

Everyone With Type 2 Diabetes Should Do It ... Shouldn't They?

Since its adoption into clinical practice in the early 1980s, self-monitoring of blood glucose (SMBG) has emerged as the primary means of supporting blood glucose management outside the clinical setting. Clinical practice guidelines widely advocate its use for everyone living with diabetes. But despite SMBG being common practice, there is uncertainty about its benefits — especially in patients with type 2 diabetes not using insulin. The testing frequency for people with diabetes is also unclear.

In Canada, SMBG is routine among patients with type 2 diabetes not using insulin, with over 50% of the expenditure for blood glucose test strips from these patients.

As health care providers, you want what is best for your patients with type 2 diabetes, both clinically and economically. You want to maximize health outcomes and you don't want your patients or the health care system paying for

interventions that won't contribute to this goal. With all that in mind, you need to know the answers to the following questions:

- o *Should people with type 2 diabetes not using insulin be testing their blood glucose? What about those with insulin-treated type 2 diabetes?*
- o *If the answer is "yes," how often should they be testing?*

This is significant when considering how best to use finite health care resources while supporting good health for your patients living with diabetes.

Your Patients With Type 2 Diabetes Not Using Insulin

Given the increasing prevalence of type 2 diabetes, chances are that a significant portion of your practice consists of patients in this category. They include those managing their diabetes through diet and exercise alone and those taking various drugs. Should these patients be testing their blood glucose at home?

A systematic review conducted by the Canadian Agency for Drugs and Technologies in Health (CADTH) identified several randomized controlled trials (RCTs) evaluating SMBG in patients with non-insulin-treated type 2 diabetes. Pooling of results from seven RCTs demonstrated that SMBG is associated with a statistically significant, but not clinically relevant, improvement in glycemic control (difference in A1C = -0.25% [95% CI -0.36% to -0.15%]). A similar effect on A1C was observed regardless of whether education was provided to help patients interpret and act upon SMBG results. For patients with type 2 diabetes who were not using pharmacotherapy to control their diabetes, improvements in glycemic control were less pronounced and statistically non-significant.

In summary, the clinical review demonstrates that SMBG in patients with type 2 diabetes not treated with insulin does not result in clinically significant improvement of glycemic control.

The cost-effectiveness analysis using clinical data from the systematic review found that SMBG, at a frequency of around nine tests each week in patients with type 2 diabetes not treated with insulin, was associated with an incremental cost of \$113,643 per quality-adjusted life-year (QALY) gained (exceeding widely cited cost-effectiveness thresholds). The results did not change substantially when considering patients with greater baseline A1C or those treated with oral antidiabetes drugs alone.

Bottom Line:

- o For most adults with type 2 diabetes who are taking oral antidiabetes medication:
 - Routine SMBG is not required.
 - Testing may be required in some situations, but only if it helps to determine a specific course of action by the patient ([see list on page 2](#)).
- o For most adults with type 2 diabetes who control their diabetes through diet alone:
 - Routine SMBG is not required.

Your Patients With Type 2 Diabetes Using Insulin

In patients with insulin-treated type 2 diabetes, low-quality evidence suggests that SMBG is associated with improvements in glycemic control. However, there is insufficient clinical evidence to determine the optimal frequency of testing.

The cost-effectiveness analysis indicates that a testing frequency beyond 21 strips per week is unlikely to provide good value for money; and the lower the number used per week, the more cost-effective the practice is likely to be. It suggests that SMBG performed more than 14 times per week on average would have to be associated with a large benefit for A1C (i.e., a reduction of greater than 1%) for it to be considered cost-effective.

Bottom Line:

- o For most adults with type 2 diabetes who require basal insulin:
 - SMBG should be tailored to best guide them in achieving optimal blood glucose control.
 - This should require no more than 14 tests each week, on average, for most patients.

If recent recommendations on SMBG were adopted in Canada, health outcomes for those living with diabetes would not be compromised, while more than \$260 million annually could be redirected to other priorities. This is significant when considering how best to use finite health care resources while supporting good health for your patients living with diabetes.

Type 1 Diabetes

There is limited evidence, but clinical experience and standards of practice suggest that, for people with type 1 diabetes, SMBG should be individualized to guide adjustments in insulin therapy to achieve optimal blood glucose control.

Consider SMBG (or more frequent SMBG) in the following patient situations:

- o Multiple daily insulin injections
- o Newly diagnosed or newly initiated on medication or insulin
- o History of, or at increased risk for, hypoglycemia
- o Acute illness
- o Changes in insulin or other medication dose/regimen, or significant changes in routine
- o Poorly controlled or unstable blood glucose levels
- o Pregnant or planning to become pregnant
- o Working in an occupation where hypoglycemia poses safety concerns.

In these cases, testing should lead to a specific course of action, such as adjusting medication or food intake.

There's More to Self-Management Than Blood Glucose Readings

Self-monitoring of blood glucose is not synonymous with self-management of diabetes. Other important aspects of effective self-management of diabetes by your patients include:

- o Regular visits with a diabetes health team
- o Taking all prescribed medications as directed
- o Monitoring blood pressure
- o Eating a healthy, nutritious diet
- o Exercising regularly
- o Maintaining a healthy weight
- o Ensuring good foot, eye, and dental care
- o Effectively managing stress
- o Talking to their doctors about A1C results
- o Managing cholesterol.

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