Continuous Glucose Monitoring

What is Continuous Glucose Monitoring?

Your blood glucose meter measures the level of sugar in your blood whereas continuous glucose monitoring (CGM) is a system that measure sugar levels in the fluid surrounding the cells in your tissue, called interstitial fluid.

Most of the time sugar travels first to your blood and then to your interstitial fluid. Because of this your blood glucose meter readings and CGM sensor readings will rarely be exactly the same, but you can expect them to be close. When sugar levels are rising or falling quickly such as after a meal or after taking insulin, you can expect to see a larger difference between your blood glucose meter reading and your CGM sensor reading. Your blood glucose meter reading measures your blood sugar level at that exact moment in time and you must use this reading in making treatment decisions, not your CGM reading. CGM systems do not eliminate the need for regular blood glucose testing.

Using CGM

A sensor is inserted into the body using an insertion device and is relatively painless. A transmitter is attached to the sensor that sends information wirelessly to a small monitoring device. The monitoring system can be incorporated into some pumps or be a stand-alone device.

Calibration is like buying a watch and setting it for the first time and then checking the time throughout the day to make sure it is right. Calibration is essential for the system to work. To calibrate the CGM system you will need to test your blood glucose using your usual blood glucose meter 2-4 times daily.

Timing of calibration is very important!

On day 1 of a new sensor calibration is needed:

- Approximately 2 hours after connecting your transmitter to the sensor (the system will notify you when this is needed)
- Again **within** 6 hours
- Again **within** 12 hours

After the first day you will need to calibrate 2-4 times daily for optimal sensor accuracy (more than 4 times is not recommended). A minimum of one calibration every 12 hours is needed to receive sensor glucose readings. The best times to calibrate are when your sugar levels are least likely to be changing rapidly such as before meals and before taking insulin, and before bedtime.

CGM sensors can send information to the monitoring device as frequently as every 5 minutes. The CGM sensor is usually in place for 6-7 days before being removed or replaced.

Why is Continuous Glucose Monitoring Helpful?

Testing your blood sugar is useful, but it only gives you a blood sugar reading for that particular moment in time. CGM provides trend information and can tell you if blood sugars are rising or falling at any given time. Blood glucose testing is like trying to watch a movie but only seeing a single picture on the movie screen every time you test; CGM is like being able to watch the entire movie from start to finish.

Benefits of CGM:

1. Helps reduce the frequency and severity of lows by early detection and alerts
2. Helps with spotting trends in blood sugar levels
3. Helps avoid oncoming high or low blood sugar levels
4. Helps reduce your A1C with tighter control without increased risk of lows

Drawbacks to CGM:

1. Can be costly if not covered by your insurance.
2. More invasive than regular blood glucose testing
3. Does not replace regular blood glucose testing because blood glucose is **NOT** the same as sensor glucose
4. Must wear an additional device

Site Selection

Choose a place on your body at least 2 inches from your navel and 2 inches from your pump infusion site or 3 inches from any manual insulin injection site. For best sensor performance, avoid sites where clothing might rub or constrict (eg. beltline), sites where your body naturally bends a great deal, or sites that are scarred, have hardened tissue, lumps, bumps, bruises, tattoos, or stretch marks. Remember to choose a new site each time you wear a new sensor.