

Screening for potentially inappropriate prescribing in primary care

Canadian guideline

Emily G. McDonald MD MSc Nav Persaud MD MSc CCFP FCFP Marie-Eve Gagnon PhD Derek J. Jorgenson PharmD FCSHP
 Roni Y. Kraut MD CCFP MSc Justin Lee MD PhD ACPR FRCPC Larry Leung PharmD Dee Mangin MBChB DPH FRNZCGP
 Georges Marcoux Rita K. McCracken MD PhD CCFP(COE) FCFP Lalitha Raman-Wilms PharmD FCSHP
 Caroline Sirois PhD Johanna Trimble Jennifer Young MD CCFP(EM) Amal Rizvi MHSc Aine Workentin BSc

Abstract

Objective To develop a guideline addressing potentially inappropriate prescribing (PIP) screening in primary care, in accordance with the priority established in Bill C-64 by the Canadian government as part of a strategy for appropriate medication use.

Methods The guideline was informed by 2 systematic reviews related to PIP in older adults.

Recommendations The guideline recommends that adults aged 65 years or older receive prescription checkups or a related intervention to optimize medication appropriateness. Effective interventions include medication reviews paired with suggestions by a prescriber or pharmacist using a structured approach or set of rules (strong recommendation, moderate-certainty evidence). Second, it is recommended that governments fund prescription checkups or related interventions to optimize medication appropriateness (strong recommendation, moderate-certainty evidence).

Conclusion This guideline complements other guidance on how to deprescribe certain medication classes, such as proton pump inhibitors and sedative hypnotics. Interventions should be implemented and funded as part of a pan-Canadian strategy on appropriate medication use, and taken up by provincial, territorial, and federal governments as part of larger strategies to avoid medication-related harms. The effects of interventions should be carefully tracked.

Medication overload, or potentially inappropriate prescribing (PIP), is defined as prescribing medications with risks that may outweigh benefits,¹ and is common among older adults in Canada.^{2,3} Direct costs of potentially inappropriate medicines (PIMs) for older Canadian adults were estimated at \$1 billion in 2021.² Potential harms of PIP include increased risk of injurious falls, impaired cognition, and death.⁴⁻⁶ Most care of older adults takes place in primary care, where PIMs are common. Among outpatients, 25% of community-dwelling older Canadians are prescribed an average of 10 medication classes and more than two-thirds are prescribed 5 medication classes.^{7,8}

A proposed solution to PIP is deprescribing, the structured process of reviewing medications and stopping or reducing candidate PIMs through shared decision making between the patient and their health care provider. Without dedicated deprescribing interventions, PIMs continue to be prescribed and taken owing to prescriber, patient, and system factors.⁹ For example, prescribers may be reluctant to stop a medicine prescribed by a colleague, lack the time to deprescribe, lack an accurate medication list, or apply clinical practice guidelines that focus on 1 medical

Editor's key points

- ▶ Potentially inappropriate prescribing (PIP), also known as medication overload, is common in older adults and can lead to harms such as impaired cognition and death. Deprescribing, the process of reviewing medications and stopping or reducing potentially inappropriate medicines, is a possible solution to PIP.
- ▶ This guideline provides 2 recommendations on how to deprescribe in older adults; namely, adults aged 65 years or older should receive prescription checkups or a related PIP intervention to optimize medication appropriateness (effective interventions include medication reviews paired with suggestions by a prescriber or pharmacist using a structured approach or set of rules [strong recommendation, moderate-certainty evidence]). Governments should fund prescription checkups or related interventions to optimize medication appropriateness (strong recommendation, moderate-certainty evidence).
- ▶ Interventions should be implemented and funded as part of a pan-Canadian strategy on appropriate medication use, and taken up by provincial, territorial, and federal governments as part of larger strategies to avoid medication-related harms.

condition instead of several.^{10,11} Patients may continue taking a PIM because it was prescribed or recommended by a trusted health care provider, may fear the harms of stopping, or be unsure whether to raise the issue with their provider.^{12,13} The Canadian health care system funds and facilitates the initiation and continuation of medications, whether appropriately or inappropriately prescribed, but there has been disproportionately less funding and support for deprescribing.¹⁴

Patients prefer to take fewer medicines and want to stop taking medicines when safe to do so.^{15,16} The Government of Canada has made PIP a priority through Bill C-64, passed in October 2024, which mandates a strategy for promoting appropriate medicine use and regular reporting.¹⁷

Scope

The purpose of this guideline is to provide recommendations on PIM screening interventions (as opposed to being specific to a type of medication class) for older adult outpatients (65 years or older) in Canada. An age threshold of 65 years or older was selected to align with the bulk of existing evidence for PIP interventions. While frailty is also associated with PIP, we used age in our recommendation, as it is readily available information and measuring frailty at bedside is more time consuming. Our guidance is intended to be used by family physicians and other primary care providers and their patients in outpatient settings. We also provide recommendations related to government funding and support. The studied interventions are described below, and examples are provided in the tool for providers (Appendix 1, available from **CFPlus***).

Terminology

Many terms are used to refer to PIP and related problems, as well as to potential solutions or interventions. We recognize that some terms, such as *PIP*, may have negative connotations and could be misconstrued as a criticism of prescribers. In some places, we use the term *medication overload* to distinguish PIP from polypharmacy, which for some patients is indicated and beneficial.¹⁸ We also use the term *optimize medication appropriateness* synonymously with *address PIP* and *PIP interventions* to describe interventions. In tools for patients and providers, we use the more colloquial term *prescription checkup*.¹⁸

— Methods —

This topic was prioritized and refined by the Canadian Task Force on Preventive Health Care, and a dedicated working group was created.¹⁹ The project was taken up and completed by the Canadian Medication Appropriateness and Deprescribing Network (CAdEN). We used the

Grading of Recommendations Assessment, Development and Evaluation approach²⁰ and followed Appraisal of Guidelines for Research & Evaluation II guidance.²¹

Guideline panel composition

The co-leads (E.G.M., N.P.) circulated a notice about the guideline panel to CAdEN members and selected a total of 14 members to ensure the involvement of patient partners (n=2), primary care clinicians (n=4), geriatricians (n=1), pharmacists (n=3), and deprescribing experts (n=4). Members of the former Canadian Task Force on Preventive Health Care working group and its external expert advisors were invited to join the panel via email. The co-leads selected a diverse (eg, by gender) group of panel members from across Canada.

Literature review and knowledge synthesis

The working group began meeting in 2018 to refine the scope of the guideline based on scoping literature searches and scoping reviews. Outcomes were rated with input from patients and providers.¹⁹ A systematic review protocol was developed by the Knowledge Synthesis and Application Unit (KSAU) at the University of Ottawa in Ontario, was approved by the Canadian Task Force on Preventive Health Care in 2021, and was published in 2022.²² The systematic review asked 2 key questions: What were the effects of PIP interventions on health outcomes based on randomized controlled trials and what was the acceptability of PIP interventions based on controlled studies? The searches were run by a health information scientist and records for the effectiveness systematic review were screened by KSAU. The systematic reviews were then completed with support from CAdEN. Records were screened independently by 2 reviewers, data were abstracted, and risk of bias was assessed. We pooled study results using a meta-analysis and also used vote counting where statistical pooling was not possible.

Development of recommendations

Systematic review results, an evidence-to-decision table (Appendix 2, available from **CFPlus***), and potential draft recommendations were circulated prior to guideline panel meetings that took place by videoconference on October 23 and November 13, 2024. Using an online form circulated prior to the first meeting, guideline panel members indicated their preferred draft recommendation options and provided comments and suggestions. Consensus was achieved through discussions during the meetings. Patient values and preferences (Appendix 3, available from **CFPlus***) were taken into account when discussing and drafting recommendations. People with lived experience were included in the guideline panel that determined the recommendations. The draft guidance was shared with guideline panel members for input in November 2024 to confirm consensus prior to external review.

***Appendices 1 to 3** are available from <https://www.cfp.ca>. Go to the full text of the article online and click on the **CFPlus** tab.

Management of competing interests

An external Competing Interest Oversight Committee, consisting of 1 lead and 2 additional members (academic family physicians with expertise in managing conflicts of interest), applied Guidelines International Network principles to advise the steering committee on how to handle competing interests.²³ Interests were declared using the February 2021 form from the International Committee of Medical Journal Editors before the first meeting and again before manuscript submission. Declarations were reviewed by the guideline co-leads, who proposed actions; and the external oversight committee provided risk assessments and advice.

— Recommendations —

The grading of the recommendations is summarized in **Box 1**,²⁰ and the recommendations are outlined in **Box 2**.

We recommend adults aged 65 years or older receive prescription checkups or a related PIP intervention to optimize medication appropriateness. Effective interventions include medication reviews paired with suggestions by a prescriber or pharmacist using a structured approach or set of rules (strong recommendation, moderate-certainty evidence).

We recommend that governments fund prescription checkups or related interventions to optimize medication appropriateness (strong recommendation, moderate-certainty evidence).

Rationale based on benefits and harms

Our dedicated systematic review of 118 randomized controlled trials found that interventions reduce the number of medicines (standardized mean difference [SMD]=−0.25; 95% confidence interval [CI] −0.38 to −0.13; $I^2=90\%$; $n=16,174$); may slightly reduce hospitalizations, although the difference is not statistically significant (relative risk [RR]=0.95, 95% CI 0.89 to 1.02; $I^2=45\%$; $n=57,636$); and may slightly reduce all-cause mortality, although the difference is not statistically significant (RR=0.94; 95% CI 0.85 to 1.04; $I^2=0$; $n=16,682$). Interventions may result in little to no difference regarding adverse reactions that are not serious, injurious falls, quality of life, outpatient visits, and emergency department visits.²⁴ For medicines requiring monitoring for withdrawal effects, PIP interventions may temporarily (and appropriately) increase the number of outpatient visits.²⁴ Our dedicated systematic review of 9 controlled studies found that interventions were at least as acceptable to patients as usual care, with similar patient satisfaction ratings as usual care (SMD=0.45; 95% CI −0.14 to 1.04; $I^2=96\%$; $n=4414$) and an increased rate of discussions about stopping medicines (RR=4.32, 95% CI 0.0 to 56.270; $I^2=43\%$; $n=429$), which we considered an indicator of patient acceptability.²⁵

We made a strong, rather than weak or conditional, recommendation after considering patient values and preferences together with the effects of PIP interventions from the 2 dedicated systematic reviews. Patients prefer to stop taking medicines that are not needed when safe to do so and PIP interventions safely reduce the number of medicines while potentially reducing the risk of hospitalization and death. No substantial or irreversible harms of PIP interventions were identified, and patients may be more satisfied with PIP interventions compared with usual care, even though they require time and effort. Without PIP interventions, patients are likely to continue taking PIMs that should be stopped; as such, implementing PIP interventions tends to avoid unhelpful health care that can cascade and escalate after other screening (eg, screening for cancer). In this respect, PIP interventions are antithetical to other forms of screening. According to our review, the benefits clearly outweigh harms or downsides, and it appears most informed patients would want to be offered PIP interventions.

Practical considerations

The interventions assessed in our systematic reviews ranged from reviews by family physicians and other primary care providers (or other prescribers), reviews by a pharmacist, and software-guided decision supports for

Box 1. Grading of recommendations

We used the Grading of Recommendations Assessment, Development and Evaluation approach to make recommendations.²⁰ Strong recommendations, indicated by “we recommend,” mean that the benefits clearly outweigh negative effects. Weak recommendations (also called “conditional” recommendations), indicated by “we suggest,” mean that the benefits outweigh negative effects based on available information. Statements about certainty in effect estimates (high, moderate, low, or very-low certainty) refer to our assessment of how well the findings from included studies reflect the true effects

Box 2. Guideline recommendations

- We recommend adults aged 65 years or older receive prescription checkups or a related PIP intervention to optimize medication appropriateness. Effective interventions include medication reviews paired with suggestions by a prescriber or pharmacist using a structured approach or set of rules (strong recommendation, moderate-certainty evidence)
- We recommend that governments fund prescription checkups or related interventions to optimize medication appropriateness (strong recommendation, moderate-certainty evidence)

PIP—potentially inappropriate prescribing.

providers.²⁴ The different types of interventions included in our systematic reviews did not appear to have substantially different effects based on sensitivity analyses, although the main purpose of the knowledge synthesis was not to compare interventions directly.²⁴ Structured approaches are also called *implicit* interventions, in which a provider reviews a patient's medicines (eg, to ensure each is indicated) and relies on clinical judgment. Approaches that use a set of rules are also called *explicit* interventions because medication lists are reviewed for specific enumerated medications or medication combinations. The selection of a particular intervention to implement could be governed by available resources such as the availability of a pharmacist and the use of electronic health records. Reviews by prescribers may be the easiest to implement in some settings, but they require additional supports for prescribers who may have limited time for implementation. Examples of studied interventions are provided in the tool for providers (Appendix 1, available from **CFPlus***).

Our recommendation refers to the studied interventions, which are different from medication reconciliation, a process where a patient's various medication lists are compared against the medications they actually take to identify discrepancies. The studied interventions involved reviews by providers within outpatient clinics (eg, primary care centres, family medicine clinics). Most (85%, 100 of 118) of the studied interventions did not involve reviews provided within community pharmacies, and the interventions that involved community pharmacies entailed discussions between pharmacists in community pharmacies and prescribers, or communications from prescribers to community pharmacists. Our recommendation applies to the studied interventions, and not to independent reviews by community pharmacists. We make this distinction as there is limited evidence supporting the impact of community pharmacy medication reviews²⁶; however, we recognize there are different views on their merits.^{27,28}

The ideal frequency of offering or applying interventions has not been clearly established based on studies. Considering the potential for stopped medicines to be restarted, and the benefit and feasibility of repeatedly offering or applying the intervention, an interval of 1 to 2 years might be reasonable. Additionally, interventions should be offered or applied whenever there is a substantial change in health status, such as a diagnosis of a new condition treatable with medications, hospital discharge, or admission to a long-term care facility.

The recommendation applies to patients taking any number of medicines. Although patients in the included studies were typically taking more than 5 medicines, some were taking only 1, and the studied interventions sometimes identified potential prescribing omissions that could have applied to patients taking no medications. The benefits of the interventions may be greater in

patients taking more medications, and it may be reasonable to offer or apply interventions more frequently to patients taking 5 or more medications. In practice, this could be operationalized by focusing on older patients who are more likely to experience polypharmacy.

Financial implications

Because interventions involve the process of deprescribing, which is separate from prescribing or medication reconciliation, we recommend specific funding for PIP interventions. A cost-effectiveness systematic review of 13 PIP interventions found that all but 1 (which involved 2 home visits by a pharmacist) were cost-effective.²⁹ Most were cost-saving, with savings being driven by avoided direct medication costs and reduced hospitalizations in some studies, with a maximum cost per quality-adjusted life year (QALY) of \$40,846 (below the usual cost-effectiveness threshold of \$50,000 per QALY).²⁹ The costs of implementing PIP interventions depended on the type of intervention, the country, and the existing resources in the setting.³⁰ For example, a trial of clinical medication reviews found that an intervention costing €199 per patient resulted in €181 lower total health care costs (including the cost of the intervention) per patient compared to usual care.³¹

— Discussion —

Health care provider time constraints are an important barrier to implementation, especially in settings with few family physicians and other primary care providers. Implementation of the main recommendation could be facilitated by providing funding to prescribers specifically for deprescribing and related care (eg, managing withdrawal effects), “parachuting” in clinical pharmacists from outside the usual care team, as is done in some of the included studies, or funding and supporting software-based PIP interventions. Information and education for patients and the public may promote the implementation of our main recommendation. PIP interventions would ideally be implemented as part of a pan-Canadian strategy on appropriate medication use and taken up by provincial, territorial, and federal governments. Implementing our guidance relies on effective and timely communication of information on prescriptions between providers and institutions; this is something that is currently time consuming, slow, and incomplete.

Monitoring and evaluation

The immediate and longer-term effects of PIP interventions should be tracked. This can be done by individual providers or institutions as part of quality improvement efforts, by provincial or territorial governments using health administrative data, and by the federal government as part of its national strategy.

Other guidelines

Our guidance on general PIP interventions, which to our knowledge is the first of its kind, complements other guidance on how to deprescribe particular types of medicines—such as those available for proton pump inhibitors and benzodiazepines³²—and more than 1 medication type, such as the Maudsley deprescribing guidelines for antidepressants, benzodiazepines, and gabapentinoids.³³ Deprescribing medicines in certain classes may have unique challenges or risks, with opioids being a notable example.^{34,35}

Gaps in knowledge

The most effective type of PIP intervention was not established by our knowledge synthesis, nor was the optimal frequency for administering interventions. The longer-term effects of PIP interventions are not clear. Our guidance may or may not be applicable to adults younger than 65 years.

Limitations

Our systematic reviews included a range of types of PIP interventions and addressed medications with variable associated risks of harm (eg, docusate versus lorazepam). The effects of different types of PIP interventions could be distinct. Deprescribing in certain contexts, or of certain classes of medicines, could be more risky than indicated by the systematic reviews supporting general PIP guidelines. The CIs for outcomes such as hospitalizations and deaths were relatively wide, in part because a very large number of participants taking high-risk medications would need to be included in trials for precise estimates of effects. Study populations were heterogeneous and included patients ranging from quite frail to relatively healthy; whether the effects of PIP interventions depend on health status is unclear. The available data provided limited information on any differences in effects based on sex, gender, race, or ethnicity. In some studies, usual care would have also involved some PIP interventions.

Conclusion

We recommend PIP interventions for older adult outpatients. Interventions should be funded as part of larger strategies to avoid medication-related harms. The effects of interventions should be carefully tracked. 🌿

Dr Emily G. McDonald is Associate Professor at McGill University Health Centre and Director of the Canadian Medication Appropriateness and Deprescribing Network in Montréal, Que. **Dr Nav Persaud** is Canada Research Chair in Health Justice, a family physician in the Department of Family and Community Medicine at St Michael's Hospital, Professor in the Department of Family and Community Medicine at the University of Toronto, and Scientist in the MAP Centre for Urban Health Solutions in the Li Ka Shing Knowledge Institute at St Michael's Hospital, all in Toronto, Ont. **Dr Marie-Eve Gagnon** is Associate Professor at the University of Quebec in Rimouski. **Dr Derek J. Jorgenson** is Director of the Medication Assessment Centre and Director of the USask Chronic Pain Clinic, both at the University of Saskatchewan in Saskatoon, and is Director of RxFiles Academic Detailing Service. **Dr Roni Y. Kraut** is a practising family physician, Assistant Professor in the Faculty of Health Sciences at Queen's University in Kingston, Ont, and Adjunct Assistant Professor in the Faculty of Medicine & Dentistry at the University of Alberta in Edmonton. **Dr Justin Lee** is Assistant Professor in Geriatric Medicine at McMaster University, Geriatrician-Scientist at the GERAS Centre for Aging Research, and Associate Research Director at the St Joseph's Health System Centre for Integrated

Care, all in Hamilton, Ont. **Dr Larry Leung** is Associate Professor of Teaching at the Faculty of Pharmaceutical Sciences at the University of British Columbia in Vancouver. **Dr Dee Mangin** is Professor of Family Medicine at McMaster University and Professor of General Practice at the University of Otago Christchurch in New Zealand. **Georges Marcoux** is a patient partner in Montréal. **Dr Rita K. McCracken** is a practising family physician and Assistant Professor in the School of Medicine at Simon Fraser University in Burnaby, BC. **Dr Lalitha Raman-Wilms** is Professor in the Faculty of Pharmaceutical Sciences at the University of British Columbia. **Dr Caroline Sirois** is a pharmacist, pharmacoepidemiologist, and Professor in the Faculty of Pharmacy at Université Laval in Quebec. **Johanna Trimble** is a patient partner in Vancouver. **Dr Jennifer Young** is a family physician practising in Collingwood, Ont, and Associate Clinical Professor in the Department of Family Medicine at McMaster University. **Amal Rizvi** is Research Assistant in the MAP Centre for Urban Health Solutions, Li Ka Shing Knowledge Institute, St Michael's Hospital, and Unity Health Toronto. **Aine Workentin** is Research Coordinator in the MAP Centre for Urban Health Solutions and Unity Health Toronto.

Acknowledgment

The guideline process was supported both through the Canadian Task Force on Preventive Health Care (funded by the Public Health Agency of Canada) and through the Canadian Medication Appropriateness and Deprescribing Network (CADEn; funded by Health Canada).

Contributors

This guideline is based on a published systematic review protocol developed by Canadian Task Force on Preventive Health Care. **Drs Emily G. McDonald** and **Nav Persaud** co-lead the completion of the systematic reviews. **Amal Rizvi** and **Aine Workentin** collected data. All authors were involved in data analysis, data interpretation, and revising the manuscript critically for important intellectual content. All authors gave approval of the final version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Competing interests

Dr Nav Persaud reports grants from the Canadian Institutes of Health Research (CIHR) and the Canada Research Chairs program. **Dr Emily G. McDonald** reports co-ownership of MedSafer, a for-profit business. **Dr Lalitha Raman-Wilms** has received in-kind support through CADEn and is Co-Chair of the Healthcare Provider Committee at CADEn. **Dr Roni Y. Kraut** reports an honorarium from Deprescribing.org for feedback on actions to address polypharmacy in primary care. **Dr Dee Mangin** reports funding for polypharmacy research from CIHR, the Canadian Frailty Network, the Labarge Foundation, and the University of Western Australia. **Dr Larry Leung** reports a grant from the McKesson Foundation.

Correspondence

Dr Nav Persaud; email nav.persaud@utoronto.ca

References

- O'Mahony D, Gallagher PF. Inappropriate prescribing in the older population: need for new criteria. *Age Ageing*. 2008 Mar;37(2):138-41. doi: 10.1093/ageing/afm189.
- Huon JF, Sanyal C, Gagnon CL, Turner JP, et al. The cost of potentially inappropriate medications for older adults in Canada: A comparative cross-sectional study. *J Am Geriatr Soc*. 2024 Nov;72(11):3530-40. doi: 10.1111/jgs.19166. Epub 2024 Sep 5.
- Squires JE, Cho-Young D, Aloisio LD, Bell R, et al. Inappropriate use of clinical practices in Canada: a systematic review. *CMAJ*. 2022 Feb 28;194(8):E279-96. doi: 10.1503/cmaj.211416.
- Shen HN. Polypharmacy and clinical outcomes. *CMAJ*. 2015 Aug 11;187(11):827. doi: 10.1503/cmaj.1150048.
- Muhlack DC, Hoppe LK, Weberpals J, Brenner H, et al. The Association of Potentially Inappropriate Medication at Older Age With Cardiovascular Events and Overall Mortality: A Systematic Review and Meta-Analysis of Cohort Studies. *J Am Med Dir Assoc*. 2017 Mar 1;18(3):211-20. doi: 10.1016/j.jamda.2016.11.025. Epub 2017 Jan 26.
- Chen CC, Cheng SH. Potentially Inappropriate Medication and Health Care Outcomes: An Instrumental Variable Approach. *Health Serv Res*. 2016 Aug;51(4):1670-91. doi: 10.1111/1475-6773.12417. Epub 2015 Nov 25.
- Faquet ML, Frey G, Stämpfli D, Weiler S, et al. Prevalence of potentially inappropriate medications among newly treated patients with type 2 diabetes in UK primary care. *Br J Clin Pharmacol*. 2024 Jun;90(6):1376-94. doi: 10.1111/bcp.16018. Epub 2024 Feb 26.
- Reason B, Turner M, Moses McKeag A, Tipper B, et al. The impact of polypharmacy on the health of Canadian seniors. *Fam Pract*. 2012 Aug;29(4):427-32. doi: 10.1093/fampra/cmr124. Epub 2012 Jan 5.
- Doherty AJ, Boland P, Reed J, Clegg AJ, et al. Barriers and facilitators to deprescribing in primary care: a systematic review. *BJGP Open*. 2020 Aug 25;4(3):bjgpopen20X101096. doi: 10.3399/bjgpopen20X101096.
- Anderson K, Stowasser D, Freeman C, Scott I. Prescriber barriers and enablers to minimising potentially inappropriate medications in adults: a systematic review and thematic synthesis. *BMJ Open*. 2014 Dec 8;4(12):e006544. doi: 10.1136/bmjopen-2014-006544.
- Robinson M, Mokrzecki S, Mallett AJ. Attitudes and barriers towards deprescribing in older patients experiencing polypharmacy: a narrative review. *NPJ Aging*. 2024 Jan 23;10(1):6. doi: 10.1038/s41514-023-00132-2.
- Alilabouni NJ, Rebecca Weir K, Reeve E, Turner JT, et al. Barriers and enablers of older adults initiating a deprescribing conversation. *Patient Educ Couns*. 2022 Mar;105(3):615-24. doi: 10.1016/j.pec.2021.06.021. Epub 2021 Jun 24.
- Reeve E, To J, Hendrix I, Shakib S, et al. Patient barriers to and enablers of deprescribing: a systematic review. *Drugs Aging*. 2013 Oct;30(10):793-807. doi: 10.1007/s40266-013-0106-8.

14. Pierson T, Arcand V, Farrell B, Gagnon CL, et al. Proceedings of the Canadian Medication Appropriateness and Deprescribing Network's 2023 National Meeting. *Drug Saf*. 2024 Sep;47(9):829-39. doi: [10.1007/s40264-024-01444-2](#). Epub 2024 Jun 17.
15. Hauber AB, Han S, Yang JC, Gantz I, et al. Effect of pill burden on dosing preferences, willingness to pay, and likely adherence among patients with type 2 diabetes. *Patient Prefer Adherence*. 2013 Sep 18;7:937-49. doi: [10.2147/PPA.S43465](#).
16. Mansfield C, Tangka FK, Ekwueme DU, Smith JL, et al. Stated Preference for Cancer Screening: A Systematic Review of the Literature, 1990-2013. *Prev Chronic Dis*. 2016 Feb 25;13:E27. doi: [10.5888/pcd13.150433](#).
17. Parliament of Canada. Bill C-64. First Session, Forty-fourth Parliament, 70-71 Elizabeth II – 1-2-3 Charles III, 2021-2022-2023-2024. Statutes of Canada 2024. Chapter 24: An Act respecting pharmacare [Internet]. Parliament of Canada; 2024 Oct 10 [cited 2024 Oct 24]. Available from: <https://www.parl.ca/documentviewer/en/44-1/bill/C-64/royal-assent>.
18. Lown Institute. Medication overload and older Americans [Internet]. Lown Institute; [cited 2024 Dec 19]. Available from: <https://lowninstitute.org/projects/medication-overload-how-the-drive-to-prescribe-is-harming-older-americans>.
19. Canadian Task Force on Preventive Health Care. Methods [Internet]. Canadian Task Force on Preventive Health Care; 2022 [cited 2024 Oct 24]. Available from: <https://canadiantaskforce.ca/methods>.
20. Guyatt GH, Oxman AD, Vist GE, Kunz R, et al. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ*. 2008 Apr 26;336(7650):924-6. doi: [10.1136/bmj.39489.470347.AD](#).
21. Brouwers MC, Kerkvliet K, Spithoff K; AGREE Next Steps Consortium. The AGREE Reporting Checklist: a tool to improve reporting of clinical practice guidelines. *BMJ*. 2016 Mar 8;352:i1152. doi: [10.1136/bmj.i1152](#). Erratum in: *BMJ*. 2016 Sep 06;354:i4852. doi: [10.1136/bmj.i4852](#).
22. Beck A, Persaud N, Tessier LA, Grad R, et al. Interventions to address potentially inappropriate prescriptions and over-the-counter medication use among adults 65 years and older in primary care settings: protocol for a systematic review. *Syst Rev*. 2022 Oct 20;11(1):225. doi: [10.1186/s13643-022-02044-w](#).
23. Schünemann HJ, Al-Ansary LA, Forland F, Kersten S, et al. Guidelines International Network: Principles for Disclosure of Interests and Management of Conflicts in Guidelines. *Ann Intern Med*. 2015 Oct 6;163(7):548-53. doi: [10.7326/M14-1885](#).
24. Persaud N, Workentin A, Rizvi A, Pierson T, et al. Interventions to Address Potentially Inappropriate Prescribing for Older Primary Care Patients: A Systematic Review and Meta-Analysis. *JAMA Netw Open*. 2025 Jun 2;8(6):e2517965. doi: [10.1001/jamanetworkopen.2025.17965](#).
25. Persaud N, Rizvi A, Workentin A, Skidmore B, et al. Acceptability of Interventions to Address Polypharmacy in Older Adult Outpatients: A Systematic Review and Meta-Analysis. *Health Sci Rep*. 2025 Jul 31;8(8):e70981. doi: [10.1002/hsr2.70981](#).
26. Harris J, Argáez C. Community Pharmacist-Led Medication Reviews. *Can J Health Technol*. 2021 Jul 27;1(7). doi: [10.51731/cjht.2021.102](#).
27. Kolhatkar A, Cheng L, Chan FK, Harrison M, et al. The impact of medication reviews by community pharmacists. *J Am Pharm Assoc* (2003). 2016 Sep-Oct;56(5):513-20.e1. doi: [10.1016/j.japh.2016.05.002](#).
28. King A, Brockbank N. Ontario's MedsCheck program could see changes amid allegations of improper use. *CBC News* [Internet]. 2024 Apr 29 [cited 2024 Nov 5]. Available from: <https://www.cbc.ca/news/canada/toronto/ontario-medscheck-program-redesign-1.7186143>.
29. Romano S, Figueira D, Teixeira I, Perelman J. Deprescribing Interventions among Community-Dwelling Older Adults: A Systematic Review of Economic Evaluations. *Pharmacoeconomics*. 2022 Mar;40(3):269-95. doi: [10.1007/s40273-021-01120-8](#). Epub 2021 Dec 16.
30. Croke A, Cardwell K, Clyne B, Moriarty F, et al. The effectiveness and cost of integrating pharmacists within general practice to optimize prescribing and health outcomes in primary care patients with polypharmacy: a systematic review. *BMC Prim Care*. 2023 Feb 6;24(1):41. doi: [10.1186/s12875-022-01952-z](#).
31. Verdoorn S, van de Pol J, Hövels AM, Kwint HF, et al. Cost-utility and cost-effectiveness analysis of a clinical medication review focused on personal goals in older persons with polypharmacy compared to usual care: Economic evaluation of the DREAMER study. *Br J Clin Pharmacol*. 2021 Feb;87(2):588-97. doi: [10.1111/bcp.14421](#). Epub 2020 Jun 30.
32. Deprescribing.org. Deprescribing Guidelines Repository (DEPOT) [Internet]. Deprescribing.org; [cited 2024 Oct 24]. Available from: <https://deprescribing.org/deprescribing-guidelines-repository-depot>.
33. Benzodiazepine Information Coalition. The Maudsley Deprescribing Guidelines: Antidepressants, Benzodiazepines, Gabapentinoids and Z-drugs [Internet]. Benzodiazepine Information Coalition; 2024 Feb 5 [cited 2024 Oct 24]. Available from: <https://www.benzoinfo.com/2024/02/05/the-maudsley-deprescribing-guidelines>.
34. Hamilton M, Kwok WS, Hsu A, Mathieson S, et al. Opioid deprescribing in patients with chronic noncancer pain: a systematic review of international guidelines. *Pain*. 2023 Mar 1;164(3):485-93. doi: [10.1097/j.pain.0000000000002746](#). Epub 2022 Aug 9.
35. Langford AV, Gnjidic D, Lin CC, Bero L, et al. «The lesser of two evils»: a framework analysis of consumers' perspectives on opioid deprescribing and the development of opioid deprescribing guidelines. *Pain*. 2021 Nov 1;162(11):2686-92. doi: [10.1097/j.pain.0000000000002270](#).

This article is eligible for Mainpro+ certified Self-Learning credits. To earn credits, go to <https://www.cfp.ca> and click on the Mainpro+ link.

This article has been peer reviewed.

Can Fam Physician. 2026 Mar;72(3):173-8.
doi: [10.46747/cfp.7203173](#)

La traduction en français de cet article se trouve à <https://www.cfp.ca> dans la table des matières du numéro de mars 2026 à la page e59.