

CONTINUOUS GLUCOSE MONITORING

[Home](#) > [Health Hub](#) > [Health Library](#) > [Continuous Glucose Monit...](#)

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What is continuous glucose monitoring (CGM)?

How do these devices work?

Are the CGM devices easy to use?

Can I give up fingerstick monitoring?

What are the advantages of using a CGM device?

What's the best way to use CGM devices?



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Continuous Glucose Monitoring

What is continuous glucose monitoring (CGM)?

Continuous glucose monitoring is a way of determining information about a diabetic patient's shifting blood glucose levels at any time - day or night - automatically.

How do these devices work?

With currently used CGM devices, small glucose sensors (i.e., electrodes) are injected just under your skin (usually into the abdominal wall or arm). The insertion is quick, just like a shot, and is not painful. The sensor is held in place with adhesive tape. The sensor measures changes in glucose levels in the body's fluid (interstitial fluid) around the sensor and sends the information to the pager-sized device called a monitor attached to a belt or the waistline of your pants. The CGM device automatically records glucose measurements continuously around the clock, displaying the results on a monitor every few minutes. Each sensor must be changed every few days, according to each device manufacturer's recommendations.

Are the CGM devices easy to use?

The CGM devices are complex little machines. They do require some upfront time to understand their technical aspects. For example, you will need to learn how to insert the sensor properly, how to calibrate the device with fingerstick blood glucose readings, how to set device alarms (for those devices that come with them), how to transfer monitoring data to a computer (for long-term analysis), and how to respond to and make changes to your care plan based on the collected data.

Can I give up fingerstick monitoring?

Absolutely not. You still need to do fingerstick monitoring to:

- Calibrate your CGM device.
- Check your blood glucose before making any changes in your care - including:
 1. Taking a corrective dose of insulin for high blood glucose.
 2. Checking your blood glucose level before driving or doing any activity that could be considered dangerous if you had low blood glucose levels or symptoms of low blood glucose levels.

What are the advantages of using a CGM device?

The biggest advantage of CGM devices is that they provide information on what is happening to your blood glucose level every few minutes. The newest devices display glucose readings on a screen so you can see – in real time - whether glucose levels are rising or falling. Some systems also contain an alarm to let you know when your glucose reaches high or low levels. Some devices are able to display graphs revealing glucose levels collected over a certain number of hours on its display screen. The data collected on all devices can be uploaded to a computer for graphing and further important trend analysis.

What's the best way to use CGM devices?

CGM devices can offer information that can be used immediately, over the short term, or over a longer period of time.

How To Use The Information Immediately

The device reports your blood glucose levels every few minutes so you can track not only where blood glucose level is but also which direction it is heading. Based on the trend – i.,e., whether the glucose is rising or falling – you may decide to respond differently to the same number. Being able to see trends in your glucose levels may allow you to take preventive actions before glucose levels become problematic.

How To Use The Information Over The Short-Term

The device can assist in helping you decide when, and possibly what, triggered an episode of an “intermediate” problem - such as hypoglycemia - to develop. Data analysis can help you determine how well you responded to the problem and may give you some insight on how to prevent the problem from happening again.

How To Use The Information Over The Long-Term

The device can assist in analyzing blood glucose information overnight, over a portion of a day, or over several days to see the bigger management picture. Depending on the CGM device being used, you may be able to display trends on the monitor itself or you may need to

download the information onto a computer.

You may begin to ask yourself why certain time periods or certain days look different from others. Questions begin to emerge. What typically happens after meals? Does it depend on the type of foods eaten, time of day, and timing of insulin dose? When does hypoglycemia happen? What effect does exercise, school, work, or dining out have on glucose levels? The trends noted with CGM device tracking data plus detailed written records of your daily routines should be evaluated together by you and your diabetes care provider at your next appointment. Together you can decide what changes you may need to make to keep blood glucose levels in the target range plus any other changes you can make to improve your diabetes care.

What are the disadvantages of the CGM devices?

- Not all insurance providers cover the CGM devices but more and more of them are. You will need to check with your insurance provider to determine the extent that your device and supplies might be covered. Keep in mind that the sensors must be replaced every couple of days and monitors have a lifetime ranging from 6 months to around 2 years, depending on the manufacturer.
- The need for traditional fingerstick blood glucose measuring is not eliminated. This is still needed for device calibration and to confirm hypo- or hyperglycemia before taking corrective action.
- Discussion continues to be raised over the “lag time” of between 5 and 20 minutes reported by the various CGM devices because the blood glucose reading is taken from interstitial fluid and does not reflect actual blood sugar concentration that is found in standard fingerstick blood samples drawn from capillary blood. Trend is the keyword to keep in mind about the advantage of the CGM devices. Lag time is insignificant when blood glucose levels are relatively consistent – and this can be seen on the CGM monitor. However, if the CGM monitor shows that the blood glucose level has been dropping over a short period of time, a fingerstick test is advised to check for hypoglycemia, for example.

Final word on CGM devices

The cost of these devices is not inexpensive. They may or may not be covered by your insurance provider. They require time and patience to understand their technical aspects and need to be viewed as a management tool to assist you with your care. These devices help you keep a closer eye on glucose trends instead of individual glucose numbers, with the goal of preventing problems or certainly catching them early on.

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