DIABETES TREATMENT: DIET AND TECHNOLOGY - TOGETHER TOWARDS TOMORROW

Cara Schrager, MPH, RD, LDN, CDE
Joslin Diabetes Center

Disclosures to Participants

Notice of Requirements for Successful Completion:
For successful completion, participants are required to be in attendance in the full activity, complete and submit the program evaluation at the conclusion of the educational event.

Presenter Conflicts Of Interest and Financial Relationships Disclosures
Cara Schrager, MPH, RDN, LDN, CDE – Sponsored by Dairy Council of Arizona

Disclosure of Relevant Financial Relationships and Mechanism to Identify and Resolve Conflicts of Interest: No conflicts of Interest.

Non-Endorsement Of Products: Accredited status does not imply endorsement by AADE, ANCC, or ACPE of any commercial products displayed in conjunction with this educational activity.

Off-Label Use: Participants will be notified by speakers to any product used for a purpose other than that for which it was approved by the Food and Drug Administration.
Objectives

- Identify and compare continuous glucose monitors (CGMs) and insulin pumps
- Describe how healthy eating and technology can work together to improve diabetes outcomes
- Interpret technology data to guide nutrition recommendations

www.ttpoll.com
- Log into your web browser on your phone.
- It will say “polling is closed” until I click on the next slide.
How much do you agree with this statement: I am proficient in the latest diabetes technology?

A. Strongly Agree
B. Agree
C. Somewhat Agree
D. Neutral
E. Somewhat Disagree
F. Disagree
G. Strongly Disagree

Managing diabetes – walking a tight rope

Hyperglycemia consequences:
- Retinopathy
- Nephropathy
- Neuropathy
- Vascular complications

Hypoglycemia consequences:
- Psychosocial
- Financial
- Morbidity
- Mortality
**Therapy options available for PWD today**

<table>
<thead>
<tr>
<th><strong>MDI</strong></th>
<th>![MDI Image]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CSII (Traditional &amp; Patch)</strong></td>
<td>![CSII Image]</td>
</tr>
<tr>
<td><strong>Personal CGM</strong></td>
<td>![Personal CGM Image]</td>
</tr>
<tr>
<td><strong>Integrated CSII &amp; CGM</strong></td>
<td>![Integrated CSII &amp; CGM Image]</td>
</tr>
<tr>
<td><strong>Suspend Before Low</strong></td>
<td>![Suspend Before Low Image]</td>
</tr>
<tr>
<td><strong>Predictive Low-Glucose Suspend</strong></td>
<td>![Predictive Low-Glucose Suspend Image]</td>
</tr>
<tr>
<td><strong>Hybrid Closed Loop</strong></td>
<td>![Hybrid Closed Loop Image]</td>
</tr>
</tbody>
</table>
Continuous Glucose Monitors (CGM)

- Wearable device that tracks interstitial glucose (SG)
- Provides SG readings every 5 minutes
- Some CGMs allow individual to set alerts and alarms
- Personal and professional devices

The Diabetes Educator Role in Continuous Glucose Monitoring, AADE Practice Paper, 2018

CGMs—how do they work?

- Still recommended to check BG if sensor readings do not match symptoms
- Trend arrows offer predictive blood glucose information

Images sourced from: Medtronic, Apple
Benefits of CGM

- **Identify % Time In Range (TIR)**
- Can reduce time spent in hypoglycemia
- Can reduce A1C
- Trend arrows provide direction of BG levels
- Can be used as entry-level technology to illustrate need for pump

The Diabetes Educator Role in Continuous Glucose Monitoring, AADE Practice Paper, 2018
Using trend arrows in dosing mealtime insulin

<table>
<thead>
<tr>
<th>Receiver App</th>
<th>Glucose Direction</th>
<th>Glucose Increasing or Decreasing per Minute</th>
<th>Approximate Change in 30 minutes</th>
<th>Insulin Dose Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rising Rapidly</td>
<td>Increasing</td>
<td>&gt;3 mg/dL/min</td>
<td>&gt;90 mg/dL</td>
<td>+</td>
</tr>
<tr>
<td>Rising Slowly</td>
<td>Increasing</td>
<td>2-3 mg/dL/min</td>
<td>60-90 mg/dL</td>
<td>+</td>
</tr>
<tr>
<td>Rising Slowly</td>
<td>Increasing</td>
<td>1-2 mg/dL/min</td>
<td>30-60 mg/dL</td>
<td>+ 1.5</td>
</tr>
<tr>
<td>Steady</td>
<td>Not increasing or decreasing &gt;1 mg/dL/min</td>
<td>No adjustment</td>
<td>No adjustment</td>
<td></td>
</tr>
<tr>
<td>Falling Slowly</td>
<td>Decreasing</td>
<td>1-2 mg/dL/min</td>
<td>30-60 mg/dL</td>
<td></td>
</tr>
<tr>
<td>Falling Rapidly</td>
<td>Decreasing</td>
<td>2-3 mg/dL/min</td>
<td>60-90 mg/dL</td>
<td></td>
</tr>
<tr>
<td>Falling Rapidly</td>
<td>Decreasing</td>
<td>&gt;3 mg/dL/min</td>
<td>&gt;90 mg/dL</td>
<td></td>
</tr>
</tbody>
</table>

No Arrow
System cannot calculate the rate and direction of glucose change

What does an A1C of 7.1% look like?
Beyond A1C

Glucometrics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Target Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1C</td>
<td>&lt;7%</td>
</tr>
<tr>
<td>Mean Glucose</td>
<td>120-160 mg/dL</td>
</tr>
<tr>
<td>CV</td>
<td>&lt;35%</td>
</tr>
<tr>
<td>SD</td>
<td>1/3 of mean</td>
</tr>
<tr>
<td>TIR (70-180mg/dL)</td>
<td>70% +</td>
</tr>
<tr>
<td>TIR (54-70 mg/dl)</td>
<td>&lt; 4 % ( 58 min)</td>
</tr>
<tr>
<td>TIR (&lt;54 mg/dl)</td>
<td>&lt; 1% ( 14 min)</td>
</tr>
</tbody>
</table>

Set CGM expectations

- Finger sticks still required for some devices
  - Calibrations
  - Confirm outlier data
  - If symptoms do not match BG readings
  - CGM failure

- Potential for information overload

- Access
  - Cost and Insurance coverage varies

The Diabetes Educator Role in Continuous Glucose Monitoring, AADE Practice Paper, 2018

CGM device choices

<table>
<thead>
<tr>
<th>Device</th>
<th>Alerts</th>
<th>Alarm</th>
<th>Constant glucose visualization</th>
<th>Calibration/required finger sticks</th>
<th>1 Button insert</th>
<th>Sensor life</th>
<th>Pump pairing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dexcom G6</td>
<td>✗</td>
<td>▶</td>
<td>✗</td>
<td>0</td>
<td>✗</td>
<td>10 days</td>
<td>Tandem Omnipod (dash)</td>
</tr>
<tr>
<td>Dexcom G5</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>2</td>
<td></td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td>Freestyle libre</td>
<td>✗</td>
<td>✗</td>
<td>On-demand</td>
<td>0</td>
<td>✗</td>
<td>10 or 14 days</td>
<td></td>
</tr>
<tr>
<td>Guardian</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>2</td>
<td></td>
<td>7 days</td>
<td>670G</td>
</tr>
<tr>
<td>Eversense</td>
<td>✗</td>
<td>✗</td>
<td>On-demand</td>
<td>2</td>
<td></td>
<td>3 months</td>
<td></td>
</tr>
</tbody>
</table>
Continuous subcutaneous insulin infusion (CSII): Insulin pump

How a Pump Works


How Does an Insulin Pump Work?

Components and their functions:

- A small computerized, battery operated pump
  - Allows the patient to control exactly how much insulin is delivered
- A pump reservoir
  - Similar to a regular syringe, holds 2 to 3 days worth of FAST ACTING insulin
- A thin plastic tube called an infusion set
  - Has a soft cannula or needle at the end inserted just under the skin, usually on the abdomen

How does it work?

- Insulin passes from the pump reservoir through the tubing into the subcutaneous tissue
There is Some Similarity Between Insulin Pumps and a Normal Pancreas

1. They only use one type of insulin:
   - Rapid Acting (Humalog/Novalog)

2. They deliver insulin in two ways:
   - **Basal**: background insulin
   - **Bolus**: Insulin for food and to bring blood glucose levels down

Pumps Are Designed for Multiple Basal Rates

Example of a Basal Profile

- Basal rate can be programmed to increase for dawn phenomenon
- Basal rate can be decreased
- Higher rate can be programmed if needed after dinner

Pumps can be programmed to deliver basal insulin at different rates throughout the day according to each patient’s unique requirements

Lenhard MJ, Reeves GD. Arch Intern Med. 2001;161:2293-2300
Patient Indications

Indications may include:

- Patients who take insulin for meals
- Elevated A1C
- Glycemic variability
- Recurrent hypoglycemia
  - Nocturnal
  - Activity induced
- Hypoglycemia unawareness
- People who forget shots often
- Dawn phenomenon
- Pregnancy and/or pre-pregnancy
- Gastroparesis
- Patient Quality of Life
  - Meal flexibility
  - Activity induced
- Hypoglycemia unawareness
- People who forget shots often

Assess for:

- Willingness to monitor BGs
- Quantify food intake
- Comply with medical follow-up
- Responsible /psychologically stable
- Cost considerations; managing supplies
- Potential for weight gain

Pump expectations

- Willing to check BG at least 4 times/day or wear CGM
- Insight and ability to problem solve and make pump adjustments
- Cost considerations; managing supplies
- Potential for weight gain
## Pumps options

<table>
<thead>
<tr>
<th>Pumps</th>
<th>Tubing</th>
<th>Link to CGM</th>
<th>App to manage data/link to clinic</th>
<th>Insulin storage capacity</th>
<th>Waterproof</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulet Corp: Omnipod</td>
<td>Linked</td>
<td>•</td>
<td>300 units</td>
<td>• up to 25 ft for 60 min</td>
<td></td>
</tr>
<tr>
<td>Medtronic MiniMed 670G with Guardian</td>
<td>•</td>
<td>Integrated</td>
<td>•</td>
<td>300 units</td>
<td>• up to 12 ft for 24 hr</td>
</tr>
<tr>
<td>Medtronic MiniMed 630G, 530G</td>
<td>•</td>
<td>Linked</td>
<td>•</td>
<td>300 units</td>
<td>• up to 12 ft for 24 hr</td>
</tr>
<tr>
<td>Tandem: Basal IQ t:slim X3, t:flex</td>
<td>•</td>
<td>Integrated</td>
<td>•</td>
<td>300-480 units</td>
<td>• up to 3 ft for 30min</td>
</tr>
<tr>
<td>OpenAPS (Artificial Pancreas System) DIY</td>
<td>•</td>
<td>Linked/Integrated</td>
<td>•</td>
<td>Depends on pump used</td>
<td>Depends on pump used</td>
</tr>
</tbody>
</table>

## Commercial pumps

![Commercial pumps images]
Insulin delivery technology

- **InPen**
  - Bluetooth pen
  - Novolog or Humalog
  - Records insulin doses, IOB, calculations, reminders
  - Download app to simulate

- **V-Go**
  - Insulin delivery
  - Daily use

Apps to explore the digital interface

- **Medtronic**

- **Tandem**

- **Omnipod**

- **InPen**
Why did the tomato blush?

Because it saw the salad dressing!

How many carbohydrates are in this restaurant entrée salad?
How many carb grams are in the salad?

A. 25  
B. 50  
C. 75  
D. 100

Smartphone apps
Bluetooth meter app

Traditional pattern management data

<table>
<thead>
<tr>
<th>Time</th>
<th>Before</th>
<th>After</th>
<th>Time</th>
<th>Before</th>
<th>After</th>
<th>Bedtime</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 am</td>
<td>201</td>
<td>68</td>
<td>6:30 pm</td>
<td>245</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td>BG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and Amount</td>
<td>2 peppers</td>
<td>1 oz. Reduced fat cheddar</td>
<td>Egg whites scrambled</td>
<td>8 oz. Orange juice</td>
<td>Low fat turkey sandwich</td>
<td>1 bag of chips</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Granola bar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Before</th>
<th>After</th>
<th>Time</th>
<th>Before</th>
<th>After</th>
<th>Bedtime</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 am</td>
<td>72</td>
<td>136</td>
<td>6:30 pm</td>
<td>163</td>
<td>280</td>
<td></td>
</tr>
<tr>
<td>BG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and Amount</td>
<td>2 slices of wheat toast</td>
<td>1 tsp peanut butter</td>
<td>6 oz. Skim milk</td>
<td>Grilled chicken Caesar salad</td>
<td>1/2 whole wheat pita bread</td>
<td>Apple</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Before</th>
<th>After</th>
<th>Time</th>
<th>Before</th>
<th>After</th>
<th>Bedtime</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 am</td>
<td>198</td>
<td>124</td>
<td>6:30 pm</td>
<td>150</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>BG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and Amount</td>
<td>6 oz. Plain Greek yogurt</td>
<td>1 cup blackberries</td>
<td>8 oz. Minestrone soup</td>
<td>Medium apple</td>
<td>6 crackers</td>
<td>1 oz. Reduced fat cheddar</td>
</tr>
</tbody>
</table>
Current: CGM report patterns

Time in range

<table>
<thead>
<tr>
<th>Night 12am - 6am</th>
<th>Morning 6am - 12pm</th>
<th>Afternoon 12pm - 6pm</th>
<th>Evening 6pm - 12am</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Total Readings:</td>
<td>Total Readings:</td>
<td>Total Readings:</td>
<td>Total Readings:</td>
</tr>
<tr>
<td>0%</td>
<td>5%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>3%</td>
<td>95%</td>
<td>8%</td>
<td>1%</td>
</tr>
<tr>
<td>Time in range (Avg)</td>
<td>Time in range (Avg)</td>
<td>Time in range (Avg)</td>
<td>Time in range (Avg)</td>
</tr>
<tr>
<td>3 min</td>
<td>15 min</td>
<td>4 min</td>
<td>10 min</td>
</tr>
<tr>
<td>132</td>
<td>135</td>
<td>137</td>
<td>159</td>
</tr>
<tr>
<td>Standard Deviation (mg/dL):</td>
<td>Standard Deviation (mg/dL):</td>
<td>Standard Deviation (mg/dL):</td>
<td>Standard Deviation (mg/dL):</td>
</tr>
<tr>
<td>30</td>
<td>30</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>88</td>
<td>85</td>
<td>75</td>
<td>55</td>
</tr>
</tbody>
</table>

12am-6am: 95%  6am-12pm: 82%  12pm-6pm: 71%  6pm-12am: 81%
What can dietitians do with this data?

- Assess prior knowledge, motivation diabetes QOL
- Collect and review glucometrics
- Trends graphs and statistics
- Notice positive behaviors
- Offer 1-2 recommendations
  - May recommend diet changes
  - Patterns: Overnight highs? Post meal lows?
- Write down smart goals
Interview offers critical information to drive treatment changes

Use data to drive recommendations
Current eating patterns in the United States

Percent of the U.S. Population Ages 1 Year and Older Who are Below, At, or Above Each Dietary Goal or Limit

<table>
<thead>
<tr>
<th>Category</th>
<th>Below</th>
<th>At or Above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables</td>
<td><img src="image" alt="Bar Chart" /></td>
<td><img src="image" alt="Bar Chart" /></td>
</tr>
<tr>
<td>Fruit</td>
<td><img src="image" alt="Bar Chart" /></td>
<td><img src="image" alt="Bar Chart" /></td>
</tr>
<tr>
<td>Dairy</td>
<td><img src="image" alt="Bar Chart" /></td>
<td><img src="image" alt="Bar Chart" /></td>
</tr>
<tr>
<td>Oils</td>
<td><img src="image" alt="Bar Chart" /></td>
<td><img src="image" alt="Bar Chart" /></td>
</tr>
<tr>
<td>Total grains</td>
<td><img src="image" alt="Bar Chart" /></td>
<td><img src="image" alt="Bar Chart" /></td>
</tr>
<tr>
<td>Protein</td>
<td><img src="image" alt="Bar Chart" /></td>
<td><img src="image" alt="Bar Chart" /></td>
</tr>
<tr>
<td>Added sugars</td>
<td><img src="image" alt="Bar Chart" /></td>
<td><img src="image" alt="Bar Chart" /></td>
</tr>
<tr>
<td>Saturated fat</td>
<td><img src="image" alt="Bar Chart" /></td>
<td><img src="image" alt="Bar Chart" /></td>
</tr>
<tr>
<td>Sodium</td>
<td><img src="image" alt="Bar Chart" /></td>
<td><img src="image" alt="Bar Chart" /></td>
</tr>
</tbody>
</table>

Note: The center (0) line is the goal or limit. For most, those represented by the orange sections of the bars, shifting toward the central line will improve their eating pattern.

Data Source: What We Eat in America. NHANES 2007-2010 for average intakes by age-sex group. Healthy U.S.-Style Food Patterns, which vary based on age, sex, and activity level, for recommended intakes and limits.

Goals of nutrition therapy for people with diabetes

- To promote and support healthful eating patterns, emphasizing a variety of nutrient-dense foods in appropriate portion sizes, to improve overall health and:
  - Achieve and maintain body weight goals
  - Attain individualized glycemic, blood pressure, and lipid goals
  - Delay or prevent the complications of diabetes
- To address individual nutrition needs based on:
  - Personal and cultural preferences
  - Health literacy and numeracy
  - Access to healthful foods
  - Willingness and ability to make behavioral changes, and barriers to change
    - Stages of change
- To maintain the pleasure of eating by providing nonjudgmental messages about food choices
- Back away from being the food police

ADA 2019 Standards of Care
Glycemic response to a meal

- Macronutrient digestion time:
  - Carbohydrate: 1-2 hours
  - Protein: 2-4 hours
  - Fat: 4-6 hours
- Rapid acting insulin action:
  - Peaks 60-90 minutes and last 3 to 4 hours

How Does Food Affect Blood Glucose?

- Starches, fruit, vegetables, milk, desserts → Carbohydrate → 100% turns to glucose
- Meat, poultry, fish, eggs, cheese, tofu → Protein → Very little turns to glucose
- Oil, salad dressing, nuts, butter → Fat → Very little turns to glucose

Most foods are a combination of carbohydrate, protein, and fat
Glycemic index

- System that ranks foods on a scale from 1-100 based on their effect on blood-glucose levels
- Can use CGM to understand the impact of food on glucose
- Low GI <55
- Glycemic Index is individualized

Factors that influence GI

<table>
<thead>
<tr>
<th>Lowering GI</th>
<th>Raising GI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acidity</td>
<td>Cooking time</td>
</tr>
<tr>
<td>Fiber</td>
<td>Ripeness</td>
</tr>
<tr>
<td>Protein and fat</td>
<td>Processing food</td>
</tr>
<tr>
<td>Solid foods</td>
<td>Liquid foods</td>
</tr>
</tbody>
</table>

Glycemic Index of dairy foods

<table>
<thead>
<tr>
<th>Dairy Products and Alternatives</th>
<th>Glycemic Index, (mean ±SEM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk, full fat</td>
<td>39 ±3</td>
</tr>
<tr>
<td>Milk, skim</td>
<td>37±4</td>
</tr>
<tr>
<td>Ice cream</td>
<td>51±3</td>
</tr>
<tr>
<td>Yogurt, fruit</td>
<td>41±2</td>
</tr>
<tr>
<td>Soy milk</td>
<td>34±4</td>
</tr>
<tr>
<td>Rice milk</td>
<td>86±7</td>
</tr>
</tbody>
</table>

Source: International tables of glycemic index; 2008. Diabetes Care
Macronutrients in dairy

<table>
<thead>
<tr>
<th>Dairy Source</th>
<th>Serving Size</th>
<th>Protein</th>
<th>Carb</th>
<th>Fat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>8oz or 1 cup</td>
<td>8-10g</td>
<td>12g</td>
<td>0-8g</td>
</tr>
<tr>
<td>Cheese</td>
<td>1oz</td>
<td>6-8g</td>
<td>0g</td>
<td>5-9g</td>
</tr>
<tr>
<td>Cottage Cheese</td>
<td>½ cup</td>
<td>13g</td>
<td>4g</td>
<td>0-5g</td>
</tr>
<tr>
<td>Greek Yogurt</td>
<td>6oz</td>
<td>14-18g</td>
<td>7-20g</td>
<td>0-5g</td>
</tr>
<tr>
<td>Traditional Yogurt</td>
<td>6oz</td>
<td>5-7g</td>
<td>15-30g</td>
<td>0-5g</td>
</tr>
</tbody>
</table>

Insulin/glucose after high-GI meal

Glucose after high-GI meal

Meal & bolus
The “Spike”

Insulin/glucose after lower-GI meal

Glucose after medium GI meal

Meal & bolus

Glycemic Index (GI)
Reducing the “SPIKE”

Greek yogurt, almonds & Blueberries

Choose a healthy *placemat*!
Use good nutrition to help glucose excursions

• Balanced “mixed” meals
• Variety of foods with variety of nutrients
• Keep track of what works!

Image: How Sweet Eats

Low GI meals and snacks

• Hummus and whole wheat pita with vegetables
• Nut-based bar
• Whole grain salad with vegetables, nuts and cheese
• Greek Yogurt with seeds and berries
• Apple and string cheese
• Egg and cheese on sprouted grain bread
Case study

• E. is a 28 year old with type 1 diabetes presented for follow up.
• She has been trying lower the number of refined carbohydrates in her diet.
• Her total daily dose of insulin has reduced from 56 units to 42 units.

Case: cont’d

Management plan:
• Novolog by continuous subcutaneous infusion (pump)
  • Insulin to carb ratio: 1 unit for every 10 grams of Carb
  • Insulin correction factor: 1 unit for every 40 mg/dL
• She always boluses before meals but noticed lately that her BG are high 3-4 hours after eating despite counting carbs correctly.
What breakfast would you recommend to this patient?

A. Raisin bran  
B. Eggs with sausage and bacon  
C. Fruit smoothie  
D. 2% Greek yogurt with blueberries and walnuts

Case: cont’d

Breakfast:  
Coffee / plain Greek yogurt with ½ cup of blueberries

Lunch:  
Salad (lettuce, spinach, tomatoes, cucumbers, chick peas) w/grilled chicken, cheese and olive oil dressing  
1 cup chopped mixed fruit

Dinner:  
Sweet potato fries, 6 oz steak  
4 oz. dark chocolate  
Water
• What further information do you need from the patient?
• What could explain her CGM tracing?
• What would you advise the patient?

What information to gather?

• Timing of Insulin
  – Bolus before vs. after meal
  – Combo bolus/Extended/Dual Wave
  – Insulin delivery

• Amount of Carbs in the meal
  – Consider portion size of meal
  – Consider meal composition:
    • High carb/ type of carb
    • Fat content
    • Amount of protein/type of protein

• Effect of exercise
  – Duration, frequency, intensity
Glucose response to a high fat meal

Impact of a meal rich in saturated fatty acids

Hernández et al, 2017
Advanced pump features

- Standard (Normal) Bolus
- Square Wave Bolus
- Combination, Extended (Dual) Bolus

What type of bolus would your recommend to E?

A. Normal Bolus
B. Extended / dual wave bolus
C. Extended / dual wave bolus + 10-20% more insulin
What is DANA? Diabetes Advanced Network Access

DANA is a robust, always-current destination where AADE members can participate in a variety of areas:

- **Products**: Research and review the latest technology products, devices and mobile apps
- **Education**: Access tech-focused continuing education and device training
- **Innovation**: Participate in innovation-shaping research and learn the latest news
- **Resources**: Search a repository of curated evidence-based research and information

www.danatech.org

Take Away Points

- Diabetes technology is advancing rapidly
- Technology reports offer RDs more targeted discussion points
  - Exciting opportunity for pattern management and data interpretation
  - Longer RD appointments allow for detailed interview to match CGM tracings to behaviors
    - Medication dose and time of delivery (if not on CGM integrated pump)
    - Impact of food, exercise, alcohol on blood glucose
    - Opportunity to fine-tune insulin dosing, timing
- Not all individuals will be receptive to or engage with technology in the same way
Resources

- **Download device/Read Reports**
- LibreView: [https://pro.libreview.com/support/](https://pro.libreview.com/support/)
- Dexcom Clarity: [Dexcom Clarity User Guide for Clinics](#)
- AnimasDiasend: [Diasend Support](#)
- Tandem t:connect: [https://tconnect.tandemdiabetes.com/Help/Help.aspx](https://tconnect.tandemdiabetes.com/Help/Help.aspx)
- Practice button pushing – search app store for device
- AADE Practice papers (pump and CGM)