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Original Investigation

Targeted Deprescribing in an Outpatient Hemodialysis Unit: A Quality Improvement Study to Decrease Polypharmacy

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Background: Polypharmacy in hemodialysis patients can result in adverse patient outcomes. Deprescribing tools can reduce polypharmacy, yet no method exists for an outpatient hemodialysis population.

Design: Quality improvement study.

Setting & Participants: 240 patients in a tertiary-care outpatient hemodialysis unit.

Quality Improvement Plan: We aimed to: (1) develop a deprescribing tool for target medications with poor evidence for efficacy and safety, (2) determine its effectiveness in decreasing polypharmacy, and (3) monitor patient safety and satisfaction.

Outcomes: The primary outcome was the proportion of target medications completely deprescribed after 4 weeks. Secondary outcomes were the proportion of target medications completely deprescribed after 6 months, average number of medications per patient before and after deprescription, and proportion of successful deprescriptions for each target medication.

Measurements: Number of medications deprescribed at 4 weeks and 6 months. Patient safety and satisfaction were monitored using drug-specific monitoring parameters.

Results: A deprescribing tool for specific medications was developed and implemented in the hemodialysis unit. 5 medication classes were selected: quinine, diuretics, α_1-blockers, proton pump inhibitors, and 3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitors (statins). All 240 patients in the unit were screened using the deprescribing tool. There were 171 of 240 (71%) patients prescribed at least 1 of the 5 target medications, and after applying the tool, 35 of 40 (88%) eligible patients had the medications deprescribed. There were 31 of 40 (78%) target medications completely deprescribed. 6 months after the study, only 5 of 31 (16%) medications discontinued were represcribed. At the end of the study, 57% of patients were taking fewer medications than at baseline. No adverse events were observed.

Limitations: Single-center study that relied on patient self-reporting of medication use and adherence to our recommendations.

Conclusions: Deprescribing tools can be applied successfully in an outpatient hemodialysis unit to reduce polypharmacy while maintaining patient safety and satisfaction.

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INDEX WORDS: Deprescribing; polypharmacy; hemodialysis (HD); medication optimization; patient safety; quality improvement activity; pill burden; end-stage renal disease (ESRD); elderly; potentially inappropriate medications; medication prescribing patterns; outpatient HD.

Editorial, p. 596

Polypharmacy, defined as "the use of multiple medications or the use of more medications than are medically necessary,"[1,p57] is associated with decreased adherence to medication regimens and increased risk for adverse effects, falls, hospital admissions, and mortality.[2-8] Hemodialysis patients are at increased risk for polypharmacy because they have the highest pill burden of all chronically ill patient populations, with an estimated average of 12 medications per day.[9,10] In addition to taking numerous medications, patients on hemodialysis therapy are rarely included in clinical trials, leading to uncertainty about the efficacy and safety of many drug therapies.

One strategy to reduce polypharmacy and suboptimal medication use is deprescribing.[3-6,8,11] Deprescribing has been defined as "the process of tapering, stopping, discontinuing, or withdrawing drugs, with the goal of managing polypharmacy and improving

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outcomes."[7, p201] Because seniors commonly experience polypharmacy, many studies have examined deprescribing in this patient population.[3-6,8,11] The use of specific tools and algorithms to guide deprescribing can effectively reduce polypharmacy by decreasing the number of medications that patients are taking per day.[3,5,11] These studies suggest that such tools are also associated with decreased mortality, fewer referrals to nursing homes, lower drug costs, and improvements in patient's perception of their global health.[3,5-6,11] Furthermore, the deprescribing tools have shown no increased risk for long-term adverse outcomes.[3,5-6,11]

Deprescribing tools fall into 2 distinct groups: general tools and specific tools. General tools provide a guide for the overall reassessment of a patient's current medications.[6,11] Specific tools target the deprescribing of specific medications with the use of algorithms and are developed based on the evidence for efficacy and safety of these drug therapies. An example of a specific tool that has been validated for elderly inpatients involves the use of the STOPP (Screening Tool of Older Persons' Potentially Inappropriate Prescriptions) and START (Screening Tool to Alert to Right Treatment) criteria. This tool was developed to reduce the misuse of medications, prevent adverse drug reactions, and decrease drug costs.[5]

Existing deprescribing tools cannot be applied to an outpatient hemodialysis population because they have not been validated for this indication. Therefore, the aim of this quality improvement study was to develop a specific deprescribing tool for hemodialysis patients and determine its ability to reduce polypharmacy while maintaining patient safety and satisfaction.

METHODS

This study was conducted at a large tertiary-care hospital (University Health Network, Toronto, ON, Canada) and included patients on conventional in-center hemodialysis therapy (4 hours per treatment, 3 times per week) from May 1, 2014, to March 31, 2015. The hemodialysis center is composed of a multidisciplinary team including 10 staff nephrologists, 2 nephrology fellows, 1 nurse practitioner, 1 pharmacist, 2 or more pharmacy trainees, and other allied health professionals, including dieticians, social workers, and nurses. Pharmacists do not prescribe on the unit. There are 3 dialysis sessions per day, each with about 45 patients. The multidisciplinary team rounds once a month with monthly blood work, as well as once a week for follow-up on issues. Medication reconciliation occurs at least once per month and after any hospital discharge. This is usually conducted by a pharmacy trainee or nurse.

This study was composed of 3 phases. The first phase was to develop the deprescribing tool; the second, to refine the medication-specific algorithms included in the tool; and the third, to implement and assess the impact of the tool. Approval for this quality improvement study was received from the research ethics board at the University Health Network. The plan for the quality improvement activity was approved by the clinical leadership team of the organization.

Phase 1: Development of Deprescribing Tool

Target medications were selected based on a review of 50 hemodialysis patient charts, the current evidence for the efficacy and safety of these medications, and consultation with the nephrology team (nephrologists, pharmacists, and nurse practitioners). A search using PubMed and MEDLINE from 1950 to

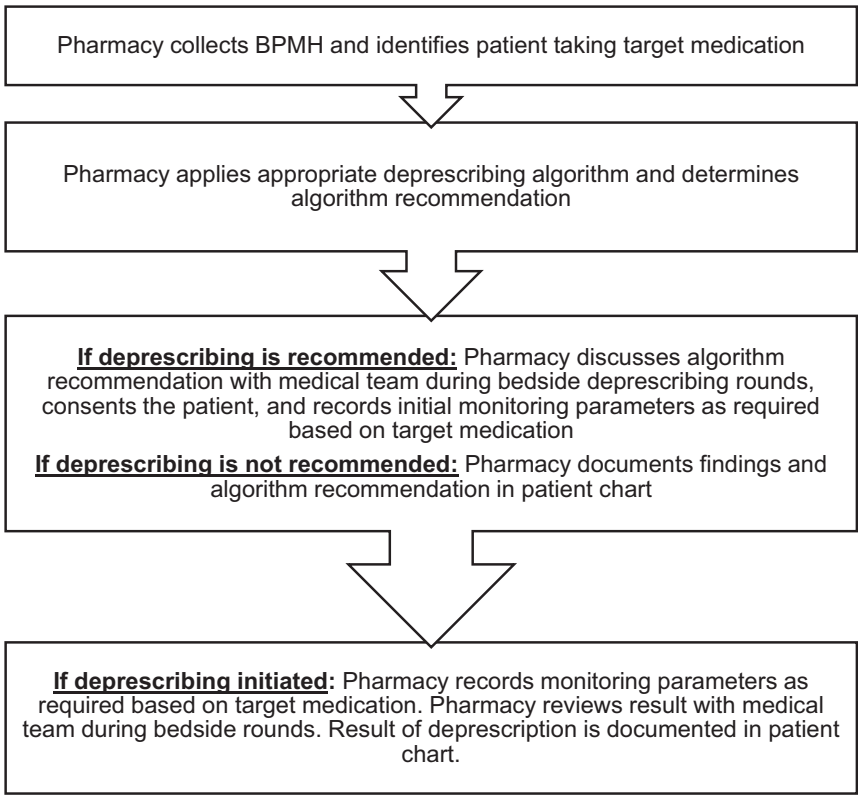

Figure 1. Overview of deprescribing algorithm implementation. No medications for which there was a valid indication (as defined by the algorithm) were included in the study. Abbreviation: BPMH, best possible medication history.