# Recommendations for Use of Continuous Glucose Monitors in the School Setting

## What is a Continuous Glucose Monitor?

CGMs consist of three parts: 1) a sensor that is inserted under the skin and remains in place for 6-7 days; 2) a transmitter that is attached to the sensor that records and transmits glucose data continuously; and 3) a receiver that provides a visual display of the student's real-time glucose data. The CGM records glucose levels at five-minute intervals, and these data can be viewed on the receiver. There are several devices that can be used as the receiver, depending on the type and model of the CGM. These include a CGM manufacturer-issued display device that can be carried by the student; an insulin pump worn by the student; and/or a smart device (current supported devices are iPhone, iPad, or iPod) that has wireless connectivity or an active data plan. If the student is using a smart device as the receiver, currently the glucose data can be shared with up to 5 mobile devices if the student's iDevice has wi-fi/cellular connectivity. The number of students with type 1 diabetes using continuous glucose monitors (CGM) to monitor "real-time" glucose levels is on the rise. Many students are sharing data real time with parent(s)/guardian(s) and in some cases, a school nurse or designee.

In addition to showing real-time glucose levels, CGMs are used to identify trends in glucose levels (i.e. if glucose levels are steady, or if they are rising or falling rapidly). CGMs measure interstitial glucose (glucose in the fluid that surrounds the cells), not plasma glucose (found in the blood vessels and capillaries). While glucose values in the two fluids correlate well, interstitial glucose levels reported by the CGM tend to lag behind plasma glucose levels measured by blood glucose meters. By way of example, the CGM may report an interstitial glucose level of 80 mg/dL, while the meter may simultaneously report a plasma glucose level of 66 mg/dL and the student may feel symptoms of hypoglycemia. Blood glucose levels obtained using the student's blood glucose meter should be used to calculate correction doses to treat hyperglycemia and to confirm and treat hypoglycemia when it is identified by the CGM. CGMs must be calibrated using plasma glucose data, in most cases twice daily. It is recommended that the same blood glucose meter be used at all times to calibrate the CGM.

CGMs can contribute to improved glycemic control and patient and caregiver reported quality of life (Pickup et al, 2015). For pediatric users, CGMs have been shown to contribute to improved glycemic control when the device is used a minimum of 6 days a week (The Juvenile Diabetes Research Foundation Continuous Glucose Monitoring Study Group, 2008). CGM contributes to earlier identification of low glucose in users who cannot recognize or communicate that they are experiencing low glucose (Fonseca et al., 2016). Finally, CGMs have been reported to provide peace of mind for parent caregivers who are concerned that hypoglycemia may go undetected overnight, when the child is alone, or when the child is not being watched carefully, such as on a school playground or in a public swimming pool (Barnard et al., 2014). CGMs can also be helpful in identifying missed insulin doses, particularly in the adolescent population, because a trending post-meal high glucose level may be detected earlier with CGM use than when using only a blood glucose meter. The American Diabetes Association recommends that diabetes education, training on the device, and ongoing support should be provided when a CGM is prescribed to optimize its benefits (ADA, 2016).

## CGM Alarms and How to Respond

CGMs have customizable alarms that are used to alert the user when glucose levels are above or below a pre-programmed target range. Additional alarms can be enabled that sound when glucose levels are rising or falling rapidly. While all care should be individualized to the student, it is recommended that the minimum number of alarms should be enabled to keep the student safe in the school setting, and delegated school staff should be prepared to respond to low and high BG alarms rather than trends/trend arrows.

Since hypoglycemia is an acute risk, CGM alarms for hypoglycemia will usually be set as audible alarms. For most students using CGMs, the recommended low alert is 80 mg/dL. High alerts should be determined by the student's diabetes care team and prescribed in the DMMP; however, to minimize disruptions to the learning environment and limit the attention drawn to the student by the device, we recommend that the high alert be set to vibrate if the student's receiver is capable of multiple alarm settings. Other alarms should only be enabled under specific circumstances (e.g., inability to recognize hypoglycemia) and should be specified in the student's Diabetes Medical Management Plan (DMMP). Again, alarms should be used conservatively to avoid unnecessary disruption of the student's school activities.

School personnel should be prepared to respond to CGM alarms. If the CGM alarms due to glucose levels that are above or below the target range specified in the student's DMMP, a plasma glucose level should be obtained by meter to confirm the CGM data, followed by the treatment instructions in the DMMP. As noted above, CGM data should not be used to make treatment decisions. Students who have been identified as capable of managing diabetes independently may choose to respond to alarms and provide treatment without assistance. Younger students who cannot self-manage independently will require help responding appropriately to CGM alarms. All students, regardless of level of independence, may require assistance when they experience severe hypoglycemia

## Special Considerations

## Data Sharing

The option to share CGM data via smart device was approved by the FDA in 2015. Since that time, adoption of CGM technology has increased rapidly, particularly in the pediatric population. Students and their parents may request to share CGM data with their parent/guardian, school nurse or school staff member, or their diabetes care provider. The following considerations should be taken into account when data-sharing is requested by a student and his parent(s)/caregiver(s).

- **Access to CGM receiver:** The student should have access to his or her CGM receiver at all times. As described above, CGM data may be transmitted to the student's insulin pump, a smart device, or CGM manufacturer-issued display device. The student should be allowed to charge the receiver during school hours as necessary.
- **Access to school wireless network:** While some students may have a smart device with a cellular data plan, others will depend on access to the school's wireless network to enable sharing capabilities.
- **Data sharing with school staff:** The student, parents/guardian, and school nurse should discuss data sharing options. Many school nurses find it helpful to be able to monitor students with type 1 diabetes in real time using share technology. If this is agreed upon, an appropriate smart device is needed for remote monitoring purposes.
- **Data sharing with parents or off-site caregivers:** Students with a device that is capable of sharing data real-time will be able to share data with parent(s)/caregiver(s) remotely. As students will be able to receive text messages and advice from off-site parents, the role of parent(s)/guardian(s) in "real-time" diabetes management while in school should be specified in the student's 504 Plan. Although parents have the potential to provide diabetes management advice during the school day, this does not absolve the school of its responsibility to provide diabetes care for the child with diabetes under federal and state

law. More information about the rights of children with diabetes may be accessed by going to www.diabetes.org/safeatschool.

## Calibration

CGMs require calibration at least twice daily with the same blood glucose meter. CGMs should be calibrated at home in the morning before school and in the evening before bedtime. If the student is attending a school-related event at a time when calibration is required, such as an overnight field trip, special provisions should be made. Students who are managing their diabetes independently can take care of calibrations on their own, but some students may require assistance. If this is the case, training should be provided to school personnel.

## Sensor replacement at school.

If the CGM sensor/transmitter pod falls off at school, all parts should be collected and stored in a safe place and sent home with the student. No part of the CGM should be discarded. Sensor replacement requires training and should be performed at home. Blood glucose levels should continue to be monitored with a blood glucose meter in accordance with the student's DMMP.

## Training for school personnel

The school nurse or designee should be familiar with the CGM components, acquire basic troubleshooting skills, and know how to respond to alarms. Other school staff who have responsibility for the child in the school setting should be aware that the child is using a CGM and be trained to respond appropriately to CGM alarms. Training resources are available at www.diabetes.org/safeatschool.

## 504 Plan/Individualized Education Program (IEP).

If CGM use is specified in the DMMP, accommodations for CGM use should be incorporated into the student's 504 Plan or IEP. Specific considerations should include a plan for response to CGM alarms, the location of the student's smart device receiver during standardized testing (e.g., on the proctor's desk within range of the student's transmitter to receive CGM data), a data sharing plan, provisions for charging the receiver, a training plan for school personnel, etc.

In the school setting, delegated school staff should respond to low and high BG alarms rather than trends. Parents and the diabetes care team will set the alarms and notify the school nurse of the parameters. Alarms should be used conservatively to avoid unnecessary disruption of the student's school activities.

Remote monitoring of the CGM in the school setting is generally not required as the student is usually adult supervised by trained school staff and frequent routine BG monitoring is scheduled as indicated. It is not the responsibility of school personnel to monitor the CGM readings. However, in certain unique cases (e.g. preschool age, non-verbal, impaired cognition, severe hypoglycemia unawareness) monitoring/remote monitoring may be appropriate and the school nurse along with the Section 504 Team will determine this need based on the student's individual unique need(s). When determined appropriate, these accommodations will be indicated in a Section 504 plan and other individualized written plans.

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