A comparison of drug therapy problems in patients eligible and ineligible for provincial medication review programs in Canada

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Background

Most provinces in Canada have variations of a pharmacist service commonly referred to as a *medication review*. These services, while they differ in each province in terminology and specific pharmacist expectations (e.g., the extent of documentation required), all have the common goals of providing patient education regarding medications and medical conditions, the development of the best possible medication history, and the identification and resolution of drug therapy problems (DTPs).

It has been previously documented that medication review programs in Canada have significantly varied eligibility criteria from province to province.¹ In some provinces, patients are eligible for a medication review if they are taking 3 or more chronic medications (Prince Edward Island, Nova Scotia, Ontario), while in other provinces, patients are eligible only if they have a specific chronic medical condition that is treated with specific medications (Alberta, Newfoundland and Labrador), if they are over a certain age and are taking a minimum number or specific type of medication (New Brunswick and Saskatchewan), or if they are taking 5 or more medications from a specific list (British Columbia). Some provinces (Prince Edward Island, Nova Scotia, Ontario, Saskatchewan and Alberta) also have multiple tiers of medication review services, which depend on different patient characteristics and can affect the extent of service provided and the amount of remuneration claimed. Further complicating the matter, in some jurisdictions, federally insured patients (e.g., First Nations and Inuit people covered by the Non-Insured Health Benefits Program) are ineligible for these services.²

The restrictive eligibility criteria of the medication review programs in each province serve 2 potential purposes. First, the criteria can be used to direct the service to those patients who may benefit the most, such as those at high risk for DTPs or adverse drug reactions, or patients with poorly managed chronic disease.³⁻⁵ Second, the criteria can be used to allow the provinces to stay within their budgetary limitations. It is unclear how many provinces developed their medication review program eligibility criteria with the former purpose in mind, and to our knowledge, the provincial medication review programs have not been evaluated to determine if their current eligibility criteria are capable of effectively identifying patients who would benefit the most from the service.

The purpose of this study was to compare the number and severity of DTPs identified in patients who were eligible or ineligible for each Canadian provincial medication review program, in an effort to assess if each program's eligibility criteria identifies patients who will benefit from the service.

Methods

Three community pharmacies in Saskatoon, Saskatchewan, participated in this cross-sectional study and acted as recruitment sites. Adult patients (≥ 18 years old) requesting or picking up at least 1 refill prescription (defined as a prescription medication that had remained at the same dose and directions for a minimum of the past 6 months) for themselves at the pharmacy counter were approached to participate in consecutive order as they picked up their prescription.

All consenting patients, regardless of whether or not they met the eligibility criteria for a medication review in any province, received a comprehensive medication review with the licensed research pharmacist (i.e., all medication reviews were performed by the same pharmacist), who had additional training in performing medication reviews in the form of an ADAPT Certificate in Patient Care Skills from the Canadian Pharmacists Association. Early in the data collection period, the research team had patient case conversations on a regular basis to provide clinical support to the pharmacist to ensure that DTPs were being identified and documented in a consistent manner.

Information from the completed medication reviews (i.e., patient demographics, number of medications [including prescription, nonprescription, vitamins and natural products], number and type of medical conditions) was used to determine if each patient would have been eligible to receive a medication review in each Canadian province that offered such a program (assuming the patient was a resident of the province and a beneficiary of the provincial drug plan). A detailed description of the provincial eligibility criteria used for this study is reported elsewhere.¹

While performing the medication reviews, the pharmacist collected information on the number, types and severity of DTPs that were identified in each patient. Although not part of the study protocol, all DTPs identified during the medication reviews were addressed by the pharmacist, in collaboration with other care providers (e.g., physicians, nurse practitioners and community pharmacists), as clinically indicated.

The severity of identified DTPs was classified by the pharmacist who performed the medication reviews using adapted Schneider criteria (see Appendix 1 available online at cph.sagepub.com/supplemental),⁶ in which the severity of each DTP was determined based on the status of the DTP (i.e., a DTP occurred in the past or a DTP is currently present) and the nature and degree of the intervention undertaken by the pharmacist. The level of pharmacist intervention ranged from a pharmacist providing advice to the patient to resolve the DTP (for mild severity DTPs), the pharmacist communicating with the patient's health care team to recommend a change of therapy (for moderate-severity DTPs) and the pharmacist recommending the patient proceed to the emergency

department of the local hospital or calling emergency services for the patient (for severe DTPs). The severity classification of the identified DTPs was confirmed using a structured audit process with a pharmacist and physician external to the project. Each audit member (the research pharmacist, the external pharmacist and the external physician) independently applied a severity classification to each DTP using the adapted Schneider criteria. In the event of a disagreement between any of the 3 auditors, the DTP was discussed until all 3 auditors came to an agreement on an appropriate severity category.

The number of DTPs in patients eligible and ineligible for each provincial medication review program was compared using a *t* test. The number of mild, moderate, and severe DTPs was also compared in eligible and ineligible patients using a *t* test. Data were collected between November 2013 and February 2014. Analysis was done using IBM SPSS version 22.0.

The University of Saskatchewan Behavioural Research Ethics Board approved the study protocol.

Results

One hundred twenty-eight patients were approached to participate in this study, with 52 patients consenting to participate and 49 patients completing the entire study protocol and included in the data analysis. One patient withdrew consent prior to completing the medication review because of a perceived lack of benefit, and 2 patients could not be contacted to schedule the medication review. The average age of the patients was 53.9 years, 75.5% were female, 95.9% spoke English as a first language and 77.6% had some postsecondary education. The mean number of medications (prescription and nonprescription) per patient was 7.2.

A comparison of the number of DTPs in patients eligible and ineligible for medication review services in each province is reported in Table 1. When the eligibility criteria from each provincial medication review program was applied to participants of this study, patients meeting the provincial eligibility criteria had a greater number of DTPs than those who did not meet the criteria ($p < 0.01$), in all provinces. The difference in the mean number of DTPs in eligible and ineligible patients ranged from 2.7 to 3.7 (Table 1).

A comparison of the number of moderate-severity DTPs in eligible and ineligible patients is reported in Table 2. Patients meeting provincial

TABLE 1 Drug therapy problems (DTPs) identified in patients eligible and ineligible for medication reviews in each province offering the service

Province	Eligible patients		Ineligible patients		Difference in mean number of DTPs ($p < 0.01$)
	Mean number of DTPs (n)	Standard deviation of DTPs	Mean number of DTPs (n)	Standard deviation of DTPs	
Newfoundland and Labrador	5.9 (8)	2.2	2.9 (41)	2.6	3
Prince Edward Island	4.5 (28)	2.9	1.8 (21)	1.6	2.7
Nova Scotia	4.5 (28)	2.9	1.8 (21)	1.6	2.7
New Brunswick	5.9 (11)	2.5	2.6 (38)	2.4	3.3
Ontario	4.5 (28)	2.9	1.8 (21)	1.6	2.7
Saskatchewan	6.2 (10)	2.5	2.6 (39)	2.3	3.6
Alberta	4.8 (25)	3.0	1.9 (24)	1.6	2.9
British Columbia	5.7 (18)	2.9	2.0 (31)	1.5	3.7

TABLE 2 Moderate-severity drug therapy problems (DTPs) identified in patients eligible and ineligible for medication reviews in each province that offered the service

Province	Eligible patients		Ineligible patients		Difference in mean number of moderate-severity DTPs ($p < 0.01$)
	Mean number of moderate-severity DTPs (n)	Standard deviation of moderate-severity DTPs	Mean number of moderate-severity DTPs (n)	Standard deviation of moderate-severity DTPs	
Newfoundland and Labrador	4.5 (8)	1.8	1.3 (41)	1.5	3.2
Prince Edward Island	2.7 (28)	2.1	0.7 (21)	0.9	2
Nova Scotia	2.7 (28)	2.1	0.7 (21)	0.9	2
New Brunswick	4.1 (11)	2	1.2 (38)	1.3	2.9
Ontario	2.7 (28)	2.1	0.7 (21)	0.9	2
Saskatchewan	4.4 (10)	1.8	1.2 (39)	1.3	3.2
Alberta	3 (25)	2	0.6 (24)	0.9	2.4
British Columbia	3.7 (18)	1.8	0.7 (31)	1	3

eligibility criteria had more moderate-severity DTPs than those who did not meet the criteria when the eligibility criteria from all provincial programs was applied ($p < 0.01$). The difference in the mean number of moderate-severity DTPs in eligible patients ranged from 2 to 3.2. No severe DTPs (i.e., patient who had to be sent for emergency intervention) were identified in any patients. The difference between the mean number of mild DTPs identified in eligible and ineligible patients ranged from -0.2 to 0.7, none of which were statistically significant.

Additional information regarding the DTPs identified is available in a separate publication.⁷

Discussion

When the eligibility criteria from each provincial medication review program in Canada were applied to the participants enrolled in this study, patients who met the eligibility criteria had more DTPs than patients who were ineligible (Table 1), and their DTPs were more serious (Table 2), regardless of which program's eligibility criteria was used. The mean number of identified DTPs in eligible patients ranged between 4.5 and 6.2 per patient, while patients who would be ineligible for medication reviews in each province had between 1.8 to 2.9 DTPs per patient. This indicates that the eligibility criteria of the medication

review programs in Canada, despite being highly variable across provinces, may indeed be serving as useful tools to identify patients who may benefit more from the programs. Unfortunately, the results of this study cannot determine which provincial criteria might be more effective at identifying patients who need a medication review the most.

It is potentially concerning that, although all of the programs appear to identify patients with more serious and numerous DTPs, they also all exclude patients who might still benefit from a medication review. Patients ineligible for the provincial programs had between 1.8 and 2.9 DTPs each, some of which were moderately severe (0.6–1.3 moderately severe DTPs per patient), suggesting that pharmacist intervention might be useful for these patients.

Study limitations

The possibility of participant bias cannot be ruled out, since information about patients who chose not to participate was not collected for comparison. It is also possible that some DTPs may have been missed or inaccurately identified, as only 1 pharmacist performed all of the medication reviews without external validation. However, we believe the impact is likely minimal since the pharmacist had additional training and strong support from the research team, as described in the Methods section.

This study used the number and severity of DTPs as markers for the extent to which patients might benefit from a medication review, despite the fact that this is an unproven surrogate marker

for this outcome. The rationale for the use of this surrogate marker is that the more DTPs a patient has, and the greater the severity of those DTPs, the more useful a medication review might be for the patient. While the DTP endpoint lacks the compelling evidence of hard endpoints such as morbidity, mortality, and cost-effectiveness, it nonetheless provides some useful initial information about a topic that was previously unstudied in Canada.

The DTP severity index was modified slightly from an index that was developed specifically for patients with chronic kidney disease (CKD) at the community pharmacy level. While the modifications were slight (i.e., removal of wording specifically related to CKD), it has not been previously validated for application to all patients in the primary care setting.

Conclusion

The eligibility criteria used by Canadian provincial medication review programs, despite being highly variable across provinces, appear to identify patients who have more serious DTPs and who might consequently benefit more from the services. Unfortunately, the criteria in each province could also be excluding some people who might benefit. Future research should focus on identifying optimal and consistent eligibility criteria for medication review programs in Canada that identify all patients who require the service, while maintaining the affordability of the program to the public payer. ■

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Author Contributions: R. Pammett wrote the initial draft of the article. D. Jorgenson reviewed and revised the article. Both authors approved the final version of the article.

Declaration of Conflicting Interests: The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding: The authors received no financial support for the research, authorship and/or publication of this article.

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