

Deprescribing practices in Canada: A scoping review

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ABSTRACT



Background: Excessive and inappropriate use of medications, defined as polypharmacy, can increase the risk of adverse drug reactions while affecting patient adherence and quality of life. Therefore, optimizing pharmacotherapies through deprescribing practices plays a crucial role in managing chronic conditions, avoiding adverse effects and improving patient outcomes. The purpose of this study was to explore research initiatives surrounding deprescribing in Canada.

Methods: A scoping review was conducted that involved a search of 6 databases. Studies that highlighted deprescribing interventions, experiences and other effects on Canadian populations were included.

Results: Searches yielded 2327 citations, of which 31 were included in this review. Five major themes and ideas were identified: deprescribing targeted medications, financial effects of deprescribing, deprescribing in special populations, insight from health care providers and deprescribing frameworks.

Conclusion: Deprescribing practices in Canada have shown a wide range of beneficial results across various health care settings, populations and medication classes and have the potential to reduce medication-related harm in all Canadian health care settings. *Can Pharm J (Ott)* 2022;155:249-257.

Introduction

Polypharmacy is most commonly defined as the use of 5 or more prescription and nonprescription medications by a single individual; however, there is noted variability in the literature with this definition and a need to include comorbidities.^{1,2} Given the increase in Canada's older adult population and the increasing number of younger individuals with complex health conditions, harmful polypharmacy practices are becoming a growing concern. Inappropriate polypharmacy can increase the risk of adverse drug reactions and poor health outcomes while affecting patient adherence and quality of life.³ Additionally, polypharmacy has been shown to be an independent risk factor for hip fractures and is known to lead

to prescribing cascades.^{4,5} Therefore, optimizing pharmacotherapies plays a crucial role in managing chronic conditions, avoiding adverse effects and improving medical outcomes.⁶ Targeted deprescribing practices have been developed to address these harmful clinical practices.

Deprescribing practices in Canada focus on assessing medications and withdrawing inappropriate medications with the goal of improving outcomes and managing polypharmacy under the supervision of a health care professional.⁶ The benefits of deprescribing practices, including safety and efficacy, have been supported by multiple studies. Systematic reviews have shown that drug cessation in complex older adult patients is effective in reducing adverse events,

At the start of my honors nursing degree, I realized that many older adults present with concerns of polypharmacy, falls and delirium. With a background in pharmacology, I conducted this research study to explore the benefits of deprescribing and barriers to deprescribing in order to address these issues and mitigate risk factors.

Au début de mon baccalauréat spécialisé en soins infirmiers, j'ai réalisé que de nombreux adultes plus âgés se préoccupent de la polypharmacie, des chutes et du délire. En raison de mes antécédents en pharmacologie, j'ai mené cette recherche afin d'explorer les bienfaits et les obstacles à la déprescription pour régler ces problèmes et atténuer les facteurs de risque.

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KNOWLEDGE INTO PRACTICE



- Currently, targeted deprescribing practices have been implemented to address inappropriate polypharmacy and prescribing cascades often seen in Canada's increasing older adult population.
- Through a scoping review, 5 major themes surrounding deprescribing were identified.
- This study summarizes a wide range of health care settings, populations and different medication classes that have shown successful outcomes of deprescribing.
- Many deprescribing initiatives were dependent on pharmacists.

decreasing rates of falls and improving cognitive function.⁷ Patient-specific deprescribing interventions aimed at reducing polypharmacy improve longevity without adversely affecting health outcomes.⁸ Within the last decade, countless studies have emerged with evidence on the safety and efficacy of deprescribing, along with clinical criteria and tools to facilitate deprescribing. Toolkits by Choosing Wisely Canada have been released to assist health care practitioners with the reduction and discontinuation of benzodiazepines, proton pump inhibitors and antipsychotics.⁹ Health care practitioners can consider deprescribing when a medication is no longer indicated, appropriate or aligned with patient-specific goals of care. For patients who have changing clinical conditions, have existing conditions like dementia that are progressing, need assistance with day-to-day activities or have increased risk of falls and/or decreased liver and renal function, deprescribing can be used as a tool to decrease inappropriate polypharmacy.

More than 25% of Canadian adults over the age of 65 take at least 10 medications per day. This number increases to almost 40% for Canadians over the age of 85. Deprescribing algorithms, tools and criteria have been developed to reduce medication burden in the face of these polypharmacy practices. Although evidence-based tools have been developed, very little is known about their implementation into practice and progression in the field. The objective of this scoping review is to determine guidelines for deprescribing in Canada, identify research initiatives that are implementing deprescribing into practice and discover the outcomes and perspectives that shape Canada's deprescribing approaches.

Methods

To provide an overview of the vast amount of knowledge and research in the field of deprescribing in Canada, we chose a scoping review as the method of study. For this project, the protocol and final scoping review were based on the methods published by Arksey and O'Malley.¹⁰ The framework includes identifying the research question, identifying relevant studies, selecting studies, charting the data, and collating, summarizing and reporting the

MISE EN PRATIQUE DES CONNAISSANCES



- À l'heure actuelle, des pratiques de déprescription ciblées ont été mises en œuvre pour traiter les polypharmacies inappropriées et les cascades de prescription souvent observées dans la population adulte plus âgée du Canada.
- Suite à un examen de la portée, 5 grands thèmes relatifs à la déprescription ont été identifiés.
- Cette étude résume un large éventail de contextes de soins de santé, de populations et de différentes classes de médicaments qui ont démontré des résultats positifs de la déprescription.
- De nombreuses initiatives de déprescription dépendaient des pharmaciens.

results.¹⁰ The research question that guides this study asks what the literature has to say about deprescribing practices in Canada.

Data collection

The search strategy was developed in collaboration with a health science research librarian using a combination of terms and keywords around deprescribing. Search terms included *deprescribing*, *polypharmacy*, *prescribing cascade*, *discontinuation/tapering/stopping of medications* and *Canada*. The databases that were searched in July 2020 included CINAHL, EMBASE, MEDLINE, Cochrane Library, Scopus and Web of Science. The initial search strategy was reviewed by both the librarian and the supervisor of this study. An example of the EMBASE search strategy is included in Appendix 1.

Eligibility criteria

Resources and various articles had to be based on a setting in Canada and written in English to be included in this study. No other restrictions were imposed on the population (e.g., age, patients or health care providers) and setting (e.g., long-term care home or hospital). Any studies that did not report deprescribing practices and have the specific term *deprescribing* in the title were excluded. Experimental studies, quasi-experimental studies, observational studies, qualitative studies, quantitative studies, mixed methods studies and literature reviews that contributed to Canadian deprescribing guidelines could be included in the study. Although the term *deprescribing* was first used in publications in 2002,¹¹ no restrictions were placed on publication timeframes. Grey literature, including editorials, conference proceedings and websites, were excluded from this scoping review.

Study selection

Information and resources gathered were stored and screened in RefWorks. Initially, the abstracts and titles of each resource

FIGURE 1 Modified PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) flowchart⁴⁷



were screened by M.D. in consultation with T.P. A rationale was recorded for each piece of literature excluded from the study. Literature that fit the eligibility criteria was read and reviewed several times. Conflicts among team members were resolved through discussion. Once screening was completed, reference lists of included studies were reviewed to identify any additional relevant citations.

Data charting and coding

The final data charting table was developed by the team and focused on publication information (title, author, year of publication), method (study setting, study design, location, and primary investigators, participants and objectives), definitions (deprescribing and polypharmacy), targeted medications, if any, and study results. Extracted data were then compared and categorized using a coding pattern to identify any patterns and recurrent themes. Data charting from the final included studies was done by one team member and verified by another. Throughout analysis of the data, an audit trail was kept to record relevant decisions, thoughts or ideas along the way.

Results

Search results

The initial search identified 2932 articles; once duplicates were removed, title and abstract screening was conducted on 2327 records. A total of 58 full articles were retrieved for further

examination, of which 31 articles met the specific inclusion and exclusion criteria (Figure 1).

Study characteristics

A summary of all included studies is presented in Table 1. All 31 studies were conducted with a focus on Canadian populations. The 31 studies were based in the following provinces: 1 study in Nova Scotia; 4 studies in Quebec; 1 study in Alberta; 1 study in Manitoba; 3 studies in British Columbia; 1 study in Newfoundland and Labrador; 11 studies in Ontario; 1 study in Nova Scotia and New Brunswick; 1 study in Quebec, Ontario, British Columbia and Alberta; 5 studies with no designated provincial setting; and 2 studies based on data from various provinces across the country. Of the 31 studies, there were 12 experimental studies, 1 case-based study, 4 quantitative studies, 8 qualitative studies, 1 systematic review, 4 miscellaneous studies and 1 randomized controlled trial. Aside from 1 youth case study, all articles included data from participants aged 18 years or older. The 31 studies can be further classified as follows: 3 prospective studies, 8 studies based on pharmacist-led interventions, 1 study investigating nursing experiences, 2 studies in unique populations, 3 studies about strategies and barriers, 3 studies targeting benzodiazepines, 2 studies focused on the drug class of proton pump inhibitors, 1 youth case study, 3 economic analysis studies and 5 studies reporting health care worker and patient opinions. From these 31 studies, 5 major themes and ideas were identified: deprescribing targeted medications, financial effects of deprescribing, deprescribing in special populations, insight from health care providers and deprescribing frameworks.

Deprescribing targeted medications

Benzodiazepines and proton pump inhibitors (PPIs) were 2 commonly targeted drug classes for deprescribing interventions.¹²⁻¹⁶

Benzodiazepines. From the 5 studies that examined targeted drug classes, 3 studies focused primarily on deprescribing benzodiazepines.¹²⁻¹⁴ An evidence-based guideline was developed through a systematic review to help clinicians make decisions about when and how to stop benzodiazepine use for insomnia.¹³ An executive decision was made to include the systematic review in our investigation because that review provided clarification about situations in which deprescribing benzodiazepines was appropriate in Canada. Two studies pertained to initiating benzodiazepine and/or sedative medication deprescribing awareness and motivation through patient education.^{12,14} Wilson et al.¹⁴ concluded that hospitalized individuals aged 65 and older were willing to deprescribe after initiation of the process through education brochures during a hospital stay. Martin and Tannenbaum¹² examined the same population 6 months later and revealed that brochures targeting patient motivation and capacity

TABLE 1 Papers included in literature review

Author	Profession	Province	Initiatives	Method	Theme
Trenaman et al. 2020	Pharmacists	NS, NB	Patient engagement in deprescribing	Qualitative	Deprescribing frameworks
Martin and Tannenbaum 2017	Not specified	QC	EMPOWER intervention	Experimental	Deprescribing targeted medications
Tannenbaum et al. 2017	Canadian Deprescribing Network	QC, ON, BC, AB	Report of development of deprescribing process	Informative	Deprescribing frameworks
Elbeddini et al. 2021	Not specified	N/A	Report of challenges during COVID-19 pandemic	Informative	Insight from health care providers
Farrell et al. 2020	Pharmacists	ON	Pharmacist-led implementation of deprescribing guidelines	Mixed methods	Insight from health care providers
Sirois et al. 2017	Pharmacists	QC	Polypharmacy survey	Qualitative	Deprescribing frameworks
Thompson et al. 2019	Pharmacists	ON	Implementation of patient decision tools	Experimental	Insight from health care providers
Sanyal et al. 2020	Researchers	QC	Evaluation of cost of D-PRESCRIBE intervention	Quantitative	Financial effects of deprescribing
Pottie et al. 2018	Interdisciplinary team	N/A	Systematic review of benzodiazepine deprescribing trials	Systematic review	Deprescribing targeted medications
Farrell et al. 2019	Not specified	ON	International symposium	Informative	Deprescribing frameworks
Walsh et al. 2016	Primary care providers	ON	Development and implementation of prescribing tool	Experimental	Deprescribing targeted medications
McLennan 2019	Psychiatry	ON	Report of systematic deprescribing	Case study	Deprescribing in special populations
Harriman et al. 2014	Family physicians	BC	Survey of physicians	Qualitative	Insight from health care providers
Thompson et al. 2016	Not specified	ON	Impact of guideline and tool for deprescribing proton pump inhibitors	Mixed methods	Financial effects of deprescribing
Wilson et al. 2018	Physicians	QC	EMPOWER intervention	Experimental	Deprescribing targeted medications
Gazarin et al. 2020	Pharmacists and nurses	ON	Analysis of deprescribing program	Experimental	Insight from health care providers
Sun et al. 2019	Nurses	ON	Deprescribing barriers	Qualitative	Insight from health care providers
Korenvain et al. 2020	Pharmacists	ON	Behavioural change model	Qualitative	Insight from health care providers

(continued)

TABLE 1 (continued)

Author	Profession	Province	Initiatives	Method	Theme
Abu Fadaleh et al. 2020	Not specified	Canada wide	Deprescribing cost scenarios	Quantitative	Financial effects of deprescribing
Balsom et al. 2020	Pharmacists	NL	Pharmacist-led deprescribing intervention	Experimental	Insight from health care providers
Edey et al. 2019	Pharmacists	BC	Pharmacist-led deprescribing intervention	Experimental	Insight from health care providers
Kennie-Kaulbach et al. 2020	Primary care providers	NS	Evaluation of TDF(v2) & BCW	Qualitative	Insight from health care providers
Turner and Tannenbaum 2017	N/A	Canada wide	Household survey	Qualitative	Deprescribing frameworks
Doell et al. 2018	N/A	MB	Patient file audit	Qualitative	Deprescribing targeted medications
Farrell et al. 2018	Prescribers	ON	Deprescribing self-efficacy survey	Qualitative	Insight from health care providers
Turner et al. 2018	Canadian Deprescribing Network	Canada wide	Deprescribing network strategy	Informative	Deprescribing frameworks
McIntyre et al. 2017	Hemodialysis team	ON	Implementation of deprescribing tools	Experimental	Deprescribing in special populations
Marin et al. 2020	Palliative care team	AB	Database review	Qualitative	Deprescribing in special populations
Farrell et al. 2015	Research team	N/A	Survey	Mixed methods	Insight from health care providers
Tandun et al. 2019	Pharmacists	BC	Pharmacist-led deprescribing intervention	Experimental	Insight from health care providers
McDonald et al. 2019	Interdisciplinary team	ON	Evaluation of MedSafer (electronic decision support tools)	Experimental	Insight from health care providers

BCW, behavior change wheel; N/A, not applicable; TDF (v2), theoretical domains framework version 2.

to deprescribe showed long-term successful outcomes in situations where health care providers were supportive and patients did not want to remain on the drug therapy.

Proton pump inhibitors. PPIs are another class of medications commonly deprescribed. The inappropriate use of PPIs was identified and targeted in 2 separate studies conducted in family health care settings and long-term care facilities.^{15,16} Patient chart reviews conducted in Manitoba long-term care facilities revealed that the majority of residents would benefit from being taken off PPIs and that there was opportunity to increase deprescribing interventions.¹⁶ A family health care

team in Ontario took their deprescribing initiatives a step further and developed a standardized process and guidance tool for clinicians to reassess and deprescribe PPIs.¹⁵ As a result, many patients taking a PPI chronically for gastroesophageal reflux disease without an indication were able to successfully eliminate their medication.

Financial effects of deprescribing

Along with affecting medication profiles, deprescribing practices also have the potential to cause economic changes associated with decreased pharmacotherapy. In this literature search,³ studies examined the financial implication of deprescribing.¹⁷⁻¹⁹

Using pharmacist-led educational interventions, 1 study discovered that deprescribing nonsteroidal anti-inflammatory drugs in community-dwelling older adults was beneficial and cost-effective.¹⁸ In another study, deprescribing PPIs in long-term care facilities initially showed a significant reduction in the average cost of PPI prescriptions. However, due to difficulties maintaining long-term PPI deprescribing efforts, average cost returned to baseline over time.¹⁷ The third study investigated the financial implications of deprescribing on community pharmacies across all provinces and territories in Canada using a case scenario that reflects the average senior's medication regime. Although medication costs and coverages differed significantly from province to province, overall deprescribing scenarios across the country typically reduced patient costs and lowered pharmacy income with minimal impact on government costs.¹⁹ Together, these 3 studies show that if deprescribing practices are continuously adhered to, a beneficial decrease in patient costs is noted.

Deprescribing in special populations

Positive impacts from deprescribing practices were recorded in 3 unique Canadian populations: patients at an outpatient hemodialysis unit, cancer patients receiving palliative care and a young patient described in a mental health case study.²⁰⁻²² On a hemodialysis unit in Ontario, deprescribing tools were applied to reduce polypharmacy for patients while maintaining patient safety and satisfaction.²⁰ At the end of the study, 57% of patients were taking fewer medications in comparison to the start. On a palliative care unit, potentially inappropriate medications were significantly decreased after palliative care consults.²¹ Only 1 study was identified to have implemented systematic deprescribing and cross tapering of medications in a youth population.²² This youth case study analysis revealed a significant positive decrease in weight with no behavioural deteriorations and lower rates of aggression after the deprescribing of 5 psychotropic medications in an individual with psychiatric and behavioural concerns. These 3 studies create new context for deprescribing among unique populations outside of the commonly targeted older adult group.

Insight from health care providers

Various deprescribing studies in this literature review focused on investigating the experiences and opinions of health care providers or used front-line health care workers as key players to carry out deprescribing interventions.

Key outcomes of deprescribing. Pharmacists were identified as the most commonly targeted health care profession. Six studies in this literature review focused on pharmacists as the catalyst for deprescribing practices.²³⁻²⁸ Deprescribing activities were successfully implemented into daily practice at 4 different pharmacies in Ontario,²⁴ through discharge prescription rounds²⁵ and in nursing home residents.²⁶ All 4 pharmacies integrated deprescribing into routine workflow through 4

similar steps: processes to engage patients, preliminary interactions, detailed interactions with the pharmacist and follow-ups.²⁴ Additionally, a number of home medications taken prior to hospital admission were discontinued without an increase in need for medical attention through patient-specific deprescribing rounds.²⁵ In long-term care facilities, pharmacist-led deprescribing interventions reduced the number of potentially harmful and unnecessary medications used by residents.²⁶ Two deprescribing strategies using pharmacists focused on PPIs as the main targeted drug.^{27,28} PPIs were successfully deprescribed in long-term care facilities,²⁸ and shared decision making between pharmacists and patients to deprescribe PPIs was a strategy proven to improve patient knowledge, realistic expectations and decisional confidence with deprescribing.²⁷

At a rural community hospital, a team of interdisciplinary health care workers were successful in deprescribing 46 medications in 11 patients who presented to the emergency room with 3 or more potentially inappropriate medications, clinical manifestation of an adverse drug reaction or referral by pharmacist or physician.²⁹ Furthermore, using an electronic decision support tool, a hospital health care team increased the proportion of patients with 1 or more potentially inappropriate medications deprescribed at the time of discharge.³⁰

Health care providers' experiences and opinions. The global pandemic has resulted in many changes to our health care system, including direct effects on deprescribing practices. Because deprescribing is considered a nonessential service during a pandemic, 1 study highlighted some barriers that older adults may experience and described virtual care as a potential solution.³¹ Five studies explored the perspectives of health care practitioners regarding deprescribing practices.³²⁻³⁶ Challenges identified by Vancouver family physicians included reluctance to deprescribe when they were not the original prescriber, reluctance to act due to organizational challenges and concerns about possible consequences.³² Home care nurses identified challenges of managing polypharmacy, including lack of open communication and inconsistent medication reconciliation practices.³⁶ Differences in what was emphasized in the deprescribing processes were noted between family physicians, nurse practitioners and pharmacists in Nova Scotia.³³ Practitioners from 8 provinces identified the following 5 top-rated drugs or drug classes to be deprescribed: benzodiazepines, atypical antipsychotics, statins, tricyclic antidepressants and PPIs.³⁵ Long-term care and family health care teams in Ontario identified increased clinician self-efficacy when developing and implementing a deprescribing plan for specific drug classes.³⁴

Deprescribing frameworks

In various articles, the Canadian Deprescribing Network (CaDeN) and the Bruyere Deprescribing Research Team identified key areas of focus that govern current deprescribing practices

in Canada.³⁷⁻³⁹ For example, CaDeN identified the process of public engagement and potential public engagement activities that can help deprescribing practices focus on public awareness and education.³⁷ CaDeN also highlighted the various theoretical foundations, developments and evaluation plans on which they have collaborated to achieve their 2020 deprescribing goals.³⁸

Patient perspectives around deprescribing were explored in the literature as well. Trenaman et al.⁴⁰ reported engaging patients and implementing their opinions and perspectives in the development of a pharmacist-led deprescribing framework. Telephone surveys of community-dwelling older adults revealed that health care providers can facilitate patient-initiated deprescribing conversations by providing information on medication harms and using the term *deprescribing*.⁴¹ Community-dwelling older adults were eager to undertake deprescribing, especially if they believed that they were taking a large number of medications, used medications that they no longer needed or experienced side effects.⁴²

Discussion

This present study is the first to examine deprescribing research initiatives across Canada. Initially, deprescribing interventions were created as a response to the increasing, inappropriate practice of polypharmacy in the older adult population with multiple morbidities.⁴³ However, this literature review revealed that the scope of deprescribing practices has expanded to include a variety of age groups and diverse settings. Deprescribing is not limited to older adult settings such as long-term care facilities but is now being incorporated into vulnerable populations such as patients receiving hemodialysis or palliative care.^{20,21} Additionally, the majority of the studies in this literature review included participants aged 18 years or older, rather than limiting the patient population to adults aged 65 or older. Together these findings reveal that deprescribing may be a beneficial practice for all age ranges and that any patient interaction, regardless of the patient's age, can be an opportunity for critical medication review.⁴⁴ Furthermore, although multiple evidence-based deprescribing guidelines are available,^{6,9} the authors of the majority of the studies in this literature review chose to create their own deprescribing intervention specific to their population of interest.

The majority of the deprescribing interventions reported in this literature review were carried out by interdisciplinary teams or pharmacists. These findings indicate that although physicians encompass the majority of prescribers and are the most common profession to engage in the clinical skill of prescribing, this may not be the case for deprescribing practices. Deprescribing requires a comprehensive interdisciplinary team to ensure that interventions not only are patient-centred but also take into account the complexity of the patient's situation.⁴⁵ This literature review highlights an opportunity for pharmacists across various health care settings to take leadership and improve drug safety among all age groups using deprescribing interventions. The challenges of deprescribing, which include the multifactorial

nature of polypharmacy and patient experiences, can be addressed through the patient-focused role of pharmacists as they use their knowledge of tapering regimens, monitor processes through scheduled follow-up visits and provide education about withdrawal effects and patient concerns.

Although the World Health Organization has identified harm from medications as a priority, many countries are approaching this in different ways. The United Kingdom has chosen to focus on changing the culture around prescribing to decrease the number of unnecessary medications.⁴⁶ This literature review portrays a shift in focus for current deprescribing leaders in Canada. Similarly to the US Deprescribing Research Network, Canadian deprescribing approaches are centred on promoting mutual learning and collaboration through patient, caregiver and health care provider engagement. CaDeN and the Bruyere Deprescribing Research Team have outlined the need to shift away from developing deprescribing guidelines toward encouraging public awareness and public engagement.^{37,39} Numerous studies have shown the effectiveness and efficacy of evidence-based deprescribing practices; however, the majority of this knowledge has yet to be translated to clinical practice. Current deprescribing leaders like CaDeN have decided to translate this knowledge through patient education strategies.³⁷ Although some research on understanding the patient perspective has begun, additional research is necessary to determine whether patient education strategies can truly be effective and allow for the system-level changes that are needed to support this practice.

Limitations

There are several limitations to this review. Studies based on populations outside of Canada and studies written in languages other than English were not considered. Grey literature that was not peer reviewed, such as conference proceedings, abstracts and websites that may contain useful information related to this topic, was omitted due to difficulties with access to the resources. Scoping reviews often lack detailed methodological steps, guidance and standards to adhere to; as well, rigor and quality of studies are not investigated in this form of review.

Conclusion

Deprescribing practices in Canada have shown a wide range of beneficial results across various health care settings, populations and different medication classes. A notable amount of evidence indicates that deprescribing practices have significant beneficial results for patient outcomes. Through this scoping review, 5 major themes and ideas surrounding deprescribing were identified: deprescribing targeted medications, financial effects of deprescribing, deprescribing in special populations, insight from health care providers and deprescribing frameworks. More research needs to be conducted to determine outcomes from new deprescribing-targeted goals of patient education, awareness and engagement. ■

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