



The pharmacy clinical experience: A physician-pharmacist trainee collaboration



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ABSTRACT

Adverse drug reactions are a common and preventable cause of hospitalizations in older adults. Therefore, educating physicians and trainees on appropriate medication management is a priority. The Liaison Committee on Medical Education requires graduating medical students to be adequately prepared to collaborate with health professionals from other disciplines. This study aimed to improve medical student confidence and ability to document a patient's complete medication list and improve students' attitudes towards collaboration with pharmacists and pharmacy trainees. Second-year medical students rotated through pharmacist run clinics, working with pharmacists, pharmacy residents, and visiting pharmacy students during their Clinical Skills 2 course. During the session, students practiced documenting the complete medication list for at least one patient. Before and after this pharmacy clinical experience (PCE), they completed a survey asking about their confidence in documenting a complete medication list, the usefulness of the PCE, and their agreement with statements from the Student Perceptions of Physician-Pharmacist Interprofessional Clinical Education (SPICE) instrument regarding attitudes about physician-pharmacist collaboration. Participants also completed a 3-month follow-up survey. The PCE resulted in an increase in understanding of pharmacist and physician roles in an interdisciplinary care team and an increase in confidence in documenting a complete medication list. Students generally agreed that the PCE improved their skills related to the three medication management geriatrics competencies for graduating medical students. This curricular intervention is useful for incorporating interprofessional (IP) experience into the pre-clinical medical school curriculum, especially at institutions where other professional schools may not be represented. Additionally, this intervention addresses gaps in medical student education regarding medication management in order to prepare them for post-graduate training. Surveys and handouts used in the study can be found at the end of this report.

1. Format

The PCE is a 90-min clinical experience in which groups of one to three second-year medical students worked with a pharmacist and pharmacy trainees in a pharmacist run clinic.

2. Target audience

Second-year medical students at the medical school affiliated with a tertiary medical center and fourth-year pharmacy students who were rotating at the medical center in the ambulatory clinical setting.

3. Goals and objectives

Goals:

1. Improve medical student confidence in documentation of a complete medication list.
2. Improve medical student attitudes towards collaboration with

pharmacists and pharmacy trainees.

Learner Objectives (not provided to students prior to the intervention to avoid biasing the results):

After this curricular intervention:

1. Medical students will demonstrate complete documentation of a patient's medication list.
2. Medical students will state an increase in their ability to perform the 3 medication management competencies for graduating medical students (Table 1).
3. Medical students will state an improvement in their confidence related to documentation of a complete medication list.
4. Medical and pharmacy students will state an improvement in their agreement with the SPICE statements^{1,2} regarding physician-pharmacist collaboration.

Program Objectives:

This curricular intervention will:

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1. Provide each medical student with the opportunity to have an IP patient care experience with a pharmacy team.
2. Provide each medical student with the opportunity to work with a patient with polypharmacy or with advanced age (> 65).

Table 1: Geriatrics competencies for graduating medical students related to medication management. In 2007, the Association of American Medical Colleges (AAMC) and the John A. Hartford Foundation (JAHF) hosted a National Consensus Conference on Competencies in Geriatric Education to produce a minimum set of geriatrics competencies for graduating medical students. These comprised 26 competencies in 8 domains. One domain, encompassing 3 competencies, focuses on medication management in older adults³.

4. Activity description

All second-year medical students rotated through one of several pharmacy clinics during their Clinical Skills 2 course, a course designed to teach students necessary physical exam and history-taking skills for patient care. In the 2015–2016 academic year, students rotated through the Anticoagulation Management Service (AMS) clinic or the outpatient Medication Therapy Management (MTM) clinic. The primary focus of the AMS Clinic was to manage warfarin dosing and monitoring for patients, while the primary focus of the MTM clinic was improving health literacy and providing medication reconciliation for patients with polypharmacy or multiple chronic medical conditions. In the 2016–2017 and 2017–2018 academic year students rotated through the AMS, Heart Transplant, or Pre-renal Transplant clinics. One to three medical students worked with pharmacists, pharmacy residents, and fourth-year pharmacy students for a 90-min clinical session.

First, pharmacists reviewed how to perform a medication review and explained the role of the pharmacist and the purpose of the clinic. Then, students joined the pharmacy team for patient encounters. During the sessions, learners practiced documenting the complete medication list for at least one patient. They were provided with a worksheet to record the age and gender of the patients, the name, route, frequency, dose, and indication for all medications. The worksheet also prompted the learner to consider if the patient was taking any unnecessary medications, if the patient had difficulty with medication adherence, and if any changes needed to be made to the patient's regimen (See [Appendix A](#)). Students had the opportunity to ask the pharmacists questions and to participate in the patient encounter.

The Institutional Review Board deemed this study exempt. Likert scores are reported using medians and interquartile ranges given they are ordinal values. All before and after surveys, and before and 3-month follow-up surveys, were matched, and p-values were calculated using paired t-tests.⁴

5. Assessment

Assessment of learner objectives was conducted via 3 surveys: before, after, and 3 months after the PCE. Learners rated their confidence and agreement with the SPICE statements on a 5-point Likert scale.^{1,2} They received hard copies of the before and after surveys and completed them immediately before or after the PCE. A similar 3-month follow-up survey was administered online using REDCap.¹ Additional questions asked participants to reflect upon whether they utilized the skills gained from the PCE and how the experience had affected their

¹ Study data were collected and managed using REDCap electronic data capture tools hosted at the University of Chicago⁵. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing: 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources.

Table 1

Medication management competencies for medical students.

MM1. Explain age-related changes in drug selection and dose based on knowledge of age-related changes in renal and hepatic function, body composition, and central nervous system toxicity
MM2. Identify medications including anticholinergic, psychoactive, anticoagulant, analgesic, hypoglycemic, and cardiovascular drugs that should be avoided or used with caution in older adults and explain the potential problems associated with each.
MM3. Document a patient's complete medication list, including prescribed, herbal and over-the-counter medications and for each medication provide the dose, frequency, indication, benefit, side effects, and an assessment of adherence.

medication review and interprofessional practice. During the second year of the PCE, learners completed an abbreviated after survey. They reported their confidence in documenting a patient's complete medication list and whether the experience changed the likelihood they would consult a pharmacist in the future.

In the first academic year of the PCE (AY 2015–2016), 85 out of 88 participants completed the before and after surveys with a response rate of 93%. Three (4%) of the 85 students were pharmacy students. Response rate for the 3-month follow-up survey was 70/88, or 80%. In the second academic year (AY 2016–2017), 43 of 84 participants completed after surveys for a response rate of 51%. In the third academic year, 68/86 participants completed surveys for a response rate of 79%. In the second and third academic years, all respondents were medical students. The overall response rate was 193/258, or 75%.

5.1. Medication management competencies

Learners turned in their worksheets for assessment of completeness by the investigators. Medication lists were considered complete if students listed the name, route, frequency, and dose for all medications. ([Fig. 1](#)).

In the after survey, participants were asked if the experience “improved [their] understanding of how physiology impacts drug choice and dosing” (competency 1), “improved [their] ability to identify potentially inappropriate and high-risk medications” (competency 2), and “improved [their] ability to document a medication history and perform a medication review” (competency 3). They rated their agreement on a 5-point Likert Scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree). These results are displayed in [Table 2](#).

5.2. Confidence in documenting the medication list

Learners rated their confidence in completely documenting a medication list on a 5-point Likert scale (1 = not at all confident, 2 = slightly confident, 3 = moderately confident, 4 = quite confident, 5 = extremely confident) before, immediately after, and 3 months after the PCE. The median confidence scores are displayed in [Table 3](#). A breakdown of self-reported confidence ratings before, after and 3 months after the PCE are displayed in [Fig. 2](#).

5.3. Attitudes towards interprofessional education

Attitudes towards interprofessional education, particularly regarding physician-pharmacist collaboration, were assessed using the SPICE instrument.^{1,2} Students were asked to rate their agreement with the 10 SPICE statements (here labeled SP1-SP10) on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree). Increasing Likert scale score corresponds to more positive attitudes towards interprofessional collaboration. Attitudes were assessed in before and after surveys and a 3-month follow-up survey ([Table 4](#)).

As is demonstrated in [Table 4](#), for three of the SPICE statements,

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