



Deprescribing Medications: Barriers and Enablers

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This Rapid Evidence Report was prepared by the Newfoundland & Labrador Centre for Applied Health Research (NLCAHR), Memorial University. It was developed through the analysis, interpretation and synthesis of scientific research and/or health technology assessments conducted by other parties. It also incorporates selected information provided by expert consultants in the subject area. This document may not fully reflect all the scientific evidence available at the time this report was prepared. Other relevant scientific findings may have been reported since completion of this synthesis report.

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About This Report

About NLCAHR

The Newfoundland and Labrador Centre for Applied Health Research, established in 1999, contributes to the effectiveness of health and community services in Newfoundland and Labrador and to the physical, social, and psychological wellbeing of its population. NLCAHR accomplishes this mandate by building capacity in applied health research, supporting high-quality research, and fostering the effective use of research evidence by decision makers and policy makers in the provincial healthcare system.

About *Rapid Evidence Reports*

NLCAHR designed *Rapid Evidence Reports* to provide support for evidence-based decision making in the Newfoundland and Labrador healthcare system on an expedited basis as compared to the lengthier '*Evidence in Context*' reports issued through the Contextualized Health Research Synthesis Program. Through these expedited reports, NLCAHR provides a succinct review of recent research evidence on a high-priority research topic selected by decision makers in the province.

Rapid Evidence Reports include:

- A clear statement of the issue and the background to the issue/problem;
- A description of the scope and nature of the pertinent English-language scientific literature from the past five years;
- A summary of the principal features of the available evidence – points of consensus, points of disagreement, areas of uncertainty or silence on some or all of the following issues: effectiveness of interventions, potential benefits and harms, risks, costs, and cost-effectiveness; and
- A brief analysis of the types of issues that might affect the applicability of the evidence to the local context.

It is important to note that, unlike our other decision-support product, the '*Evidence in Context*' report, a *Rapid Evidence Report* is **not** a comprehensive and systematic synthesis of the literature on the topic.

A *Rapid Evidence Report* provides decision makers with a summary of the scope and nature of the recent scientific literature on the topic in question, an initial assessment of the strengths and gaps in this literature, and a review of the key points of agreement and disagreement among researchers.

Researchers and Consultants

For this report, researchers from the Newfoundland and Labrador Centre for Applied Health Research were Sarah Mackey, Research Officer, Contextualized Health Research Synthesis Program (CHRSP) and Dr. Stephen Bornstein, Director of NLCAHR. Our team benefited from the advice and expertise of Dr. Justin Turner, Senior Advisor on Science Strategy for the Canadian Deprescribing Network. Dr. Turner’s credentials are included in Appendix A.

Background

Medications carry with them benefits and risks for our health. On one hand, they allow us to prevent and treat disease, alleviate symptoms and extend our lives. On the other hand, some medications can expose patients to risks that outweigh their benefits for example when medications are no longer useful or when multiple medications are involved (1,2).

The use of multiple medications, known as polypharmacy, is especially concerning for older patients, as it is associated with negative health outcomes, such as falls, adverse drug reactions, hospitalization, increased length of stay in hospital and even mortality (3).

Deprescribing is a solution proposed to address the use of unnecessary or inappropriate medications through the process of safely stopping or reducing harmful or unnecessary medication (2).

Relevance to Healthcare Decision Making in NL

Decision makers in Newfoundland and Labrador recognize that deprescribing has the potential to improve quality of care and patient health

outcomes. In 2019, the Government of Newfoundland and Labrador collaborated with Memorial University’s School of Pharmacy and the Canadian Deprescribing Network to implement a three-year universal deprescribing initiative called SaferMedsNL. Several additional deprescribing initiatives have also been implemented in NL: by the Canadian Foundation for Health Improvement, by Quality of Care NL and by Memorial University’s School of Pharmacy through its Medication Therapy Service clinic. To help increase uptake for these initiatives, our provincial health system partners asked the Contextualized Health

What is “deprescribing”?

Deprescribing is a term first used in the early 2000s by Australian health researchers to describe the process of reviewing and reducing medications in older people to achieve better health outcomes (1,4) . In 2015, Reeve et al. conducted a systematic review to examine how researchers in the field define deprescribing and to determine consensus around the definition of the term. The authors found that the definition of deprescribing varied in the literature they reviewed. In the absence of an externally validated and internationally recognized definition, Reeve et al. proposed the following definition of deprescribing:

Deprescribing is the process of withdrawal of an inappropriate medication, supervised by a healthcare professional with the goal of managing polypharmacy and improving outcomes (1, p.1262).

Research Synthesis Program (CHRSP) team to examine high-level research evidence that identifies barriers and enablers to deprescribing.

In consultation with a national expert and with provincial health system decision-makers working in this area, we have arrived at the following research question for this *Rapid Evidence Report*:

“What barriers and enablers to deprescribing medications are identified in the scientific research literature?”

Scope and Nature of the Scientific Literature

For this *Rapid Evidence Report*, we searched the health research databases PubMed, Embase, and CINAHL to locate English-language systematic reviews and primary research studies published between December 2013 and December 2019. To avoid double-counting the evidence, any primary studies that were also included in the systematic review literature were not given separate consideration. Throughout this process, we sought guidance from Kristen Romme, a health sciences librarian at Memorial University, who helped us develop search terms that reflected the various descriptors used in the literature and that aligned with the nature of the published research evidence on this topic.

Inclusion and Exclusion Criteria

We included a broad set of research parameters to optimize the inclusion of as many research articles on the barriers and enablers of deprescribing medications as possible. In many instances, this means that we included studies with mixed populations and settings in order to include as much information on relevant barriers and enablers as we could.

We excluded only those studies that looked at certain exclusive populations (e.g., children, patients at the end of life), a single setting (e.g., acute care hospitals) or that were concerned with deprescribing as an intervention in a specific circumstance (e.g., at the end of life). The parameters of our search and our inclusion/ exclusion criteria are outlined in Table 1 below.

Table 1: Inclusion and exclusion criteria for evidence in this report

Parameter	Inclusion Criteria	Exclusion Criteria
Population	<ul style="list-style-type: none"> Adults or older adults Mixed populations where adults made up the majority Healthcare providers e.g., general practitioners, pharmacists, nurses 	<ul style="list-style-type: none"> Studies that looked exclusively at children Studies that looked exclusively at patients at the end of life
Setting	<ul style="list-style-type: none"> Community dwelling Long-term care General Practice Mixed settings 	<ul style="list-style-type: none"> Studies that looked exclusively at acute care/ hospital settings
Intervention	Deprescribing in various forms: <ul style="list-style-type: none"> Pharmacist-led medication reviews Physician-led interventions Prescriber education programs Multidisciplinary interventions Clinical support systems Patient education 	<ul style="list-style-type: none"> Deprescribing as an intervention at the end of life
Outcome	<ul style="list-style-type: none"> Barriers and enablers to deprescribing medications 	

Evidence included in this report

This report includes the evidence from six systematic reviews, one comprehensive environmental scan, and ten primary studies¹. Of the systematic reviews:

- two are reviews of qualitative studies (4,5);
- two are reviews of mixed-methods² studies (6,7);
- two are reviews of studies with randomized or controlled designs (8,9); and
- one is a comprehensive environmental scan of 48 online deprescribing materials (10).

Of the additional primary studies not captured in these systematic reviews:

- seven reported results from online or mailed surveys (11–17);
- one was a retrospective analysis of linked data on prescriptions (18);
- one was a post-hoc secondary analysis of a deprescribing trial (19); and
- one reported on semi-structured interviews (20).

¹ Because we found a large number of recent published primary studies, we decided to limited our primary study selection to those that received $\geq 70\%$ on the Downs and Black critical appraisal tool and were published after recent systematic reviews included in this report.

² Even though these two reviews characterize their methods as mixed-methods, the study authors note that the majority of the primary research reviewed was qualitative in nature.

Appraising the evidence

We conducted a quality appraisal of all systematic reviews and primary studies included in this report. To appraise systematic reviews, we used the AMSTAR tool, an 11-item instrument that assesses methodological rigor. Based on AMSTAR criteria, the quality of systematic reviews is rated using the categories: Low, Moderate, High, or Very High (21). For primary studies, we used the Downs and Black checklist to assess the methodological quality of both randomized controlled trials and non-randomized studies (22). Based on Downs and Black criteria, the quality of primary studies is rated as being: Poor, Fair, Good or Excellent (23). The results of our quality appraisal are indicated in Table 2.

Table 2: Quality of the evidence included in this report

Systematic Reviews- AMSTAR Quality Appraisal Results	
Anderson, 2014 (4)	Moderate Quality
Bokhof, 2016 (5)	
Hansen, 2018 (8)	
Mokhar, 2018 (9)	
Reeve, 2013 (7)	
Fajardo, 2019 (10)	
Gillespie, 2018 (6)	Low Quality
Primary Studies- Downs and Black Quality Appraisal Results	
Goyal, 2019 (12)	Good Quality
Linsky, 2019 (11)	
Niznik, 2019 (18)	
Reeve, 2019 (13)	
Tegegn, 2018 (15)	
Kua,Saw, 2019 (16)	
Reeve, 2018 (14)	
Turner, 2019 (19)	
Zhang, 2018 (17)	Fair Quality
Hansen, 2019 (20)	

Characterizing the evidence

Qualitative studies

Although the evidence in this report includes a number of moderate-quality systematic reviews and numerous good-quality primary research studies, we should point out that much of the evidence we included in this report is qualitative in nature. Systematic review authors have interpreted and analyzed evidence using mainly narrative synthesis rather than quantitative meta-analyses, and recent primary research is limited to mostly qualitative surveys rather than gold standard randomized controlled trials. Readers of this report are, therefore, cautioned to keep in mind that the evidence we reviewed about barriers and enablers to deprescribing is largely descriptive, having been gleaned from the reported experiences, attitudes and perceptions of patients and healthcare providers rather than being the result of any proven quantitative relationships.

Defining “deprescribing”

The main difficulty in gathering and assessing information for this report is that there is a lack of consensus in the healthcare literature on the definition of deprescribing (1). A recent analysis that attempted to clarify the definition of what deprescribing means in research and clinical practice concluded that “deprescribing is a term used with varying degrees of precision and without a widely-accepted definition” (24). In the absence of a validated definition, we searched for a variety of interventions that involved either discontinuing or reducing medications, including:

- Pharmacist-led medication reviews,
- Physician-led medication reviews/ interventions,
- Prescriber education programs,
- Multidisciplinary interventions,
- Clinical support systems, and
- Provider/Patient-education.

Although we included these conceptions of deprescribing in our literature search, the evidence typically defined deprescribing in very basic terms. A definition given by one of the systematic reviews we included illustrates the kind of definition typically encountered in the literature:

The process of reducing or discontinuing medications, with the goal of minimizing inappropriate use and preventing adverse patient outcomes (4).

General deprescribing vs. deprescribing specific medications

Another noteworthy point is that the majority of the literature we reviewed focused on deprescribing as a *general approach* to reducing medication use/polypharmacy and not on deprescribing a specific class or type of medication (e.g., opioids, antidepressants, etc.). This includes six systematic studies (4–8,10) and eight recent primary studies (11,13–17,19,20).

Only two systematic reviews identified the specific medication classes of included primary studies (4,7). Anderson et al. reported that four included studies focused on polypharmacy while ten focused specifically on centrally acting agents such as psychotropics, hypnotics, benzodiazepines, minor opiates and antidepressants; 2 for proton pump inhibitors and 5 for miscellaneous PIMs [potentially inappropriate medications] (4, p.3).

Reeve et al. 2013 included the following medication classes/therapeutic groups: benzodiazepines, psychotropic medications, depression/anxiety medications, selective serotonin reuptake inhibitors, donepezil, methadone, antiepileptics, hormone replacement therapy, proton pump inhibitors, interferon-b1a, antihypertensives, and long-term drug therapy (7).

One final systematic review by Mokhar et al. focused solely on deprescribing a single class of medication: *benzodiazepines*³ and *z-drugs* (9).

In the recent primary studies, we found only two primary studies that looked at specific medication classes:

- Goyal et al. on deprescribing cardiovascular medications (12), and
- Niznik et al. on deprescribing acetylcholinesterase inhibitors (18).

This heterogeneity of focus creates further challenges when attempting to generalize the results of the evidence in an effort to identify a common set of barriers and enablers to deprescribing.

Study Populations

Systematic reviews focused either on providers, or on patients or on both patients and providers. The variation in target populations in the systematic review literature poses an additional challenge to synthesis. For example, one review examined medical and non-medical⁴ prescribers of medicines (mostly GPs) (4); one review focused on patients of any age (7); and, another environmental scan focused on those older than 18 years (10). The four remaining reviews focused on both adult patients (mostly over the age of 65), and a mix of healthcare providers⁵ (5,6,8,9).

In terms of the recent primary literature, six of the ten recent primary studies focused on patient perspectives (11,14,15,17–19); and two other studies included perspectives of both patients and caregivers (13,16). The remaining two primary studies focused on clinicians. One of these included a mix including geriatricians, general internists and cardiologists (12) and the other focused on community pharmacists (20).

Study Settings

Most systematic reviews included in this report did not limit the settings for deprescribing. Taken together, the following settings are included in the review literature:

- primary care settings,
- outpatient care settings,
- general practice settings,
- community pharmacies,
- residential care facilities,
- geriatric facilities, and
- hospitals.

³ Benzodiazapines and Z-drugs are often prescribed for the treatment of anxiety or sleep problems.

⁴ Although authors this review sought to include research on the perspectives of non-medical prescribers, they did not find any studies to include on non-medical prescribers (4).

⁵ Except for the systematic review by Gillespie et al. that only included general practitioners (6).

The majority of the primary studies examined similar settings:

- Three studies focused specifically on the community (17,19,20);
- Two studies focused on outpatient settings (12,15);
- One study focused on primary care (11);
- One study focused on nursing homes (18); and
- One study included community pharmacies and primary care settings (16).

Only two primary studies placed no limit on the setting type for deprescribing other than the country where the study was conducted; one in Australia (13) and one in the USA (14).

Categorizing barriers and enablers in the literature

In the literature we reviewed, some authors categorized their findings simply as barriers and enablers to deprescribing. In other instances, authors described potential influences or factors that related to deprescribing more generally. Findings from qualitative systematic reviews and primary studies often reported factors that influenced deprescribing from the perspective of patients and providers. A small number of the reviews and studies we reviewed conducted deprescribing interventions and then examined factors common to successful interventions.

For the purposes of this report:

- **a barrier** is a factor that could negatively affect the acceptance, willingness or practice of deprescribing; and
- **an enabler** is a factor that could positively influence the acceptance, willingness or practice of deprescribing.

In instances where the authors described such factors more generally, we analyzed each factor and placed it in the most appropriate category based on its alignment with the definitions above.

The systematic reviews in this study encapsulated the findings from 118 primary studies and identified barriers and enablers in the following ways:

- they described barriers, enablers, or other factors (e.g., experiences, perceptions, attitudes) that influence deprescribing of medications in a general way (4–7).
- they looked at the characteristics or factors that might help or hinder specific kinds of deprescribing interventions, including:
 - behavioral change techniques used in deprescribing interventions (8),
 - patient-centered interventions for reducing Benzodiazepines and z-drug prescribing (9), and
 - online educational materials for deprescribing (10).

Of the primary studies included in this report:

- most reported on patient attitudes and beliefs that contributed to their willingness to discontinue or reduce medication use (13–16,19),
- two focused on patient willingness to have medications deprescribed by certain providers (11,17) and,
- three described barriers, facilitators or other factors in deprescribing or dispensing medications more generally (12,18,20).

To assist decision makers in assessing the evidence, we have organized the barriers and enablers to deprescribing in this *Rapid Evidence Report* as follows:

- **Patient-level** barriers and enablers
- **Provider-level** barriers and enablers
- **System-level** barriers and enablers

The following sections summarize the evidence on barriers and enablers at each of these levels.

Patient-level Barriers and Enablers

Patient-level Barriers

Overall, most of the patient-level barriers that we found involved patient perspectives (attitudes, fears, perceptions, experience) or a lack of knowledge or understanding about their medications as reported by patients, mostly older adults. A small minority of studies reported on the perspectives of caregivers and we have included those findings in this section as well.

Barrier 1 | Patient attitudes and perspectives

The research on patient attitudes and perspectives provides insight as to why patients might be hesitant to discontinue or reduce medication use. Two systematic reviews and one primary study suggested that some patients are hesitant to discontinue using medication that they perceive to be beneficial (i.e., that they believe helps to reduce symptoms) or that they perceive the prescribed medication as being necessary for treating a given health condition (5,7,14).

Patients also reported concerns about the negative effects of discontinuing medications, including:

- experiencing unfavorable outcomes (e.g., the return of symptoms or of a condition) (6,7),
- missing out on the future benefits of medication use (15), or
- experiencing withdrawal effects (7).

Some patients were concerned about the lack of a clear process to support their medication cessation according to one systematic review (7). Adding to this, a primary study that surveyed older adults found a correlation between those who expressed concern about discontinuing use of a medication and a decreased willingness to stop taking a medication (13).

Further complicating matters, patients quite often expressed conflicting beliefs about medication use. For example, both a systematic review (6) and a primary study (14) reported that while patients may believe that a medication is medically necessary, they may also express a willingness to have the same medication deprescribed if their doctor recommended doing so. Similarly, another primary study found that military veterans receiving primary care “generally disagreed that medicines were either unimportant or overused,” and yet “patients were generally interested in stopping medicines” (11, p.4).

Another primary study revealed that certain patient attitudes and behaviors towards deprescribing, might not accurately predict patient deprescribing behavior. In this study, the authors conducted a post- hoc secondary analysis of a deprescribing trial. They examined patient responses to a survey before a deprescribing intervention to see whether these responses were a predictor of success in the intervention. The authors found that “baseline attitudes and beliefs about medications failed to predict behavior, despite expressed motivation to deprescribe” (19).

This lack of predictive validity in current tools that assess patients’ attitudes and beliefs about deprescribing was highlighted as a challenge for understanding how patient perspectives will actually translate into deprescribing behaviors (19).

Research evidence also suggests that certain *influences* may be barriers to deprescribing for patients. Reeve et al. found that patients often report feeling pressure from family or health professionals to either start or discontinue taking a medication. Conversely, patients might be confused or ill-informed about deprescribing when:

- there is a lack of communication about the opportunity to deprescribe;
- patients receive conflicting advice from different prescribers; or
- there is uncertainty about the roles and responsibilities of different prescribers (6,7).

A recent primary study on military veterans calls attention to the role of a provider’s expertise as an influence on patient willingness to deprescribe. Although the authors caution that these findings may not be generalizable to other settings, survey responses indicated that:

....some patients were willing to allow any provider to deprescribe, [while] others were uncomfortable accepting such recommendations from providers with different levels of expertise (11).

Barrier 2 | Lack of patient knowledge about medications/medication management

Two systematic studies found that a lack of patient knowledge or understanding about their medications could be a barrier to deprescribing (5,7). One of the systematic reviews examined older patients' experiences of reducing polypharmacy. Patients identified that a key challenge for them was the complexity of their medication regimens (5). Patients have also reported feeling uninformed about various aspects of their medication use such as the purpose of a medication, the nature of the medication being prescribed, the number of medications needed to control a disease, or medication side-effects (5,6). Reeve et al. also revealed that patients' confusion about how to stop medications may persist even after they have spoken to their physician about stopping. Some patients also reported receiving conflicting information when multiple prescribers were involved, leading to another source of patient confusion (7).

Evidence from a comprehensive environmental scan provided insight into how online deprescribing materials for patients may actually contribute to a lack of patient knowledge or understanding. The authors found that freely available online deprescribing information for patients:

- does not equally present the benefits and harms of deprescribing;
- is often communicated above patients' reading levels; and
- rarely addresses the issue of patient preferences and values (10).

These authors suggested that:

There is a pressing need to develop materials that provide balanced information about both benefits and harms of deprescribing, so that patients can make informed choices and know which warning signs and symptoms to look out for when medications are being discontinued (10, p.1403).

Barrier 3| Patient Characteristics

One primary study did a retrospective analysis of a national sample of residents of older nursing home with severe dementia and found that certain characteristics of these patients decrease the likelihood of discontinuing acetylcholinesterase inhibitors⁶ in nursing homes.

These included:

- memantine use;
- use of strong anticholinergics;

⁶ These medications are used to treat a range of conditions including: Alzheimer's disease, the Lewy body dementias and Parkinson's disease.

- polypharmacy;
- rurality; and
- being treated by a primary care prescriber rather than by a geriatric specialist (18).

Although these results are from a single research study, we have chosen to highlight them here to illustrate the possibility that certain patient characteristics may have the potential to create barriers to deprescribing.

Patient-level Enablers

The evidence indicates that certain patient perspectives, as well as some proposed improvements to patient knowledge or understanding about their medications may be potential enablers of deprescribing.

Enabler 1| Patient attitudes and perspectives

In the discussion of patient-level barriers above, we described certain patient perspectives that seem to make patients feel less comfortable about deprescribing. On the other hand, some evidence also indicated that patients who report concerns related to the burden or risk of medication use may be more willing to consider deprescribing. The kinds of concerns that may enable deprescribing include:

- fear of side-effects or experience of side-effects,
- fear of addiction/dependency and drug tolerance (6,7),
- perceived burden of taking multiple medications/fear of drug interactions (6),
- inconvenience and cost of medications (7,15), or
- a general dislike of taking medications (7).

In describing patient fear of addiction or dependency and drug tolerance, one review specified that:

Fear of addiction/dependency arose in four included studies as an enabler to cessation, but this was only expressed in articles with medications related to the nervous system (BZDs, antidepressants/anti-anxiety medications and SSRIs) (7).

Another systematic review indicated that some older adults place the value of ongoing quality of life over the value of life expectancy. The authors suggested that this kind of value judgment might prompt some patients who are experiencing significant side effects from medication use to consider deprescribing (6).

We also found evidence indicating that certain patients' attitudes or experience with medication effects may enable deprescribing. Patients may be more ready to accept deprescribing when they:

- feel that a medication is no longer necessary for their condition;
- experience a lack of symptoms;
- feel medication lacks effectiveness; or

- generally dislike medications (7).

One primary study associated greater involvement of older adults and their caregivers in medication management with a willingness to have medications deprescribed (13).

Enabler 2| Patient-prescriber relationships

Several studies agree on the importance of the patient- prescriber relationship in enabling deprescribing. One review suggests that a good relationship between patients and physicians enables physicians to influence deprescribing in a positive way (7). Another systematic review and five primary studies found that patients' willingness to deprescribe increased if their doctor indicated that deprescribing was possible (6,13–16,19). Caregivers in two of these studies also expressed a willingness to support deprescribing if the care recipient's doctor said it was possible (13,16). Bokhof et al. 2016 suggest that a trusting relationship is crucial for patients to feel comfortable with a prescriber's regimen. In this review, key factors identified by patients that create prescriber-patient trust included:

- providing patient access to information on the medications;
- having a good communication style that allows for negotiation;
- considering a patient's individuality; and
- allowing for shared decision-making (5).

Similarly, another review found that older adults based their trust in general practitioner (GP) prescribing practices on various factors such as:

....the perceived clinical knowledge of their GP, a belief that their GP would make decisions with their best interests in mind, and on the strength of the relationship established between themselves and their GP based on mutual respect, good communication, and knowledge of their preferences (6).

Importantly, deprescribing did not harm the patient and healthcare provider relationship (17).

Enabler 3| Improving patient knowledge or understanding of medications or the deprescribing process

Two systematic reviews (7,9) and one primary study (17) suggest that patients are enabled to stop or reduce medication use when they have gained an improved knowledge or understanding of their medications or of the deprescribing process itself. Patients may be more likely to accept deprescribing when they receive new evidence on the benefits or risks of a medication and when they understand the appropriateness of stopping a medication (7).

A recent systematic review by Mokhar et al. that examined patient-centered care interventions to reduce the inappropriate use benzodiazepines (BZDs) or z-drugs identified the dimensions of patient-centered care that were most relevant to patients. Interventions

to reduce BZDs use were more effective when they involved the dissemination by a healthcare provider of comprehensive, well-arranged written information on BZDs (e.g., self-help booklet, information about reducing medication and coping, discontinuation letter with advice). These interventions were also effective when patients received information or education about discontinuing these medications with additional planned advice from a healthcare provider (e.g., direct to patient educational brochure or a letter from the family doctor in the mail plus a follow-up appointment) (9).

One primary study looked at the impact of an educational deprescribing intervention on patient trust in their doctor or pharmacist (17). For this study, community pharmacists distributed an educational brochure to community-dwelling older adults on the harms associated with their prescribed medications. The brochure included safer drug or non-drug therapy options as potential substitutes for their current medications. This study also found that receipt of these educational interventions had no negative impact on in the level of trust patients placed in their healthcare providers. The authors suggest that these findings should bolster prescriber confidence in the effectiveness of patient-education materials to help enable deprescribing (17).

Enabler 4| Patient characteristics

Three patient surveys and one secondary analysis revealed that certain patient characteristics are associated with a patient's willingness to deprescribe. In these three studies, factors associated with patient willingness to deprescribe included: patient age, deteriorating health, or complex medication regimes (14,16,18).

Finally, one primary study found that caregivers were more willing to support deprescribing medications for a care recipient when the care recipient was rated as having good physical health (13).

Provider-level Barriers and Enablers

Provider-level Barriers

This section outlines the barriers and enablers to deprescribing from the perspective of providers, including general practitioners, specialists who prescribe medications as well as other healthcare providers who may dispense and administer medications (e.g., pharmacists). The majority of evidence about provider-level barriers was either related to provider perspectives (e.g., their fears, beliefs, and perceptions), or to the limitations of provider knowledge, skills, or experience.

Barrier 1| Provider perceptions and concerns

Most commonly, the literature indicated that a provider's fears about perceived negative consequences of deprescribing was seen as being a barrier. Some fears reported by providers in the systematic review literature included:

- fear of negative effects of deprescribing on patient health (e.g., return of symptoms, withdrawal) (4);
- fear that poor patient outcomes could lead to litigation (4–6); and
- fear of losing credibility and patient trust in the therapeutic relationship (4–6).

Conversely, two systematic reviews found that a provider's positive perceptions about the benefits of medications for patient health are potential barriers to deprescribing. Providers report being less likely to deprescribe in cases where they perceive a medication has few adverse effects or where they believe that the medication has been clinically effective on previous occasions (4,6).

We also found evidence that provider perceptions and attitudes about their patients can be barriers to deprescribing. Two systematic reviews reported that some providers perceive pressure from their patients to prescribe medications (5,6). Moreover, Gillespie et al. found that certain general practitioner (GP) attitudes and perceptions about older adults inhibited deprescribing. These included:

- the perception that older adults are generally resistant to change and unlikely to accept deprescribing advice;
- the belief that older adults do not mind taking multiple medications (polypharmacy); and
- the perception that it is hard to explain deprescribing to older patients (6).

In the recent primary literature, providers report similar perceptions. In one study, patient reluctance was a common barrier reported by physicians deprescribing cardiovascular medications (12). A second study similarly found that patient demands influenced whether or not community-pharmacists would change or discontinue a medication (20).

Taking into account the different perspectives relayed by providers above, it is not surprising that Anderson et al. noted that:

Prescriber beliefs at a population level did not necessarily translate to prescribing practices at an individual level. For example, agreement among prescribers that benzodiazepines should not be used regularly or in the long term did not necessarily preclude such prescribing in individual patients (4, p.6).

Barrier 2| Provider concerns about inter-professional relationships

Some providers also conveyed a concern that changing medications might cause conflict or negative consequences for other healthcare professionals (4) or interfere with other clinicians' treatment plans (12). Evidence from general practitioners (GPs) in one systematic review suggests that some GPs perceive a hierarchical relationship between themselves and specialists that prevents them from questioning a specialist's prescribing decisions (6). This uncertainty around providers' roles and responsibilities in terms of deprescribing seems to

be a barrier for providers that may contribute to the failure to deprescribe even when it might be appropriate (4,5,8).

Barrier 3/ Limitations of knowledge, skills, or experience

In the systematic review literature, limitations of deprescribing knowledge, skills, self-efficacy or experience and a general lack of clarity in the deprescribing process are commonly reported provider-barriers. The identified gaps in provider knowledge and skills involve:

- recognizing adverse drug effects;
- identifying appropriate medications;
- understanding or identifying potential drug interactions;
- understanding the benefits and risks of long-term medication use; or
- the ability to develop, implement, and monitor deprescribing (4,6).

One review found that limitations in pharmacological knowledge have a negative impact on a provider's willingness and confidence to deprescribe (6). Three systematic reviews also identified key informational gaps that challenge providers such as: a lack of information about non-pharmacological alternatives, a lack of suitable deprescribing guidelines, a lack of health literacy resources to share with patients, and incomplete clinical pictures of older patients (4–6).

Two systematic reviews also noted that the complex decision making involved in the process of deprescribing for older adults with multiple conditions and co-morbidities is a barrier to deprescribing. When providers do not have appropriate knowledge, skills or support to weigh the risks versus the rewards of deprescribing, they may simply take no action, particularly when assessing medication use among adults with multiple morbidities (4,5). Anderson et al. also found that some prescribers were unaware of their inappropriate prescribing until it was pointed out to them (4).

Two recent primary studies provide further insight into barriers to deprescribing for specific types of providers. One good-quality study that surveyed geriatricians, general internists, and cardiologists about deprescribing cardiovascular medications found that:

...geriatricians were less likely to report insufficient evidence of deprescribing efforts as a barrier when compared to other specialties (8% of geriatricians, 19% of general internists, and 24% of cardiologists; $P < .001$) and [geriatricians were also] less likely to report limited formal training on deprescribing (2% of geriatricians, 16% of general internists, and 6% of cardiologists; $P < .001$) compared to other specialties (12).

The second primary study conducted semi-structured interviews with community pharmacists working in the community. Some pharmacists within this primary study identified limitations in the guidelines for deprescribing. Specifically, these respondents felt

that, even when existing guidelines described how to identify potentially inappropriate prescriptions, they still lacked specific instructions about the next steps to take to manage these medications (20).

Provider-level Enablers

As in the section on provider-level barriers above, we also found evidence that certain provider perspectives could enable deprescribing. We also discovered that the perspectives reported by providers in a number of studies included suggestions about how to improve their deprescribing knowledge, skills and experience.

Enabler 1/ Provider perspectives and concerns

Two systematic reviews described fears, beliefs or perceptions among providers that can enable deprescribing (4,6). One systematic review noted the following provider-reported perceptions that enable deprescribing:

- the fear of negative consequences related to *continuing* a medication;
- a positive attitude about discontinuing medication use; and
- the belief that deprescribing is beneficial (4).

The second systematic review revealed that general practitioners are more motivated to deprescribe when they perceive a greater risk in continuing medication than in discontinuing its use (6). In this review, providers were also more likely to deprescribe when certain clinical characteristics of the patient were evident, such as: cognitive impairment, a limited life expectancy, the express wishes of the patient or family, the number of medications being taken, or the functional dependence of the patient on caregivers (6).

Enabler 2/ Adverse drug reactions

A primary study that surveyed three types of specialists - geriatricians, general internists and cardiologists found that the most common reason physicians considered deprescribing cardiovascular medications was that patients experienced adverse drug reactions. Interestingly, this study also found that the limited life expectancy of the patient enabled some specialists to deprescribe cardiovascular medications. Geriatricians reported being the most likely care providers to consider deprescribing medications, followed by general internists and then by cardiologists (12).

Enabler 3/ Provider-patient relationships

Providers also noted the positive influence of a good patient-provider relationship on reducing medication use. Three systematic reviews found that good communication and a trusting relationship between providers and patients enabled deprescribing from the point of view of providers (4–6). General practitioners in one of these systematic reviews further indicated that having more familiarity with a patient helped to build a trusting relationship and improved the provider's knowledge about patient preferences, health concerns and medications (6).

Enabler 4| Improving provider knowledge, skills and experience

The evidence indicates that improving provider knowledge, skills and experience, especially for general practitioners, can enable deprescribing (4–6,9). One systematic review identified the following knowledge and skills as being potentially helpful for minimizing inappropriate prescribing and for deprescribing when necessary:

- *better quantification of the benefits and harms of [each medication];*
- *confidence to deviate from the guidelines and to stop medication use, if thought necessary;*
- *greater experience, and targeted training, especially in prescribing for older people* (4, p.8).

Another review also noted that general practitioners were more likely to engage in deprescribing if they had done it before (6).

A third systematic review that examined patient-centered care elements of deprescribing interventions used a multifaceted approach to reduce the inappropriate use of benzodiazapines and z-drugs. The findings indicated that active exchanges with healthcare providers can improve the prescribing behavior of providers. The intervention under study involved healthcare providers receiving education on the appropriateness of prescribing benzodiazapines and z-drugs medications as well as a review or evaluation of their own prescribing practices (9).

We noted previously that unsuitable deprescribing guidelines are a barrier for some providers. Conversely, the evidence indicates that if the current limitations of evidence-based guidelines were to be addressed, such improved guidelines could be very useful for providers. In one study, general practitioners suggested developing evidence-based guidelines that take into account multi-morbidity and the age of a patient. These providers suggested that guidelines should also “contain risk assessments on continuing versus stopping medications and alternative treatment options” (5). Additionally, some community pharmacists interviewed in a recent primary study welcomed the opportunity to receive more education and guidelines about reducing potentially inappropriate prescriptions (PIP) and suggested that such guidelines include information on the steps to follow once a PIP is identified (20). In response to the request for deprescribing guidelines, Canadian guidelines for deprescribing benzodiazepine receptor agonists have recently been created; however, there is no published research to date on their effectiveness in changing prescribing behavior (25).

System-level Barriers and Facilitators

System-level Barriers

The majority of system-level barriers identified in the literature included a lack of multidisciplinary coordination/communication as well as other system constraints that we describe below.

Barrier 1| Lack of multidisciplinary coordination and communication

As mentioned earlier in the report, much of the research we reviewed for this report relates to deprescribing medications for older adults, many of whom are receiving medications for multiple conditions and who therefore receive care from multiple providers. Three systematic reviews (4–6) and three primary studies (11,12,20) identified gaps in communication and coordination between prescribers when patients require multidisciplinary care. Two systematic reviews agreed that either a lack of communication or poor communication between healthcare providers can negatively affect deprescribing decisions (4–6). A survey of community pharmacists in one primary study reported that this lack of communication between healthcare providers leads to confusion about medication changes and impedes the implementation of these changes (20). Elsewhere, patients themselves reported receiving conflicting information about their medications from the different providers involved in their care which creates confusion and can act as a barrier to deprescribing at the patient level (11).

Other communication/information barriers to deprescribing at the system level included:

- the ineffective or inadequate transfer of patient information at various care interfaces; and
- cases in which medical records are either fragmented or difficult to access (4,5,8).

It is likely that these issues with care coordination and communication at the system-level exacerbate the level of certainty or of discomfort about provider roles and responsibilities highlighted in some studies (4,6,8,12). In one systematic review, general practitioners described a hierarchical relationship between themselves and specialists, noting that this systemic issue prevented them from questioning some prescribing decisions even when it made sense to do so (6).

Barrier 2| Time required for consultations

A lack of consultation time to review and discontinue medications is a barrier identified by healthcare providers and patients in three systematic reviews (4–6) and one primary study (20). For example, Bokhof et al. 2016 found that:

Both older adults and their GPs thought that there was not enough time during consultations to review medications, consider patient preferences, and determine the priorities that patients valued (5).

Barrier 3/ Other system-level barriers

Other system-level constraints noted in the research literature include the following:

- the limited availability of effective non-drug treatment options (4);
- inadequate reimbursement for general practitioners to perform complex consultations (6); and
- the use of information technology applications that are not a good fit for complex cases, particularly for older patients with multiple morbidities (6).

System-level Enablers

Common enablers proposed in the literature at the system-level involve key supports and organization across the healthcare system that would simplify and clarify deprescribing processes and decision-making for patients and health providers alike.

Enabler 1/ Access to professional or technical support

A number of research studies suggest that various supports at the health-system level could positively affect deprescribing. The most commonly suggested systemic enabler to deprescribing is timely access to decision support for care providers (4–7,11,12,20). In particular, two systematic reviews specified that general practitioners would benefit from decision-support on deprescribing practices from specialists, geriatricians, psychiatrists, and pharmacists (4,6). Other reviews suggest that deprescribing can be enabled by optimizing interdisciplinary co-operation and communication and by ensuring that providers have access to complete and accurate patient records (4,5). Clarifying prescribing roles and responsibilities for interface management could also help reduce polypharmacy (5).

Other system supports that have the potential to enable deprescribing for providers include:

- access to medical IT support for dealing with interactions and dosage adjustments;
- protected consultation time for medication reviews (5); and
- access to a clinical record system for sharing patient information between providers (20).

Enabler 2/ System-level knowledge and skills improvement

In response to the many barriers to deprescribing, several studies propose that supporting patient and provider knowledge about deprescribing at the system-level could help enable deprescribing practices. Examples of system-level support suggested in the research literature include:

- providing care providers with interdisciplinary education and training opportunities related to medication use and patient-centered care (9,12,20),
- developing evidence-based deprescribing guidelines that consider the needs of healthcare professionals and their practice settings (5,20),
- informing, training, and involving patients (5) in the development and dissemination of deprescribing materials that are intended for use by patients. Such

materials should ideally indicate both the benefits and harms of deprescribing and consider patient preferences (10,11).

Enabler 3/ Supporting system-level cultural and attitudinal changes

In discussing system-level support for deprescribing practices, Anderson et al. suggest that:

Professional organizations and colleges have an important role to play in encouraging the necessary cultural and attitudinal shifts towards 'less can be more' in appropriate patients (4, p.16).

In terms of the requirements to support such a cultural shift, a recent systematic review provides insight into some behavioral change techniques that can encourage more appropriate prescribing practices. Hansen et al. examined behavioral change techniques used to support deprescribing interventions that involved older patients and healthcare professionals with the authority to prescribe, dispense or administer medications. These included education/training, clinical assessments/treatments, electronic message alerts, and prescription reviews. Polypharmacy and inappropriate prescribing were reduced when the interventions included the behavioural change techniques specified in the following quotation:

- (i) a goal and an action plan to solve prescribing problems,*
- (ii) monitoring of behaviour,*
- (iii) social support and the use of a credible source, and*
- (iv) clear instructions and guidance on implementation to the prescriber and information about health consequences of doing/not doing the behavior (8).*

These authors also found that effective interventions required delivering prescribing recommendations orally and face-to face (8).

Summary Table: Barriers and Enablers to Deprescribing Medications

Table 3 below provides readers with a quick summary of the key findings that are outlined in detail in the sections above.

Table 3: Summary of key findings

Level	Barriers	Enablers
Patient-level	<ul style="list-style-type: none"> • Attitudes and perspectives about the consequences of <i>not</i> taking medications • Lack of knowledge about medications/ medication management • Influence of patient characteristics 	<ul style="list-style-type: none"> • Attitudes and perspectives about the consequences of taking medications • Positive, trusting patient-prescriber relationships • Improved knowledge and understanding of their medications and of deprescribing • Influence of patient characteristics
Provider-level	<ul style="list-style-type: none"> • Perspectives and concerns about negative outcomes of deprescribing patient medications • Concerns about negative consequences for inter-professional relationships • Limitations of knowledge, skills or experience 	<ul style="list-style-type: none"> • Perspectives and concerns about negative outcomes of continuing patient medications • Positive and trusting provider-patient relationships • Improving provider knowledge, skills and experience
System-level	<ul style="list-style-type: none"> • Lack of multidisciplinary coordination and communication • Lack of time or funding required for consultation • Lack of other practical supports at the system-level 	<ul style="list-style-type: none"> • Access to professional or technical support • System-level knowledge and skills improvement • Support for system-level cultural and attitudinal changes

Potentially Relevant Contextual Issues

Throughout the course of this project, we have tried to identify potential contextual-factors unique to our provincial health and healthcare context that may influence the relevance and applicability of the research-based evidence on the barriers and enablers of deprescribing medications. This section of the report addresses those factors in brief.

Demographic & Population Health Factors

Patient and provider perspectives in the literature indicate that polypharmacy, older patients and the presence of complex comorbidities compound decision making about deprescribing. Newfoundland and Labrador has the oldest and the most rapidly aging population in Canada, with people 65 years of age and older currently representing 21.5% of the population (26). The percentage of seniors taking either 5-10 medications or more than 10 medications is higher in Newfoundland and Labrador than in most other Canadian provinces. Seniors in our province also use more potentially inappropriate medications when compared to seniors who live elsewhere in Canada (27). Organizations like the Canadian Deprescribing Network and SaferMedsNL warn that extensive health risks such as falls, fractures, hospitalizations and death can result from the use and overuse of these medications (2,28). In fact, a report on medication use among seniors in Canada found that:

The number of drugs being prescribed to seniors was the factor most responsible for hospitalizations related to adverse drug reactions (ADRs). Seniors prescribed 10 to 14 drug classes were over 5 times more likely to be hospitalized for an ADR than seniors prescribed between 1 and 4 drug classes, after controlling for other factors; seniors prescribed 15 or more different drug classes were 8 times more likely (27).

Therefore, we can reasonably expect that both providers and patients in Newfoundland and Labrador are likely to face the types of challenges described in the literature when it comes to deprescribing medications for aging patients with complex health issues. Key provider-level enablers identified in the literature that could have a positive effect on the uptake in deprescribing in Newfoundland and Labrador include:

- clearly defining roles and responsibilities for deprescribing,
- improving communication among prescribers and other health care providers to support decision-making for complex patient cases, and
- developing clear guidelines to enable deprescribing medications that take into account older adults and patients with multiple morbidities.

For patients, the research suggests that patient-centered approaches to deprescribing are helpful. Fostering positive and open patient-physician relationships in the Newfoundland and Labrador context could encourage patients to initiate conversations about the benefits and harms of their medications.

The research evidence also indicates that improving patients' knowledge or understanding of their medications or of the deprescribing process enables patients to deprescribe. A challenge for educating patients in our province is that our population tends to have below-average literacy levels (29). In addition, evidence on health literacy in Canada suggests that seniors often have lower health literacy skills. ABC Life Literacy Canada report that people with low literacy are more likely to misunderstand warning labels and less likely to "be able to identify their own medications, understand how to take their medications, and understand the potential side-effects" (30). Efforts to educate this province's patients on deprescribing will need to consider carefully the literacy and health literacy levels of our population.

We also found that online sources of information for deprescribing do not always equally represent the benefits and harms nor do they always consider patient preferences (10). Ensuring that online materials for use in NL are appropriate and considerate of patient needs could support better uptake of deprescribing in Newfoundland and Labrador.

Organizational Capacity

The evidence suggests that various patient, provider and system level supports can help enable deprescribing. In Newfoundland and Labrador, decision-makers, key provincial organizations, and community groups have already collaborated on various initiatives with both provincial and national partners to target various overprescribed or inappropriately prescribed medications and to increase the capacity to support deprescribing overall in the province. Key among these initiatives include the following:

- The Government of Newfoundland and Labrador and the Canadian Foundation for Healthcare Improvement have collaborated in an effort to help reduce the use of antipsychotic medication among people with dementia in publicly-funded long-term care homes (31).
- The Government of Newfoundland and Labrador has collaborated with Memorial University's School of Pharmacy and the Canadian Deprescribing Network (CaDeN) to implement SaferMedsNL. This three-year universal deprescribing initiative focuses on reducing the inappropriate use of Proton Pump Inhibitors and Sedative-Hypnotics. The network of partners that support SaferMeds NL includes the Canadian Agency for Drugs and Technologies in Health, the Canadian Association for Retired Persons, the Canadian Deprescribing Network, deprescribing.org, and the Canadian Patient Safety Institute. Local provincial partners include Choosing Wisely/Quality of Care NL, the College of Registered Nurses NL, the Medication Therapy Services Clinic, and the Newfoundland Government, the NL Medical Association, the NL Pharmacy Board, the Pharmacists' Association of NL, the Provincial Advisory Council for Aging and Seniors, the NL 50+ Federation, the Canadian Association for Retired Pensioners and RxFiles (32).
- Additionally, Quality of Care NL and Choosing Wisely have initiated a number of projects that focus on drug utilization and deprescribing, including:
 - Gastroesophageal Reflux (GER) in Infants – Clinician Campaign

- Antibiotic Utilization – Physician Campaign
- Antipsychotic Utilization – Physician Campaign
- Proton-Pump Inhibitor (PPI) Utilization – Nurse Practitioner Campaign
- Proton-Pump Inhibitor (PPI) Utilization in NL – Physician Campaign
- Opioids Utilization – Physician Campaign
- Antibiotic Utilization – Nurse Practitioner Campaign
- Antibiotic Utilization – Physician Campaign
- Antibiotic Utilization – Public Campaign
- Antibiotic Utilization – Physician Campaign
- Reducing the Use of Acid Blockers and Motility Agents for the Treatment of Gastroesophageal Reflux (GER) in Healthy Infants: A Survey (33)
- Other supports for deprescribing are available through the School of Pharmacy's Medication Therapy Services Clinic, research conducted in the School of Pharmacy and the Drug Information Centre located in the Health Sciences Library (34).
- In January 2020, a pilot for a national e-prescribing service called PrescriberIT[®] developed by Canada Health Infoway was launched at a community pharmacy in Bonavista (in partnership with provincial stakeholders e.g., Eastern Health, the Newfoundland and Labrador Centre for Health Information, Newfoundland and Labrador Pharmacy Board). The success of the pilot will be analyzed in the coming months as a possible solution within the electronic health record (HEALTHeNL). Potential benefits of this service include improvements in communication and workflow between prescribers and pharmacists and the facilitation of better health outcomes and improvement in the continuity of care for patients (35,36).

It is expected that the long-delayed implementation of the new provincial electronic health record (HEALTHe NL) will also help address barriers identified in the literature related to fragmented patient records and a lack of information-sharing among healthcare providers. This new system should help support healthcare delivery and decision-making for deprescribing by providing more accurate and reliable patient data.

Summary of Key Points

The research evidence on barriers and enablers to deprescribing medications that we reviewed is largely qualitative in nature and based on the perspectives of patients and providers rather than on tested interventions.

Although evidence indicates some willingness on the part of both patients and providers to support deprescribing in principle, in practice deprescribing involves a complex interplay of patient, provider, and system-level factors that affect whether medication reduction or cessation will be enabled or inhibited.

For older patients and patients with multiple morbidities, the complexity of medication management for patients and providers alike increases with the number of medications being prescribed. This complexity poses challenges to deprescribing.

Research suggests that improvements in system-level communication and coordination of care among multiple providers would likely improve deprescribing practices. Other system supports that will help enable deprescribing include interface management, accurate patient records and IT support.

When preparing deprescribing resources for patients, decision makers should consider literacy and health literacy levels, patient preferences, and the need to present both the risks and benefits of deprescribing clearly. Evidence also suggests that receiving information about deprescribing directly from a healthcare provider is beneficial to patients.

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Appendix A: Our Consultant

Justin Turner

Dr Justin Turner received a Bachelor of Pharmacy and a Masters of Clinical Pharmacy from University of South Australia, and a PhD from Monash University, Australia. Dr Turner is currently based at the Centre de Recherche, Institute Universitaire de Geriatrie de Montreal, and the faculty of medicine at the University of Montreal.

Research Program

Dr. Turner's research interests focus on optimizing the safe and effective use of medications in older people, with a specific interest in deprescribing. Deprescribing is the process of identifying and stopping a medication where the potential for harm outweighs the potential for benefit. Dr. Turner's passion for deprescribing comes from his work as a pharmacist in hospitals, community, aged care and policy sectors across Australia and the United Kingdom., Dr. Turners current research includes a number of deprescribing initiatives across Canada and the USA, building upon his research interests in randomized controlled trials, pharmacoepidemiology, pharmacoeconomics, implementation science, qualitative research and policy based research. As the Senior Advisor, Science Strategy for the Canadian Deprescribing Network, Dr. Turner is passionate about implementing deprescribing initiatives and measuring outcomes that matter for older adults at an individual and community level.

Appendix B: Additional References

Below we list a number of additional primary references that didn't meet our specific inclusion criteria for this report but provide further knowledge about the barriers and enablers to deprescribing medications:

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