ECHO IDAHO

K12 School Nurses

Diabetes Management and Technology

4/9/25

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Please keep in mind that your School District policies and Health Services procedures, medication administration protocols, process guidelines, remain the guiding principles to your practice. | None of the planners or presenters for this educational activity have relevant financial relationship(s) to disclose with ineligible companies whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.

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Learning Objectives

Glucose Monitoring Technology

-glucometers

-continuous glucose monitors

Automated Insulin Delivery Systems

-Tandem T-slim and Tandem Mobi

- Insulet Omnipod 5

- Medtronic 780 G

Managing diabetes technology at school

Monitoring Glucose

One of the most important practices of diabetes management

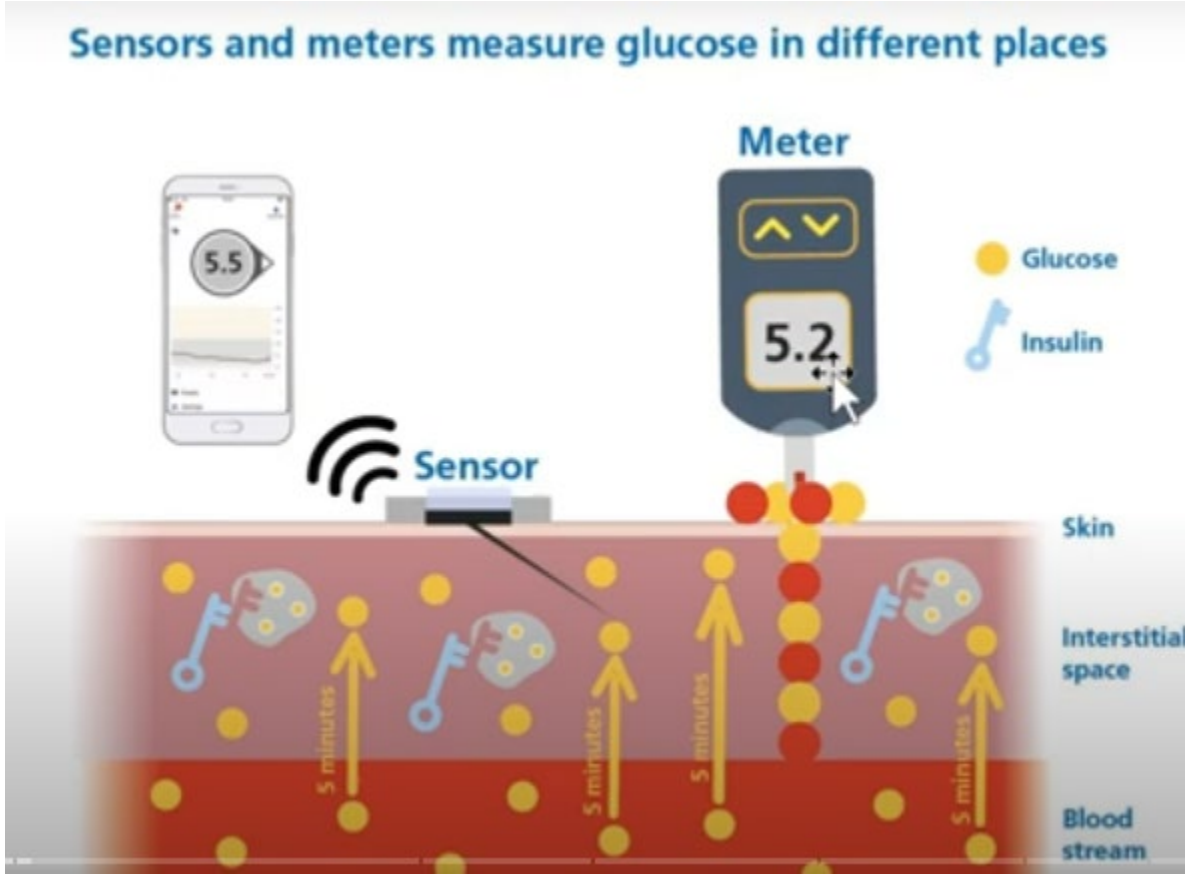
Glucometer (meter, test strips, lancets)

Gold standard, real time glucose values

Continuous Glucose Monitors (CGMs)

Reads glucose value in interstitial fluid (delay), technology is predicting 15-30 minutes ahead of real time glucose

Glucometer vs. Continuous Glucose Monitor



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Recommended Times to Check Glucose

- Before getting on bus (AM: parents/caregivers PM: school staff)
- Arrival at school
- Before snacks and meals
- Before and after PE/recess/sports
- Alarms going off, could be low BG, high BG, sensor errors
- Low BG from sensor non symptomatic, check BG with meter
- Sensor readings not matching symptoms check BG with meter

Glucometer & CGM

- ❑ Students should bring meter to school every day in case of CGM failure and to verify BG in certain scenarios
- ❑ Check expiration date on glucometer strips, once opened they expire in 90 days, and they should not be used past expiration
- ❑ When in doubt check BG with meter

Rely on your BG meter for treatment decisions in these situations:

- G6 does not show both a number and arrow.

  For example, if your home screen displays any of these:

When you see	Notice
	No number
	No arrow

Glucose Targets & Recommendations

*General goal for all students w/ diabetes: glucose between 70-180 mg/dL most of the time

ACTIVITY	Before Bus	Before Meals	Exercise/PE/Recess	Alarms
GLUCOSE TARGET	>120 mg/dL with no trend arrow slanted down or straight down	80-150 mg/dL	Before >150mg/dL and <300 mg/dL After >80 mg/dL	>70 mg/dL with no trend arrows slanted down or straight down <250 mg/dL
RECOMMENDATIONS	Have snacks available for student in case of low BG on bus. Do not get on bus if BG is <70 mg/dL until low BG has been treated and >70 mg/dL	<70 mg/dL treat low BG with sugar, when BG is >70 ok to dose insulin for meal. CGMs take longer to read glucose, a meter may be quicker to verify >70 mg/dL	Below 150 mg/dL: give small snack 5-15 gm Above 300 mg/dL: not recommend… if ketones are negative or trace ok to exercise, encourage hydration	If sensor is predicting low BG treat low BG with sugar If sensor is reading high above 250 mg/dL encourage water intake and follow corrective actions per health plan

Continuous Glucose Monitors

Dexcom

Dexcom G6

- 10-day wear
- 2 components (transmitter & sensor)
- 2 hour warm up period
- Connects to receiver, smartphone app, Tandem & Omni pod pumps

30 pt.

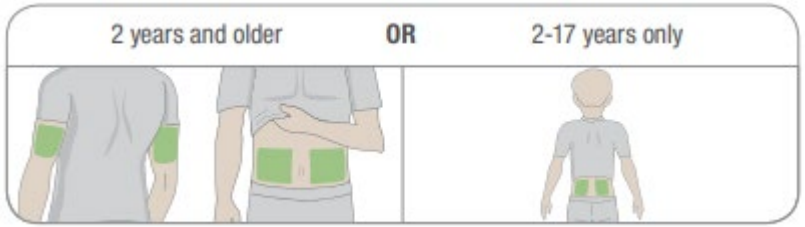
30-60 pt.

60-90 pt.

90+ pt.

Trend Arrows	Where Your Glucose Is Going	
	Steady	Changing up to: • 0.06 mmol/L each minute • 1.8 mmol/L in 30 minutes
	Slowly rising or falling	Changing: • Between 0.06–0.1 mmol/L each minute • Up to 3.4 mmol/L in 30 minutes
	Rising or falling	Changing: • Between 0.1–0.2 mmol/L each minute • Up to 5 mmol/L in 30 minutes
	Rapidly rising or falling	Changing more than: • 0.2 mmol/L each minute • 5 mmol/L in 30 minutes
	No arrow	Cannot determine trend

*G6 trend arrows show change in 30 minutes.
New reading every 5 minutes, Bluetooth range 20 ft



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Continuous Glucose Monitors

Dexcom

Dexcom G7

- 10-day wear (extended 12-hour period)
- Transmitter and sensor in one device
- 30-minute warm up period
- Connects to receiver, smartphone app, watch, Tandem & Omni pod pumps

Predicting 15 minutes in future

Within 15 pt.

15-30 pt.

30-45 pt

45+ pt

Trend Arrows	Where Your Glucose Is Going	
	Steady	Changing up to: • 0.06 mmol/L each minute • 1.8 mmol/L in 30 minutes
	Slowly rising or falling	Changing: • Between 0.06–0.1 mmol/L each minute • Up to 3.4 mmol/L in 30 minutes
	Rising or falling	Changing: • Between 0.1–0.2 mmol/L each minute • Up to 5 mmol/L in 30 minutes
	Rapidly rising or falling	Changing more than: • 0.2 mmol/L each minute • 5 mmol/L in 30 minutes
	No arrow	Cannot determine trend

- New reading every 5 minutes
- Bluetooth range 33 feet

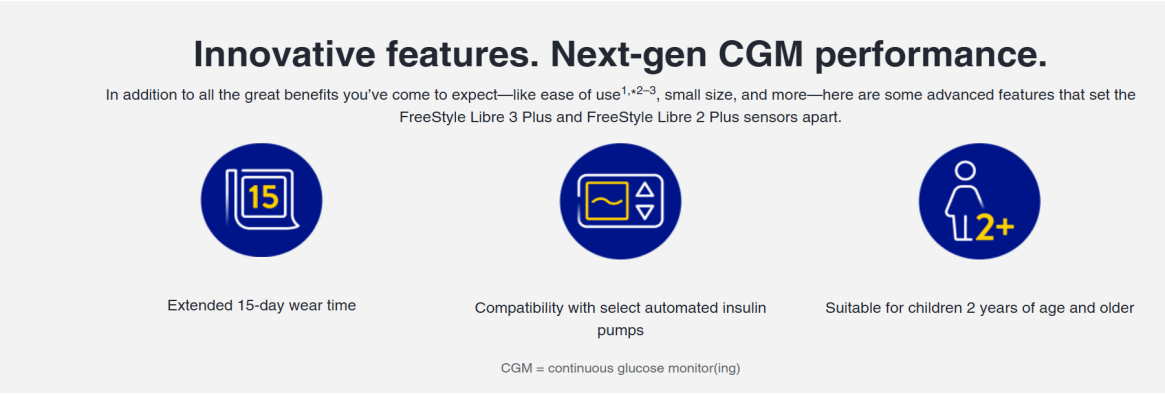
Continuous Glucose Monitors

Libre 2 + and Libre 3+

Libre 2+ and Libre 3+ are new generation no more scanning required with readers, glucose data will go directly to app or reader

Libre 2+

- 15-day wear
- Transmitter and sensor 1 device
- Bluetooth range 20 ft
- Connects to reader, app, Omni 5, Tandem T slim X2



Libre 3+

- Bluetooth range 33 ft
- Connects to reader, app
- 15-day wear, 1 device

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Libre 2+ and 3+ Connectivity to Pumps

Explore compatible AID systems

Sensor	Partner	AID (Automated Insulin Delivery) System
FreeStyle Libre 2 PLUS Sensor 	omnipod simplify life™	 **Omnipod® 5 Automated Insulin Delivery System** Omnipod 5 App†
	TANDEM Diabetes Care	 **t:slim X2™ insulin pump** t:connect mobile app
FreeStyle Libre 3 PLUS Sensor 	Beta Bionics	 **iLet Bionic Pancreas** iLet mobile app

↑	**Glucose is rising quickly** (more than 2 mg/dL per minute)
↗	**Glucose is rising** (between 1 and 2 mg/dL per minute)
→	**Glucose is changing slowly** (less than 1 mg/dL per minute)
↘	**Glucose is falling** (between 1 and 2 mg/dL per minute)
↓	**Glucose is falling quickly** (more than 2 mg/dL per minute)

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CGM Troubleshooting and Tips

- ✓Hydration supports best readings for continuous glucose monitors
- ✓Connectivity issues? Keep phone and or reader near student
- ✓At school consider keeping Tegaderm or CGM over patches to place over sensor if it looks like its starting to fall off at school

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Tandem Insulin Pumps

Connects to CGMs Dexcom G6, G7, and Libre 2+

Connects to CGMs Dexcom G6 and G7

Tandem T slim X2 AID pump

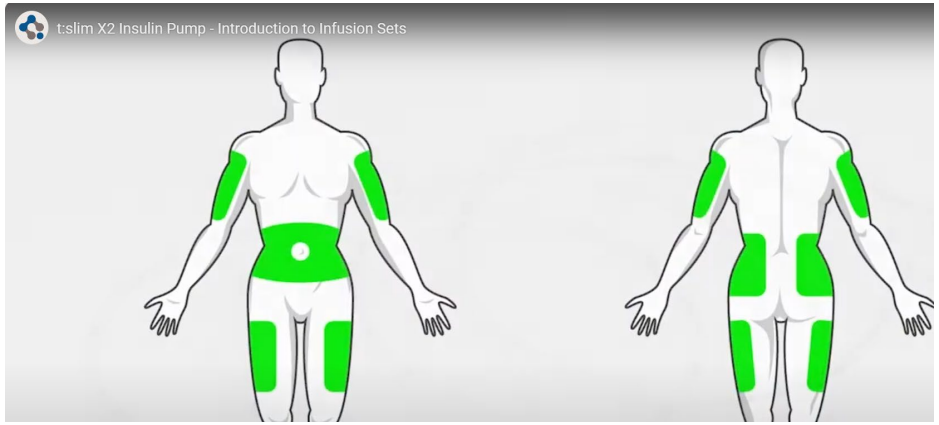
- Holds 300 units of insulin, battery charge should not be less than 20%, insulin should not be less than 20 units
- Bolus from pump or T slim mobile app
- Gives corrections every hour up to 60% corrective dose
- If a student is running lower BGs at school, consider turning on sleep mode. Sleep mode automates basal rate but will not give autocorrections. Exercise mode will give autocorrections

Tandem Mobi AID pump

- Holds 200 units of insulin, battery charge is dependent on phone
- Bolus from Mobi phone app only
- Same software as T slim X2 so same applies for autocorrections and turning on sleep mode

Troubleshooting Tandem T slim/Mobi Pumps

- CGM connected to Insulin Pump ⟹ Automated Insulin Delivery
- CGM not connected to Insulin Pump ⟹ No Automation, use glucometer
- Rotation of infusion sites very important, see insertion sites below
- Child may need Tegaderm over infusion site or CGM if peeling off
- If suspected “kinked canula” and high BGs change pump supplies



Omnipod® 5 System Components

Controller/Android

1

Omnipod® 5 App

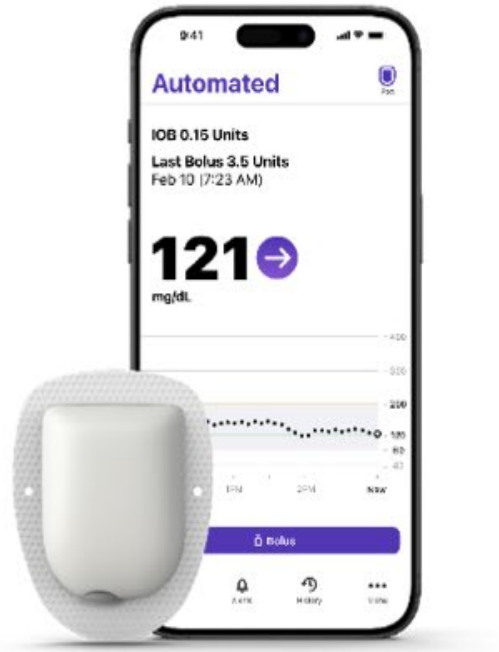
2

Pod with SmartAdjust™ technology

3

Compatible Sensor

iPhone



Dexcom G6

OR

Dexcom G7

OR

FreeStyle Libre 2 Plus Sensor*

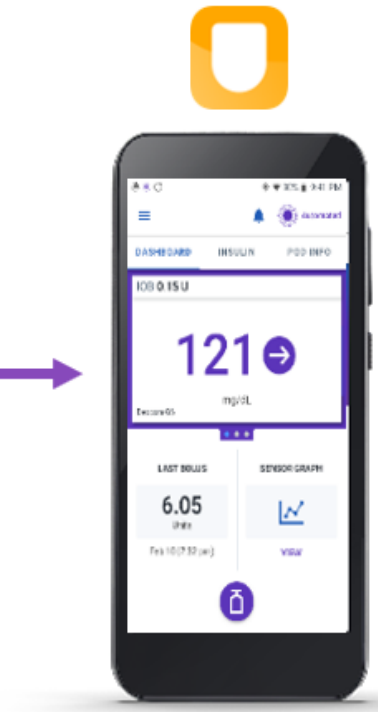
** Only available with Insulet-provided Controller*

Dexcom G6

Omnipod 5 System Communication with Dexcom G6 and G7

Omnipod 5 App

- Does not have to be near Pod to deliver insulin
- Should be kept nearby so you don't miss important alerts and alarms



Apps do NOT interact

Dexcom App

- Displays sensor values and trends
- Displays alerts and alarms

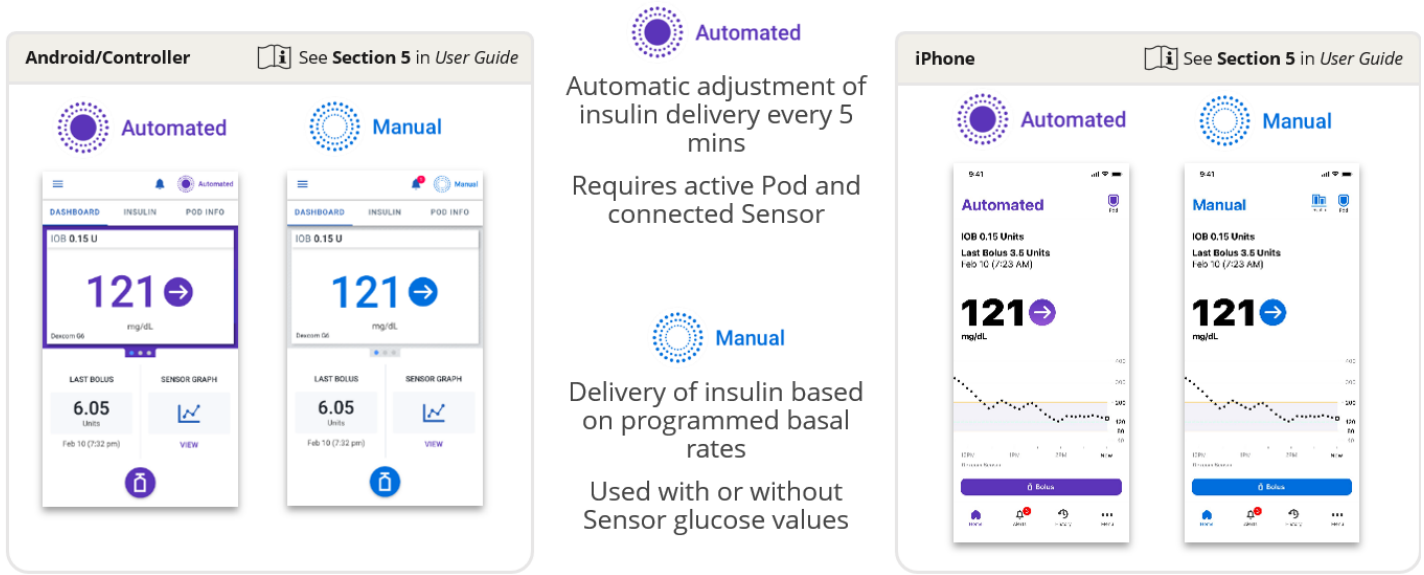
Omnipod 5 Pod

Dexcom G6 or G7 Sensor*

Omnipod Modes

Activity Mode	**Targets BG to 150 mg/dL and reduces insulin delivery overall. Can only be activated in automated mode. Best practice is to activate 1 hour before planned activity like PE or recess.**
Automated Limited	**If child is in automated limited mode, there are connection problems between the CGM and pump. Use BG meter for insulin dosing. Check sensor connection, line of sight and CGM info in controller/app.**

System Modes



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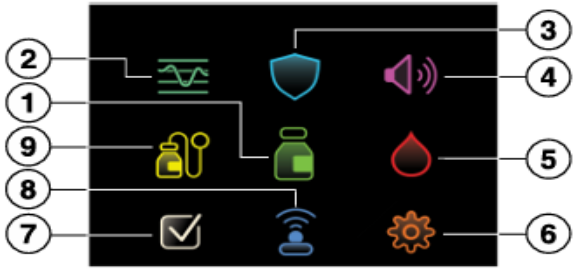
Medtronic Insulin Pump

* To prepare pump for activity/exercise/recess turn on Temp Target which targets BG to 150 mg/dL and will give no autocorrections. Best practice is to do this 1 hour before planned activity.

Medtronic

MiniMed™ 780G system

Detailed Menu Map



1 Insulin
Bolus/Stop Bolus*
- Bolus Wizard
- Manual Bolus
- Preset Bolus*
- Delivery Settings

Basal/Cancel Temp Basal*
- Temp Basal
- Preset Temp*
- Basal Patterns
- Basal Pattern Setup

Suspend All Delivery/Resume Basal*
Delivery Settings

6 Settings
Alert Settings
- High Alert
- Low Alert
- Snooze High & Low
- Reminders

Delivery Settings
- Bolus Wizard Setup
- Basal Pattern Setup
- Max Basal/Bolus
- Dual/Square Wave
- Bolus Increment
- Bolus Speed
- Preset Bolus Setup
- Preset Temp Setup

2 History & Graph
History
- Summary
- Daily History
- Alarm History
- Paired Sensors

Sensor Glucose Review
- High Limit
- Low Limit
- Days to Average

Graph
Time in Range

6 Settings continued
Device Settings
- Sensor (On and Off)
- Time & Date
- Device Info
- Display
- Block Mode
- Self Test
- Review Settings
- Manage Settings
- Easy Bolus
- Auto Suspend
- Language

3 SmartGuard
SmartGuard Checklist
Temp Target/Cancel Temp Target*
SmartGuard Settings
- Target
- Auto Correction

SmartGuard (On and Off)

4 Sound & Vibration
Silence Sensor Alerts
Volume
Sound
Vibration
Alert Settings

5 Blood Glucose
BG

7 Status
Stop Bolus
Suspend All Delivery/Resume Basal*
SmartGuard Checklist
Pump
Sensor

8 Paired Devices
Pair New Device
Pair CareLink
Mobile
Meter
CGM

9 Reservoir & Set
New Reservoir & Set
New Reservoir Only
New Set Only
Fill Cannula

Managing CGM'S at School

- Provide adequate training to staff members who will interact with patient wearing a CGM and or Insulin Pump and how to respond to alarms.
- Staff members who may require training include nurses, teachers, substitute teachers, recess staff, lunch staff, bus drives and administration.

Key Points

- Diabetes Management and Technology is complex, provide instruction to all staff members who need to respond to CGM/pump alerts.

- Insulin pumps offer settings that can be utilized to help prevent low blood sugars with physical activity. Nurses may see BG patterns or trends at school that warrant a discussion with health care team and parents. If student has up to date ROI (release of information) with health care team Nurses are encouraged to call diabetes team.

- Keep general supplies at school for students who may wear CGM and insulin pumps (sugar, ketone strips, over patches or Tegaderm, charging cords for phones and pumps, single use lancets and school glucometer/meter strips)

“Example” School CGM Alert Plan

Glucose Goal 70-180 mg/dL Most Times	Glucose Value “sensor or BG meter”	Treatment	Considerations
Exercise	>150 mg/dL	If <150 mg/dL give small snack 10-15 gm before exercise, adjust pump settings for activity	>300 mg/dL do not exercise, test for ketones if small or trace ok to exercise
CGM ALARM Predicted Low or Urgent Low	Glucose value > 70mg/dL but with trend arrow down	Give 10-15 gm of sugar to treat predicted low BG	Have child sit, be still until sugar has stabilized >70 mg/dL
CGM ALARM Low <70 mg/dL	<70 mg/dL	Give 10-15 gm of sugar to treat low, wait 15 minutes if still low give additional 10 - 15 gm sugar	Have child sit, be still until sugar has stabilized >70 mg/dL. Ok to test BG with meter.
CGM ALARM Urgent LOW <55 mg/dL	<55 mg/dL	Give 20-30 gm of sugar to treat low, wait 15 minutes if still low give additional 10-15 gm of sugar	Have child sit, be still until sugar has stabilized >70 mg/dL. Ok to test BG with meter.
CGM ALARM High >250 mg/dL	>250 or >300 mg/dL	Encourage water intake, if wearing an insulin pump can see if pump recommends a correction for high BG	Check ketones if over 250-300mg/dL for >4 hours with nausea, vomiting, stomach pain, sick.
CGM ALARM Loss of Signal, No readings	Unknown glucose value	Test BG with meter for treatments, keep phone or receiver near CGM.	No number or arrow- test BG with meter for treatment decisions

Hypoglycemia & Hyperglycemia

Signs & Symptoms

Hypoglycemia <70 mg/dL

General symptoms of hypoglycemia may include looking pale, shakiness, sweating, headache, irregular or fast heartbeat, irritability, anxiety, dizziness or lightheadedness, numbness or tingling of lips, tongue or cheek.

As hypoglycemia worsens, signs and symptoms can include:

- Confusion, unusual behavior or both, such as the inability to complete routine tasks
- Loss of coordination
- Slurred speech
- Blurry vision or tunnel vision

Severe hypoglycemia may cause:

- Unresponsiveness (loss of consciousness)
- Seizures

Hyperglycemia >250 mg/dL

Early signs and symptoms

Recognizing early symptoms of hyperglycemia can help identify and treat it right away. Watch for:

- Frequent urination
- Increased thirst
- Blurred vision
- Feeling weak or unusually tired

Later signs and symptoms

If hyperglycemia isn't treated, it can cause toxic acids, called ketones, to build up in the blood and urine. This condition is called ketoacidosis. Symptoms include:

- Fruity-smelling breath
- Dry mouth
- Abdominal pain
- Nausea and vomiting
- Shortness of breath
- Confusion
- Loss of consciousness

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References

St.Lukes Childrens Endocrinology

208-381-7340, ask to speak with diabetes educator

Varisoft

- How to Insert a New VariSoft Insulin Pump Infusion Set

Tandem

- Tandem guide to different infusion sets, recommendations for site placement
- Tandem Diabetes Care - Tips On Improving Infusion Set Adhesion

Omnipod

- Omnipod-5_Quick-Start-Guide.pdf

Medtronic

- MiniMed™ 780G system - User Guides & Manuals | Medtronic

American Diabetes Association and CGM guidance

- CGMguidane-6-20-24.pdf
- Diabetes Care in the School Setting: A Statement of the American Diabetes Association | Diabetes Care | American Diabetes Association
- Hypoglycemia - Symptoms and causes - Mayo Clinic
- Hyperglycemia in diabetes - Symptoms & causes - Mayo Clinic