

Continuous Glucose Monitors

Guidelines for the use of Continuous Glucose Monitors (CGM) and Other Sensors in the School Setting

The purpose of this guidance document is to provide general information about continuous glucose monitor (CGM) and glucose sensor use in the school setting. Specific questions unique to individual students should be directed to the student's diabetes provider. This document will be updated as new devices are approved by the US Food and Drug Administration (FDA), so we encourage you to check back.

The use of CGMs and glucose sensors by students with type 1 diabetes (T1D) has increased dramatically over the past three years. According to data from a large T1D clinic registry, approximately 50% of children with T1D under the age of 18 have adopted this technology, and these numbers continue to rise as the technology becomes more accessible, easier to use, and further reduces disease burden¹.

The use of a CGM or glucose sensor provides valuable information about glucose levels for the student, parent/guardian, school team (e.g., school nurse), and diabetes provider. CGM devices, for example, update glucose data every 5 minutes, providing up to 288 readings per day. In addition, CGMs have trend arrows that, in combination with the current glucose level, allow the user to know what the current blood glucose level is, where it is going, and how fast it is changing. Of note, the REPLACE-BG study demonstrated the safety of direct dosing from CGM data without confirmatory fingersticks².



A summary of benefits:

- 1. Immediate access to glucose levels.** CGM devices continuously provide updated glucose data every 5 minutes. **Personalized alerts** are also displayed on the device to prompt an immediate response when the student's glucose level is above or below the prescribed target.
- 2. Trend arrows** that predict a rise or fall in the student's glucose level, and the speed it is increasing or decreasing. Newer devices can predict hypoglycemia and provide alerts to avert it.
- 3. Insight into cause and effect**, and the ability to see how different foods, activities, stress, and other factors may affect glucose levels.
- 4. Retrospective data review**, in which patterns can be identified to inform changes to the student's insulin regimen or behavior (e.g., indication for before meal versus post meal insulin dosing vs. indication that the prescribed amount of insulin is not being administered).
- 5. Remote** monitoring of the student's glucose to minimize the frequency of unnecessary educational disruptions. For more information, see Additional Considerations—Data-Sharing below.

Continuous Glucose Monitors (continued)

CGM/Sensor use in the school setting Highlights and general guidelines:

Dexcom G5 Continuous Glucose Monitor

- Approved by the FDA for non-adjunctive insulin dosing (treatment decisions) if blood glucose levels are between 80-250 mg/dL.³⁻⁵
- Must be calibrated twice daily when blood glucose is stable. Calibration at home is recommended.
- If sensor display does not show trend arrows, the CGM may be malfunctioning and should not be used for dosing. A fingerstick should be done in order to dose.
- Acetaminophen (Tylenol) may falsely elevate CGM values and the CGM data should not be used within 4-8 hours of acetaminophen administration.⁶

Dexcom G6 Continuous Glucose Monitor

- Approved by the FDA for non-adjunctive insulin dosing (treatment decisions) if blood glucose levels are between 80-250 mg/dL.³⁻⁵
- Calibrations are **NOT** required
- Must check blood glucose via fingerstick if symptoms do not match sensor readings
- If the CGM is reading “LO” or “HI,” check blood glucose with fingerstick
- If sensor display does not show trend arrows, the CGM may be malfunctioning and should not be used for dosing. A fingerstick should be done in order to dose.
- Acetaminophen does **NOT** affect the DEXCOM G6.⁶

Abbott Libre Flash Glucose Monitoring System

- User must use a device to scan sensor at least 3 times per day to obtain glucose data.
- Glucose readings are visible on the meter display only AFTER the user scans the sensor with the actual meter.

Medtronic Guardian Connect CGM System

- The Medtronic Guardian™ Sensor 3 (age 2 and up) or Enlite Sensor (age 7 and up) can only be used in conjunction with the Medtronic 640G or 670G insulin pump systems. It is **NOT** approved by the FDA for non-adjunctive insulin dosing (treatment decisions).

General guidelines:

ALWAYS consult the student’s Diabetes Medical Management Plan (DMMP) before using CGM or sensor data to make treatment decisions.

Even if a student is using a device that has been approved by the FDA for treatment decisions, the student may not have permission from his/her diabetes provider (e.g., physician, nurse practitioner, or physician/medical assistant) who prescribed it to do so. Ultimately, the diabetes provider assumes responsibility for determining the student’s readiness to use a particular device for the purpose of making dosing decisions in the school setting. The appropriateness for using a CGM or sensor to make treatment decisions must be confirmed in the DMMP or updated school orders.

Continuous Glucose Monitors (continued)

Additional Considerations:

Data-Sharing

Students who use the Dexcom G5 or G6 CGMs have the option to pair their smart device with the CGM. This allows the student to receive glucose data on their device via Bluetooth. In addition to convenience, this gives the student the ability to share their glucose data with up to five followers, who might include the school nurse and parent/guardian. The student's CGM data is shared via app on a smartphone or tablet using a wireless network or cellular data. Students using the data sharing feature of their CGM devices may request access to the school's wireless network to enable this feature while avoiding smart device data charges.

The utility and need for remote monitoring should be individualized for each student based upon age and unique needs. Remote monitoring of CGM data in the school setting by staff is usually not required as the child is supervised by trained staff and CGM alarms are used to identify glucose levels requiring action. However, in certain cases (e.g. preschool age, non-verbal, impaired cognition) closer monitoring, including remote monitoring, may be appropriate. The school nurse and 504 team should discuss each student's needs and determine if remote monitoring is necessary based on the DMMP/school orders.

Parent/guardian considerations:

- Please discuss data sharing with your designated school team members such as the school nurse and other

officials—preferably those who participate in the development of your child's 504 plan—to negotiate expectations on behalf of both your family and the school team to develop a plan for communication. Information from your child's DMMP or updated school orders will serve as a guide during this discussion because it includes recommendations for your child's diabetes management at school directly from your child's diabetes care team.

- If possible, have this discussion with your child's educational team prior to the start of school.
- Keep in mind that the school team members, including school nurses and school staff, who are trained to care for students with diabetes, aim to provide support that will promote the student's safety. While it will be difficult for them to respond to all trend arrows and reply to frequent parental phone calls, it is important to keep this shared goal—your child's safety—in mind. Developing a collaborative relationship between the parent/guardian, healthcare provider, and school staff is key.

Hypoglycemia (low blood glucose)

- The DMMP will specify CGM alert levels for each student.
- To reiterate: **For all CGM users, if the student exhibits symptoms of hypoglycemia, and a glucometer is not readily available for confirmation of the glucose level, the priority should be to treat the low glucose level per the DMMP.**

Continuous Glucose Monitors (continued)

- If CGM or sensor use and/or data-sharing is disrupted due to device malfunction, Bluetooth glitch, or other interruptions, the student's DMMP should be referenced to ensure that appropriate diabetes management continues.

Hyperglycemia (high blood glucose) and Ketones:

- If the CGM glucose reading is >250 mg/dL, check the student's blood glucose with a fingerstick. Provide correction insulin based on the fingerstick blood glucose level as per the DMMP.
- It is essential to check for serum or urine ketones if:
 - CGM reading is >300 mg/dL two times in a row for students who use multiple daily injections or MDI
 - CGM reading is >300 mg/dL one time for students on insulin pump therapy.
- If ketones are present, give the student correction insulin by injection (even if the student uses an insulin pump) and alert the student's family. ⁶

Use of Trend Arrows

The use of trend arrows and other advanced CGM features like predictive low glucose alerts should be clearly enumerated in the DMMP.

Other concerns

- If a CGM or sensor falls off at school, the school nurse should help the student place all pieces into a sealable plastic bag to be sent home with the student. No portion of the

CGM should be discarded while at school.

- Until the sensor is replaced, the child should be monitored by fingerstick with a glucometer.
- It is suggested that the sensor be replaced by the family at home.
- Please note that students who have been approved to self-manage their diabetes at school may reinsert the sensor while at school. The student's DMMP should be referenced to confirm that this is appropriate for the student.

References

1. Foster, N. C., Beck, R. W., Miller, K. M., Clements, M. A., Rickels, M. R., DiMeglio, L. A., . . . Garg, S. K. (2019). State of type 1 diabetes management and outcomes from the T1D Exchange in 2016-2018..
2. Aleppo G, Ruedy, KJ, Riddlesworth, TD et. al. REPLACE-BG: A Randomized Trial Comparing Continuous Glucose Monitoring With and Without Routine Blood Glucose Monitoring in Adults With Well-Controlled Type 1 Diabetes. *Diabetes Care*. 2017; 40(4): 538-45.
3. Forlenza GP, Argento NB, Laffel LM. Practical Considerations on the Use of Continuous Glucose Monitoring in Pediatrics and Older Adults and Nonadjunctive Use. *Diabetes Technol Ther*. 2017;19(S3):S13-s20.
4. Shah VN, Laffel LM, Wadwa RP, Garg SK. Performance of a Factory-Calibrated Real-Time Continuous Glucose Monitoring System Utilizing an Automated Sensor Applicator. *Diabetes Technol Ther*. 2018;20(6):428-33.
5. Wadwa RP, Laffel LM, Shah VN, Garg SK. Accuracy of a Factory-Calibrated, Real-Time Continuous Glucose Monitoring System During 10 Days of Use in Youth and Adults with Diabetes. *Diabetes Technol Ther*. 2018;20(6):395-402.
6. Collaborative Guidelines for DEXCOM G5 and G6: Therapeutic Dosing in the School Setting. Colorado Kids with Diabetes Care and Prevention Collaborative (8.19)

<http://www.coloradokidswithdiabetes.org/wp-content/uploads/2019/08/Collaborative-Guidelines-for-Dexcom-G5-G6-Aug-4-2019.pdf>
Be sure to check out additional Safe at School training resources and tools