Diabetes Overload: Making Sense of the Data

Emily Rohling, PharmD,
Belinda Childs, APRN, BC-ADM, CDCES

GREAT PLAINS DIABETES

ESTD 1976
DANDURAND
DRUGSTORE

Disclosures

- Emily Rholing, PharmD-No disclosures
- Belinda Childs, APRN
  - Abbott Diabetes -,<$6000 in research support to Great Plains Diabetes (2021-2023)
  - Embecta-advisory board, paid to Great Plains Diabetes
  - PreventionBio-advisory board, paid to Great Plains Diabetes

Learning Objectives

- Define Continuous Glucose Monitoring (CGM) and the use in improving diabetes management

- Compare and contrast FreeStyle Libre 3 and Dexcom 7

- Identify pumps that integrate CGM in hybrid closed loop systems

- Define Time in Range and goals for different individuals, CV, GMI

- Participants with review case studies to identify patterns and potential solutions

You are the Expert

- We are going to ask you to break into groups of 3. Some will be experts, some will be novices. Those of you who do this every day, find someone who may be less sure of reviewing reports.
- The primary purpose of this session is to learn from each other.
- We only have 45 minutes so we will do a brief introduction and then share reports to review, have 2 or 3 groups share their recommendations.
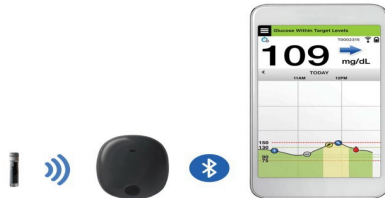
What is Continuous Glucose Monitoring (CGM)?

- Tiny sensor that is inserted under the skin; measures glucose levels in the interstitial fluid

- Records data every 1-5 minutes ≈ 288 finger sticks

- Provides alarms for high and low glucose levels
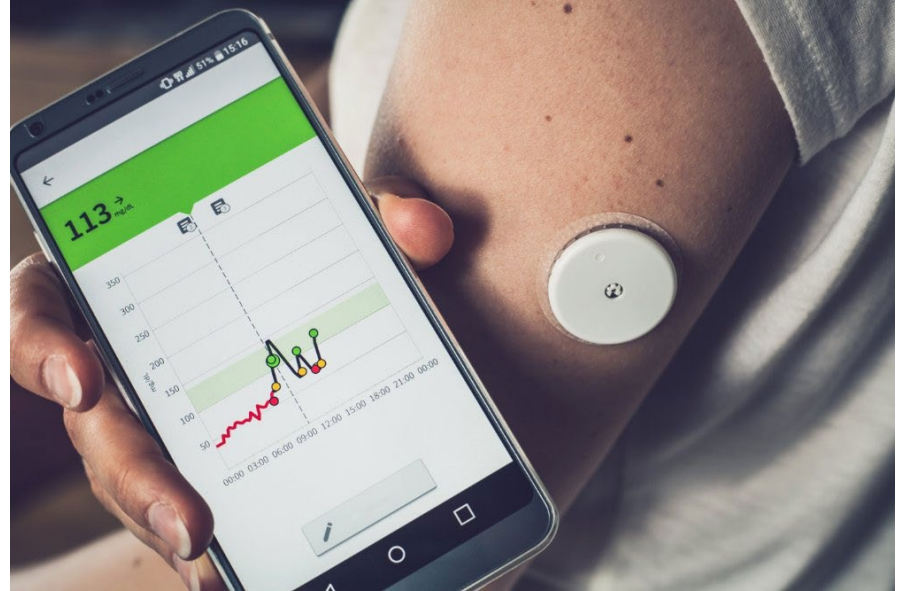
What Are The Options?

Eversense

Guardian 4
from Minimed
Still looking for
picture

2023

	FreeStyle Libre 3	**Dexcom G7**
Indications	Used in ages 4 and up; Approved for Type 1, Type 2 diabetes, and gestational	Used in ages 2 and up; Approved in Type 1, Type 2 diabetes, and gestational
Size	Smaller than two stacked pennies	60% smaller than G6 and more circular
Wear Time	14 days	10 days
Warm-Up Time	60 minutes	30 minutes
Glucose Reading Frequency	Every minute	Every 5 minutes

	FreeStyle Libre 3	Dexcom G7
Approved Body Locations	Back of the upper arm	Back of the upper arm Buttocks (age 2 to 6 y/o)
Waterproof (Water Resistance)	30 minutes at 3 feet	24 hours at 8 feet
Smartphone Apps Available	Compatible with iOS and Androids *Refer to website for compatibility*	Compatible with iOS and Androids *Refer to website for compatibility*
Healthcare Provider Apps Available	LibreView	Dexcom Clarity
Retail Price	$154 for a 28-day supply (quantity 2 sensors) $75 with Relay Health Coupon	$444 for a 30-day supply (quantity 3 sensors) Coupon can make this $89

Why Use CGM?

- Provides people with diabetes as well as providers an expanded knowledge and awareness regarding glucose excursions

- Offers an opportunity to explore the impact of:
  - Food
  - Medications
  - Physical activity
  - Stress

- Provides guidance for medication adjustments, meal planning, physical activity and improve glucose management

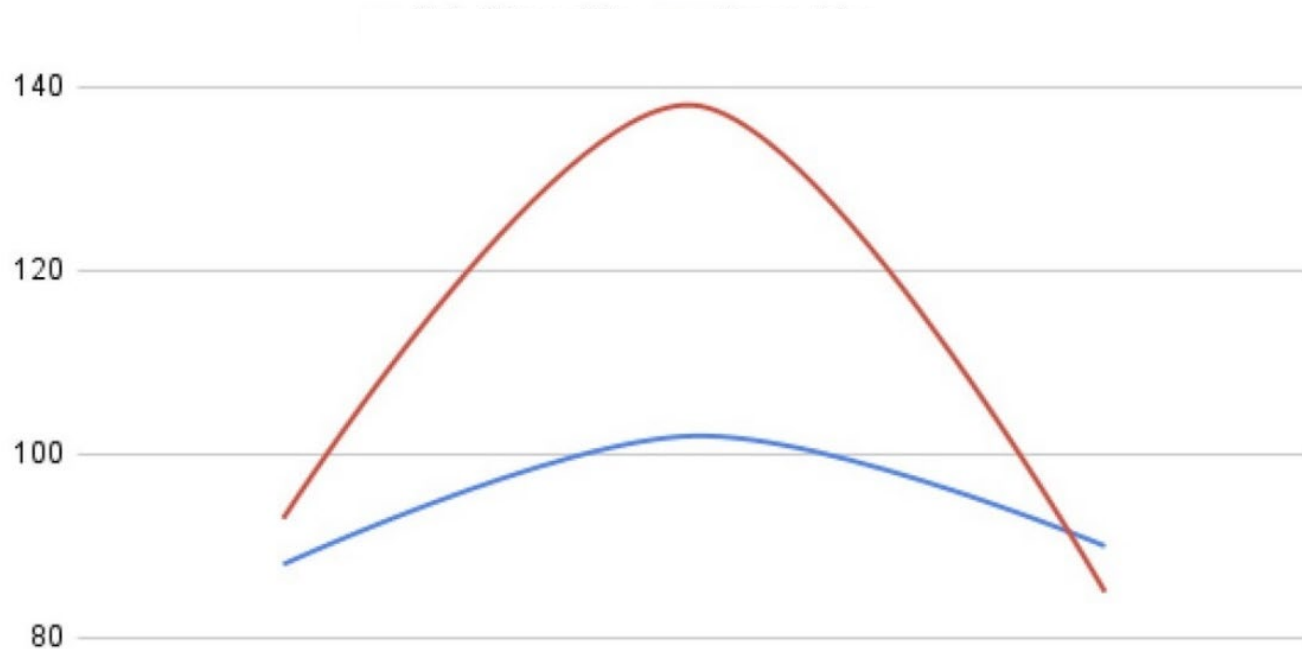- Can be useful in prediabetes-lifestyle changes

Even without diabetes

- 36 y/o, healthy, woman wanted to make improvements in her diet. She usually purchases the Green Juice from Whole Foods. She was curious about how her glucose levels responded to the green juice.

Green Juice vs. Fab 4 Smoothie

Which Breakfast Drink is the "Healthiest" Choice?

Green Juice Effects on Your Blood Sugar Balance
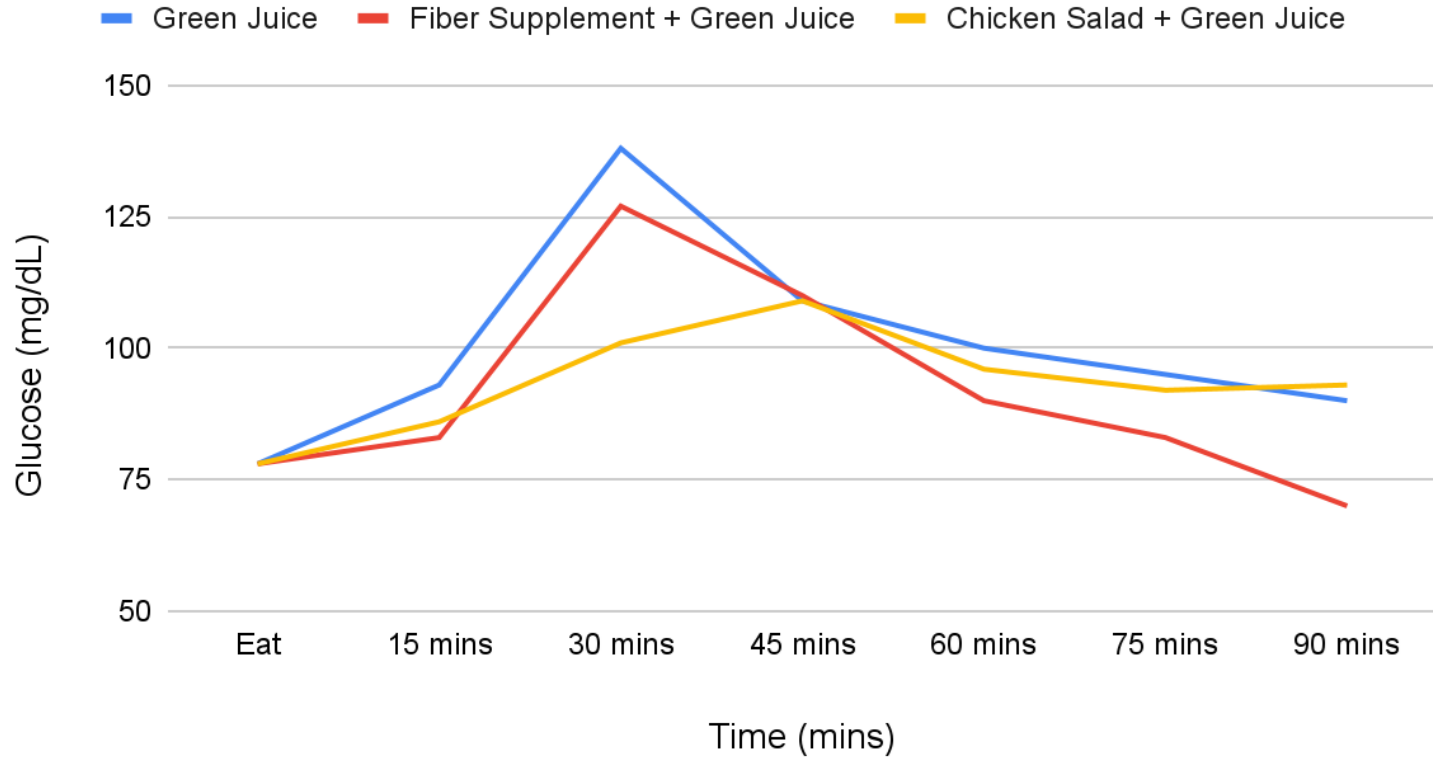
The Bigger Picture

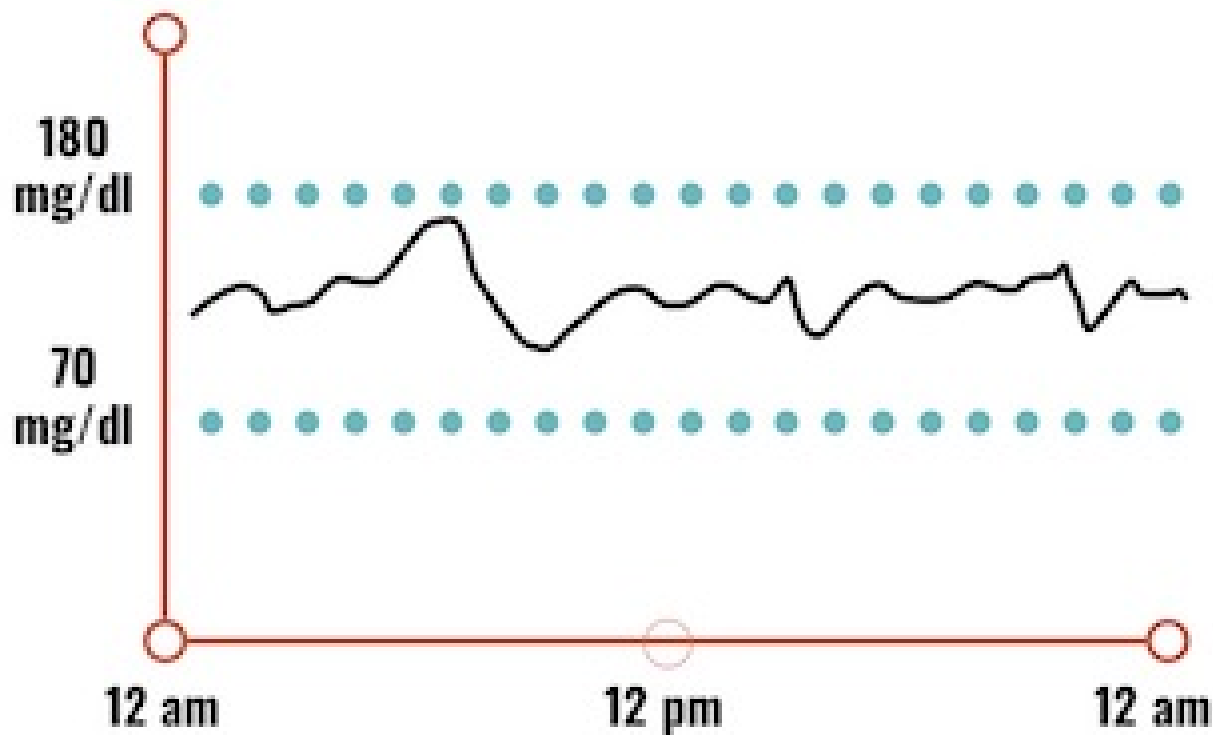- CGM provides graphs, charts, and analyses of a patient's glucose levels
  - **Provides a CGM reading every few minutes**
  - **Plots data on a trend graph**
  - **Trend arrows to show the rate of direction**
  - **Can set high and low glucose alerts**
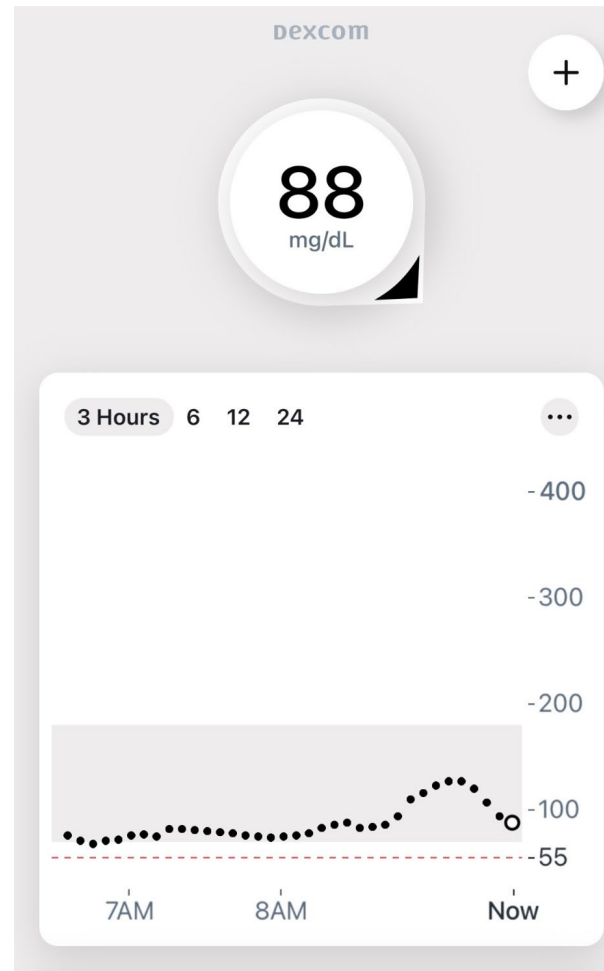
Value of the Trend Arrows
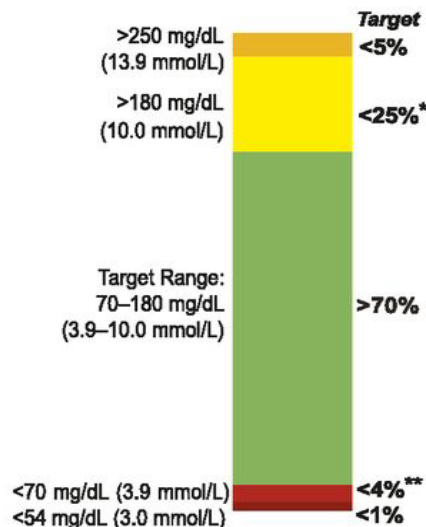
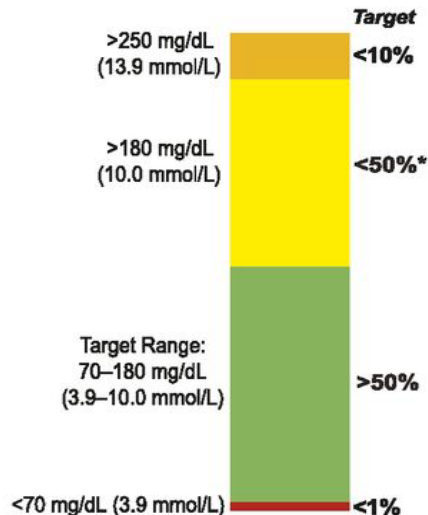|	
➡	Constant: your glucose is steady (not increasing/decreasing more than 1 mg/dL each minute)
➚	Slowly rising: Your glucose is rising 1–2 mg/dL each minute
⬆	Rising: Your glucose is rising 2–3 mg/dL each minute
⬆⬆	Rapidly rising: Your glucose is rising more than 3 mg/dL each minute
➘	Slowly falling: your glucose is falling 1–2 mg/dL each minute
⬇	Falling: your glucose is falling 2–3 mg/dL each minute
⬇⬇	Rapidly falling: your glucose is falling more than 3 mg/dL each minute
no arrow	No rate of change information: the receiver cannot always calculate how fast your glucose is rising or falling

Time in Range Recommendations

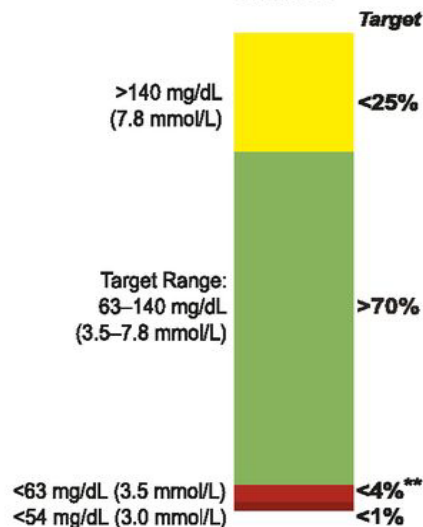**Type 1¤ & Type 2 Diabetes**

	Target
>250 mg/dL (13.9 mmol/L)	<5%
>180 mg/dL (10.0 mmol/L)	<25%*
Target Range: 70–180 mg/dL (3.9–10.0 mmol/L)	>70%
<70 mg/dL (3.9 mmol/L)	<4%**
<54 mg/dL (3.0 mmol/L)	<1%

Older/High-Risk: Type 1 & Type 2 Diabetes

	Target
>250 mg/dL (13.9 mmol/L)	<10%
>180 mg/dL (10.0 mmol/L)	<50%*
Target Range: 70–180 mg/dL (3.9–10.0 mmol/L)	>50%
<70 mg/dL (3.9 mmol/L)	<1%

Pregnancy: Type 1 Diabetes†

	Target
>140 mg/dL (7.8 mmol/L)	<25%
Target Range: 63–140 mg/dL (3.5–7.8 mmol/L)	>70%
<63 mg/dL (3.5 mmol/L)	<4%**
<54 mg/dL (3.0 mmol/L)	<1%

Pregnancy: Gestational & Type 2 Diabetes§

>140 mg/dL (7.8 mmol/L)
Target Range: 63–140 mg/dL (3.5–7.8 mmol/L)
<63 mg/dL (3.5 mmol/L)
<54 mg/dL (3.0 mmol/L)

¤ For age <25 yr., if the A1C goal is 7.5%, then set TIR target to approximately 60%. (See *Clinical Applications of Time in Ranges* section in the text for additional information regarding target goal setting in pediatric management.)

† Percentages of time in ranges are based on limited evidence. More research is needed.

§ Percentages of time in ranges have not been included because there is very limited evidence in this area. More research is needed. Please see *Pregnancy* section in text for more considerations on targets for these groups.

* Includes percentage of values >250 mg/dL (13.9 mmol/L).

** Includes percentage of values <54 mg/dL (3.0 mmol/L).

AGP (Ambulatory Glucose Profile) Report

- Minimum of 14 day report
- Is on standard print outs of CGM and AIP
- Statistical summary of pt information and glucose exposure
- Visual display with 14 day modal day
- Condensed daily view of glucose excursions
- Average displayed
- Coeffient of variation < 36%(the higher the CV the more variation

AGP Report

Name _____

MRN _____

American Diabetes Association

GMI (Glucose Management Indicator)

- GMI tells you what your approximate A1C level is likely to be, based on the average glucose level from your CGM readings for 14 or more days.
- What might cause a variation between the GMI and A1c?

Case Study 1: T1DM

- **Background:** 4 y/o girl, T1DM, who has a tradition of spending her Friday nights watching movies and eating pizza with her siblings. Her mom noticed when her daughter ate homemade pizza alone, her glucose levels would spike above **300mg/dL** and crash below **75mg/dL**. Her mom was concerned and contacted the Diabetes Care and Education Specialists at Dandurand's Wellness for diabetes and nutrition counseling.

Take a few minutes to review this report

- **Our Study:** After the individual counseling session, we evaluated her glucose levels with our new recommendations. We collected data from her lunch and dinner on a Friday.

The Menu
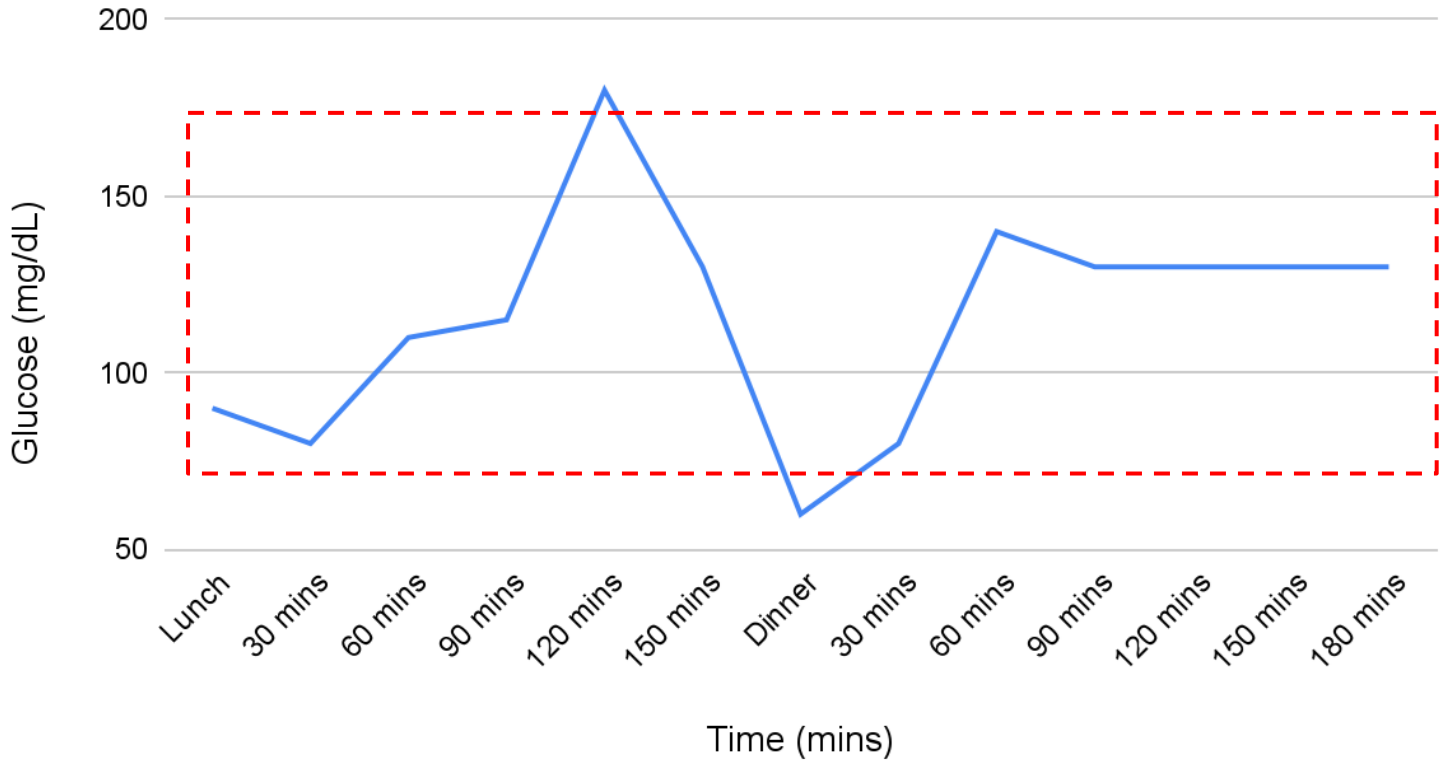
- **Lunch**
    - 3:00pm: ate a corn dog
- **Dinner**
    - 5:15pm: Received insulin dose
    - 5:25pm: Started eating dinner
        - Broccoli
        - Beef stick
        - Pizza

4 y/o T1DM; Lunch and Dinner Effects on Glucose Levels

Red-dotted line: Time in Range

AUTOMATED INSULIN PUMPS

OmniPod 5

Tandem X2 Control IQ

iLet by BetaBionics

Minimed 780G

Tandem Mobi

https://consumerguide.diabetes.org/collections/pumps

Tslim x2 with Control IQ

Tandem X2 with Control IQ

◈ 💧 **Delivers**	Delivers an automatic correction bolus if sensor glucose is predicted to be above 180 mg/dL	
180		
◈ B **Increases**	Increases basal insulin delivery if sensor glucose is predicted to be above 160 mg/dL	
160		
◈ B Maintains	Maintains active Personal Profile settings	
112.5		
◈ B **Decreases**	Decreases basal insulin delivery if sensor glucose is predicted to be below 112.5 mg/dL	
70 mg/dL		
◈ 0 **Stops**	Stops basal insulin delivery if sensor glucose is predicted to be below 70 mg/dL	

Role of the Health Care Professional

- Identify patients that would benefit from a CGM device

- Help determine which device best suits the individual needs of the patient

- Educate and counsel on proper placement and upkeep of the device

- Help read and interpret the data to adjust insulin regimens, other diabetic medications, and implement lifestyle modifications

References

- Dexcom. *Dexcom Continuous Glucose Monitoring | DexCom*. https://www.dexcom.com

- *Continuous Glucose Monitoring (CGM) | FreeStyle Libre (CGM) systems*. https://www.freestyle.abbott/us-en/home.html

- Katie Cook, PharmD Candidate, and PharmD Jonathan Ogurchak. "Continuous Glucose Monitoring: An Opportunity to Understand and Individualize Diabetes Management." *Pharmacy Times*, 15 Nov. 2021, www.pharmacytimes.com/view/continuous-glucose-monitoring-an-opportunity-to-understand-and-individualize-diabetes-management.

- *Dexcom G7 & Libre 3 comparison*. ADCES. https://www.diabeteseducator.org/danatech/glucose-monitoring/continuous-glucose-monitors-(cgm)/cgm-selection-training/dexcom-g7-libre-3-comparison

References

American Diabetes Association, Diabetes technology: standards of medical
care 2023, Diab Care *2023,* Jan; 46 (Supplement 1):S97-S110 (glycemic targets),
S111-127 (technology

Bergenstal R, Beck R, Close, et all. Glucose management indicator (gmi): a
new term for estimating A1c from continuous glucose monitoring. Diab
Care 41(11) 2275-2280.

Ekhlaspour L, Tabatabai I, &Buckingham B. A review of continuous glucose
monitoring datain the age of automated insulin delivery. JSc&Tech 13 (4): P
645-663.

Carlson AL, Mullen, DM, Bergenstal RM. Clinical use of continuous glucose
monitoring in adults with type 2 diabetes. Diabetes Technologies 2017;
(Suppl 2): S4-S11.

Hirsch IB, Veerdersese CA. Professional flash continuous glucose monitoring with
ambulatory glucose profile reporting to supplement A1C: rationale and practical
implementation. Endo Practice 2017; 23:1333-1344.

Messer LH, Berget C, Forlenza GP. A Clinical Guide to Advanced Diabetes Devices and Closed-
Loop Systems Using the CARES Paradigm. Diabetes Technol Ther. 2019 Aug;21(8):462-
469. doi: 10.1089/dia.2019.0105. Epub 2019 May 29. PMID: 31140878; PMCID:
PMC6653788.

GREAT PLAINS
DIABETES CENTER

BELINDA "LINDY" CHILDS, APRN-CNS, BC-ADM, CDCES
JENNIFER SEBES, DNP, NP-C

834 N. SOCORA, SUITE 4
WICHITA, KANSAS 67212
PHONE 316-440-2802
FAX 316-440-2809

EMAIL:INFO@GREATPLAINSDIABETES.COM
WWW.GREATPLAINSDIABETES.COM