

Flash Glucose Monitoring

Flash glucose monitoring is a method of glucose testing that measures, displays, and continuously stores glucose readings that are recorded automatically. It can be used by adults to make diabetes treatment decisions, including insulin dosing, without obtaining a blood sample from the fingertip (finger prick). This has the potential to improve blood sugar control and quality of life for people with type 1 or type 2 diabetes, resulting in physical, social, and emotional benefits.



A flash glucose monitoring system uses an externally-worn glucose sensor with a small filament inserted under the skin of a person's upper arm. When the sensor is "flashed" or scanned with a separate

touchscreen reader device, it transmits the real-time glucose reading and information on the most recent 8-hour trend to the reader. If the person with diabetes performs at least 3 sensor scans per day

at approximately 8-hour intervals, the flash glucose monitor can record 24-hour glucose profiles. A sensor can be worn continuously for up to 14 days.

Blood glucose monitoring gives people living with diabetes a more complete picture of their glucose control, which can lead to better short and long-term treatment decisions and health outcomes. It can help them identify when their blood sugar is trending down, which allows for appropriate and timely action to be taken to avoid hypoglycemia (low blood sugar). It can also provide early indication of hyperglycemia (high blood sugar) over the course of the day and prompt adjustments to medications, activity, and food intake to help achieve blood sugar targets.

Regular testing of blood glucose is critical to effectively manage type 1 and type 2 diabetes when taking insulin therapy. Until recently, the standard way to test blood sugar has been to obtain a drop of blood from a finger prick and to get a blood glucose reading using a blood glucose meter. This is called self-monitoring of blood glucose (SMBG). SMBG has some drawbacks, including the pain of pricking one's finger (up to several times a day when using insulin therapy) and less thorough information on blood glucose trends.

Flash glucose monitoring avoids painful finger pricking and can provide comprehensive glucose data making it more likely for people to remain in their recommended blood sugar range. This helps people living with diabetes avoid short term complications like hypoglycemia.

Even though there is provincial health plan coverage for flash glucose monitoring in Ontario and Quebec and among most private insurance plans, the cost is still a barrier for many Canadians who rely on their provincial health plans for coverage and/or diabetes support.

Flash Glucose Monitoring: The Clinical Evidence

Diabetes Canada's Clinical Practice Guidelines recommend that people with diabetes monitor their



blood sugar levels to ensure they remain within the target range. This helps to prevent cases of severe low or high blood sugar. Hypoglycemia or low blood sugar can be a life-threatening complication of diabetes.

Diabetes Canada states that using flash glucose monitoring will:

- Determine if glucose is high or low at a given time;
- Demonstrate how health behaviours and diabetes medication(s) affect glucose levels; and
- Help the person living with diabetes and their health care team make changes to health behaviours and medications that will improve blood glucose levels.

Flash glucose monitoring systems can be used to help people with diabetes stay within their target glucose range and to prevent hyperglycemia or hypoglycemia.¹ If used consistently, flash glucose monitoring has the potential to prevent life-threatening emergencies. Flash glucose monitoring technology, which provides patients with information about their glucose levels on an ongoing basis, has been shown to reduce the time spent in low glucose range and increases the time spent in the target glucose range in adults with type 1 and type 2 diabetes.

In addition, people using flash glucose monitoring report a positive impact on their diabetes management and quality of life.

Who uses flash glucose monitoring?

There is evidence that flash glucose monitoring may be beneficial for people with type 1 or type 2 diabetes aged 18 years and older.² It is intended to replace blood glucose testing.^{3,4}

The detailed benefits of flash glucose monitoring for some patient populations are unclear because clinical trials often exclude children or people at high risk for complications. Flash glucose monitoring has not been evaluated for use with other implanted medical devices such as pacemakers. It has also not been evaluated for use in pregnant women, or persons on dialysis. The data are continuing to emerge at a fast pace and recommendations must be updated based on the new information.

Diabetes management should always be individualized and people living with diabetes should work with their health-care team to determine the medications, devices, and supplies that best support their needs.

Cost and coverage in Canada

Many private insurance plans provide flash glucose monitoring coverage. However, public funding is only currently available in Ontario and Quebec. The Ontario Drug Benefit (ODB) program provides public

reimbursement for the flash glucose monitoring system for Ontario residents who manage diabetes with insulin. In Quebec the current coverage criteria for flash glucose monitoring sensors by RAMQ are for Quebec residents 18 years or older managing diabetes with insulin and with two years' experience in diabetes self-management.

A flash glucose monitoring system typically costs close to \$2,500 a year. The cost for each sensor is approximately \$90 and the reader costs approximately \$50. Each sensor can be worn for 2 weeks (14 days) and the iOS and Android apps to read the sensor information on one's phone is available for free. Many people cannot afford this cost out of their own pocket.

Where can you get a flash glucose monitor?

Those interested in purchasing or learning more about flash glucose monitors available in Canada can contact*: www.myfreestyle.ca

Recommendations

Diabetes Canada recommends that:

- Flash glucose monitoring may be offered to people with insulin-treated diabetes to decrease time spent in hypoglycaemia.
- Provincial governments publicly fund flash glucose monitoring for people with diabetes where there are demonstrated improved health outcomes.

* Diabetes Canada does not endorse or recommend one particular device.

1. Diabetes Canada Clinical Practice Guidelines Expert Committee, Berard LD, Siemens R, Woo V. Monitoring Glycemic Control. *Can J Diabetes*. 2018 Apr;42 Suppl 1:S47-S53.
2. Health Canada. Regulatory Decision Summary - FreeStyle Libre Flash Glucose Monitoring System - Health Canada. April 2019. Available from: <https://hpr-rps.hres.ca/reg-content/regulatory-decision-summary-medical-device-detail.php?lang=en&linkID=RDS10151>
3. Bolinder, J., Anutuna, R., Geelhoed-Duijvestin, P., et al. (2016). Novel glucose-sensing technology and hypoglycemia in type 1 diabetes: A multicenter, non-masked, randomized controlled trial. *Lancet*, 388, 2254-2263.
4. Haak, T., Hanaire, H., Ajjan, R., et al. (2017). Flash glucose-sensing technology as a replacement for blood glucose monitoring for the management of insulin-treated type 2 diabetes: A multicenter, open-label randomized controlled trial. *Diabetes Therapy*, 8, 55-73.



In Their Own Words...



Lindsey LeClaire,
British Columbia

Why did you choose flash glucose monitoring technology for your diabetes management?

I love that the flash glucose monitor sensors are not obtrusive or difficult to apply, they generally stay on for a reasonable period of time, and I am still able to swim with my daughter.

How long have you been using flash glucose monitoring?

I have been using a flash glucose monitor for about two years.

What would you say to someone who is considering a flash glucose monitoring?

I would strongly recommend to anyone who is considering a flash glucose monitor that they not be intimidated by new technology. I have type 1 and type 2 diabetes friends from teens to seniors who use flash glucose monitors and are achieving better control and better health. I know that making changes to a diabetes regimen can be daunting – be courageous! Try flash glucose monitoring! If it does not work for you, finger pokes and testing strips will always be available.



Dave Davidson,
Ontario

Why did you choose flash glucose monitoring technology for your diabetes management?

I had used continuous glucose monitor sensors in the past and saw the potential for me but could not afford to use them. When the Freestyle Libre became available to me, as an Ontario senior, funded by ODB this seemed like the time to graduate from periodic finger pokes to gaining access to much better blood glucose data. With access to this information, I've been able to make steady improvements in my A1c.

How long have you been using flash glucose monitoring?

Seven weeks.

What would you say to someone who is considering a flash glucose monitoring?

You need to be aware of the limitations of this technology, it's not as accurate as glucometer readings. Make a commitment to yourself to take advantage of the added benefit this provides, it's a lot more than no more finger pokes.



Dane Wilson,
Manitoba

Why did you choose flash glucose monitoring technology for your diabetes management?

I started using a flash glucose monitoring system when it first became available in Canada. As I am insulin-dependent, using both rapid and long-acting insulin, I found that I was sticking myself several times a day to monitor my blood glucose levels. Since I started using a flash glucose monitor, I can check my levels numerous times a day without having to constantly stick myself with the lancet. I am also able to determine which foods cause my blood sugar to spike. The flash glucose monitoring system is quite expensive but being able to constantly monitor my blood glucose levels is worth the price.

How long have you been using flash glucose monitoring?

I have been using a flash glucose monitor for several years now, ever since it became available in Canada.

What would you say to someone who is considering a flash glucose monitoring?

Anyone that is interested in using the flash glucose monitoring system, I would tell them that it is the best way to monitor your blood glucose levels at any time during the day or night. It is so handy and convenient that it is well worth the money to invest in this system.



Sigal Matasaro,
Ontario

Why did you choose flash glucose monitoring technology for your diabetes management?

I choose the flash glucose technology for my diabetes management for many reasons. It is a game changer! It has changed my life from bad to the best life that I could achieve living with type 1 diabetes. It helps me achieve every goal that I set; I am free of worrying about my blood sugar.

I don't have to poke myself every time to know my blood sugar numbers, I can check as many times as I need to make sure I am staying on the right track. I can see my blood sugar trend and react immediately. I can see my estimated A1c which helps me prepare my plan to achieve my A1c target. I've been living with type 1 diabetes for 17 years and this is the first time I've managed to stay on target with my A1c; it's been below 5.5 for two years now.

How long have you been using flash glucose monitoring?

I have been using the flash glucose monitoring for two years.

What would you say to someone who is considering a flash glucose monitoring?

In my opinion, this is the best device out there. It has changed my type 1 diabetes life. I am in full control of my disease, and by that I am adding more years to my life. It allowed me to go to an Extreme Adventure, climbing a mountain, which I couldn't achieve without it since I was the oldest one who accomplished it!

Continued on next page

This device has given me back my life; I am not on survivor mode anymore, and I would recommend it to anyone who wants like me to become the best version of himself living with type 1 diabetes.



Candace Bell

Why did you choose flash glucose monitoring technology for your diabetes management?

For me there were several reasons for choosing flash glucose. Traditional meters provide only a “point in time” view. I wanted to see a better spread of data for trends. I wanted some insight into where my diet was not meeting the needs of my diabetes. I also wanted the statistics that are available with flash, such as standard deviation. In other words, an A1C and a traditional meter were not providing me with the information I needed to get my diabetes under control.

An A1C is a population-based statistic while a traditional meter is “point in time”. It’s hard to manage diabetes using that combination. I wanted a better result than that combination would suggest. And I have a better result! My blood is well within my self-defined range of 3.9-8.0 which is normal.

How long have you been using flash glucose monitoring?

Almost two years.

What would you say to someone who is considering a flash glucose monitoring?

It’s a total game changer!

If you want to improve your diabetic profile, this is the way to do it. It takes some time to get used to the quirks, such as compression lows and reading variability at the beginning and end of a sensor, but within a few months you should be quite comfortable with it.