Seamless Care: Pharmacists intervene to prevent adverse drug events and optimize drug therapy

Patients are particularly vulnerable to medication discrepancies and adverse drug events when they transition between various care settings. Four Canadian studies highlighted the role that pharmacists play when intervening at strategic points along the continuum of care to improve patient safety and optimize drug therapy.

- Pharmacists play a valuable role in facilitating seamless care at hospital discharge
- Pharmacists intercept clinically significant medication errors
- Medication reconciliation conducted by pharmacists decreases the number of medication discrepancies and potential adverse drug events
- Pharmacists perform medication histories to create discharge plans

Pharmacists play a valuable role in facilitating seamless care at hospital discharge


Issue: Seamless care refers to the continuity of care provided when transitioning from one health care setting to another, allowing pharmacy care to be carried out without any interruptions. Medication reconciliation is a division of seamless pharmaceutical care that involves comparing medications ordered by a prescriber with the medications the patient is actually taking. While seamless care may be a key strategy for improving the medication-use system, it has yet to be implemented in many hospitals, and there are few Canadian studies evaluating the value of these services.

A solution: This study was designed to assess the clinical impact of a seamless care service managed by a pharmacist on drug-related outcomes and overall care.

Of the 99 inconsistencies and omissions identified and resolved by the clinical pharmacist, 90 were significant or very significant.

The无缝穿梭药剂师通过干预来预防不良药物事件并优化药物治疗

患者特别容易在不同医疗护理环境中经历药物差异和不良药物事件。四项加拿大研究强调了药剂师在护理连续性中的作用，特别是在治疗的各个阶段，他们通过干预来改善患者安全和优化药物治疗。

- 药剂师在医院出院时促进无缝护理的宝贵作用
- 药剂师拦截临床显著的药物错误
- 药物重整由药剂师执行，减少了药物差异和潜在的不良药物事件
- 药剂师执行药物历史来创建出院计划

药剂师在医院出院时发挥有价值的作用


问题：无缝护理是指从一个医疗保健环境到另一个环境过渡时，持续提供护理服务，让药物护理能够在没有中断的情况下进行。药物重整是无缝药学护理的一个分支，它涉及比较处方者开立的药物处方和患者实际服用的药物。虽然无缝护理可能是改善药物使用系统的关键策略，但尚未在许多医院实施，而且很少有加拿大的研究评价这些服务的价值。

解决方案：这项研究旨在评估由药剂师管理的无缝护理临床影响。

从99个不一致和缺失中，90个是显著或非常显著的。

The Translator is an initiative launched by the Canadian Pharmacists Association to support the knowledge translation between pharmacy practice research and health policy. Each issue selects a number of pharmacy practice research articles, briefly summarizes them and discusses the health care policy implications. These articles are submitted by Canadian researchers who have a strong desire to support evidence-based health care policy and best practices.
Pharmacists play a valuable role in facilitating seamless care at hospital discharge

Implications: A comprehensive seamless care service managed by a pharmacist significantly improved medication safety and processes of care. This study supports a large, multi-pharmacist and multi-centre pharmacy department, must be surmounted before seamless pharmaceutical care can become standard practice, however; the benefits of these services are only realized once the patient leaves the hospital.


Background or research methods: This randomized, controlled trial was carried out at the Moncton Hospital, South-East Regional Health Authority, New Brunswick, over nine months, with a six-month follow-up period. The 134 patients in the intervention group received thorough seamless pharmaceutical care at discharge, consisting of medication reconciliation, discharge counselling by the seamless care clinical pharmacist, and a comprehensive pharmaceutical care workup to identify and communicate drug therapy problems with the patient’s community pharmacy, hospital staff, and their family physician(s). The 119 patients in the control group received standard care, where the nurse provided the discharge counselling and transcribed the discharge notes manually from the patient’s medical chart. The number and type of DTPs and DTIOs were evaluated at the time of hospital discharge and assessed for their potential impact.

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Pharmacists intercept clinically significant medication errors


Issue: Medication errors at transitions in health care services, such as at admission, transfer and discharge, are especially common and these preventable errors have the potential to harm patients.1 Medication reconciliation is the process of verifying medication use and comparing it to medication orders, identifying discrepancies, and rectifying medication errors at interfaces of care.2 In the national patient safety goals established by the Joint Commission on Accreditation of Healthcare Organizations,3 accurate and complete medication reconciliation is an expectation of all accredited hospitals, yet there are few studies that examine the impact of medication reconciliation on errors at interfaces of care.

A solution: This study was designed to examine the frequency and severity of medication errors during interfaces of care, and the potential impact of medication reconciliation conducted by pharmacists on reducing these discrepancies. Medication reconciliation consisted of a thorough interview by a pharmacist upon admission, where the patient’s medication orders were compared with their medication use history.

It was discovered that 60% of patients had one or more discrepancies in their medications at admission or discharge, with 18% of these regarded as clinically significant. An average of 2.3 unintentional variances per patient was observed. Reconciliation by the pharmacist intercepted 75% of these clinically significant medication errors before harm was caused to patients. Medication discrepancies only resulted in changes to medication orders 49% of the time. This low acceptance of pharmacists’ suggestions may have resulted because the reconciliation pharmacist was not an existing member of the physician/pharmacist team.

The average time pharmacists spent on medication reconciliation at admission was 15 minutes, which was estimated to cost $11 per patient or $64 per clinically significant variance based on a pharmacist’s salary of $35 per hour. This relatively low cost associated with reconciliation significantly outweighs the high health care costs incurred by adverse drug events.

Implications: Medication reconciliation carried out by a pharmacist was an effective means of improving patient safety by identifying and resolving medication variances at hospital admission and discharge. This study is limited by its small sample size, and because it focused on discrepancies in prescription medications. The results of this study support the need for more comprehensive research to confirm the benefits of medication reconciliation led by pharmacists. These studies should also consider discrepancies in herbal products and non-prescription medications. Including medication reconciliation as part of a pharmacist/physician team may also confer further benefits than those discussed in this study.


Background or research methods: This study took place from April 2005 to June 2005 at a teaching hospital in Toronto. Patients were randomized by a computerized random number generator to receive either the intervention or standard care. Patients receiving the intervention were subject to medication reconciliation, where a pharmacist performed a thorough standardized medication history interview to review their home medications at the surgical preadmission clinic. The medications were recorded in a preprinted postoperative medication order form for the surgeon to easily indicate which home medications were to be reordered, and which needed further assessment. Patients receiving standard care had their medication histories gathered by a nurse at the surgical preadmission clinic or over the phone, and medication orders were generated directly by the surgeon.

Financial support: UHN Department of Pharmacy/Residency Program (no external funding provided).

Issue: Patients are highly susceptible to clinically significant medication errors and inconsistencies following admission to hospital. Information about home medications can be accidentally omitted when a patient is admitted to hospital, and these medication errors are often carried through their hospital stay. Patients coming out of surgery are particularly vulnerable as they may not have the capacity to clarify questions regarding their home medications.

A solution: This Surgical Pharmacist in Preadmission Clinic Evaluation (SPPACE) study measured the effect of an intervention of structured pharmacist assessments in the surgical preadmission clinic with the use of a pharmacist-generated order form on reducing medication discrepancies.

A pharmacist performing a structured medication history interview significantly reduced postoperative medication discrepancies in the patient's home medications.

Following surgery, 40% of patients receiving usual care had at least one medication discrepancy.

Forty percent of patients receiving the standard care had at least one discrepancy in their postoperative medications, compared to only 20% of patients receiving the pharmacist intervention. The most common medication discrepancy observed in both the intervention and standard care arms was forgetting to reorder home medications.

The study also investigated the likelihood of a medication discrepancy causing harm to the patient in the form of “discomfort and/or clinical deterioration.” In the standard care arm, nearly 30% of patients had at least one postoperative medication discrepancy with the potential to cause possible or probable harm to the patient (potential adverse drug event), compared to 13% of patients in the intervention arm.

Implications: As medication experts, pharmacists can offer valuable contributions to an interprofessional team by obtaining accurate and complete medication histories. This study demonstrated that incorporating a pharmacist in the surgical preadmission clinic can significantly reduce medication errors at admission to hospital and improve patient safety. Limitations of this study were that it was not blinded and the clinical impacts of the medication discrepancies were determined retrospectively. Future studies should focus on a cost-benefit analysis of implementation of such services and on the contributions pharmacists can make at other risky interfaces, such as hospital discharge.


Pharmacists perform medication histories to create discharge plans


**Issue:** Inconsistencies are frequently noted between discharge medication orders and medication use at home. Elderly patients with medication discrepancies are significantly more likely to be re-hospitalized than patients without discrepancies. A medication discharge plan (MDP), a comprehensive report of the patient’s medications at discharge, has been identified as a tool for reducing medication errors.

**A solution:** The purpose of this study was to evaluate the effect of using and communicating an MDP to the patient’s community pharmacy and family doctor, on the rate of medication discrepancies occurring following hospital discharge. This was evaluated by comparing the discharge orders with the dispensing records from the patient’s community pharmacy and the patient’s self-reported medication use, a few days following discharge.

There was no statistically significant reduction in the rate of medication discrepancies in patients whose MDP was shared with their community pharmacy and family doctor compared to those receiving the usual care. The most common source of medication discrepancies was missing information about medications re-prescribed at discharge without any changes, and medications that were discontinued while in hospital. When the discharge orders were compared to the community pharmacy records, 66% of MDP intervention patients and 68% of patients receiving the usual care had at least one medication discrepancy. When the discharge orders were compared to patient’s self-reported medication use, 62% of the MDP intervention patients and 58% of the usual care patients had at least one medication discrepancy.

**Implications:** The results of this study suggested that communicating an MDP with a patient’s pharmacy and family doctor did not decrease the rate of medication discrepancies occurring between hospital discharge and the community setting. Authors hypothesize that there are many factors contributing to these differences when patients are admitted and discharged from hospital, and several strategies will be required to decrease their frequency. To reflect the real-life value of an MDP, medication histories upon admission need to be more comprehensive, including acquiring patient medication profiles from community pharmacies; clinical ward pharmacists need to be trained in the completion of MDPs, and community pharmacists in the use and the need to incorporate information on the MDPs into patients’ records; and rigorous medication reconciliation needs to be implemented during the hospitalization to ensure that a comprehensive and accurate MDP can be produced at the time of discharge.

**Background or research methods:** This open, randomized controlled trial was conducted from October 2003 to April 2004 at the Cité de la Santé de Laval hospital and in community pharmacies in Laval, Quebec. All patients received the customary pharmaceutical care provided by pharmacists during their hospital stay and at discharge. An MDP was created for all patients prior to randomization. For patients receiving the MDP intervention care (n=42), their MDP was shared with their community pharmacy and family doctor at hospital discharge, whereas patients receiving the usual care were not given a copy of the MDP and it was not sent to their health care providers (n=41).

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**The Translator**

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