Diabetes Education

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What is Diabetes?

- Diabetes is a group of diseases characterized by high levels of blood glucose (blood sugar)
- Diabetes can lead to serious health problems and premature death

Types of Diabetes

- Type I: Beta cells produce little or no insulin.
  - Approximately 5% of the population with diabetes
- Type II: Fat, Liver, and muscle cells do not respond to insulin (insulin resistance)
  - Approximately 95% of population with diabetes
- Gestational Diabetes: High sugars in Pregnancy which leads to high birth weight babies and can increase chances for later development of Type II DM
Age-adjusted Percentage of U.S. Adults Who Were Obese or Who Had Diagnosed Diabetes

Diagnosing Diabetes

- Fasting Glucose
  - **Diabetes**: 126 mg/dL or greater
  - **Pre-diabetes**: 125 mg/dL to 100 mg/dL
  - **Normal**: less than 100 mg/dL

Risk Factors of Development of Type II DM

- Are overweight or obese
- Are 45 or older
- Are physically inactive
- Have a parent or sibling with type 2 diabetes
- Are African American, Native American, Hispanic American, or Pacific Islander
- High cholesterol
- Gestational DM or a baby over 9 lbs.
- High blood pressure
Optimal lab values for Type II DM

- Optimal Lab values
  - Fasting (no food or liquid prior to testing)
    - 90-130 mg/dL
  - Post-prandial (2 hours after taking first bite of food)
    - <180 mg/dL
  - A1c <7% most individuals

Long-term effects of Hyperglycemia

- Eyes: Retinopathy, Glaucoma, Cataracts
- Teeth & Gums: Dental Caries and Gingivitis
- Heart disease
- Kidney: Nephropathy
- Erectile Dysfunction
- Blood Vessels: Stroke, Heart Attack, HTN
- Neuropathy
- Diabetic Food Ulcers, Infections/Loss of limbs

Neuropathy & Microvascular Complications

<table>
<thead>
<tr>
<th>Neuropathy</th>
<th>Microvascular</th>
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<tbody>
<tr>
<td>Feet &amp; Hands</td>
<td>#1 Cause of adult blindness in U.S.</td>
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<tr>
<td>Heart/Circulation</td>
<td>Kidney disease</td>
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<tr>
<td>Stomach</td>
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<tr>
<td>Bladder/Sex organs</td>
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</table>
**Signs & Symptoms**

<table>
<thead>
<tr>
<th>Hypoglycemia</th>
<th>Hyperglycemia</th>
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</thead>
<tbody>
<tr>
<td>Shakiness</td>
<td>Frequent urination</td>
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<tr>
<td>Anxiety/nervousness</td>
<td>Increased thirst</td>
</tr>
<tr>
<td>Sweating</td>
<td>Blurred vision</td>
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<tr>
<td>Confusion</td>
<td>Fatigue</td>
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<tr>
<td>Irritability</td>
<td>Headache</td>
</tr>
<tr>
<td>Dizzy</td>
<td>Fruity-smelling breath</td>
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<tr>
<td>Hunger</td>
<td>Nausea and vomiting</td>
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<tr>
<td>Sleepiness</td>
<td>Dry mouth</td>
</tr>
<tr>
<td>Blurred vision</td>
<td>Weakness</td>
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**Self-Management**

- Check blood sugars as recommended
- Take Medication
- Follow a meal plan
- Exercise regularly

**How do you know...**

- A diabetic will not know if they are hyperglycemia or hypoglycemic until they test their blood sugars
- Both HYPO & HYPER have a lot of common signs and symptoms
- ...So - if you do not test you do not know!
Common Medications

- Many oral anti-diabetic medications are on the market today
  - Metformin
  - Glyburide/Glipizide
  - Actos
  - Januvia/Precose
  - Victoza

- *Only insulin works for Type 1 Diabetes*....

Pathophysiology of Diabetes

When you eat, your body breaks food down into glucose. **Glucose** is a type of sugar that is your body’s main source of energy.

Meal Planning

- Very few foods are off limits
- It all comes down to how MUCH you are eating of a food item... **Portion control**
- Remember **carbohydrates**- have the greatest effect on blood sugars
- Feed you body on a routine
Consistent Carbohydrate intake

CHO

Breakfast

CHO

Lunch

CHO

Dinner

What is in our food?

Carbohydrate
- Starch
- Fruit
- Milk/Yogurt
- Sweets/desserts
- Starchy vegetables

Protein
- Meats, eggs, cheese, tofu
- Fat
  - Oils, sour cream, mayonnaise, salad dressings, avocados

Blends: Nuts, peanut butter, beans, etc.

Protein
- Animal Based
  - Meat: beef, poultry, fish
  - Eggs
  - Cheese
- Plant Based
  - Tofu
  - Edemame
  - Quinoa
  - Beans
  - Nuts/Seeds

• Protein is needed for cell growth and repair
• Absorbed and broken down to glucose much slower than carbohydrates
• Protein provides early satiety
Fats

- All oils are 120 calories per tablespoon
- Fat is essential to supply energy, maintain healthy skin and carry fat-soluble vitamins like A, D, E, and K
- Contributes to flavor and texture

Carbohydrates

Your body burns carbohydrate for energy and needs more of this nutrient than any other.

This is the only form of energy the brain can use!

Look for high fiber versions of carbohydrates and monitor the portion.

Digestion of Fat/Protein/Carbohydrate effect on Blood Glucose Levels
Liquid Calories

- As much as 100% of carbohydrate may be changed into sugar in your body within 2 hours after eating.
- Liquids are even more quickly digested and absorbed than solid food.
- Eliminating sugar sweetened beverages are highly recommended
  - I.e. Sodas, Sweet Tea, Koolaid, Lemonade, Sports Drinks etc.

Carb Dense Food Items

- Foods with added sugar, such as cookies and candy, contain a lot of carbohydrate per bite.
- HIGH RISK FOOD ITEMS for over eating carbohydrates and spiking blood sugar levels
  - If you plan to eat a dessert, it is better to have a small portion right after the meal rather than waiting a couple of hours.

Serving Sizes

- Bread- 1 slice
- Pasta- 1/3 cup
- Rice- 1/3 cup
- Beans- 1/3 cup
- Cereal- ½ cup
- Corn- ½ cup
- Green peas-½ cup
- Potato- ½ cup or 3 oz
- Bagel, 1/4th
- Tortilla, 6" across- 1
- Popcorn- 3 cups
- Hamburger/hotdog bun- ½
- Corn bread, 2” X 2”
- Grapes (small)- 17
- Banana- ½ large
- Orange/Apple- size of a tennis ball
Carbohydrate Counting

- Typically...
  - MEN can eat 60 grams of carbohydrate per meal and 15-30 grams per snack.
  - Women can eat 45 grams of carbohydrate per meal and 15 grams per snack.

  1 carbohydrate serving = 15 grams
  2 carbohydrate servings = 30 grams
  3 carbohydrate servings = 45 grams
  4 carbohydrate servings = 60 grams

Plate Method

1/2 plate (non-starchy) Veggies
1/4 plate (lean= Poultry/Fish etc.) Protein
1/4 plate (high= Grains & Starchy Veg.) Carbohydrate

Exercise

- Why is exercise important for those with diabetes?
  - Improves blood glucose usage by the muscles
  - Lose weight
  - Gain energy
  - Improves overall health
  - Lowers risk of heart disease
  - Reduce the amount or need for medication
Cant Exercise?

- Pools
- Exercise balls or exercise bands
- Walking tape
- Stationary bikes
- Exercise videos
- Yoga
- Local Recreation Centers or school facilities i.e. YMCA

Chronic Diseases

- The majority of those with diabetes are overweight or obese ... who are also at increased risk of Hypertension and High Cholesterol
- Nearly all adults with diabetes have one or more cholesterol problems, such as:
  - high triglycerides
  - low HDL (“good”) cholesterol
  - high LDL (“bad”) cholesterol

The ABC’s of Diabetes

- A – A1c, or hemoglobin A1c test.
  - ADA goal is <7%
  - AACE goal is <6.5%
- B – Blood pressure
  - <130/80 mmHg for non-pregnant adults.
- C – Cholesterol
  - HDL (good) cholesterol – >40 mg/dl (men); >50 mg/dl (women)
  - LDL (bad) cholesterol – <100 mg/dl
  - Triglycerides – <150 mg/dl
The End

• Questions?