CONTINUOUS GLUCOSE MONITORING SYSTEM IN CHILDREN WITH TYPE 1 DIABETES MELLITUS

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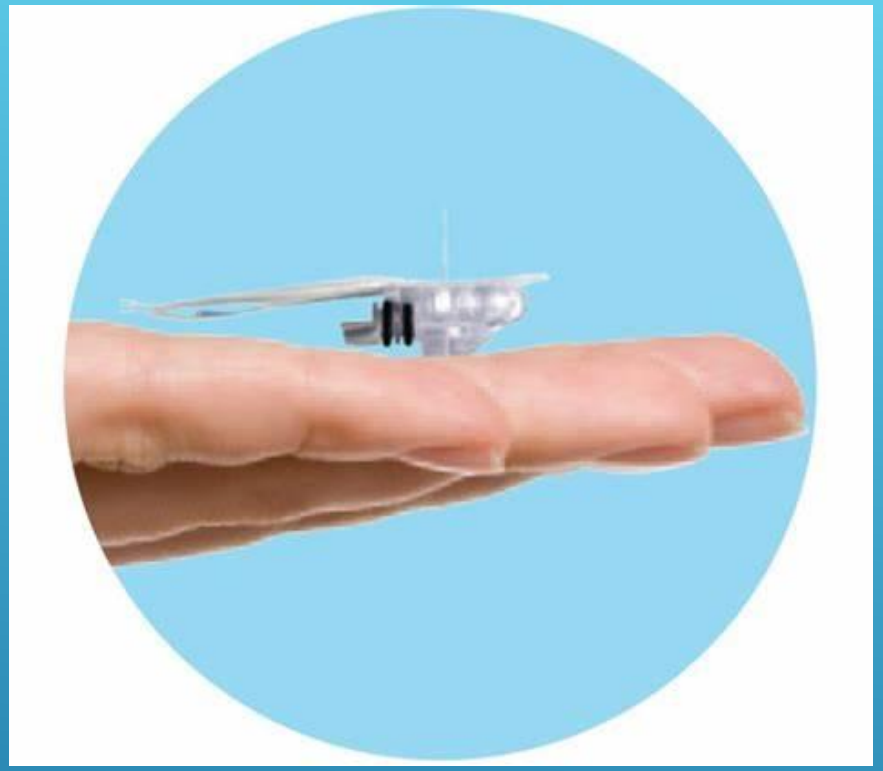
Challenges of glycemic control in pediatric patients:

- Changing insulin requirements
- Unpredictable food intake and physical activity
- Concerns about hypoglycemic risk
- Close monitoring needed to recognize when the patient outgrows their insulin dose(s)



SOLUTION

Continuous glucose monitoring (CGM)

- provides maximal information about changes in blood glucose levels throughout the day
- facilitates optimal treatment decisions for the diabetic patient

Continuous glucose monitoring (CGM)

- provides information about the direction, duration, frequency and the causes of fluctuations in blood glucose levels.

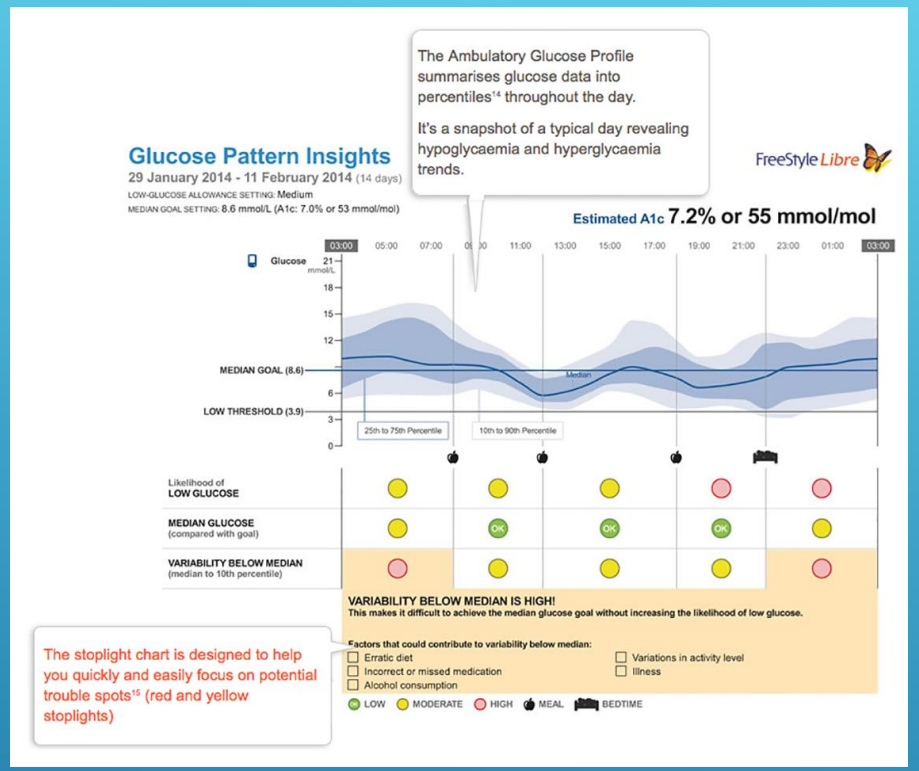
- continuous monitoring provides much greater insight into glucose levels throughout the day

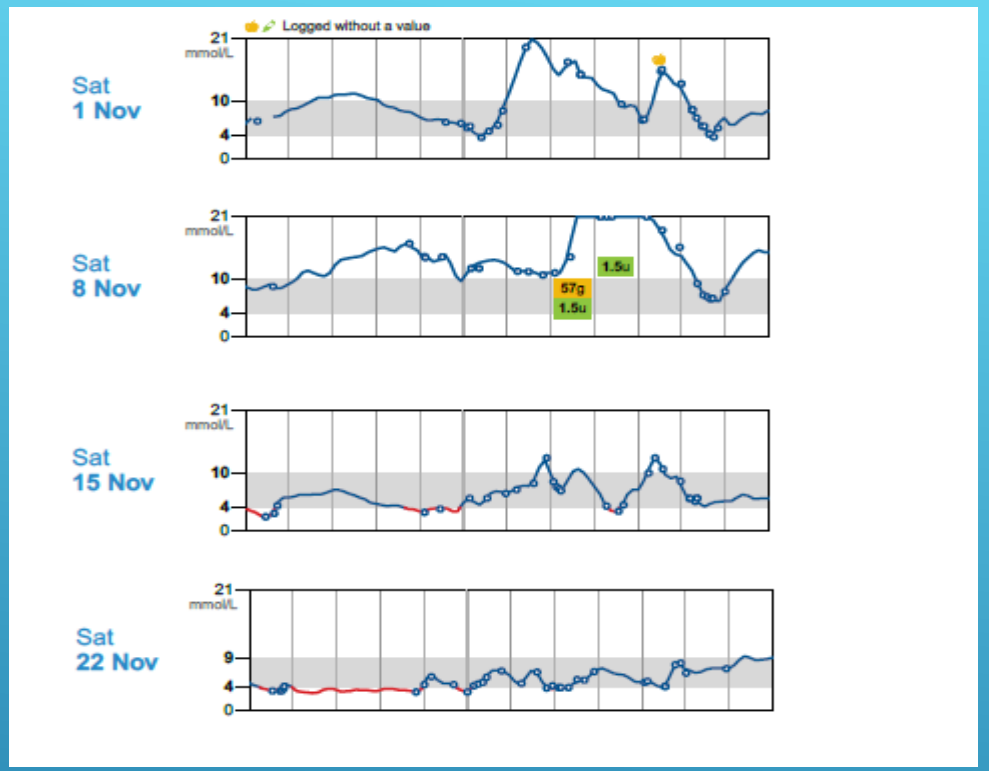
Types of CGMS IN UAE

- DEXCOM
- FREE STYLE LIBRE
- GARDIAN CONNECT(MEDTRONIC)

FREESTYLE LIBRE FLASH GLUCOSE MONITORING SYSTEM

- the FreeStyle Libre reader displays the current glucose reading
- a trend arrow showing if glucose levels are going up down or changing slowly
- Review glucose patterns
- 14-days sensor wear

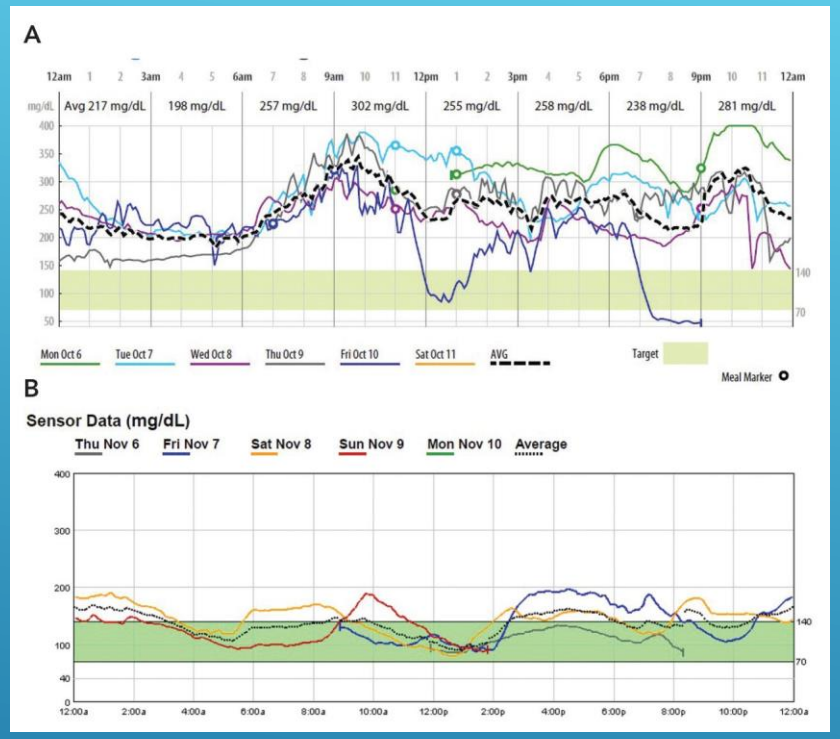




FREESTYLE LIBRE

DEXCOM G5 GLUCOSE MONITORING SYSTEM

- Set your range and get notified when you're heading high or low
- Share your glucose data with up to 10 followers
- The only provider of CGM systems indicated for children ages 2 years and older
- 10-day sensor wear


A
12am 1 2 3am 4 5 6am 7 8 9am 10 11 12pm 1 2 3pm 4 5 6pm 7 8 9pm 10 11 12am
mg/dL
Avg 217 mg/dL
198 mg/dL
257 mg/dL
302 mg/dL
255 mg/dL
258 mg/dL
238 mg/dL
281 mg/dL
400
350
300
250
200
150
100
50
140
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Mon Oct 6
Tue Oct 7
Wed Oct 8
Thu Oct 9
Fri Oct 10
Sat Oct 11
AVG
Target
Meal Marker
B
Sensor Data (mg/dL)
Thu Nov 6
Fri Nov 7
Sat Nov 8
Sun Nov 9
Mon Nov 10
Average
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40
0
140
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12:00a
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4:00a
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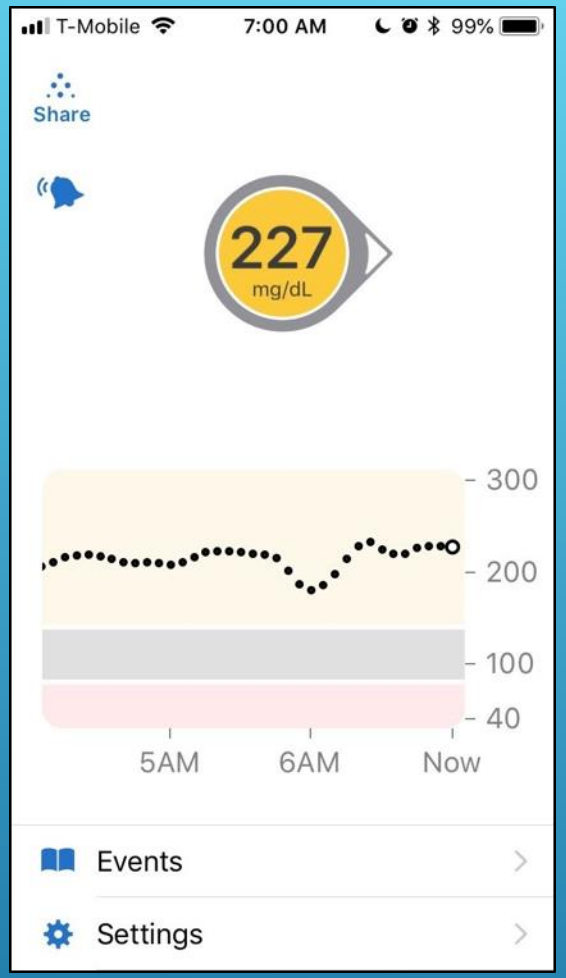
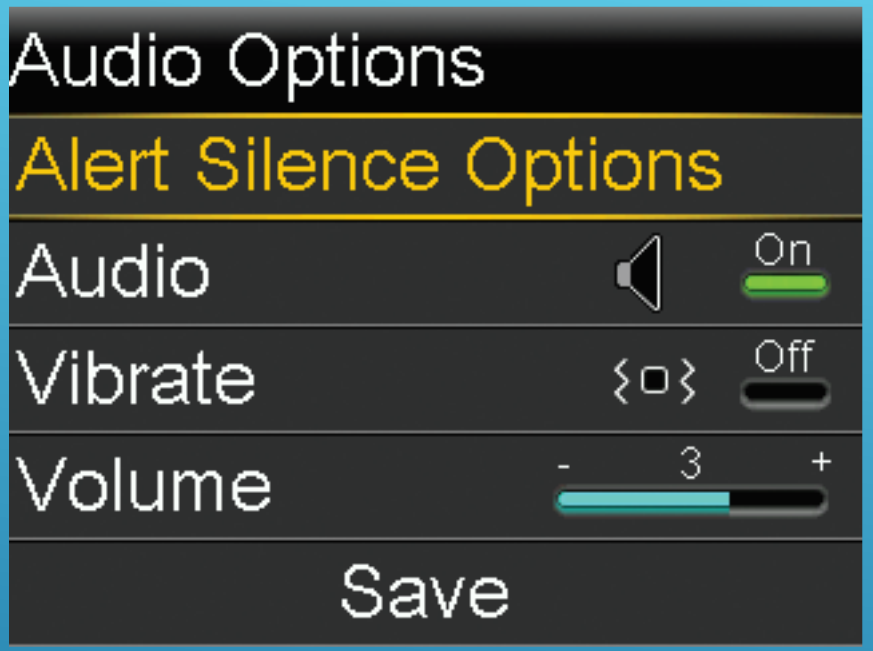
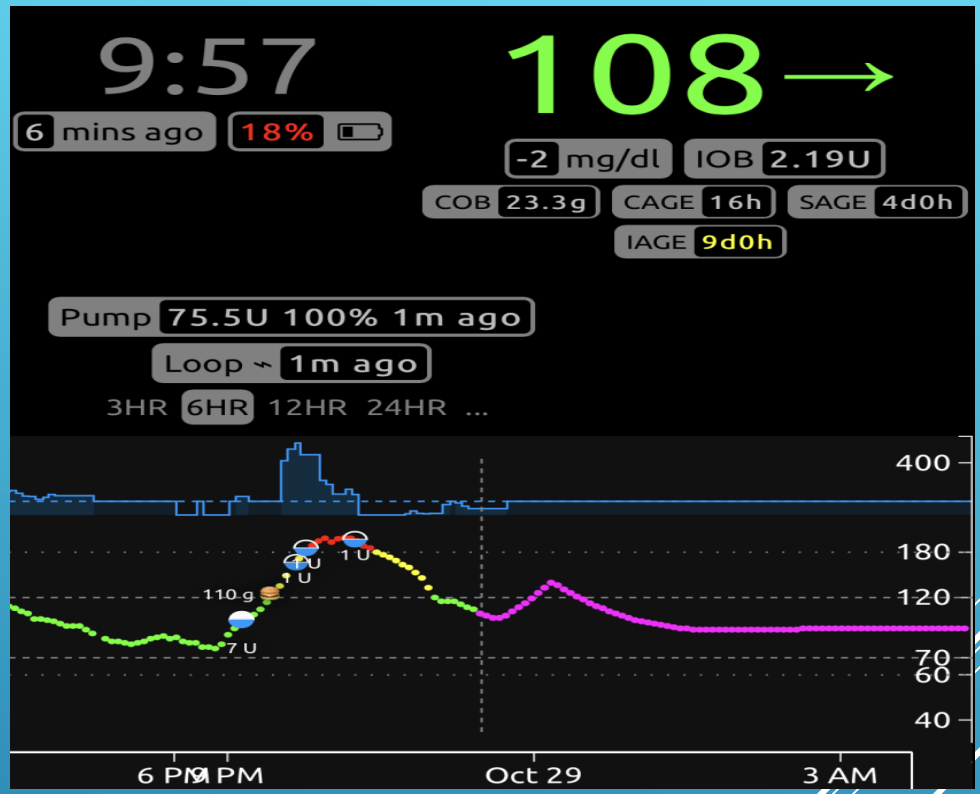

T-Mobile
7:00 AM
99%
Share
227
mg/dL
300
200
100
40
5AM
6AM
Now
Events
Settings

DEXCOM

GUARDIAN CONNECT GLUCOSE MONITORING SYSTEM





GUARDIAN CONNECT

- the system will alert you from 10 to 60 minutes before a high or low
- The system includes a small sensor with discreet Bluetooth transmitter
- 7-day sensor wear

Frequent BGM is an essential element in effective T1DM management because it:

Detects glycemic variability and hypoglycemia

Informs treatment modifications and reflects the impact of food intake and physical activity[1-3]

Provides important information on treatment efficacy[1,4]

- All major clinical practice guidelines recommend individualized, frequent BGM for patients with T1DM[1,3-6]
- CGM is particularly important for patients with a history of severe hypoglycemia or hypoglycemia unawareness

1. JOSLIN DIABETES CENTER, 2014. HTTP://WWW.JOSLIN.ORG/DOCS/ADULT_GUIDELINE_-UPDATE_THRU_10-23-14_2.PDF; 2. AMERICAN DIABETES ASSOCIATION. *DIABETES CARE.* 2015;38(SUPPL 1):S1-S94; 3. AMERICAN ASSOCIATION OF DIABETES EDUCATORS. 2011.

BENEFITS AND DRAWBACKS OF CGM

Pros	Cons
Alerts patients to • Episodes of hypoglycemia and hyperglycemia • *Predicted* episodes of hypoglycemia and hyperglycemia	Issues related to • Accuracy • Comfort • Convenience • Patient acceptance • Expense
Device displays help patients with clinical decision making	Most devices require frequent calibration

CGM = continuous glucose monitoring.

CGM should be considered for regular daily use in pediatric patients with T1DM who perform frequent blood glucose testing and have:

- Severe hypoglycemic episodes
- Hypoglycemic unawareness (especially in younger children)
- Nocturnal hypoglycemia
- Wide glucose excursions, regardless of HbA1C
- Suboptimal glycemic control, with HbA1C exceeding target range
- HbA1C levels <7%, to maintain target glycemic control while limiting hypoglycemia risk

- Understanding Clinical Standards for Accuracy of Current BGMs and CGMs
- The question of how the accuracy of both technologies interact is still not well understood
- CGM system accuracy has greatly increased
- CGM commonly making errors of 20% of the reference value

BGM = BLOOD GLUCOSE MONITOR;
CGM = CONTINUOUS GLUCOSE MONITOR

UNDERSTANDING CLINICAL STANDARDS FOR ACCURACY OF CURRENT BGMS AND CGMS

FDA Draft Guidance (2014)[1]		
50-400 mg/dL (2.8-22.2 mmol/L)	±15%	95%
and		
50-400 mg/dL (2.8-22.2 mmol/l)	±20%	99%

- The draft proposes smaller errors in the hypoglycemic range

BGM = blood glucose monitor; CGM = continuous glucose monitor; FDA = US Food and Drug Administration.

1. US Food and Drug Administration. 2014. Available at: http://www.fda.gov/downloads/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/UCM380327.pdf; 2. Freckmann G, Schmid C. *J Diabetes Sci Technol.* 2015;9(4):885-894.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DANK U
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