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Effect of Postdismissal Pharmacist Visits for Patients Using High-Risk Medications

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Abstract

Objective: To determine whether a pharmacist visit after hospital dismissal for patients taking at least 1 medication that places patients at high risk for emergent hospital admissions (termed *high-risk medication*) would decrease the risk of hospital readmission at 30 days compared with usual care.

Patients and Methods: This was a retrospective study at a tertiary care center conducted from July 26, 2013, through April 1, 2016. We reviewed outcomes among patients who did or did not have a post—hospital dismissal pharmacist visit immediately before a clinician visit. We included patients who were at least 18 years old and were taking at least 10 total medications at hospital dismissal, 1 or more of which were high-risk medications. A Cox proportional hazards model was used to compare the risk of 30-day readmission between the groups.

Results: The study cohort included 502 patients in each group (pharmacist + clinician group and clinician-only group). After adjusting for differences in background demographic characteristics, patients in the pharmacist + clinician group were significantly less likely to be readmitted to the hospital within 30 days postdismissal compared with the clinician-only group (hazard ratio, 0.49; 95% CI, 0.35-0.69; $P<.001$).

Conclusion: Patients seen by a pharmacist immediately before a clinician visit after hospital dismissal had a lower risk of readmission than patients who had a clinician-only visit. Patients taking high-risk medications for hospital admissions are ideal candidates for pharmacist involvement.

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Adverse drug events are the most common preventable adverse events that occur after hospital dismissal.[1] In patients older than 80 years, adverse drug events were found to be involved in nearly 25% of readmissions.[2] Because of their expertise in pharmaceutical care, pharmacists have had more opportunities to be involved in transitions of care to help prevent adverse drug events. Several initiatives involving pharmacist visits in primary care during care transitions have led to decreases in hospital readmission rates.[3-8] Expanding pharmacist involvement has the potential for substantial financial impact, given the potential for decreased reimbursement for higher 30-day readmission rates, per the Affordable Care Act of 2010.

Although many drugs may cause adverse events, 3 studies have highlighted certain medications that place patients at high risk for adverse drug events specifically leading to hospital admission, termed *high-risk medications*.[2,9,10] Studies have identified anticoagulants, antiplatelet agents, and diuretics as high-risk medications. Other medications, however, such as insulin and oral hypoglycemic agents, have also been listed as among the medications with the highest risk.[2,9,10]

Given that adverse drug events requiring hospitalization are more common with certain classes of medications, focusing pharmacist visits on care transitions involving these medications may decrease readmission risk. The existing literature has yet to focus on pharmacist care transition visits in patients taking only high-risk medications.

The objective of this study was to determine whether a pharmacist visit after hospital dismissal for adult patients taking at least 10 medications, with a minimum of 1 high-risk

medication, would decrease the risk of hospital readmission at 30 days compared with usual care (UC).

PATIENTS AND METHODS

Design, Setting, and Participants

The Mayo Clinic Institutional Review Board approved this study. This retrospective study includes patients seen at 6 different primary care practice sites (in either the Department of Family Medicine or the Division of Primary Care Internal Medicine) of Mayo Clinic in southeastern Minnesota from July 26, 2013, to April 1, 2016. Patients with any admission diagnosis were eligible for inclusion if they were 18 years or older, had been dismissed from the hospital within 30 days, had at least 10 medications on their discharge summary list, and had at least 1 high-risk medication on their discharge summary list. High-risk medication classes included oral anticoagulants, low-molecular-weight heparins, antiplatelet agents, insulin, noninsulin hypoglycemic agents, and loop diuretics (Supplemental Appendix, available online at http://www.mcpiqojournal.org). Patients were excluded if they were postpartum within 30 days, were pregnant, were prison inmates, or declined research authorization.

Patients were classified by whether they had a visit with a clinician only (the UC group) or a pharmacist plus a clinician (the pharmacist and clinician collaborative [PCC] group). If any patient had multiple qualifying visits within the time frame, the first qualifying visit was assessed. Patients in the UC group were seen by a clinician only for a 30-minute visit; patients in the PCC group were seen by a pharmacist for 30 minutes immediately before a 30-minute clinician visit. Clinicians include physicians, nurse practitioners, and physician assistants and were members of the Department of Family Medicine or the Division of Primary Care Internal Medicine.

During the visit in the PCC group, a pharmacist completed medication reconciliation, identified medication discrepancies, screened for drug interactions and high-risk medications, assessed adherence, identified drug therapy problems, and documented a clinical note on a standard documentation template. All recommendations were shared with the provider via verbal, written, or electronic means before the provider appointment with the patient. During the study period, 12 different pharmacists conducted visits. All pharmacists are credentialed by the study institution to deliver medication therapy management services and were authorized via a collaborative practice agreement to initiate, modify, or discontinue medications used to treat chronic diseases on the clinician's behalf. Pharmacists intentionally limited collaborative practice agreement use during their portion of the visit so that the pharmaceutical care plan could be discussed with the clinician and agreed upon before the clinician implemented the plan with the patient.

Outcomes

Our institutional electronic health record (EHR) was reviewed for patient characteristics and clinical variables, including the LACE index (*L*ength of stay, *A*cuity of admission, *C*omorbidities, *E*mergency department visits during previous 6 months), which predicts the risk of death or unplanned readmission within 30 days after dismissal from the hospital.[11] The study sites have 2 affiliated hospitals within the same community. Records of hospitalizations within these hospitals and 12 affiliated hospitals in the surrounding area were available in the EHR, and these were reviewed to abstract outcomes data on readmissions. The prespecified primary outcome measure was risk of readmission at 30 days after index hospital dismissal. Secondary outcomes were risk of readmission at 60 days and 180 days after dismissal.

For the PCC group only, additional descriptive outcomes were assessed. These included the number of drug therapy problem recommendations per patient made by the pharmacist and the number of drug therapy problem recommendations per patient made by the pharmacist relating specifically to high-risk medications, as determined from the documentation. We defined a *drug therapy problem* as "any undesirable event experienced by a patient that involves, or is suspected to involve, drug therapy and that interferes with achieving the desired goals of therapy and requires professional judgment to resolve."[12] Drug therapy problems were classified on the basis of the approach by Cipolle et al[12] and included the categories *indication*, *efficacy*, *safety*, and *adherence*. The EHR was also reviewed for the percentage of drug therapy problem recommendations that were acted on