

Continuous Glucose Monitors



What is CGM?

- Continuous Glucose Monitoring systems use a tiny sensor inserted under the skin to check glucose levels in tissue fluid.
- Sensor replaced every 7-10 days
- A reusable transmitter sends information about glucose levels via radio waves from the sensor to a wireless device
- The information may go to a phone, receiver or insulin pump

How CGM works

- A tiny electrode (sensor) is inserted just under the skin
 - Sensor is replaced every 7-10 days
- A reusable transmitter is attached to the sensor
 - Transmitter is reused and replaced when needed
- Sensor continually measures glucose levels in the interstitial fluid (IF)
 - There is a lag time between when glucose hits blood and the fluid
- Transmitter locks into the sensor
 - Sends data via blue tooth to a receiver or smart device
 - Sensor glucose reading is shown on a screen
 - Includes directional arrows and a graph

Parts of CGM

1. Sensor



2. Transmitter



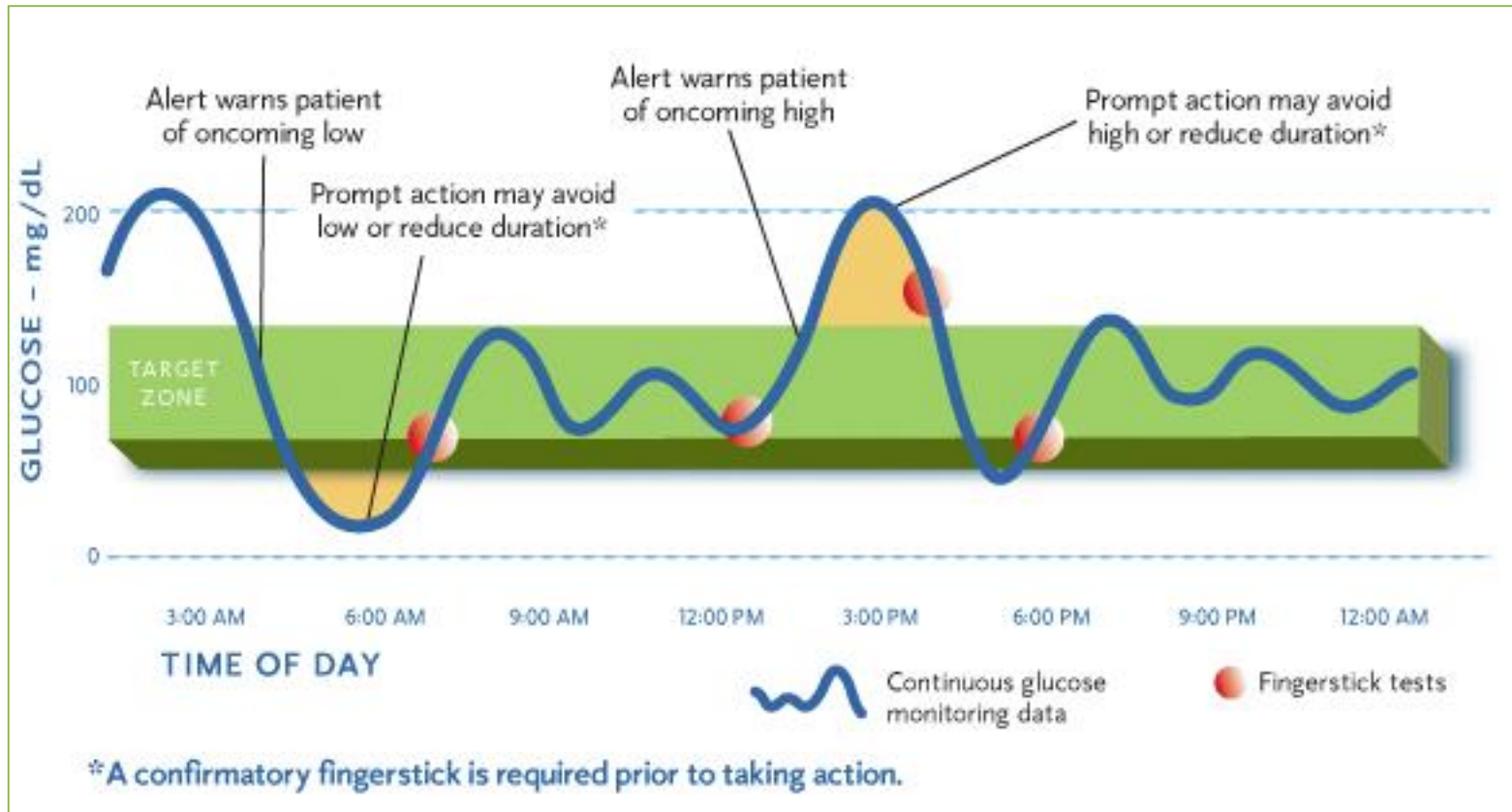
3. Receiver



Advantages

- Can provide real time glucose information every 5 minutes
 - Up to 288 readings in a 24 hour period
- Shows where glucose is
 - Current number on machine
- Shows where glucose was
 - Trend graph
- Predicts where glucose is going
 - Rate of change arrows
- Certain devices are FDA approved to use for dosing
- Remote monitoring
- Multiple alarm settings
- Reduced or eliminates finger-sticks

Blood Glucose Data Vs. CGM Data



Dexcom



Available Models: G5, G6

Similarities:

- Remote Monitoring-If the student has a blue-tooth enabled device near them, the results can be remotely monitored.
- Set high and low alarms
- Shows glucose trending arrows
- Updates glucose reading every five minutes
- May be covered by state health insurance

Dexcom Comparison

Dexcom G5	Dexcom G6
<ul style="list-style-type: none">-CAN NOT be used to dose from unless you are sure it is being calibrated twice per day.-Requires Calibrations-Can NOT be used with acetaminophen -Larger size-Set high and low alarm-7-day wear	<ul style="list-style-type: none">-CAN be used to determine insulin dose-Does not require calibrations-CAN be used with acetaminophen -Smaller size-Predictive low alarm in addition to high and low alarms-10-day wear

Libre Flash

- Quarter-sized sensor that will give glucose value when the reader is swiped over the top.
- Shows trending arrows
- CAN be used to determine dosing
- Not covered by state health insurance
- Can be used with phone app for sensor glucose readings



Medtronic Pump

- Enlite or Guarian 3 Sensors used with Medtronic pumps
- NOT used for dosing
- Shows trending arrows
- Set high and low alarms



Trend Arrows

Trend Arrows show the direction and speed of glucose change and can only be seen with CGM. Catch highs and lows before they happen.



Constant

0-30 mg/dL up or
down in ½ hour



Slowly Rising

30-60 mg/dL
up in ½ hour



Rising

60-90 mg/dL
up in ½ hour



Rapidly Rising

90 or more mg/dL
up in ½ hour



Slowly Falling

30-60 mg/dL down
in ½ hour



Falling

60-90 mg/dL
down in ½ hour



Rapidly Falling

90 or more mg/dL
down in ½ hour

CGM Accuracy

MARD: Mean Absolute Relative Difference between the blood glucose monitoring system value and the lab reference value. (The lower the better)

- The glucometer and CGM can have different values and still fall within a range that is considered accurate

CGMs	MARD
Dexcom	9%
Libre	11.4%

Most Glucometers are around 15%

CHW Recommendations for Use in School Setting

- The student may need to have cell phone with them or use school Wi-Fi to transmit data to remote receivers during the school day.
- Constant monitoring by school personnel is not expected, priority should be given to low and high alerts.
- High alerts may occur after eating and will not always need to be treated. There must be two hours between insulin doses.
- Blood glucose should be checked with finger poke if symptoms don't match the sensor glucose reading or if the trending arrows are double arrows up.