

COMMENTARY

Self-Monitoring of Blood Glucose in People with Type 2 Diabetes: Canadian Diabetes Association Briefing Document for Healthcare Providers

BACKGROUND

The Canadian Diabetes Association (CDA) believes that self-monitoring of blood glucose (SMBG) is an important and essential tool for the care of individuals with diabetes. The Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada (1) recommend that SMBG be individualized for each person with diabetes based on their circumstances and needs.

It is the intent of the CDA to inform Canadian healthcare providers of its position concerning SMBG, to respect the CDA guidelines (1) and to proactively influence public policy concerning SMBG, while at the same time addressing issues concerning cost-effectiveness raised by the Canadian Optimal Medication Prescribing and Utilization Service (COMPUS) (2-7). To do this, a working group of members of the Clinical & Scientific Section (C&SS), Diabetes Educator Section (DES) and National Advocacy Committee (NAC) of the CDA was formed to draft a briefing document regarding SMBG. This document has been accepted by the executive committees of both the C&SS and DES.

The SMBG working group believes that some level of SMBG is appropriate for many people with type 2 diabetes, where clinically indicated. The frequency of SMBG will vary depending on the clinical situation.

This document was developed by the SMBG working group as a briefing document and not as a guidelines statement. The purpose of this document is as follows:

1. To make recommendations on SMBG in the management of type 2 diabetes, following a review of current data on its efficacy and cost-effectiveness.
2. To address the allocation of healthcare funding in an environment of limited fiscal resources.
3. To provide support for people with diabetes who, based on certain circumstances, will benefit from structured SMBG as a way to self-manage their disease.

This document provides general comments on all 5 COMPUS recommendations, and presents specific information and comments for patients with type 2 diabetes, so that the CDA's perspective on SMBG is shared with healthcare providers and stakeholders alike.

To complement this document and provide practical education, the CDA has developed an SMBG tool for

healthcare providers and 2 tools for people with diabetes, to identify optimal self-management and best practices regarding individualized requirements for SMBG (8,9), including optimal frequency and timing. These tools will be disseminated to physicians, diabetes educators and other healthcare professionals who work with people with diabetes and will be available on the CDA website, www.diabetes.ca.

Self-management of diabetes remains the cornerstone of diabetes care. Every effort should be made by all involved with diabetes care in the Canadian healthcare system to support SMBG as part of an overall self-management strategy. This would be greatly beneficial to people with diabetes and their families. SMBG should be considered and evaluated in conjunction with all other aspects of diabetes self-management and care within the Canadian healthcare system.

GENERAL CDA COMMENTS IN RESPONSE TO THE COMPUS REPORTS AND RECOMMENDATIONS

- SMBG should not be viewed as an intervention, but rather as an aid to assessing interventions.
- There are scientific concerns with the studies that have been chosen for review by COMPUS and form the basis of the COMPUS recommendations (8,9). Further, the meta-analysis methodology used by COMPUS serves to present diabetes as a homogeneous condition, which it is not. Subsets of patients with diabetes cannot be fully accounted for within a meta-analysis.
- COMPUS did not differentiate between the numerous oral antihyperglycemic agents prescribed for type 2 diabetes. Some oral antihyperglycemic agents place individuals at higher risk for hypoglycemia than others. We believe that some differentiation between these oral agents is necessary.
- Regarding the “underlying values and preferences” following the COMPUS Expert Review Committee (CERC) recommendations, it is noted that the primary consideration for these recommendations was cost-effectiveness (Recommendation 3) and cost for payers (Recommendation 4), rather than any clinical outcome measure (6,7).
- We disagree with some of the methodology used to assess cost-effectiveness (8).

SPECIFIC CDA COMMENTS IN RESPONSE TO THE COMPUS RECOMMENDATIONS REGARDING TYPE 2 DIABETES

Recommendation 2

Adults with type 2 diabetes using insulin

CERC recommends that SMBG be used and that the optimal daily frequency of SMBG be individualized for most adults with type 2 diabetes using insulin. When SMBG has been individualized, CERC suggests that the maximum average weekly frequency of SMBG for most adults with type 2 diabetes using insulin is 14 tests per week (6).

The CDA is in general agreement (8); however, we recommend that the amount of SMBG be individualized for all people with type 2 diabetes using insulin.

COMPUS includes a list of exceptions to its general recommendation, included within the clinical notes (see below) (6). The CDA is in agreement with this list of exceptions. However, given that the list of exceptions to the general recommendation is lengthy, we believe it is most practical and reasonable not to limit SMBG for adults with type 2 diabetes using insulin.

CERC clinical notes

This population is heterogeneous regarding the dose and frequency of insulin administration. Given a lack of evidence, the following reflects CERC clinical opinion and accepted standards of practice.

- Patients at increased risk of hypoglycemia or its consequences may benefit from performing SMBG more than 14 times per week. These include individuals:
 - Using multiple daily insulin injections (i.e., 3 or more per day).
 - With a history of hypoglycemia.
 - Working in an occupation where hypoglycemia poses safety concerns or where testing is mandated by an employer (e.g., pilots, air-traffic controllers, critical positions in railways).
 - Private and commercial drivers who should abide by jurisdictional regulations concerning SMBG, hypoglycemia and operation of motor vehicles.
- Other populations that may benefit from performing SMBG more than 14 times per week include those:
 - Newly initiated on insulin.
 - Experiencing acute illness.
 - Undergoing changes in insulin dose/regimen or significant changes in routine.
 - With poorly controlled or unstable blood glucose levels.
 - Who are pregnant or planning a pregnancy.
- Patients who are not identified in the populations above may benefit from performing SMBG less than 14 times per week.

Recommendations 3 and 4

Adults with type 2 diabetes who use oral antihyperglycemic agents

Routine use of blood glucose test strips for SMBG is not recommended by CERC for most adults with type 2 diabetes using oral antihyperglycemic agents (6).

Adults with type 2 diabetes who do not use diabetes pharmacotherapy

Routine use of blood glucose test strips for SMBG is not recommended by CERC for most adults with type 2 diabetes who do not use diabetes pharmacotherapy (6).

The CDA is in disagreement with the evidence and methodology used to support these 2 recommendations (8,10). The main areas of disagreement are CERC's emphasis on cost-effectiveness rather than clinical usefulness and its lack of acknowledgement of individual circumstances in which SMBG could prove useful.

COMPUS includes a list of exceptions to its general recommendation, included within its clinical notes (see below) (6). The CDA is in agreement with this list of exceptions.

CERC clinical notes

Given a lack of evidence, the following reflects CERC's clinical opinion and accepted standards of practice:

- Patients treated with insulin secretagogues may benefit from routine use of SMBG to reduce the risk of hypoglycemia.
- Other populations that may benefit from SMBG include those:
 - At increased risk of hypoglycemia (e.g. due to a history of severe hypoglycemia or hypoglycemia unawareness, instances of inadequate caloric intake, unforeseen or unplanned physical activity).
 - Experiencing acute illness.
 - Undergoing changes in pharmacotherapy or significant changes in routine.
 - With poorly controlled or unstable blood glucose levels.
 - Who are pregnant or planning a pregnancy.

The CDA recognizes that some limitation of government-reimbursed SMBG test strips in this population might be reasonable. We believe patients should be divided into 2 different groups (consistent with COMPUS's clinical notes) (Table 1):

- Group 1: those using no pharmacotherapy or pharmacotherapy with a lower risk of hypoglycemia.
- Group 2: those using any pharmacotherapy with a higher risk of hypoglycemia.

The CDA is prepared to suggest a minimum government reimbursement for SMBG test strips of 15 test strips

Table 1. Pharmacotherapy: risk of hypoglycemia

Pharmacotherapy with a lower risk of hypoglycemia (Group 1)	Pharmacotherapy with a higher risk of hypoglycemia (Group 2)
<ul style="list-style-type: none"> • Metformin • Acarbose • Pioglitazone, rosiglitazone • Saxagliptin, sitagliptin • Liraglutide, exenatide 	<ul style="list-style-type: none"> • Gliclazide, glimepiride • Glyburide • Nateglinide, repaglinide • Chlorpropamide, tolbutamide

per month for Group 1 and 30 test strips per month for Group 2. However, where exceptions need to be made for clinically valid reasons, governments should have a special authorization mechanism in place, thus providing coverage on an individual basis.

This document, in conjunction with tools currently in development for patients with diabetes and their health care providers, aims to highlight areas where the CDA believes that SMBG can play a useful role in diabetes self-management. At the same time the CDA acknowledges that while there are differences, there is also significant concordance with COMPUS documents regarding SMBG

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