



**DIABETES
CANADA**

Continuous Glucose Monitor (CGM)

A continuous glucose monitor (CGM) is a wearable device that tracks blood glucose (sugar) every few minutes, throughout the day and night. The readings are relayed in real time to a device which can be read by the patient, caregiver or health-care provider, even remotely. This can be lifesaving for people who experience low glucose at night and risk not waking up in the morning.

A CGM includes a small disposable sensor that is worn under the skin (often on the stomach or arm). The sensor tests sugar levels every few minutes and sends this information to an attached transmitter and, usually, to a separate receiving device, such as a smart phone. This is a 'stand-alone' CGM. CGM can also be paired with an insulin pump, and this is called an 'integrated' CGM.

Blood glucose monitoring gives people living with diabetes a more complete picture of their blood sugar 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, 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.

Integrated CGM treatment employs a CGM, an insulin pump and software to allow the two to communicate. These newer systems can automatically adjust insulin delivery based on CGM readings. Automated insulin delivery automatically adjusts and delivers insulin every five minutes. This significantly decreases severe hypoglycemia.

Stand alone CGM and Sensor Augmented Treatment can make it more likely for people to remain in recommended blood sugar ranges. This helps people

living with diabetes avoid short term complications like hypoglycemia, and longer-term serious complications, such as vision loss or lower-limb amputations.

Continuous Glucose Monitoring (CGM): The Clinical Evidence

Diabetes Canada states that CGM systems can be used to help people with diabetes stay within their target blood sugar range and prevent low blood sugar episodes. Hypoglycemia or low blood sugar can be a life-threatening complication to diabetes.

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. This is particularly important for people over night when they are not checking their blood sugars with finger stick testing. CGM is constantly and automatically monitoring with alarms and alerts when their blood sugar drops too low or is anticipated to drop too low.

Diabetes Canada states that CGM systems can be used to help people with diabetes stay within their target blood sugar range and to prevent hyperglycemia and diabetic ketoacidosis. If used consistently, CGM has the potential to prevent life-threatening emergencies. Health Quality Ontario also performed a review and recommended continuous glucose monitoring in patients with type 1 diabetes who are willing to use continuous glucose monitoring for the vast majority of the time and who experience severe hypoglycemia without an obvious precipitant, despite optimized use of insulin therapy and conventional blood glucose monitoring; or those who are unable to recognize, or communicate about, symptoms of hypoglycemia

Real-time [CGM technology](#), which provides patients with information about their blood glucose levels on an ongoing basis, also has been shown to reduce the time spent in low blood sugar range as well as overall blood sugar (known as A1C which is the average blood sugar over a three month period) in adults and children.

Better outcomes associated with CGM use are greatest with long term use. Also, patients using CGM who have access to a structured education program, typically have A1C values within the targeted range.

Who uses a CGM?

There is evidence to suggest CGM may be beneficial for both adults and children with type 1 diabetes who have not achieved their blood sugar targets or have difficulty with hypoglycemia.

People who are educated and supported to use CGM get more benefits. People who persist and use CGM get more benefits.

The detailed benefits of CGM for some patient populations is unclear because clinical trials often exclude children or people at high risk. 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

- Some private plans provide CGM coverage. However, public funding is only currently available for people who have access to the Ontario Disability Support Program or the Non-Insured Health Benefits program for First Nations and Inuit. All others must pay the entire cost out-of-pocket and there are no other provinces or territories that currently publicly fund this technology.
 - CGM systems typically range in price from \$3,000 to \$6,000 a year. Many people cannot afford this cost.
 - The cost can vary between manufacturers and is based on the components of the system and the frequency with which equipment needs to be replaced.

Where can you get a CGM?

Those interested in purchasing or learning more about CGM available in Canada can contact (in alphabetical order) the following companies*:

www.dexcom.com/en-CA

www.medtronic.com/ca-en/diabetes/home/guardian-connect.html

www.medtronic.com/ca-en/diabetes/home/products/minimed-670g.html

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

Recommendation

Diabetes Canada recommends that provincial governments publicly fund continuous glucose monitors for people with diabetes where there are demonstrated improved health outcomes.



In their own words...



Karen Kemp,
62 years, Ontario

Why did you choose CGM technology for your diabetes management?

I choose CGM technology for several reasons to manage my diabetes. It provides me with an accurate reading of my blood glucose 24/7 and prevents long-term complications. I always know my glucose level and never have to guess; there is less testing required with a CGM i.e. less finger needles. I suffer from hypoglycemic unawareness; therefore, it is a medical necessity for me. The CGM has saved me from going into a diabetic coma during my sleep on several occasions. By wearing a CGM, I'm always aware as to what's happening with my body and it shows the direction of your glucose level, providing better control in situations of illness, fitness and meal planning. It also gives me confidence throughout the day and I have better control of my diabetes. In addition, my family feels more at ease knowing that I wear this technology. I can share my data with my healthcare providers and if my glucose is out of range, an alarm will alert me so I can adjust as needed.

How long have you been using CGM?

I have been using a CGM System off and on for the past 11 years. It wasn't always affordable - at times I would wear it only intermittently. When not wearing it, I would need to set my alarm at 2 a.m. to test my blood glucose level. For the past two years I've been wearing a CGM 24/7.

What would you say to someone who is considering a CGM?

I would tell them if they can afford it to start using one and prevent any future complications. With wearing a CGM, you almost forget that you have type 1 diabetes. I have had type 1 diabetes for 35 years and highly recommend a CGM for anyone with hypoglycemic unawareness. The cost is similar to multi-testing and the accuracy is 90 per cent!



Caitlin Gallant,
22 years, Prince
Edward Island

Why did you choose CGM technology for your diabetes management?

I felt that I had reached the limit in terms of what I was able to do to manage my type 1 diabetes and was looking to take the next step. I wanted to be more proactive about managing my diabetes, and CGM could provide me with the information I needed to achieve this goal. Knowing not only what your blood sugar is at any given moment, but also in what direction it is moving and how quickly was a total game changer. Also, knowing that my family and I could monitor my blood sugar 24/7 and would be alerted to changes provided that extra bit of security and peace of mind.

How long have you been using CGM?

Since January 2018

What would you say to someone who is considering a CGM?

CGMs can seem overwhelming, but it really is the best tool I have to manage my diabetes. The information provided by my CGM allows me to anticipate changes in my blood sugar sooner and act quicker and with more accuracy. It's a lot of data but it allows me to avoid major changes in my blood sugar, which ultimately reduces the amount of time I spend worrying about my blood sugar overall. Diabetes is a challenging disease to manage and it can often make you feel helpless. My CGM has empowered me to regain control over my management by giving the information that I need to manage my diabetes the way I want to, and it has made all the difference.



Lilly Anna LeClercq,
11 years, Alberta

Why did you choose CGM technology for your diabetes management?

Before I got the CGM, I felt like a pin cushion. I was poking anywhere from 8-12 times in a day. I'd have to poke at breakfast, morning/afternoon/bedtime snacks, lunch, and supper. Also, before & after gym and dance class; when I was having a low and 15 minutes after a low. Now with the CGM I poke in the morning and bedtime to calibrate. My fingers were full of calluses before and my fingers were too sore to hold a pencil at school. It also shows me when my sugars are dropping or if I'm going high so I can prevent lows and highs from happening. I can always see and follow my blood sugars and my mom and dad can follow the app which allows them to follow and see my numbers. It's peace of mind for them too.

How long have you been using CGM?

It's been one year.

What would you say to someone who is considering a CGM?

I would recommend the CGM. I also like that it has alarms on it to alert me of a low or of a high. And my mom can sleep at night knowing my CGM will wake her up if I have a low. The only thing I don't like is that when I have it on, I have to wear it for two or more weeks at a time without a break. But when the sensor no longer works, mom lets me take a few days rest with nothing in my arm as a break, before I have to put a new sensor on.



Mark Buckle,
26 years, Nova Scotia

Why did you choose CGM technology for your diabetes management?

I live my life on my own terms. This means doing the things I enjoy doing and trying new ones. The tough part about a highly variable lifestyle is predicting the impacts that new activities and situations will have on my blood sugar. I chose CGM because I needed a more “real time” analysis on what was happening. Before using it, I would check myself 8-12 times a day. Not only was this rough on the fingers, but it meant carrying around my tester everywhere I went. More importantly, a glucometer just gives me a snapshot of my sugar levels. I don't see any trends. CGM gives me the full story. I test my sugars twice a day for calibration purposes; when I wake up and before bed. What I didn't know going into using CGM was the lessons it would teach me. I've learned that certain things influence my blood sugars differently than I once thought. Not just food, but certain activities spike my sugars differently. I can look back at my CGM graph and use it to better predict how I manage my insulin the next time I'm doing that activity. I can make corrections faster. I set alarms on my phone to notify me any time my level goes below 4.0mmol/L or over 7.0mmol/L. (and I can customize this). Now that I can see how certain foods, activities, and moods/feelings impact my blood sugars I have the ability be preventative or fix it faster. This means more time spent in range and consequently a happier me.

How long have you been using CGM?

I used my first CGM in 2013 but I stopped using it because it was not reliable enough for me. Sometimes I would check my sugars and they would be way off from what the CGM was displaying. I lost faith in the integrity of the system and went back to using my glucometer. I began using it again in January 2018 since the new CGM technologies are far more accurate. I've been using them ever since.

What would you say to someone who is considering a CGM?

It's expensive. I had partial coverage from my previous employer but was still paying the majority out-of-pocket. For me it is worth the money. It's been the biggest diabetes confidence booster I've had since getting my first insulin pump. My health is important to me so I adjust my personal budget accordingly.

Advocating may help. If you work for a company that has private insurance but doesn't cover CGM supplies then don't be afraid to reach out to their benefits team and tell them why CGM's should be covered for your dependant(s). I did this with my company in 2017. In 2018 they implemented partial coverage on both the CGM transmitter and sensors all because people living with diabetes were reaching out to their employers and informing them on how CGMs can benefit both the employee and the employer through improved productivity, decreased absenteeism, etc.; It's a win-win.

diabetes.ca

1-800-BANTING (226-8464)

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