



Sustainable Solutions Report: A Focus on Pharmacist Medication Reviews



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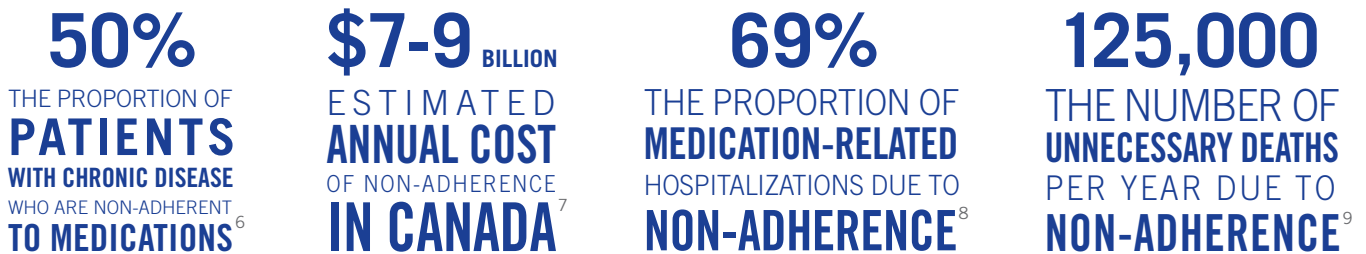
Foreword

Increasingly, Canadians are living with multiple complex chronic illnesses, putting significant strain on our health care system. As Canadians age and more are faced with managing multiple medications, they will need help and support to avoid drug therapy problems*, such as adverse drug reactions** (ADRs), improper dosing, non-compliance and drug interactions.

Today, approximately 5% of all emergency room visits and 6% of all hospital stays are the result of ADRs.¹ ADRs can cost the health care system significantly more through longer lengths of hospital stays compared to those visiting the emergency room for other reasons. Not only do ADRs cause significant costs from an acute care perspective, they can also result in unnecessary pain, suffering and lost productivity. Since 2009, ADRs have cost the Canadian health care system an estimated \$2 billion.²

Adverse drug reactions increase with the number of prescriptions used.³ In 2005, the average Canadian aged 60 to 79 received 35 prescriptions per year, while Canadians aged 80 or older received 74 prescriptions at retail per year compared with an average of 14 prescriptions for the general Canadian population.⁴ According to Canadian Institute for Health Information, older Canadians are five times more likely than all other Canadians to be hospitalized due to an ADR.⁵

In addition, medication non-adherence (not taking medications properly, including not filling a prescription, skipping doses, missing refills, or discontinuing medications altogether) is a serious problem affecting the health of Canadians and impacting the cost to our health care system. The statistics are alarming:



There has never been a greater need to find innovative ways to address the effect these issues have on Canadians not to mention the impact these issues have on our already stretched health care system.

Provincial governments have begun to unlock pharmacists' expertise as a solution for health system sustainability. The pharmacy sector has embraced the ability to provide solutions to health care sustainability and generate positive health outcomes for patients. One of the important services pharmacists provide is the medication review. Shoppers Drug Mart has committed resources to focus on medication reviews and understands the value they provide the patient.

Foreword

In this document, we examine how pharmacists, as medication experts, are well-positioned to help Canadians better manage their medications. A medication review can improve health outcomes by educating patients on the safe and effective use of prescription medications, over-the-counter medications and natural health products. Medication reviews can also facilitate better communication among health care providers, including physicians and pharmacists, resulting in improved patient care.

With an aging population, it is clear sustainable solutions are needed. In spite of many governments recognizing the importance of funding medication reviews, we must now establish consistent eligibility criteria and make funding of this service available to all Canadians who take chronic medications. Private insurers also have a role to play to make medication reviews available to those who do not qualify under the provincial government plans.

The following Sustainable Solutions Report outlines the results of a survey of Canadian family physicians; a survey of patients in British Columbia, Alberta and Ontario who met with their pharmacist for a medication review; as well as a recent poll conducted with CARP members.

The results of each demonstrate clear public support for expanding access to and funding for medication reviews nationally.

The report concludes with a set of recommendations for the widespread implementation of medication reviews in every province and the creation of consistent eligibility requirements. This is a sustainable solution we believe will make better use of health care professional resources, improve patient care and ultimately make Canadians healthier.

Domenic Pilla

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The *Sustainable Solutions Report: A Focus on Pharmacist Medication Reviews* is the third in a series of reports being issued by Shoppers Drug Mart. The reports explore different ways pharmacists can contribute to reforming our health care system and generally help Canadians improve their health while cutting costs, reducing wait times and improving patient care.

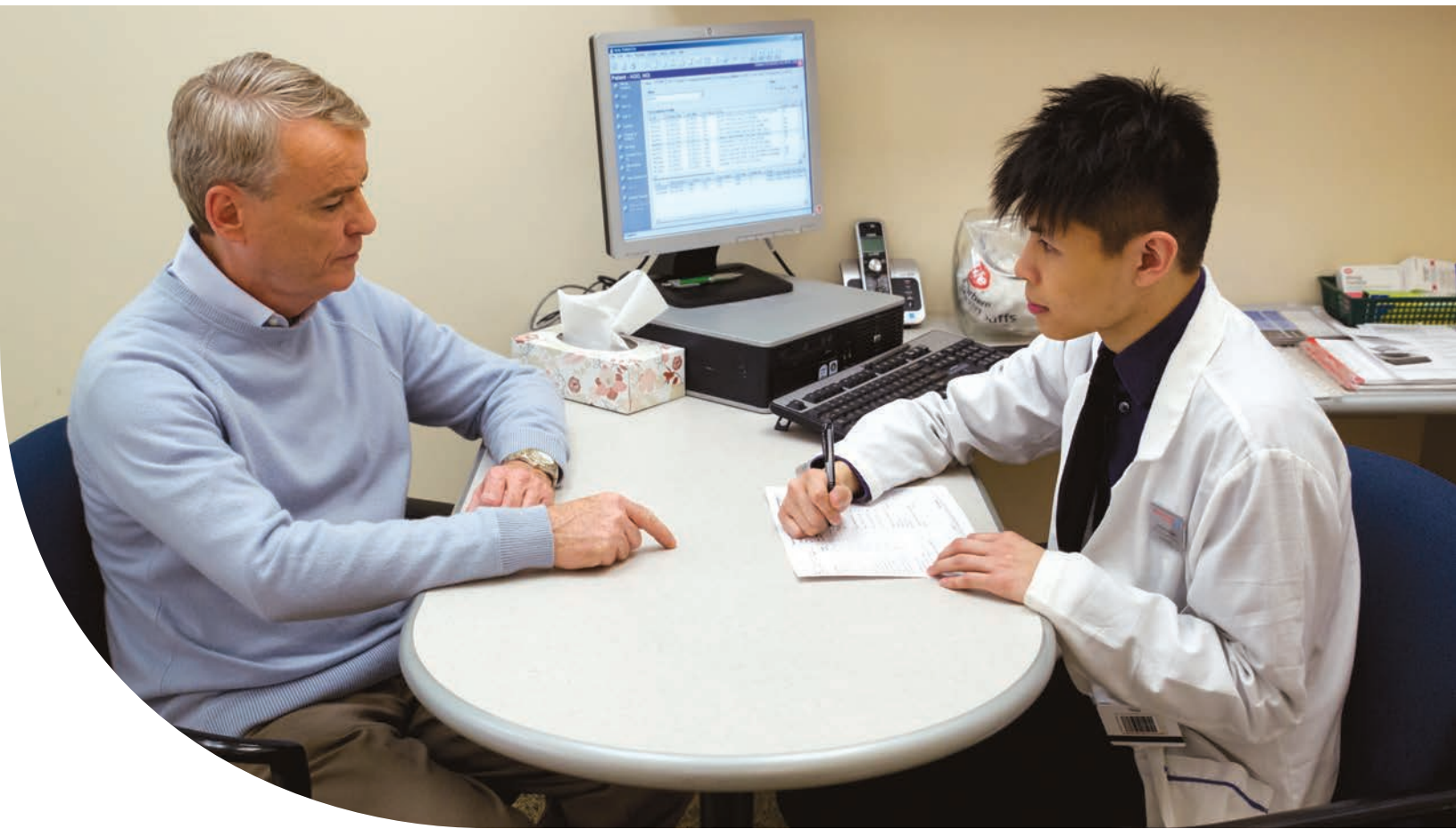
This report draws on different sets of individual research to determine the attitudes and perspectives of Canadians and the health care community related to medication reviews by pharmacists.

Specifically, research was conducted with Canadians who had received a one-on-one medication review with a Shoppers Drug Mart pharmacist. The goal of this survey was to determine if Canadians who participated in a medication review found the service beneficial and if it helped them better understand and better manage their medications. The medication review research was conducted by Environics Research Group with 506 individuals in British Columbia, Alberta, and Ontario who participated in a medication review with a Shoppers Drug Mart pharmacist within the previous month. The survey was completed online and via phone from February 21 to July 4, 2014. A probability sample of this size would yield a margin of error of +/- 3.5 points, 19 times out of 20.

Research was also conducted with Canadian family physicians to find out their views on expanding the role of pharmacists in the health care system and included questions regarding physician views on pharmacist-conducted medication reviews. The physician research was conducted by Environics Research Group with 204 general practitioners and was completed online from May 14 to May 27, 2013. A probability sample of this size would yield a margin of error of +/- 6.9 points, 19 times out of 20.

Finally, as older Canadians are more likely to have an adverse drug reaction, are challenged to be adherent with their medications¹⁰ and are at greatest risk of harm, research was conducted with members of the Canadian Association of Retired Persons (CARP) to find out their perspective on pharmacists offering medication reviews. The research was conducted by Environics Research Group via email to 2,416 CARP members from June 9 to June 18, 2014. A probability sample of this size would yield a margin of error of +/- 1.96 points.

What Is a Medication Review?



A Medication Review Is an Individualized, In-person Meeting Between a Patient and Pharmacist that Includes a Review of the Patient's Medication Regimen and Promotes the Safe and Appropriate Use of Medication.

The goal of the medication review is to better identify and manage any concerns with the patients taking their prescription medications, over-the-counter medications and natural health products.

1. Talk about medications
2. Review how medications are best taken
3. Discuss what each medication is for
4. Highlight common side effects and how to minimize them
5. Identify and address problems related to specific medications

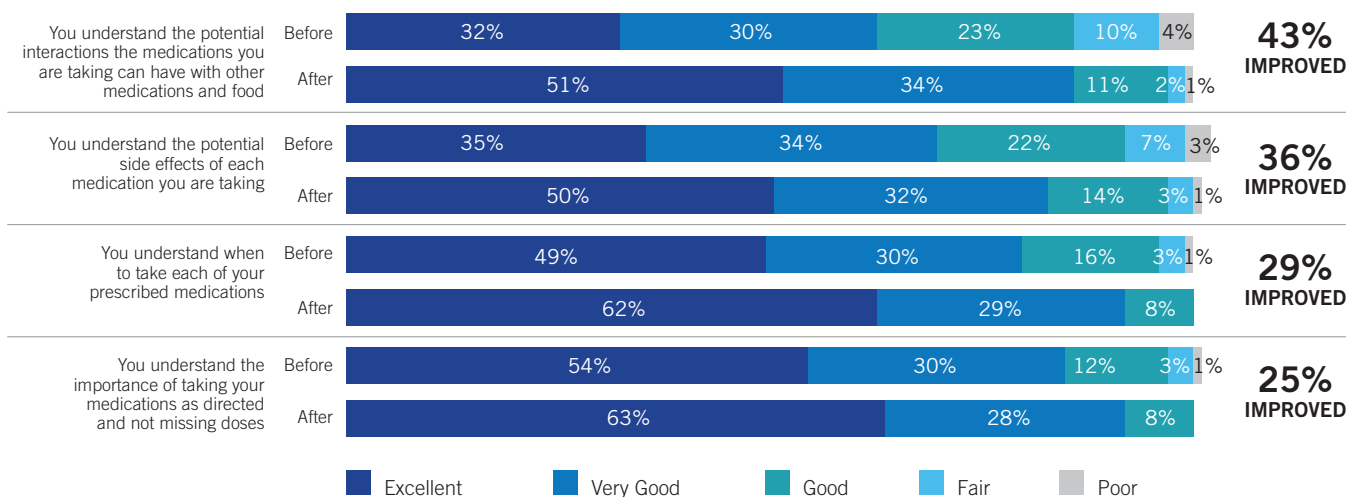
What Is a Medication Review?

During a medication review, the patient and pharmacist:

- **Talk about medications the patient is taking, including medications that do not require a prescription.** Together, the patient and the pharmacist create an up-to-date, accurate, and complete medication list so that the patient, their family and any health care professionals involved (e.g., family physicians, specialists, emergency doctors, etc.) know exactly what medications the patient is taking.
- **Review how medications are best taken.** The pharmacist will first determine how the patient is currently taking their medications. For example, does the patient take their medication on an empty or full stomach? In the morning or the evening? At a different time than other medications? Then, if the pharmacist determines the patient is not taking the medications appropriately, they will educate the patient on how to correct this regimen.
- **Discuss what each medication is for** and how it contributes to their overall health.
- **Highlight common side effects and how to minimize them** and address potential drug interactions with other drugs, natural health products and food.
- **Identify and address problems related to specific medications.** These may include issues such as taking drugs that are no longer required, not taking medications according to schedule, adverse drug reactions, food restrictions, drug interactions or need for dose changes.

Figure 1 demonstrates that by going through these steps, pharmacists help seniors and others better understand their medications and how to take them safely and most effectively. In fact, 2 in 3 Canadians from British Columbia, Alberta and Ontario who recently completed a medication review showed an improvement in their understanding, in one area or another, in regards to the medications they were taking.

Figure 1: Understanding of Medications Before and After Medication Review



What Is a Medication Review?

When Is a Medication Review Recommended?

Medication reviews, available through community pharmacies, should be based on the patient's personal health needs. Funding varies by province, personal situation, and clinical needs. The following are circumstances where a medication review may be recommended:¹¹

- **When a patient is starting a new medication**
- **When the patient does not understand why they are taking certain medicines and/or is not sure how best to take them**
- **When the patient wants a recommendation for a non-prescription product but is not sure whether it will interact with his/her prescription medications**
- **When a patient is late for renewing medication(s)**
- **Prior to or following a hospital admission**
- **When a patient has been diagnosed with a new chronic condition**
- **If a patient is having difficulty meeting the targets for good control of their conditions, such as blood sugar levels in patients with diabetes or high blood pressure readings**

Benefits of Offering Medication Reviews

Medication reviews offer benefits to Canadian patients, health care professionals, and the health care system as a whole.

A survey of Canadians from British Columbia, Alberta and Ontario who recently completed a medication review found they had a positive experience. The majority (85%) agreed that they were likely to make medication reviews a regular part of managing their medications and their health. In addition, 82% of CARP members who have had a medication review in the past year, agree that they're likely to make medication reviews a regular part of how they manage their medications.

Positive Interventions Associated with Medication Reviews



What Is a Medication Review?

1 Prevent and Manage Drug Therapy Problems

Canadians with multiple chronic conditions taking multiple medications may be seeing more than one health care professional to manage their conditions. They may also be taking over-the-counter medications and natural health products that their health care providers may not be aware of.

Medication reviews are one of the best ways to identify and prevent drug therapy problems including adverse drug reactions. They also allow for an in-depth review of the patient's current prescription medications, over-the-counter medications and natural health products to minimize drug interactions and discover where potential drug therapy concerns may exist. There are a variety of ways a pharmacist can do this.

- **Confirming each medication, the reason for the medication and whether or not it is effective in the patient achieving their health goals**
- **Assessing if the patient is adhering to their drug therapy by asking how and when they are currently taking their medication**
- **Checking for drug interactions with over-the-counter medications and natural health products and treatment duplication**
- **Asking the patient about any side effects they may be experiencing**
- **Assessing the suitability of the drug to the patient's current circumstances**
- **Checking for drugs that are being taken that are no longer required**

More than three-quarters (79%) of Canadian family physicians surveyed believe expanding the role of pharmacists (including offering services like medication reviews) will have an impact on reducing the incidence of adverse drug reactions. More than half (54%) also agree it is the pharmacist's role, not the physician's, to identify and counsel patients on possible adverse drug reactions.

Almost 30% of CARP members who have had a medication review over the past year cite pharmacist training in medications' adverse effects and drug interactions as one of the reasons they chose them over a general practitioner/family doctor to conduct a medication review.

What Is a Medication Review?

2 Ensure Medications Are Taken According to Directions and Increase Adherence

As pharmacists review medications they can identify whether patients are taking them according to directions.

The pharmacist assesses if the patient is adherent to their drug therapy by asking how and when they are currently taking their medications.

The survey revealed an overwhelming majority (82%) felt their medication review made them more confident in managing their medications and it made it easier (83%) for them to remember how to take their medications as recommended.

CASE STUDY: Home Medication Review Visits

Home medication review visits are an essential service provided by pharmacists for patients – often the frail elderly – who are not able to leave their home. Unfortunately, this service is currently funded in Ontario, New Brunswick, Nova Scotia, Newfoundland and Labrador and Prince Edward Island.

A team of Shoppers Drug Mart pharmacists from Toronto recorded the outcomes of 43 home medication review visits conducted in 2013, as seen in Figure 4.¹² Forty-four per cent of these patients were taking at least one medication from the Beers Criteria list (a list of medications known to cause adverse effects in the elderly).^{***}

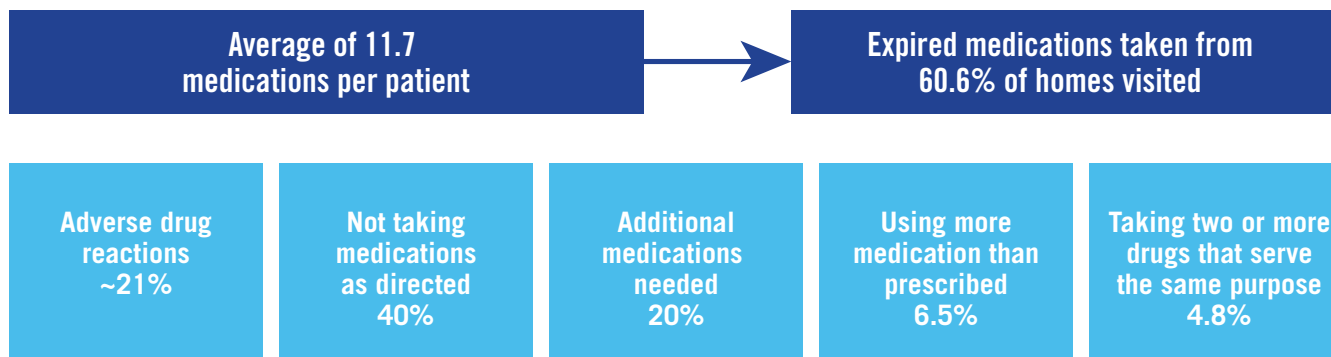
By visiting individuals in their home, the pharmacists witnessed problems they wouldn't have otherwise been aware of. This allowed them to address the issue head-on, make recommendations to the patient and alert physicians, where appropriate. For example, in some cases, people were taking twice as much of one drug because they kept their medications in two different places.

Based on the findings of this study, our recommendation is that home medication reviews be expanded to all provinces and to other vulnerable populations, such as those who are not necessarily home bound but are reliant on a caregiver to help them get to see a pharmacist.



What Is a Medication Review?

Figure 4: A Snapshot of Outcomes from Home Medication Review Visits



3 Improve Drug Treatment Efficacy and Cost Effectiveness

During a medication review, pharmacists can recommend a change of medications and how they are taken. Of Canadians who recently had a medication review with their pharmacist, 1 in 2 said their pharmacist made at least one intervention with respect to their medications. One of which was recommending a change to how the medication was taken. The top three reasons for these changes were: change in timing to provide better efficacy (41%), ensure proper usage i.e. they were supposed to be taking the medication with food but weren't (14%), they were having side effects/adverse events on the current medication (6%).

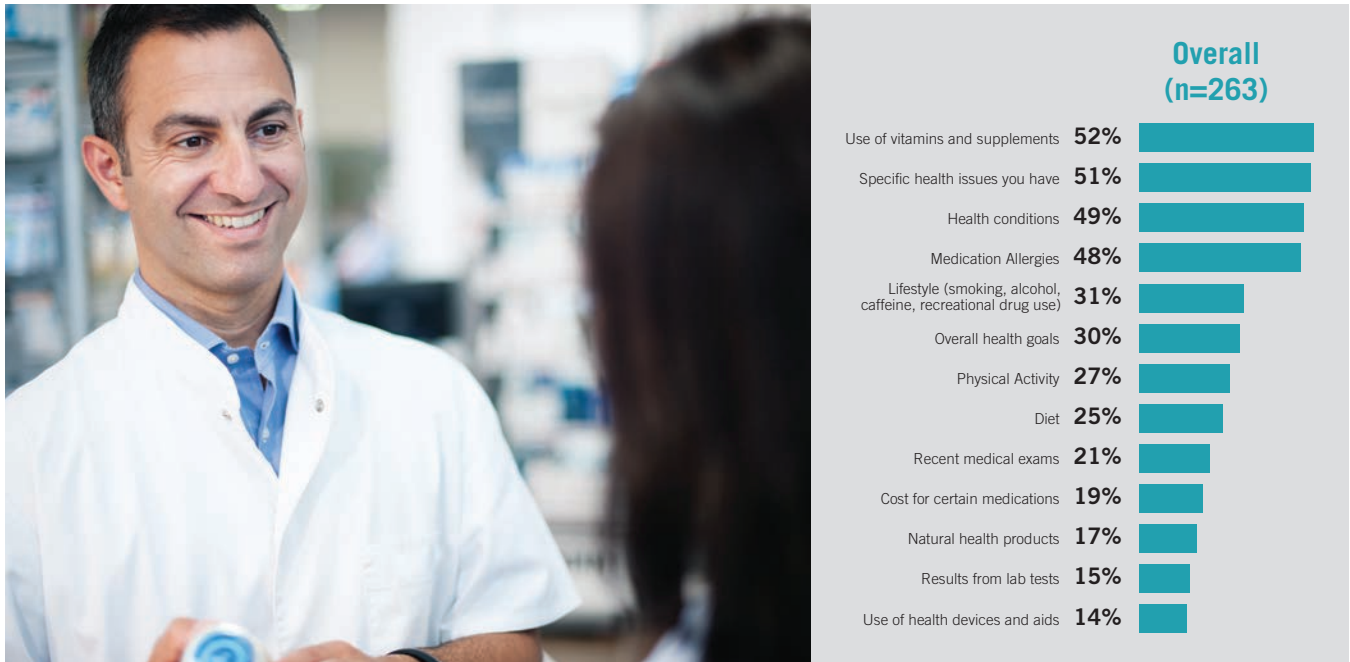
The following are some circumstances that may prompt a change in drug treatment:¹³

1. The patient is not receiving a drug that is required to manage their condition appropriately
2. The patient is receiving the wrong drug
3. The patient is receiving too low a dose of the right drug
4. The patient is receiving too high a dose of the right drug
5. The patient is not taking the drug or taking the drug inappropriately (e.g. missing doses or the drug at the wrong time or frequency)
6. The patient is experiencing an adverse reaction to the drug
7. The patient is experiencing a drug interaction (e.g., drug-drug, drug-food)
8. The patient is receiving a drug for which there is no valid reason

During a medication review, pharmacists also often provide patients with assistance on other important ways to manage overall health and well-being, see Figure 6.

What Is a Medication Review?

Figure 6: Topics Beyond Medications Discussed with Pharmacists during Medication Review Sessions



4 Improve Pharmacist-Patient-Physician Communication

By sharing the results of the medication review with a patient’s physician, pharmacists can help physicians make more informed prescribing decisions. Overall, this process helps minimize the potential for adverse drug reactions.

Of Canadians who recently participated in a medication review, 14% were told by their pharmacist that they would contact their physician to discontinue one of their medications. The main reasons for discontinuation identified through the medication reviews included harmful side effects, patient no longer has symptoms and medication was ineffective.

This process of sharing medication information has the opportunity to become even more efficient and effective. There are currently numerous efforts underway to create an electronic system to make inter-professional communication quick and user-friendly.

What Is a Medication Review?

5 Identify Additional Clinical Services that May Benefit the Patient

If an issue with medication use is identified during a medication review, there are two basic ways to make changes to resolve the issue and ultimately improve the patient's health outcomes:

1. **If the problem can be resolved within the pharmacist's scope of practice**, then the medication issue can be addressed immediately. In some jurisdictions, such as Alberta, pharmacists have increased authority to help patients manage their health by extending or renewing a prescription, adapting a prescription based on the patient's conditions, which may include changing a drug dosage or formulation; or initiating a new prescription drug therapy.
2. **If the problem is outside the pharmacist's scope of practice**, the pharmacist will contact the patient's physician and make recommendations to better align the therapy with the patient's desired health outcomes.

In all cases action plans designed to address the patient's issues should have input from the patient, physician and pharmacist. To ensure the continuity of care, changes should be communicated so all are aware of the current medications a patient is taking and the desired outcomes. We need to encourage greater collaboration between members of the patient's health care team to share changes to the patient's therapy.

Pharmacists provide further care to help their patients manage chronic conditions through the services available in their province. For example, immunizations and injections, assessment and prescribing for minor ailments and smoking cessation may be available if the provincial regulations permit and hold pharmacists to perform these services. In addition many pharmacies specialize in diabetes care and have a Certified Diabetes Educator pharmacist on site, while others specialize in areas such as respiratory care and home health products (e.g., mobility aids).

Funding and Access to Medication Reviews Across Canada



Medication reviews provide an essential service, but they are not funded for all Canadians. In fact, some provinces have not yet chosen to fund these programs at all (i.e., Manitoba and Québec). Among those that do, there are significant inconsistencies between what the service structure is and the eligibility requirements.

For example, in Nova Scotia only Pharmacare recipients are eligible for a medication review.

Alberta has one of the most comprehensive medication review programs that includes development of a care plan by the pharmacist. Patients in Alberta must have at least one chronic medical condition from a pre-defined list and be taking three or more prescription medications, or be taking insulin.

Ontario has one of the most universal programs, offering the service to anyone from Ontario taking three or more prescription medications for chronic conditions. Also, the Ontario program offers different assessments based on the patients' needs. Ontarians with diabetes are eligible for an annual medication assessment as well as follow-ups (if required) and those who cannot get to their community pharmacy in person are eligible for an at-home consultation.

Funding and Access to Medication Reviews Across Canada

In contrast, British Columbia patients need to be taking five different qualifying medications but may have two medication reviews per year. Seniors from New Brunswick, Nova Scotia and PEI taking three or more prescription medications for chronic conditions are eligible for one medication review per year, whereas seniors from Saskatchewan must be taking five or more chronic medications or meet other criteria to be eligible.

Only 1 in 3 CARP members surveyed have had a medication review with a pharmacist, and the majority of those who had a review live in Ontario. As earlier stated, this is the population most at risk for drug therapy problems. Creating a standard and consistent medication review program across the country will ensure that Canadians have the same access to care and safety no matter where they live.

Figure 7: Illustrates the Varying Eligibility Criteria by Province

Medication Review Eligibility – Summary by Province

Province	Basic Medication Review Service	Eligibility Criteria			Funding	Additional Medication Review Services Available
		# of Medications	# of Chronic Conditions	Other Requirements		
BC	Medication Review – Standard (MR-S)	5 or more (schedule I prescription meds., compound prescriptions, or insulin)		Have a clinical need for service (e.g., multiple diseases, one or more chronic disease, etc.)	Residents of BC with a BC Personal Health Number not covered under Pharmacare Plan B	Pharmacist Consultation when drug therapy problem identified
AB	Standard Medication Management Assessment (SMMA)	3 or more (schedule I prescription meds.)	1 or more		Members of the Alberta Health Care Insurance Plan	Comprehensive Annual Care Plan (CACP), SMMA Diabetes, SMMA Smoking Cessation
SK	Saskatchewan Medication Assessment Program	5 or more (incl. 3 prescription meds. on Pharmaceutical Information Program profile) OR 1 anticoagulant OR 1 medication on list of American Geriatrics Society Beers Criteria	1 or more	≥ 65 years of age and does not reside in a long-term care facility	Saskatchewan residents with a valid Saskatchewan Health Card and a beneficiary of the Drug Plan and Extended Benefits Branch (DPEBB)	Home Care or Mental Health Medication Assessment
ON	MedsCheck Annual	3 or more (prescription meds.)	1 or more		Residents of Ontario with a valid Ontario Health Card	MedsCheck Diabetes, MedsCheck at Home, MedsCheck Long-Term Care, MedsCheck Long-Term Care Quarterly

Funding and Access to Medication Reviews Across Canada

Figure 7: Illustrates the Varying Eligibility Criteria by Province *(continued)*

Medication Review Eligibility – Summary by Province

Province	Basic Medication Review Service	Eligibility Criteria			Funding	Additional Medication Review Services Available
		# of Medications	# of Chronic Conditions	Other Requirements		
NB	PharmaCheck	3 or more	1 or more		Department of Social Development clients and senior beneficiaries of New Brunswick Prescription Drug Program (NBPDP)	
NL	Enhanced Medication Review	3 or more (prescription medications)	1 or more	>65 years of age	Beneficiaries of Newfoundland and Labrador Prescription Drug Program (NLPPDP)	Diabetes Medication Review
PEI	Basic Medication Review (BMR)	3 or more (prescription medications covered by Pharmacare)	1 or more		Beneficiaries of Seniors Drug Cost Assistance Program or Financial Assistance Program or Private Nursing Home Program (exc. Gov't nursing homes)	Diabetes Medication Review
NS	Basic Medication Review	3 or more (prescription meds. covered by Pharmacare)	1 or more	Not reside in nursing home or home for special care.	Beneficiaries of NS Pharmacare Program (except LTC under 65 program)	Advanced Medication Review

Key Findings



Medication Reviews Are an Important Service. They Have the Potential to:

1. Reduce the risk of adverse drug reactions in patients
2. Improve the ability of patients to take their medicines as prescribed
3. Increase adherence to prescription medications
4. Improve drug effectiveness and value
5. Improve Pharmacist-Patient-Physician communication
6. Create patient awareness around additional pharmacy services that patients may benefit from

All of These Outcomes Represent a Win-Win Proposition for:

- **Patients** in terms of better health care outcomes and quality of life
- **The health care system** in terms of promoting a healthy community, improving communication between health care professionals, and ensuring a more efficient use of resources.

Key Findings

Overall, 1 in 2 Canadians strongly agree that medication reviews are beneficial, and this sentiment is more strongly felt by patients 65 years of age and older. They feel it gives them peace of mind and confidence. Specific benefits include:

- **It gives them a better sense of the important role medication plays in helping manage their health (91%)**
- **It makes it easier for them to remember how to take their medications as recommended (83%)**
- **It helps them understand why they take the medications and how they contribute to their overall health (88%)**

These sentiments are echoed by CARP members. They say medication reviews make them more comfortable with their medications (47%), give them peace of mind regarding their medication (39%), and make it easier for them to take their medication as recommended (22%).

CARP members think pharmacists (40%) rather than doctors (30%) are the best source of information on drug interactions. They are more likely to talk to their pharmacist about interactions between the prescription medications and they find their pharmacist's advice on any interactions more useful than their doctor's (68% versus 23%).¹⁴

The health care community also supports pharmacists taking a lead role in delivering medication reviews. More than half (54%) of physicians agree it is the pharmacist's role, not the physician's, to identify and counsel patients on possible drug interactions which can be an aspect of medication reviews.

Recommendations



The pharmacy community is calling on provincial governments to take a comprehensive and universal approach, increasing the availability of medication review programs to improve the health and safety of Canadians.

Recommendations

Pharmacists are doing so successfully in many jurisdictions already, now we need provincial governments and other drug plan sponsors to fund this service consistently across Canada to make it available to Canadians who would benefit from the service, including those who do not meet current government eligibility criteria.

Specific recommendations include:

- **Give Canadians in all provinces equal access to medication review programs.** Providing all residents with the ability to receive the medication review service would help patients better manage their medications and reduce the strain on doctors and emergency rooms by reducing preventable and predictable adverse drug reactions and improve medication adherence.
- **Ensure these consultations become standard practice with consistent eligibility criteria from coast to coast.** Medication reviews offer tangible benefits. They should be available across the country, with a consistent program design and eligibility to help all Canadians to better manage their health.
- **Improve promotion of medication reviews.** Canadians need to be made aware that this program exists so those who are eligible can take full advantage. Getting the word out will require joint effort between governments, pharmacies and other health professionals who can refer for the service.
- **Standardize funding for the service.** Individuals with chronic diseases need consistent support to help manage their conditions. Medication reviews should be supported and funded in all provinces and made available to those with chronic conditions for both public and government or employer health care plans.
- **Conduct research.** To continuously improve medication reviews, ongoing research needs to be undertaken to track patient outcomes. By building on the success of existing programs all Canadians will benefit.

These recommendations are mirrored in the document *9000 Points of Care: Improving Access to Affordable Health Care*, a position paper published by the Canadian Association of Chain Drug Stores and endorsed by the broader pharmacy community.

About Shoppers Drug Mart Corporation

Shoppers Drug Mart Corporation is one of the most recognized and trusted names in Canadian retailing. The Company is the licensor of full-service retail drug stores operating under the name Shoppers Drug Mart (Pharmaprix in Québec). With more than 1,253 Shoppers Drug Mart and Pharmaprix stores operating in prime locations in each province and two territories, the Company is one of the most convenient retailers in Canada. The Company also licenses or owns 56 medical clinic pharmacies operating under the name Shoppers Simply Pharmacy (Pharmaprix Simplement Santé in Québec) and six luxury beauty destinations operating as Murale. As well, the Company owns and operates 62 Shoppers Home Health Care stores, making it the largest Canadian retailer of home health care products and services. In addition to its retail store network, the Company owns Shoppers Drug Mart Specialty Health Network Inc., a provider of specialty drug distribution, pharmacy and comprehensive patient support services, and MediSystem Technologies Inc., a provider of pharmaceutical products and services to long-term care facilities. Shoppers Drug Mart is a unique and independent operating division of Loblaw Companies Limited.

About CARP – A New Vision of Aging for Canada

CARP is a national, non-partisan, non-profit organization committed to advocating for a New Vision of Aging for Canada, social change that will bring financial security, equitable access to health care and freedom from discrimination. CARP seeks to ensure that the marketplace serves the needs and expectations of our generation and provides value-added benefits, products and services to our members. Through our network of chapters across Canada, CARP is dedicated to building a sense of community and shared values among our members in support of CARP's mission.

CARP calls for national standards of accessible and affordable health care and, in its "One Patient" paper, for the health care system to provide a seamless continuum of care that ordinary families can navigate as they take increasingly more responsibility for their post-acute and chronic care needs. Community pharmacists play a vital role in a multi-disciplinary care team, especially in preventing adverse drug reactions and interactions – leading preventable causes of serious injury and death among older Canadians. Please visit www.carp.ca for more information.

References

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- ⁵ Canadian Institute for Health Information. Press Release, March 26, 2013. http://www.cihi.ca/cihi-ext-portal/internet/en/document/types+of+care/pharmaceutical/release_26mar13
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- ¹⁴ CARP Prescription Drug Poll Report, 1,700 CARP panel members polled, May 3–6, 2013

Glossary of Terms

- * Drug Therapy Problems NAPRA. Professional Competencies for Canadian Pharmacists at Entry to Practice. Second revision March 2007. <http://www.nbpharmacists.ca/LinkClick.aspx?fileticket=f7%2Fs2K14JvM%3D&tabid=261&mid=695>
 - ⁱ Patient requires drug therapy but is not receiving it
 - ⁱⁱ Patient is taking or receiving the wrong drug
 - ⁱⁱⁱ Patient is taking or receiving too little of the right drug
 - ^{iv} Patient is taking or receiving too much of the right drug
 - ^v Patient is not taking or receiving the drug or is taking or receiving the drug inappropriately
 - ^{vi} Patient is experiencing an adverse reaction to the drug
 - ^{vii} Patient is experiencing a drug interaction (including drug-drug, drug-food, drug-laboratory test, drug-disease, or drug-blood product)
 - ^{viii} Patient is taking or receiving a drug for no medically valid indication or substance abuse
- ** According to Health Canada, adverse drug reactions are undesirable effects to health products. Health products include drugs, medical devices and natural health products. Drugs include both prescription and non-prescription pharmaceuticals; biologically-derived products such as vaccines, serums, and blood derived products; cells, tissues and organs; disinfectants; and radiopharmaceuticals. Reactions may occur under normal use conditions of the product. Reactions may be evident within minutes or years after exposure to the product and may range from minor reactions like a skin rash to serious and life-threatening events such as a heart attack or liver damage.
- *** The Beers Criteria catalogues medications that cause adverse drug events in older adults due to their pharmacologic properties and the physiologic changes of aging. *Ages Beers Criteria For Potentially Inappropriate Medication Use In Older Adults*. <http://www.americangeriatrics.org/files/documents/beers/PrintableBeersPocketCard.pdf>
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