

## Blood Glucose Monitors and Test Strips: A Review

### Context

Diabetes mellitus is a chronic disease characterized by the body's inability to produce enough insulin or to use it properly. Untreated, diabetes results in high levels of glucose in the blood. Over the long term, this can lead to complications including cardiovascular disease, chronic renal failure, peripheral neuropathy, and retinopathy. Self-monitoring of blood glucose is recognized as one approach to improving glycemic control. The total Canadian expenditure on blood glucose test strips was an estimated \$370 million in 2006 and exceeded \$500 million in 2010.

### Technology

Self-monitoring of blood glucose requires obtaining a small blood sample — usually capillary blood from a finger puncture. The blood sample is applied to a reagent strip (or blood glucose test strip), and the glucose concentration is determined by an electronic monitor. A variety of blood glucose monitors and test strips are available in Canada.

### Issue

Although electronic blood glucose monitors and test strips were introduced three decades ago, their accuracy remains uncertain. The recent introduction of cheaper test strips further complicates the decision-making process when choosing a monitor and test strips for self-monitoring. A review of the comparative clinical and cost-effectiveness of the available blood glucose monitors and test strips for patients with diabetes in Canada will help to inform decisions about their use. An examination of monitor and test strip factors that are related to better patient outcomes will also help to inform the decision-making process.

### Methods

A limited literature search was conducted of key resources, and titles and abstracts of the retrieved publications were reviewed. Full-text publications were evaluated for final article selection according to predetermined selection criteria (population, intervention, comparator, outcomes, and study designs).

### Key Messages

#### For self-monitoring of blood glucose for patients with diabetes:

- Five blood glucose monitors available in Canada were reviewed and are clinically accurate.
- No evidence was found on the cost-effectiveness of blood glucose monitors and test strips for patients with diabetes.
- No evidence on glucose monitors or test strip features related to better patient outcomes was found.

This review is an update to a 2011 CADTH report on the same topic.

### Results

The literature search identified 455 citations of which 41 were deemed potentially relevant. No articles were identified from the grey literature. Of the 41 reports, 2 diagnostic accuracy studies met the criteria for inclusion in this review.

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