
Safe at School[®]: Dosing From Continuous Glucose Monitoring Data

Case: John was recently prescribed a continuous glucose monitor (CGM) to help manage his type 1 diabetes. He just started a new school year, and his school nurse is questioning whether the CGM is accurate and can be used for dosing. John's **Diabetes Medical Management Plan (DMMP)** says that his insulin can be dosed off the CGM sensor reading. However, she has noticed discrepancies between his CGM and blood glucose meter readings.

Discussion:

- There are multiple types of CGMs currently on the market for children with type 1 diabetes. These are increasingly becoming the standard of care, with over 50% of children with type 1 diabetes using them in the United States.
- The Abbott FreeStyle Libre (generations 2 and 3) and Dexcom G6 (G7 is expected in early 2023) are both approved by the Food and Drug Administration (FDA) for dosing decisions, as they meet rigorous special controls determined by the FDA for integrated CGM. The Medtronic Guardian 3 system is not yet approved for dosing decisions.
- CGMs are reliable and the readings are valid. In observational studies, these sensors demonstrate a high degree of accuracy in comparison to the gold standard of matched venous blood glucose (blood sugar) measurements, with 91.6–95.3% of CGM readings within 20% of agreement with venous glucoses—depending on the system. This is comparable to the accuracy of most commercially available blood glucose meters. Keep in mind that blood glucose meter readings can also be slightly different than actual blood glucose levels!
- If you were to check a blood glucose meter and a CGM sensor reading simultaneous, they may not correlate perfectly. The sensor measures glucose concentrations in the interstitial fluid and converts that information to an estimated blood glucose. As the CGM is not measuring blood glucose levels directly, the CGM readings may lag blood glucose readings by 10–15 minutes. If blood glucose levels are changing rapidly, you are more likely to see a discrepancy between the two.
- In general, it is recommended to use a consistent method for dosing, whether it be a blood glucose meter or CGM, based on the recommendations in the student's DMMP.
- Though you do not need to routinely compare the sensor reading to a blood glucose meter reading, there are certain times that a meter glucose should be checked:
 - At glucose extremes (hypoglycemia <70 mg/dL, hyperglycemia >250 mg/dL)
 - If a child has symptoms of hypoglycemia or hyperglycemia which do not match the CGM reading

For additional information, please see the **Safe at School: Guidelines for Continuous Glucose Monitoring** guidance document.