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Perspectives in Practice

Role of the Pharmacist Certified Diabetes Educator Along the Type 2 Diabetes Care Continuum

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Key Messages

- Pharmacist certified diabetes educators (CDEs) in the community have the potential to address common care gaps across the diabetes management continuum.
- Pharmacist CDEs can have an important role in self-management education, monitoring, addressing treatment adherence and reducing clinical inertia.
- Improving the scope of practice for pharmacist CDEs across Canada can maximize their role in the diabetes care team.

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Introduction

Diabetes Canada (DC) has stated that diabetes is a health-care epidemic (1). One in 3 Canadians have diabetes or prediabetes, and a Canadian is diagnosed with diabetes every 3 minutes (1). Not only is prevalence concerning, but many of these individuals are not reaching guideline-recommended targets to reduce the risk of diabetes complications (2).

As the number of Canadians being diagnosed with diabetes and their need for ongoing support continues to increase, all health-care professionals must play an active role in improving diabetes outcomes. This multidisciplinary patient-centred approach is encouraged by current DC guidelines (3).

Certified diabetes educators (CDEs) have played an integral role in the delivery of diabetes care in Canada. CDEs are recognized for their excellence in diabetes education and possess the knowledge, skill and abilities to practice within their scope of practice and according to the Canadian Standards for Diabetes Education (4). There are approximately 2,200 CDEs in Canada, with pharmacists accounting for almost one-half of this group (5). Pharmacist CDEs in the community are considered the most accessible diabetes health-care professionals because in most cases no appointment is required to see them, and they have the highest level of patient contact (6).

Unlike most other health-care professionals, the scope of practice of pharmacists varies across Canada (5). Some provinces allow expanded scopes of practice, such as independent prescribing, laboratory ordering/monitoring and administering medications/vaccines by injection, where others have limited scope beyond patient education and medication dispensing (5). This difference in scope of practice could limit the ability of pharmacists to intervene in a timely manner to enhance the care provided to people with diabetes.

Although the number of pharmacist CDEs in the community is continuing to increase, many are not fully using their skillset. An innovative approach to integrating and supporting this group of pharmacists in diabetes screening, prediabetes education and type 2 diabetes management could help patients to be identified, monitored and managed according to current guidelines (Table 1).

Screening for Type 2 Diabetes

A substantial number of Canadians are living with diabetes and have not been diagnosed (7). The lag between the onset of

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Table 1
Summary of the potential role of certified diabetes educator pharmacists in patients along the type 2 diabetes continuum

Screening for type 2 diabetes	Prediabetes	Type 2 diabetes
• Screening of patients at risk of type 2 diabetes • Could include laboratory assessment or CANRISK questionnaire • May screen individuals missed by other health-care professionals	• Collaborate with other diabetes team members to educate and reinforce behavioural changes that reduce risk of type 2 diabetes • Address cardiovascular risk factors: ◦ Hypertension ◦ Dyslipidemia ◦ Smoking cessation	• Delivery of patient-centred SME and SMS over the course of the condition • Medication reviews ◦ Develop a complete medication history ◦ Identify and address drug therapy problems • Identify and address nonadherence • Monitoring and ensuring screening based on guidelines • Addressing clinical inertia to optimize glycemic control

CANRISK, Canadian Diabetes Risk Assessment Questionnaire; *SME*, self-management education; *SMS*, self-management support.

diabetes and clinical diagnosis places these patients at risk of diabetes complications (7).

By being the most accessible health-care professional, pharmacist CDEs can play an important role in actively screening people at risk of diabetes according to the DC guidelines. Through their access in the community, pharmacists commonly see patients who are candidates for screening who may be missed by other health-care professionals. These include asymptomatic people at elevated diabetes risk who do not see their physician regularly or who do not have a family physician but could be in the pharmacy purchasing over-the-counter (OTC) medications or other products for themselves or family members. Identification of these individuals can ensure timely early treatment of this unrecognized group at risk.

Depending on the province of practice, pharmacist screening could include ordering a laboratory assessment of people at risk or be done through validated tools, such as the Canadian Diabetes Risk Questionnaire (7). Screening of at-risk populations in pharmacy is encouraged because it can assess people where they commonly are and reduce the burden on the primary health-care system (1).

Prediabetes

One-half of all people with prediabetes will develop type 2 diabetes (1). This group of patients presents a challenge to the current health-care system. With the current focus on disease management, there is generally a lower level of available health-care resources for the management of people with prediabetes.

Behavioural changes

Lifestyle adaptation significantly reduces the incidence of diabetes development (8). Most of these successful lifestyle adaptations involve significant interaction with the patient and a health-care professional, which may not be available in the current Canadian health-care system (8). Working within an interdisciplinary team model, the pharmacist CDE could use their frequent contact with this patient population to deliver education, provide DC-approved educational resources, reinforce lifestyle changes proposed by other team members and continue to work with patients over the long term. This ongoing support and education may help to address long-term adherence to behavioural changes.

Reducing cardiovascular risk factors

People with prediabetes and diabetes are at elevated risk of cardiovascular disease (CVD) (9). Pharmacist interventions focusing on cardiovascular risk factors may help to reduce macrovascular complication burden.

Three predominant modifiable CVD risk factors are hypertension, dyslipidemia and tobacco use. Prescribing pharmacist interventions has been shown to lead to a significant reduction in systolic blood pressure in patients with hypertension compared with control subjects (mean ± SE reduction in systolic blood pressure at 6 months of 18.3±1.2 mmHg compared with 11.8±1.9 mmHg in the control group, an adjusted difference of 6.6±1.9 mmHg; p=0.0006) (10). In a previous study, pharmacist prescribing and follow up led to a 3.3 times higher adjusted odds of reaching low-density lipoprotein cholesterol (LDL-C) targets compared with a control group (p=0.031) (11). A systematic review found that pharmacy-based smoking cessation interventions, including behavioural support and/or nicotine replacement therapy, are effective and cost-effective in helping adults quit smoking (odds ratio, 1.85; 95% confidence interval, 1.25 to 2.75) (12).

Persons With Type 2 Diabetes

Most people with type 2 diabetes will require ongoing support and therapy adjustments to reach targets and reduce the risk of diabetes complications. Through regular interactions, pharmacist CDEs are ideally positioned to monitor, initiate and/or adjust therapy and work collaboratively with the patient and the other members of the diabetes care team. Four important roles for the pharmacist CDE could include self-management education and support, medication reviews, maximizing treatment adherence and monitoring and improving clinical inertia.

Self-management education and support

Self-management education and support are the cornerstones to diabetes education (13). In many cases, diabetes education targets the crucial time around diagnosis, but because of a lack of resources, the intensity of education and potentially the effectiveness can decrease over time. Although patient-centred and targeted education at diagnosis can address the person's needs during that stage of the disease, educational needs may evolve through the chronic nature of the disease itself. Pharmacist CDEs can play an active role in educating the person with diabetes at diagnosis and throughout their lifespan. To maximize this role, a collaborative approach with the patient and the diabetes team is strongly encouraged. Other clinicians can use the pharmacist CDE's ability to reinforce education at diagnosis by sharing individualized goals, targets and educational needs. The reverse applies when a pharmacist CDE informs the other diabetes team members when he or

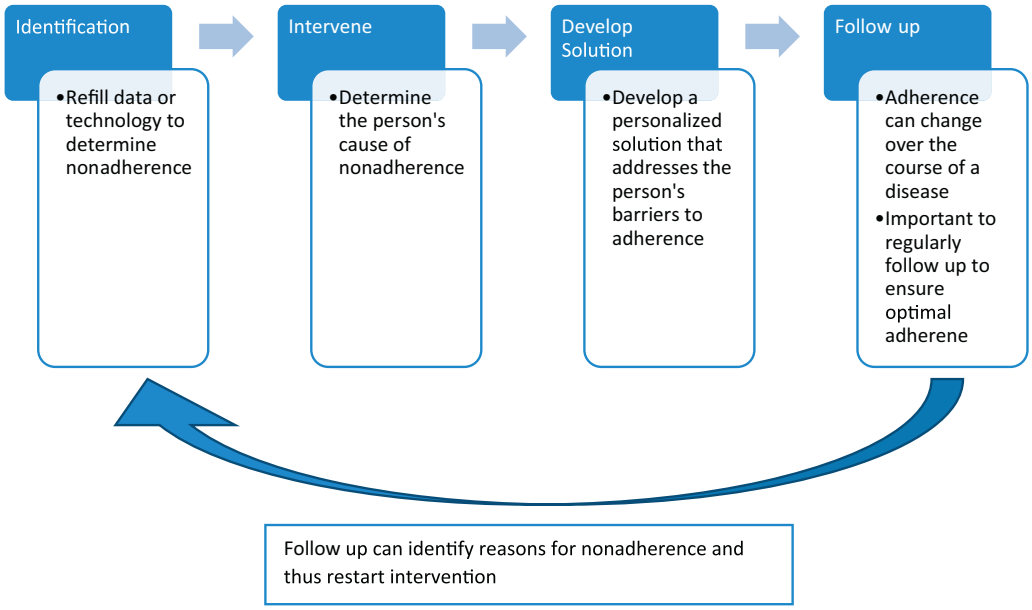

Figure 1. Developing a personalized strategy to identify and address nonadherence.

she identifies changes in goals and educational needs of the person with diabetes.

Medication reviews

Medication regimens in people with diabetes are becoming increasingly complex because of the progressive nature of the condition and treatments to manage other comorbid conditions or reduce cardiovascular risk. Many of the medications these people are taking may not have been prescribed by only one physician. People with diabetes commonly consume at least one OTC medication, and about 41% use OTC medication(s) that are deemed to be unsafe (14). Medication reviews are an effective way of identifying all the current medications (prescribed and OTC) a person is using, as well as how he or she is taking them (5). This process can identify drug-therapy problems, such as nonadherence, drug interactions, inappropriate drug use or adverse effects.

After a medication review, pharmacists will normally provide a best possible medication history to the person with diabetes and to other members of the diabetes team. In some provinces, there is additional funding for the development of comprehensive diabetes care plans and educational follow up for people with diabetes (5). Referrals from diabetes team members and encouraging people with diabetes to use these education services may help to improve the uptake of this resource (15).

Treatment adherence

Nonadherence to a diabetes treatment regimen is a major contributing factor to not reaching targets. Adherence to long-term therapy for chronic illnesses in developed countries averages 50% (16). A systematic review of adherence to oral anti-hyperglycemic therapy ranged from 36% to 93% of patients remaining on treatment for 6 to 24 months (17). Nonadherence in Canada is estimated to result in 5% of hospital admissions, 5% of physician visits annually and contributes $4 billion to health care each year (18). Medication adherence is a complex health decision behaviour, which has many possible determinants (19). Not one single strategy will address nonadherence in all people with type 2 diabetes because each person may have different barriers to taking his or her medications (20).

With the high cost and poor outcomes associated with non-adherence, multiple strategies have been attempted to improve medication adherence. Many of these interventions have used technology to assess pill taking behaviour (e.g. smart pill bottles, wearable tracking pill consumption or pill bottle opening), offer reminders (e.g. smartphone apps, short message service text messaging, telephone refill reminders) and provide education (e.g. quick response code pill bottles with links to information and videos) (19,21,22). Many of these technologies have been shown to be effective in identifying nonadherence, but the results on improving adherence or clinical markers, such as glycated hemoglobin (A1C), are mixed (19).

Addressing nonadherence in people with diabetes requires a 4-step approach (Figure 1). A systematic review found that community pharmacist interventions statistically improved adherence and contributed to better blood pressure and cholesterol control; however, the results in diabetes outcomes were not statistically significant (23). Pharmacist CDEs are ideally positioned to address nonadherence in people with diabetes. With most of these CDEs working in the community setting, they have access to the technology to quickly identify nonadherence and identify the person's reason(s) for nonadherence. By working collaboratively within the interprofessional environment, pharmacists can provide solutions to address common causes of nonadherence, such as education, tools to simplify administration (e.g. blister packaging), cost-reducing adjustments and consistent follow up.

Monitoring

Pharmacist CDEs are regularly involved in the training and education surrounding self-monitoring of blood glucose, continuous glucose monitoring and flash glucose monitoring. They play an active role in educating people on the glucose targets and strategies to reach these targets. In many provinces, these pharmacists can order laboratory tests, such as A1C, LDL-C and renal

function. Including laboratory monitoring in scope of practice of all pharmacist CDEs can help to ensure that all patients are being monitored according to DC guidelines and allow for interventions when patients are not meeting targets.

Improving clinical inertia

Clinical practice guidelines stress the importance of anti-hyperglycemic therapy intensification to reach glycemic targets in 3 to 6 months (24). Clinical inertia is defined as the failure to intensify therapy when clinically indicated (25). A real-world observational study in the United States found that close to two-thirds of people with an A1C >7% did not receive therapy intensification (25). In the group of people with an A1C >9.0%, 44% did not receive therapy intensification (25). A Canadian study found that primary care clinicians waited years before initiating insulin, and many times it was not titrated to target (26).

Two studies demonstrated the potential role of prescribing pharmacists in managing people with diabetes. In the first study, the treatment group received a pharmacist assessment, laboratory assessment and CVD risk assessment and was provided with treatment recommendations and regular follow up for 3 months vs the standard of care for the control group (27). After 3 months, the intervention group was found to have a 21% relative risk reduction in cardiovascular events, a 9.37 mmHg lower systolic blood pressure, a 0.92% decrease in A1C, a 20% relative reduction in smoking and a 0.2 mmol/L greater reduction in LDL-C compared with the control group (27). The second study involving prescribing pharmacists involved initiating and titrating basal insulin therapy in poorly controlled people with diabetes (baseline mean A1C, 9.1%), who significantly improved A1C at 26 weeks (mean A1C, 7.3%), with 51% achieving an A1C target of ≤7.0% at study completion (28). During a 1-year follow up study when these participants returned to standard care, 50% of glycemic control gains were lost, suggesting a need for structured follow up in the study population (29).

Conclusions

There is an increasing number of pharmacist CDEs practising in the community. This group has the skillset that positions them to intervene and address many of the care gaps seen in people with diabetes. With the number of people with diabetes increasing, it is important for the health-care system to fully use every health-care professional to their fullest potential to maximize outcomes in people with diabetes. By addressing common barriers, such as lack of patient and other provider recognition for these services, universal provincial funding for this new model of practice and consistent scope of practice, pharmacist CDEs can potentially take an innovative role in the diabetes care team to improve the management of people with diabetes.

Author Contributions

M.B. wrote the article.

Author Disclosures

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