines for various diseases and health conditions, including cardiovascular disease,²²⁻²⁶ diabetes mellitus,²⁷⁻²⁹ thromboembolism,³⁰⁻³² and others.^{33,34}

For example, using a retrospective cohort design, Soumerai et al.³⁵ documented that, after adjustment for other predictors of survival, the mortality rate among patients who received beta-blockers after

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acute myocardial infarction was 43% less than that among patients who had not received these drugs (relative risk [RR] 0.57, 95% CI 0.47–0.69). In addition, those who received beta-blockers were readmitted to hospital 22% less often than those who did not receive this class of drugs (RR 0.78, 95% CI 0.60–0.90). The authors concluded that beta-blockers are underused for elderly survivors of acute myocardial infarction and that this practice leads to adverse outcomes.

More recently, Anderson et al.³⁶ determined clinical success rates for patients undergoing percutaneous coronary interventions after implementation of the 2001 American College of Cardiology/American Heart Association guidelines for such procedures. Clinical success was 93% among patients whose procedure was rated as Class 1 (for which, according to the guidelines, there is evidence for and/or general agreement that the procedure or treatment is useful and effective) but only 85% among patients in whom the intervention was designated as Class 3 (where there is evidence and/or general agreement that the procedure is not useful or effective and in some cases may be harmful).

2.4 Work to Improve Quality and Safety

In response to this evidence, there have been great strides in improving quality and safety over the past decade, to the extent that this area has become a new discipline. Several organizations focus exclusively on quality and safety (e.g., Canadian Patient Safety Institute, Institute for Safe Medication Practices Canada) or now have an increased focus on patient safety (e.g., Accreditation Canada).

Some key strategies to improve patient safety, as recommended by various organizations, are listed in Table 1.^{3,10,37-40} A recent book entitled *Safe and Effective: The Eight Essential Elements of an Optimal Medication-Use System* highlighted 8 specific elements of the medication-use system that affect medication safety, and the role of the pharmacist

has been addressed in several other texts and by various groups (Table 2).^{7,41-44} Each of these resources has typically focused on the key aspects of the medication-use process – prescribing, dispensing, administering, and monitoring. For example, the Institute of Medicine has recommended including a pharmacist during rounds of patient care units.⁷ However, data from the *Hospital Pharmacy in Canada 2007/2008 Report* revealed that pharmacists are not consistently participating in evidence-based clinical care activities.²

3. HOSPITAL PHARMACY PRACTICE: WHAT HOSPITAL PHARMACISTS DO

Until the emergence of clinical pharmacy in the 1960s, the traditional role of the pharmacist was to dispense medications.⁴⁵ Initially, clinical pharmacy reflected a product- or drug-centred approach, but this model has evolved over the past 2 decades to one that is patient-centred. This model of “pharmaceutical care”, as defined by Hepler and Strand,⁴⁶ is grounded in the prevention of drug-related morbidity and mortality. Although other models of practice, including disease management, medication management, medication therapy management, and seamless care, have since emerged, they are all similar in terms of being patient-centric, with pharmacists taking responsibility for patient outcomes and for safe and effective drug use.⁴⁷

The contemporary hospital pharmacist performs a mix of 5 key roles and responsibilities, which may vary considerably from one facility to another: provision of direct patient care; drug use management; management of the drug distribution system; education of patients and their families, other healthcare professionals, and the pharmacists of the future; and participation in research^{15,48} (Table 3).

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The reader is referred to the Canadian Society of Hospital Pharmacists (CSHP) background paper “Hospital Pharmacists: Direct Patient Care and Beyond” for a full description of the role of the hospital pharmacist.⁴⁹

4. HOSPITAL PHARMACISTS: QUALITY OF CARE AND MEDICATION SAFETY

Hospital pharmacists can lead or contribute to quality and safety initiatives at any stage of the medication-use process.

4.1 Evidence that Hospital Pharmacists’ Direct Patient Care Activities Improve Quality of Care and Medication Safety

Pharmacists specialize in pharmacotherapy and can therefore have a significant impact in the optimization of drug therapy choices. The goals of pharmacists, working with physicians and other healthcare professionals, are to ensure that safe and appropriate prescribing decisions are made, that patient outcomes are monitored, and that ADEs are prevented and/or managed.

Although there are reports that care provided by pharmacists has little or a negative impact on patient outcomes,⁵⁰⁻⁵⁶ the overall body of evidence, from both original studies and systematic reviews, indicates that pharmacists’ care is associated with improvements in the quality of drug therapy,⁵⁷⁻⁵⁹ process-of-care indicators, patient outcomes,^{54,60-63} and quality of life⁶⁴ and also with reductions in the incidence of preventable ADEs,^{65,66} mortality,^{67,68} drug costs,⁶⁹ total costs of care,⁶⁹⁻⁷¹ length of stay,⁶⁹ medication errors,²⁰ readmission to hospital,⁵⁷ emergency department visits or readmissions,⁷² and adverse drug reactions.^{73,74}

4.1.1 Reducing Preventable ADEs

Two randomized controlled trials demonstrated the benefits, in terms of reducing ADEs, of having a pharmacist participate in rounds with the medical team. In the first of these studies, Leape et al.⁶⁵ reported a two-thirds reduction in ADEs when a pharmacist was present in the intensive care unit. Similarly, Kucukarslan et al.⁶⁹ found that preventable ADEs were reduced by 78% when pharmacists participated in rounds in the internal medicine setting.

4.1.2 Improving Clinically Meaningful Patient Outcomes

The provision of direct patient care services by pharmacists was supported by a series of landmark papers by Bond et al., who investigated the correlation between the provision of 14 types of clinical pharmacy services (5 central and 9 patient-specific services) and patient outcomes using data from large US hospital databases^{20,67-70,73,75-80} (Table 4). Although causal relationships were not examined, Bond and his group were able to demonstrate that clinical pharmacy services were associated with reductions in patient mortality, medication errors, adverse drug reactions, drug costs, total costs, and length of stay in hospital. These results led Bond’s group to recommend certain “core” clinical pharmacy services: participation in cardiopulmonary resuscitation, provision of in-service education, management of adverse drug reactions, provision of drug information, participation in medical rounds, management of drug protocols, and taking of admission drug histories⁸¹ (Table 5).

Kaboli et al.⁷⁴ systematically reviewed the effects of interventions by hospital-based clinical pharmacists on processes and outcomes of care for hospital inpatients. They included 36 studies in their review: 10 dealing with participation on patient care units and rounds, 11 dealing with medication reconciliation services on admission or discharge,

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and 15 dealing with services specific to certain drug classes (e.g., therapeutic drug monitoring). Kaboli et al.⁷⁴ concluded that the addition of clinical pharmacist services to the care of hospital inpatients generally resulted in better care with no evidence of harm. They documented improved medication adherence, knowledge, and appropriateness of therapy in 7 of the 11 studies that included these outcomes, shorter hospital stays in 9 of 17 studies, and reduced frequency of ADEs, adverse drug reactions, and medication errors in 7 of 12 trials. No intervention led to worse clinical outcomes, and only one study reported greater use of healthcare services. The authors concluded by issuing a challenge to the profession of pharmacy: “Cost-effectiveness can be improved by identifying pharmacist duties most beneficial to patients and determining whether less skilled and costly personnel can perform other duties.”⁷⁴

4.1.3 Working in Multidisciplinary Teams

Although direct patient care is not always provided in the context of a multidisciplinary care team, this model is very common. Therefore, most of the evidence described in sections 4.1.1 and 4.1.2 can be extrapolated to work in multidisciplinary teams.

A group of Canadian researchers recently demonstrated the positive impact of collaborative care, including a team-based clinical pharmacist, on the quality of prescribed drug therapy and the frequency of hospital readmission among 452 patients admitted to internal and family medicine wards at 3 large teaching hospitals.⁵⁷ Quality of medication use was measured using 20 indicators targeting 5 conditions. Team-care patients were more likely than usual-care patients to receive the care specified by the indicators overall (56.4% versus 45.3%; adjusted mean difference 10.4%, 95% CI 4.9%–15.7%) and for each targeted disease state except heart failure. Team-care patients experienced fewer readmissions at 3 months (36.2% versus 45.5%; adjusted odds ratio [OR] 0.63, 95% CI 0.42–

0.94) but not at 6 months (50.7% versus 56.3%; adjusted OR 0.78, 95% CI 0.53–1.15).⁵⁷ In addition, the participating pharmacists, nurse practitioners, and physicians reported their sense that the integration of pharmacists into the teams facilitated positive patient outcomes by improving the team’s drug-therapy decision making, continuity of care, and patient safety.⁸²

More recently, Gillespie et al.⁷² documented that, relative to standard care (without the direct involvement of a pharmacist at the ward level), interventions by ward-based pharmacists, relative to standard care reduced hospital visits by 16% and emergency department visits by 47% in a trial of 368 Swedish patients 80 years of age or older.⁷²

4.1.4 Prescribing by Pharmacists

Hospital pharmacists have also shown that they are very capable of assuming additional patient-related responsibilities, such as prescribing drug therapies. In fact, in the recent *Hospital Pharmacy in Canada 2007/2008 Report* a majority (61%) of respondents reported that prescribing rights for pharmacists have been approved within their respective hospitals.² Collaborative practice models involving pharmacists in a prescribing capacity have been shown to result in improved outcomes and better patient care. As an example, there is extensive evidence from Canada and the United States that pharmacist-managed anticoagulant programs are associated with fewer adverse events and better patient outcomes.⁸³⁻⁸⁹ CSHP advocates the role of the pharmacist as a prescriber and has developed a statement and information paper on this issue.^{90,91}

4.1.5 Educating Patients

Teaching patients about their medications – what they are taking, why they are taking it, how they should take it, and what they can expect – is another way in which pharmacists work to improve the safety of medication administration. Despite current

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evidence suggesting that this service has little effect on patient outcomes, patients should be partners in the prevention of adverse events, and they need to be educated to safely self-administer medications when they go home.⁸¹ As drug experts, pharmacists are best equipped to fulfill this role.

4.1.6 Reconciling Medications and Providing Seamless Care

A major source of preventable ADEs and errors is miscommunication of information when patients are transferred into and out of hospital (so-called medication reconciliation errors). Seamless care is “the desirable continuity of care delivered to a patient in the health care system across the spectrum of caregivers and their environments.”⁹² Medication reconciliation, which is one component of seamless pharmaceutical care, ensures the collection and communication of accurate information about a patient’s medications, with the goal of facilitating continuity of pharmaceutical care for patients at each transition point in the continuum of care.⁹³

Hospital pharmacists in Canada and other countries around the world (Australia, the United Kingdom, and the United States, among others) have been providing seamless care since the mid-1990s, as evidenced by numerous studies investigating issues related to continuity of care during transitions.⁹⁴⁻¹¹³ In an effort to minimize adverse events associated with miscommunication of information at transition points, hospital pharmacists participate in many activities designed to facilitate continuity of care for patients as the patients move across care settings (e.g., from home to hospital and back home again). Examples of these seamless care activities include taking medication histories from patients to help reduce errors on admission to hospital, communicating with community providers, participating in home visits, and discharge planning (which involves medication reconciliation and the promotion of proper drug use at discharge).

Given the number of recent publications in the pharmacy literature highlighting the pharmacist’s role in medication reconciliation, it is clear that pharmacists are showing leadership in this area of patient safety.¹¹⁴⁻¹²³ An example of a recent Canadian pharmacist-led initiative designed to improve the transfer of medication information between healthcare providers is the electronic medication information transfer tool.¹¹¹ At the national level, CSHP has initiated work in this area by establishing a joint task force with the Institute for Safe Medication Practices Canada. CSHP also has an official statement on the role of pharmacists in seamless care.¹²⁴ For more information on the evolution of seamless care and medication reconciliation in Canada, the reader is referred to an essay by MacKinnon.⁹³

4.2 Evidence that “Central” Hospital Pharmacy Activities Improve Quality of Care and Medication Safety

4.2.1 Enhancing the Medication-Use Process

Hospital pharmacists have the ability to influence medication use at various stages of the medication-use process (Table 6). Pharmacists have already led or contributed to the success of activities listed in the “enhance the medication-use process” section of the table.

Although pharmacists are trying to focus more attention on the provision of direct patient care, they still play an important clinical role in reviewing medication orders as part of the dispensing process. In many hospitals, a pharmacist reviews each medication order before the medication is dispensed.¹²⁵ Ninety percent of hospitals responding to the 2007/2008 Hospital Pharmacy in Canada Survey reported that during the hours the pharmacy is open, a pharmacist reviews the prescriber’s order for therapeutic appropriateness before the

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medication is dispensed from a central or satellite pharmacy.¹²⁵ When reviewing a drug order, the pharmacist applies knowledge of drug therapy and additional patient-specific information (e.g., diagnosis, reported allergies, body weight, renal function) to evaluate the appropriateness of the medication order for that particular 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 problems before the patient receives the drug, representing a crucial safety check within the medication-use system. Although the need for such review of medication orders has been questioned recently,¹²⁶ Accreditation Canada supports this role in its *Qmentum Program 2010*.¹²⁷

4.2.2 Creating a Culture of Patient Safety: Reporting Incidents and Performance

Components of a culture of patient safety include nonpunitive error-reporting systems; strategies to anticipate, recognize, and manage situations where patients are at risk; monitoring and publicly reporting performance; and systematically monitoring, recognizing, and reporting adverse events.

The CSHP Standards of Practice promote participation of pharmacy departments in programs for reporting medication incidents and medication discrepancies.¹²⁸ Such programs are critical for analyzing medication-related adverse events and near misses and thus to reduce the potential for future occurrences. The *Hospital Pharmacy in Canada 2007/2008 Report* noted that all of the hospitals responding to the survey had a medication incident reporting system in place; furthermore, most had strategies to report incidents and improve incident reporting, and most had a committee responsible for reviewing medication incidents.¹²⁹ The report also suggested that progress is being made regarding nonpunitive error reporting, with consistent declines in the inclusion of medication

incident reports in assessments of individual healthcare providers' performance (from 32% in the 2001/2002 survey to 11% in the 2007/2008 survey).

Progress is also being made in the use of root cause analysis and failure mode and effects analysis as ways to improve medication safety for patients. Root cause analysis and quality committees and the involvement of pharmacists and other healthcare professionals contribute to the culture of safety. Pharmacists also participate in the development of medication directives and policies that promote safe medication practices, as well as in proactive risk assessments for equipment, technology, and process changes within their respective departments. Some hospitals have pharmacists whose work focuses exclusively on patient and medication safety.¹³⁰ Although not always the leaders in this area, hospital pharmacists are valuable contributors to these quality improvement processes.

5. MOVING FORWARD: HOSPITAL PHARMACISTS' INVOLVEMENT IN QUALITY AND SAFETY INITIATIVES

Pharmacists are ready to be active leaders within and contributors to the quality and patient safety movement.

As a professional society working on behalf of its members, CSHP is engaged in improving the quality of patient care and patient safety. CSHP has established relationships with leaders in the quality and safety movements in Canada and is supporting or leading a number of patient care initiatives (Table 7). It also has a number of official publications relating to quality of care and patient safety.

In part, through these efforts, individual pharmacists and pharmacy departments across Canada continue to be engaged in activities with other healthcare professionals to enhance patient safety. Pharmacists can become involved in teams to develop critical pathways and clinical practice guidelines. As well,

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pharmacy departments can lead the implementation of safety programs, such as medication reconciliation, in their hospitals.

5.1 Targeting Excellence in Pharmacy Practice: CSHP 2015

One of the strategic objectives of CSHP's Vision 2010 was that "CSHP [would] improve patient medication outcomes and safety by advancing practice excellence through CSHP 2015." CSHP 2015 is an adaptation of the American Society of Health-System Pharmacists' 2015 Initiative. It is a quality initiative with 6 goals: helping inpatients make the best use of medications, helping nonhospitalized patients make the best use of medications, making medication use evidence based, making medication use safe, using technology to improve medication safety, and making meaningful contributions to public health. Over the next 6 years CSHP will be educating, facilitating, evaluating, and reporting on CSHP 2015 activities.¹³¹ The *Hospital Pharmacy in Canada 2007/2008 Report* included baseline data on several of these goals and highlighted a number of areas where improvements can be made, for example, increased involvement in direct patient care, implementation and management of evidence-based methods to improve medication therapy, increased role for pharmacists in safe medication use (e.g., review of medication orders before administration of the first dose), and increased use of technology (e.g., clinical decision support for computerized pharmacy order entry systems).¹³²

5.2 Contributing to the Medication Management Standards of Accreditation Canada

Canadian pharmacists worked with Accreditation Canada as that organization was developing its *Managing Medications Standards* as part of its *Qmentum Program 2010*. Through these standards,¹²⁷ Accreditation Canada recognizes the

important role of hospital pharmacists, as highlighted by the following excerpts from the standards:

- "Pharmacists and pharmacy staff are part of the organization's interdisciplinary team."
- "The pharmacy staff and other service providers are involved in designing the organization's medication use and medication management processes."

5.3 Advancing Patient-Centred Pharmacy Practice

The involvement of pharmacists has been shown to decrease the incidence of adverse events and drug therapy problems and to improve patient safety. Working with CSHP staff, hospital pharmacists contribute to the development of programs and publications that help to inspire practice excellence and innovation to advance the practice of patient-centred pharmacy practice. CSHP's advocacy efforts, educational programs (e.g., direct patient care modules, conferences), practice standards (e.g., the Professional Standards for Hospital Pharmacy Practice, published in 2003), statements, and guidelines (on topics such as pharmaceutical care, home healthcare, medication incident reporting and prevention, unit-dose and IV admixture drug distribution, drug packaging and labelling for manufacturers, and liability and risk management), and task forces (e.g., on medication reconciliation and pharmacist prescribing) are examples of initiatives that support an enhanced role in direct patient care for the pharmacist. In addition, the Canadian Hospital Pharmacy Residency Board operates under the auspices of CSHP.

6. CONCLUSION

Direct patient care services provided by hospital pharmacists improve both the quality of medication use and patient safety. Pharmacy departments and pharmacists should also be leading or should be

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involved in system-wide quality and safety initiatives. However, simply having pharmacists involved in these system-wide initiatives is insufficient. If the potential for pharmacists to have a positive influence on quality of care and patient safety is to be fully realized, they must be involved in patient care activities, and adequate time and resources must be allocated to optimize the combination of all these activities. Furthermore, the direct patient care role of the pharmacist as part of the multidisciplinary team should receive additional attention as pharmacists advance in quality and patient safety initiatives.

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Table 1
Strategies to Improve Patient Safety

The Change Foundation³	Agency for Healthcare Research and Quality³⁷
<ul style="list-style-type: none"> • Improving communication within the clinical team • Reporting adverse events • Increasing patient involvement • Developing protocols and guidelines • Managing human resources • Leadership commitment to safety culture • Public disclosure • Educating healthcare providers about a culture of safety 	<ul style="list-style-type: none"> • Use appropriate prophylaxis for venous thromboembolism • Use beta-blockers perioperatively • Use maximum sterile barriers while placing intravenous catheters • Use appropriate antibiotic prophylaxis for patients undergoing surgery • Have patients recall and restate information during informed consent process • Prevent ventilator-associated pneumonia • Prevent pressure ulcers • Perform real-time ultrasonography during insertion of central lines • Teach patients to manage their own warfarin therapy • Institute early enteral nutrition in critically ill patients and patients undergoing surgery • Use antibiotic-impregnated central catheters
Safer Healthcare Now!³⁸	Baker et al.¹⁰
<ul style="list-style-type: none"> • Improved care for acute myocardial infarction • Prevention of bloodstream infections associated with central lines • Medication reconciliation • Rapid response teams • Prevention of surgical site infections • Prevention of ventilator-associated pneumonia • Prevention of harm from antibiotic-resistant organisms • Medication reconciliation in long-term care • Prevention of falls in long-term care • Prophylaxis for venous thromboembolism in general and orthopedic surgery 	<ul style="list-style-type: none"> • Improved information and clinical decision support systems • More consistent delivery of evidence-based care • Development of reporting and learning systems • More effective teamwork • Integration of patient safety and quality improvement into the education of healthcare professionals

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Leapfrog Group ³⁹	Canadian Patient Safety Institute Safety Competencies ⁴⁰
<ul style="list-style-type: none"> • Computerized physician order entry • Staffing of intensive care units with board-certified internists • Evidence-based hospital referral 	<ul style="list-style-type: none"> • Contribute to a culture of patient safety: apply core knowledge, skills, and abilities to everyday work • Work in teams for patient safety • Communicate effectively for patient safety • Manage safety risks, anticipating, recognizing, and managing situations that put patients at risk • Optimize human and environmental factors • Recognize, respond to, and disclose adverse events

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Table 2
Selected Strategies to Improve Medication Safety

Institute of Medicine (To Err is Human)⁷	National Quality Forum (<i>Safe Practices for Better Healthcare</i>)⁴⁴	MacKinnon (<i>Safe and Effective</i>)⁴¹
<ul style="list-style-type: none"> • Adopt a system-oriented approach to reducing medication errors • Implement standard processes for medication doses, dose timing, and dose scales in a given patient care unit • Standardize prescription writing and prescribing rules • Limit the number of different kinds of common equipment • Implement physician order entry • Use pharmaceutical software • Implement unit dosing • Have the central pharmacy supply high-risk intravenous medications • Use special procedures and written protocols for high-risk medications • Do not store concentrated solutions of hazardous medications on patient care units • Ensure the availability of pharmaceutical decision support • Include a pharmacist during rounds of patient care units • Make relevant patient information available at the point of patient care • Improve patients' knowledge about their treatment 	<ul style="list-style-type: none"> • Using computerized prescriber order entry • Incorporating clinical pharmacists into the inpatient medical team during daily rounds • Creating specialized protocols for high-alert medications <p>Other strategies for which the evidence is not as strong but that are commonly recommended:</p> <ul style="list-style-type: none"> • Standardizing prescription writing • Limiting oral orders • Improving systems for identifying medication errors • Adopting system-based approaches to reducing medication errors • Promoting a culture of safety • Implementing bar coding • Unit dosing • Bar coding and smart pumps • Implementing techniques for combatting fatigue (e.g., adequate staffing of professionals involved in medication use) • Eliminating redundancies (e.g., identifying when double-checks add value in decreasing errors) • Echoing and reading back • Using reminders, constraints, and colour differentiation • Implementing systematic approaches that couple continuous surveillance of error reports and alerts • Reviewing good-practice guidance from internal and external sources with proactive prevention strategies 	<ul style="list-style-type: none"> • Timely recognition of drug indications and other signs and symptoms relevant to drug use, along with accurate identification of underlying disease • Safe, accessible, and cost-effective medicines • Appropriate prescribing for explicit (clear, measurable, and communicable) objectives • Distribution, dispensing, and administration of drug products with appropriate patient advice • Participation of patients in their own care (intelligent adherence) • Monitoring (detection and resolution of problems) • Documentation and communication of information and decisions • Evaluation and improvement of products and system performance

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Table 3
What Do Hospital Pharmacists Do?

Provision of direct patient care	Education
<ul style="list-style-type: none"> • Work collaboratively with patients and members of the interdisciplinary healthcare team to optimize health outcomes by identifying, resolving, and preventing drug-related problems; initiate or modify drug therapy; decrease unnecessary drug use; monitor and evaluate response to drug therapy • Promote rational and evidence-based drug use • Identify and report adverse drug reactions 	<ul style="list-style-type: none"> • Provide education to patients and promote patients' engagement in their own care, • Educate healthcare providers (through in-services, medical and/or nursing rounds, participation in conferences, and submissions to reference texts and journals) • Educate undergraduate and graduate pharmacy students • Ensure access to drug therapy expertise
Drug use management	Pharmacy practice and clinical trial research
<ul style="list-style-type: none"> • Provide information on the optimal use of medications • Promote cost-effective use of drugs • Create and maintain hospital formulary • Participate in development of drug policy and clinical practice guidelines at the institutional, provincial, and/or national levels • Evaluate the use of drugs via drug-use evaluation programs (e.g., concordance of medication use with guidelines) 	<ul style="list-style-type: none"> • Participate in multidisciplinary clinical drug trials • Conduct or participate in pharmacy practice research
Management of the drug distribution system	
<ul style="list-style-type: none"> • Verify prescriber's orders, check for drug interactions, and confirm doses • Work to ensure safe, effective, and efficient drug distribution systems • Work proactively to address medication system issues and thus to prevent medication errors • Promote unit-dose drug distribution, computerized physician order entry, use of error-preventive packaging • Provide 24-hour pharmacy services (i.e., on-call pharmacist) 	

(Adapted from *Blueprint for Pharmacy: the Vision for Pharmacy*,¹⁵ and *Hospital pharmacy in Canada 2007/2008 Report*⁴⁸)

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Table 4
Association of Pharmacist Services With Outcomes^{20,67-70,73,75-80}

Service	Mortality		Drug Costs	Total Costs	Length of Stay	Medication Errors	ADR
	1992 Data*	1998 Data**					
Central clinical pharmacy services							
DUE		+		+		-	
In-service education		++	+				++
Drug information	++		++++	++		++	+
Poison information							++
Clinical research	++++			----			++++
Patient-specific clinical pharmacy services							
ADR monitoring		+++		+		+	++
PK consults							+
Drug therapy monitoring							+
Drug protocol management		++++	+	+	++++	++++	++
TPN team participation				--			
Drug counselling							
CPR team participation	+	++					+++
Medical rounds participation		++		++++	+	++++	+++
Admission drug histories	+	+	++	++++		+++++	+++++

Legend: DUE = drug use evaluation, ADR = adverse drug reaction, PK = pharmacokinetic, TPN = total parenteral

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nutrition, CPR = cardiopulmonary resuscitation; “+” indicates a positive correlation with the outcome, “-“ indicates a negative correlation with the outcome (the number of plus or minus signs indicating the relative strength of the correlation), blank cell = no correlation found.

* Data were derived from the 1992 Medicare mortality rates from the Health Care Financing Administration and the 1992 National Clinical Pharmacy Services database.⁸¹

** Data were derived from the 1998 National Medicare Provider and Review (MedPAR), the 1998 American Hospital Association's Annual Survey of Hospitals, and 1998 National Clinical Pharmacy Services databases.⁶⁸



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Table 5
Recommended Core Clinical Pharmacy Services

Service	1992 data*	1998 data**
Participation in cardiopulmonary resuscitation		+
In-service education		+
Management of adverse drug reactions	+	+
Drug information		+
Medical rounds	+	+
Management of drug protocols	+	+
Admission drug histories	+	+

Note: Core clinical pharmacist services were those with at least 2 favourable associations with the 7 healthcare outcomes.

* Data were derived from the 1992 Medicare mortality rates from the Health Care Financing Administration and the 1992 National Clinical Pharmacy Services database.⁸¹

** Data were derived from the 1998 National Medicare Provider and Review (MedPAR), the 1998 American Hospital Association's Annual Survey of Hospitals, and 1998 National Clinical Pharmacy Services databases.⁶⁸

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Table 6
Ways in which Hospital Pharmacists Enhance Patient Safety

<p>Work in multidisciplinary teams</p> <ul style="list-style-type: none"> • Pharmacist provides direct patient care and patient-specific clinical pharmacy services
<p>Promote evidence-based practice and best practices (e.g., preoperative use of beta-blockers, use of angiotensin-converting enzyme inhibitors in heart failure, use of acetylsalicylic acid in patients who have had myocardial infarction, use of prophylaxis for deep vein thrombosis, prevention of ventilator-associated pneumonia and line infections)</p>
<p>Increase patients' involvement in their own care</p>
<p>Create a culture of safety through nonpunitive reporting of errors, education, and remediation, rather than punishment and blame</p> <ul style="list-style-type: none"> • Anticipate, recognize, and manage situations where patients are at risk • Monitor and publicly report performance (e.g., CSHP 2015, benchmarking of clinical performance) • Systematically monitor, recognize, and report (disclose) adverse events (system-oriented approach) • Perform root cause analysis and failure mode and effects analysis
<p>Enhance the medication-use process (which consists of purchasing, ordering or prescribing, dispensing, administration, and monitoring)</p> <ul style="list-style-type: none"> • Remove hazardous medications from wards • Develop strategies to reduce risks of interchanging sound-alike/look-alike products • Maintain a formulary to reduce the number of drugs and concentrations available • Use technology (e.g., computerized physician order entry to reduce transcription errors, clinical decision support systems to improve prescribing) and ensure access to up-to-date information • Improve access to timely information (clinical references, patients' laboratory values, allergy status, etc.) by means of technology or by having a pharmacist on rounding teams • Improve communication <ul style="list-style-type: none"> ○ Standardize abbreviations ○ Limit verbal orders ○ Read back verbal orders and test results ○ Use electronic medical records • Use unit-dose systems and central intravenous admixture services • Institute special procedures for high-risk medications • Standardize processes for medication doses, timing, labelling, and packaging • Improve patient identification • Implement bar-coding, smart intravenous pumps
<p>Improve communication during transitions</p> <ul style="list-style-type: none"> • Use medication reconciliation: compare medications to best possible medication history, and communicate during transitions • Technology (e.g., electronic medical records)
<p>Manage human resources (e.g., maintain adequate staffing levels)</p>

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Table 7
CSHP Partnerships to Promote Quality of Care and Patient Safety

Organization	Status
Canadian Patient Safety Institute	Member organization
Institute for Safe Medication Practices Canada (ISMP Canada)	<p>ISMP Canada and CSHP have signed a Memorandum of Understanding to formally recognize their close working relationship and their mutual commitment to collaborate in the advancement of patient safety.</p> <p>CSHP has a lengthy history of leadership in the advancement of safe medication practices, including the promotion of safe drug distribution systems, the advancement of pharmacists' involvement in direct patient care, and membership in the Canadian Coalition on Medication Incident Reporting and Prevention. CSHP has also played a major role in the development of standards for drug labelling and packaging. As 1 of 3 partners in the Canadian Medication Incident Reporting and Prevention System (CMIRPS) (the other 2 being Health Canada and the Canadian Institute for Health Information), ISMP Canada is now in a unique position to assume a lead in the area of enhanced drug labelling and packaging. This in turn will allow CSHP to concentrate on the direct patient care role of hospital pharmacists, a key component in patient safety.</p>
Safer Healthcare Now!	Partner in the Safer Healthcare Now! Campaign

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GLOSSARY OF TERMS

The following definitions apply for terms used in these guidelines. They may have different meanings in other contexts.

Adverse drug event	Injury caused by a medication (or lack of an intended medication). All adverse drug events result in injury to the patient. ¹³³
Adverse drug reaction	Noxious and unintended response to a drug that occurs at doses usually used in humans for the prevention, diagnosis, or therapy of a disease or for modification of physiologic function. ¹³³
Adverse event	This term has been defined many different ways: <ol style="list-style-type: none"> 1. An unexpected and undesired incident directly associated with care or services provided to a patient.⁶ 2. An incident that occurs during the provision of health care and that results in injury or death for the patient.⁶ 3. An adverse outcome for a patient, including injury or complication.⁶ 4. An event of commission or omission arising during clinical care causing unintended physical or psychological injury to a patient, their family or friends, and not due to the underlying disease process.¹³⁴ 5. “Unexpected and undesired incident directly associated with care or services provided to a patient; an incident that occurs during the process of providing health care and that results in patient injury or death; an adverse outcome for a patient, including injury or complication.”¹³³
Drug-Related morbidity	Failure of a therapeutic agent to produce the intended therapeutic outcome, or the biosocial manifestation of unresolved drug-related problems. ⁴⁶ Drug-related morbidity is an unintended patient injury with a scientifically plausible relationship to either drug therapy or an untreated indication for drug therapy. ¹³⁵ All drug-related morbidity results in injury, whereas only a small percentage of drug-related problems result in injury, and those injuries would not be serious.
Incident	An event, process, practice, or outcome that is noteworthy by virtue of the hazards it creates for patients or the harms it causes to them. ¹³⁴
Medication error	Failure to complete a planned course of action as it was intended or use of an incorrect plan at any point in the process of providing medications to patients. ⁶ Preventable event that can occur at any stage in the medication-use process, leading to patient harm or inappropriate medication use when the medication is in the control of the healthcare professional. Only a small percentage of medication errors result in injury. Any that do result in injury are also classified as adverse drug events. However, not all adverse drug events are classified as medication errors. ⁶
Near miss	An incident that has the potential to result in harm but fails to do so for any of a variety of reasons. ¹³⁴

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Patient safety	“The reduction and mitigation of unsafe acts within the health care system, as well as through the use of best practices shown to lead to optimal patient outcomes.” ⁶ “Freedom from accidental injury”. ⁷
Quality improvement	Activities intended to increase the likelihood of desired health outcomes consistent with current professional knowledge. ⁵
Quality of care	The degree to which healthcare services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge. ¹³⁶ Quality of care has 6 dimensions: ¹³⁷ <ol style="list-style-type: none"> a. Accessibility: Services are obtained in the most suitable setting within a reasonable time and distance. b. Appropriateness: Services are relevant to the user’s needs and are based on accepted or evidence-based practice. c. Effectiveness: The services provided are based on scientific knowledge to achieve desired outcomes. d. Acceptable/patient-centred: The choice of services considers the preferences and goals of individual patients. e. Efficiency: Resources are optimally used in achieving desired outcomes. f. Safety: Risks are mitigated to avoid unintended or harmful results
Underuse	Failure to provide a healthcare service when it would have produced a favourable outcome for a patient. ⁵