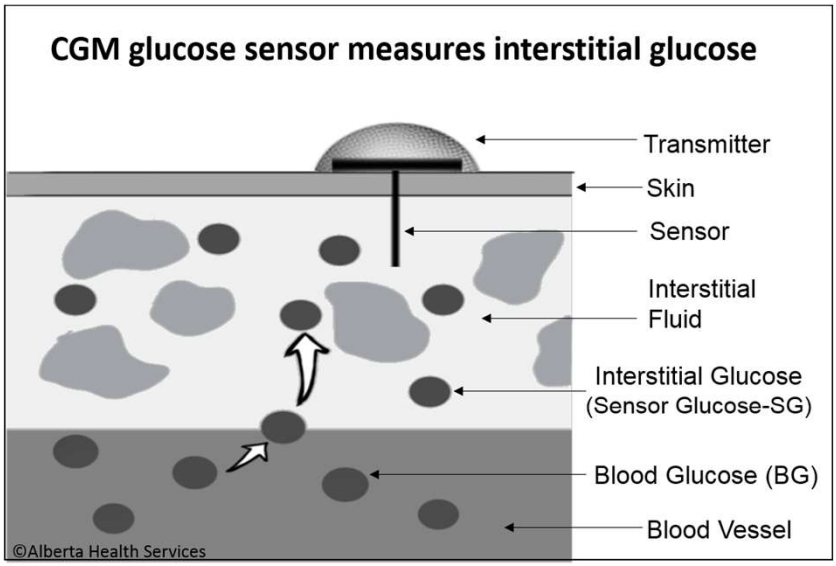
Continuous Glucose Monitoring (CGM): The Basics

Continuous glucose monitoring (CGM) allows you to see glucose readings 24 hours a day while doing few or no finger stick tests. CGM uses a small wearable device to measure interstitial glucose (glucose that has left the blood and moved into the tissues).

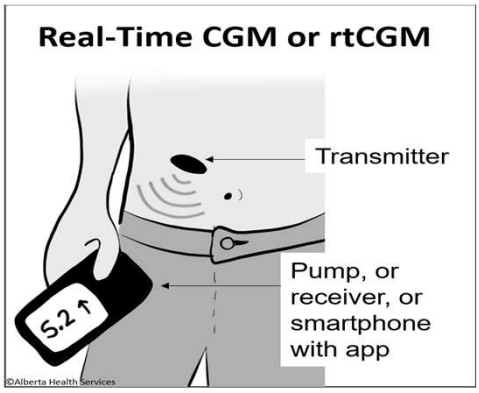
Interstitial glucose readings are slightly "older" than blood glucose readings by a few minutes. This lag can be as longer if blood glucose levels are changing quickly e.g. after eating meals or after treating a low blood sugar.

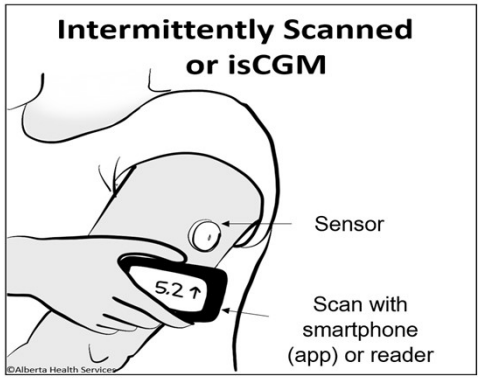
How CGM Works



A glucose sensor (small electrode) is inserted under the skin and measures interstitial glucose every 1-5 minutes. The readings are sent wirelessly to a device, either automatically or by manually scanning the sensor with a reader. There are two major types of CGM.

Types of CGM





All brands require finger testing if symptoms don't match CGM readings. One brand requires finger stick testing twice daily for calibration. Some brands integrate with some insulin pumps.

Most sensors are now **Real-Time CGMs (rtCGM**). They have a transmitter attached to a sensor. The transmitter automatically sends glucose readings every 1 to 5 minutes to an app on a smartphone, a hand-held receiver or an integrated insulin pump. These CGMs can also alarm when glucose levels reach certain limits.

Intermittently Scanned CGMs (isCGM) refer to Abbott's older Libre 1 and Libre 2 (where the app is not updated). The user must scan the sensor with a smartphone (app) or a reader to see the glucose reading.

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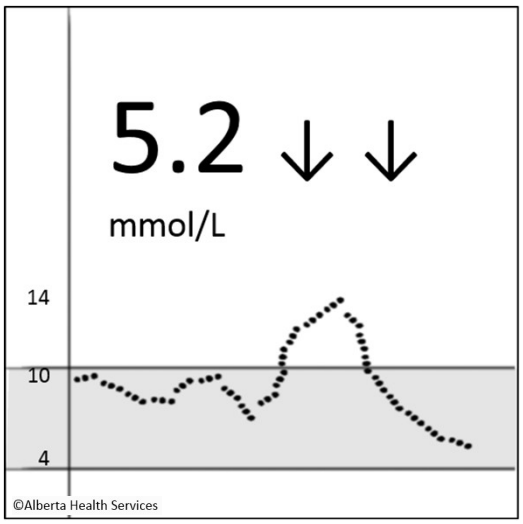
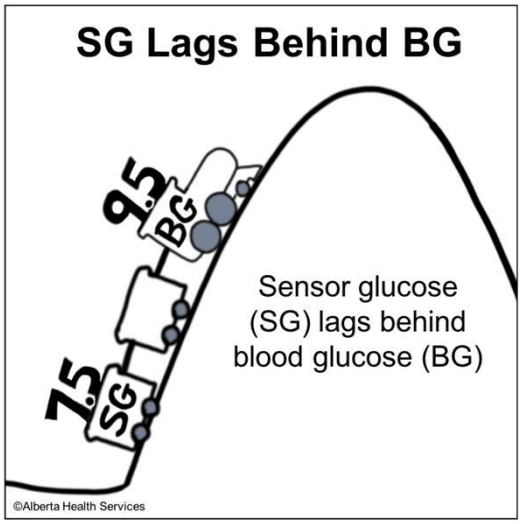
Benefits



- CGM use may help improve glucose levels. It may help you find glucose patterns and make daily management decisions as well as alert you with alarms to readings that are out of target.
- CGM provides more information than finger stick tests. CGM provides a current glucose reading, a graph of previous hours' readings and rate of change (ROC) arrows. A reading of 5.2 mmol/L ↓↓ (dropping quickly) would likely require action to prevent a low, whereas a 5.2 mmol/L → (stable) might not.

Challenges



- Some challenges of CGM include cost, alarm fatigue, feeling overwhelmed by data (this could lead to too many insulin adjustments), unrealistic expectations, skin irritation and still needing finger stick glucose tests for some situations.
- Another challenge is remembering that sensor glucose (SG) readings can lag behind blood glucose (BG) readings at times.

Brands – please contact companies for pricing. Sensor wear length & cost ($80+/-) varies.

1. Abbott's Libre 2 (rtCGM if using 2023 Oct app; isCGM if earlier version) https://myfreestyle.ca. Sensor wear time is 2 weeks. Requires smart phone app (free) or reader. No separate transmitter is required.
2. Dexcom G6 (rtCGM) www.dexcom.com: Sensor wear time is 10 days. G7 has a build in transmitter. G6 has separate transmitter. Requires a smart phone app (free) or stand-alone receiver (separate purchase).
3. Medtronic Guardian Connect (independent sensor) or Guardian Link used in Medtronic Insulin Pumps. Both are (rtCGM) https://www.medtronic.com/ca-en/diabetes/home.html Wear time is 7 days. A separate rechargable transmitter is required. A free smart phone app is required or Medtronic pump.