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Safe at School®: Guidelines for the Use of Continuous Glucose

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

The use of CGMs by students with type 1 diabetes has increased dramatically over several years. According to data from a large type 1 diabetes registry, over 50% of children with type 1 diabetes 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 burden.[1]

The use of a CGM provides valuable information about glucose levels for the student, parent/ guardian, school team (e.g., school nurse), and diabetes care provider. For example, CGMs update glucose data every one to five minutes, depending on the system. In addition, CGMs have trend arrows that, in combination with the current glucose level, allow the user to know how glucose levels are changing. Of note, the REPLACE-BG study demonstrated the safety of direct dosing from CGM data without confirmatory fingersticks.[2] However, a blood glucose meter may be needed if hypoglycemia (low blood glucose) or hyperglycemia (high blood glucose) is noted on the CGM or if the child has symptoms which do not match the CGM reading.

A Summary of Benefits:

1. **Immediate access to glucose levels.** CGMs continuously provide updated glucose data. **Personalized alerts** are displayed on ` the device (e.g., receiver, pump, or phone) to prompt an immediate response when the student's glucose level is above or below the prescribed target.

2. **Trend arrows** that demonstrate the direction and speed of the change in a student's glucose and in some cases the ability to predict hypoglycemia so actions can be taken 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** of glucose trends which can inform changes to the student's insulin regimen or behavior.

5. **Remote monitoring** and/or alarm notifications of the student's glucose, giving the opportunity to address high or low blood glucose levels and hopefully minimize the frequency of unnecessary educational disruptions. For more information, see Additional Considerations—Data-Sharing, below.

6. **Pairing** between certain CGMs and insulin pumps in a hybrid closed loop with automatic insulin adjustments based on CGM readings.

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Types of CGMs:

Dexcom G6 CGM

- Provides readings every five minutes
- Transmitter is not disposable
- Sensor lasts for 10 days
- Two-hour warm-up period after placement
- Compatible with a reader, selected pumps (Tandem t:slim X2 with Control IQ or Basal IQ and Omnipod 5), and smart devices (e.g., phone, watch, tablet)
- Approved for insulin dosing

Abbott FreeStyle Libre 2 and Libre 3 CGM

- Provides readings every minute
- Sensor/transmitter is disposable
- Sensor lasts for 14 days
- One-hour warm-up period after placement
- Compatible with reader (Libre 2) and smart phones (Libre 2 or 3)
- Approved for insulin dosing
- Readings may be falsely raised by vitamin C or lowered by salicylic acid

Medtronic Guardian 3 CGM System

- Provides readings every five minutes
- Transmitter is rechargeable and not disposable
- Sensor lasts for seven days
- Requires calibration at minimum twice a day
- Compatible with smart phones and certain pumps (Medtronic MiniMed 600 and 700 series)
- A blood glucose meter must be used to make insulin dose decisions
- Acetaminophen may falsely elevate glucose readings

General Guidelines:

Always consult the student's Diabetes Medical Management Plan (DMMP) before using CGM 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 their diabetes care provider (e.g., physician, nurse practitioner, or physician assistant) who prescribed it to do so.

Ultimately, the diabetes care 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 to make treatment decisions must be confirmed in the DMMP or updated school orders.

Current CGMs on the market are accurate and readings should not be directly compared to glucometer readings unless instructed to do so in the student's DMMP.

The CGM consists of a thin, flexible sensor that sits in the skin, a transmitter that is affixed to that sensor and a receiver, or another device which displays the glucose reading. 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 behind blood glucose readings by 5 to 15 minutes depending upon the device. As a result, there can be discrepancies (generally proportional to the glucose level) compared with a blood

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glucose meter. In particular, this is expected if the glucose level is changing rapidly. The most recent data indicates that CGMs are highly accurate—comparable to most glucometers.

Additional Considerations:

Data-Sharing

Data-sharing is possible when a student uses a smart device to view their CGM tracing and glucose data via Bluetooth. In addition to convenience, this gives the student the ability to share their glucose data with multiple followers, who might include the school nurse and their parent/guardian. The student's CGM data is shared via an app on a smartphone or tablet using a wireless network or cellular data. Students using the data-sharing feature of their CGMs may request access to the school's wireless network to enable this feature while avoiding smart device data charges.

The utility and need for school nurses to remotely monitor should be individualized for each student based on their age and unique needs. Remote monitoring of CGM data in the school setting by staff is usually not required as the child is supervised at regular intervals and CGM alarms can identify glucose levels requiring action. However, in certain cases (e.g., preschool age, non-verbal, impaired cognition), 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.

The school nurse must consider their capacity to provide remote monitoring, including the number of students and schools they are responsible for, the number of students in their schools with type 1 diabetes who do or do not use CGM, school district policies and ability to provide equipment, and other day-to-day responsibilities.

For school nurses who do plan to remotely monitor a student's CGM, we recommend the following:

- The school/school district should provide a device (e.g., tablet) to link to the CGM sharing app for the child's system.
- The school district should establish clear expectations with parents for the school nurse's ability to monitor the CGM in real time in relation to their other responsibilities. Specifically, outlining the frequency of monitoring, limiting monitoring to school hours, and delineating actions/communication to be taken in response to glucose trends.
- School nurse monitoring of the CGM should not supersede existing strategies to identify and manage hypoglycemia as outlined in the student's DMMP.

Parent/Guardian Considerations:

Please discuss data-sharing with your designated school team members, including the school nurse and/or other trained staff (preferably those who participate in the development of your child's 504 plan). You should review expectations for communication between the school team, yourself, and your child's health care provider. Information from your child's DMMP or updated school orders will guide this discussion as it prescribes the plan for your child's type 1 diabetes management at school directly from your child's medical 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

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are trained to care for students with diabetes, aim to provide support that will promote the student's safety and facilitate learning. 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, diabetes care provider, and school staff is key.

Hypoglycemia (Low Blood Glucose)

The DMMP will specify CGM alert levels for each student.

- Check with a blood glucose meter (finger stick) if hypoglycemia is noted on the CGM. Also check with a blood glucose meter if the child has symptoms which do not match the CGM reading.
- Following treatment for low glucose, due to sensor lag times and rapidly changing glucose levels, the improvement in glucose levels may not yet be visible by CGM. To avoid over-treating lows, use a fingerstick reading before treating a second time if the sensor reading continues to appear low.
- **For all CGM users**, if the student exhibits symptoms of hypoglycemia and a blood glucose meter is not readily available for confirmation of the glucose level, the priority should be to treat the low glucose level per the DMMP.
- If CGM 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:

- The student's DMMP will indicate a threshold high sensor reading at which point you should check the student's blood glucose with a meter and check for urine ketones.
- Provide correction insulin based on the fingerstick blood glucose level as per the DMMP.
- The student may require additional insulin if ketones are present.
- If ketones are present in a student who uses an insulin pump, give the correction insulin by injection only and alert the student's family.[6] Ketones may be an indication of a pump site issue.

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.

For some children with type 1 diabetes, their management plan may include dose adjustments based on trend arrows at routine dosing times. Frequent interventions based on the CGM data/trend arrows are not considered best practice and it may impact learning and the student's stress level. Concerns related to this should be discussed with the child's diabetes care provider.

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Other Concerns:

- If a CGM 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 blood glucose meter.
- It is recommended that the sensor be replaced by the student's family at home.
- Please note that students who have been approved to self-manage their diabetes at school may be permitted to reinsert the sensor while at school. The student's DMMP should be referenced to confirm that this is appropriate for the student.
- Confirm that appropriate diabetes care supplies are available and schedule routine inventory of the supplies. Maintain inventory to ensure that supplies have not expired (e.g., test strips).

Be sure to check out additional **Safe at School®** training resources and tools at **diabetes.org/safeatschool**

Thank you to the ADA's Safe at School Working Group members for their contributions to this guidance.

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