

SHORT REVIEW

Deprescribing in older adults

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Abstract

Polypharmacy, the concurrent use of multiple medications, is highly prevalent among the elderly and has been associated with various adverse outcomes such as cognitive impairment, falls, hospitalisations, and increased mortality. In this context, deprescribing plays a critical role. Deprescribing is the process of discontinuing harmful or no longer necessary medications, addressing the harms of inappropriate polypharmacy. This process requires shared decision-making between the prescriber and the patient. This article explores the approach, tools, and challenges associated with deprescribing. It also reviews findings from various trials on deprescribing in older adults, emphasising its growing importance in enhancing geriatric care.

Keywords: deprescribing, polypharmacy, inappropriate medication use, medication review

Introduction

Mr M, a 90-year-old man, had been taking atorvastatin for dyslipidaemia for over 20 years, despite having no history of heart disease, and developed muscle pain and fatigue. Considering his age and the limited benefits of statins in primary prevention, his medications were discontinued after discussing the risks and benefits. His myalgia improved, and he remained in good health. This case highlights the concept of deprescribing.

Deprescribing is a relatively new term referring to the review and discontinuation of certain medications to improve health outcomes and enhance quality of life in older adults [1]. It is particularly relevant in the context of polypharmacy, defined as the concurrent use of five or more medications. Polypharmacy is common in the elderly, given the prevalence of multiple chronic conditions, each of which may lead to the prescription of numerous medications according to different disease-specific guidelines. With the rise of specialist care and increased visits to various healthcare providers, patients may be prescribed a greater number of medications, many of which may not be reviewed together, further exacerbating the issue of polypharmacy.

Polypharmacy carries various risks, including cognitive decline, falls, non-adherence, and adverse drug reactions [2-4]. It is also associated with increased hospital admissions, falls, and premature mortality [5]. Deprescribing can mitigate these risks and help reduce frailty. This process must be individualised, evidence-based, and conducted under the supervision of healthcare professionals. Research suggests that a significant proportion of older adults can tolerate reductions or discontinuation of medications without adverse effects and often experience improvements in quality of life [6].

Why is deprescribing important?

Medications in the elderly should be regularly reviewed to assess their effectiveness and to achieve care goals. While patients generally prefer taking fewer medications, they often rely on their clinician's guidance to initiate or discontinue treatments. The fear of discontinuing medications and the possible return of symptoms for which the drug was initially prescribed must be addressed through proper doctor-patient discussions. The emphasis should be on assisting patients in understanding the importance of and advantages of deprescribing.

Events such as falls, hospitalisations, cognitive decline, and difficulties with daily activities should trigger a medication review [7]. Polypharmacy may be the underlying cause of such events in the elderly, with deprescribing being an effective therapeutic strategy. Medications should be titrated to the minimum effective dose or discontinued if the risks outweigh the benefits.

Medication review is also a vital part of comprehensive geriatric assessments. Older adults face a considerably higher risk of falls, a risk that is further increased by polypharmacy, especially with drugs such as anticholinergics, psychotropics, and cardiovascular medications [7,8]. A study conducted in New Zealand showed that deprescribing sedatives and anticholinergic drugs reduced the frequency of falls [9]. However, the study also found that, although deprescribing did not reduce the risk of a first fall, it did lower the incidence of subsequent falls among elderly individuals who had already experienced a fall [10].

Elderly patients are more susceptible to adverse drug reactions due to increased frailty, poor homeostasis, and alterations in pharmacokinetics and pharmacodynamics [11]. It becomes especially challenging to identify these adverse effects in individuals with cognitive impairment, as well as to distinguish between symptoms caused by medications and those related to underlying conditions. This can lead to prescribing cascades, where a side effect from one drug is treated with additional medications [12]. For example, ankle swelling caused by amlodipine could be treated with furosemide, which then results in urinary frequency, leading to the prescription of tamsulosin, which causes dizziness, and so forth. In such cases, deprescribing may serve as a therapeutic intervention that optimises the patient's medication regimen.

Polypharmacy also significantly increases healthcare costs, imposing a financial burden on patients. The necessity to purchase multiple medications can reduce affordability, leading some patients to self-adjust their regimens by discontinuing more expensive, essential medicines in favour of cheaper alternatives. This practice can reduce overall treatment efficacy and potentially contribute to disease progression. For example, patients with diabetes mellitus or rheumatoid arthritis may opt to stop taking biologics or disease-modifying drugs in favour of NSAIDs or steroids, which are less expensive but provide only symptomatic relief. As a result, disease flare-ups and uncontrolled symptoms may occur. Therefore, deprescribing, combined with patient education, is crucial in managing the affordability aspect of polypharmacy.

A study published in Sri Lanka assessed medication practices in elderly care homes [13]. The research identified multiple errors related to prescribing, dispensing, administration, and storage of medications among residents. The authors noted that "multiple errors related to

prescribing, dispensing, administration, and storage were identified amongst those using medication in elderly care homes," emphasising the need for improved medication management in these settings.

Deprescribing barriers

Barriers to deprescribing are often encountered at the patient, provider, and system levels. At the patient level, barriers include limited knowledge, difficulty understanding the concept of deprescribing, and fear of adverse outcomes, such as withdrawal symptoms or the re-emergence of a disease condition. Deprescribing may be perceived as a radical change, mainly when the patient has been accustomed to taking a medication for a long time. Clear communication about the risks and benefits of medications is essential to facilitate the patient's willingness to consider deprescribing [14].

At the provider level, a lack of experience, knowledge, or training in deprescribing can be a barrier [15]. Providers may fear the consequences of discontinuing medications, particularly if regular follow-up is not ensured. Additional barriers include consultation constraints, poor communication among providers, and insufficient time and resources.

System-level barriers arise due to the lack of evidence-based guidelines for adults with multimorbidity. While there are guidelines for initiating medications, few recommendations exist on when to discontinue them. This absence of guidelines reflects the complexity of polypharmacy, as what may benefit one patient may harm another. Active patient involvement and caregiver participation, supported by clear communication, are essential for successful deprescribing. Additionally, raising awareness about the dangers of drug treatment overload through media campaigns can help normalise the practice of deprescribing [11].

Approach and key strategies for deprescribing

The following strategies can help enhance the success of deprescribing:

- **Training and education:** Both providers and patients should receive training to enhance their understanding and confidence in the deprescribing process. Other strategies, such as motivational interviewing, clinical decision support tools, and deprescribing algorithms, can also be beneficial.
- **Gradual approach:** Deprescribing should follow a "start low, go slow" approach, ultimately reaching the desired target. Collaboration with patients and caregivers to set realistic goals is essential.
- **Withdrawal symptoms:** Some medications, such as

benzodiazepines and Z-drugs, may cause withdrawal symptoms when discontinued. These should be carefully tapered to minimise adverse effects [17].

- **Re-emergence of symptoms:** Deprescribing may lead to the reappearance of original symptoms or conditions. Close monitoring is essential to ensure the patient's health is not compromised [18].
- **Frail patients:** Frail patients are more likely to experience adverse effects from medications. In these cases, deprescribing should focus on stopping drugs that no longer align with the patient's care goals [19].
- **Prescribing inertia:** Providers should be aware of "prescribing inertia"—the tendency to automatically renew a medication even when the original indication is no longer present—and actively deprescribe when appropriate [20].
- **End-of-Life care:** In patients with terminal illnesses, medication review should identify drugs that provide no meaningful benefit, shifting the focus from disease prevention to symptom management [21].

Tools to assist in deprescribing

Several tools can assist clinicians in deprescribing medications for older adults [22]. Deprescribing algorithms provide guidelines to identify medications for discontinuation. Explicit tools such as the STOPP/START criteria and the Beers Criteria provide structured approaches for identifying potentially inappropriate medications (PIMs) and potentially appropriate prescribing omissions (PPOs). Other tools, such as the GP-GP algorithm, match the appropriate medications to the patient's care plan.

STOPP/START criteria [23] focus on deprescribing medications with adverse effects and introducing the beneficial medications in the routine of elderly patients with multimorbidity and polypharmacy. The STOPP criteria

are used to detect potentially inappropriate medications (PIMs), whereas the START criteria are designed to detect potential prescribing omissions (PPOs). The latest STOPP/START version 3 consists of 133 STOPP-PIMs and 57 START-PPOs.

Similarly, the Beers Criteria lay down a list of medications called PIMs [24]. The aim is to reduce exposure to PIMs, guide clinicians in making safer decisions and serve as a tool for quality care and appropriate drug use in older adults. In addition, the deprescribing.org research team has developed other deprescribing algorithms and guidelines for specific drug classes, such as proton pump inhibitors, antipsychotics, benzodiazepines, and diabetes medications. These guidelines provide a structured approach to safely tapering and discontinuing medications, minimising withdrawal symptoms, and ensuring patient safety.

Outcomes of deprescribing

A systematic review conducted in 2016 found that deprescribing polypharmacy can reduce mortality in non-randomised studies [10]. It also reduces the likelihood of adverse drug reactions, lowers the risk of falls and fall-related injuries, and prevents unnecessary hospitalisations. By simplifying their medication regimens, patients often experience improved overall satisfaction and quality of life. Recent evidence further suggests that deprescribing is both safe and feasible, and integrating it into early patient care may play a key role in preventing frailty [29]. A study conducted at an outpatient medical clinic in Sri Lanka found that 68.9% of patients did not have a clear indication for their medication use, while 31.1% continued taking medications beyond the prescribed duration [30]. Deprescribing should be viewed as an ongoing process, continuously adjusted to align with the patient's evolving health status and care goals.

Table 1. Deprescribing tools

Tool	Purpose
STOPP/START [23] (Screening tool for older people prescriptions/Screening Tool to Alert to Right Treatment)	Explicit rules for ceasing certain medications.
Beers Criteria [24]	An explicit list of potentially inappropriate medicines in older patients
GP-GP (Good palliative- Geriatric practice algorithm) [25]	Tree diagram for deprescribing decision
MATCH-D criteria (Medication appropriateness tool for co-morbid health conditions during dementia) [26]	To optimise medicine use in people with dementia
CEASE (Current medicines, Elevated risk, Assess, Sort, Eliminate) algorithm [27]	Guide on the deprescribing process during the doctor-patient encounter
ERASE (Evaluate, resolved conditions, ageing normally, select targets, Eliminate) approach [28]	Review diagnosis and medicines

Conclusion

Given the growing concern over inappropriate polypharmacy and its associated harms, deprescribing is an essential aspect of clinical care for elderly patients. By using available tools and involving a multidisciplinary healthcare team, deprescribing can become a routine part of care. Regular medication reviews, particularly after significant health events, help ensure that a patient's medication regimen remains appropriate and effective. While careful consideration is necessary when stopping medications, deprescribing, when tailored to the individual and based on evidence, can reduce mortality, improve cognition, and enhance the overall quality of life for patients.

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References

- Woodward MC. Deprescribing: Achieving better health outcomes for older people through reducing medications. *J Pharm Pract Res.* 2003;**33**(4):323–8. DOI:10.1002/jppr2003334323
- Hamilton HJ, Gallagher PF, O'Mahony D. Inappropriate prescribing and adverse drug events in older people. *BMC Geriatr.* 2009;**9**(1):5. DOI:10.1186/1471-2318-9-5
- Lai S-W, Liao K-F, Liao CC, Muo CH, Liu CS, Sung -C. Polypharmacy correlates with increased risk for hip fracture in the elderly: a population-based study. *Medicine (Baltimore).* 2010;**89**:295–9.
- Tamura BK, Bell CL, Inaba M, Masaki KH. Outcomes of polypharmacy in nursing home residents. *Clin Geriatr Med.* 2012;**28**(2):217–36. DOI: 10.1016/j.cger.2012.01.005
- Gnjidic D, Hilmer SN, Blyth FM, et al. Polypharmacy cutoff and outcomes: five or more medicines identify community-dwelling older men at risk of adverse outcomes. *J Clin Epidemiol.* 2012;**65**(9):989–95. DOI: 10.1016/j.jclinepi.2012.02.018
- Iyer S, Naganathan V, McLachlan AJ, Le Couteur L. Medication withdrawal trials in people aged 65 years and older: a systematic review. *Drugs Aging.* 2008;**25**:1021–31.
- Page AT, Potter K, Clifford R, McLachlan AJ, Etherton-Beer C. Medication appropriateness tool for co-morbid health conditions in dementia (MATCH-D): consensus recommendations from a multidisciplinary expert panel. *Intern Med J.* 2016;**46**:1189–97.
- Woolcott JC, Richardson KJ, Wiens MO, et al. Meta-analysis of the impact of 9 medication classes on falls in elderly persons. *Arch Intern Med.* 2009;**169**(21):1952–60. DOI:10.1001/archinternmed.2009.357
- Ailabouni N, Mangin D, Nishtala PS. DEFEAT-polypharmacy: deprescribing anticholinergic and sedative medicines feasibility trial in residential aged care facilities. *Int J Clin Pharm.* 2019;**41**(1):167–78. DOI:10.1007/s11096-019-00784-9
- Page AT, Clifford RM, Potter K, Schwartz D, Etherton-Beer CD. The feasibility and effect of deprescribing in older adults on mortality and health: a systematic review and meta-analysis. *Br J Clin Pharmacol.* 2016;**82**:583–623
- Hung A, Kim YH, Pavon JM. Deprescribing in older adults with polypharmacy. *BMJ.* 2024;**385**:e074892. DOI:10.1136/bmj-2023-074892
- Rosenberg J, Rochon PA, Gill SS. Unveiling a prescribing cascade in an older man. *J Am Geriatr Soc.* 2014;**62**(3):580–1. DOI:10.1111/jgs.12714
- Prasanna SMS, Cader TSB, Sabalingam S, Shanika LGT, Samaranyake NR. Are medications safely used by residents in elderly care homes? A multi-centre observational study from Sri Lanka. *PLoS One.* 2020;**15**(6):e0233486. DOI: 10.1371/journal.pone.0233486
- Pilla SJ, Meza KA, Schoenborn NL, Boyd CM, Maruthur NM, Chander G. Older adults' perspectives on deintensifying diabetes medications: a qualitative study. *J Gen Intern Med.* 2023;**38**(4):1008–15. DOI: 10.1007/s11606-022-07828-9
- Zechmann S, Trueb C, Valeri F, Streit S, Senn O, Neuner-Jehle S. Barriers and enablers for deprescribing among older, multimorbid patients with polypharmacy: an explorative study. *BMC Fam Pract.* 2019;**20**(1). DOI:10.1186/s12875-019-0953-4
- Okeowo DA, Zaidi STR, Fylan B, Alldred DP. Barriers and facilitators of proactive deprescribing in primary care: a systematic review. *Int J Pharm Pract.* 2023;**31**(2):126–52. DOI:10.1093/ijpp/riad001
- Martin P, Tamblyn R, Benedetti A, Ahmed S, Tannenbaum C. Effect of a pharmacist-led educational intervention on inappropriate medication prescriptions in older adults: the D-PRESCRIBE randomized clinical trial. *JAMA.* 2018;**320**:1889–98.
- Gulla C, Flo E, Kjome RL, Husebo BS. Deprescribing antihypertensive treatment in nursing home patients and the effect on blood pressure. *J Geriatr Cardiol.* 2018;**15**(4):275–83. DOI:10.11909/j.issn.1671-5411.2018.04.01
- Koller K, Rockwood K. Frailty in older adults: implications for end-of-life care. *Cleve Clin J Med.* 2013;**80**(3):168–74. DOI: 10.3949/ccjm.80a.12100
- Gurwitz JH. The physics of geriatric pharmacotherapy: overcoming therapeutic inertia and momentum. *Am J Med.* 2012;**125**(6):523–4. DOI: 10.1016/j.amjmed.2012.02.007
- Turner J, Singhal N, Bell JS. Opportunities for deprescribing statins in patients with poor cancer prognosis. *J Palliat Med.* 2013;**16**(11):1328. DOI: 10.1089/jpm.2013.0278
- Thompson W, Lundby C, Graabæk T, Nielsen DS, Ryg J, Søndergaard J. Tools for deprescribing in frail older persons

- and those with limited life expectancy: a systematic review. *J Am Geriatr Soc.* 2019;**67**:172–80.
23. O'Mahony D, Sullivan O, Byrne S, O'Connor MN, Ryan C, Gallagher P. Corrigendum: STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. *Age Ageing.* 2018;**47**(3):489. DOI: 10.1093/ageing/afx178
24. American Geriatrics Society Beers Criteria® Update Expert Panel. American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *J Am Geriatr Soc.* 2023;**71**(7):2052–81. DOI: 10.1111/jgs.18372
25. Etherton-Beer C, Potter K, Page A, Clifford R. Deprescribing in frail older people. *Innov Aging.* 2017;**1**(suppl_1):972–972. DOI: 10.1093/geroni/igx004.3509
26. Page AT, Clifford RM, Potter K, Seubert L, McLachlan AJ, Hill X, et al. Exploring enablers and barriers to implementing MATCH-D criteria in Australia: a qualitative study. *BMJ Open.* 2017;**7**(8):e017906. DOI: 10.1136/bmjopen-2017-017906
27. Scott IA, Le Couteur D. Physicians need to take the lead in deprescribing. *Intern Med J.* 2015;**45**:352–6.
28. Page A, Etherton-Beer C. Undiagnosing to prevent over-prescribing. *Maturitas.* 2019;**123**:67–72. DOI: 10.1016/j.maturitas.2019.02.010
29. Kua C-H, Mak VSL, Lee SWH. Health outcomes of deprescribing interventions among older residents in nursing homes: a systematic review and meta-analysis. *J Am Med Dir Assoc.* 2019;**20**(3):362–372.e11. DOI: 10.1016/j.jamda.2018.10.026
30. Perera UAWL, Jayasinghe IK, Wijesingha WMCR, Rathnayaka DL, Rupasinghe S, Abeywickrama UK. Deprescribing in an outpatient medical clinic at a tertiary care hospital in Sri Lanka. *Asian J Intern Med.* 2024;**3**(2):29–35. DOI: 10.4038/ajim.v3i2.173
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