# MY TYPE 1 STORY: NAVIGATING DIABETES WITH RESILIENCE

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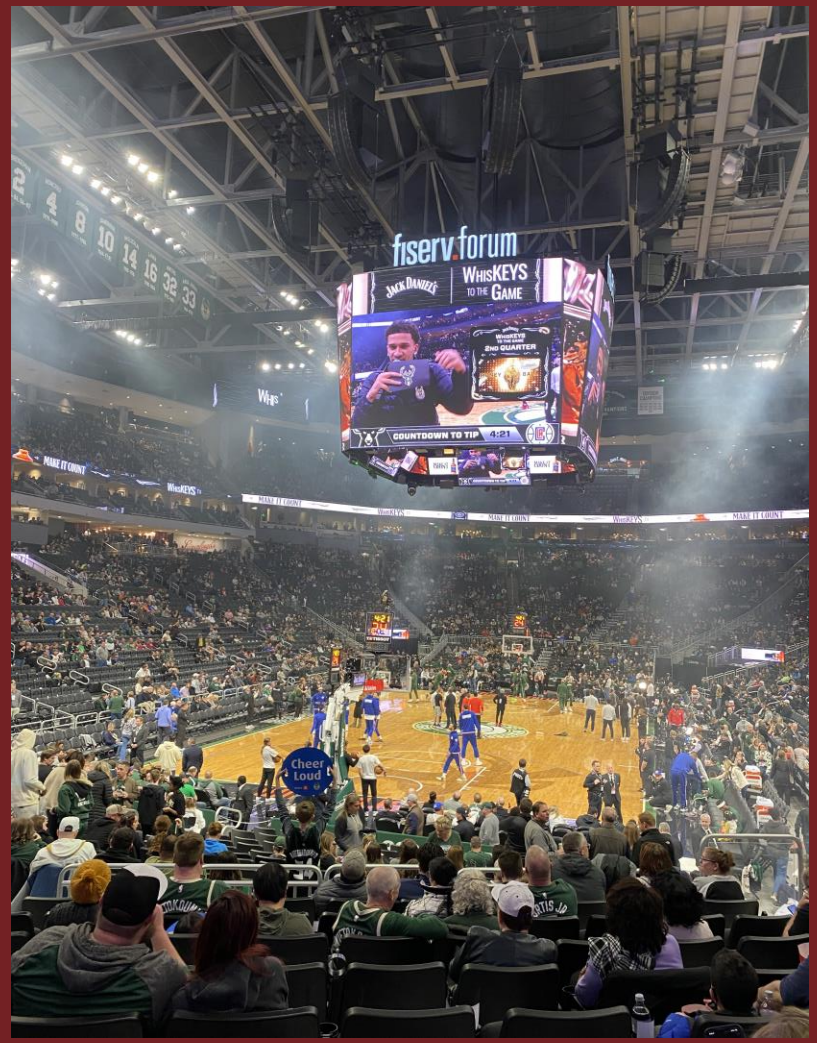
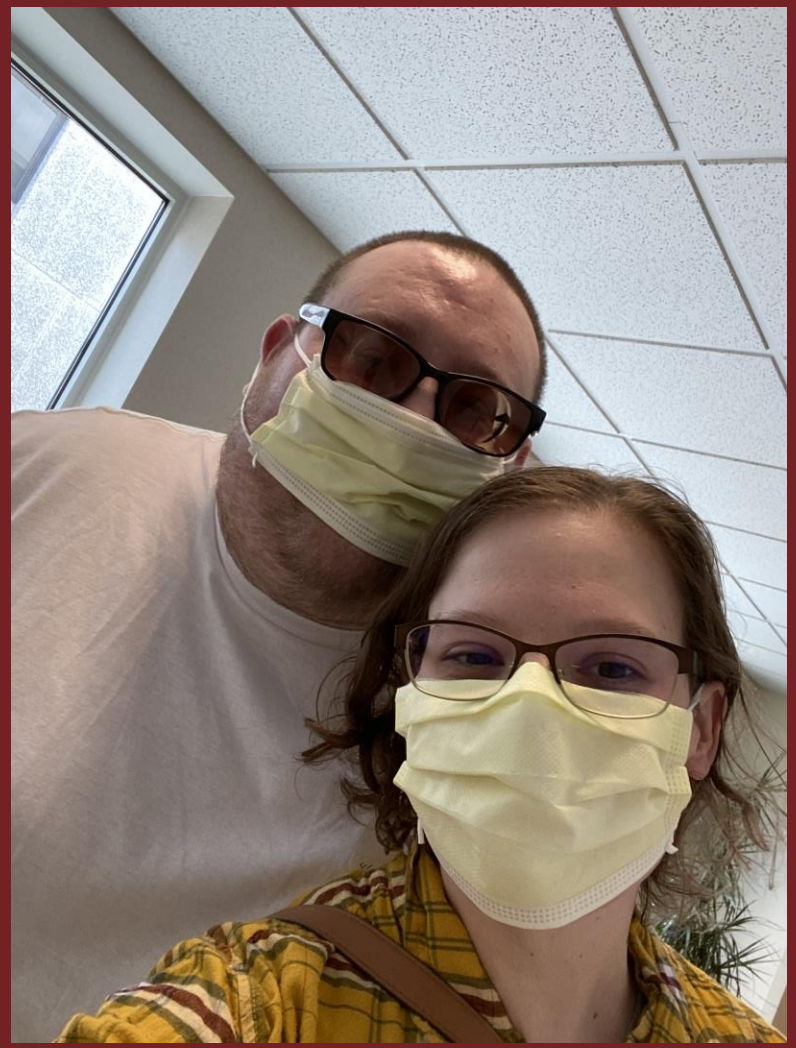
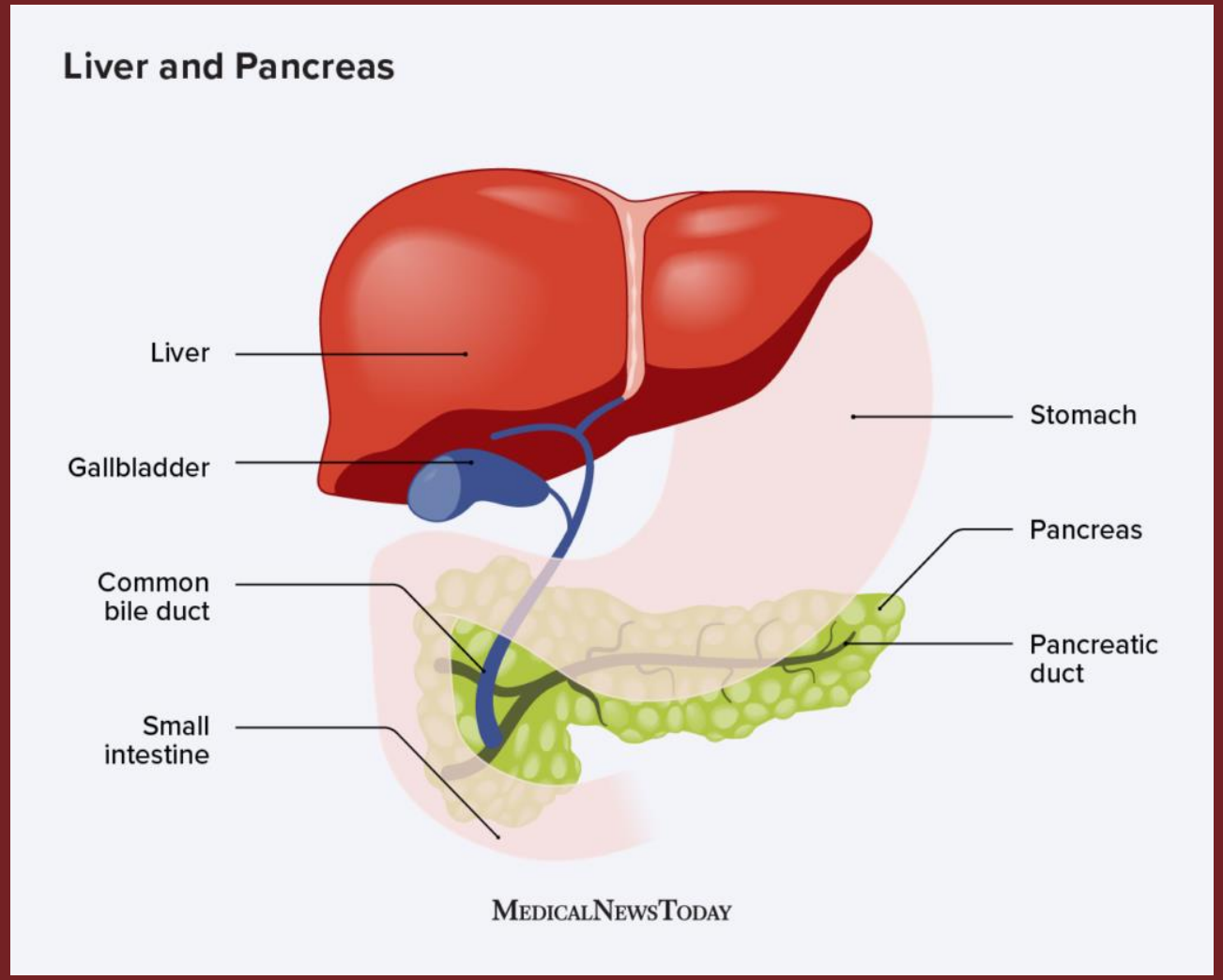
# MY DIABETES JOURNEY


fiserv.forum
WHISKEYS TO THE GAME
COUNTDOWN TO TIP 4:21
Cheer Loud



# AGENDA

- What is diabetes?
- Types of diabetes
- Diabetes management & accommodations
- Life with diabetes
- Resources




# What is Diabetes?

# What is Diabetes?

## Diabetes

**Total:** 38.4 million people have diabetes (11.6% of the U.S. population)

**Diagnosed:** 29.7 million people, including 29.4 million adults

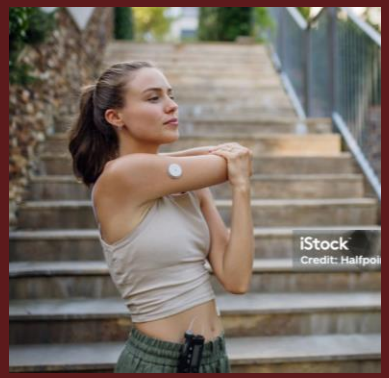
**Undiagnosed:** 8.7 million people (22.8% of adults with diabetes are undiagnosed)

## Prediabetes

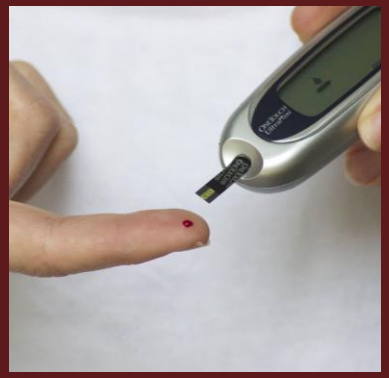
**Total:** 97.6 million people aged 18 years or older have prediabetes (38.0% of the adult U.S. population)

**65 years or older:** 27.2 million people aged 65 years or older (48.8%) have prediabetes

*Statistics from the CDC*







# What is Diabetes?

- A1C
  - Normal: Below 5.7
  - Prediabetes: 5.7-6.4 on two separate tests
  - Diabetes: 6.5+ on two separate tests
- Blood glucose test
  - Random: over 200
  - Fasting
    - 100 – 125  2x = Prediabetes
    - 126+ 2x = Diabetes
- Glucose tolerance test

| A1C % | Estimated Average Glucose (eAG) |
|---|---|
| 10.0+ | 240+ |
| 9.5 | 226 |
| 9.0 | 212 |
| 8.5 | 197 |
| 8.0 | 183 |
| 7.6 | 171 |
| 7.5 | 169 |
| 7.3 | 163 |
| 7.1 | 157 |
| 7.0 | 154 |
| 6.7 | 146 |
| 6.5 | 140 |
| <6.5 | <140 |

*Image from iHealth Labs*

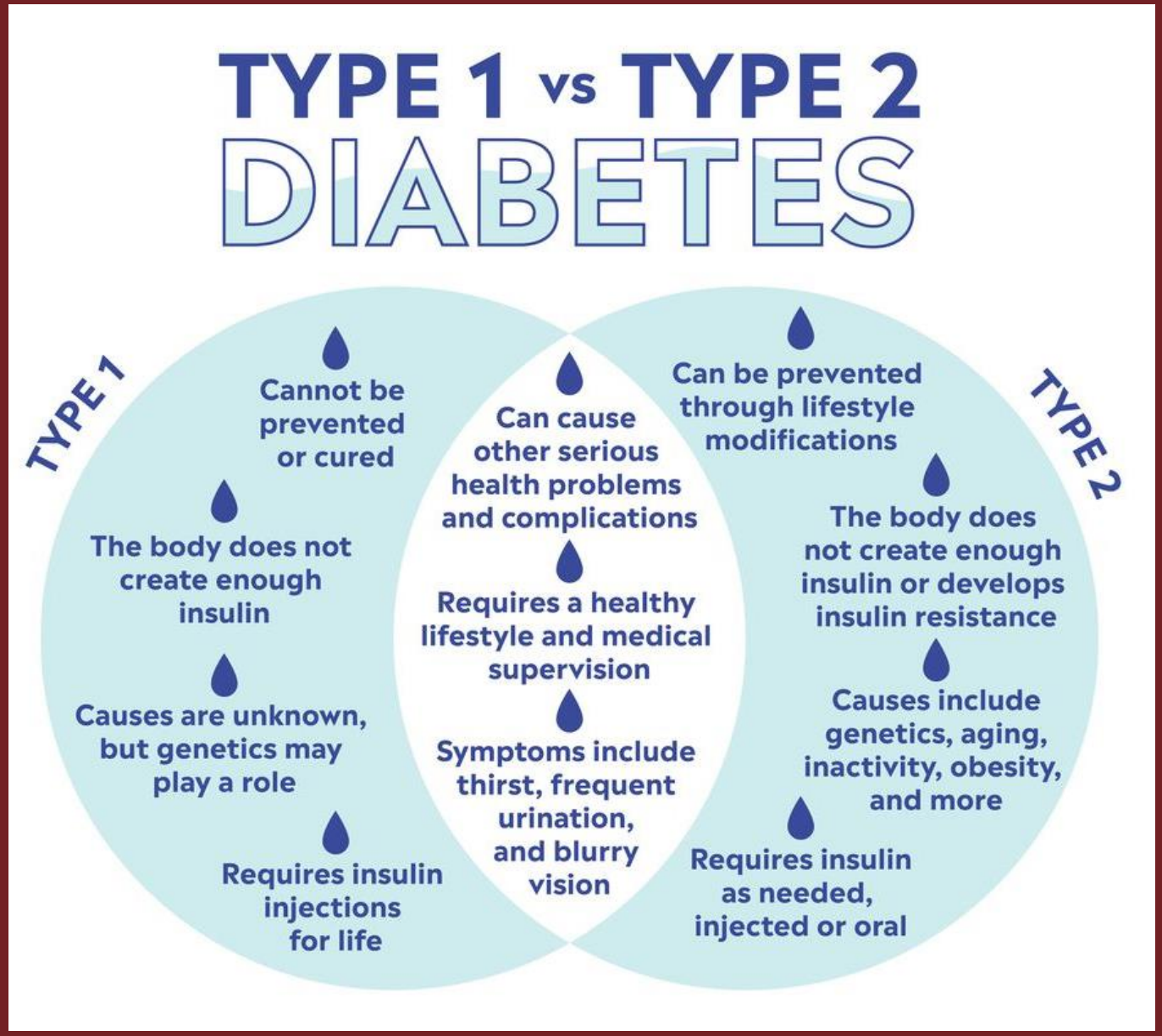



*Image from Prevention*

# Management of Diabetes – Type 2

- Healthy diet
- Regular exercise
- Monitoring of blood sugar
- Medication (metformin, glipizide, januvia, jardiance, ozempic, insulin, etc.)

# Management of Diabetes – Type 1

- Healthy diet
- Regular exercise
- Monitoring of blood sugar
- Administration of insulin
- Counting carbohydrates, fats, and protein


# Monitoring Blood Sugar Levels

## BLOOD SUGAR METERS

- "Old School" prick finger
- Required by the FDA to be accurate within 20% of the actual reading.
- One time cost for the meter, but ongoing cost for test strips

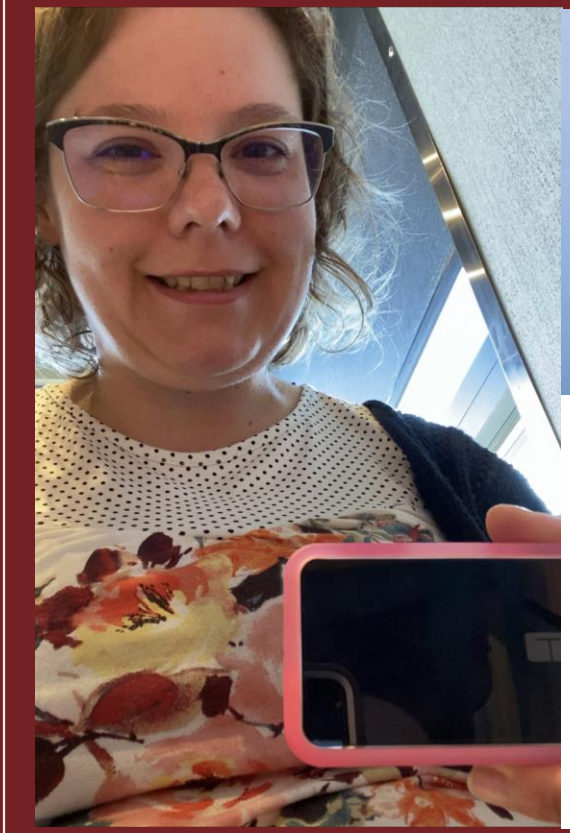
## CONTINUOUS GLUCOSE MONITOR (CGM)

- "New School" wearable monitor
- Accuracy is measured through Mean Absolute Relative Difference (MARD) - the average difference between the device reading and the actual measurement. FDA requires a MARD of 10% or less.
- Gives you real time updates
- Shares data with your medical team (with permission)
- Less accurate than meters, sometimes needs to be calibrated with a meter
- Ongoing cost per month


# Insulin Administration: Manual Daily Injections (MDI)

- Rapid-acting insulin (Humalog, Novolog, FiAsp)
  - Works ~15 mins
  - Peaks ~60 mins
  - Lasts ~4 hours
  - Needs to be taken with every meal
- Long-acting insulin (Lantus, Levemir, Tresiba)
  - Long term coverage 14–40 hours
  - Usually taken 2x a day, morning and night

# Insulin Administration: Insulin Pumps



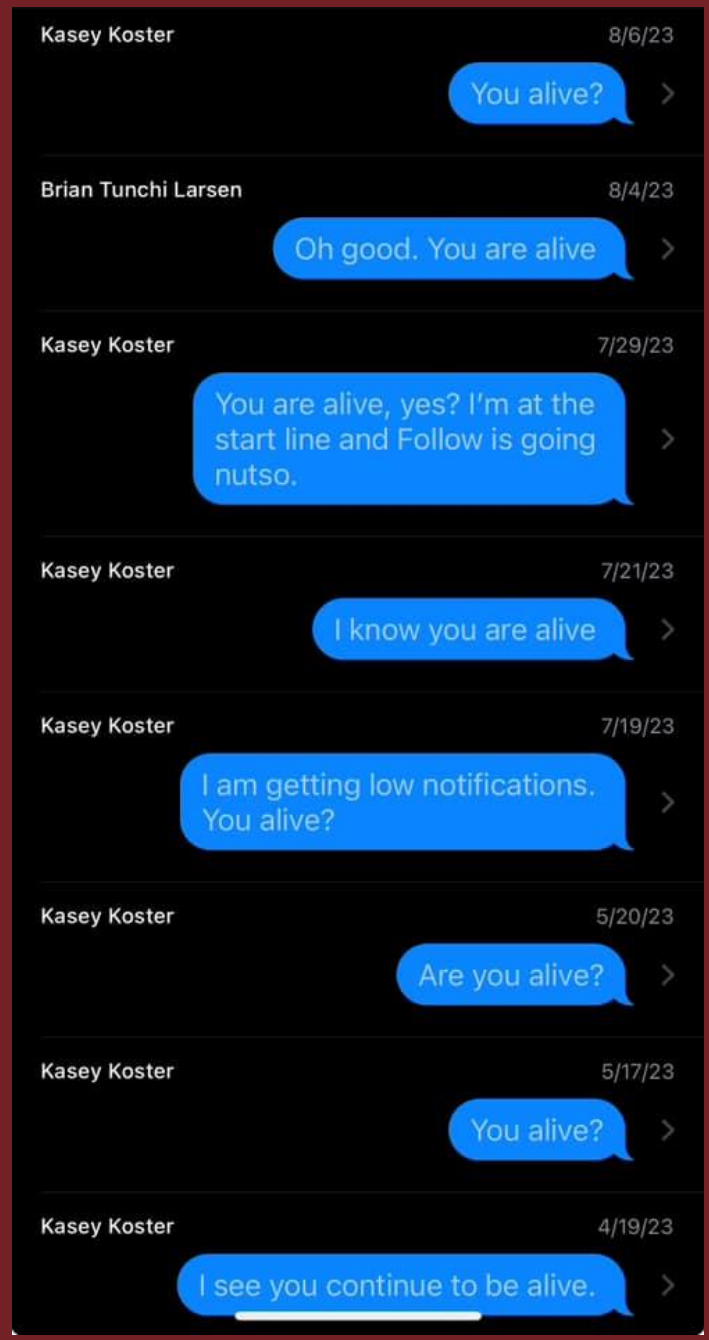

Insulin pumps continuously provide rapid-acting insulin (basal) and on demand (bolus).

Open-loop insulin delivery: individual monitors their own glucose and administers insulin as needed.

Closed-loop insulin delivery: individual's glucose monitoring system communicates with their pump via Bluetooth, which administers insulin as needed to correct glucose levels.

Sounds doable...

Until it's not.



# HIGH

WHEN BLOOD SUGAR IS ABOVE 180

- Taking too little insulin for what was consumed
- Illness or infection
- Stress
- Pump site issue
- Hormonal changes

# LOW

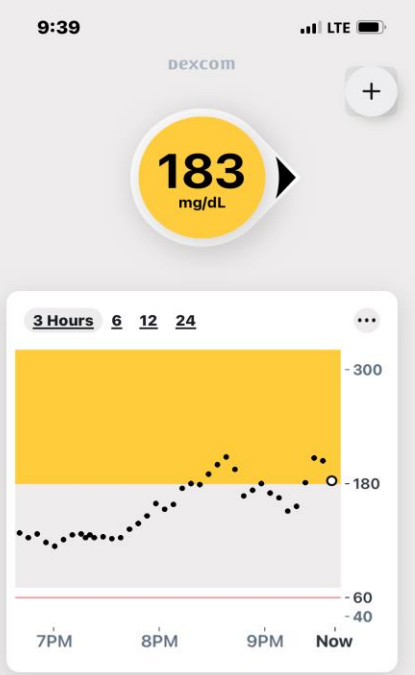
WHEN BLOOD SUGAR IS BELOW 70

- Taking too much insulin for what was consumed
- Waiting too long to eat after taking insulin
- Physical activity

# HIGH

WHEN BLOOD SUGAR IS ABOVE 180

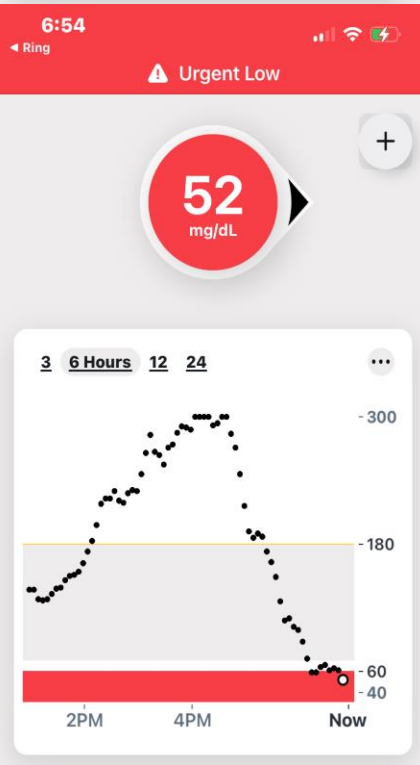
- Thirst*
- Frequent urination*
- Blurry vision
- Increased hunger
- Tiredness*




# LOW

WHEN BLOOD SUGAR IS BELOW 70

- Sweating*
- Shaking*
- Dizziness
- Poor coordination
- Blurry vision*
- Difficulty concentrating*
- Anxiety*
- Irritability*
- Hunger*
- Nausea
- Erratic behavior



# HIGH

WHEN BLOOD SUGAR IS ABOVE 180

- Check pump and infusion sites for malfunctions
- Drink water and/or move around
- Administer a correction dose of insulin
- Check for ketones (if above 240)
- Re-check blood sugar in one hour

*If blood sugar remains high, the individual may go into diabetic ketoacidosis. Symptoms include fruity breath, exhaustion, confusion, nausea, or vomiting. Ask if the person needs medical attention. If they lose consciousness, call 911.*

# LOW

WHEN BLOOD SUGAR IS BELOW 70

- Consume 15 grams of fasting acting carbohydrates like glucose tablets, gel, 4 ounces of juice/regular soda, or fruit snack
- Rest
- Re-check blood sugar in 15 minutes

*In emergency low situations, the individual may lose conscious or have a seizure. Treat with a dose of glucagon (shot or nasal spray), turn on side, and call 911.*

WarriorBuddy™ Bear from Deck My Diabetes

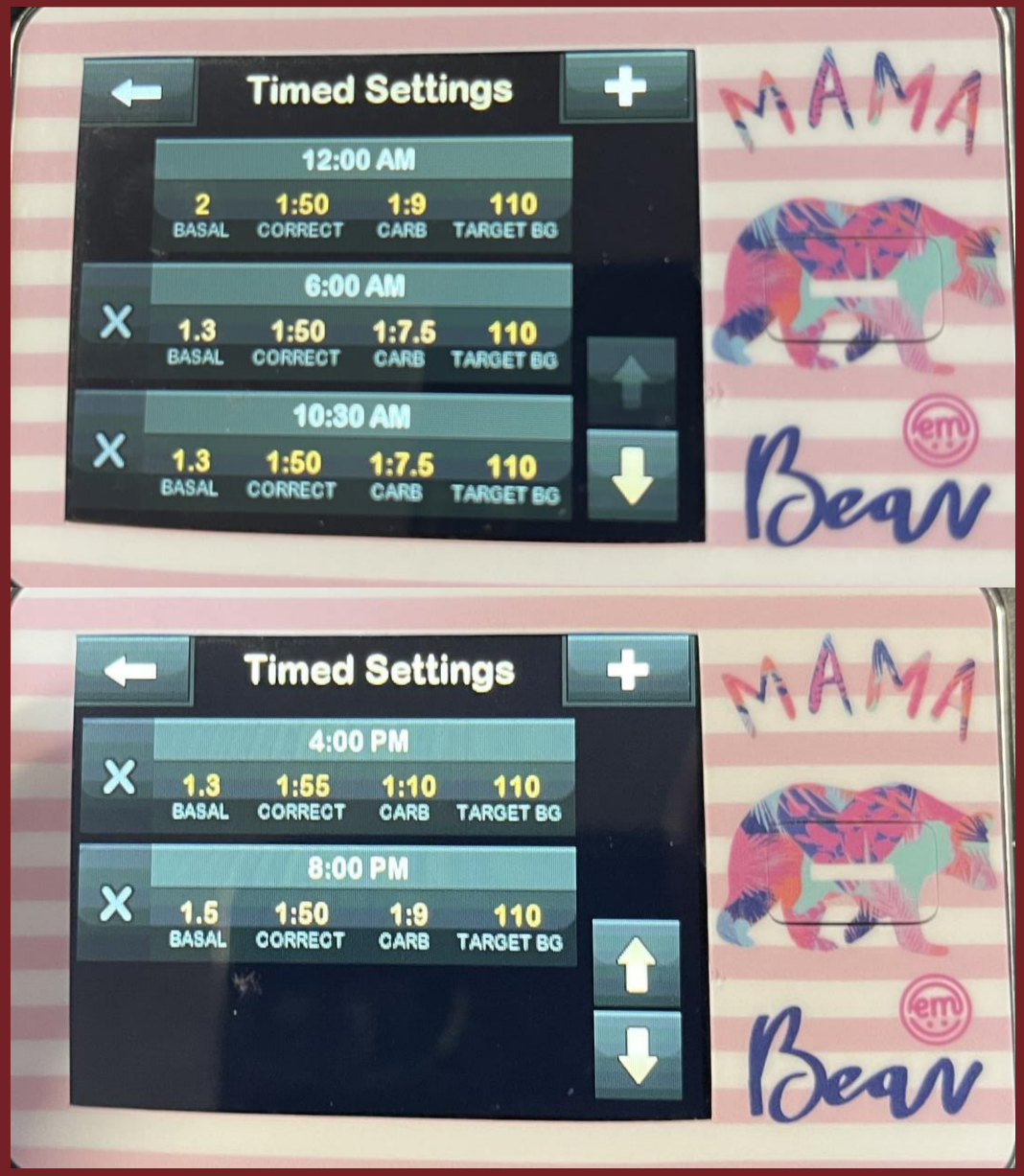
# Diabetes Complications

- Neuropathy
- Vision problems
- Kidney disease
- Cardiovascular disease
- Infection
- Thyroid disease
- Diabetic ketoacidosis
- Diabetes management burnout

# COUNTING CARBOHYDRATES

Type 1 diabetics need to "carb count" to administer the correct amount of insulin. Every individual has a different insulin : carbohydrate ratio. This ratio can vary month to month, week to week, day to day, and even hour to hour.

For example, I currently have five different carb ratios a day. Every time I eat, I need to know how many carbohydrates are in what I am consuming. I enter the amount into my insulin pump, which calculates the carb ratio and administers my insulin. For those on MDI, they calculate it themselves and round to the nearest whole unit,  or use a smart insulin pen.



# How Many Carbs?

# 23G SUGAR
# 41G TOTAL CARBS

Over 41g = LOW
Under 41g = HIGH

6:00a-4:00p
5.47 units

4:00p-8:00p
4.1 units

8:00p-12:00a
4.5 units

**Nutrition Facts**

6 servings per container
**Serving size** **1 brownie (62g)**

**Amount per serving**
**Calories** **270**

| | % Daily Value* |
|---|---|
| **Total Fat** 11g | **14%** |
| Saturated Fat 5g | **25%** |
| Trans Fat 0g | |
| Polyunsaturated Fat 2g | |
| Monounsaturated Fat 3.5g | |
| **Cholesterol** 0mg | **0%** |
| **Sodium** 170mg | **7%** |
| **Total Carbohydrate** 41g | **15%** |
| Dietary Fiber 1g | **4%** |
| Total Sugars 23g | |
| Includes 23g Added Sugars | **46%** |
| **Protein** 2g | |

Vit. D 0mcg 0% • Calcium 20mg 0%
Iron 1.7mg 8% • Potas. 80mg 0%

# How Many Carbs?

# 14G SUGAR
# 27G TOTAL CARBS

Over 27g = LOW

Under 27g = HIGH

6:00a - 4:00p

3.6 units

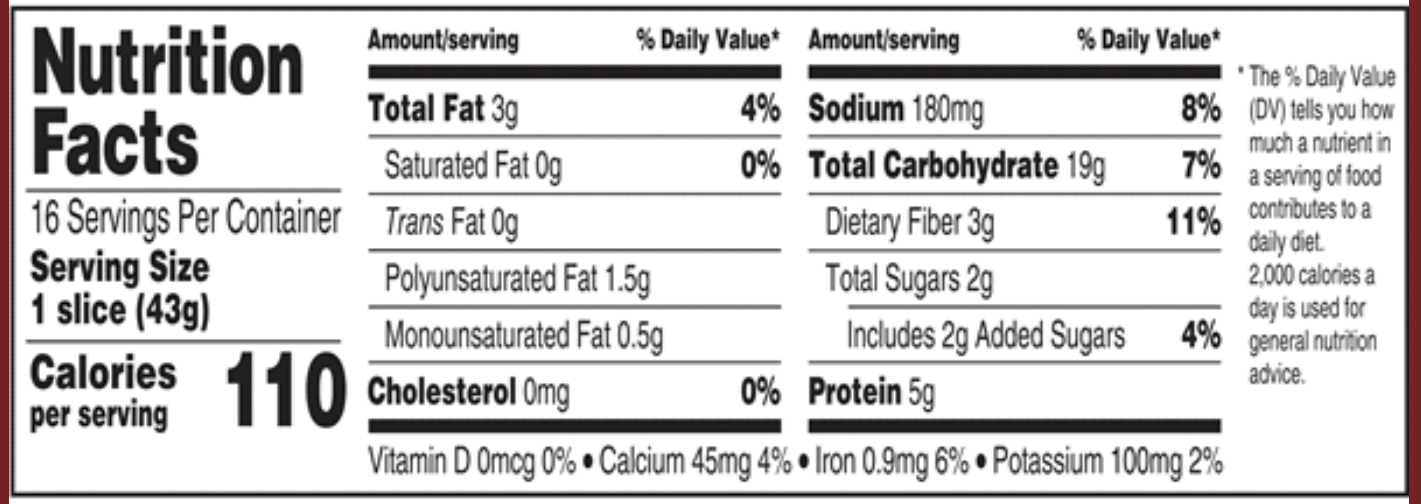
4:00p - 8:00p

2.7 units

8:00p – 12:00a

3 units

# How Many Carbs?



**Nutrition Facts**

16 Servings Per Container

**Serving Size**
**1 slice (43g)**

**Calories per serving** **110**

| Amount/serving | % Daily Value* | Amount/serving | % Daily Value* |
|---|---|---|---|
| **Total Fat** 3g | **4%** | **Sodium** 180mg | **8%** |
| Saturated Fat 0g | **0%** | **Total Carbohydrate** 19g | **7%** |
| *Trans* Fat 0g | | Dietary Fiber 3g | **11%** |
| Polyunsaturated Fat 1.5g | | Total Sugars 2g | |
| Monounsaturated Fat 0.5g | | Includes 2g Added Sugars | **4%** |
| **Cholesterol** 0mg | **0%** | **Protein** 5g | |

Vitamin D 0mcg 0% • Calcium 45mg 4% • Iron 0.9mg 6% • Potassium 100mg 2%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

# 2G SUGAR
# 19G TOTAL CARBS
# (PER SLICE)

Over 19g = LOW

Under 19g = HIGH

6:00a - 4:00p

2.53 units

4:00p - 8:00p

1.9 units

8:00p - 12:00a

2.1 units

# To Put In Perspective

Recommended carbohydrate consumption per meal for a diabetic from the U.S. Centers for Disease Control and Prevention is 60g per meal.

When I was in the hospital, I was "educated" to keep my carb intake at breakfast to 30g, lunch to 40g, and dinner to 60g. I've since abandoned this idea and have adopted my own standards to carb consumption, because as a Type 1, I am my pancreas and can give myself as much insulin as I need!

# Diabetes & Pregnancy

## Gestational Diabetes

- Only occurs during pregnancy – typically diagnosed 2nd trimester
- Treated with changes in diet/exercise or medication/insulin
- Unknown cause
  - Insulin resistance caused by hormones released by placenta
  - Mother's pancreas not producing enough insulin or body isn't using insulin effectively

## Pregnant Person with Type 1 Diabetes

- Not only during pregnancy
- Insulin resistance
- High risk pregnancy

# Diabetes & Pregnancy

- Expected to keep blood sugars below 160 mg/dl the entire pregnancy
  - Before a meal: 95 mg/dL or less
  - One hour after a meal: 140 mg/dL or less
  - Two hours after a meal: 120 mg/dL or less
- Type 1 Diabetics experience low blood sugar levels 1st trimester, with insulin resistance growing after the 2nd trimester. Many Type 1s end up using at least 2x the normal amount of insulin they were using before pregnancy.
- Pregnancy complications include higher risk of miscarriage, high blood pressure, preeclampsia, birth defects, large birth weight, neonatal care (low blood sugar, jaundice, breathing problems, heart problems).

# My Pregnancy

- 1st trimester lows (below 60 is considered low during pregnancy, 160 is considered high), 2nd trimester insulin resistance, with insulin needs plateauing at 34 weeks.
- Extra monitoring
  - 1x month meetings with my endocrinologist with bloodwork to measure my A1C and thyroid levels
  - 1x week meetings with my diabetes educator to adjust carb ratios as needed
  - 1x month visits with local OBGYN and a maternal fetal medicine physician 1st & 2nd trimester, every two weeks in 3rd trimester
    - Nearest maternal fetal medicine department was 2 hours away
  - Starting 3rd trimester, 2x a week with local OBGYN office
- Went from using an average of using 31 units of insulin/day to 61/day.
- With hard discipline, maintained an A1C in the normal range (lowest was 4.9, highest was 5.4).

# The Financial Cost of Having Type 1 Diabetes

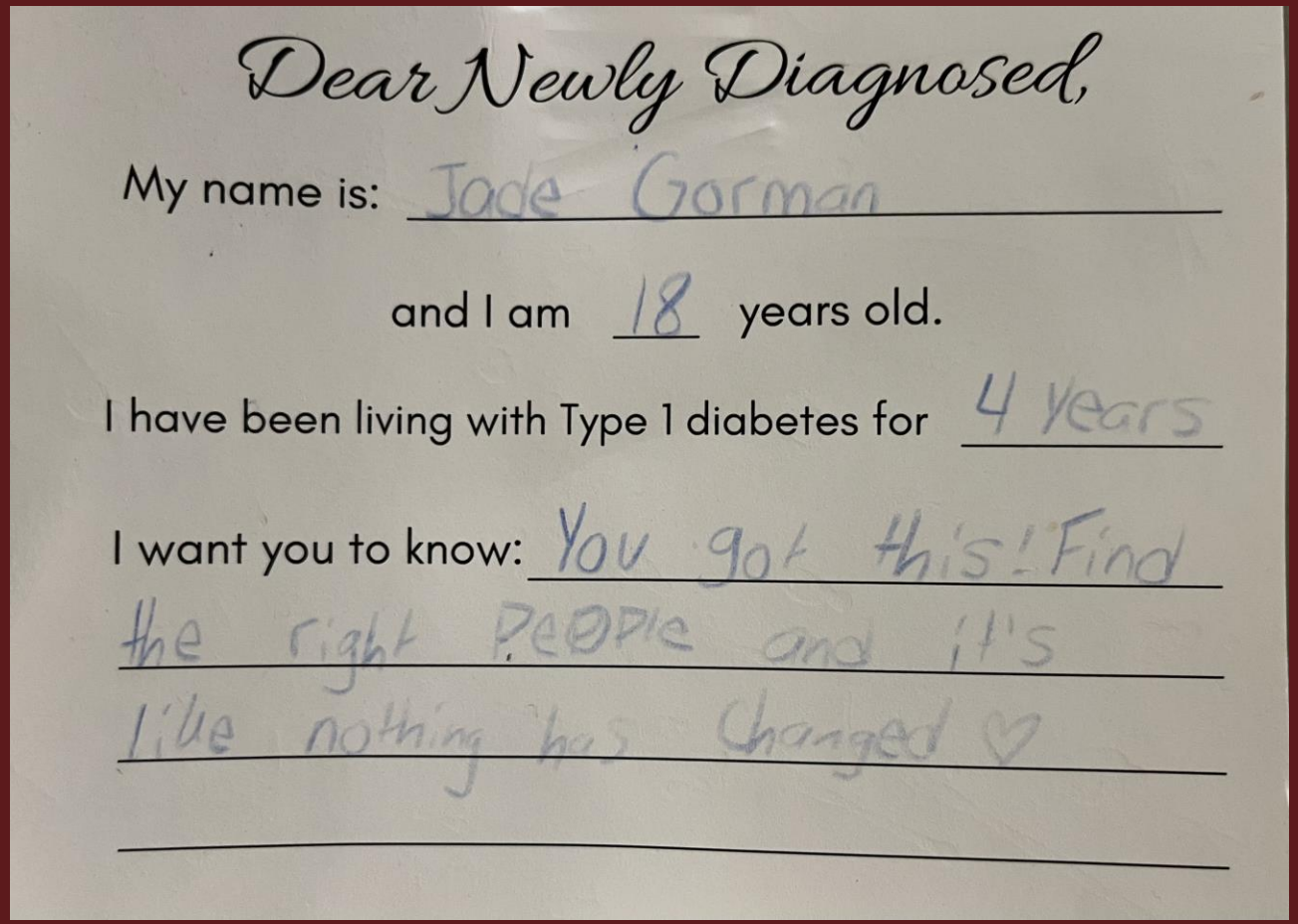
- Health Insurance
- Frequent Doctor Appointments
- Continuous Glucose Monitors
- Insulin
- Lower Carb Diet

# Accommodations

- Give the ability to monitor glucose levels periodically through their phone, device, or insulin pump.
- Allow for temperature-controlled storage of medications, like insulin or food.
- Provide a space to administer medications.
- Have appropriate containers for needles/syringe disposal.
- Provide appropriate food for office events or reward programs.
- Allow time off for medical appointments related to diabetes management, such as a diabetes educator.

# Resources

- Breakthrough T1D
- DiaTribe
- Diabetes Strong
- Facebook groups
  - Type 1 Diabetes Support Group
  - Type 1 Diabetes and Pregnancy
- Podcasts
  - Juicebox
  - This is Type 1
- Dexcom Warriors
- Freestyle Libre



# Accessories

- ExpressionMed
- Pump Peelz
- The Sugar Patch
- Deck My Diabetes


# Will There Be A Cure?

- Pancreas transplantation
- Islet transplantation
- Beta cells replacement
- Gene therapy
- Prevention of T1D

**Janež, A., Guja, C., Mitrakou, A., Lalic, N., Tankova, T., Czupryniak, L., Tabák, A. G., Prazny, M., Martinka, E., & Smircic-Duvnjak, L. (2020). Insulin Therapy in Adults with Type 1 Diabetes Mellitus: a Narrative Review. Diabetes therapy : research, treatment and education of diabetes and related disorders, 11(2), 387–409. https://doi.org/10.1007/s13300-019-00743-7**

**Boscari, F., & Avogaro, A. (2021). Current treatment options and challenges in patients with Type 1 diabetes: Pharmacological, technical advances and future perspectives. Reviews in endocrine & metabolic disorders, 22(2), 217–240. https://doi.org/10.1007/s11154-021-09635-3**

**Powers A. C. (2021). Type 1 diabetes mellitus: much progress, many opportunities. The Journal of clinical investigation, 131(8), e142242. https://doi.org/10.1172/JCI142242**

Medical News Today: www.medicalnewstoday.com

Center for Disease Control: www.cdc.gov

Mayo Clinic: www.mayoclinic.org

American Diabetes Association: www.diabetes.org

Freestyle Libre: www.freestyle.abbott

# THANK YOU

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Project: VISIONS

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