Diabetes Fundamentals

- Nutrition guidelines
- Describe current MNT recommendations
- List 3 teaching strategies to help patients succeed

Exercise Guidelines
- Discuss exercise goals for people with diabetes
- Describe safety precautions

Critical Points to Provide Self-Management Education
- At diagnosis
- Annually to assess education, nutrition and emotional needs
- When new complicating factors arise that influence self-management
- Transitions in care
Diabetes Self Management Ed/Benefits

- Facilitates knowledge, skills, abilities needed for optimal diabetes self-care.
- Incorporates the needs, goals, and life experiences of the individual.
- Supports informed decision making, self-care behavior, problem solving and active collaboration.
- Supports informed decision making
  - Lowers A1c
  - Lose weight
  - Improved quality of life
  - Reduced all cause mortality
  - Reduced health care costs

Diabetes Self Management Ed Benefits

- Increased primary care and preventive services
- Less frequent use of acute care and inpatient admissions
- More likely to follow best practice recommendations (esp those with Medicare)
  - Only 5-7% of Medicare pts receive DSME

Quick Question - 1

- What do you think is contributing to increasing prevalence of type 2 diabetes?
  - A. Junk food
  - B. Lack of exercise
  - C. Changes in gut bacteria
  - D. Environment
  - E. All of the above
BMI Chart with Ranges

Poll Question 2

- For overweight patients with new type 2 diabetes, which would be appropriate nutrition goals?
  (multiple)
  - A. Avoid all desserts and processed foods
  - B. Try to lose 5-7% of current body weight
  - C. Eat less than 7% saturated fat
  - D. Eat breakfast
  - E. Limit sugary beverages

Assess Knowledge, Self Management Skills

- All people with diabetes should be offered a referral for individualized MNT by a Registered Dietitian.
- Individualized MNT Plan
- Eating Patterns
  - Preferences, portion sizes, timing on meals and snacks, eating environment, disordered eating
Medical Nutrition Therapy – What Medicare Covers

- Must be ADA/AADE Recognized
- 3 hours initial benefit in first calendar year
- 2 hours follow-up annually
- Only 10% of patients are referred
- MNT provided by RD can reduce A1c 1-2% points

Medical Nutrition Therapy – ADA

- No ideal percentage of calories from protein, carbohydrate and fat for people with diabetes.
- Macronutrient distribution should be based on an individualized assessment of eating patterns, preferences and metabolic goals.

Goals of Medical Nutrition Therapy – ADA

- Promote and support individualized healthful eating patterns
  - Emphasize eating a variety of nutrient dense foods in appropriate portions to:
    - Attain individualized B/P, BG and lipid goals
    - Attain and maintain body wt goals
    - Delay and/or prevent complications
  - Address individual nutrition needs based on
    - personal and cultural preferences, access to food, willingness and barriers
  - Maintain pleasure of eating by providing positive messages about food
    - Limit food choices only when backed by science
  - Provide practical tools for day-to-day planning
Sodium, Vitamins, Fat and Fiber

- Sodium – Try and keep less than 2,300 mg a day (one tsp a day)
- Vitamin and mineral supplements not recommended -lack of evidence.
  - Consider B12 replacement therapy for those on metformin if level is low
- Fat - same as recommended for general population
  - Less than 10% saturated fat,
  - Limit trans fats
  - Less than 300 mg cholesterol daily
  - Mediterranean Diet looks like good option
- Fiber 25 -38 gms a day

Average American Consumes 22 teaspoons of added sugar a day

- WHO and AHA – Goal 6 teaspoons a Day
  - 1 tsp = 4 gms sugar (15 cals)
  - 15cals x 22 teaspoons a day = 330 cals a day just from added sugars
  - One soda has 12 tsp sugar
  - New labels will list added sugar

Reduce refined Carbs, Added Sugars - ADA

- To control wt, reduce risk of CVD and fatty liver disease
- ADA strongly discourages consumption of:
  - Sugar sweetened beverages
  - Processed “low-fat” or “non-fat” foods with high amounts of refined grains & added sugar

Sugary and processed foods can displace healthier, more nutrient dense food choices
Your health can only get better

Non-Nutritive Sweeteners

- Use can reduce overall calorie intake if substituting for sugary beverages
- But overall, people are encouraged to decrease both sweetened and non-sweetened beverages.
- Emphasize water intake.

Limit refined carbs and added sugars – Instead eat more:

- High fiber carbs loaded, vitamins, minerals and phytonutrients
- 25 gms of fiber a day
- Power Carbs include:
  - Beans
  - Veggies
  - Fruits
  - Whole grain foods
**Approach Depends on Patient**

- **Type 2**
  - Portion Control – lose 5%
  - Plate Method
  - More fiber rich foods
  - Education
- **On Insulin?**
  - Intensive insulin therapy with carb counting should be offered
  - On fixed insulin dose, teach consistent carbs

**Healthy Eating Patterns**
- Mediterranean Diet
- DASH Diet
- Plant based eating
- Diabetes Plate Method
- Weight Watchers or other groups

**Move toward the Tomato**
DASH Diet – Dietary Approaches to Stop Hypertension

- The DASH diet emphasizes vegetables, fruits and low-fat dairy foods — and moderate amounts of whole grains, fish, poultry and nuts.
- Pt recommendations
  - Eat lots of whole grains, fruits, vegetables and low-fat dairy products.
  - Also includes some fish, poultry and legumes, and encourages a small amount of nuts and seeds a few times a week.
  - Red meat, sweets and fats in small amounts. Focus on low saturated fat, cholesterol and total fat.

The Mediterranean diet emphasizes:

- Eating primarily plant-based foods, such as fruits and vegetables, whole grains, legumes and nuts
- Replacing butter with healthy fats such as olive oil and canola oil
- Using herbs and spices instead of salt to flavor foods
- Limiting red meat to no more than a few times a month
- Eating fish and poultry at least twice a week
- Enjoying meals with family and friends
- Drinking red wine in moderation (optional)
- Getting plenty of exercise

Mediterranean Diet Pyramid

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**Balancing Calories**

- Enjoy your food, but eat less.
- Avoid oversized portions.

**Foods to Increase**

- Make half your plate fruits and vegetables.
- Make at least half your grains whole grains.
- Switch to fat-free or low-fat (1%) milk.

**Foods to Reduce**

- Compare sodium in foods like soup, bread, and frozen meals — and choose the foods with lower numbers.
- Drink water instead of sugary drinks.

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**Another plate example**

*Mi planificador de plato
Una comida sabrosa sabe bien*

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**Weight Loss is Important – Type 2**

- Strong evidence that in overwt/obese pts, a 5% *initial* body wt loss:
  - Delays progression from Pre-diabetes to Diabetes
  - Improves glycemic control
  - Improve triglycerides
  - Reduces need for medications
- Optimal goal – Sustained weight loss of 7%
How to Achieve Weight Loss?

- Diet, physical activity and behavioral therapy
- Interventions should be high intensity (16+ sessions in 6 months)
- Goal: 500 - 700 kcal/day energy deficit (3,500 kcals = 1 pound)
- What is 500 kcals?
  - 4 slices bacon, a Big Mac, bagel w/ cream cheese, 4 oz’s tortilla chips, 3 sodas, 9 Oreo cookies, blueberry muffin
  - 5 apples, 5 bananas, 5 eggs, 2 cups of beans, 1 cup almonds

Successful weight loss strategies include

- Weekly self-weighing
- Eat breakfast
- Reduce fast food intake.
- Decrease portion size
- Increase physical activity
- Use meal replacements
- Eat healthy foods
- Drink Water
- Get Sleep

Long Term Weight Loss is the Goal

- Comprehensive wt loss maintenance program prescription:
  - Provide monthly contact
  - Encourage ongoing body weight monitoring (weekly)
  - Continued consumption of reduced calorie diet
  - Participation in high levels of physical activity:
    - 200 – 300 minutes a week
    - 40- 50 minutes, 5 times a week
Metabolic Surgery Benefits

- Increases gut hormone availability
- More likely to cause remission* with recently diagnosed diabetes (more beta cell mass)
- 30 - 63% remission over 1-5 years
- 35 - 50% redeveloped diabetes
  - Avg remission time 8.3 years
- Most pts who undergo surgery maintain substantial improvement of BG control from baseline for ~5 yrs
- Trials demonstrate metabolic surgery achieves superior BG control and reduction of CV risk factors in obese pts with type 2 compared to lifestyle/medical intervention
- Improvements in micro and macro disease and cancer have been observed.
- Procedure may reduce long term mortality
  *remission = BG levels normal without meds

How nutrients affect blood sugar

- Starch
- Fruit
- Milk
- Desserts
Poll Question 3

Which of the following servings equals ~ 15 gms of carbohydrate? (multiple)

A. Bagel
B. 1 ¼ cup strawberries
C. Cup of milk
D. ½ cup of rice
E. ½ cup of jello

Carbohydrate Needs Estimate for Most Adults

<table>
<thead>
<tr>
<th></th>
<th>Grams</th>
<th>Servings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each Meal</td>
<td>45-60 gm</td>
<td>3 - 4</td>
</tr>
<tr>
<td>Snacks</td>
<td>15-30 gm</td>
<td>1 - 2</td>
</tr>
</tbody>
</table>

Carbs affect Post Meal Blood Glucose

RDA – at least 130 gms of Carb a day

Carb Counting - Starch

Each Food has:
80 Calories
15 grams carb
Carb counting - fruit
Each Food has:
- 60 Calories
- 15 grams carb

- 1 small fresh fruit
- 1 1/4 cup strawberries
- 1 slice bread
- 17 small grapes
- 1/4 cup dried fruit
- 2 tbsp nuts
- 1 1/4 cup strawberries

Carb Counting - Milk
Each Food has:
- 90-150 calories
- 12-15 grams carb

- 8 oz buttermilk
- 1 packet diet hot cocoa
- 8 oz milk
- 8 oz soy milk
- 6 oz plain yogurt
- 6 oz light fruit yogurt

Carb Counting - Sweets
Each Food has:
- Calories vary
- 15 grams carb

- 2 inch square cake or brownie, unfrosted
- 1/8 cup diet pudding
- 1/6 cup regular jelly
- 2 tbsp light syrup
- 2 small cookies
- 1 tbsp syrup, jam, jelly, table sugar, honey
- 1/6 cup ice cream or frozen yogurt
- 1/8 cup sherbet
- 1/8 cup sorbet
10 Superfoods

- Beans
- Dark Green Leafy Veggies
- Citrus Fruit
- Sweet Potatoes
- Berries
- Tomatoes
- Fish High in Omega-3 Fatty Acids
- Whole Grains
- Nuts
- Fat-Free Milk and Yogurt

Poll Question 4

- Which of the following is true about alcohol and diabetes? (multiple)
  a. White wine increases blood sugars
  b. Men can have 2 drinks and women can have one drink a day
  c. Alcohol increases risk of hypoglycemia
  d. "If you are going to drink, eat a starchy food"
  e. A shot of tequila is better than a margarita.
Using Alcohol Safely

- Women: 1 or fewer alcoholic drinks a day
- Men: 2 or fewer alcoholic drinks a day
  - 1 alcoholic drink equals:
    - 12 oz beer, 5 oz glass of wine, or 1.5 oz distilled spirits (vodka, gin etc)
- If drink, limit amount and drink with food.
- Can cause hypo and worsen neuropathy

Ms. Gonzales’ Daily Meal plan

<table>
<thead>
<tr>
<th>Break</th>
<th>Lunch</th>
<th>Dinner</th>
<th>Night</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 corn tortillas, 1/2 c. beans, salsa, peppers, egg beaters</td>
<td>Sandwich, low fat potato chips, 1c. juice, 2-4 lowfat cookies</td>
<td>Lg bowl low salt soup, 1c. rice, BBQ meat, salad &amp; cooked vegs, 1 glass wine</td>
<td>1 bowl of cereal</td>
</tr>
</tbody>
</table>

Avg BG
- Break: 120’s
- Lunch: 200’s
- Dinner: 200’s
- Night: 180’s

Poll Question 5

- If someone with diabetes is underweight, what are some possible causes? (multiple)
  - A. Not taking meds / insulin
  - B. Celiac disease
  - C. Undereating
  - D. Poor dentition
  - E. Gastroparesis
Disordered Eating

- "DiaBulimia"
- People with type 1 diabetes give themselves less insulin than needed to lose weight
- Tends to start in adolescence, more likely to occur in women than men.
- Signs: unexplainable spikes, A1c, weight loss, lack of marks from fingerpricks, lack of prescription refills for diabetes meds, records that don’t match A1c.
- Treatment – Mental health specialist and team

Poll question 6

- John has gastroparesis. What is the best recommendation?
  a. Eat raw vegetables and limit fruit
  b. Eat low fiber, small meals
  c. Always take insulin after meals
  d. Avoid foods containing wheat

Gastroparesis

- Gastroparesis: affects 20 – 30% of pt’s w/ longstanding dm
- Delayed emptying of stomach contents due to nerve damage
- S/S include early satiety, fullness, postprandial hypo, vomiting
- Diagnosis: gastric emptying studies, post-prandial hypoglycemia
- Tx: improve BG, small, low fat & fiber meals  meds: reglan, erythromycin
Physical Activity – Key areas

- ADA Physical Activity Position Statement
- Benefits, barriers precautions
- Exercise and activity plan (aerobic, resistance training, etc)
- Adjustment and monitoring of food and/or meds

Where are your patients on this continuum?

Poll Question 7

- Which of the following is an accurate exercise recommendation for people with diabetes?
  - a. Exercise must be done daily for 30 mins to be effective
  - b. Must get stress test before starting an exercise program
  - c. Try not to miss more than 2 consecutive days of exercise
  - d. Incorporate resistance training 2 days a week
  - E. C and D
Exercise Standards

- Adults – 150 min/wk moderate intensity
  - over 3 days a week.
  - Don’t miss > 2 consecutive days w/out exercise
  - Get up every 30 mins - Reduce sedentary time
- T1 and T2 – resistance training 2-3 xs a week
- Flexibility and balance training 2-3 xs a week (Yoga and Tai Chi)

Physical Activity - Kids

- Children should be encouraged to engage in at least 60 minutes of moderate/vigorous physical activity a day.
- Plus bone/muscle strengthening 3 times a week

A hard truth

- Exercise alone doesn’t cause weight loss
- But...
  - It helps keep weight off
  - Decreases visceral fat
  - Decreases CV Risk
- To combat obesity, we need to change the food environment
  - “You cannot outrun a bad diet”
Benefits of Exercise and Diabetes

- Increase muscle glucose uptake 5-fold
- Glucose uptake remains elevated for 24 - 48 hours (depending on exercise duration)
- Increases insulin sensitivity in muscle, fat, liver.
- Reduce CV Risk factors (BP, cholesterol, A1c)
- Maintain wt loss
- Contribute to well being
- Muscle strength
- Better physical mobility

Exercise decreases:

- Sleep apnea
- Diabetic kidney disease, retinopathy
- Depression
- Sexual dysfunction
- Urinary incontinence
- Knee pain
- Need for medications
- Health care costs

Importance of Exercise with Diabetes

- Vital component of prevention as well of the management of type 2 diabetes
- Greatest impact in improving metabolic abnormalities when started early (prediabetes, diabetes)
- Type 1 – emphasis on adjusting insulin to allow for safe participation in all forms of activity.
What Medication works best to prevent and treat type 2 Diabetes?

This medication has been around since beginning of time, but lost popularity due to new life styles, technology and public transportation.

**Major side effects:** sore muscles, improved energy, less depression, increased strength and balance.

**Main action:** improved insulin sensitivity and one dose can lower blood glucose for up to 48 hours.

**Dosing:** Patients can use treatment on most days with instruction to gradually increase dose as tolerated.

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What Medication works best to prevent and treat type 2 Diabetes?

**Cost:** Free with or without a prescription. Actually, due to its effect on blood pressure and lipid reduction, it may end up saving money as the need for other medications diminishes.

**Safety:** Safe and effective for those at risk for diabetes and those diagnosed with diabetes.

**Availability:** Generic - Walking 30 minutes on most days. Designer brands: Dancing, Water Aerobics, Juggling, Gardening, Shopping ++

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After dinner stroll “Passaggiata”

- Walk 10-15 minutes after dinner (and other meals if possible)
- Maximize the walking benefit
- Get the most BG lowering effect
- Especially after high carb meals

Each minute of activity lowers BG by 1 point

- Each minute of exercise lowers BG 1 point
  - 15 minutes of walking drops BG 15 points
  - 30 minutes of biking drops BG 30 points
  - 40 minutes of housework drops BG 40 points
  - 50 minutes of walking and window shopping lowers BG 50 points

Good Exercise Info / Quotes

- “Passagiata” – take an after meal stroll
- Exercise decreases A1c 0.7%
- No change in body wt, but 48% loss in visceral fat
  - ADA PostGrad 2010

  “Every minute of activity lowers blood sugar one point.”

  “I don’t have time to exercise, I MAKE time.” - Mike Huckabee

Best Shake For People with Diabetes

“The only diet shake I recommend is the shake your body makes when you exercise.”

From Debbie Nagata’s slide collection
People are more likely to keep active

- Motivated by keeping healthy
- Benefits are beyond physical
- Host of psychological benefits
  - More energized
  - Less stressed
- Encourage exercise to promote well being
- These effects keep people on track

Progressive Resistance exercise

- Improves insulin sensitivity
- Goal is 2 sessions a week
- Examples include:
  - Exercise with free weights, wt machines, resistance bands
- Each session consisting of least:
  - One set of five or more resistance exercises using large muscle groups

Resistance Training Guidelines

Remember the Following Guidelines:
- Only do the exercises you can.
- Maintain proper posture.
- Keep movements slow and controlled.
- Breathe with each repetition.
- Keep to a comfortable range of motion.

Resistance Exercise Guidelines

Do 2 sets of 8 repetitions for each of the 8 exercises, and do this 2 times a week. Work up to 2-3 sets of 12 repetitions of each exercise (up to 12), and do this 3 times a week.

It is recommended you see a diabetes care provider or a qualified exercise professional, or refer to the resistance training video, to learn how to do the exercises provided in this handout.
General Rules of Thumb

- Perform 2-3 Sets of 8-12 Repetitions, 2-3 Days a week
- If it hurts, stop. Talk to a physical therapist.
- If difficulty with balance, use a chair to stabilize
- Start slow with eventual goal of moderate intensity
- The last few repetitions should be slightly difficult
- Have fun

Poll Question 8

- What are some exercise precautions for people with diabetes? (multiple)
  a. Carry some form of ID on you at all times
  b. Always have a snack if BG <100
  c. Look for signs of hypo for up to 24 hrs after exercise
  d. Carry a snack with you during exercise.
  e. Let someone know your route

Patients to discuss symptoms with provider before starting exercise

- Chest pain and/or shortness of breath
- Leg cramps that go away with rest
- Head, shoulder, neck and or back aches.
- *Any unexplained pain above the belt line should be considered cardiac in origin until proven otherwise.*
Duration of Hypoglycemia Risk

- During exercise
- Immediately after exercise
- Post exercise late onset hypo
  - More often in type 1
  - More often at night
  - Moderate to high intensity exercise
    - > 30 min
  - 4 to 15 hours following an exercise session

Hypoglycemia Prevention Strategies

- If planned activity, adjust insulin in anticipation of activities
- Reduce insulin in post exercise period
- Frequent monitoring in post exercise period
- Pt to keep log to determine how responds to different activities, duration and intensity.

Hypoglycemia Prevention Strategies for Patients on Insulin/Secretagogues

- Carry carb snack/ glucagon ER Kit
- Extra Carb in post exercise period
- Caution with alcohol post exercise
- Adjust carbohydrate prior to planned activity:
  - If using insulin and /or secretagogues
    - BG < 90, consume 15 -30 gms
Behavior Change Strategies

- Five key techniques for success:
  1. Prompt focus on past success
  2. Barrier identification/problem-solving
  3. Use of follow-up prompts
  4. Provision of information on where & when to perform the behavior
  5. Prompt review of behavioral goals.

Help Patients Prepare for Setbacks

“The greatest glory in living lies not in never falling, but in rising every time we fall.”

- Nevil Maskit

Thank You

- Questions?
- Email bev@diabetesed.net
- Web DiabetesEd.net