

Collaborative Guidelines for CGM/iCGM Therapeutic Dosing in the School and Child Care Setting – Colorado

Introduction

The FDA has approved several continuous glucose monitoring (CGM) systems for therapeutic dosing for the pediatric population. Currently, these include the Dexcom G6 CGM and the Abbott Freestyle Libre 2 Integrated Continuous Glucose monitoring (iCGM) system for non-adjunctive therapeutic use,^{1-3,7} meaning that with proper technique, these CGM/iCGMs can be used directly to make treatment decisions without needing to test finger-stick blood glucose (BG) values. The *Colorado Kids with Diabetes Care and Prevention Collaborative* is supportive of these changes in labeling. These CGM/iCGMs have different operating procedures, which will be addressed in these guidelines. Additional systems including the Dexcom G7 and the Medtronic Guardian 4 may become available this school year pending FDA approval with therapeutic dosing indications.

The REPLACE-BG study⁴ demonstrated the safety of direct dosing from CGM values without confirmatory finger-sticks. The Endocrine Society⁵ has also come out with expert guidelines for pediatric dosing from CGM values. In addition, Dexcom provides some clinical guidance on non-adjunctive use that are available at Dexcom.com/guides. After over four years of clinical experience with therapeutic dosing, we are recommending the following guidelines be used in schools for therapeutic CGM dosing.

General Guidelines for Safe Use of CGM/iCGM for Therapeutic Dosing

General:

- Check the blood glucose via finger-stick if the child's symptoms do not match the sensor readings (e.g. the child feels low but the sensor is not reporting a low value).
- If the CGM is reading “LO” or “HI” then check blood glucose with a finger-stick
- If there are no trend arrows displayed with the sensor glucose reading, the CGM may not be measuring correctly and should not be used for dosing. In these instances, use a finger-stick blood glucose to determine dose/treatment.
- Child should be treated *immediately (i.e. classroom, playground)* if symptomatic or if blood glucose is below Target Range. Note: If a child is sent to the school health office, another responsible person must always accompany the child.

Meals

- For correction boluses at mealtime, the sensor value may be used in place of finger-stick testing and correction dosing should occur as per the health care provider's school orders/DMMP.
- Trend Arrows: The health care provider may indicate on the DMMP the use of trend arrows at mealtime in determining insulin dosing/treatment.

Lows

- If a child feels that his/her blood sugar is low, then the CGM sensor reading may be used to determine treatment. Provide carbohydrates based on the sensor reading and symptoms and recheck sensor reading BG in 15 min. If still low, repeat the treatment.
- The CGM may have an optional “Urgent Low Soon Alert” which notifies you when the reading is predicted to reach 55 mg/dL within 15-30 minutes. It is OK to treat with carbohydrates for an “Urgent Low Soon Alert” even if the current CGM value is not low.
- If the CGM is reading low, but the child is not symptomatic, confirm glucose with a finger-stick prior to treating. Treat according to the finger-stick value, as per the health care provider's school orders/DMMP.
- Trend arrows may be used in treatment decision (as agreed upon by the school nurse and parent or per DMMP). Trend arrows may vary slightly per CGM system. In general, up arrows indicate glucose is rising and down arrows indicate glucose is falling. See specific user guides for more information.

*No insulin should be given for the treatment of lows or pending lows as described above. Fast-acting carbohydrates include but are not limited to: juice, glucose tablets, Skittles, honey, regular soda, etc.

Highs

- The CGM sensor reading may be used for correction and dosing per the health care provider order/DMMP.
- If the sensor glucose reading is >300 mg/dL over a 2 hour period or longer, check for serum or urine ketones (if possible) and treat per the health care provider's school orders/DMMP. Follow the **Standards of Care for Diabetes Management in the School Setting & Licensed Child Care Facilities – Colorado 2021.**
www.coloradokidswithdiabetes.org

Specific Guidelines for Safe Use of the Dexcom G6 for Therapeutic Dosing

- The G6 has also been approved to be factory calibrated, meaning that no routine finger-stick calibrations are necessary as part of its use. Therefore, no calibrations are needed as long as the sensor code was entered when the sensor was started. If the family does not enter the sensor code when starting the sensor, then the G6 will require a fingerstick calibration every 12 hours (this is rare).
- Acetaminophen does not affect the G6 CGM.

Guidelines for Safe Use of the Abbott Freestyle Libre 2 for Therapeutic Dosing

- Scan the sensor with handheld reader/cell phone to see glucose reading, trend arrow, and eight-hour history
- Reader/cell phone will alert automatically without scanning when glucose levels are above or below targets
- Vitamin C supplements (more than 500mg/day) may falsely raise the sensor glucose readings
- Acetaminophen does not affect the Abbott Freestyle Libre 2.

ACKNOWLEDGEMENT OF AUTHORS:

Cari Berget, MPH, RN, CDE Faculty, Barbara Davis Center, University of Colorado

Greg Forlenza, MD Associate Professor, Barbara Davis Center, University of Colorado

Andrea Houk, RN, CDCES Co-President, Diabetes Resource Nurses of Colorado, Inc.,
Owner, Diabetes Care Services, LLC

References:

1. 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.
2. 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.
3. 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.
4. Aleppo G, Ruedy KJ, Riddlesworth TD, Kruger DF, Peters AL, Hirsch I, 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.
5. Laffel LM, Aleppo G, Buckingham BA, Forlenza GP, Rasbach LE, Tsalikian E, et al. A Practical Approach to Using Trend Arrows on the Dexcom G5 CGM System to Manage Students and Adolescents With Diabetes. *Journal of the Endocrine Society.* 2017;1(12):1461-76.
6. Sherr, J. ,Tauschmann, M., Battelino, T., de Bock, M., Forlenza, G., Roman, R., Hood, K., Maahs, D. (2018, Oct). ISPAD clinical practice consensus guidelines 2018: diabetes technologies. *Pediatric Diabetes* October 2018; 19 (Suppl. 27): 302–325. [L1 SEP]
7. Abbott. (2020, June 15). Press Release Abbott's Freestyle Libre 2 ICGM cleared in U. S. for Adults and children with diabetes, achieving highest level of accuracy and performance standards.
<https://abbott.mediaroom.com/press-releases>

Adopted: January 2017

Revised: August 30, 2021