

Thoughtful Prescribing and Deprescribing



Vassiliki Pravodelov, MD^{a,b,*}

KEYWORDS

- Polypharmacy • Older adults • Deprescribing
- Potentially inappropriate medications • Shared decision making

KEY POINTS

- Potentially inappropriate medications and polypharmacy have been associated with adverse events in the older adult population.
- Deprescribing is an important element of the thoughtful prescribing process and can help decrease inappropriate polypharmacy.
- Shared decision making and consideration of patient goals are essential for successful deprescribing.
- Algorithms and clinical decision tools are available to assist providers with identifying potentially inappropriate medications and applying the deprescribing process.

OVERVIEW

In this article, we (1) discuss polypharmacy and deprescribing of potentially inappropriate medications (PIMs) in the older adult population; (2) explore the benefits, risks, barriers, and enablers of deprescribing; and (3) review and apply the deprescribing process to a patient case.

INTRODUCTION TO OUR CASE

An 81-year-old woman presents to the clinic for a geriatric assessment. Her medical problems include Parkinson disease complicated by mild dysphagia, knee osteoarthritis complicated by falls, hypertension, and type 2 diabetes mellitus. The patient's main concern is fatigue and difficulty managing a long list of medications. She reports difficulty swallowing multiple pills at the same time, especially "the really large pills." The patient notes that her goal is to improve her current quality of life and functionality

^a Section of Geriatrics, Department of Medicine, Boston University School of Medicine, 72 East Concord Street, Robinson 2, Boston, MA 02118, USA; ^b Boston Medical Center, One Boston Medical Center Place, Boston, MA 02118, USA

* Section of Geriatrics, Department of Medicine, Boston University School of Medicine, 72 East Concord Street, Robinson 2, Boston, MA 02118.

E-mail address: vpravode@bu.edu

by managing her parkinsonian symptoms as much as possible. She does not want any invasive interventions. On review of the record, the patient's hemoglobin A_{1c} was 5.2% a few weeks before the visit. Her blood pressure is 130/74. The patient has brought in all her medications. She is taking acetaminophen and naproxen for knee osteoarthritis, carbidopa-levodopa for Parkinson disease, losartan for hypertension, metformin for diabetes mellitus, pantoprazole, baby aspirin, simvastatin, and a calcium/vitamin D daily supplement. The patient notes difficulty swallowing metformin, simvastatin, and her calcium/vitamin D supplement because of the size of the tablets. She asks, "Do I need all these medications?"

POLYPHARMACY

Polypharmacy is commonly defined as taking five or more regularly prescribed medications.¹ Studies suggest that polypharmacy is common in older adults.^{2,3} This is likely multifactorial. Older adults can have many chronic conditions. Clinical practice guidelines for individual conditions often lead to polypharmacy, which can initially seem rational but may be problematic in older adults with multiple comorbidities; especially because this population is often excluded from trials used to develop clinical practice guidelines.⁴ Prescribing cascades (prescribing a medication to manage a side effect of another medication) may also lead to problematic polypharmacy.^{5,6}

POTENTIALLY INAPPROPRIATE MEDICATIONS

With a vast number of medications prescribed in the older adult population, the use of PIM is common.^{7,8} Potentially inappropriate prescribing may include overprescribing, misprescribing, or underprescribing.⁹ As patients age, their physical and functional condition may change, as do their goals of treatment or what matters to them most. Therefore, a medication that had been appropriately prescribed in the past may become inappropriate later in life because of its risks outweighing any potential benefits for the particular patient.

Polypharmacy and the use of PIM is harmful in older adults with studies showing its association with decreased quality of life and increased adverse drug reactions, falls, hospitalizations, and mortality.¹⁰ Budnitz and colleagues¹¹ identified the medications and medication classes accounting for the most emergency department visits for adverse drug events among older adults in the United States. Warfarin, insulin, oral antiplatelet agents, and oral antihyperglycemics topped the list.

As part of the Choosing Wisely campaign, the American Geriatrics Society recommended conducting a medication reconciliation before prescribing a medication to identify polypharmacy and PIMs.¹²

Several tools have been published to assist with the identification of PIMs. In the United States, the Beers Criteria was first published in 1991 and it includes medications that can cause adverse effects in the geriatric population and therefore, should be avoided or used with caution. The most recent update, the 2019 AGS Beers Criteria for Potentially Inappropriate Medication Use in Older Adults, includes a comprehensive list of medications and drug classes whose risks may outweigh their benefits in older adults in general and in conjunction with specific comorbidities.¹³

In addition, the STOPP (Screening Tool of Older Person's Prescriptions) and START (Screening Tool to Alert Doctors to Right Treatment) screening tools can help providers identify PIMs.¹⁴⁻¹⁶ In 2015, experts from seven European countries published the EU(7)-PIM list containing PIMs for older adults along with dose adjustments and therapeutic alternatives.¹⁷

Table 1 lists commonly prescribed medication classes that may be inappropriate because of their potential for harm in older adults.^{13,14,17}

WHAT IS DEPRESCRIBING?

In response to the prevalence of polypharmacy and inappropriate prescribing, deprescribing was suggested as a method to minimize harm.³¹ Deprescribing is defined as the positive patient-centered process of stopping or reducing the dose of medications that are considered inappropriate for a particular patient because their risks outweigh their potential benefits, they are unnecessary, or they are ineffective.³² The deprescribing process is supervised and directed by a health care professional through shared decision making and its goal is to manage polypharmacy and reduce harm according to patient priorities.^{31,32}

Common reasons to consider deprescribing medications in the geriatric population are listed in **Table 2**.

DEPRESCRIBING: BENEFITS AND RISKS

Deprescribing, as a response to polypharmacy and inappropriate prescribing, is believed to reduce harm associated with PIMs. A systematic review by Page and

Table 1 Common medication classes that may be inappropriate in older adults because of their potential for harm	
Medication Class	Potential Risks
Proton pump inhibitors ^{13,14,17–19}	Osteoporotic fractures <i>Clostridium difficile</i> infection Kidney injury
Benzodiazepines ^{13,14,17,20,21}	Confusion Falls
Antihyperglycemics ^{13,14,17,22–24}	Depending on pharmacologic class Hypoglycemia Pancreatitis (GLP-1 receptor antagonists, DPP-4 inhibitors) Worsening heart failure symptoms (DPP-4 inhibitors) Genitourinary infections (SGLT2)
Cholinesterase inhibitors ^{14,25–27}	Gastrointestinal symptoms Bradycardia Confusion
Antipsychotics ^{13,14,17,28}	Increased risk of stroke, cognitive decline, and mortality in patients with dementia
Nonsteroidal anti-inflammatory drugs ^{13,14,17,29}	Gastrointestinal bleeding Kidney injury Hypertension
Anticholinergics ^{13,14,17,30}	Confusion Dry mouth Constipation and urinary retention
Nonbenzodiazepine hypnotics ^{13–15,17,30}	Confusion Falls

Data from Refs.^{13,14,17–30}

Table 2	
When to consider deprescribing in older adults	
Reasons for Deprescribing	Clinical Examples
Medication risks outweigh potential benefits	β -Blocker used in a patient with orthostatic hypotension and multiple falls. Trimethoprim-sulfamethoxazole prescribed for a patient with chronic kidney disease who is already taking an angiotensin-converting enzyme inhibitor.
Medication may be inappropriate (PIM)	Zolpidem used for insomnia in a patient with falls. Sulfonylurea used in a patient with aberrant feeding pattern and frequent hypoglycemic episodes.
Medication is not necessary	Chronic proton pump inhibitor used in an asymptomatic patient. The medication was started 2 y ago for acid reflux, which has since resolved. Daily multivitamin in an asymptomatic patient without malnutrition.
Medication is ineffective	Cholinesterase inhibitors used for years for a patient with end-stage dementia without providing an observed additional benefit.
Medication is burdensome and difficult to adhere to	Medications that must be administered multiple times daily (eg, hydralazine, carvedilol, labetalol) when other alternatives exist to decrease burden and improve adherence.
Medication does not align with patient wishes	Multiple medication classes used per guideline recommendations for one condition (eg, heart failure) but patient's primary goal is to minimize polypharmacy and pill burden.
Medication time-to-benefit inconsistent with patient prognosis	Preventive medications used in patients on hospice care (eg, statin, aspirin).
Medication may be contributing to an adverse drug effect	Symptomatic bradycardia in a patient with dementia who was started on donepezil.

Data from Refs. ^{13,18,31–33}

colleagues³⁴ determined that, among nonrandomized studies, deprescribing was found to decrease mortality. Among randomized studies, deprescribing did not have a significant effect on mortality.³⁴

Studies have shown that deprescribing may be beneficial for patients with limited life expectancy. For example, in Kutner and colleagues³⁵ patients whose life expectancy was less than 12 months had no mortality difference at 60 days if statin was deprescribed. Furthermore, patients who stopped statin had a significantly better quality of life. Statin deprescribing for older adults who are not at their end of life remains controversial.^{36,37}

Risks of deprescribing include the possibility of rebound or withdrawal symptoms. A Cochrane review of deprescribing antipsychotics in patients with dementia showed that stopping an antipsychotic may be feasible and may have a minor important effect on behavioral symptoms and cognitive function. The authors, however, note that two

Box 1**Patient-related barriers to deprescribing**

- Fear of adverse drug withdrawal effects
- Fear of changing the “status quo”
- Disagreement with deprescribing reasoning
- Negative “influences” to deprescribe medication (eg, previously told they should take the medication “for the rest of their life,” influence from family/caregivers/friends)
- Absence of a deprescribing process

Data from Refs. ^{41–44}

of the included studies, who only included patients who had responded to antipsychotic treatment, suggested an increased risk of rebound symptoms after discontinuation of antipsychotics.³⁸

Overuse and misuse of proton pump inhibitors (PPI) have been described in the literature, especially with rising concerns regarding possible adverse effects with their long-term use.¹⁸ Studies suggest that, despite the risk of rebound symptoms, deprescribing PPIs is feasible, especially if medication tapering is used.^{39,40}

BARRIERS TO DEPRESCRIBING

Surveys among patients and providers have described several barriers to deprescribing.^{41,42} Some of the most important barriers identified in the literature are summarized in **Boxes 1** and **2**.

Box 2**Provider-related barriers to deprescribing**

- Assumption that patient/caregiver is not interested in deprescribing
- Fear of adverse drug withdrawal effects
- Fear of changing the “status quo”
- Difficulty with medication reconciliation (patient receiving medications from multiple providers, multiple pharmacies, multiple institutions)
- Reassigning responsibility to another provider
- Pressure from clinical practice guidelines to prescribe
- Lack of skills in identifying and managing polypharmacy, PIM, and deprescribing
- Lack of time: clinic visits are too short and deprescribing may not be the most pressing issue on the agenda
- Lack of organizational support: deprescribing requires effort and close monitoring
- Concern that effective alternatives are not available
- Fear of consequences in quality measures
- Ambiguity regarding feasibility of deprescribing
- Unclear medication indication

Data from Refs. ^{41,42,45}

ENABLERS FOR DEPRESCRIBING

Studies suggest that patient-centered interventions for deprescribing are more effective than non-patient-centered interventions.⁴⁶ Patients are interested in reducing the number of medications they take if their provider thought it would be possible.⁴³ Therefore, engaging the patient and/or caregiver in the deprescribing process is crucial for its success. Jansen and colleagues⁴⁷ described a four-step deprescribing process for older adults focused on shared decision making: (1) creating deprescribing awareness, (2) discussing options, (3) exploring patient preferences, and (4) making the decision.

Including a multidisciplinary team with clinical pharmacists and/or nursing staff for close monitoring can help with the logistical constraints faced by primary care clinicians. Interdisciplinary teams, such as The Geriatric Patient-Aligned Care Team (GerIPACT) in the Veteran Affairs system, have shown promise in augmenting the deprescribing process in older adults.⁴⁸

THE PROCESS OF DEPRESCRIBING

Deprescribing is an essential element of the thoughtful prescribing process. When a medication is prescribed, its effectiveness, indication, potential benefits and harms, and alignment with the patient's preferences should be reassessed at regular intervals to ensure its appropriateness.⁴⁹

The literature includes multiple different approaches to deprescribing. Deprescribing interventions can take place in various settings (outpatient, long-term care, inpatient)^{50,51} and target different patient populations (older adults, patients at the end of life, patients with cognitive impairment, cancer, human immunodeficiency virus, chronic kidney disease).^{21,46,52–60}

Most deprescribing processes in the literature emphasize the importance of patient/caregiver involvement (or “buy-in”) in the deprescribing process. Reeve and colleagues³¹ summarized the importance of “consumer involvement” in the process. Ouellet and colleagues⁵⁸ described a rational prescribing and deprescribing process based on “what matters” most to older patients while weighing the risks and benefits of medications. This is achieved through shared decision making. In a recent article, Green and colleagues⁵⁷ described helpful language that can facilitate conversations between clinicians and patients/caregivers to improve appropriate prescribing.

Essential steps of the deprescribing process based on the available literature were collected and visually summarized in **Fig. 1**.^{19,20,22,28,31–33,46,47,61}

PRACTICAL PRESCRIBING AND DEPRESCRIBING RESOURCES IN THE CLINIC

Multiple resources are available to assist clinicians with deprescribing. Canada, Australia, and several European countries have developed extensive online resources, many of which are free to use^{62–65}. The Canadian Deprescribing Network⁶⁶ is well-established and its website includes a plethora of practical clinician-oriented algorithms, patient handouts, and educational videos (<https://deprescribingnetwork.ca>). In the United States, the US Deprescribing Research Network (USDeN) was launched in November 2019. The USDeN is funded by the US National Institute of Aging and it aims to help promote deprescribing research in order to improve appropriate medication use among older adults.⁶⁷ Its website (<https://deprescribingresearch.org/>) contains links to useful online deprescribing resources for practicing clinicians, investigators, as well as patients.

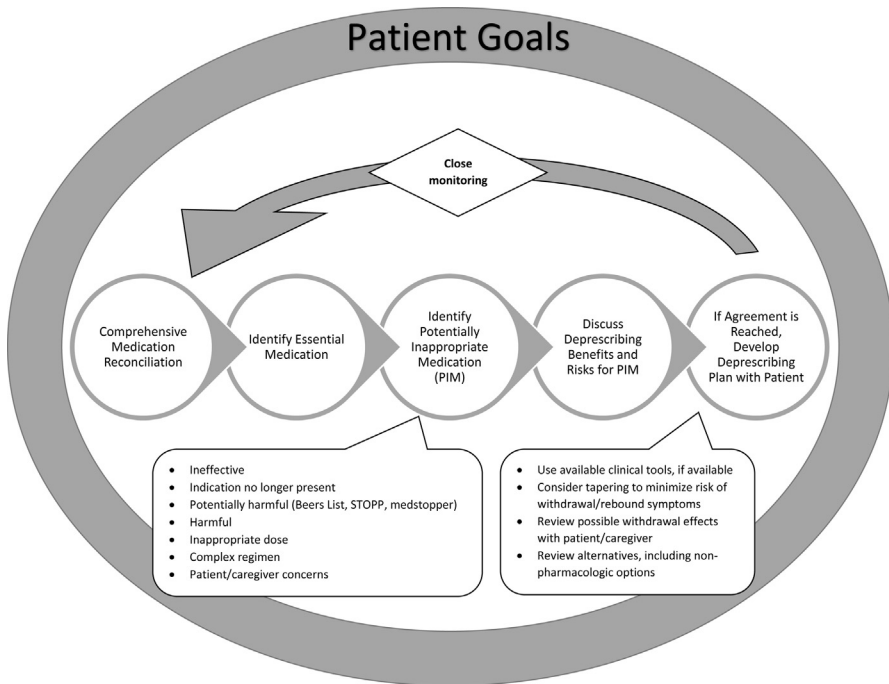


Fig. 1. Deprescribing process.

APPLYING THE DEPREScribing PROCESS TO OUR CASE

Our patient has multiple chronic medical conditions and a long medication list. Next we apply the steps of the deprescribing process as shown in [Fig. 1](#).

Detailed medication reconciliation is done using the “brown bag” method.⁶⁸ We identify potentially essential medications. We also find that the patient is experiencing polypharmacy and PIMs: her list contains medications that may be contributing to her presenting symptoms, medications that may no longer be indicated, medications without an associated diagnosis, and medications whose benefits may no longer outweigh their risks.



On discussion with the patient, we discover that she has concerns about how her current medications may be affecting her everyday life and how they may be contributing to some of her symptoms (dysphagia, fatigue, falls). She would like to simplify her medication list if her clinical providers think it would be possible.





We then take a closer look at her medication list and we identify areas to further clarify with the patient. These are listed in [Table 3](#).

We work with the patient to prioritize her concerns and develop a deprescribing plan. Based on what matters most to the patient and our previous medication-related discussion, we agree on the following deprescribing plan:

- It is unclear what is causing her fatigue but hypoglycemia may be contributing. In 2019, the American Diabetes Association suggested that A_{1c} goals for older adults are less stringent (<7.5%–8.5% depending on comorbidities, cognitive function, and functional status).²⁴ Her A_{1c} (5.2%) is well below her goal based on her age and comorbidities. Besides, the patient has difficulty swallowing the medication because of its size. Therefore, as a first step, it is reasonable to stop metformin. The patient readily agrees to stop metformin but is worried about

Table 3
Polypharmacy and PIM concerns for the patient

Medication	Concerns	Patient Clarification	PIM?
Acetaminophen	Appropriate dose? Effective?	The patient says she takes this as needed, 325 mg at a time. She does not use it more than twice daily. She is not sure if it is effective.	
Naproxen	Appropriate dose? Any adverse events?	The patient takes this when the knee pain is worse than usual, about twice a month. She takes it twice daily during flare-ups. She finds it worrisome that it could make her hypertension worse.	
Carbidopa-levodopa	Appropriate dose? Effective? Monitored by a neurologist?	She takes the medication as prescribed by her neurologist, 4 times daily. She notices improvement in stiffness after taking the medication. She last saw her neurologist 3 months ago and has an upcoming appointment next month.	
Losartan	Any adverse events, such as dizziness?	It is hard to tell whether she has any dizziness after taking this because she takes it with most of her other medications. She has been taking this medication for more than 10 y now.	
Metformin	Any adverse events, such as dizziness, fatigue, dyspepsia? Burdensome?	She is uncertain if she has any dizziness after taking this because she takes it with most of her other medications. She has a hard time swallowing the pill because of its large size. The patient is wondering if there is a smaller pill formulation for her to try.	

Pantoprazole	Indication for use? Appropriate administration?	She is not sure why she is taking this. The patient reports she had acid reflux in the past but has not had any symptoms in years. She has never been diagnosed with esophagitis, Barrett esophagus, or peptic ulcer disease. She takes the medication before breakfast.	
Aspirin	Indication for use? Any adverse effects, such as acid reflux or gastrointestinal bleed?	The patient is not sure why she is taking this. She was told by her doctor years ago that she has to take it "for life" to protect her heart. She has never had a heart attack or a stroke. She had acid reflux symptoms in the past, now resolved. She has not noticed any blood in her stool.	
Simvastatin	Indication for use? Burdensome? Any adverse effects, such as muscle aches?	She is not sure why she is taking this. She does note difficulty swallowing the medication because of its size. She has not noticed any persistent muscle aches.	
Calcium/vitamin D	Indication for use? Burdensome?	She started taking this years ago because she heard that calcium and vitamin D can help keep her bones strong. She obtains it over the counter. The patient says she had a test for osteoporosis a year ago and it was normal. Calcium and vitamin D levels are within normal levels.	

her diabetes control. We discuss lifestyle modifications (nonconcentrated sweets diet, exercise) and plan to monitor closely.²²

- The patient's use of naproxen is problematic. Chronic nonsteroidal anti-inflammatory drug (NSAID) use has been associated with various adverse events including kidney injury, hypertension, and gastrointestinal ulcers.^{69,70} NSAIDs have a Boxed Warning regarding serious cardiovascular thrombotic events, such as myocardial infarction and stroke.⁷¹ We discuss the risks and benefits of use with the patient. She does not think that the medication's benefits outweigh its potential risks and we remove the medication from her list. However, she is concerned about pain management during flare-ups. We review alternatives, including appropriate use and dosing of acetaminophen, nonpharmacologic interventions (eg, physical therapy), and topical analgesics. The patient is open to trying diclofenac gel as needed during flare-ups.
- The patient has a significant pill burden and some medications lack an indication: pantoprazole, aspirin, simvastatin, and calcium/vitamin D supplementation. Given that we are already implementing two high-priority changes with metformin and naproxen, we review our options with the patient. She feels comfortable stopping the calcium/vitamin D supplementation because she finds the tablet difficult to swallow because of its size. We recommend foods rich in calcium that she can include in her diet.

By the end of our visit, naproxen, metformin, and calcium/vitamin D have been stopped, whereas diclofenac gel has been added for pain control. The medication changes are communicated with her pharmacy.

A week after our visit, the clinic nurse makes an outreach telephone call to the patient to review medications and address any concerns. A month later, the patient returns for a comprehensive medication review follow-up with our clinical pharmacist. She has not had any adverse withdrawal events and her quality of life has improved since our last visit: her medication list is down to six pills and one topical gel and her fatigue has improved. The clinical pharmacist continues the discussion regarding risks and benefits of aspirin, simvastatin, and pantoprazole use with the patient. The patient is not ready to stop another medication at this time but she is open to continuing medication appropriateness discussions at subsequent visits.

SUMMARY

Thoughtful prescribing and deprescribing are aspects of the same continuum. Recognizing opportunities for intervention and engaging the patient and caregiver in the interdisciplinary process may prove rewarding for patients and providers. Although several tools are available to enable thoughtful prescribing and deprescribing, more research is needed to fill in the gaps and provide further practical guidance for front-line clinicians.

CLINICS CARE POINTS

- PIMs and polypharmacy are associated with adverse events in the older adult population.
- Clinical tools are available to identify PIMs.
- Deprescribing is an important element of the thoughtful prescribing process.
- Shared decision making and awareness of patient preferences are essential for successful deprescribing.
- Multidisciplinary teams can enhance the deprescribing process.

- Deprescribing algorithms and decision aids are available for several medication classes including PPIs, antihyperglycemics, antipsychotics, cholinesterase inhibitors, and benzodiazepines.

DISCLOSURE

The author has nothing to disclose.

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