Diabetes Technology 101: Pumps, CGM's and Trends... Oh My!!

Presented by

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OBJECTIVES

1) Review insulin pumps and how they work

2) Review continuous glucose monitoring (CGM) technology

3) Recognize utility of diabetes technology in different settings

HOW DOES AN INSULIN PUMP WORK?

"Insulin pumps are small, computerized devices that mimic the way the human pancreas works by delivering small doses of short acting insulin continuously (**basal rate**). The device also is used to deliver variable amounts of insulin when a meal is eaten (**bolus**)". https://www.endocrineweb.com/guides/insulin/insulin-pump-overview

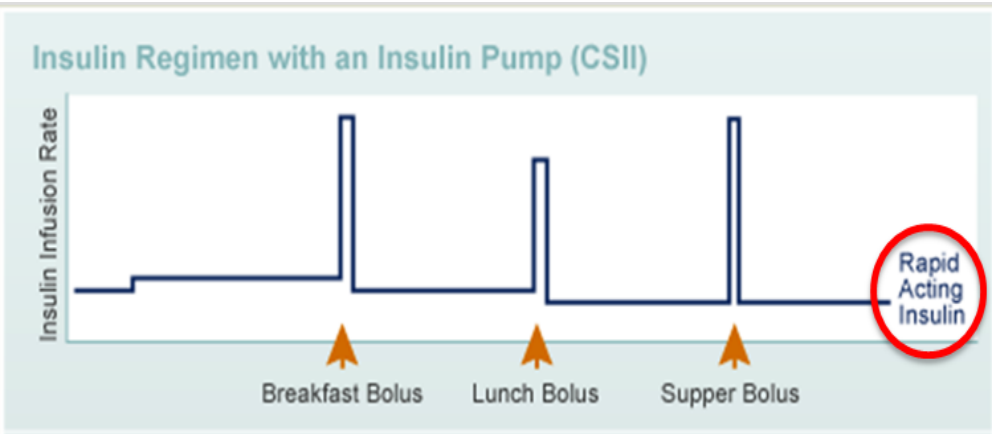
BASAL RATES vs. BOLUS

- **Basal rate** – small amount of background insulin delivered continuously at a preset rate

- **Bolus** – dose of insulin delivered when needed
  (meal and/or correction)

- **Extended** – feature used for certain meals such as high-carbohydrate/high fat

Temp rate – adjust (increase or decrease) basal rate for a pre-determined period of time
(exercise, illness, stress, menstrual cycle)



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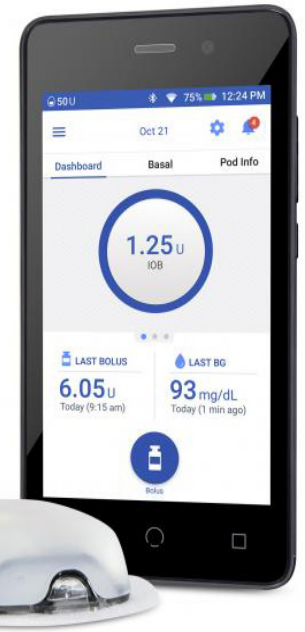
TYPES OF INSULIN PUMPS

- **“Traditional Insulin pumps** have an insulin reservoir (or container) and pumping mechanism, and attach to the body with tubing and an infusion set. The pump body contains buttons that allow you to program insulin delivery for meals, specific types of basal rates, or suspend the insulin infusion, if necessary”.
- **“Insulin patch pumps** are worn directly on the body and have a reservoir, pumping mechanism, and infusion set inside a small case. Patch pumps are controlled wirelessly by a separate device that allows programming of insulin delivery for meals from the patch”.
- https://www.endocrineweb.com/guides/insulin/insulin-pump-overview

EXAMPLES OF DEVICES AVAILABLE



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INFUSION SETS

Insulin pumps

- Infusion sets and reservoirs
  - change every 3 days (or sooner if needed…)

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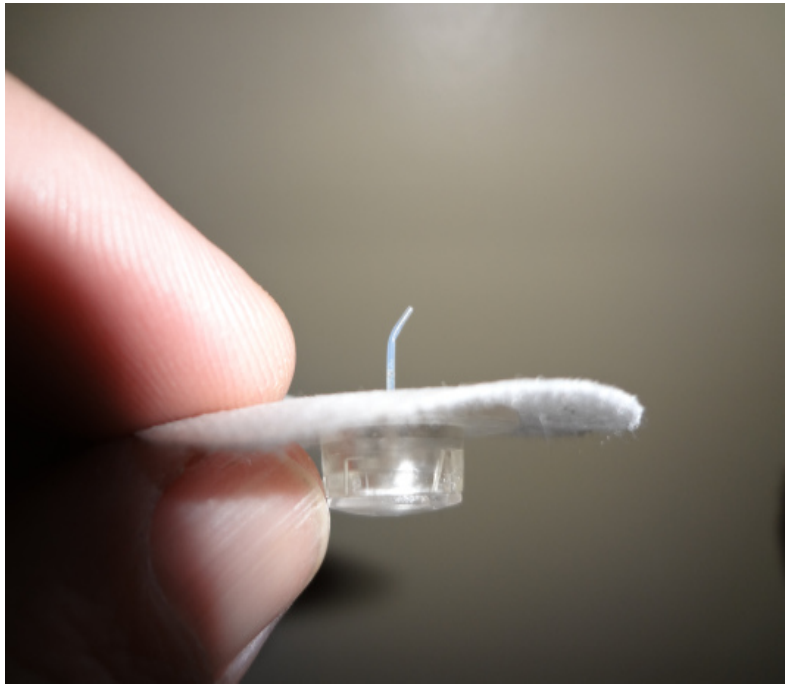
USING AN INSULIN PUMP AT SCHOOL

- "Insulin pumps can effectively be used at school with close **teamwork** by the child, parents, school nurses, teachers, and healthcare provider.
- The American Diabetes Association recommends the following care plan:
- Diabetes Medical Management Plan —This plan describes how a child's diabetes should be managed at school and typically includes information on the following:
  - blood glucose checks
  - your child's usual symptoms of hypoglycemia/hyperglycemia
  - insulin therapy
  - snacks and meals
  - where to contact you
  - emergency plans for hypoglycemia and hyperglycemia"

https://www.endocrineweb.com/guides/how-disconnect-pump-plus-tips-traveling-pump-using-pump-school

TROUBLE SHOOTING: BENT CANNULAS???

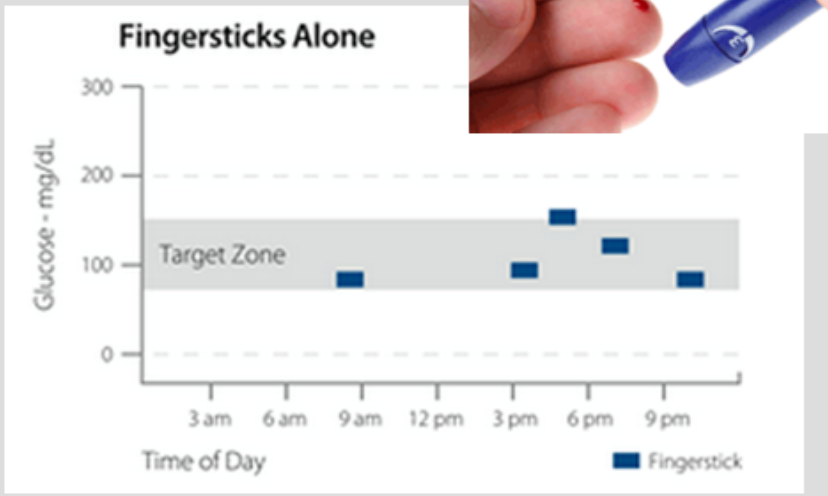


CONTINUOUS GLUCOSE MONITORING (CGM)

"Continuous Glucose Monitoring (CGM) systems track glucose levels throughout the day. CGM users insert a tiny sensor wire just under their skin using an automatic applicator. An adhesive patch holds the CGM sensor housing in place so the sensor can measure glucose readings in interstitial fluid throughout the day and night. A small, reusable transmitter connects to the sensor wire and sends real-time readings wirelessly to a receiver, so the user can view the information. With some systems, a compatible smart device with the CGM system app can serve as the display device. The receiver or compatible smart device displays current glucose levels, as well as historical trends in levels". https://www.dexcom.com/

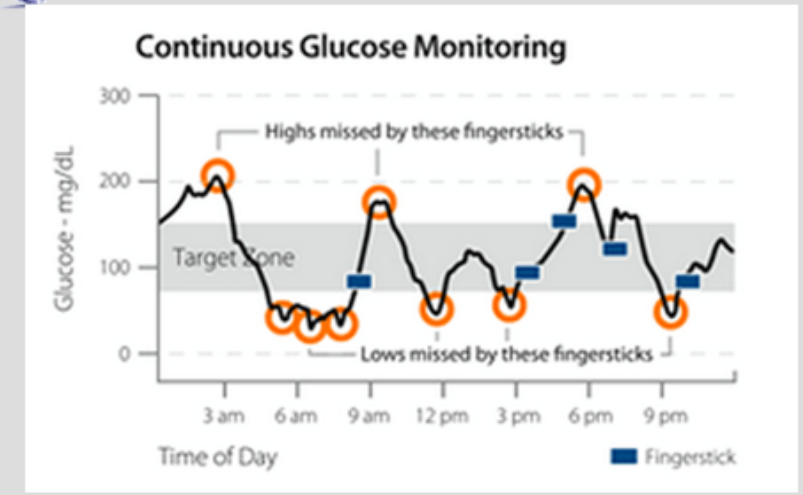
FINGER STICKS vs CGMS

- Traditional "fingerstick" glucose testing

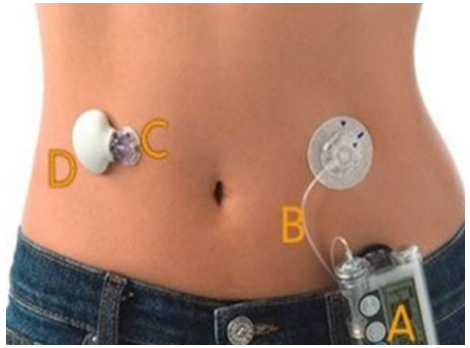


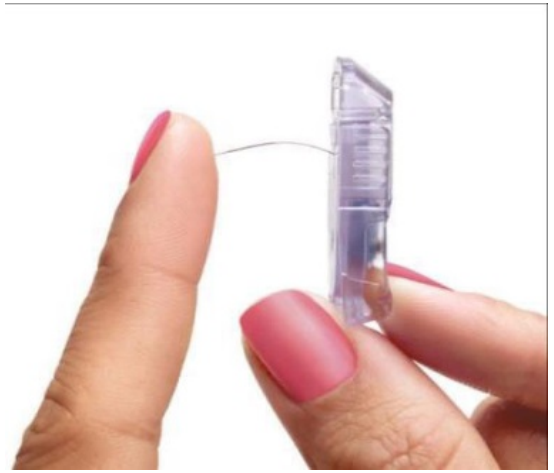
- Continuous glucose monitoring (CGM)

A. Sensor
B. Transmitter
C. Display device



TYPES OF CGM'S





Guardian Sensor 3 measures glucose levels under your skin.

Guardian Connect transmitter* connects to your glucose sensor and sends glucose readings to your app.

Guardian Connect app shows glucose readings on your own cellular phone or mobile device.

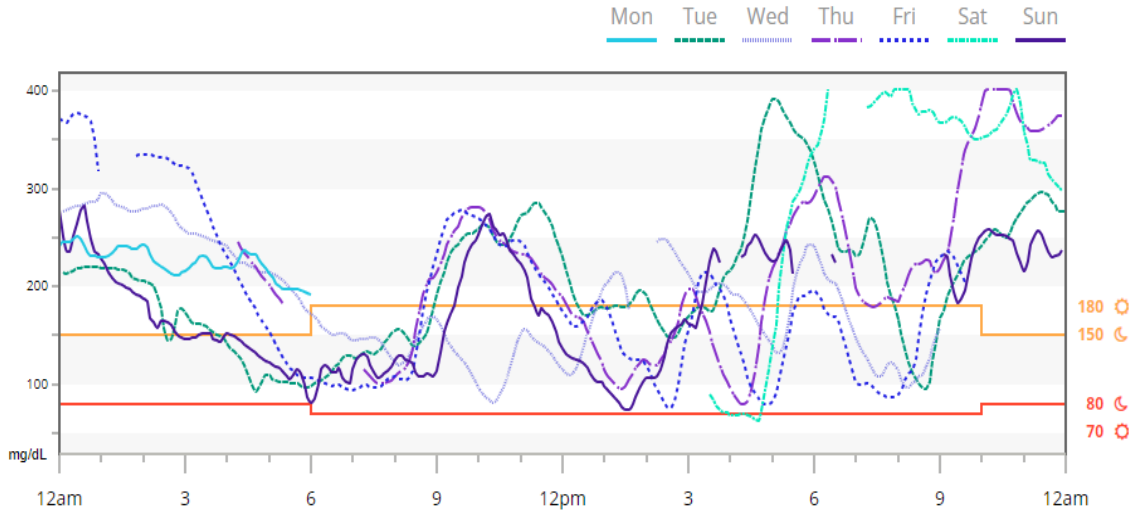
USING CGM FOR TREATMENT DECISIONS

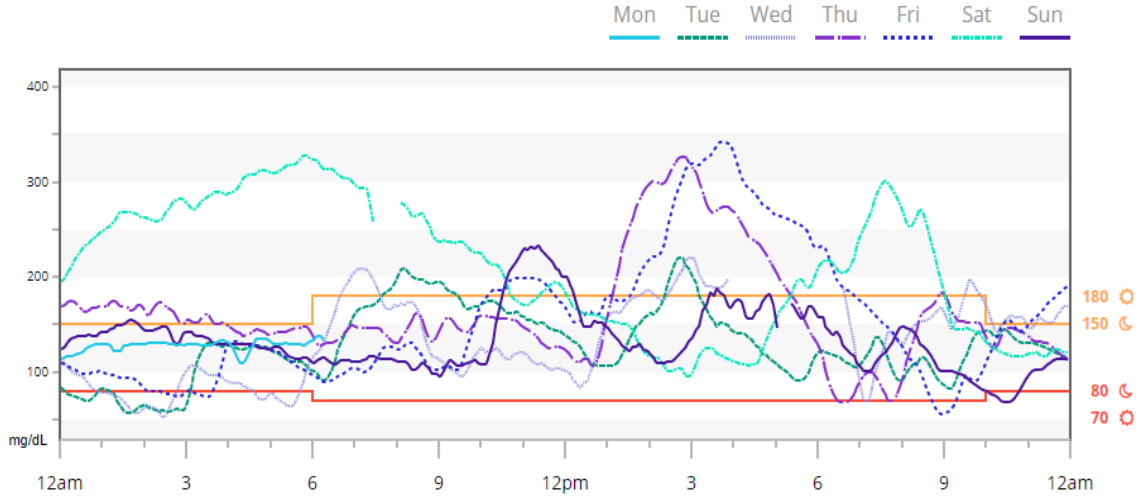
- Home use
- Exercise
- Sick Day Management
- School
- Stress
- Fluctuating Hormones
- Trouble Shooting a Pump

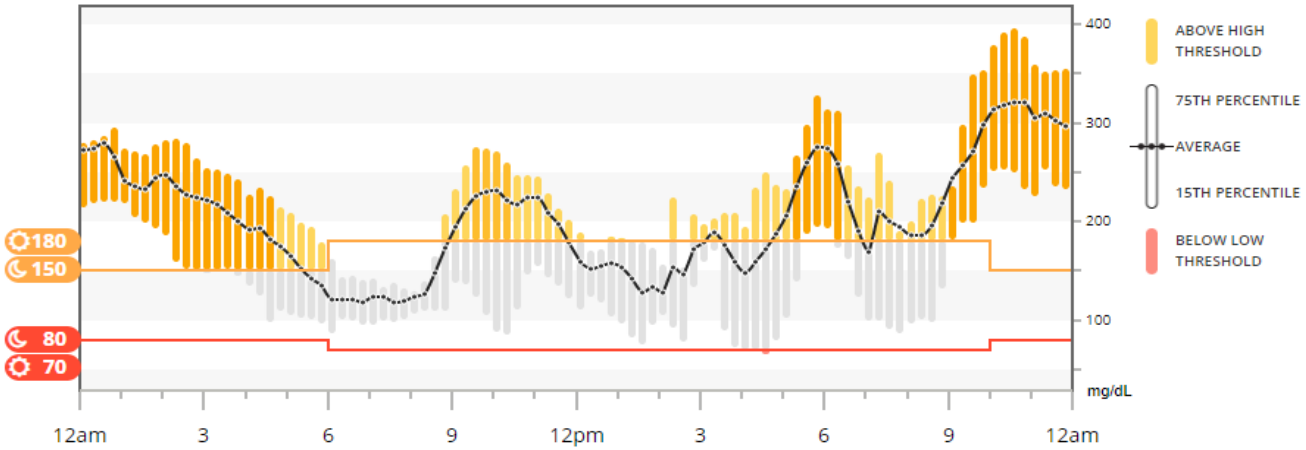
WHAT WOULD YOU DO? (WITHOUT VS WITH CGM)

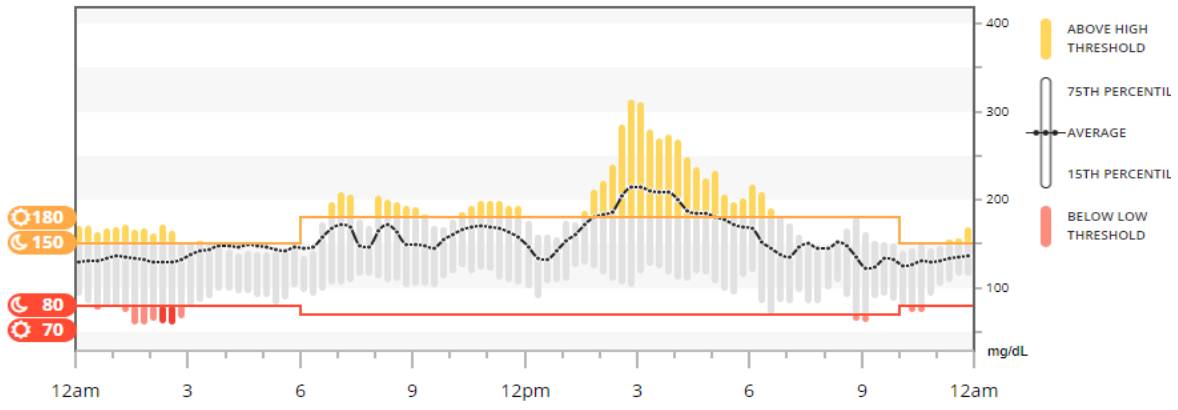
- BG is 150 with ⬆ and PE/Recess is next?
- BG is 125 with ➡? On a pump and going to exercise… Temp Basal?
- BG is 90 with ⬇⬇ and it's lunchtime…
- BG is 250⬆, on a pump and it's been 2 hours since the last bolus…

CGM TRENDS









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THE END

Any Questions??