



Research

A student pharmacist-led medication reconciliation service and its impact on the identification of drug-related problems in an ambulatory clinic

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Abstract

Introduction: Describe a model of care in which student pharmacists are engaged in medication reconciliation services and document the impact of this model on the identification of drug therapy-related problems.

Material and methods: Student pharmacists in the PY4 year completing a required Advanced Ambulatory Care Pharmacy Practice Experience at a free clinic for indigent, uninsured adults conducted medication reconciliation services immediately prior to the patients' scheduled medical appointment with their physician. Following each encounter, students updated the medication list in the electronic medical record, clarified discrepancies, and identified the presence of drug therapy problems with the patient's physician. The main outcome measures included the presence of drug therapy-related problems, clinical interventions recommended to the provider, and recommendation acceptance rates. Recommendations were further categorized by disease state.

Results: Students documented 673 clinical interventions. The most common type of problem identified was an untreated indication. Providers accepted 89% of the student pharmacists' recommendations. Interventions related to immunizations, hypertension, and diabetes were the most frequent.

Discussion: Student pharmacists can participate in medication reconciliation services in primary care settings at a level that contributes to the identification and resolution of drug-related problems. The utilization of students in this role is an effective strategy for the implementation of medication reconciliation services when resources are limited.

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Introduction

Medication reconciliation is, in the shared definition from the American Pharmacists Association and the American Society of Health System Pharmacists, "the comprehensive evaluation of a patient's medication regimen any time there is a change in therapy in an effort to avoid

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medication errors such as omissions, duplications, dosing errors, or drug interactions, as well as to observe compliance and adherence patterns.”¹ As such, performance of medication reconciliation goes beyond the creation of an accurate medication list. In a study conducted by Nickerson et al., medication reconciliation is a means by which drug-related problems such as unnecessary drug therapy, incorrect dose and drug selection, and adverse drug reactions can be identified.² Previous research has explored which members of the health care team are the best suited to conduct medication reconciliation. Pharmacists, through their unique training to recognize incorrect medications, interactions, inappropriate treatments, and other factors, are arguably the preferred professionals in completing this task based on previous studies.^{3–8} In the 2014 National Patient Safety Goals, the Joint Commission identifies the maintenance and communication of patients’ medication information as a critical measure in all practice settings.⁹ Presently, however, most outpatient clinics and primary care centers do not have a pharmacist to conduct this task. In those that do, it is unlikely that this service can be provided to every patient at every appointment, given the patient to pharmacist ratio. Despite the evidence and support for pharmacists as the leader of medication reconciliation practices, inpatient and outpatient centers are limited by resource issues that prohibit widespread implementation. Strategies to mitigate this barrier are needed for the optimization of medication reconciliation in all settings. One strategy to overcome resource limitations implemented and reported by Pitman et al. utilizes student pharmacist volunteers to conduct medication reconciliation in an inpatient, general internal medicine, and intensive medical care unit in an academic medical center.¹⁰ The impact of this model on outcomes beyond obtaining an accurate medication list was not assessed.

The Accreditation Council for Pharmacy Education (ACPE) requires advanced pharmacy practice experiences (APPEs) in the PharmD curriculum to include experiences that “involve direct patient care ... (and) be of sufficient length to provide both continuity of patient care and an opportunity for the student to practice the competencies associated with that practice setting.”¹¹ The Center for Advancement of Pharmacy Education identifies the ability to identify and resolve medication-related problems as a core educational outcome of student pharmacists.¹² Conducting a medication history and evaluating the information gathered cultivates the skills practiced during APPEs. Previous research has demonstrated the impact of student pharmacists in acute care settings through clinical interventions and recommendations.^{13–28} In these studies, students delivered recommendations through activities including chart review, rounds, and other pharmaceutical care programs; medication reconciliation was not a service students were typically engaged in. Lubowski et al.¹⁵ did specifically look at the impact of students delivering medication reconciliation in a community hospital and found that

students were able to identify and resolve drug-related problems. While this research in the acute care setting has shown that student involvement in medication reconciliation has had a positive impact on the identification and resolution of drug-related problems, it is unknown if a similar effect occurs within the ambulatory practice setting. This limitation was addressed by Mersfelder et al. in their review of the value of student pharmacists to APPE practice sites. While their review demonstrates the valuable role of student involvement in acute care settings, they identify the need for more studies that evaluate students’ impact in ambulatory care.²⁹

In the present study, we describe in detail an innovative approach to deliver a model of care in which student pharmacists are highly engaged in medication reconciliation services. This study also documents the impact of student pharmacists on patient care while delivering medication reconciliation in an ambulatory care setting by quantifying the identification of drug-related problems (DRPs) and the acceptance of recommendations to remedy DRPs.

Materials and methods

This prospective observational study was conducted at an urban indigent care center that provides free medical and dental services to uninsured adults with household incomes less than 200% of the Federal Poverty Level. Patients eligible for care at the center cannot have private or government health insurance and must be between 18 and 65 years of age. Open approximately 40 hours per week, the center is under the direction of a physician and full-time nurse practitioner, with volunteer nurses and physicians providing the majority of patient services, including primary and specialty care. Clinical pharmacy services have been a part of the clinic’s structure since January 2008 through an academic partnership agreement with a school of pharmacy that provides a clinical faculty member approximately 20 hours per week. The clinical services were expanded in April 2009 with the implementation of a pharmacy-led medication reconciliation service.³⁰ In October 2010, due to an increase in patient volume, the primary responsibility for conducting medication reconciliation was transitioned from pharmacists to student pharmacists and became an established service at the site in subsequent years.

Student pharmacists in their PY4 year can choose the rotation site as one of their required Advanced Ambulatory Care Pharmacy Practice Experience or Elective Pharmacy Practice Experience. The rotation is five weeks in length and typically includes three students per rotation. On the first day of rotation, students observe several medication reconciliation encounters with a clinical pharmacist preceptor or pharmacy resident. As the training at the site progresses, they begin to conduct their own medication reviews supervised by the pharmacist preceptor. By the end of the first week of the rotation, students conduct the medication reviews individually, reporting their findings to

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